

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT**

**FINAL SUBSEQUENT MITIGATED NEGATIVE DECLARATION FOR:  
SIGNAL HILL PETROLEUM, INC.; SIGNAL HILL WEST UNIT (SHWU)  
GAS PLANT MODIFICATION PROJECT  
(SCAQMD ID 101977)**

**SCH No. 2014111077**

**February 2015**

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## PREFACE

This document constitutes the Final Subsequent Mitigated Negative Declaration (SMND) for the Signal Hill Petroleum, Inc.; Signal Hill West Unit (SHWU) Gas Plant Modification Project. The Draft SMND was released for a 30-day public review and comment period from December 5, 2014 to January 3, 2015. No comment letters were received from the public relative to the environmental analysis in the Draft SMND. The environmental analysis in the Draft SMND concluded that the proposed project would not generate adverse significant hazards and hazardous materials, noise, or aesthetics impacts after feasible mitigation measures are implemented.

No modifications were made to the proposed project subsequent to release of the Draft SMND for public review. As a result, the conclusions reached in the Draft SMND do not change, and thus, does not require recirculation of the document pursuant to California Environmental Quality Act (CEQA) Guidelines §15073.5. Therefore, this document now constitutes the Final SMND for the project.

Minor revisions to the text of the SMND have been made to identify the document as the Final SMND. Additions to the text are denoted in an underline format; text that has been deleted is shown in a ~~strikeout~~ format.

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## **CHAPTER 1**

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### **PROJECT DESCRIPTION**

Introduction  
Agency Authority  
Background  
Project Description  
Project Location  
Construction Schedule  
Operating Scenarios

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## CHAPTER 1 - PROJECT DESCRIPTION

### 1.1 INTRODUCTION

On June 16, 1998, the City of Signal Hill adopted a Mitigated Negative Declaration (MND) and issued permits to Signal Hill Petroleum, Inc. (SHP) for modifications at the Signal Hill West Unit (SHWU) NO<sub>x</sub> RECLAIM Facility (ID 101977); refer to [Appendix A, Draft Initial Study/Mitigated Negative Declaration \(adopted June 16, 1998, City of Signal Hill Resolution 98-06-4831\)](#). On June 16, 1998, in conjunction with the MND, the City of Signal Hill also approved a Conditional Use Permit (CUP) for the continued operation of seven oil production facilities (Sites No. 1-7) by Signal Hill Petroleum, Inc. with no physical change to the site boundaries or the type of operations, with exception of a new natural gas processing facility at CUP Site No. 2. A new 7,000 square foot (s.f.) modernized gas processing plant replaced an existing adjacent 200,000 s.f. facility constructed in the 1920's. This smaller, modernized gas processing plant (subject gas plant) was constructed in year 2000 and is the subject of this document.

Signal Hill Petroleum, Inc. operates approximately 200 active oil production wells in the Long Beach/Signal Hill area. SHP also operates several processing facilities that process the crude oil, associated gas, and water produced from these wells. The two largest of these processing facilities are: Signal Hill West Unit (SHWU, ID 101977) and Signal Hill Central Unit (SHCU, ID 045086). The SHWU facility includes the subject gas plant that processes (i.e., removes liquids from) the produced gas from most of SHP's wells in the area, as well as produced gas from wells operated by third parties; refer to [Figure 1A, Regional Map](#), [Figure 1B, Local Vicinity Map](#), and [Figure 2, Third Party Operators](#). No changes are occurring at the SHCU Facility.

The subject gas processing plant was originally installed in the year 2000 as a replacement for an aging plant on an adjacent parcel. The subject plant was subsequently modified in 2008 by adding additional compression capacity at the inlet to the plant. Presently, gas exiting the gas processing facility cannot be sold to an end user, primarily because of naturally occurring carbon dioxide (CO<sub>2</sub>) in the gas (which is not removed by the existing gas processing facility). Instead, a combustion turbine (Device D115) at the facility uses 100% of the processed gas as fuel to generate electricity for use within SHP's operations.

The existing gas processing plant and the combustion turbine are currently operating near capacity. To remedy increased gas gathered in the future, it will be sold to a local supplier; however, modifications to the existing gas processing plant are required in order to process (e.g. remove CO<sub>2</sub> from) the produced gas to meet specifications and allow for the sale of the excess gas that cannot be used as fuel in the combustion turbine. There is no proposed change to the current turbine with the proposed project. The proposed modifications will also enable the field gathering system to operate at a lower pressure, which will improve the gas plant's ability to reliably perform its function as the vapor recovery/control system for SHP and third party oil wells and processing facilities in the area. The gas plant is considered vapor control since the gas from these wells is handled as a renewable resource (for example, generating power or heat) and not flared.

In addition, the proposed modifications will enable the gas plant to continue operating (at less than full capacity) even when the combustion turbine is out of service (e.g., for maintenance), because it will be possible to sell processed gas. This, again, improves the reliability of the gas plant as a vapor recovery/control system for SHP and third party oil wells and facilities. Finally, the proposed modifications will enable SHP to deliver pipeline quality gas to the local gas distribution system through the existing meter and sales line. Following construction of the proposed improvements, the onsite turbines will continue to operate at or near capacity with excess gas being sold through the sales line.

The proposed modifications to SHP's existing gas processing plant are to:

1. Modify the existing vapor recovery system by adding additional compression capacity;
2. Modify the existing natural gas dehydration (LTS) system by upgrading the propane refrigeration and glycol dehydration equipment; and,
3. Add a new CO<sub>2</sub> filtration system.

Project construction involves three phases: asphalt and soils removal, pouring the footings and slabs, and finally, installing the prefabricated equipment. The project will commence with the removal of a small amount soil beneath the asphalt. This first phase will take two days. Two adjacent locations will be subject to construction activities, as described below:

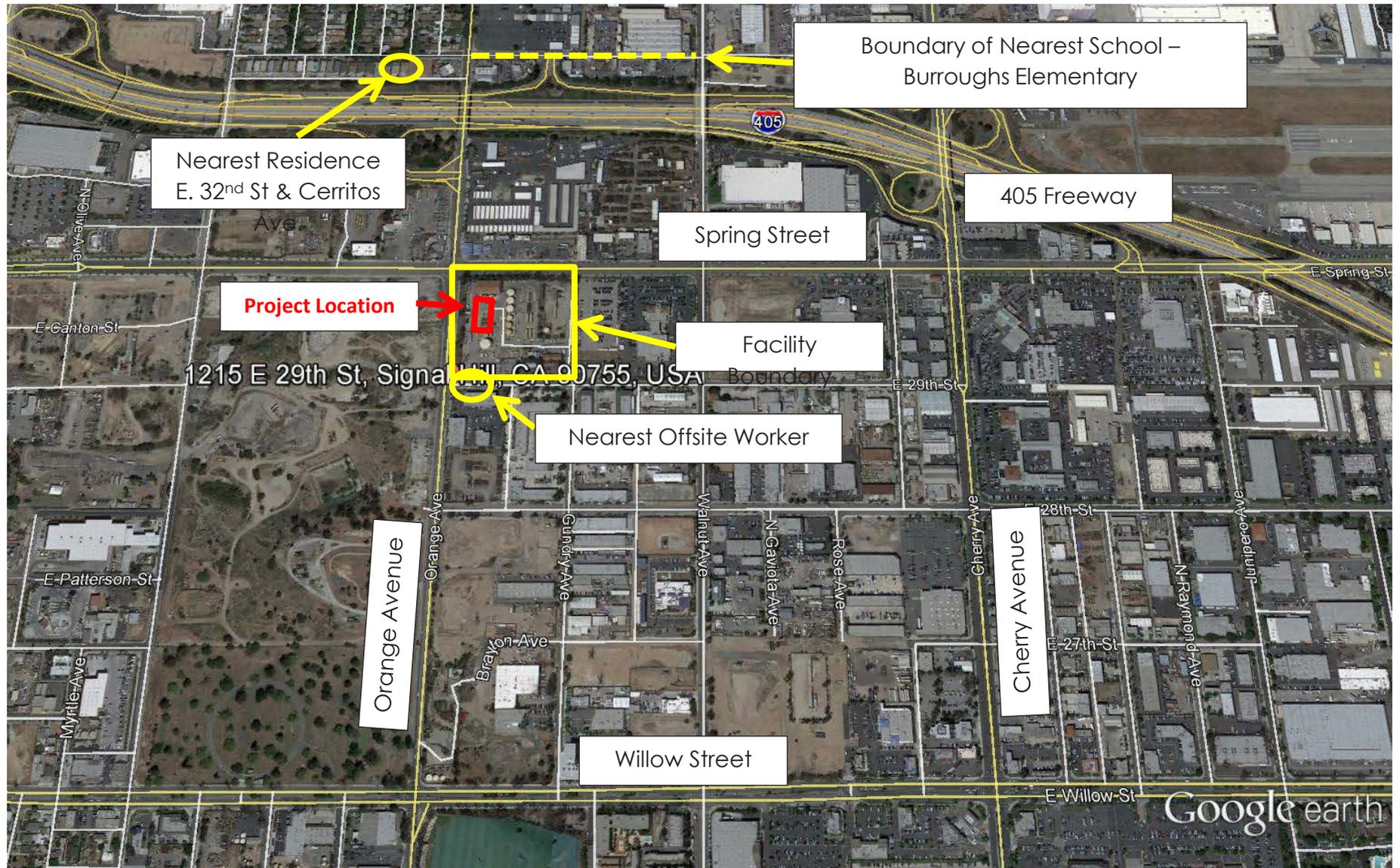
1. On the larger site, the impacted surface area will be approximately 1,400 s.f., or 20 feet by 70 feet. This area sits within the current Drill Site #2, which is completely paved. Asphalt will be removed from the entire 1,400 s.f. area. A concrete containment wall will be built on the perimeter, three feet of the rectangle. Within the center of the rectangle, a 924 s.f. area, 14 feet by 66 feet, will be excavated to a depth of five feet, and filled in with concrete. This area will act as a skid pad for the new compression train that is the subject of the SCAQMD permit; and,
2. The smaller site will be located just southwest of the larger pad and will be 10 foot by 35 feet. The existing asphalt will be removed and the site excavated to a depth of five feet. The excavation will be filled with concrete and will serve as a skid pad for the CO<sub>2</sub> membrane filter.

The first slab and containment area will be formed, poured, and cured over a 19-day period. The second slab will be formed, poured, and cured over a 29-day period. The final equipment installation will require another 11 days. All equipment will be rubber tired and diesel powered and will operate on paved surfaces.

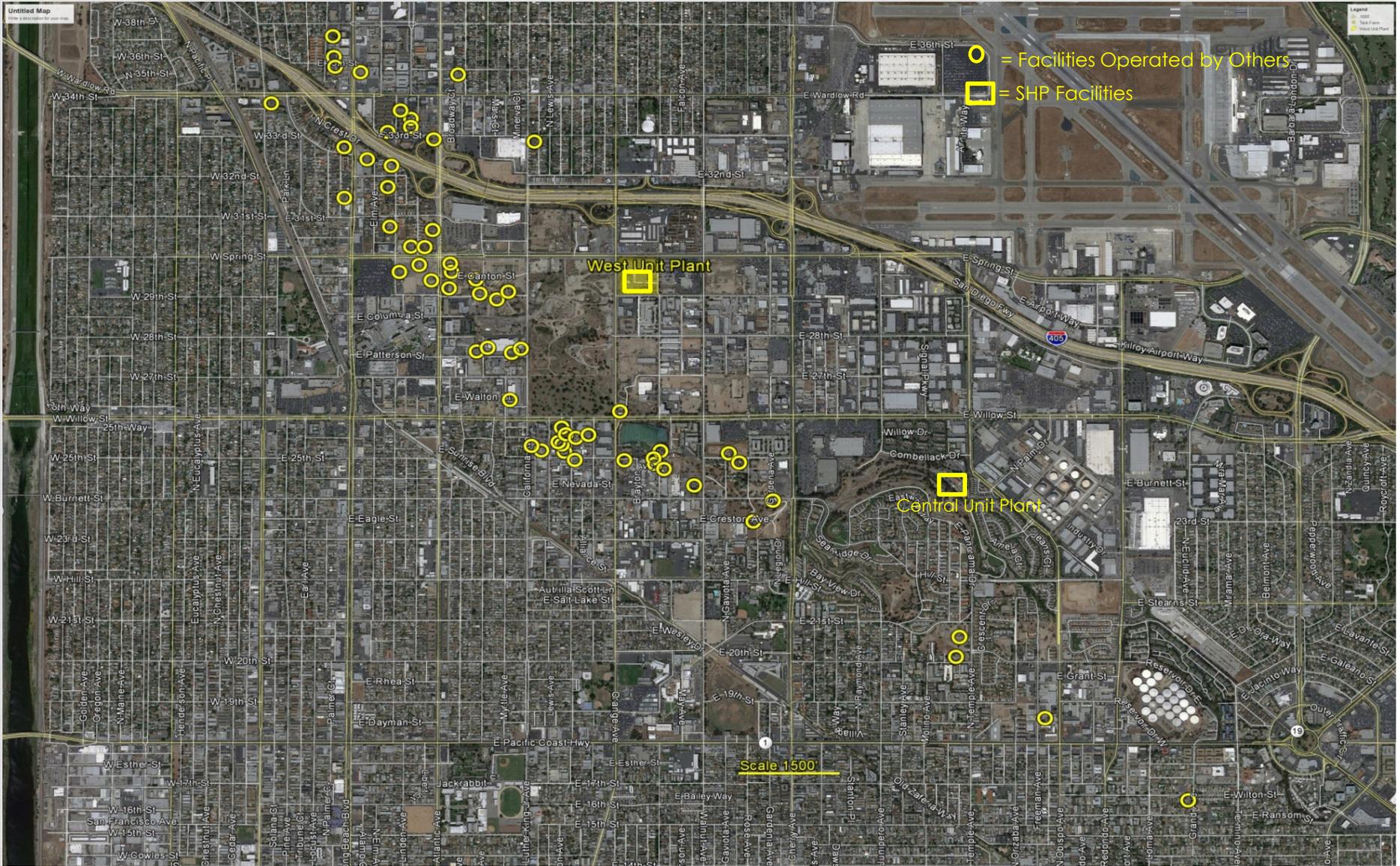
The SCAQMD has primary approval authority over the project as currently proposed. Therefore, under §15367 of the California Environmental Quality Act (CEQA) Guidelines, the SCAQMD will serve as the “lead agency” of the proposed project. The SCAQMD shall be responsible for preparation of the appropriate environmental document, per the requirements of CEQA. To analyze potential environmental impacts resulting with implementation of the proposed modifications to the existing gas plant (current project), the SCAQMD has prepared this Final Subsequent Mitigated Negative Declaration (SMND) which supplements the previously-adopted 1998 Mitigated Negative Declaration for the subject site.



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## **1.2 AGENCY AUTHORITY**

California Public Resources Code §21000 *et seq.* requires evaluation of all environmental impacts resulting with proposed “projects” as well as the identification and implementation of feasible methods aimed at reducing, avoiding, and/or eliminating any significant adverse impacts that may result with project implementation. As defined by CEQA, the proposed modifications to the existing gas plant represent the “project.” Accordingly, this Final Subsequent MND has been prepared to evaluate the proposed modifications and to determine the potential impacts that such improvements may have on the existing environment.

As stated above, the SCAQMD will serve as the “lead agency” for the proposed project. The lead agency is the public agency having the principal responsibility for carrying out or approving a project that may have a significant adverse effect upon the environment (Public Resources Code §21067). Because the proposed project requires discretionary approval from the SCAQMD for modifications to existing stationary source equipment and for installation of new stationary source equipment, the SCAQMD has the greatest responsibility for supervising or approving the project as a whole. Therefore, the SCAQMD is the most appropriate public agency to act as the lead agency (CEQA Guidelines §15051(b)).

Since changes have been made to the project that was previously analyzed under the 1998 MND, a Subsequent MND is the appropriate CEQA document for the proposed (current) project (CEQA Guidelines §15162 and 15369.5). Further, a Subsequent MND is appropriate because any potentially significant adverse impacts have been identified as less than significant as a result of the incorporation of the proposed modifications to the 1998 project (CEQA Guidelines §15162) and after imposing mitigation measures. Due to the nature of the modifications, the only responsible agency with oversight is SCAQMD.

## **1.3 BACKGROUND**

### **1.3.1 PREVIOUS MND**

As stated above, on June 16, 1998, the City of Signal Hill (City) adopted an MND for the project as originally proposed, and approved SHP’s request for approval of CUP 97-03. The project, as evaluated in the 1998 MND, allowed for the continuing operations at the seven existing consolidated oil and gas drilling, production, storage, processing, and shipping facilities and to construct the new 7,000 s.f. natural gas processing facility at 1215 E. 29<sup>th</sup> Street. The project was intended to allow for the continuation of existing operations at seven individual SHP sites (CUP Sites No. 1-7). Additionally, it provided a new, modernized processing plant and replaced the adjacent natural gas processing plant, which operated inefficiently on outdated equipment and produced large quantities of emissions in processing operations, provided unaesthetic attributes to the visual setting, and subjected adjacent properties to high levels of noise and groundborne vibration.

Key environmental issues evaluated in the 1998 MND included aesthetics, air quality, geology and soils, hazards, and noise. Mitigation measures were provided to reduce impacts to a level of less than significant.

### 1.3.2 SCAQMD PERMITTING

Following adoption of the MND and issuance of CUP 97-03 on June 16, 1998 that allowed for the continued operation of the seven CUP Sites, the SCAQMD issued permits to SHP for the construction and operation of the (new) natural gas processing plant. The permit issued for the project at that time identified certain conditions for operation of the proposed equipment and emissions limitations. A subsequent permit modification in 2008 added additional compression capacity at the inlet to the plant.

In 2009 and 2010, SHP requested corrections to the permit issued in 2008 in order to address discrepancies identified by SHP. Subsequently, in February 2014, a permit application package was submitted to the SCAQMD for proposed modifications to the existing natural gas processing plant, which is the subject of this document. Refer to Appendix 2 of [Appendix B, SCAQMD Permit Application \(February 2014\)](#), of this Final Subsequent MND for additional details.

### 1.3.3 CUP PROCESSING

In the mid-1970's, the City originally approved CUPs for seven drill sites (some of which also included treatment/processing functions) and three central processing facilities to allow major oil companies in the Signal Hill area to proceed with a unitization plan. These CUPs specifically included a condition that the CUPs expire in 20 years, and that the City could revoke the CUPs for noncompliance with conditions.

Historically, in November 1971, Shell Oil Company formed the Central Unit and initiated secondary recovery operations by implementing a water flooding program.<sup>1</sup> Texaco and the Atlantic Richfield Corporation (ARCO) initiated similar secondary recovery operations in the West and East Units in 1974 and 1975, respectively. SHP acquired Shell Oil Company oil wells, including three drill sites in the Central Unit, one of which included a Central Processing Facility. SHP also acquired ARCO facilities, which included a Central Processing Facility and two drill sites in the East Unit.

In early 1992, the City advised SHP and Texaco that their CUPs had expired. SHP submitted preliminary applications to renew their CUPs on October 15, 1991 for the East and Central Units. SHP subsequently acquired Texaco's West Unit sites, which include a Central Processing Facility and two consolidated drill sites, for which CUP applications had not been submitted.

On July 31, 1997, SHP submitted a consolidated application package for the seven CUP sites considered in the 1998 MND. On June 16, 1998, the City approved a request submitted by SHP to approve CUP 97-03 and MND (dated September 18, 1997) for a five-year term to continue the operation of the seven existing consolidated oil and gas drilling, production, storage, processing and shipping facilities and to construct a new 7,000 s.f. natural gas processing facility at 1215 E. 29<sup>th</sup> Street.

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<sup>1</sup> Water flood involves the use of wells to re-inject fluid, primarily produced water (no fresh water is used) with minor concentrations of additives, into the subsurface oil/gas reservoir to re-pressurize the sandstone and flush oil into recovery (extraction) wells. This technique is not the same as hydraulic fracturing that applies high pressure water injection to break up the reservoir.

On October 1, 2002, the City approved amendments to CUP 97-03 for a ten-year term to continue the operation of the seven existing consolidated oil and gas drilling, production, storage, processing, and shipping facilities and to construct a simple cycle gas turbine power plant at 1215 E. 29<sup>th</sup> Street to work in conjunction with the gas processing facility to generate electric power for oil operations.

On September 4, 2012, the City Council approved a one-year extension of CUP 97-03. The one-year extension was expected to allow sufficient time to complete additional and updated analysis of the seven drill sites; however, the time required to collect, digitize, manage and analyze the data was much greater than expected. As a result, on August 20, 2013, the City Council approved an additional six-month extension of CUP 97-03, set to expire February 2014. An additional extension for CUP 97-03 was subsequently requested, and Resolution No. 2014-02-6058 was approved by the City of Signal Hill on February 4, 2014, extending CUP 97-03 through December 31, 2014. The extension covered the seven existing consolidated drilling sites with oil and gas storage, processing, and shipping operations, and the gas turbine facility. As applicable, modifications occurring with the proposed project will be subject to such conditions for CUP Site No. 2; refer also to Section 2.5, Environmental Checklist and Discussion, for further details on the conditions that will apply to the current project. It should be noted that the modifications proposed to the existing gas plant with the current project (evaluated in this CEQA document) do not change the conditions relative to the previously-adopted CUP for the subject site; refer also to Section 1.4, Project Description, for a detailed description of the proposed improvements.<sup>2</sup>

#### **1.3.4 GAS PROCESSING PLANT - PERFORMANCE ISSUES**

Gas production in the affected oil field is rising and will continue to rise in the future. The increase in gas is due to a number of reasons. SHP has replaced gas gathering lines within the system, both to third parties and its own wells. This system works on a vacuum, and the new lines no longer allow atmospheric air into the system, creating more vacuum at the well head and an increase in gas production at the same level of oil production. Additionally, SHP has completed new 3-D Seismic Surveys on the oilfield and continues to interpret data and target new or replacement wells into fault blocks that have not previously been produced, with the result that these wells produce less water and more gas and oil than the older wells. Each new well or well work-over contributes to the knowledge of the reservoir. New technology in the form of electrical logs, and the interpretation of those logs along with better well completion methods, are increasing gas production in new wells and re-drilled or recompleted wells. By applying the new technologies and normal reservoir management practices, an improved gas-to-oil rate from existing facilities and operations can be achieved.

The existing gas processing plant and the combustion turbine are currently operating near capacity. To remedy increased gas gathered in the future, it will be sold to a local supplier. Therefore, modifications to the existing gas processing plant are necessary to process (e.g. remove CO<sub>2</sub> from) the produced gas to meet specifications to sell excess gas that cannot be used

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<sup>2</sup> The City of Signal Hill Planning Commission approved an extension of the CUP on November 12, 2014. Final approval of the CUP by the City of Signal Hill City Council is anticipated to occur at the City Council hearing scheduled for December 2, 2014.

as fuel in the combustion turbine. The modifications to the gas plant will further increase vacuum pressure at the well heads with the result being an increase in gas, even if no new wells were drilled or existing wells re-drilled. The proposed modifications will: enhance the gas plant's ability to reliably perform its function as the vapor recovery/control system for SHP and third party oil wells and processing facilities in the area by generating renewable power (via turbine and gas sales and not flaring); enable the gas plant to continue operating even when the combustion turbine is out of service because it will be possible to sell processed gas; and, enable SHP to deliver pipeline quality gas to the local gas distribution system.

### **1.3.5 CURRENT OPERATIONS**

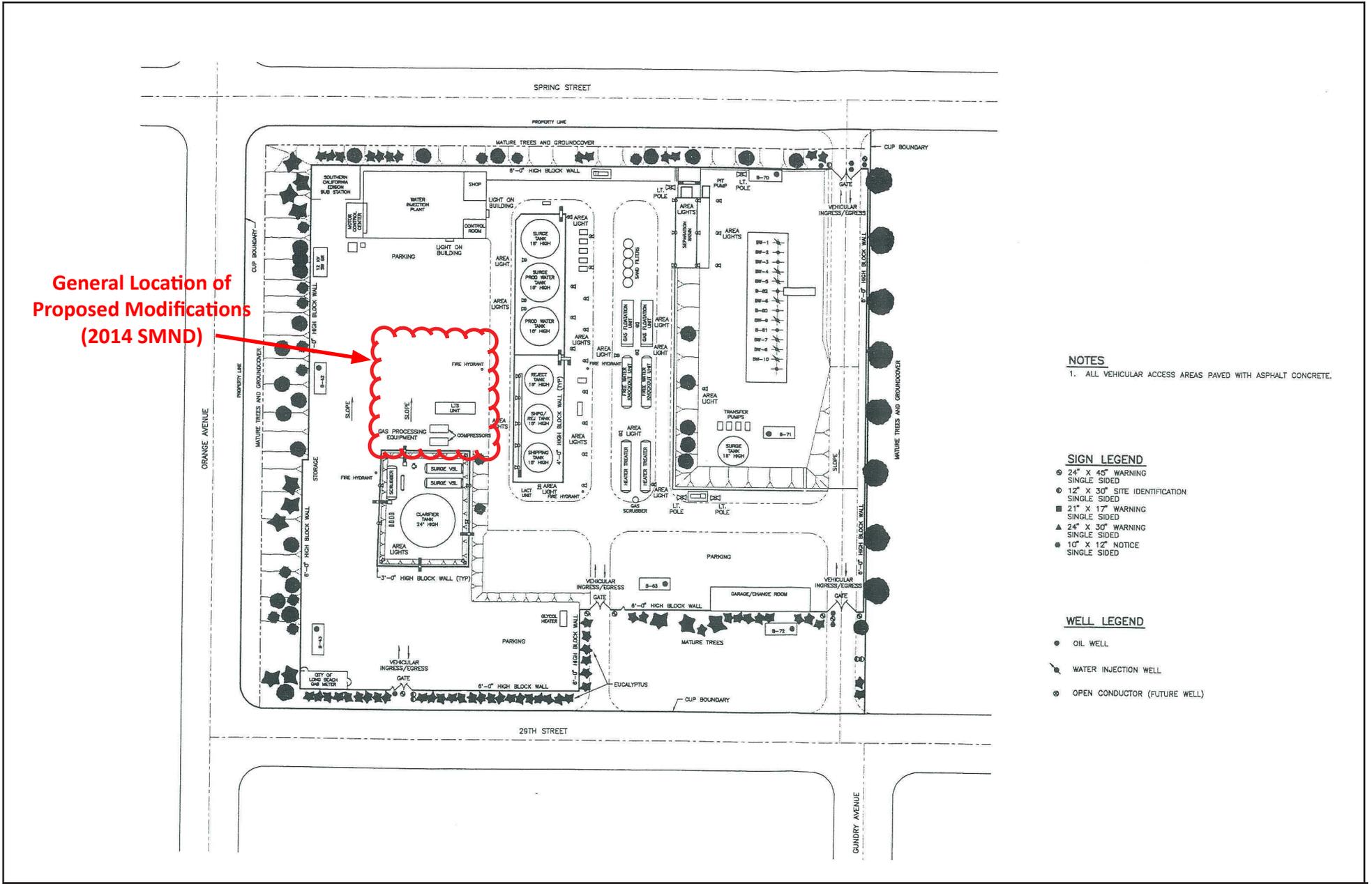
Signal Hill Petroleum, Inc. operates approximately 200 active production wells in the Long Beach/Signal Hill area. SHP also operates several processing facilities that process the crude oil, associated gas, and water produced from these wells. The two largest of these processing facilities are: Signal Hill West Unit (SHWU, ID 101977) and Signal Hill Central Unit (SHCU, ID 045086). The proposed project site lies within the SHWU.

The overall property on which the proposed project is located is identified as the “B” Drill Site of the Signal Hill West Unit (also referenced as “Site 2” in the current CUP). The property is used for the recovery of petroleum hydrocarbons through the continued operation of production and drilling facilities in connection with the SHWU of the Long Beach Oil Field. The site supports a field office and water injection plant and serves as the primary operating plant for the West Unit. The main components of the site include a fluid dehydration plant, a water injection plant, gas processing/dehydration equipment, oil and gas shipping equipment, and an Edison electrical substation. The site also serves as a gathering site for oil, gas, and water production, as well as a distribution site for water injection, and a control center for electrical systems associated with the turbine. In addition, the site has active oil, gas, and water injection wells, is designed for well drilling activities, and provides material storage for daily operations. This site now also supports the natural gas processing facility that replaced the outdated existing facility formerly located across Orange Avenue (see description below) and is the location of the proposed modifications.

## **1.4 PROJECT DESCRIPTION**

### **1.4.1 SUMMARY OF THE 1998 PROJECT VS. THE PROPOSED PROJECT**

The project as evaluated in the 1998 MND is summarized below. Additionally, [\*Table 1, Summary of Changes between the Affected Equipment Analyzed in the 1998 MND and the Proposed Project Equipment\*](#), provides a comparison of the improvements proposed with the 1998 project and the project as currently proposed and that is being analyzed in this Final Subsequent MND. Refer also to [\*Figure 3A, Existing Configuration – CUP Site No. 2\*](#), and [\*Figure 3B, Proposed Gas Plant Modification\*](#), which show the conditions analyzed under the 1998 MND and those evaluated in this Final SMND.



**NOTES**

1. ALL VEHICULAR ACCESS AREAS PAVED WITH ASPHALT CONCRETE.

**SIGN LEGEND**

- ⊙ 24" X 45" WARNING SINGLE SIDED
- ⊙ 12" X 30" SITE IDENTIFICATION SINGLE SIDED
- 21" X 17" WARNING SINGLE SIDED
- ▲ 24" X 30" WARNING SINGLE SIDED
- 10" X 12" NOTICE SINGLE SIDED

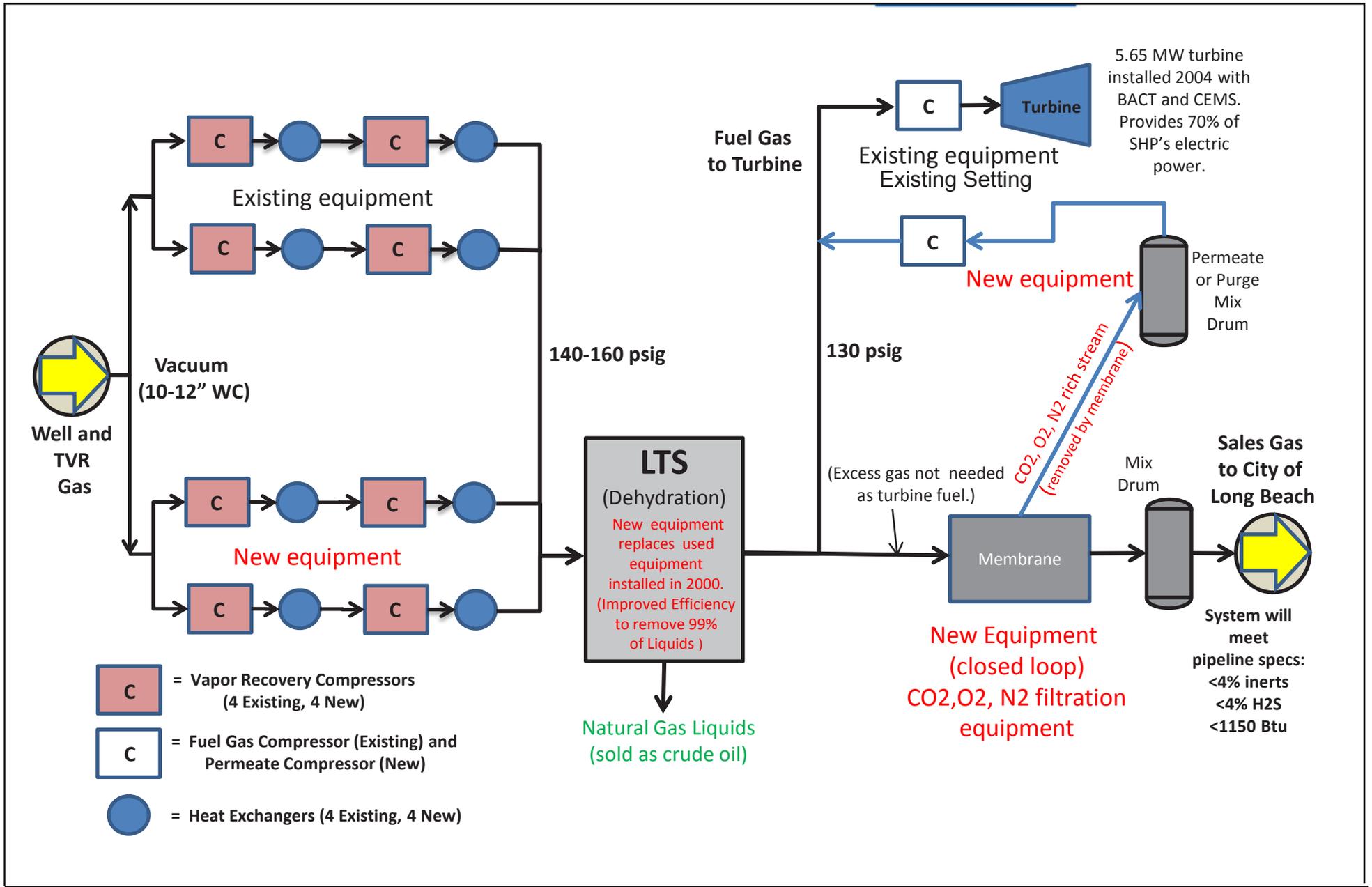
**WELL LEGEND**

- OIL WELL
- ⊙ WATER INJECTION WELL
- ⊙ OPEN CONDUCTOR (FUTURE WELL)



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From the 1998 MND:

*The existing 200,000 s.f. natural gas processing facility was located at 2901 Orange Avenue in the City of Long Beach. It was constructed and placed into operation in the early 1920's to meet the expanding needs of the newly discovered Long Beach Oil Field. The facility is outdated, over-sized, and very inefficient. It uses processed dry gas for the internal combustion engines which drive the compressors. As a result, a large quantity of the emissions is continuously exhausted into the atmosphere. The facility's aesthetics are undesirable, as it contains five large cooling towers of 50 +/- feet; two stacks of 70 +/- feet, and miscellaneous other equipment and several old buildings. The perimeter of the site is bounded by chain link fence with no landscaping and is easily visible from the surrounding street network. In addition, the existing facility operates at noise levels in excess of 80 dB at its property line, and generates ground-borne vibration in the area as a result of fuel gas combustion engines. This facility is ultimately planned for demolition and redevelopment, although no specific development plans have been approved at this time.*

*The new proposed 7,000 s.f. natural gas processing facility would allow the replacement of the existing facility and would be located across from the existing site, within CUP Site No, 2. The new gas facility equipment would be much smaller and would integrate well with the existing West Unit processing facility. In contrast to the existing facility, the new facility would include one 12-inch diameter stabilizer, 34 feet in height, located behind an existing 24-foot high water tank. General equipment height would be 10 feet, mostly located three feet below ground in the new facility's containment area. The facility would be visually screened from the surrounding area by a 6-foot block wall and mature landscaping, in accordance with the City's Oil Code. In addition, the new facility is anticipated to operate at noise levels of less than 70 dB at the property line, according to the compressor manufacturer and the applicant. The new compressors would be driven by two (2) 150-horsepower electric motors. The new facility would also allow for the eventual abandonment of the existing site which would benefit the proposed development of the area by the Signal Hill/Long Beach Joint Powers Authority.*

Since the time of adoption of the 1998 MND, the above-described improvements have been constructed. At present, the existing facility includes a gas processing plant that processes (i.e., removes liquids from) the produced gas from most of SHP's wells in the area as well as produced gas from wells operated by third parties. The gas plant was originally constructed in year 2004 (as a replacement for the aging plant on the parcel immediately adjacent to the west of Orange Avenue) and was subsequently modified in 2008 to increase compression capacity at the inlet to the plant. At present, the gas exiting the gas processing facility cannot be sold to an end user, primarily because of naturally occurring CO<sub>2</sub> in the gas (which is not removed by the existing gas processing facility). Instead, a combustion turbine (Device DII5) at the facility uses 100% of the processed gas as fuel to generate electricity for use within SHP's operations.

Due to various technological improvements being made to oil wells (e.g., reworking existing mature wells, better field management practices, and better downhole completion techniques) and to the gas gathering system serving the SHWU gas processing plant and to the third party facilities which it serves, the volume of gas processed at the SHWU gas processing plant is increasing. The existing gas processing plant and the combustion turbine are currently operating near capacity. To remedy increased gas gathered in the future, it will be sold to a local supplier. As the SHWU gas processing plant will no longer be able to utilize all of the fuel in the combustion turbine, modifications are needed. The proposed modifications will also enable the field gathering system to operate at a lower pressure, which will improve the gas plant's ability to reliably perform its function as the vapor recovery/control system for SHP and third party oil wells and processing facilities in the area.

The proposed upgrade will add two additional 2-stage compression trains, replace the current propane refrigeration unit with “state of the art” equipment that represent Best Available Control Technology (BACT), and add a CO<sub>2</sub> filtration system. No new combustion equipment will be installed. The changes will increase the vacuum on the gathering lines, reducing back-pressure and reducing the potential for leaks in the upstream gathering system. The addition of the new compression trains will allow the processing of 4,000 mscf/day up from 2,000 mscf/day. The increase in volume will accommodate the growth of gas production from the mature water flood as oil production naturally declines over time.

In addition, the proposed modifications will enable the gas plant to continue operating (at less than full capacity) even when the combustion turbine is out of service (e.g., for maintenance), because it will be possible to sell processed gas. This will further improve the reliability of the gas plant as a vapor recovery/control system for SHP and third party oil wells and facilities. Additionally, the proposed modifications will enable SHP to deliver pipeline quality gas to the local gas distribution system.

The objectives of the proposed modifications to SHP's existing gas processing plant are to:

1. Expanding the existing vapor recovery system;
2. Modify the existing natural gas dehydration (LTS) system;
3. Make beneficial use of the natural gas by sale; and,
4. Provide operational flexibility by allowing for reduced operations and the ability to sell excess gas to Long Beach.

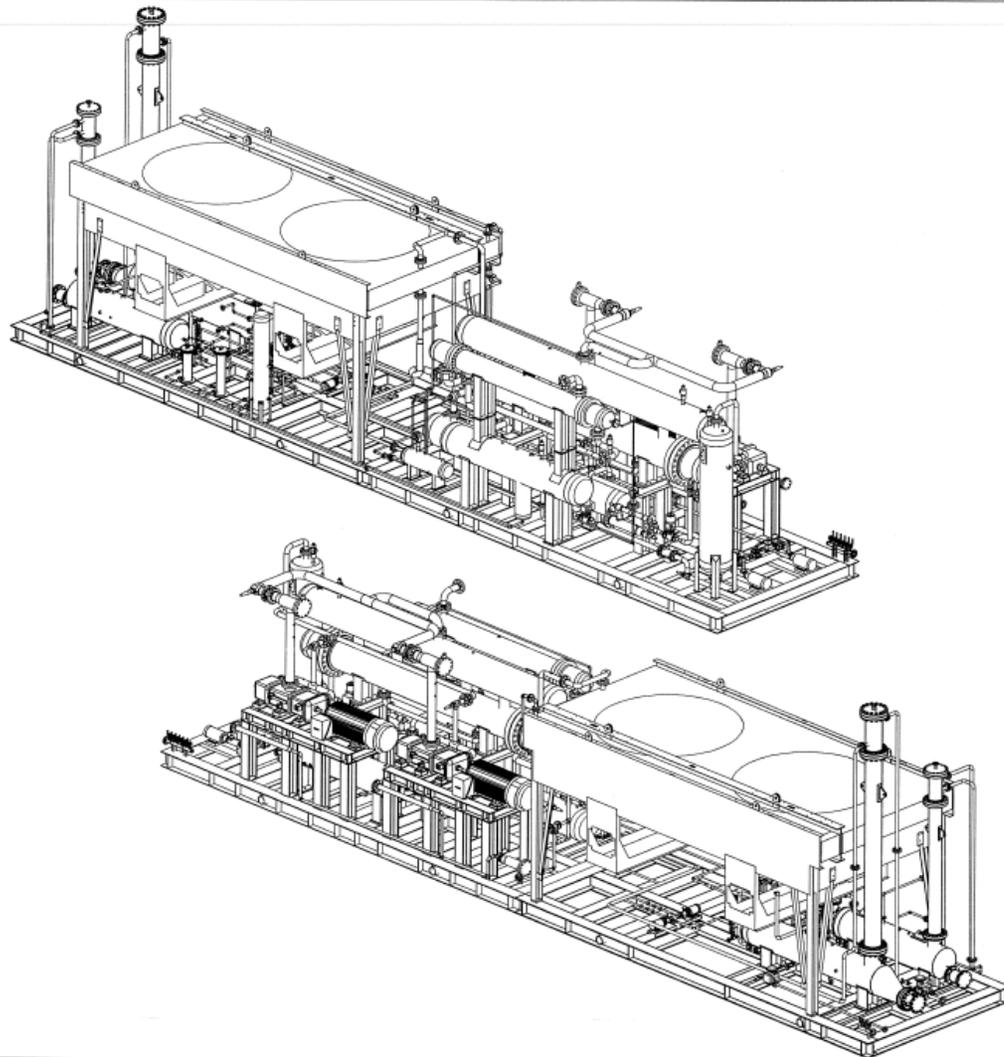
A comparison of the 1998 project (previously analyzed) as compared to the currently proposed project is provided in [Table 1](#). Refer also to [Figure 3A, Existing Configuration – CUP No. 2 Site No. 2](#), and [Figure 3B, Proposed Gas Plant Modification](#). Additionally, [Figures 4A to 4D](#) show the anticipated site disturbance and new/modified equipment proposed with the project.



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CUSTOMER CONNECTIONS		
DESIGNATION	DESCRIPTION	SIZE & RATING
(A)	PROCESS INLET	4" - 600# RFSD FLANGE
(B)	GAS PRODUCT	4" - 600# RFSD FLANGE
(C)	INSTRUMENT AIR	2" - 150# RFSD FLANGE
(D)	TO VRU (BY OTHERS)	2" - 300# RFSD FLANGE
(E)	LPG TO STORAGE	2" - 300# RFSD FLANGE
(F)	INSTRUMENT AIR	2" - 150# RFSD FLANGE
(G)	BLANKET GAS	1" - 150# RFSD FLANGE
(H)	TO BTEX	1" - 150# RFSD FLANGE
(J)	TO ATMOSPHERE	1" - 150# RFSD FLANGE

QTY. REQ.D.: 1

	<b>INDUSTRIAL EQUIPMENT SOLUTIONS, INC.</b> <small>301 N. SMITH AVE., CORONA, CA 92606          PH: (951) 273-5960          FAX: (951) 273-1788</small>	<small>CONFIDENTIAL</small> <small>FOR INFORMATION PURPOSES ONLY. THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION OR REPRODUCTION WITHOUT THE WRITTEN PERMISSION OF INDUSTRIAL EQUIPMENT SOLUTIONS, INC.</small>
	<small>301 N. SMITH AVE., CORONA, CA 92606          PH: (951) 273-5960          FAX: (951) 273-1788</small>	<b>MACHINERY ARRANGEMENT</b> <b>400HP MRU UNIT</b> (SKID ISOMETRIC)
<small>REV. DATE</small> AA 12/26/13	<small>ISSUED</small> MS 12/26/13	<small>PROJECT</small> IES-223A-011
<small>BY</small> AA	<small>CHKD</small> CL	<small>APP</small> MG
<small>NOTICE</small> This drawing and all design details and data shown herein, is the sole property of JOULE PROCESSING, LLC. It is to be used only in connection with work being performed by Joule Processing. Reproduction in whole or in part for any purpose other than work performed by Joule Processing is forbidden except by express written permission by Joule Processing.		<small>QTY.</small> 4 OF 4

NOTES:

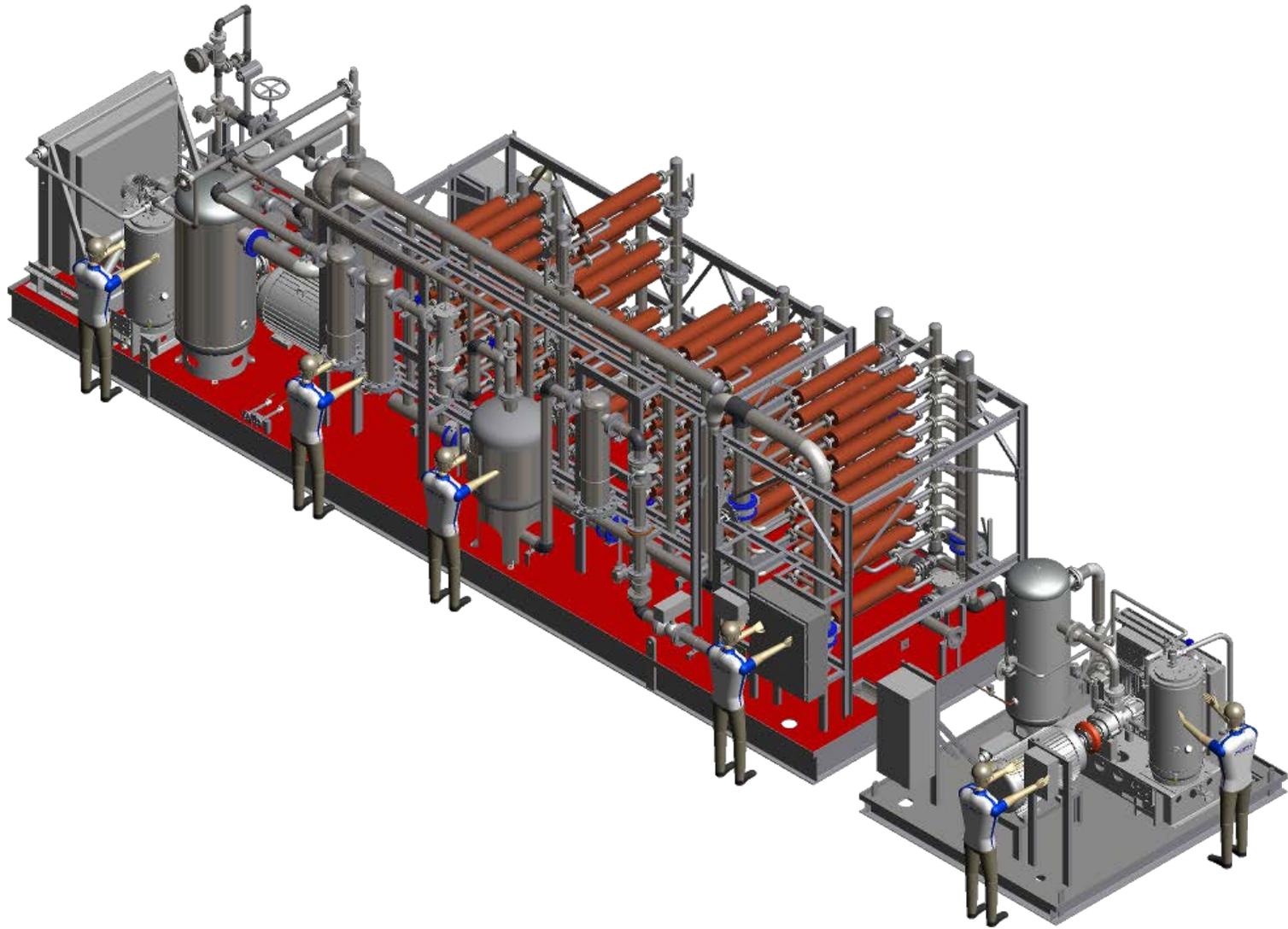
REV	DATE	REVISIONS	BY	CHKD	APP
A	11/15/13	ISSUED FOR APPROVAL	AA	CL	MG
B	12/26/13	REVISED PER CLIENT COMMENTS	AA	CL	MG



3008 SOUTHVIEW FREEMARK, SUITE 229L, HOUSTON, TX 77057, USA PHONE: 1-713-481-1844

<b>PROJECT TITLE</b> MACHINERY ARRANGEMENT 400 HP MRU UNIT (SKID ISOMETRIC) BOZCO ENGINEERING SIGNAL HILL, CA 90755			
<small>SCALE</small> N.T.S.	<small>DRAWING NUMBER</small> IES-223A-011	<small>SHT</small> 4 OF 4	<small>REV</small> B

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**Table 1. Summary of Changes between the Affected Equipment Analyzed in the 1998 MND and the Proposed Project Equipment**

Equipment Category	1998 MND (Current)	Proposed Project (2014)
Vapor Recovery System	<ul style="list-style-type: none"> <li>▪ Two identical 2-stage compression trains</li> <li>▪ 4-6 inch water vacuum to 140-160 pounds per square inch gauge (psig)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Two identical 2-stage compression trains</li> <li>▪ <b>Two additional identical 2-stage compression trains</b></li> <li>▪ <b>10-12 inch</b> water vacuum to 140-160 psig</li> </ul>
Natural Gas Dehydration (LTS) System	<ul style="list-style-type: none"> <li>▪ Propane refrigeration / low temperature (-2°F) separation</li> </ul>	<ul style="list-style-type: none"> <li>▪ Propane refrigeration / low temperature <b>(-30°F)</b> separation <b>(replace with high efficiency equipment)</b></li> </ul>
CO <sub>2</sub> Filtration	<ul style="list-style-type: none"> <li>▪ None</li> </ul>	<p>All new equipment:</p> <ul style="list-style-type: none"> <li>▪ <b>CO<sub>2</sub> filtration system to meet City of Long Beach pipeline quality specifications</b></li> </ul>
Product Streams	<ul style="list-style-type: none"> <li>▪ Natural Gas Liquids, or NGLs, (unfractionated) combined and sold with crude oil</li> <li>▪ Processed gas used as fuel in self-generation turbine</li> </ul>	<ul style="list-style-type: none"> <li>▪ NGL's (unfractionated) combined and sold with crude oil</li> <li>▪ Processed gas:                             <ul style="list-style-type: none"> <li>– Used as fuel in self-generation turbine</li> <li>– <b>To City of Long Beach distribution system</b></li> </ul> </li> </ul>

The proposed project to be evaluated under this Final Subsequent MND will result in the following benefits:

- Increased Efficiency and Reliability
  - Improved vapor recovery for SHP’s 200 wells and 7 tank facilities (ID’s 101977, 045086, and 170540 through 170544); and, for 64 wells and 47 facilities operated by 20 different third party operators (this will avoid the need for combustion through flaring)
  - Modern Technology and Equipment
    - Fewer equipment leaks and mechanical upsets in the gas plant itself
  - More efficient LTS system
  - More effective and efficient gathering and processing of produced gas will result in less back-pressure and reduced potential for leaks in the upstream gathering system
- Ability to Sell Gas
  - Less Reliance on Turbine as Ultimate Control Device

- Will be able to maintain (reduced) operations by selling gas when the gas turbine is out of service, e.g., for maintenance
- o Increase the supply of local natural gas into the City of Long Beach distribution system, replacing gas transported from long distances, and therefore, reducing potential fugitive emissions currently associated with natural gas transmission lines; refer also to [\*Appendix C, Commitment Letter from City of Long Beach Gas & Oil Department \(September 2014\)\*](#).

Additionally, within the area associated with the proposed actions, oil production is regulated by the State of California Department of Oil, Gas, & Geothermal Resources (DOGGR) and the Cities of Long Beach and Signal Hill. In respect to drilling, the DOGGR defers to local agencies with land use responsibilities for CEQA oversight.

The City of Signal Hill only allows drilling to occur on approved Conditional Use Permit Drill Sites. These sites are located in non-residential zones in order to provide a buffer between sensitive land uses and more industrial-type operations. Within the City, far fewer wells have been drilled in the last ten years than have been abandoned. Rather, emphasis has been placed on increasing efficiencies of existing wells in order to maintain current production. This is due in part to the high cost of drilling a new well.

The City of Signal Hill recently revised the Oil Code section of its Municipal Code (Title 16, Oil Code). Such revisions resulted in the requirement for well permits for all new wells and any re-drilling or recompletion of existing wells (Section 16.12.030). Prior to the issuance of a drilling permit, applicants are required to submit an application and accompanying materials to enable adequate understanding and review by the City and the California Division of Oil and Gas (DOG) during the permit process.

Similarly, the City of Long Beach permits oil drilling only within established Drilling Districts. Such Drilling Districts are identified in the City's Strategic Plan. Similar to the City of Signal Hill, the City of Long Beach Municipal Code also includes an Oil Code section pertaining to the regulation of oil production activities (Title 12, Oil Production Regulations). The City requires a permit for any new wells, or re-drilling or recompletion of existing wells.

Third party operators within the City of Signal Hill do not benefit by the "water flood" operation, and operate on sites that are largely considered to be "non-conforming existing uses" per the Municipal Code. These sites offer limited or no opportunity for future expansion of existing operations. Therefore, without implementation of the modifications to the gas plant as proposed with the project, any increase to restrictions on these third party operators could potentially result in alternative gas handling measures, such as flaring, thereby leading to a potential increase in the generation of harmful emissions.

Downstream effects of the proposed project will include decreased emissions and reduced reliance on other non-local gas sources. Gas marketing will occur through the Public Utility, which is owned by the City of Long Beach. The existing natural gas processing facility is currently fitted with a meter, and therefore, installation of a new meter onsite will not be necessary to allow for the sale of gas enabled by the proposed project.

Implementation of the proposed modifications to the existing gas plant will result in an increased locally produced supply of available sales gas in the City of Long Beach distribution system. The natural gas industry was deregulated in the 1980's, and as a result, the City of Long Beach Gas & Oil (LBGO) Department currently purchases the gas supply for its customers on the open competitive market from sources within California, Texas, Wyoming, New Mexico, Canada, with the potential for expansion outside of the United States into Mexico. Additionally, Long Beach presently operates both on-shore and off-shore natural gas fields. Under negotiated long-term contracts, LBGO purchases approximately 10 billion cubic feet of natural gas on an annual basis.<sup>3</sup> If and when the gas plant is operating at full capacity, the 2,000 mcf a day that is in excess of the turbine capacity would mean that SHP could sell approximately 730 million cf per year, or 7.3% of the total volume currently utilized by the City of Long Beach.

By replacing gas supplies that are currently transported to the area over long distances from non-local sources (refer to [Appendix C](#)), the Project would allow for potential fugitive emissions associated with natural gas transmission lines to be reduced, thereby further reducing potential adverse effects on air quality and from greenhouse gas emissions. Additionally, the proposed modifications and resultant availability of the sales gas will reduce reliance on gas supplies from non-local sources.

The proposed improvements will result in enhancement of local gas supplies available for public sale and consumption through the proposed improvements at the natural gas plant. The proposed project will allow for the transfer of pipeline quality gas to the local gas distribution system for sale to third party(s) for beneficial use; however, the availability of such supplies as a result of the project will not be growth-inducing. The gas made available for sale by the proposed project will meet area demand for such resources and will therefore reduce the need for imported gas supplies; however, it is not anticipated that the availability of such resources will enable new development that would not have otherwise occurred under existing conditions (i.e. make available a new resource required to enable growth that was not previously available). Rather, future demand for the gas produced will be influenced by economic conditions at the time that the gas is purchased. Therefore, the project is not considered to represent a significant growth-inducing impact.

#### **1.4.2 NEW OPERATIONS**

The natural gas processing plant will continue to perform the same basic functions as the current facility: vapor recovery, natural gas dehydration, and production of natural gas liquids (unfractionated) and processed gas. As stated above, the proposed modifications will result in improved efficiency and reliability in plant operations, and will enable SHP to process and transfer the excess gas produced for sale. Refer also to [Figures 4A to 4D](#) which show the anticipated disturbance and proposed modifications at the project site.

Basic changes in operations that will occur after construction of the proposed equipment modifications are completed and gas sales begin are as follows:

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<sup>3</sup> City of Long Beach Gas & Oil Department. "Who We Are." Available at: [http://www.longbeach.gov/lbgo/who\\_we\\_are/default.asp#business](http://www.longbeach.gov/lbgo/who_we_are/default.asp#business). Accessed September 17, 2014.

1. Enhanced vapor recovery for SHP and third-party oil wells and area processing facilities;
2. Enhanced, more efficient natural gas dehydration processes;
3. Excess gas produced will be processed (e.g. removal of CO<sub>2</sub> from) to meet required City of Long Beach pipeline quality specifications; and,
4. Transfer of pipeline quality gas to the local gas distribution system for sale to end users for beneficial use.

It should be noted that SHP has received confirmation from the City of Long Beach Gas & Oil Department that it intends to enter into a Natural Gas Delivery Agreement for Locally Produced Gas (Agreement) with SHP for the delivery and purchase of locally-produced natural gas produced by SHP to supply a portion of the City's gas requirements. Under the agreement, the City will purchase all locally-produced gas delivered to the City by SHP, and such gas will displace an equivalent volume of natural gas imported by the City from more remote sources; refer to [Appendix C, Commitment Letter from City of Long Beach Gas & Oil Department](#) (September 18, 2014).

### **1.4.3 PERMIT CONDITION MODIFICATIONS**

On February 26, 2014, SHP submitted an application to the SCAQMD for the permit required for the proposed modifications to the existing natural gas processing plant. The application addressed modifications to the vapor recovery system/natural gas dehydration system, installation of CO<sub>2</sub> filtration system, and improvements to enable SHP to deliver pipeline quality gas to the local gas distribution system for sale; refer also to Appendix 2 of [Appendix B, SCAQMD Permit Application \(February 2014\)](#), of this Final Subsequent MND. Construction and operation of the other components currently present onsite (identified for the 1998 project in [Table 1](#), above) were analyzed in the previous 1998 MND (with exception of the modifications made to add compression capacity at the inlet to the plant in 2008).

Permit conditions consistent with the required mitigation measures (see also [Table 2](#), below) will be included in the final permit for the proposed project.<sup>4</sup>

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<sup>4</sup> The City of Signal Hill Planning Commission approved an extension of the CUP on November 12, 2014. Final approval of the CUP by the City of Signal Hill City Council is anticipated to occur at the City Council hearing scheduled for December 2, 2014.

#### 1.4.4 MITIGATION MEASURES CHANGES

As discussed above, the 1998 MND imposed mitigation measures for the project as proposed at the time. The 1998 mitigation measures are identified in [Table 2, Summary of Mitigation Measures from the 1998 MND](#). The 1998 mitigation measures will continue to be implemented. The changes to the project analyzed in the 2014 Draft Subsequent MND will necessitate modifications to and/or replacement of these measures. Therefore, mitigation measures proposed for implementation with the current (2014) project are identified in [Table 3, Summary of Mitigation Measures for the Proposed Project \(2014\)](#), below, and are discussed in greater detail in Section 2.5, Environmental Checklist and Discussion, of this Final Subsequent MND.

**Table 2. Summary of Mitigation Measures from the 1998 MND**

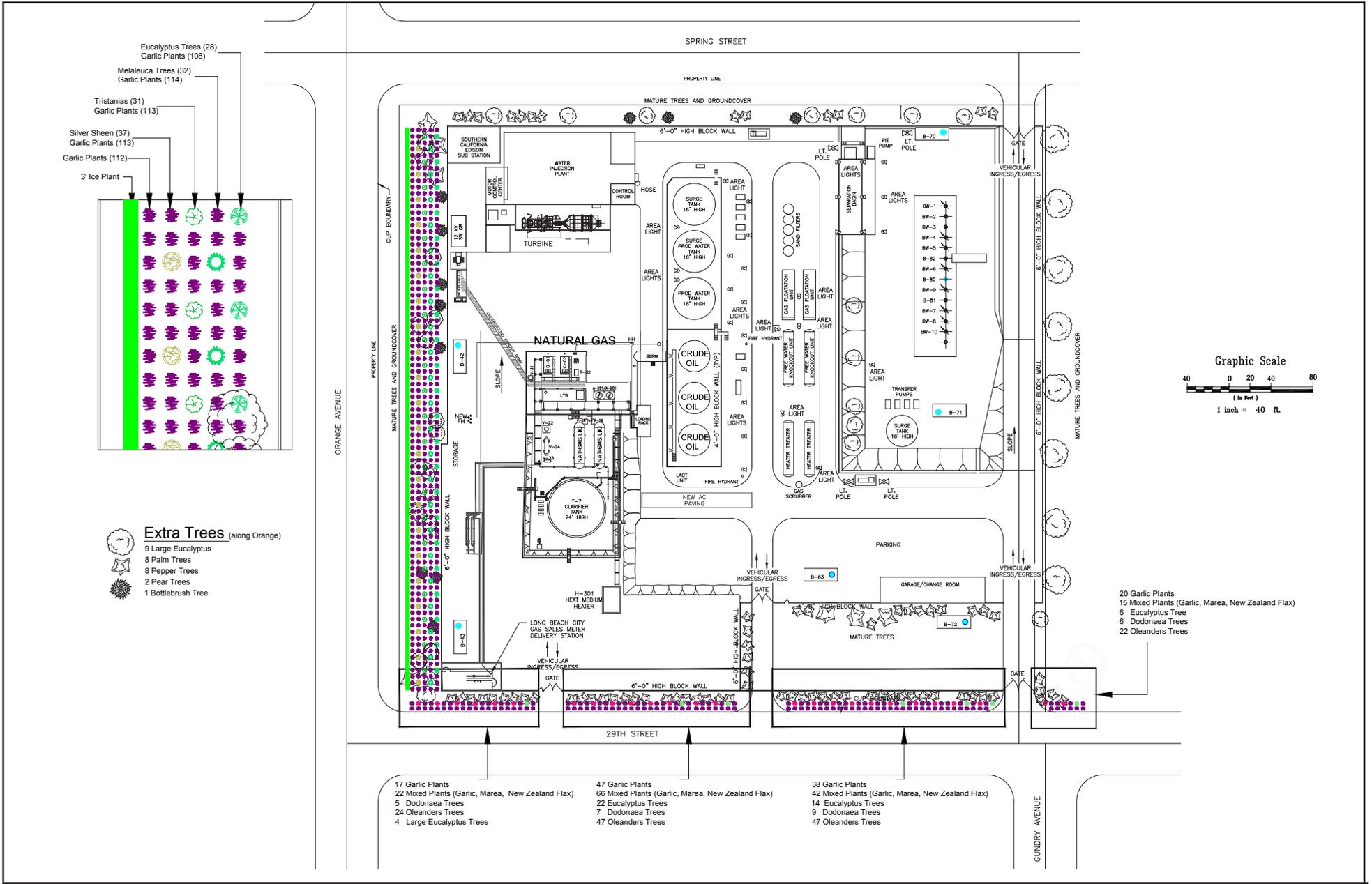
1998 MND Mitigation Measure	1998 MND
<b>GEOPHYSICAL (GEOLOGY AND SOILS)</b>	
#1a	A structural engineer, civil engineer or architect, experienced with earthquake-resistant design, shall sign off on all building plans to determine the adequacy of seismic criteria for project structures, and to ensure incorporation of necessary design changes, prior to issuance of building permits.
#1b	Prior to issuance of building permit(s), the Building Official shall review and approve all building plans to ensure compliance with the Uniform Building Code as adopted by the City of Signal Hill.
#1c	All site preparation and operation shall be in compliance with the City's grading and paving standards (no further mitigation is required).
<b>AIR QUALITY</b>	
#2	<p>In order to reduce fugitive dust emissions, the following measures shall be implemented during construction of the proposed natural gas processing facility to the satisfaction of the City Engineer.</p> <ol style="list-style-type: none"> <li>a. The project shall comply with State, City, and UBC dust control regulations, so as to prevent the soil from being eroded by wind, creating dust, or blowing onto a public road or roads or other public or private property.</li> <li>b. Adequate watering techniques shall be employed to partially mitigate the impact of construction-generated dust particulates. Unpaved construction roads shall be watered at least two times per day.</li> <li>c. SCAQMD Rule 403, as amended, shall be adhered to, ensuring the cleanup of the construction-related dirt on approach routes to the site, and the application of water and/or chemical dust retardants that solidify loose soils shall be implemented for construction vehicle access, as directed by the City Engineer. This shall include covering, watering, or otherwise stabilizing all inactive soils piles (left more than 10 days) and inactive graded areas (left more than 10 days).</li> </ol>

<b>1998 MND Mitigation Measure</b>	
	<b>1998 MND</b>
#3	Prior to approval of the proposed project, the applicant shall demonstrate SCAQMD compliance or provide Agency staff with a copy of the preliminary application for an SCAQMD operating permit. Upon issuance of the CUP, the applicant shall provide evidence of a SCAQMD operating permit.
<b>HAZARDS</b>	
#4a	Prior to CUP approval SHP shall demonstrate compliance with applicable hazardous materials rules and regulations, to include, at minimum, an Emergency Response Plan as required by the Fire Department addressing spill, fire, and explosion hazards, and relative risk of upset to adjacent land uses.
<b>NOISE</b>	
#5a	a. Construction activities shall comply with City of Signal Hill Noise Ordinance Section 9.16.050 relating to construction noise. Construction is permitted only between the hours of 7:00 a.m. to 6:00 p.m. Monday through Friday.
#5b	b. All construction equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers, to the satisfaction of the City Inspector.
#5c	c. Stationary construction equipment shall be placed such that emitted noise is directed away from sensitive noise receivers to the satisfaction of the City Inspector.
#5d	d. On an annual basis, the operator shall measure the noise at the property line and submit said readings to the Planning Director for review. The Planning Director shall require the construction of sound barriers around the facility or any other mitigation both feasible and appropriate, should the gas processing equipment not meet noise standards found in Signal Hill Municipal Code Chapter 9.16, entitled "Noise," for industrial areas.
#5e	f. All servicing, reworking, and redrilling at the CUP sites shall comply with Section 9.16.070 of the Signal Hill Municipal Code.
<b>AESTHETICS</b>	
#6	CUP site landscaping shall comply with the landscaping concept as shown on the site plans and conditions of approval for additional landscape enhancement and maintenance requirements.

**Table 3. Summary of Mitigation Measures for the Proposed Project (2014)**

2014 Mitigation Measure	Proposed Project (2014)
	<b>HAZARDS</b>
MM-HAZ-1	Prior to approval of the proposed project, SHP shall demonstrate compliance with applicable hazardous material rules and regulations, to include, at minimum, an Emergency Action Plan as required by the Fire Department addressing spill, fire, and explosion hazards and relative risk of upset to adjacent land uses.
	<b>NOISE</b>
MM NOI-1	<p><i>Short-Term Construction</i></p> <p>In order to reduce construction noise, the following measures shall be implemented during construction of the proposed natural gas processing facility to the satisfaction of the SCAQMD or designee:</p> <ol style="list-style-type: none"> <li>a. Construction activities shall comply with City of Signal Hill Noise Ordinance Section 9.16.050 relating to construction noise. Construction is permitted only between the hours of 7:00 a.m. to 6:00 p.m. Monday through Friday.</li> <li>b. All construction equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers, to the satisfaction of the SCAQMD or designee.</li> <li>c. Stationary construction equipment shall be placed such that emitted noise is directed away from sensitive noise receivers to the satisfaction of the SCAQMD or designee.</li> </ol>
MM NOI-2	<p><i>Long-Term Operation</i></p> <p>In order to reduce long-term operational noise, the following measures shall be implemented for the proposed natural gas processing facility to the satisfaction of the SCAQMD or designee:</p> <ol style="list-style-type: none"> <li>d. Within thirty (30) days of installation of the proposed equipment modifications at the existing gas processing facility at Site No. 2, the operator shall measure the noise at the property line and submit said readings to the SCAQMD for review. The SCAQMD shall require the construction of sound barriers around the facility, or any other mitigation both feasible and appropriate, should the gas processing equipment not meet noise standards found in the Signal Hill Municipal Code Chapter 9.16, entitled "Noise," for industrial areas.</li> <li>e. On an annual basis, the operator shall measure the noise at the property line and submit said readings to the SCAQMD for review. The SCAQMD shall require the construction of sound barriers around the facility, or any other mitigation both feasible and appropriate, should the gas processing equipment not meet noise standards found in the Signal Hill Municipal Code Chapter 9.16, entitled "Noise," for industrial areas.</li> </ol>

<b>2014 Mitigation Measure</b>	<b>Proposed Project (2014)</b>
	<b>AESTHETICS</b>
MM AES-1	Within 30 days of completion of the construction phase, the project applicant shall install perimeter landscaping consistent with that shown on the Conceptual Landscape Plan prepared for the project (refer to <a href="#">Figure 5, Conceptual Landscape Plan</a> , in the 2015 Final SMND). Improvements to the existing irrigation system shall be made, as required, to adequately accommodate the landscape plantings and to ensure long-term success of establishment. The project applicant shall be responsible for maintaining the landscaping installed to the satisfaction of the SCAQMD or designee, with landscape maintenance being part of the annual review for CUP 97-03.



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## 1.5 PROJECT LOCATION

The proposed project site is located in the City of Signal Hill, within Los Angeles County in southern California. The City of Long Beach completely surrounds the City of Signal Hill. Interstate 405 (I-405) is located approximately 0.22 miles to the north of the site and provides regional access to this area of southern California, including the Cities of Santa Monica and Los Angeles, located further to the north of Signal Hill.

The CUP Sites No. 1-7, previously considered in the 1998 MND, include the proposed project site and are located throughout the City of Signal Hill, within the Long Beach Oil Field. The Long Beach Oil field encompasses the entirety of the City of Signal Hill, as well as portions of Long Beach to the northwest and southeast of the City. Additionally, the SHWU Facility is located on the western region of the South Coast Air Basin (Basin), which is a sub-area of the SCAQMD's area of jurisdiction.

The proposed modifications to the natural gas processing plant will occur at the same location as that was considered in the 1998 MND. The 1998 MND considered construction of the new natural gas processing facility at CUP Site No.2, which is the site where the current modifications are proposed; however, the 1998 MND also considered CUP Sites No. 1 and 3-7. These CUP sites are not included as part of the current project being evaluated. All improvements associated with the proposed project will occur within the boundaries of CUP Site No. 2, and no offsite properties will be affected; refer to [Figure 1A, Regional Vicinity Map](#), and [Figure 1B, Local Vicinity Map](#).

The existing SHWU natural gas processing facility (ID Signal Hill West Unit (SHWU) NO<sub>x</sub> RECLAIM Facility (ID 101977) where the proposed improvements will occur is within the larger boundary of CUP Site No. 2; refer to [Figure 1B, Local Vicinity Map](#). The SHWU site is bounded by Orange Avenue to the west, E. Spring Street to the north, a retail car sales dealership to the east, and E. 29<sup>th</sup> Street to the south. The City of Long Beach borders the northern edge of Spring Street.

Surrounding land uses include a self-storage operation to the north, across E. Spring Street, with an auto-oriented commercial retail business to the northwest, and equipment/collision repair businesses to the northeast. A retail car sales business borders the site to the east. To the south, the site is bordered by E. 29<sup>th</sup> Street. Across E. 29<sup>th</sup> Street are various commercial retail businesses (e.g. real estate office) and a chapel, and a commercial office park is located just to the south/southeast. To the west is Orange Avenue, with a generally vacant and highly disturbed parcel that supported the former gas processing facility (demolished subsequent to the construction of the existing natural gas processing facility located on the proposed project site) bordering the street.

According to the City of Signal Hill Zoning Map, the site is zoned GI (General Industrial). Adjacent lands to the south/southeast have similar zoning classifications, as well as SP-4 (Auto Center Specific Plan) and are intended for industrial-type and auto-related uses. Lands immediately to the west of Orange Avenue and north of Spring Street are located within the City of Long Beach.

## 1.6 CONSTRUCTION SCHEDULE

The proposed project would involve limited removal and/or replacement of some existing onsite equipment and subsequent installation of new equipment (as described above in Section 1.4, Project Description) in order to improve operations at the existing gas processing plant. Construction will be limited to minor demolition and hauling activities to remove the outdated equipment and to install the proposed equipment at the existing gas processing facility site.

Demolition and construction activities are anticipated to occur over an approximate 61-day period, following certification of the Subsequent MND and issuance of the required permits; refer to Chapter 2, Section III, Air Quality, of this Final Subsequent MND for a detailed description of demolition and construction requirements. Construction, including initial demolition to connection of the new equipment installed, is anticipated to commence in the 4<sup>th</sup> quarter of 2014; however, this date may ultimately vary, depending on the length of the approval process. Although the actual dates of the construction phase may change, it should be noted that the construction analysis and emissions described herein in this Final Subsequent MND will remain the same (i.e., the construction analysis is conservative and all projected emissions will be the same or greater than actual emissions if construction is delayed).

## 1.7 OPERATING SCENARIO

SHP's Gas Plant is captured under the California Accidental Release Program (Cal-ARP), the U.S. EPA's Risk Management Programs and the California Occupational Safety Administration (OSHA) Process Safety Management (Cal-ARP/RMP/PSM) regulations. These regulations require SHP to operate the gas plant in a very prescriptive manner to prevent releases from the gas plant to the environment. SHP must conduct hazard analyses, process safety and hazards assessments, mechanical integrity assessments, management of change, pre-construction review, operational training and post maintenance auditing. The goal of these programs is to prevent accidental releases to the environment that may have catastrophic consequences.

Installation of the proposed equipment will occur in a logical sequence in order to ensure that all new equipment is operating effectively prior to shut down of any existing equipment. The installation sequence will be analyzed and fine-tuned as part of the pre-construction review. The operational procedures will be reviewed prior to construction, even those aspects that haven't changed. Training will be implemented subsequent to the review of the operational procedures. The new equipment to be installed is illustrated in [Figure 3B, Gas Plant Modification - Proposed Improvements](#). Overall facility operations and maintenance will not change substantially, but will still require review under the Cal-ARP/RMP/PSM program. [Appendix B, SCAQMD Permit Application \(February 2014\)](#), includes detailed construction and operational emissions for the new equipment.

## CHAPTER 2

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### ENVIRONMENTAL CHECKLIST FORM

Introduction  
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Potentially Significant Impact Areas  
Determination  
Environmental Checklist and Discussion  
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    Agriculture and Forestry Resources  
    Air Quality  
    Biological Resources  
    Cultural Resources  
    Energy  
    Geology and Soils  
    Greenhouse Gas Emissions  
    Hazards and Hazardous Materials  
    Hydrology and Water Quality  
    Land Use and Planning  
    Mineral Resources  
    Noise  
    Population and Housing  
    Public Services  
    Recreation  
    Transportation/Traffic  
    Utilities and Services  
    Mandatory Findings of Significance  
References  
Acronyms  
Glossary

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## CHAPTER 2 - ENVIRONMENTAL CHECKLIST

### 2.1 INTRODUCTION

The environmental checklist provides a standard evaluation tool to identify a project's adverse environmental impacts. This checklist identifies and evaluates potential adverse environmental impacts that may be created by the proposed project.

### 2.2 GENERAL INFORMATION

Project Title:	Signal Hill Petroleum, Inc., Signal Hill West Unit (SHWU) Facility (SCAQMD ID #101977), Gas Plant Modification Project
Lead Agency Name:	South Coast Air Quality Management District
Lead Agency Address:	21865 Copley Drive Diamond Bar, CA 91765
Contact Person:	Michael Krause
Contact Phone Number:	(909) 396-2706
Project Sponsor's Name:	Signal Hill Petroleum, Inc.
Project Sponsor's Address:	2633 Cherry Avenue Signal Hill, California 90755
General Plan Designation:	Light Industrial
Zoning:	GI (General Industrial)
Description of Project:	<p>The proposed project is a modification to a previously-approved project that was evaluated in a 1998 Mitigated Negative Declaration (MND), prepared and adopted by the City of Signal Hill. The 1998 project allowed for the issuance of a single Conditional Use Permit (CUP) for the continued operation of seven oil production facilities (CUP Sites No. 1-7) operated by Signal Hill Petroleum, Inc. (SHP) with no physical change to the site boundaries or the type of operations, with exception of a new natural gas processing facility on CUP Site No. 2. The 7,000 square foot (s.f.) modernized processing facility was intended to replace an existing adjacent 200,000 s.f. facility constructed in the 1920's.</p> <p>Presently, gas exiting the gas processing facility cannot be sold to an end user, primarily because of naturally occurring CO<sub>2</sub> in the gas (which is not removed by the existing gas processing facility).</p>

Modifications to the existing gas processing plant are therefore necessary in order to process (e.g. remove CO<sub>2</sub> from) the produced gas to meet specifications to sell excess gas that otherwise cannot be used as fuel in the combustion turbine. The proposed modifications will also enable the field gathering system to operate at a lower pressure, which will improve the gas plant's ability to reliably perform its function as the vapor recovery/control system for SHP and third party oil wells and processing facilities in the area.

In addition, the proposed modifications will enable the gas plant to continue operating (at less than full capacity) even when the combustion turbine is out of service (e.g., for maintenance), because it will be possible to sell processed gas. This, again, improves the reliability of the gas plant as a vapor recovery/control system for SHP and third party oil wells and facilities. The proposed modifications will also enable SHP to deliver pipeline quality gas to the local gas distribution system that meets the required specifications of the City of Long Beach. The City has provided SHP with a commitment letter to accept delivery and purchase of locally-produced natural gas processed by SHP to supply a portion of the City's gas requirements; refer to [Appendix C](#).

Surrounding Land Uses and Setting:

The proposed project site is located in the City of Signal Hill, within Los Angeles County in southern California. The City of Long Beach completely surrounds the City of Signal Hill.

The existing natural gas processing facility [contained within Signal Hill West Unit (SHWU) NO<sub>x</sub> RECLAIM Facility (ID 101977)] where the proposed improvements will occur is within the larger boundary of CUP Site No. 2. The SHWU processing facility site (which contains the natural gas processing facility) is bounded by Orange Avenue to the west, E. Spring Street to the north, a retail car sales dealership to the east, and E. 29<sup>th</sup> Street to the south. The City of Long Beach borders the northern edge of Spring Street.

Surrounding land uses include a self-storage operation to the north, across E. Spring Street, with an auto-oriented commercial retail business to the northwest, and equipment/collision repair businesses to the northeast. A retail car sales business borders the site to the east. To the south, the site is bordered by E. 29<sup>th</sup> Street. Across E. 29<sup>th</sup> Street are various commercial retail businesses (e.g. real estate office) and a chapel, and a commercial office park is

located just to the south/southeast. To the west is Orange Avenue, with a generally vacant and highly disturbed parcel that supported the former gas processing facility (demolished subsequent to the construction of the existing natural gas processing facility located on the proposed project site) bordering the street.

Other Public Agencies            None.  
Whose Approval is  
Required:

### 2.3 POTENTIALLY SIGNIFICANT IMPACT AREAS

The following environmental impact areas have been assessed to determine their potential to be affected by the project. As indicated by the checklist on the following pages, environmental topics marked with a "✓" may be adversely affected by the project. An explanation relative to the determination of impacts can be found following the checklist for each area.

- |   |   |   |
|---|---|---|
| <input checked="" type="checkbox"/> Aesthetics              | <input type="checkbox"/> Greenhouse Gas Emissions                   | <input type="checkbox"/> Population and Housing             |
| <input type="checkbox"/> Agriculture and Forestry Resources | <input checked="" type="checkbox"/> Hazards and Hazardous Materials | <input type="checkbox"/> Public Services                    |
| <input type="checkbox"/> Air Quality                        | <input type="checkbox"/> Hydrology and Water Quality                | <input type="checkbox"/> Recreation                         |
| <input type="checkbox"/> Biological Resources               | <input type="checkbox"/> Land Use and Planning                      | <input type="checkbox"/> Transportation/Traffic             |
| <input type="checkbox"/> Cultural Resources                 | <input type="checkbox"/> Mineral Resources                          | <input type="checkbox"/> Utilities and Service Systems      |
| <input type="checkbox"/> Geology and Soils                  | <input checked="" type="checkbox"/> Noise                           | <input type="checkbox"/> Mandatory Findings of Significance |
| <input type="checkbox"/> Energy                             |   |   |

## 2.4 DETERMINATION

On the basis of this initial evaluation:

- I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- I find that although the project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- I find that the project MAY have a significant effect(s) on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
- I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
- I find that although the project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the project, nothing further is required.

Date: 11/25/2014

Signature:   
Michael Krause  
Program Supervisor

## 2.5 ENVIRONMENTAL CHECKLIST AND DISCUSSION

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### I. AESTHETICS

#### Significance Criteria

The proposed project impacts on aesthetics will be considered significant if:

- The project will block views from a scenic highway or corridor.
- The project will adversely affect the visual continuity of the surrounding area.
- The impacts on light and glare will be considered significant if the project adds lighting which would add glare to residential areas or sensitive receptors.
- Environmental Setting and Impacts

#### ***Impacts Analyzed in Previous 1998 Project MND***

The 1998 MND analyzed the impacts of continued operation of seven oil production facilities operated by SHP (CUP Sites No. 1-7) with no proposed changes to the physical site boundaries or type of operations, with the exception of a new natural gas processing facility to be located at CUP Site No.2 (current proposed project site). The new natural gas processing facility included a vapor recovery system, natural gas dehydration system, and production of natural gas liquid (NGL) and fuel gas.

The changes from the 1998 project compared to the proposed project are: 1) modification of the existing vapor recovery system (additional compression capacity); 2) modification of the existing natural gas dehydration system (upgrade of propane refrigeration and glycol dehydration equipment); 3) addition of a new CO<sub>2</sub> filtration system to produce gas that meets City of Long Beach specifications; and, 4) delivery of pipeline quality sales gas to the local gas distribution system. Further, the plant was modified in 2008 by adding compression capacity at the plant inlet; such improvements are part of the current baseline conditions and are not analyzed in this Final Subsequent MND. As applicable, any terms, conditions, or requirements previously imposed by the City of Signal Hill in their former determinations for the gas processing plant will remain in effect during construction and operation of the proposed project.

The 1998 MND identified potentially significant adverse impacts for the aesthetic resources checklist items, and therefore mitigation (Mitigation Measure #6 in the 1998 MND) was proposed to reduce potential impacts to a less than significant level. The mitigation measure required CUP site landscaping to comply with the landscaping concept shown on the site plans and conditions of approval for additional landscape enhancement and maintenance requirements. In accordance with the 1998 MND, this mitigation measure has been implemented to date; refer to [Figure 3A, Existing Configuration – CUP Site No. 2](#), and [Figure 5, Conceptual Landscape Plan](#). The benefits from the 1998 mitigation measure will continue as the new equipment will be located in the same vicinity as the existing equipment. The 1998 mitigation measures will continue to be implemented.

***Other Applicable Regulations for Previously Approved 1998 Project***

Additionally, the Conditions of Approval for extension of CUP 97-03 to December 31, 2014 included Condition 6, which required that no structures, including tanks, shall exceed 40 feet, except that the height of the emissions stack for the gas turbine power plant shall not exceed 45 feet in height, and no pumping unit shall exceed 50 feet in height above existing grades. Additionally, Condition 11.c) requires that (during drilling operations), the operator shall maintain a minimum of five off-street parking spaces at each Consolidated Drilling and Oil Production Site, as requested by Signal Hill Municipal Code Section 16.16.050, entitled “Off-Street Parking.” Condition 11.h) requires that the operator 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 of the Municipal Code. Furthermore, CUP Condition 11.i) requires that the operator maintain paint on all equipment. Equipment tanks shall be painted a neutral color, and 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.

Additionally, Condition 14.b) cites the following specific improvements for CUP Site No. 2 (encompasses the proposed project site) which were required to be implemented within four months of the approval of the CUP, subject to review and approval by the Director of Community Development. Condition 14.b) required that, for CUP Site No. 2 (proposed project site), the operator shall remove the dead trees from the Orange Avenue (west) and east sides of the facility. Additionally, the operator was required to remove weeds from the ground-covered areas long Orange Avenue and new ground cover planted as needed; plant new trees along the east side of the site; and, design and install a new landscaped area on E. 29th Street, including an automatic irrigation system. Such enhancements have been implemented to date to reduce potential adverse visual effects of the new equipment project.

Further, Condition 24 required that the operator install and maintain landscaping at all seven drill sites to the satisfaction of the Planning Commission, improving on the specification of Condition 14 from the previous Conditions of Approval for CUP 97-03. Condition 25 required that the operator install such landscaping no later than January 24, 2014, and maintain it to the satisfaction of the Planning Commission, with landscape maintenance being part of the annual review for CUP 97-03. Such improvements have been made to date, thereby improving the visual aesthetics of CUP Site No. 2.

The above conditions were applied to the 1998 project. As existing commitments and requirements, such measures will also apply to the currently proposed project, as appropriate (and if not already in place), in order to further avoid and/or reduce potential effects of the proposed project on aesthetic resources.

	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
Would the project:				
a) Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**I.a), .b), and .c).** The existing visual character of the surrounding locale is highly industrial and commercial. The proposed project is not located within or along a designated scenic corridor, and the existing SHWU Facility does not contain any scenic resources such as trees, rock outcroppings, etc. Those existing components of the gas plant not affected with the proposed project would retain their current physical height and appearance. As constructed, the existing facilities include one 12-inch diameter stabilizer, 14 feet in height, located behind an existing 24-foot water tank. General equipment height is approximately 10 feet, generally located between three feet below ground in the containment area. The facility is visually screened by a 6-foot high block wall and mature landscaping in accordance with the City’s Oil Code. The existing facilities are therefore generally not visible from street level beyond the existing perimeter wall.

The equipment installed with the proposed project for the vapor recovery or natural gas dehydration system will have similar characteristics as the existing equipment. No component of the new CO<sub>2</sub> filtration system or improvements made to enable distribution of sales gas will exceed the height of the existing facilities onsite; refer also to Appendix 2 of [Appendix B, SCAQMD Permit Application \(February 2014\)](#), for proposed equipment descriptions. The proposed improvements will be consistent with similar industrial-type elements associated with existing surrounding land uses (e.g. oil and gas extraction, industrial uses, etc.). Additionally, as stated above, the Conditions of Approval with extension of CUP 97-03 to December 31, 2014 have been implemented and further reduce the visibility of the site while enhancing the existing visual setting.

Based on the above discussion, the proposed modifications at the existing SHWU Facility are not expected to substantially degrade the existing character or quality of the visual landscape; however, to ensure that the proposed improvements do not result in a significant impact over the long-term, mitigation is proposed (MM AES-1) to require installation of landscape plantings along the western and southern perimeters of the larger SHP parcel (adjacent to Orange Avenue and E. 29<sup>th</sup> Street); refer to [Figure 5, Conceptual Landscape Plan](#). The landscaping will enhance the visual setting and screen views into the site from offsite locations. Additional plantings at a lower density will also be planted along the northern and eastern perimeters of the property to enhance the appearance of the property. Maintenance of the landscaping will be the

responsibility of SHP (or via contract with a private landscaping company) and will be subject to the satisfaction of the Planning Commission, with landscape maintenance being part of the annual review for CUP 97 03. Implementation of MM AES-1 will reduce potential impacts with regard to a substantial change in the existing character of the visual landscape to a level of less than significant.

	<b>Potentially Significant Impact</b>	<b>Less Than Significant With Mitigation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
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 type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**I.d).** The proposed equipment modifications will not require a new onsite light source to operate safely during nighttime operations. Construction-related activities will occur during daylight hours. Therefore, no increase in lighting associated with the project at the SHWU Facility is expected. No impacts relative to light and glare will occur with the proposed project.

### Mitigation Measures

With regard to aesthetics, the following mitigation measure is proposed to reduce visual impacts resulting from potential degradation of the existing visual character or quality of the site and its surroundings to a level of less than significant. The 1998 mitigation measures will continue to be implemented.

#### MM AES-1

Within 30 days of completion of the construction phase, the project applicant shall install perimeter landscaping consistent with that shown on the Conceptual Landscape Plan prepared for the project (refer to *Figure 5, Conceptual Landscape Plan, in the 2015 SMND*). Improvements to the existing irrigation system shall be made, as required, to adequately accommodate the landscape plantings and to ensure long-term success of establishment. The project applicant shall be responsible for maintaining the landscaping installed to the satisfaction of the SCAQMD or designee, with landscape maintenance being part of the annual review for CUP 97-03.

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## II. AGRICULTURE AND FORESTRY RESOURCES

### Significance Criteria

Project-related impacts on agricultural resources will be considered significant if any of the following conditions are met:

- The proposed project conflicts with existing zoning or agricultural use or Williamson Act contracts.
- The proposed project will convert prime farmland, unique farmland, or farmland of statewide importance, as shown on the maps prepared pursuant to the farmland mapping and monitoring program of the California Resources Agency, to non-agricultural use.
- The proposed project conflicts with existing zoning for, or causes rezoning of, forest land (as defined in Public Resources Code §12220(g)), timberland (as defined by Public Resources Code §4526), or timberland zoned Timberland Production (as defined by Government Code §51104(g)).
- The proposed project would involve changes in the existing environment, which, due to their location or nature, could result in conversion of farmland to non-agricultural uses.

## **Environmental Setting and Impacts**

### ***Impacts Analyzed in Previous 1998 Project MND***

The 1998 MND analyzed the impacts of continued operation of seven oil production facilities operated by SHP (CUP Sites No. 1-7), with no proposed change to the physical site boundaries or type of operations, with the exception of a new natural gas processing facility at CUP Site No.2 (current proposed project site). The new natural gas processing facility included a vapor recovery system, natural gas dehydration system, and production of NGL and fuel gas.

The changes from the 1998 project compared to the proposed project are: 1) modification of the existing vapor recovery system (additional compression capacity); 2) modification of the existing natural gas dehydration system (upgrade of propane refrigeration and glycol dehydration equipment); 3) addition of a new CO<sub>2</sub> filtration system to produce gas that meets City of Long Beach specifications; and, 4) delivery of pipeline quality sales gas to the local gas distribution system. Further, the plant was modified in 2008 by adding compression capacity at the plant inlet; such improvements are part of the current baseline conditions and are not analyzed in this Final Subsequent MND. As applicable, any terms, conditions, or requirements previously imposed by the City of Signal Hill in their former determinations for the gas processing plant will remain in effect during construction and operation of the proposed project, as appropriate.

The 1998 MND did not identify potentially significant adverse impacts for issues relative to any agricultural resources checklist items (analyzed under Land Use and Planning in the 1998 MND). The analysis of project impacts on forestry resources was not included as a checklist item in 1998; however, such analysis is included herein.

	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code §12220(g)), timberland (as defined by Public Resources Code §4526), or timberland zoned Timberland Production (as defined by Government Code §51104(g))?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**II.a), .b), and .c).** There are no agricultural resources (i.e., food crops grown for commercial purposes) located on in the near vicinity of the SHWU Facility; refer to [Figure 1B, Local Vicinity Map](#), for industrial location. The proposed project will not involve construction of any structures outside of the existing boundaries of the SHWU Facility, where agricultural resources may be located. The zoning of the SHWU Facility will remain as GI (General Industrial); the existing use of the site for the natural gas processing facility is an allowed use under the GI zone. Therefore, the proposed project will not result in a significant adverse impact on agricultural resources, convert prime farmland, unique farmland, or farmland of statewide importance to non-farming use, or, conflict with zoning for agriculture.

	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
Would the project:				
d) Result in the loss of forest land or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**II.d).** There are no forestry resources (i.e., park forests, timber crops grown for commercial purposes, etc.) located in or near the vicinity of the SHWU Facility. The proposed project will not involve construction of any improvements or structures outside of the existing boundaries of the SHWU Facility, where forestry resources may occur. The proposed project does not require a

rezone, and the existing zoning (GI – General Industrial) will remain in effect. Therefore, the proposed project will have no significant adverse impact on forestry resources, result in the loss of forest land or conversion of forest land to non-forest use, or conflict with zoning for forestry.

	<b>Potentially Significant Impact</b>	<b>Less Than Significant With Mitigation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
Would the project:				
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**II.e).** Refer to the analysis provided under II.a) through II.d), above. Due to existing conditions onsite and in the surrounding area, the proposed project would not involve other changes in the existing environment which, due to their location or nature, could result in the conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use. No significant adverse impact would occur.

**Mitigation Measures**

Based on the above information relative to impacts relative to agriculture and forestry resources, no significant adverse impacts were identified, and therefore, no mitigation measures are required for the construction or operation of the proposed project.

**III. AIR QUALITY**

**Significance Criteria**

To determine whether or not air quality impacts from the proposed project may be significant, impacts will be evaluated and compared to the criteria in [Table III-1, SCAQMD Air Quality Significance Thresholds](#). If impacts equal or exceed any of the criteria in [Table III-1](#), they will be considered significant. As necessary, all feasible mitigation measures will be identified and implemented to reduce any significant adverse air quality impacts from the proposed project to the maximum extent feasible.

**Table III-1. SCAQMD Air Quality Significance Thresholds**

<b>Mass Daily Thresholds</b>		
<b>Pollutant</b>	<b>Construction</b>	<b>Operation</b>
NO <sub>x</sub>	100 lbs/day	55 lbs/day
VOC	75 lbs/day	55 lbs/day
PM <sub>10</sub>	150 lbs/day	150 lbs/day
PM <sub>2.5</sub>	55 lbs/day	55 lbs/day
SO <sub>x</sub>	150 lbs/day	150 lbs/day
CO	550 lbs/day	550 lbs/day
Lead	3 lbs/day	3 lbs/day
<b>Toxic Air Contaminants (TACs), Odor and GHG Thresholds</b>		
TACs (including carcinogens and non-carcinogens)	Maximum Incremental Cancer Risk $\geq$ 10 in 1 million Cancer Burden > 0.5 excess cancer cases (in areas $\geq$ 1 in 1 million) Chronic & Acute Hazard Index $\geq$ 1.0 (project increment)	
Odor	Project creates a minimal odor nuisance pursuant to SCAQMD Rule 402	
GHG	10,000 MT/yr CO <sub>2</sub> eq for industrial facilities	
<b>Ambient Air Quality Standards for Criteria Pollutants</b>		
<b>NO<sub>2</sub></b> 1-hour average annual arithmetic mean	SCAQMD is in attainment; a 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)	
<b>PM<sub>10</sub></b> 24-hour average annual average	10.4 $\mu\text{g}/\text{m}^3$ (construction) & 2.5 $\mu\text{g}/\text{m}^3$ (operation) 1.0 $\mu\text{g}/\text{m}^3$	
<b>PM<sub>2.5</sub></b> 24-hour average	10.4 $\mu\text{g}/\text{m}^3$ (construction) & 2.5 $\mu\text{g}/\text{m}^3$ (operation)	
<b>SO<sub>2</sub></b> 1-hour average 24-hour average	0.25 ppm (state) & 0.075 ppm (federal – 99 <sup>th</sup> percentile) 0.04 ppm (State)	
<b>Sulfate</b> (24-hour average)	25 $\mu\text{g}/\text{m}^3$ (State)	
<b>CO</b> 1-hour average 8-hour average	SCAQMD is in attainment; a project is significant if it causes or contributes to an exceedance of the following ambient standards: 20 ppm (state) and 35 ppm (federal) 9.0 ppm (State/federal)	
<b>Lead</b> 30-day average rolling 3-month average quarterly average	1.5 $\mu\text{g}/\text{m}^3$ (State) 0.15 $\mu\text{g}/\text{m}^3$ (federal) 1.5 $\mu\text{g}/\text{m}^3$ (federal)	
PM <sub>10</sub> = particulate matter less than 10 microns in size, $\mu\text{g}/\text{m}^3$ = microgram per cubic meter; ppm = parts per million; TAC = toxic air contaminant; AHM = Acutely Hazardous Material; NO <sub>2</sub> = Nitrogen Oxide, CO = Carbon Monoxide, VOC = Volatile Organic Compounds, SO <sub>x</sub> = Sulfur Oxide; SO <sub>2</sub> = Sulfur Dioxide. Lbs = pounds. Source: SCAQMD; data obtained April 2014.		

**Environmental Setting and Impacts**

***Impacts Analyzed in Previous 1998 Project MND***

The 1998 MND analyzed the impacts of continued operation of seven oil production facilities operated by SHP (CUP Sites No. 1-7) with no proposed change to the physical site boundaries or type of operations, with the exception of a new natural gas processing facility at CUP Site No.2 (current proposed project site). The new gas processing plant included a vapor recovery system, natural gas dehydration system, and production of NGL and fuel gas.

The changes from the 1998 project compared to the proposed project are: 1) modification of the existing vapor recovery system (additional compression capacity); 2) modification of the existing natural gas dehydration system (upgrade of propane refrigeration and glycol dehydration equipment); 3) addition of a new CO<sub>2</sub> filtration system to produce gas that meets City of Long Beach specifications; and, 4) delivery of pipeline quality sales gas to the local gas distribution system. Further, the plant was modified in 2008 by adding compression capacity at the plant inlet; such improvements are part of the current baseline conditions and are not analyzed in this Final Subsequent MND. As applicable, any existing terms, conditions, or requirements previously imposed by the City of Signal Hill in their former determinations for the gas processing plant will remain in effect during construction and operation of the proposed project (if not already in place) in order to further avoid and/or reduce potential effects of the proposed project on air quality.

The 1998 MND did not identify a potentially significant adverse impact relative to air quality for the checklist items; however, mitigation was identified (Mitigation Measures #2 and #3 in the 1998 MND). In accordance with the 1998 MND, this mitigation has been implemented to date. The 1998 mitigation measures will continue to be implemented.

	<b>Potentially Significant Impact</b>	<b>Less Than Significant With Mitigation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**III.a).** The SHWU is located within the South Coast Air Basin (Basin), which is under the jurisdiction of the SCAQMD. The SCAQMD is the air pollution control agency primarily responsible for preparing the Air Quality Management Plan (AQMP), which is a comprehensive air pollution control program for making progress towards and attaining the State and federal ambient air quality standards. The most recent AQMP was adopted by the Governing Board of the SCAQMD on December 7, 2012 (2012 AQMP). An inventory of existing emissions from industrial facilities is included in the baseline inventory in the 2012 AQMP, as well as projections of the future emissions which are based on source category growth factors provided by the Southern California Association of Government (SCAG). The 2012 AQMP also identifies

emission reductions from existing sources and air pollution control measures that are necessary in order to comply with applicable State and federal ambient air quality standards. A significant impact would occur if the proposed project were not consistent with the AQMP.

The 2012 AQMP demonstrates that applicable ambient air quality standards can be achieved within the timeframes required under federal law. The proposed project must comply with applicable SCAQMD rules and regulations for new or modified sources or the necessary air quality permits to implement the project will not be issued. For example, new emission sources associated with the proposed project are required to comply with the SCAQMD's Regulation XIII - New Source Review, including Best Available Control Technology (BACT), offsets, and modeling requirements, as applicable. The proposed project must also comply with prohibitory rules, as applicable, such as Rule 403, for the control of fugitive dust. By meeting these requirements, the proposed project will be consistent with the goals and objectives of the 2012 AQMP to improve air quality in the Basin. Compliance with State and federal sulfur limits on diesel fuel, including the use of ultra-low sulfur diesel fuel as a control measure under the 2012 AQMP, is also required. As described in the following discussion, the proposed project is not expected to generate significant adverse air quality impacts. For these reasons, the proposed project is concluded to be consistent with applicable AQMPs and is not expected to diminish an existing air quality rule or a future compliance requirement.

The Growth Management Chapter (GMC) of the Regional Comprehensive Plan and Guide (RCPG) forms the basis of the land use and transportation control measure portions of the AQMP. Projects that are consistent with the projections of the employment and population forecasts identified in the GMC are considered consistent with the 2012 AQMP growth projections.

A limited number of construction workers will be required during project construction; however, these workers will be temporary workers who will be supplied by the existing local labor pool. The number of vendors that travel to and from work at the facility is not expected to change upon completion of the proposed project. No new employees will be required at the facility for operation as the result of the proposed modifications. Therefore, the proposed project will also be consistent with the 2012 AQMP population and employment forecasts.

The proposed project would serve existing and intended land uses and would be consistent with the goals and policies of the 2012 AQMP. The project would not substantially affect regional employment or job growth. Existing uses on and surrounding the project site would not be changed by the proposed project. The proposed project will not conflict with the AQMP or the other applicable plans described above. As a result, it is concluded that the proposed project is consistent with the AQMP, and therefore, is expected to result in a less than significant impact with regard to the applicable air quality plan.

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**III.b).** The proposed project area is located in and is part of the Basin, which currently exceeds and is in violation of the National Ambient Air Quality Standards (NAAQS) and the California Ambient Air Quality Standards (CAAQS), specifically with respect to ozone (O<sub>3</sub>) (8-hour standard) and fine particulates (PM<sub>2.5</sub>) (24-hour standard).

There are several monitoring stations located in Long Beach which include: Hudson Monitoring Station located at 2425 Webster Avenue in Long Beach at the Hudson School Building Services Facility, which is approximately 2.65 miles west/southwest of the gas plant; and, Edison Monitoring Station located at 625 Maine Avenue, at the Edison Elementary School, approximately 2.84 miles southwest of the gas plant.<sup>1, 2</sup> Both stations are also within the vicinity of I-710.

To assess the impacts of project-related construction and operational emissions, the SCAQMD has established regional significance thresholds that are shown above in [Table III-1](#). Construction and operational emissions from the proposed project that are below these thresholds will be considered less than significant.

To assess local air quality impacts, the SCAQMD has also established emission thresholds for one-hour average (NO<sub>2</sub>, CO, SO<sub>2</sub>), eight-hour average (CO), 24-hour average (PM<sub>2.5</sub>, PM<sub>10</sub>, and SO<sub>2</sub>), and annual average (NO<sub>2</sub>, PM<sub>10</sub>, SO<sub>2</sub>) emissions. Project emissions are compared to concentration standards (i.e., background plus incremental) for pollutants for which the Basin is in attainment (i.e., NO<sub>2</sub>, CO) and to incremental standards (i.e., incremental increase) for pollutants for which the Basin is in non-attainment (i.e., PM<sub>10</sub> and PM<sub>2.5</sub>).

The only emissions of criteria pollutants associated with operation of the proposed project are fugitive emissions from component leaks. Incremental criteria emissions from fugitive components (i.e., the net increase in fugitive components) were determined in accordance with methodology prescribed by the SCAQMD for oil and gas production facilities. This methodology utilizes Rule 1173 screening data from the prior eight calendar quarters to calculate site-specific emission factors by component category (i.e., the highest weighted average leaking / non-leaking factor in any one quarter). These factors are then multiplied by a factor of 1.2 and by the incremental component counts associated with the proposed project to determine incremental fugitive emissions by permit unit. Representative gas analytical data for the facility was used to convert the incremental fugitive emissions from TOG to VOC. Rule 1173 screening data and gas analytical data associated with the gas processing plant portion of the SHWU Facility were used.

<sup>1</sup> SCAQMD. Long Beach Monitoring Stations. Available at: <http://www.aqmd.gov/home/library/air-quality-data-studies/air-quality-monitoring-studies/rule-1158>. Accessed September 23, 2014.

<sup>2</sup> SCAQMD, Monitoring Network Plan. Available at: <http://www.aqmd.gov/home/library/clean-air-plans/monitoring-network-plan>. Accessed November 21, 2014.

Additional details are included in Appendix 3 and Appendix 8 of [Appendix B, SCAQMD Permit Application \(February 2014\)](#), of this Final Subsequent MND.

### ***Construction Emissions and Analyses***

Construction typically occurs in general phases including demolition, site preparation, construction of structures, and final site work. Specific construction activities required to implement the proposed project include: excavation, concrete work, erection, and replacement/installation of the individual pieces of equipment, as shown in [Table III-2, Daily Project Activity and Emissions – Demolition and Construction](#), below. Each task will require the operation of onsite equipment (e.g., rubber-tired backhoes), and vehicles to transport workers or for deliveries. All proposed project improvements will be completed on a paved surface within the existing boundaries of the gas plant facility; refer to [Figure 3A, Site Plan – CUP Site No. 2 \(as Analyzed in 1998 MND\)](#). Initial excavation activities for the project will be undertaken using rubber-tired backhoes.

**Table III-2. Daily Project Activity and Emissions – Demolition and Construction**

Schedule	Task	Backhoe	Diesel (gal)	Dump Truck	Diesel (Gal)	Concrete Truck	Diesel (Gal)	Truck	Gas (Gal)	Crane	Diesel (Gal)	CO, lbs	VOC, lbs	NO <sub>x</sub> , lbs	SO <sub>x</sub> , lbs	PM <sub>10</sub> , lbs
Day 1	Demo LTS Area	8 hours	10	4 Trucks 2 miles	6			20 mi	2			<b>5.955</b>	1.657	<b>10.550</b>	<b>1.502</b>	0.792
Day 2	Demo LTS Area	8 Hours	10	4 Trucks 2 miles	6			20 mi	2			<b>5.955</b>	1.657	<b>10.550</b>	<b>1.502</b>	0.792
Day 3	Form Foundations							20 mi	2			0.255	0.097	0.995	0.001	0.033
Day 4	Form Foundations							20 mi	2			0.255	0.097	0.995	0.001	0.033
Day 5	Pour Foundations					3 Hours, 2 Miles	6	20 mi	2			1.474	0.138	3.577	0.001	0.246
Day 6	Deliver Rebar							20 mi	2			0.255	0.097	0.995	0.001	0.033
Day 7	Deliver Piping							20 mi	2			0.255	0.097	0.995	0.001	0.033
Day 8	Hand trench and Set piping							20 mi	2			0.255	0.097	0.995	0.001	0.033
Day 13	Hand trench and Set piping							20 mi	2			0.255	0.097	0.995	0.001	0.033
Day 14	Set rebar							20 mi	2			0.255	0.097	0.995	0.001	0.033
Day 15	Pour Slab					8 Hours, 8 miles	16	20 mi	2			3.505	0.206	7.881	0.002	0.648
Day 16	Cure Slab							20 mi	2			0.255	0.097	0.995	0.001	0.033
Day 21	Cure Slab							20 mi	2			0.255	0.097	0.995	0.001	0.033
Day 22	Set Skid							20 mi	2	4 Hours	12.8	2.539	6.817	7.115	0.012	2.753
Day 23	Convert Equipment							20 mi	2			0.255	0.097	0.995	0.001	0.033
Day 36	Convert Equipment							20 mi	2			0.255	0.097	0.995	0.001	0.033
Day 37	Remove Old LTS Skid							20 mi	2	6 Hours	19.2	3.681	<b>10.105</b>	10.175	0.017	<b>4.113</b>
Day 38	Demo Skid Area	8 hrs	10	4 trucks, 2 miles	6			20 mi	2			<b>5.955</b>	1.657	<b>10.550</b>	<b>1.502</b>	0.792
Day 39	Form Foundations	2 hrs	2.25	1 Truck 1 mile	2			20 mi	2			0.763	0.518	3.405	0.003	1.490
Day 40	Pour Foundations					2 Hours, 2 miles	4	20 mi	2			1.067	0.124	2.716	0.001	0.067

**Table III-2, continued**

Schedule	Task	Backhoe	Diesel (gal)	Dump Truck	Diesel (Gal)	Concrete Truck	Diesel (Gal)	Truck	Gas (Gal)	Crane	Diesel (Gal)	CO, lbs	VOC, lbs	NO <sub>x</sub> , lbs	SO <sub>x</sub> , lbs	PM <sub>10</sub> , lbs
Day 41	Hand trench, Set Plumbing							20 mi	2			0.255	0.097	0.995	0.001	0.033
Day 43	Hand Trench, Set Plumbing							20 mi	2			0.255	0.097	0.995	0.001	0.033
Day 44	Pour Slab					4 hours, 4 miles	8	20 mi	2			1.880	0.151	4.438	0.001	0.341
Day 45	Cure Slab							20 mi	2			0.255	0.097	0.995	0.001	0.033
Day 50	Cure Slab							20 mi	2			0.255	0.097	0.995	0.001	0.033
Day 51	Set Skid							20 mi	2	4 hours	12.8	2.539	6.817	7.115	0.012	2.753
Day 52	Connect Equipment							20 mi	2			0.255	0.097	0.995	0.001	0.033
Day 61	Connect Equipment							20 mi	2			0.255	0.097	0.995	0.001	0.033
Total			32.25		20		34		118		44.8					
<b>Total Gasoline, gals</b>		<b>118.00</b>		<b>Project Max Day, lbs</b>								<b>6.0</b>	<b>10.1</b>	<b>10.6</b>	<b>1.5</b>	<b>4.1</b>
<b>Total Diesel, gals</b>		<b>131.05</b>		<b>SCAQMD Significance Threshold, lbs/day</b>								<b>550</b>	<b>75</b>	<b>100</b>	<b>150</b>	<b>150</b>
				<b>Significant?</b>								<b>No</b>	<b>No</b>	<b>No</b>	<b>No</b>	<b>No</b>

NOTES:  
 1) Fuel consumption rates and emission factors [EMFAC, 2011, e.g.: EMFAC-PL uses the combined outputs from the two models (EMFAC-LDV and EMFAC-HD) at the most detailed level (e.g. EMFAC "Burden" output level) disaggregated by Speed (5-MPH increments) as the base inventory. Running Exhaust Emission Rate  $_{vc, Speed}$  (g/mile) = [Default Running Exhaust Emissions  $_{vc, Speed}$ ] / [Default Total VMT  $_{vc, Speed}$ ] are from the California Emissions Estimator Model (CalEEMod) version 2013.2.2 or, when not available in CalEEMod, from the manufacturer's specifications.  
 2) Cement batch plant to be used is one mile from the project site; disposal site for the asphalt and soil is 1/2 mile from the project site.  
 3) Small truck traffic of 20 miles per day is for incidentals. Except for the concrete contractor and a crane operator, demolition and construction workers are part of the normal on-site labor force.  
 Source: SHP, 2014.

Project construction-related activities will occur in one phase, commencing with the removal of onsite asphalt and excavation of small amount of soil beneath the asphalt. Two adjacent locations will be subject to construction activities, as described below:

1. On the larger site, the impacted surface area will be approximately 1,400 s.f., or 20 feet by 70 feet. This area sits within the current Drill Site #2, which is completely paved. Asphalt will be removed from the entire 1,400 s.f. area. A three-foot wide concrete containment wall will be built on the perimeter of the 1,400 s.f. rectangular area. Within the center of the rectangle, a 924 s.f. area, 14 feet by 66 feet, will be excavated to a depth of five feet, and filled in with concrete. This area will act as a skid pad for the new compression train that is the subject of the SCAQMD permit; and,
2. The smaller site will be located just southwest of the larger pad and will be 10 foot by 35 feet. The existing asphalt will be removed and the site excavated to a depth of five feet. The excavation will be filled with concrete and will serve as a skid pad for the CO<sub>2</sub> membrane filter.

During construction of the original gas plant and turbine, these soils were previously excavated to a depth of seven feet, and re-compacted with clean fill. During the proposed excavation on the two sites described above, the soils will be monitored under the conditions required by the *Various Locations Rule 1166 Contaminated Soil Mitigation Plan*. This Mitigation Plan was approved by the AQMD and is actively renewed on an annual basis.

If soil is contaminated with VOC (including TACs that are VOC), the Mitigation Plan will require that VOC emissions from the contaminated soil be controlled. Because demolition is expected to last only a few days, and a SCAQMD Rule 1166 VOC Contaminated Soil Mitigation Plan will be required to be followed if VOC contaminated soil is found, significant adverse impacts from VOC TAC emissions associated with any contaminated soils are not expected.

If contaminated soils are encountered, those soils will be isolated, stockpiled, and taken to a Waste Management Thermal Remediation site for disposal. Clean soils will be taken to the Signal Hill Petroleum soil stockpile site at Willow Street and Walnut Avenue in Signal Hill, less than one mile from the site. Further, all asphalt removed from the site will be taken to the Blue Diamond Recycling Facility located at California Avenue and Spring Street in the City of Signal Hill, less than one mile from the site. All project excavation and removal will be accomplished with a rubber-tired backhoe and loaded into trucks for removal from the site. A crane will be brought in to set the skids, download and install the prefabricated equipment onto the skids, and remove one redundant skid. All work will be performed on a paved facility, connected to paved public streets.

Construction emissions will be generated from the combustion of fuel (primarily diesel) by equipment and/or vehicle use required for project construction activities, as well as from fugitive dust due to soil-disturbing activities. As described above, minimal excavation is anticipated for construction of the required foundations; refer to [Figure 4A, Project Disturbance](#). The construction activities will be conducted during distinct time periods and will disturb approximately five percent of one acre of land within the SHWU Facility. Actual construction will generally take place in the area of the existing gas processing plant. During construction of

the proposed project, a limited number of commute trips and hauling truck trips to the facility will occur; refer to [Table III-2, Project-related Peak Daily Construction and Operational Emissions](#).

Including time for curing of the concrete, the entire construction period is estimated to be 61 days. Construction is expected to occur intermittently over the 61-day period. When construction is occurring, work is expected to typically occur ten hours per day (anticipated time of use for each specific activity and the resultant exhaust emissions generated by project demolition and construction are provided in Table III-2). The proposed construction schedule in [Table III-2](#) forms the basis for calculating emissions from construction of the proposed project. The dates of the schedule may change, but the timeline of the scheduled activities for each phase, i.e., number of days, would remain consistent. Also, the current analysis is conservative because emission factors typically decrease over time as equipment efficiency improves. Thus, if construction of the project is delayed for any reason, none of the environmental impacts conclusions in the analysis would change or worsen. For example, a conclusion of less than significant impacts from the construction phase of the project would remain less than significant even if the actual dates of the construction schedule are delayed.

Peak daily construction emissions are shown in [Table III-3, Project-related Peak Daily Construction and Operational Emissions](#). As shown, construction emissions for the project will be less than the SCAQMD’s construction air quality significance thresholds. Thus, construction of the proposed project is expected to result in less than significant air quality impacts, and no mitigation is required.

**Table III-3. Project-related Peak Daily Construction and Operational Emissions**

Parameter	SCAQMD CEQA Threshold	Localized Significance Threshold <sup>1,2</sup>	Actual Project Impact	Comments
<b>Demolition / Construction Emissions</b>				
NO <sub>x</sub> , lbs/day	100	55	10.6	<ul style="list-style-type: none"> <li>▪ 61 day project duration, see separate detail</li> <li>▪ Lbs/day is maximum day for each pollutant</li> <li>▪ PM<sub>2.5</sub> assumed equal to PM<sub>10</sub></li> </ul>
VOC, lbs/day	75	N/A	10.1	
PM <sub>10</sub> , lbs/day	150	29	4.1	
PM <sub>2.5</sub> , lbs/day	55	10	4.1	
SO <sub>x</sub> , lbs/day	150	N/A	1.5	
CO, lbs/day	550	1,180	6.0	
Lead, lbs/day	3	N/A	0	
<b>Operational Emissions</b>				
NO <sub>x</sub> , lbs/day	55	55	0	<ul style="list-style-type: none"> <li>▪ Fugitive emissions only, see application package for details (Appendix B)</li> </ul>
VOC, lbs/day	55	N/A	18	
PM <sub>10</sub> , lbs/day	150	7	0	
PM <sub>2.5</sub> , lbs/day	55	3	0	
SO <sub>x</sub> , lbs/day	150	N/A	0	
CO, lbs/day	550	1,180	0	
Lead, lbs/day	3		0	
<b>Demolition, Construction and Operational Emissions Combined</b>				
GHG, MT/yr CO <sub>2</sub> eq	10,000	N/A	2,875	Demo/Constr (2/30) + Fugitives (70) + CO <sub>2</sub> Removal (2,805)

Table III-3, continued

Parameter	SCAQMD CEQA Threshold	Localized Significance Threshold <sup>1,2</sup>	Actual Project Impact	Comments
<b>Toxic Air Contaminants from Operational Emissions (NOTE: Does not include construction emissions).</b>				
MICR	$1 \times 10^{-6}$	N/A	$0.0255 \times 10^{-6}$	Nearest Off Site Worker (Office Building @100m)
Cancer Burden	0.5	N/A	N/A	MICR is $< 1 \times 10^{-6}$
Chronic Hazard Index	1.0	N/A	$9.85 \times 10^{-5}$	Nearest Off Site Worker (Office Building @100m)
Acute Hazard Index	1.0	N/A	$2.07 \times 10^{-4}$	Nearest Acute Exposure (Public Street @25m)
<b>Odor</b>				
Odors During Construction	Rule 402 Nuisance	N/A	None Expected	Minor construction, Rule 1166 Plan for excavated soils
Odors During Operations	Rule 402 Nuisance	N/A	None Expected	Fugitive emissions subject to Rule 1173 I&M program

Source: SHP, 2014.

1. Localized Significance Thresholds are identified for Source Area Receptor 4 (South Coastal Los Angeles County). The thresholds assume a one-acre or smaller site with sensitive receptors located within 100 meters.

2. Localized Significance Thresholds apply to onsite emissions and not mobile sources.

### ***Operational Emissions and Analyses***

The modifications proposed with the project do not include the addition of any combustion equipment. As shown in [Table III-3](#), the proposed project would not result in any operational emissions with exception of VOCs. As shown in the table, VOCs generated by daily operation of the project will be less than the SCAQMD's threshold. Therefore, the project will not generate emissions during the operational phase that will result in a significant impact with regard to air quality; refer also to [Appendix B, SCAQMD Permit Application \(February 2014\)](#), for additional data.

The proposed project will be subject to the requirements of Rule 1303(a) and (b) which define three requirements - BACT, modeling, and offsets for permitting actions that result in an increase of emissions of non-attainment air contaminants (i.e., VOC, NO<sub>x</sub> and PM<sub>10</sub>), ozone depleting compounds, or ammonia. As shown in Appendix 3 of [Appendix B, SCAQMD Permit Application \(February 2014\)](#), there will be an increase in emissions of VOC from the existing vapor recovery and natural gas dehydration systems and from the proposed CO<sub>2</sub> filtration system. Thus, the proposed project is subject to the requirements of Rule 1303(a) and (b).

BACT is required if the increase in emissions of any non-attainment air contaminant, ozone depleting compound, or ammonia is greater than one pound per day. As shown in [Table III-3](#), the increase of VOC emissions relative to the proposed project (all of which will be fugitive emissions from potential equipment leaks) would exceed the one pound per day threshold. The fugitive components of the proposed project will satisfy SCAQMD BACT by complying with the requirements of Rule 1173, 40 CPR 60 Subpart 0000, and SCAQMD's Part D (non-major source) BACT guideline for "Fugitive Emission Sources at Natural Gas Plants and Oil and Gas Production Fields" which provides specific measures for equipment operation; refer to [Appendix B, SCAQMD Permit Application \(February 2014\)](#), for additional details.

Modeling (or screening per Appendix A of Rule 1303) is required to demonstrate an emission increase will not cause a violation of any State or national ambient air quality standards at any receptor location in the SCAQMD; however, per Rule 1303, Appendix A, modeling is not required for VOC. Therefore, no modeling is required for the proposed project.

Further, per Rule 1303(b)(2), unless exempt, offsets are required at a ratio of 1.2:1 for any unit for which there is an increase of 0.50 pounds per day or more in emissions of any non-attainment air contaminant. The increased VOC emissions from the project are not exempt from offset requirements. Thus, SHP will be required to offset such emissions at a ratio of 1.2:1 (or 18 lbs per day x 1.2 = 22 lbs/day). SHP will provide the required offsets upon notification from the SCAQMD.

Additionally, 40 CFR 60 Subpart 0000 establishes emission standards for the control of VOC and SO<sub>2</sub> emissions from "affected facilities" that commence construction, modification, or reconstruction after August 23, 2011. "Affected facilities" include sweetening units (e.g. the CO<sub>2</sub> filtration system) and fugitive components, among others listed, both of which will be a part of the proposed project. Because the acid gas removed by the sweetening unit will not be released into the atmosphere (it will be combined with fuel gas consumed in the existing combustion turbine), the sweetening unit is exempt from the requirements of the regulation (40 CFR 60.5365(g)(4)). Therefore, the only equipment-specific requirements of this regulation applicable to the proposed project are the portions applicable to fugitive components. Specifically, the applicable portions are found at 40 CFR 60.5400. In general, 40 CFR 60.5400 requires that fugitive components comply with the requirements of 40 CFR Part 60 Subpart VV a (Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry); however, 40 CFR 60.5401(c) and (d) provide exemptions from some of these requirements that are applicable to this project. 40 CFR 60.5401(c) provides an exemption for "sampling connection systems," and 40 CFR 60.5401(d) provides an exemption for (1) pumps in light liquid service, (2) valves in gas-vapor service, and (3) PRD's in gas-vapor service when such equipment is located at a non-fractionating gas plant with throughput less than 10 mmscf<sup>2</sup> per day. Taking into account these exemptions, the applicable requirements of 40 CFR 60.5400 to the proposed project are summarized in [Appendix B, SCAQMD Permit Application \(February 2014\)](#). Details of the air quality operational analysis are available in [Appendix B, SCAQMD Permit Application \(February 2014\)](#).

Therefore, operation of the proposed project will result in less than significant air quality impacts, and no additional mitigation measures are required.

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<sup>2</sup> mscf stands for one thousand standard cubic feet; mmscf is 1,000 mscf, or 1 million cubic feet.

	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
Would the project:				
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**III.c).** Significant adverse cumulative air quality impacts could occur if the proposed project resulted in a cumulatively considerable net increase of a criteria pollutant for which the Basin exceeds federal and State ambient air quality standards and has been designated as an area of non-attainment by the USEPA and/or the California Air Resources Board (CARB). The Basin is a non-attainment area for O<sub>3</sub> and fine particulate matter (PM<sub>10</sub><sup>3</sup> and PM<sub>2.5</sub>).

“Cumulatively considerable” means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, other current projects, and probable future projects. The Basin is currently in non-attainment for O<sub>3</sub>, PM<sub>10</sub>, and PM<sub>2.5</sub>, and related projects could exceed the applicable air quality standard or contribute to an existing or projected air quality exceedance when considered in combination with the effects of the proposed project. Therefore, this analysis assumes that individual projects that generate construction or operational emissions that exceed the SCAQMD’s recommended daily thresholds for project-specific impacts would also cause a cumulatively considerable increase in emissions for those pollutants for which the Basin is in non-attainment and, therefore, are considered to have significant adverse cumulative air quality impacts.

As discussed above, peak daily emissions associated with all phases of construction and operation of the proposed project will not generate operational or construction emission air quality impacts that exceed the SCAQMD’s regional significance thresholds. In addition, the proposed project will be located in a portion of the SHWU Facility, where other industrial facilities in the immediate vicinity are also located. Because emissions during any phase of the proposed project do not exceed the project-specific significance thresholds, they are not considered to be cumulatively considerable pursuant to CEQA Guidelines §15064(h)(1).

The SCAQMD guidance on addressing cumulative impacts for air quality is as follows. “As Lead Agency, the AQMD uses the same significance thresholds for project specific and cumulative impacts for all environmental topics analyzed in an Environmental Assessment or EIR.” “Projects that exceed the project-specific significance thresholds are considered by the SCAQMD to be cumulatively considerable. This is the reason project-specific and cumulative

<sup>3</sup> The US EPA recently proposed to find the Basin in attainment for the federal PM<sub>10</sub> standard; however, the Basin still exceeds the state PM<sub>10</sub> standard.

significance thresholds are the same. Conversely, projects that do not exceed the project-specific thresholds are generally not considered to be cumulatively significant.”<sup>4</sup>

This approach was upheld by the Court in *Citizens for Responsible Equitable Environmental Development v. City of Chula Vista* (2011) 197 Cal. App. 4th 327, 334. The Court determined that where it can be found that a project did not exceed the South Coast Air Quality Management District’s established air quality significance thresholds, the City of Chula Vista properly concluded that the project would not cause a significant environmental effect, nor result in a cumulatively considerable increase in these pollutants. The court found this determination to be consistent with CEQA Guidelines §15064.7, stating, “The Lead Agency may rely on a threshold of significance standard to determine whether a project will cause a significant environmental effect.” The court found that, “Although the project will contribute additional air pollutants to an existing nonattainment area, these increases are below the significance criteria...” “Thus, we conclude that no fair argument exists that the Project will cause a significant unavoidable cumulative contribution to an air quality impact.” As in *Chula Vista*, here the District has demonstrated, when using accurate and appropriate data and assumptions, that the project will not exceed the established South Coast Air Quality Management District significance thresholds. See also, *Rialto Citizens for Responsible Growth v. City of Rialto* (2012) 208 Cal. App. 4th 899. Here again, the court upheld the SCAQMD’s approach to utilizing the established air quality significance thresholds to determine whether the impacts of a project would be cumulatively considerable. Thus, it may be concluded that the Project will not cause a significant unavoidable cumulative contribution to an air quality impact.

Based on the foregoing analysis, project-specific air quality impacts from implementing the proposed project would not exceed air quality significance thresholds (Table III-1); therefore, based on the above discussion, cumulative impacts are not expected to be significant for air quality. Therefore, potential adverse impacts from the proposed project would not be "cumulatively considerable" as defined by CEQA Guidelines §15064(h)(1) for air quality impacts. Per CEQA Guidelines §15064(h)(4), the mere existing of significant cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed project’s incremental effects are cumulative considerable.

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<sup>4</sup> SCAQMD Cumulative Impacts Working Group White Paper on Potential Control Strategies to Address Cumulative Impacts From Air Pollution, August 2003, Appendix D, Cumulative Impact Analysis Requirements Pursuant to CEQA, at D-3, <http://www.aqmd.gov/docs/default-source/Agendas/Environmental-Justice/cumulative-impacts-working-group/cumulative-impacts-white-paper-appendix.pdf?sfvrsn=4>.

	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
Would the project:				
d) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**III.d).** This subsection evaluates whether or not the proposed project has the potential to expose sensitive receptors to substantial pollutant concentrations. The following are typically considered to be sensitive receptors: long-term health care facilities, rehabilitation centers, convalescent centers, retirement homes, residences, schools, playgrounds, child care centers, and athletic facilities. As indicated in Chapter 1, the area surrounding the site is highly developed with several uses. The nearest sensitive receptor (school/daycare) to the SHWU Facility is located approximately 0.33 mile to the north of the site; refer to [Figure 1B, Local Vicinity Map](#).

**Criteria Pollutant Health Impacts**

Construction and operation activities have the potential to generate an increase in criteria pollutants (e.g., CO, NO<sub>x</sub>, SO<sub>x</sub> and PM). Localized significance thresholds (LSTs) for NO<sub>x</sub> and CO are based on causing or exceeding health-based air quality ambient concentration standards. The PM<sub>10</sub> LST for construction is based on requirements of Rule 403, which is indirectly a health-based standard, and for operation the PM<sub>10</sub> LST is based on Rule 1303, which applies limits less than Rule 403 concentration limits. Therefore, the PM<sub>10</sub> LST provides greater health-based protection.

The degree of a health effect depends on the level of exposure, duration of exposure, and the existing health of those exposed. For example, individuals with a deficient blood supply to the heart are the most susceptible to the adverse effects of CO exposure. Inhaled, CO has no direct toxic effect on the lungs, but instead exerts its effect on tissues by interfering with oxygen transport through competition with oxygen to combine with hemoglobin present in the blood to form carboxyhemoglobin. Hence, conditions with an increased demand for oxygen supply can be adversely affected by exposure to CO. Individuals most at risk include patients with diseases involving heart and blood vessels, fetuses (unborn babies), and patients with chronic hypoxemia (oxygen deficiency) as seen in high altitudes.

Population-based studies suggest that an increase in acute respiratory illness, including infections and respiratory symptoms in children (not infants), is associated with long-term exposures to NO<sub>2</sub> at levels found in homes with gas stoves. These levels are higher than ambient levels found in southern California. Increase in resistance to air flow and airway contraction is observed after short-term exposure to NO<sub>2</sub> in healthy subjects. Larger decreases in lung functions are observed more in individuals with asthma and/or chronic obstructive pulmonary disease (e.g., chronic bronchitis, emphysema) than in healthy individuals, indicating a greater susceptibility of these sub-groups. More recent studies have found associations between NO<sub>2</sub> exposures and cardiopulmonary mortality, decreased lung function, respiratory symptoms, and emergency room asthma visits.

All asthmatics are sensitive to the effects of SO<sub>2</sub>. Exposure of a few minutes to low levels of SO<sub>2</sub> can result in airway constriction in some asthmatics. Further, increased resistance to air flow, as well as reduced breathing capacity leading to severe breathing difficulties, can be observed after high acute exposure to SO<sub>2</sub>. In contrast, healthy individuals do not exhibit similar acute responses even after exposure to higher concentrations of SO<sub>2</sub>.

There is a consistent correlation between elevated ambient fine particulate matter levels and an increase in mortality rates, respiratory infections, and the number and severity of asthma attacks. Studies have reported an association between long term exposure to air pollution dominated by fine particles and increased mortality, reduction in life-span, and, specifically, an increased mortality from lung cancer.

### ***Discussion of CARB's PM Mortality Quantification Methodologies***

While CARB (2008) has reported that it plans to develop a method for quantifying premature deaths from specific sources affecting limited geographic areas, it has not yet developed an approved approach which could be applied to small projects such as the proposed project. As noted in [Table III-3](#), the proposed project's PM<sub>2.5</sub> emissions are below emission standards set by the SCAQMD.

The analysis of the proposed project demonstrates that: 1) the criteria pollutant emissions from the proposed project are still below the LSTs or do not cause or contribute to an exceedance of any ambient air quality standard; and, 2) potential adverse health impacts associated with construction or operational emissions are still expected to be less than significant because the emissions are below a level at which health effects could occur (per LST thresholds which are based upon NAAQS standards). Therefore, the public will not be adversely affected by adverse health effects as a result of the proposed project. Thus, health impacts associated with the construction and operational emissions from the proposed project are determined to still be less than significant.

### **Toxic Air Contaminants (TAC) Analysis**

The proposed project has the potential to generate emissions that are carcinogenic or may have non-cancer health effects, depending on concentration levels and the duration of exposure. TAC emissions are generated from fugitive emissions from all potential leak points such as valves, flanges, and similar connector items. Numerous federal, State, and local regulatory agencies have developed lists of TACs and their risk characteristics. The risk characteristics of the TACs that may be generated by the proposed project are identified in the SCAQMD's Risk Assessment Procedures for Rules 1401 and 212, Appendix L (SCAQMD, 2005).

The health risks associated with increased TAC emission from the proposed project were determined for each permit unit in accordance with the SCAQMD's "Risk Assessment for Rules 1401 and 212, Version 7.0, July 1, 2005." Tier 3 analyses were used to demonstrate compliance with Rule 1401 for each permit unit. TAC emissions from operations were calculated for the proposed project when it becomes operational. A summary of the associated TAC emissions and detailed calculations are shown in Appendix 5 of [Appendix B, SCAQMD Permit Application \(February 2014\)](#), of this Final Subsequent MND. Rule 212, Standards for Approving Permits

and Issuing Public Notice, requires notification of the public when the following occurs: 1) an increase in emissions of air contaminants from a new or modified permit that is located within 1,000 feet of a school; 2) an increase in emissions of air contaminants from a new or modified facility that exceeds threshold amounts stated in the rule; or, 3) an increase in emissions of toxic air contaminants from a new or modified permit unit that causes the incremental maximum individual cancer risk (MICR) to be greater than or equal to one in one million or causes the permit unit to create a potential risk of nuisance. The emissions increases associated with the project do not exceed the threshold amounts stated in the rule, and the MICR for each new or modified permit unit is less than one in one million. As the proposed project will not be located within 1,000 feet of a school (nearest school is Burroughs Elementary, located approximately 1,450 feet away), and the system is expected to operate in compliance with all applicable regulatory requirements, a risk of nuisance is not anticipated.

Rule 1401, New Source Review of Toxic Air Contaminants, rule requires the health risk associated with projects that result in increases of toxic air contaminants to meet specific requirements. Specifically, the incremental MICR for a permit unit must not exceed one in one million and the non-cancer chronic and acute hazard indices must not exceed a value of one. As stated above, health risk analyses were performed for the proposed project in accordance with the SCAQMD's "Risk Assessment Procedures for Rules 1401 and 212, Version 7.0, July 1, 2005." The results of Tier 3 analyses indicate the requirements of the rule are satisfied. Copies of the (Tier I, Tier 2, and Tier 3) analyses are included in Appendix 5 of [Appendix B, SCAQMD Permit Application \(February 2014\)](#), of this Final Subsequent MND.

Additionally, Rule 1402, Control of Toxic Air Contaminants from Existing Sources, requires facility-wide health risk assessments and risk reduction plans for facilities that exceed certain threshold levels of emissions and risk. The facility does not exceed any of these thresholds.

The proposed project will result in changes to emissions of TACs in a manner consistent with changes in criteria emissions. TAC emissions from fugitive components (i.e., the net increase in fugitive components) were determined using criteria fugitive emissions calculated as described above and TAC concentrations in the SHWU facility produced gas based on a recent representative sample. Details are included in Appendix 4 of [Appendix B, SCAQMD Permit Application \(February 2014\)](#), of this Final Subsequent MND.

Additionally, if soil is contaminated with VOC (including TACs that are VOC), the facility owners/operators will be required to prepare a SCAQMD Rule 1166 VOC Contaminated Soil Mitigation Plan. The mitigation plan would require that VOC emissions from the contaminated soil be controlled. Because demolition is expected to last only a few days, and a SCAQMD Rule 1166 VOC Contaminated Soil Mitigation Plan will be required to be followed if VOC contaminated soil is found, significant adverse impacts from VOC TAC emissions associated with contaminated soil are not expected.

A health risk assessment (HRA) was prepared to quantify the incremental cancer and non-cancer health risks from operation of the proposed project. The maximum risk impacts from operation of the proposed project are shown in [Table III-3](#) in Section III, Air Quality. Risk impacts due to operation of the proposed project are less than the SCAQMD significance thresholds for cancer

risk for residential or worker receptors or for chronic or acute non-cancer hazard indices for residential or worker receptors. Thus, all health risk impacts potentially resulting with the proposed project will be less than significant, and no mitigation measures are required.

	<b>Potentially Significant Impact</b>	<b>Less Than Significant With Mitigation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
Would the project:				
e) Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**III.e).** The 1998 MND concluded that odor impacts from the 1998 project would be less than significant. All existing stationary emissions sources that were already at the site or were part of the 1998 project are subject to SCAQMD rules and regulations. These existing rules, regulations, and permit conditions will continue to apply to both the 1998 project and the proposed project, as appropriate.

Construction activities associated with the proposed gas plant modifications may generate detectable odors from heavy-duty equipment exhaust immediately next to the equipment. This impact would be short-term in nature, and would not cause SCAQMD thresholds to be exceeded. No noticeable offsite effects with regard to odors are anticipated to occur. Compliance with recommended SCAQMD construction measures will ensure that potential impacts are reduced to a less than significant level.

Additionally, the SCAQMD accepts air quality complaint calls 24 hours a day. During business hours (i.e., 7:00 a.m. to 5:30 p.m., Tuesday through Friday), an attendant answers the call and directs the information accordingly. During non-business hours, an automated answering service forwards the call to a standby supervisor who takes appropriate action. If a public nuisance is expected based on the number of complaints received (i.e., Rule 402 – Nuisance), the SCAQMD will respond to the complaint with an immediate investigation. Rule 402 has 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.”

The proposed project does not include any odor-emitting equipment such as new oil/gas tanks or tanks of any kind, or increases in daily oil production. Additionally, all gas plant equipment is connected to the vapor recovery system. As a result, no increase in odors related to oil/gas processing operations at the SHWU Facility where the proposed project site is located will occur, as compared to current conditions.

In addition, SCAQMD Rule 431.1 prohibits burning gaseous fuels with a sulfur content greater than 40 ppm, which serves to limit SO<sub>x</sub> emissions from stationary equipment. Affected facilities are subject to reporting of monthly gaseous fuel consumption and SO<sub>x</sub> emissions. No sources of

combustion are associated with the proposed project, and therefore, such requirements do not apply.

During construction, diesel emissions from construction equipment may be sources of odor. All construction activities required to implement the proposed project will not occur on the same day, thereby limiting the potential impacts of construction odors. In addition, odors associated with construction would be temporary and localized. The existing perimeter wall and vegetation (e.g. along Spring Street) may reduce the impacts of any potential odors outside of the facility by providing an impediment to dispersion of ground level odors.

According to the SCAQMD *CEQA Air Quality Handbook*, land uses associated with odor complaints typically include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding. During operation, potential sources of odor include: fugitive emissions, pressure relief devices, and other connections required for the proposed project; leaks from the new equipment; and, odorant for gas sales (as required by the U.S. Department of Transportation (DOT)). Total VOC emissions will be less than the regional VOC construction significance threshold, and therefore, odors associated with VOCs would be minimized; refer to [\*Appendix B, SCAQMD Permit Application \(February 2014\)\*](#). In addition, no new sources of combustion are associated with the proposed project. All existing combustion systems will be operated such that any odors associated with the proposed project will be reduced or eliminated. Project operations would also be subject to SCAQMD Rule 402 and would be prohibited from creating an odor nuisance. As a result, when gas is combusted, there will be only a minimal potential to generate odors.

Fugitive emissions are further regulated under existing inspection and maintenance programs required pursuant to SCAQMD Rules 1166 and 1176. Rule 1166 regulates VOC emissions from decontamination of soil during excavation. SHP currently complies with the requirements of this rule, and will continue to comply as it applies to the proposed modifications. Rule 1176 regulates VOC emissions from wastewater systems. Rule 1176 applies to 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.

Based on the above, potential incremental odor impacts due to the proposed project compared to the baseline are anticipated to be less than significant.

### **Mitigation Measures**

Based on the above information relative to impacts relative to air quality, no significant adverse impacts were identified, and therefore, no mitigation measures are required for the construction or operation of the proposed project. The 1998 mitigation measures will continue to be implemented.

## **IV. BIOLOGICAL RESOURCES**

### **Significance Criteria**

The impacts on biological resources will be considered significant if any of the following criteria apply:

- The proposed project results in a loss of plant communities or animal habitat considered to be rare, threatened or endangered by federal, State, or local agencies.
- The proposed project interferes substantially with the movement of any resident or migratory wildlife species.
- The proposed project adversely affects aquatic communities through construction or operation of the project.

### **Environmental Setting and Impacts**

#### ***Impacts Analyzed in Previous 1998 Project MND***

The 1998 MND analyzed the impacts of continued operation of seven oil production facilities operated by SHP (CUP Sites No. 1-7) with no proposed change to the physical site boundaries or type of operations, with exception of a new natural gas processing facility at CUP Site No.2 (current proposed project site). The new natural gas processing facility included a vapor recovery system, natural gas dehydration system, and production of NGL and fuel gas.

The changes from the 1998 project compared to the proposed project are: 1) modification of the existing vapor recovery system (additional compression capacity); 2) modification of the existing natural gas dehydration system (upgrade of propane refrigeration and glycol dehydration equipment); 3) addition of a new CO<sub>2</sub> filtration system to produce gas that meets City of Long Beach specifications; and, 4) delivery of pipeline quality sales gas to the local gas distribution system. Further, the plant was modified in 2008 by adding compression capacity at the plant inlet; such improvements are part of the current baseline conditions and are not analyzed in this Final Subsequent MND. As applicable, any existing terms, conditions, or requirements previously imposed by the City of Signal Hill in their former determinations for the gas processing plant will remain in effect during construction and operation of the proposed project (if not already in place) in order to further avoid and/or reduce potential effects of the proposed project on biological resources.

The 1998 MND did not identify any potentially significant adverse impacts for any of the biological resources checklist items.

	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Have a substantial adverse effect on federally protected wetlands, as defined by §404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.), through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Interfere substantially with the movement of any native resident, 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 type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Conflict with the provisions of an adopted Habitat Conservation plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**IV.a), .b), .c), .d), .e), and .f).** The proposed project would be located entirely within the existing boundaries of the SHWU Facility, which has already been developed for oil and gas production uses. The site is located in a highly urbanized area within the City, and typical land uses are generally industrial or commercial in nature. There are no riparian habitats or other sensitive natural communities identified in local or regional plans, policies, or regulations, or by the

California Department of Fish and Wildlife (CDFW) or U.S. Fish and Wildlife Service (USFWS) onsite or on adjacent lands. Furthermore, no federally-protected wetlands as defined by §404 of the Clean Water Act (CWA), no areas of natural open space, and no areas of significant biological resource value on or in the vicinity of the site.

With exception of landscaping around the perimeter walls of the SHWU Facility, the operating areas within the facility walls have previously been cleared of vegetation for fire safety reasons. No candidate, sensitive, or special status species identified in local plans, policies, or regulations, or by the CDFW or the USFWS are found at the facility, as the facility area supports no habitat for such species. No conflicts with local, regional, or State conservation plans are expected, as no such plans are in place on or near the facility as indicated by the existing zoning onsite and in the surrounding area (GI - General Industrial). Therefore, no significant impacts on biological resources impacts will result with project implementation.

### **Mitigation Measures**

Based on the above information relative to impacts relative to biological resources, no significant adverse impacts were identified, and therefore, no mitigation measures are required for the construction or operation of the proposed project.

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## **V. CULTURAL RESOURCES**

### **Significance Criteria**

Impacts to cultural resources will be considered significant if:

- The proposed project results in the disturbance of a significant prehistoric or historic archaeological site, a property of historic or cultural significance to a community or an ethnic or social group.
- Unique paleontological resources are present that could be disturbed by construction of the proposed project.
- The proposed project would disturb human remains.

### **Environmental Setting and Impacts**

#### ***Impacts Analyzed in Previous 1998 Project MND***

The 1998 MND analyzed the impacts of continued operation of seven oil production facilities operated by SHP (CUP Sites No. 1-7) with no proposed change to the physical site boundaries or type of operations, with exception of a new natural gas processing facility at CUP Site No.2 (current proposed project site). The new natural gas processing facility included a vapor recovery system, natural gas dehydration system, and production of NGL and fuel gas.

The changes from the 1998 project compared to the proposed project are: 1) modification of the existing vapor recovery system (additional compression capacity); 2) modification of the existing natural gas dehydration system (upgrade of propane refrigeration and glycol dehydration

equipment); 3) addition of a new CO<sub>2</sub> filtration system to produce gas that meets City of Long Beach specifications; and, 4) delivery of pipeline quality sales gas to the local gas distribution system. Further, the plant was modified in 2008 by adding compression capacity at the plant inlet; such improvements are part of the current baseline conditions and are not analyzed in this Final Subsequent MND. As applicable, any existing terms, conditions, or requirements previously imposed by the City of Signal Hill in their former determinations for the gas processing plant will remain in effect (if not already in place) during construction and operation of the proposed project in order to further avoid and/or reduce potential effects of the proposed project on cultural resources.

The 1998 MND did not identify any potentially significant adverse impacts for any of the cultural resources checklist items.

	<b>Potentially Significant Impact</b>	<b>Less Than Significant with Mitigation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**V.a).** The existing gas natural gas processing facility was recently constructed at the SHWU Facility. As an industrial facility, no equipment or structures onsite are associated with California cultural heritage, associated with important persons of the past, or embody high artistic values, etc. (CEQA Guidelines §15054.5). The proposed project will require minor excavation/demolition activities to accommodate the modifications to the existing onsite equipment; refer to [Figure 4A, Project Disturbance](#). No equipment on the area of the site affected by the proposed modifications is older than 50 years old, and no historically significant structures are present. As a result, no structures of historic importance will be affected by the proposed project.

	<b>Potentially Significant Impact</b>	<b>Less Than Significant with Mitigation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
Would the project:				
b) Cause a substantial adverse change in the significance of an archaeological resource as defined in §15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**V.b).** As stated above, the natural gas processing plant has been constructed on the site, subsequent to the City’s approval for CUP Sites No. 1-7 (97-03). The existing gas plant is located on a disturbed site with no apparent archaeological resources remaining. For this reason,

and the fact that no existing structures at the SHWU Facility are considered archaeologically or historically significant, implementing the proposed project will not adversely affect any archaeological resources.

Would the project:	<b>Potentially Significant Impact</b>	<b>Less Than Significant with Mitigation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**V.c).** For the same reasons discussed in items 5.a). and 5.b) above, no unique paleontological resources are apparent at the project site. No paleontological resources were specifically identified at the site in association with improvements resulting with the 1998 project. As there are no apparent paleontological resources located on the SHWU Facility site, minor ground-disturbing activities that may occur as a result of implementing the proposed project are not expected to generate significant adverse impacts on paleontological resources.

Would the project:	<b>Potentially Significant Impact</b>	<b>Less Than Significant with Mitigation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
d) Disturb any human remains, including those interred outside formal cemeteries?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**V.d).** As previously noted, the proposed project is located within the boundaries of the SHWU Facility site, which has been previously developed/disturbed. No known human remains or burial sites have been identified at the SHWU Facility during previous site disturbances or construction activities. As such, the proposed project is not expected to disturb any human remains. If cultural resources are encountered unexpectedly during ground disturbance associated with construction of the proposed project, the facility will use proper local and/or federal protocol (e.g. contacting professional archaeologists, temporarily halting disturbance work in the vicinity, etc.) to ensure that significant impacts to such resources do not occur.

### **Mitigation Measures**

Based on the above information relative to impacts relative to cultural resources, no significant adverse impacts were identified, and therefore, no mitigation measures are required for the construction or operation of the proposed project.

## **VI. ENERGY**

### **Significance Criteria**

The impacts to energy will be considered significant if any of the following criteria are met:

- The proposed project conflicts with adopted energy conservation plans or standards.
- The proposed project results in substantial depletion of existing energy resource supplies.
- An increase in demand for utilities impacts the current capacities of the electric and natural gas utilities.
- The proposed project uses non-renewable resources in a wasteful and/or inefficient manner.

### **Environmental Setting and Impacts**

#### ***Impacts Analyzed in Previous 1998 Project MND***

The 1998 MND analyzed the impacts of continued operation of seven oil production facilities operated by SHP (CUP Sites No. 1-7) with no proposed change to the physical site boundaries or type of operations, with the exception of a new natural gas processing facility at CUP Site No.2 (current proposed project site). The new natural gas processing facility included a vapor recovery system, natural gas dehydration system, and production of NGL and fuel gas.

The changes from the 1998 project compared to the proposed project are: 1) modification of the existing vapor recovery system (additional compression capacity); 2) modification of the existing natural gas dehydration system (upgrade of propane refrigeration and glycol dehydration equipment); 3) addition of a new CO<sub>2</sub> filtration system to produce gas that meets City of Long Beach specifications; and, 4) delivery of pipeline quality sales gas to the local gas distribution system. Further, the plant was modified in 2008 by adding compression capacity at the plant inlet; such improvements are part of the current baseline conditions and are not analyzed in this Final Subsequent MND. As applicable, any existing terms, conditions, or requirements previously imposed by the City of Signal Hill in their former determinations for the gas processing plant will remain in effect during construction and operation of the proposed project (if not already in place) in order to further avoid and/or reduce potential effects of the proposed project on energy resources.

The 1998 MND analyzed Energy and Minerals as one issue area, utilizing slightly different significance criteria than those identified above; however, the 1998 MND did not identify any potentially significant adverse impacts for any of the energy or mineral resources checklist items. Due to recent updates to the checklist, the discussion of mineral resources is discussed in greater detail in Section VIII, Mineral Resources, of this Final Subsequent MND.

	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
Would the project:				
a) Conflict with adopted energy conservation plans?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**VI.a).** The proposed project is not expected to conflict with any adopted energy conservation plan because there is no known energy conservation plan that would apply. Additionally, the modifications proposed with the project are not expected to substantially increase the SHWU Facility’s energy demand, as explained in the following discussion.

	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
Would the project:				
b) Result in the need for new or substantially altered power or natural gas utility systems?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Create any significant effects on local or regional energy supplies and on requirements for additional energy?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Create any significant effects on peak and base period demands for electricity and other forms of energy?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Comply with existing energy standards?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**VI.b), .c), .d), and .e).** As stated above, the proposed project will result in: 1) modification of the existing vapor recovery system (additional compression capacity); 2) modification of the existing natural gas dehydration system (upgrade of propane refrigeration and glycol dehydration equipment); 3) addition of a new CO<sub>2</sub> filtration system to produce gas that meets City of Long Beach specifications; and, 4) delivery of pipeline quality sales gas to the local gas distribution system.

The proposed equipment modifications are intended to improve efficiency at the gas processing plant. The equipment modifications, as specifically described in Chapter 1 of this document, will result in replacement of the existing natural gas dehydration (LTS) system (currently propane refrigeration/low temperature) with high-efficiency equipment to enhance onsite operations; refer also to Sections III, Air Quality, and Section VII, Greenhouse Gas Emissions, for related discussion.

Currently, the gas exiting the gas processing facility currently cannot be sold to an end user, primarily because of naturally occurring CO<sub>2</sub> in the gas (which is not removed by the existing

gas processing facility). Instead, a combustion turbine (Device D115) at the facility uses 100% of the processed gas as fuel to generate electricity for use within SHP's operations. The existing gas processing plant and the combustion turbine are currently operating near capacity. Thus, modifications to the existing gas processing plant are necessary to process (i.e., remove CO<sub>2</sub> from) the produced gas to meet specifications to sell excess gas that cannot be used as fuel in the combustion turbine. The proposed modifications will also enable the field gathering system to operate at a lower pressure. In addition, the proposed modifications will enable the gas plant to continue operating (at less than full capacity) even when the combustion turbine is out of service (e.g., for maintenance) because it will be possible to sell processed gas. This will improve the reliability of the gas plant as a vapor recovery/control system for SHP and third party oil wells and facilities.

Additionally, modifications made will enable SHP to deliver pipeline quality gas that will increase the supply of local natural gas into the City of Long Beach distribution system. Such resources will displace the need for gas currently transported to the area from long distances, ultimately reducing the energy used in the transport of such resources. As stated previously, SHP has received confirmation from the City of Long Beach Gas & Oil Department that it intends to enter into a Natural Gas Delivery Agreement for Locally Produced Gas (Agreement) with SHP for the delivery and purchase of locally-produced natural gas produced by SHP to supply a portion of the City's gas requirements. Under the agreement, the City will purchase all locally-produced gas delivered to the City by SHP, and such gas will displace an "equivalent of volume of far-away gas delivered to the City;" refer to Appendix C, [\*Commitment Letter from City of Long Beach Gas & Oil Department\*](#) (September 18, 2014).

Demand for electricity during the construction period is not expected to increase appreciably because most of the construction equipment will be powered by diesel fuel. Construction activities require a limited number of construction equipment and, due to onsite space limitations, small-scale equipment will be used. In addition, although construction will occur intermittently over a period of approximately two months, construction activities requiring electricity are few. As discussed in the Air Quality section, both diesel and gasoline are used to operate the construction equipment totaling 131 gallons of diesel and 118 gallons of gasoline (see Table III-2). According to the California Energy Commission, the total retail sales in Los Angeles County for year 2012 was 235 million gallons of diesel and 3,658 million gallons of gasoline. Thus, the proposed project will have a negligible effect on the fuel supply. The amount of diesel needed is 0.00006 percent ( $131/235 \text{ million} \times 100$ ) of the total diesel supply in the county where the project is located and 0.000003 percent ( $118/3,658 \text{ million} \times 100$ ) of the total gasoline supply in the county where the project is located. As a result, the total diesel and gasoline fuel that will be required for construction of the proposed project is considered to be minimal and does not represent a significant volume. Therefore, less than significant electricity or energy demand impacts are expected during the construction period.

Therefore, based on the above information, less than significant adverse energy demand impacts are anticipated with implementation of the proposed project.

## **Mitigation Measures**

Based on the above information relative to impacts relative to energy, no significant adverse impacts were identified, and therefore, no mitigation measures are required for the construction or operation of the proposed project.

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## **VII. GEOLOGY AND SOILS**

### **Significance Criteria**

The impacts on the geological environment will be considered significant if any of the following criteria apply:

- Topographic alterations would result in significant changes, disruptions, displacement, excavation, compaction or over covering of large amounts of soil.
- Unique geological resources (paleontological resources or unique outcrops) are present that could be disturbed by the construction of the proposed project.
- Exposure of people or structures to major geologic hazards such as earthquake surface rupture, ground shaking, liquefaction, or landslides.
- Secondary seismic effects could occur which could damage facility structures, e.g., liquefaction.
- Other geological hazards exist which could adversely affect the facility, e.g., landslides, mudslides.

### **Environmental Setting and Impacts**

#### ***Impacts Analyzed in Previous 1998 Project MND***

The 1998 MND analyzed the impacts of continued operation of seven oil production facilities operated by SHP (CUP Sites No. 1-7) with no proposed change to the physical site boundaries or type of operations, with the exception of a new natural gas processing facility at CUP Site No.2 (current proposed project site). The new natural gas processing facility included a vapor recovery system, natural gas dehydration system, and production of NGL and fuel gas.

The changes from the 1998 project compared to the proposed project are: 1) modification of the existing vapor recovery system (additional compression capacity); 2) modification of the existing natural gas dehydration system (upgrade of propane refrigeration and glycol dehydration equipment); 3) addition of a new CO<sub>2</sub> filtration system to produce gas that meets City of Long Beach specifications; and, 4) delivery of pipeline quality sales gas to the local gas distribution system. Further, the plant was modified in 2008 by adding compression capacity at the plant inlet; such improvements are part of the current baseline conditions and are not analyzed in this Final Subsequent MND. As applicable, any existing terms, conditions, or requirements previously imposed by the City of Signal Hill in their former determinations for the gas processing plant will remain in effect during construction and operation of the proposed project

(if not already in place) in order to further avoid and/or reduce potential effects of the proposed project with regard to geology and soils.

The 1998 MND identified potentially significant adverse impacts relative to seismic safety at the proposed gas processing plant for the geology and soil resources checklist items. Mitigation was identified (Mitigation Measure #1 in the 1998 MND) to require City review of all building plans to ensure compliance with the Uniform Building Code (UBC) and compliance with the City’s grading and paving standards. In accordance with the 1998 MND, this mitigation measure has been implemented to date. The 1998 mitigation measures will continue to be implemented.

	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**VII.a).** Specifically with regard to the proposed project, the SHWU Facility is located in a seismically active region of southern California. Seismic events are a common occurrence in southern California, with northwesterly trending major earthquake faults dominating in the region. The San Andreas Fault is the primary fault in the area and is thought to have a maximum credible event potential equivalent to a magnitude of 8.5 on the Richter scale. The most significant exposed seismic feature in the Signal Hill area is the northwest trending Newport-Inglewood fault zone which trends diagonally across the City. The Compton Thrust fault, a buried fault similar to the fault which produced the 1994 Northridge earthquake, underlies the City at a depth of approximately eight miles.

The adverse effects associated with strong seismic events depend upon several factors including the following: intensity of the event, frequency of vibration, distance from the epicenter, and

nature of earth materials through which the vibrations pass. Numerous active and potentially active faults with surface expressions (fault traces) have been mapped adjacent to, within, and beneath the Cities of Signal Hill and Long Beach;<sup>5</sup> however, no known active surface fault traces identified by the State, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map, are known to be present at or in the vicinity of the proposed project site. Therefore, the possibility of surface fault rupture affecting the proposed project area and/or the exposure of people or property to hazardous conditions resulting from rupture of a known earthquake fault would be considered low; however, such events may still occur.

As noted above, the San Andreas Fault Zone is a major structural feature in the region and forms a boundary between the North American and Pacific tectonic plates. The San Andreas Fault is a right lateral strike-slip<sup>6</sup> fault moving at approximately 30 millimeters per year (mm/yr), with a northeast-southwest trend near the site area. A strike-slip fault is where two tectonic plates slide past each other. The recent earthquakes in Japan (March 2011) resulted from movement of tectonic plates in a subduction zone, where one tectonic plate is pushed under a second tectonic plate. A subduction configuration like that off the coast of Japan does not occur off the coast of southern California.

Because the SHWU Facility is located in a seismically active region of southern California, it is conceivable that a seismic event could occur during construction or operation of the proposed project; however, this possibility exists currently regardless of the proposed project. Similar to many areas in southern California, the proposed project area is susceptible to strong ground shaking and ground failure during seismic events produced by local faults. Because the area of the proposed project is flat, landslides are not typically of concern. The potential seismic hazards from the proposed project would not be higher than existing seismic hazards from the facility under current operating conditions or greater in any way than seismic hazards in most areas of the City of Signal Hill.

While it is likely that the proposed project area will be shaken by future earthquakes produced in southern California, construction of the proposed modifications will be conducted in accordance with all applicable requirements for seismic safety in the Uniform Building Code (UBC) for the Zone in which the proposed project is located. The existing operations, as well as operation of the proposed project, will continue to be subject to all previous regulations and requirements (e.g. Conditions of CUP Approval) as well as any future changes to the City of Signal Hill Municipal Code regarding seismic designs and controls which from time to time may be promulgated.

According to the [Figure 4, Seismic Response Areas](#), of the City of Signal Hill General Plan Safety Element, the proposed project area is not located within an area susceptible to liquefaction.<sup>7</sup> In addition, according to the Safety Element, the SHWU Facility is not located

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<sup>5</sup> Active faults are classified by the State Division of Mines and Geology as faults showing evidence of surface displacement within the last 11,000 years.

<sup>6</sup> A strike-slip fault is a fault in which the dominant sense of motion is horizontal, parallel to the strike of the fault (also known as a lateral-slip fault). Motion is commonly described as left-lateral (sinistral) or right-lateral (dextral). (USGS 2011)

<sup>7</sup> City of Signal Hill, Safety Element of the City of Signal Hill General Plan, Figure 4, Seismic Response Areas, February 1986.

within a hillside area susceptible to landslides or slope instability.<sup>8</sup> The probability of seismically-induced landslides affecting the proposed project area is considered to be negligible, due to the lack of topographic relief across the area.

As described above, impacts may occur due to risks from seismic ground shaking and/or ground failure, due to the location of the proposed project within southern California. SHP’s Gas Plant is captured under the California Accidental Release Program (Cal-ARP), the U.S. EPA’s Risk Management Programs and the California Occupational Safety Administration (OSHA) Process Safety Management (Cal-ARP/RMP/PSM) regulations. These regulations require SHP to operate the gas plant in a very prescriptive manner to prevent releases from the gas plant to the environment. SHP must conduct hazard analyses, process safety and hazards assessments, mechanical integrity assessments, management of change, pre-construction review, operational training and post maintenance auditing. The goal of these programs is to prevent accidental releases to the environment that may have catastrophic consequences. Additionally, all project site preparation and operation will occur in compliance with the City’s grading and paving standards. With conformance to applicable State and local regulations, potential impacts with regard to exposure of people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving geologically unstable conditions or events will be less than significant.

	<b>Potentially Significant Impact</b>	<b>Less Than Significant With Mitigation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
Would the project:				
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**VII.b).** The majority of the SHWU Facility is currently paved; refer to [Figure 4A, Project Disturbance](#), in Chapter 1. Construction activities will require the exposure of soil to install foundation pads for new equipment; however, the area of soil exposed is expected to be relatively small, as shown in [Figure 4A](#). Any soil that is disturbed would be subject to SCAQMD Rule 403 - Fugitive Dust, which requires stabilization of soil disturbed by human activity, often in the form of spraying water on such areas two to three times per day, if applicable. Compliance with Rule 403 is expected to substantially limit soil erosion loss to the air. As a result, no significant adverse soil erosion impacts are expected with the project.

<sup>8</sup> Ibid.

	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
Would the project:				
c) Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project, and potentially result in on- or off-site landslides, lateral spreading, subsidence, liquefaction, or collapse?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**VII.c).** Refer to VII.a), above. Subsidence is associated with relatively strong seismic shaking, shallow groundwater, and the presence of loose, fine, sandy soils. These conditions are not expected to exist simultaneously within the project site and potential impacts from land subsidence are considered slight. Although subsidence within the Long Beach Oil Field occurred in the early years (1940’s), subsidence has been arrested and constant monitoring and control by the Long Beach Oil and Gas Department is ongoing and will continue into the future.<sup>9</sup> Stable land surfaces are critical for continued regional economic growth that cannot be jeopardized by the effects of oil and gas production. The strength of the geologic structure prevents subsidence as fluids are removed from the pore space of the rock. If the oil field was susceptible to subsidence, it would have likely occurred long ago, as the field reached a peak production of 87 million barrels per year in 1923 (compared to current production of an estimated 1.5 million barrels per year).

Soils within the project site are composed of weathered alluvium and are classified as silts and sands. These soils generally range in composition from non-expansive to slightly expansive; fill materials may also be encountered. These soils would not present potential impacts from soil expansion to the proposed project facilities.

The project will be designed consistent with the requirements of the UBC and standard engineering practices to reduce potential impacts from unstable soils. Therefore, the proposed project will not be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project, and potentially result in on- or offsite landslides, lateral spreading, subsidence, liquefaction, or collapse. Therefore, potential impacts with regard to geologic instability, potentially resulting in landslides, lateral spreading, subsidence, liquefaction, or collapse, will be less than significant.

<sup>9</sup> City of Long Beach Gas & Oil. <http://www.longbeach.gov/oil/subsidence/default.asp>. Accessed November 6, 2014.

	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
Would the project:				
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**VII.d).** Refer to VII.c), above. Soils at the SHWU Facility are not considered to be expansive. In addition, the amount of soil disturbed during construction is expected to be minimal; refer to [Figure 4A, Project Disturbance](#). Therefore, no significant impacts related to expansive soils are expected.

	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
Would the project:				
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**VII.e).** The proposed modifications will occur at the existing gas plant and are intended to improve efficiency and reliability of the gas plant and enable future gas sales. No septic tanks or alternative disposal systems are necessary, nor are they included as part of the proposed project. Therefore, no significant impacts on soils from alternative wastewater disposal systems will occur with the proposed project.

### Mitigation Measures

Based on the above information relative to impacts relative to geology, no significant adverse impacts were identified, and therefore, no mitigation measures are required for the construction or operation of the proposed project. The 1998 mitigation measures will continue to be implemented.

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## VIII. GREENHOUSE GAS EMISSIONS

### Significance Criteria

The analysis of GHG impacts is different from the analysis of criteria pollutants. For criteria pollutants, significance thresholds are based on daily emissions because the attainment or non-

attainment status is based on daily exceedances of applicable ambient air quality standards. Furthermore, several ambient air quality standards are based on the relatively short-term exposure effects on human health (e.g., one-hour and eight-hour). On the contrary, because the half-life of CO<sub>2</sub> is approximately 100 years, the effects of GHGs are longer-term and affect global climate over a relatively long time frame. Thus, the SCAQMD's current position is to evaluate GHG effects over a longer time frame than a single day.

On December 5, 2008 the SCAQMD adopted the “Draft Guidance Document – Interim CEQA Greenhouse Gas (GHG) Significance Thresholds.” This draft guidance proposes a tiered approach to determining GHG significance of projects.<sup>10</sup> The first two tiers involve (1) exempting the project because of potential reductions of GHG emissions allowed under CEQA and (2) demonstrating that the project's GHG emissions are consistent with a local general plan. Because neither of these tiers is applicable for the proposed project, the analysis shifts to Tier 3. It should be noted that SHP's operations are subject to CARB GHG Mandatory Reporting and Cap-and-Trade regulations. The GHG emissions increases resulting from removal of CO<sub>2</sub> from the process gas and being added to the turbine fuel will be fully offset per the requirements of CARB's GHG Cap-and-Trade regulations. Tier 3 establishes a numerical threshold of 10,000 MT CO<sub>2</sub>eq per year as the incremental increase representing significance. Projects with incremental increases below this threshold are not considered to be cumulatively considerable. The next tier of the significance threshold methodology considered for this analysis is Tier 4. The significance threshold approaches in Tier 4 were not adopted by the Governing Board and possible options continue to be under investigation by staff. Tier 4 will not be considered further. Tier 5 may be applicable if GHG emissions exceed the numerical significance threshold of 10,000 MT CO<sub>2</sub> eq per year. In this situation, offsite mitigation could be used to reduce GHG emission impacts to less than significant, but mitigation would be required for the life of the project, defined as 30 years. As additional information is compiled regarding the level of GHG emissions that constitute a significant cumulative climate change impact, SCAQMD will continue to revisit and possibly revise the level of GHG emissions considered to be significant.

To determine whether or not incremental GHG emissions from the proposed project may be significant, impacts from the proposed project may be evaluated and compared to the 10,000 metric tons of carbon dioxide equivalents per year (MT CO<sub>2</sub>e/year) guidance threshold for industrial sources.<sup>11</sup>

## **Environmental Setting and Impacts**

### ***Impacts Analyzed in Previous 1998 Project MND***

The 1998 MND analyzed the impacts of continued operation of seven oil production facilities operated by SHP (CUP Sites No. 1-7) with no proposed change to the physical site boundaries or type of operations, with the exception of a new natural gas processing facility at CUP Site No.2

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<sup>10</sup> SCAQMD. 2008. Interim CEQA GHG Significance Threshold for Stationary Sources, Rules and Plans. Adopted by SCAQMD December 5, 2008.

<sup>11</sup> SCAQMD. 2011. SCAQMD Air Quality Significance Thresholds. Revised March 2011. Available at: [www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf](http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf). Accessed July 21, 2014.

(current proposed project site). The new natural gas processing plant included a vapor recovery system, natural gas dehydration system, and production of NGL and fuel gas.

The changes from the 1998 project compared to the proposed project are: 1) modification of the existing vapor recovery system (additional compression capacity); 2) modification of the existing natural gas dehydration system (upgrade of propane refrigeration and glycol dehydration equipment); 3) addition of a new CO<sub>2</sub> filtration system to produce gas that meets City of Long Beach specifications; and, 4) delivery of pipeline quality sales gas to the local gas distribution system. Further, the plant was modified in 2008 by adding compression capacity at the plant inlet; such improvements are part of the current baseline conditions and are not analyzed in this Final Subsequent MND. As applicable, any terms, conditions, or requirements previously imposed by the City of Signal Hill in their former determinations for the gas processing plant will remain in effect during construction and operation of the proposed project.

The 1998 MND did not provide an analysis of GHG, as the Initial Study did not include such a section at that time. Therefore, the following discussion represents new information pertaining to the proposed project relative to greenhouse gas emissions.

	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
Would the project:				
a) Diminish an existing air quality rule or future compliance requirement resulting in a significant increase in air pollutant(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Generate greenhouse gases, 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"/>

**VIII.a, b).** The natural process through which heat is retained in the troposphere is called the “greenhouse effect.”<sup>12</sup> The greenhouse effect traps heat in the troposphere through a threefold process as follows: Short wave radiation emitted by the Sun is absorbed by the Earth; the Earth emits a portion of this energy in the form of long wave radiation; and greenhouse gases (GHG) in the upper atmosphere absorb this long wave radiation and emit this long wave radiation into space and toward the Earth. This “trapping” of the long wave (thermal) radiation emitted back toward the Earth is the underlying process of the greenhouse effect.

The most abundant GHGs are water vapor and carbon dioxide (CO<sub>2</sub>). Many other trace gases have greater ability to absorb and re-radiate long wave radiation; however, these gases are not as plentiful. For this reason, and to gauge the potency of GHGs, scientists have established a

<sup>12</sup> The troposphere is the bottom layer of the atmosphere, which varies in height from the Earth’s surface to 10 to 12 kilometers.

Global Warming Potential (GWP) for each GHG based on its ability to absorb and re-radiate long wave radiation.

GHGs normally associated with the proposed project include the following:<sup>13</sup>

- Water Vapor ( $H_2O$ ). Although water vapor has not received the scrutiny of other GHGs, it is the primary contributor to the greenhouse effect. Natural processes, such as evaporation from oceans and rivers, and transpiration from plants, contribute 90 percent and 10 percent of the water vapor in our atmosphere, respectively.

The primary human related source of water vapor comes from fuel combustion in motor vehicles; however, this is not believed to contribute a significant amount (less than one percent) to atmospheric concentrations of water vapor. The Intergovernmental Panel on Climate Change (IPCC) has not determined a GWP for water vapor.

- Carbon Dioxide ( $CO_2$ ). Carbon dioxide is primarily generated by fossil fuel combustion in stationary and mobile sources and is the primary greenhouse gas emitted through human activities. In 2011,  $CO_2$  accounted for approximately 84% of all greenhouse gas emissions from human activities in the U.S. Although  $CO_2$  emissions originate from a variety of natural sources, human-related emissions are responsible for the increase occurring in the atmosphere since the time of the industrial revolution.<sup>14</sup> Carbon dioxide is the most widely emitted GHG and is the reference gas (GWP of 1) for determining GWPs for other GHGs.
- Methane ( $CH_4$ ). Methane is emitted from biogenic sources, incomplete combustion in forest fires, landfills, manure management, and leaks in natural gas pipelines. In the United States, the top three sources of methane are landfills, natural gas systems, and enteric fermentation. Methane is the primary component of natural gas, which is used for space and water heating, steam production, and power generation. The GWP of methane is 21.
- Nitrous Oxide ( $N_2O$ ). Nitrous oxide is produced by both natural and human related sources. Primary human related sources include agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuel, adipic acid production, and nitric acid production. The GWP of nitrous oxide is 310.
- Hydrofluorocarbons (HFCs). HFCs are typically used as refrigerants for both stationary refrigeration and mobile air conditioning. The use of HFCs for cooling and foam blowing is growing, as the continued phase out of chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) gains momentum. The GWP of HFCs range from 140 for HFC-152a to 11,700 for HFC-23.<sup>15</sup>

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<sup>13</sup> All Global Warming Potentials are given as 100 year GWP. Unless noted otherwise, all Global Warming Potentials were obtained from the Intergovernmental Panel on Climate Change. Climate Change (Intergovernmental Panel on Climate Change, Climate Change, The Science of Climate Change – Contribution of Working Group I to the Second Assessment Report of the IPCC, 1995).

<sup>14</sup> United States Environmental Protection Agency, Climate Change – Overview of Greenhouse Gases, Updated July 31, 2013. <http://epa.gov/climatechange/ghgemissions/gases/fgases.html>. Accessed August 16, 2014.

<sup>15</sup> Ibid.

- Perfluorocarbons (PFCs). Perfluorocarbons are compounds consisting of carbon and fluorine. They are primarily created as a byproduct of aluminum production and semiconductor manufacturing. Perfluorocarbons are potent GHGs with a GWP several thousand times that of carbon dioxide, depending on the specific PFC. Another area of concern regarding PFCs is their long atmospheric lifetime (up to 50,000 years).<sup>16</sup> The GWP of PFCs range from 6,500 to 9,200.
- Sulfur hexafluoride (SF<sub>6</sub>). Sulfur hexafluoride is a colorless, odorless, nontoxic, nonflammable gas. It is most commonly used as an electrical insulator in high voltage equipment that transmits and distributes electricity. Sulfur hexafluoride is the most potent GHG that has been evaluated by the IPCC with a GWP of 23,900; however, its global warming contribution is not as high as the GWP would indicate, due to its low mixing ratio compared to carbon dioxide.

In addition to the six major GHGs discussed above (excluding water vapor), many other compounds have the potential to contribute to the greenhouse effect. Some of these substances were previously identified as stratospheric ozone (O<sub>3</sub>) depleters. Therefore, their gradual phase out is currently in effect. The following is a listing of these compounds:

- Hydrochlorofluorocarbons (HCFCs). HCFCs are solvents, similar in use and chemical composition to CFCs. The main uses of HCFCs are for refrigerant products and air conditioning systems. As part of the Montreal Protocol, all developed countries that adhere to the Montreal Protocol are subject to a consumption cap and gradual phase out of HCFCs. The United States is scheduled to achieve a 100 percent reduction to the cap by 2030. The GWPs of HCFCs range from 77 for HCFC-123 to 2,310 for HCFC-142b.<sup>17</sup>
- 1,1,1 trichloroethane. 1,1,1 trichloroethane or methyl chloroform is a solvent and degreasing agent commonly used by manufacturers. The GWP of methyl chloroform is 110 times that of carbon dioxide.<sup>18</sup>
- Chlorofluorocarbons (CFCs). CFCs are used as refrigerants, cleaning solvents, and aerosols spray propellants. CFCs were also part of the U.S. Environmental Protection Agency's (EPA) Final Rule (57 FR 3374) for the phase out of O<sub>3</sub> depleting substances. Currently, CFCs have been replaced by HFCs in cooling systems and a variety of alternatives for cleaning solvents. Nevertheless, CFCs remain suspended in the atmosphere contributing to the greenhouse effect. CFCs are potent GHGs with GWPs ranging from approximately 4,750 for CFC 11 to 14,420 for CFC 13.<sup>19</sup>

California has enacted several pieces of legislation that relate to GHG emissions and climate change, much of which sets aggressive goals for GHG reductions within the state. Per Senate Bill 97, the California Natural Resources Agency adopted amendments to the CEQA Guidelines, which address the specific obligations of public agencies when analyzing GHG emissions under

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<sup>16</sup> Ibid.

<sup>17</sup> United States Environmental Protection Agency, *Class II Ozone Depleting Substances*, Updated November 7, 2014. <http://www.epa.gov/ozone/science/ods/classtwo.html>. Accessed November 10, 2014.

<sup>18</sup> Ibid.

<sup>19</sup> United States Environmental Protection Agency, *Class I Ozone Depleting Substances*, Updated November 7, 2014. <http://www.epa.gov/ozone/science/ods/classone.html>. Accessed November 10, 2014.

CEQA to determine a project's effects on the environment; however, neither a threshold of significance nor any specific mitigation measures are included or provided in these CEQA Guideline amendments.

- **Assembly Bill 32 (Statewide GHG Regulation):** The California Global Warming Solutions Act of 2006, widely known as AB 32, requires the California Air Resources Board (CARB) to develop and enforce regulations for the reporting and verification of statewide GHG emissions. The heart of the bill is the requirement that statewide GHG emissions be reduced to 1990 levels by 2020.
- **California Senate Bills 1078, 107, and 2 - Renewables Portfolio Standard:** Established in 2002 under California Senate Bill 1078 and accelerated in 2006 under California Senate Bill 107, California's RPS requires retail suppliers of electric services to increase procurement from eligible renewable energy resources by at least 1 percent of their retail sales annually, until they reach 20 percent by 2010. On April 2, 2011, Governor Jerry Brown signed California Senate Bill 2 to increase California's RPS to 33 percent by 2020. This new standard also requires regulated sellers of electricity to procure 25 percent of their energy supply from certified renewable resources by 2016.
- **Low Carbon Fuel Standard:** California Executive Order S-01-07 (January 18, 2007) requires a 10 percent or greater reduction in the average carbon intensity for transportation fuels in California regulated by CARB. CARB identified the LCFS as a Discrete Early Action item under AB 32, and the final resolution (09-31) was issued on April 23, 2009.<sup>20</sup>

### ***Construction GHG Emissions and Analyses***

Construction typically occurs in phases including demolition, site preparation, construction of structures, and final site work. Construction activities required to implement the proposed project include: demolition, excavation, concrete work, erection, and installation of the individual pieces of equipment; refer also to [Table III-2](#) of Section III, Air Quality.

Construction emissions are generated from the combustion of fuel (primarily diesel) in off-road vehicles and other equipment required for the construction activities. Equipment to be installed with the project has already been fabricated elsewhere, purchased, and delivered to the site in anticipation of installation as proposed. Project construction activities will be conducted during distinct time periods and will disturb substantially less than one acre of land within the SHWU Facility. Actual construction will generally take place in the area of the existing gas processing plant; refer to [Figure 1B, Local Vicinity Map](#).

Construction is expected to occur intermittently over a period of approximately 61 days. When construction is occurring, work is expected to typically occur ten hours per day, five days per week. The proposed construction schedule in [Table III-2](#) in the Air Quality section forms the

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<sup>20</sup> California Air Resources Board (CARB), 2009. Resolution 09-31. Available at: <http://www.arb.ca.gov/regact/2009/lcfs09/res0931.pdf>. Accessed: July 2014.

basis for calculating emissions from construction of the proposed project. The dates of the schedule may change, but the timeline of the scheduled activities for each phase (e.g. number of days) would remain consistent. Multiple construction activities would not occur on the same day and would not result in impacts outside the scope of this analysis. Additionally, the current analysis is conservative because emission factors typically decrease over time as equipment efficiency and fuel efficiency improves. Thus, if construction of the project is delayed for any reason, none of the environmental impacts conclusions in the analysis would change or worsen. For example, a conclusion of less than significant impacts from the construction phase of the project would remain less than significant even if the actual dates of the construction schedule are delayed.

As shown in [Table III-3](#), emissions from demolition and construction activities (resulting from vehicle fuel usage) will result in 2 MT CO<sub>2</sub>e total, or 0.07 MT CO<sub>2</sub>e per year if amortized over 30 years. Construction emissions will therefore be well below the SCAQMD threshold of 10,000 MT CO<sub>2</sub>e per year. Therefore, construction of the proposed project is expected to result in less than significant GHG impacts, and no mitigation measures are required.

### ***Operational GHG Emissions and Analyses***

Implementation of the proposed modifications to the existing gas plant will result in an increased local supply of available sales gas in the City of Long Beach distribution system, thereby replacing gas supplies that are currently transported to the area over long distances from non-local sources; refer to [Appendix C, Commitment Letter from City of Long Beach Oil & Gas Department](#). Because the proposed modifications and resultant availability of the sales gas will reduce reliance on gas supplies from non-local sources, the overall potential fugitive emissions associated with natural gas transmission lines will be reduced, thereby reducing potential adverse effects on air quality and from greenhouse gas emissions.

Additionally, installation of the equipment as proposed will increase efficiency of the equipment. The changes will increase the vacuum on the gathering lines, reducing back-pressure and reducing the potential for leaks in the upstream gathering system. The addition of the new compression trains will allow the processing of 4,000 mscf/day up from 2,000 mscf/day. The increase in volume will accommodate the organic growth of gas production from the mature water flood as oil production naturally declines.

As shown in [Table III-3](#), it is anticipated that fugitive releases from potential equipment leaks would equate to approximately 70 MT of CO<sub>2</sub>e per year (PTE). The proposed modifications will result in removal of 2,805 MT of CO<sub>2</sub>e per year from sales gas (based on maximum design capacity and allowable throughput); refer to [Appendix B, SCAQMD Permit Application \(February 2014\)](#), for additional information. Most of the processed gas leaving the new gas dehydration unit would continue to go straight to the turbine to be used as fuel. The excess (i.e., the portion not needed as turbine fuel) would proceed on and pass through the new CO<sub>2</sub> membrane filtration unit where CO<sub>2</sub> (as well as some O<sub>2</sub> and N<sub>2</sub>) would be removed from the process stream. The resulting process stream would contain less than 4% inerts (i.e., CO<sub>2</sub>, O<sub>2</sub>, and N<sub>2</sub>), which will enable sale of the gas to the City of Long Beach. The gas stream rejected from the sales gas in the CO<sub>2</sub> membrane filtration unit (which will also contain methane) will be

added back to the fuel gas stream going to the turbine. The CO<sub>2</sub> in this stream would simply “pass-through” the turbine (i.e., it’s not transformed in the combustion process) and be emitted to atmosphere. Thus, the CO<sub>2</sub> removed from the sales gas stream in the CO<sub>2</sub> membrane filtration unit (which is estimated to be a maximum of 2,805 MT per year) would end up in the atmosphere as incremental CO<sub>2</sub> emissions resulting from the project.

Overall, operational GHG emissions will total an estimated 2,875 MT CO<sub>2</sub>e per year. Therefore, project impacts would be well below the SCAQMD threshold of 10,000MT CO<sub>2</sub>e. Further, the facility is subject to CARB reporting and applicable cap and trade requirements to offset any significant impacts with regard to GHG, as required. Operational impacts relative to GHG will therefore be less than significant, and no mitigation measures are required.

	<b>Potentially Significant Impact</b>	<b>Less Than Significant With Mitigation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
Would the project:				
c) 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"/>

**VIII.c).** Refer to responses VIII.a) and .b), above. The proposed project will result in minor improvements at the subject site to improve the efficiency and reliability of existing onsite operations and enable the sale of gas to third parties for ultimate distribution. GHG emissions resulting with implementation of the proposed project will be below a level of significance, as discussed above. 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 described previously, the proposed project will reduce fugitive emissions associated with natural gas transmission and reduce or avoid potential additional GHG-related emissions from independent gas producers. Impacts will be less than significant, and no mitigation measures are required.

**Mitigation Measures**

With regard to GHGs, impacts from the proposed project were concluded to have a less than significant impact, and no mitigation measures are required.

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**IX. HAZARDS AND HAZARDOUS MATERIALS**

**Significance Criteria**

The impacts associated with hazards will be considered significant if any of the following occur:

- Non-compliance with any applicable design code or regulation.

- Non-conformance to National Fire Protection Association standards.
- Non-conformance to regulations or generally accepted industry practices related to operating policy and procedures concerning the design, construction, security, leak detection, spill containment or fire protection.
- Exposure to hazardous chemicals in concentrations equal to or greater than the Emergency Response Planning Guideline (ERPG) 2 levels.

## **Environmental Setting and Impacts**

### ***Impacts Analyzed in Previous 1998 Project MND***

The 1998 MND analyzed the impacts of continued operation of seven oil production facilities operated by SHP (CUP Sites No. 1-7) with no proposed change to the physical site boundaries or type of operations, with the exception of a new natural gas processing facility at CUP Site No.2 (current proposed project site) The new natural gas processing plant included avapor recovery system, natural gas dehydration system, and production of NGL and fuel gas.

The changes from the 1998 project compared to the proposed project are: 1) modification of the existing vapor recovery system (additional compression capacity); 2) modification of the existing natural gas dehydration system (upgrade of propane refrigeration and glycol dehydration equipment); 3) addition of a new CO<sub>2</sub> filtration system to produce gas that meets City of Long Beach specifications; and, 4) delivery of pipeline quality sales gas to the local gas distribution system. Further, the plant was modified in 2008 by adding compression capacity at the plant inlet; such improvements are part of the current baseline conditions and are not analyzed in this Final Subsequent MND. As applicable, any existing terms, conditions, or requirements previously imposed by the City of Signal Hill in their former determinations for the gas processing plant will remain in effect during construction and operation of the proposed project (if not already in place) in order to further avoid and/or reduce potential effects of the proposed project with regard to hazards and hazardous materials.

The 1998 MND identified a potentially significant adverse impact for the hazards and hazardous materials checklist item relative to the accidental release of hazardous substances and the exposure of people to existing sources of potential health hazards. Mitigation was identified (Mitigation Measure #4a in the 1998 MND) to reduce project impacts to a level of less than significant. In accordance with the 1998 MND, this mitigation has been implemented to date. The 1998 mitigation measures will continue to be implemented.

	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, and 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"/>

**IX.a) and b).**

Construction and operation of the proposed gas processing facility presents the remote possibility for explosions. Gas producing equipment has been installed with automatic shut-down devices as well as instrumentation to detect explosive levels in the gas stream. New facility system piping has been installed and portions of the system are under vacuum pressure, which precludes leakage into the atmosphere and the chance for explosion. The piping system has been constructed with minimal screwed and flange connections to minimize leakage. This facility has received a permit from the Los Angeles County Fire Department. Therefore, the risk is less than significant.

All of the new equipment required as part of the proposed project will use or process produced oil field gas, which consists primarily of methane and trace amounts of other gases (e.g., propane, butane, or pentane). Methane is defined as a hazardous material by the USEPA (USEPA; 40 CFR 68.130). The other gases that comprise the oil field gas (e.g., propane, butane, or pentane) also are defined as hazardous materials; however, these gases are only present in trace amounts, if at all, and do not constitute a hazard.

The proposed modifications and removal of older equipment will also not increase hazards resulting from an earthquake as:

1. The new equipment will be required to meet UBC requirements and the latest safety standards and thus will reduce impacts related to an earthquake event compared to any older permitted equipment. Additionally, the new equipment will be more reliable and less susceptible to breakdowns and upsets, thereby reducing the potential for emergencies, upsets, and breakdowns as compared to the existing equipment.
2. Hazard impacts resulting from an earthquake are not expected to increase due to implementing the proposed project. No drilling is associated with the proposed project. No physical changes are proposed for the gas sales pipeline (no change in hazards due to the project). Therefore, there is no change in hazard impacts as a result of implementing the proposed project.

The SHWU Facility gas plant is subject to the California Accidental Release Program (CalARP) regulations in Title 19 CCR, Division 2, Chapter 4.5. CalARP requires stationary sources with quantities of a regulated substance above a threshold specified in the regulation to develop and submit a risk management plan (RMP). Methane is a regulated substance, with a specified threshold of 10,000 pounds; however, per §2770.2(b)(2)(B), “naturally occurring hydrocarbon mixtures need not be considered when determining whether more than a threshold quantity is present at a stationary source. Naturally occurring hydrocarbon mixtures include any combination of the following: condensate, crude oil, field gas, and produced water, each as defined in Section 2735.3.” Per §2735.3, field gas is defined as “gas extracted from a production well before the gas enters a natural gas processing plant.” Therefore, the quantification of methane that is on the site as natural gas is not counted toward the threshold quantity. No other regulated substances are used at the SHWU Facility. Therefore, a RMP for the facility is not required.

Operation of the proposed project will not add any systems or processes that would cause the facility to become subject to either the Process Safety Management regulations or to CalARP. All of the proposed equipment will be specifically designed to handle and process natural gas. Each system will have a number of engineered safety controls and systems such as temperature alarms and automatic shutdown devices to ensure the gas will be treated to pipeline quality and injected into the gas sales pipeline.

Additionally, SHP operators are required to participate in periodic safety training and have knowledge of how to use proper personal protective equipment (PPE). Safety training is also required by OSHA as part of annual “Hazwopper” training. SHP requires daily project meetings to review current and relevant safety issues, and safety training is required by several agency programs for newly assigned workers as well as contractors onsite. SHP’s Cal-ARP/RMP/PSM program identifies requirements for pre-review, training, startup, and maintenance of subsequent gas plant operations under EPA, OSHA, and California Unified Program Agency (CUPA) requirements to eliminate or mitigate, releases and failures that may cause harm to the environment, personnel, and/or emergency responders.

Other hazardous materials that are currently used during typical operations and would continue to be used include standard oil-based and synthetic lubrication oils used in the compressor, odorant materials mandated by DOT regulations, and materials for cleaning operations. As a result, hazardous materials are not generated regularly. All of the materials used currently, or expected to be used in the future, are stored in proper containers or vessels, are properly labeled, and are handled in accordance with all applicable regulations and safety requirements.

The construction equipment used by contractors in the construction of the new equipment will use a variety of typical hazardous materials including lube oils, gasoline and/or diesel fuels, sealants, welding gases, and paints. All of the construction equipment expected to be used onsite are the same types of construction equipment regularly used at other construction sites except that, because of space limitations onsite, smaller equipment is expected to be used.

All hazardous materials that will be used onsite for the proposed project have been used on the site in the past. The total amount of materials is not expected to increase, and there are no new

hazardous materials being introduced to the site with the proposed equipment modifications. Therefore, there is no new risk of upset and the consequences of an upset; however, if such risk were to occur, it would be similar to the consequences of an upset during current operations. Further, the proposed project proponent maintains an onsite environmental coordinator that will oversee the proper management of hazardous materials by the respective construction contractor.

As a result, the proposed project is not anticipated to increase the potential for a significant hazard to the public or the environment through the routine transport, use, and disposal of hazardous materials, or through foreseeable upset or accident conditions involving the release of hazardous materials. Impacts will be less than significant, and no mitigation measures are required.

	<b>Potentially Significant Impact</b>	<b>Less Than Significant With Mitigation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
Would the project:				
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"/>

**IX.c).** No existing or proposed schools are located within one-quarter mile of the existing SHWU Facility. The new and modified equipment to be installed with the proposed project have the potential to emit TACs; however, analysis undertaken for the proposed project concluded that cancer and non-cancer impacts from the proposed improvements will be less than significant; refer to Section III, Air Quality, above. Other potential impacts related to hazardous substances or wastes associated with the proposed project are expected to remain within the SHWU Facility because they will be stored inside areas protected by spill containment barriers. As a result, impacts to schools are considered to be less than significant.

	<b>Potentially Significant Impact</b>	<b>Less Than Significant With Mitigation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
Would the project:				
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code §65962.5, and, as a result, would create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**IX.d).** According to the California Department of Toxic Substances Control (Envirostor, 2014), the project site is not located in an area which is included on the recent list of hazardous materials sites compiled pursuant to Government Code §65962.5 (Cortese list of active hazardous waste and substances sites).<sup>21</sup> Therefore, no prior release of hazardous materials or remediation efforts has occurred at the site. No significant hazards, on the environment or to the public, relative to hazardous materials handling at the SHWU Facility are therefore anticipated, and no impact would occur.

	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
Would the project:				
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public use airport or private airstrip, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**IX.e and .f).** The SHWU Facility is not located within an airport land use plan or within two miles of a public or private airport. The proposed project does not include installing equipment that is taller than the tallest equipment currently used onsite that could potentially interfere with flight patterns. Therefore, no safety hazards are expected from the proposed project on any airports in the region.

<sup>21</sup> California Department of Toxic Substances Control: Envirostor. Available at: <http://www.envirostor.dtsc.ca.gov>. Accessed September 17, 2014.

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**IX.g).** The SHWU Facility implements an existing Spill Prevention, Control, and Countermeasure (SPCC) Plan as is required by the U.S. Environmental Protection Agency (USEPA). The SPCC requires preventative measures such as secondary containment walls, routine training, response procedures, and certifications. Additionally, this facility implements the State of California Consolidated Unified Program Agency’s Consolidated Contingency Plan/Hazardous Material Inventory program. These plans are maintained onsite to minimize the potential for the release of hazardous materials or harm to onsite workers and/or other members of the general public. If the equipment of the proposed project requires onsite storage of new hazardous materials, such materials will be added to the existing plans currently being implemented by SHP; however, as noted above, no new types of hazardous materials will be used or generated onsite as result of the proposed project. Additionally, in conformance with applicable standards, SHP will be required to prepare and demonstrate compliance with an Emergency Action Plan, as required by the Fire Department, which addresses spill, fire, and explosion hazards and relative risk of upset to adjacent land uses.

Furthermore, emergency vehicles currently have access to the proposed project via existing access gates, thereby providing adequate emergency access. All emergency personnel have access in and out of the site utilizing their own keys. No changes in access to the site are proposed with the project. As such, the proposed project is not expected to interfere with SHP’s emergency action plan or any other emergency response plan; however, to ensure that proper measures are taken to minimize the potential for the release of hazardous materials onsite and/or exposure of workers or the public to hazardous substances, mitigation is proposed (MM HAZ-1) to require implementation of additional plans for the proposed facilities.

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
h) Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
i) Significantly increased fire hazard in areas with flammable materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**IX.h and .i).** Refer also to .a) and .b), above. The proposed project will not increase the existing risk of fire hazards in wildland areas or as the result of the use of flammable materials. The SHWU Facility is not located in or adjacent to wildland areas. Further, although the perimeter outside of the fence is landscaped as required by the City of Signal Hill CUP Conditions of Approval (CUP 97-03), no substantial or native vegetation exists within the operational portions of the SHWU Facility. All vegetation within the operational portions of the facility has already been removed as a fire safety measure. Therefore, no significant increase in fire hazards involving wildlands is expected to be associated with the proposed project.

### **Mitigation Measures**

Based on the above information relative to hazards and hazardous materials, no significant adverse impacts were identified; however, to further ensure that the proposed improvements do not result in a significant impact with regard to the potential for any increased risk of damage from or exposure to hazards or hazardous materials, mitigation is proposed (MM HAZ-1) to require preparation and implementation of additional plans (i.e. Emergency Action Plan) for the proposed facilities. Implementation of MM HAZ-1 will reduce potential project impacts with regard to hazards and hazardous materials to a level of less than significant. The 1998 mitigation measures will continue to be implemented.

#### **MM HAZ-1**

Prior to approval of the proposed project, SHP shall demonstrate compliance with applicable hazardous material rules and regulations, to include, at minimum, an Emergency Action Plan as required by the Fire Department addressing spill, fire, and explosion hazards and relative risk of upset to adjacent land uses.

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## **X. HYDROLOGY AND WATER QUALITY**

### **Significance Criteria**

Potential impacts on water resources will be considered significant if any of the following criteria apply:

- Water Demand:
  - The existing water supply does not have the capacity to meet the increased demands of the project, or the project would use more than 262,820 gallons per day of potable water.
  - The project increases demand for water by more than five million gallons per day.
- Water Quality:
  - The project will cause degradation or depletion of ground water resources substantially affecting current or future uses.

- The project will cause the degradation of surface water substantially affecting current or future uses.
- The project will result in a violation of National Pollutant Discharge Elimination System (NPDES) permit requirements.
- The capacities of existing or proposed wastewater treatment facilities and the sanitary sewer system are not sufficient to meet the needs of the project.
- The project results in substantial increases in the area of impervious surfaces, such that interference with groundwater recharge efforts occurs.
- The project results in alterations to the course or flow of floodwaters.

## Environmental Setting and Impacts

### ***Impacts Analyzed in Previous 1998 Project MND***

The 1998 MND analyzed the impacts of continued operation of seven oil production facilities operated by SHP (CUP Sites No. 1-7) with no proposed change to the physical site boundaries or type of operations, with the exception of a new natural gas processing facility at CUP Site No.2 (current proposed project site). The new natural gas processing plant included a vapor recovery system, natural gas dehydration system, and production of NGL and fuel gas.

The changes from the 1998 project compared to the proposed project are: 1) modification of the existing vapor recovery system (additional compression capacity); 2) modification of the existing natural gas dehydration system (upgrade of propane refrigeration and glycol dehydration equipment); 3) addition of a new CO<sub>2</sub> filtration system to produce gas that meets City of Long Beach specifications; and, 4) delivery of pipeline quality sales gas to the local gas distribution system. Further, the plant was modified in 2008 by adding compression capacity at the plant inlet; such improvements are part of the current baseline conditions and are not analyzed in this Final Subsequent MND. As applicable, any existing terms, conditions, or requirements previously imposed by the City of Signal Hill in their former determinations for the gas processing plant will remain in effect during construction and operation of the proposed project (if not already in place) in order to further avoid and/or reduce potential effects of the proposed project on hydrology and water quality.

The 1998 MND did not identify any potentially significant adverse impacts for any of the hydrology and water quality checklist items.

	<b>Potentially Significant Impact</b>	<b>Less Than Significant With Mitigation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
Would the project:				
a) Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**X.a).** The proposed project will result in improvements to the existing gas processing plant, and will not require the drilling or re-drilling of any wells on the CUP Site No. 2. The changes will increase the vacuum on the gathering lines, reducing back-pressure and reducing the potential for leaks in the upstream gathering system. The addition of the new compression trains will allow the processing of four thousand mscf/day up from two thousand mscf/day. The increase in volume will accommodate the organic growth of gas production from the mature water flood as oil production naturally declines. Water flood involves the use of wells to re-inject fluid (primarily water with minor concentrations of additives) into the oil/gas reservoir to re-pressurize the sandstone and flush oil into recovery (extraction) wells.

The existing operations at the SHWU Facility do not produce industrial effluent wastewater streams that are rerouted to public treatment facilities. Construction and operation of the equipment of the proposed project will also not produce industrial wastewater.

Ground disturbance required for the improvements to the proposed gas processing facility will increase the potential for erosion; however, implementation of erosion control measures as required by the City and adherence to all applicable requirements set forth in the National Pollutant Discharge Elimination System (NPDES) permit will reduce potential impacts to less than significant levels.

The proposed project will be required to comply with the requirements of Chapter 12.16 of the City of Signal Hill Municipal Code which addresses stormwater and urban runoff. Further, the site operator must also meet the requirements of the Standard Urban Stormwater Mitigation Plan (SUSMP) as approved by the Los Angeles Regional Water Quality Control Board (RWQCB). These requirements are identified in the applicable Storm Water Pollution and Prevention Plans (SWPPP) for the subject site and include best management practices (BMPs) such as erosion control during construction activities, storage of material bags and drums, onsite inspections, sampling and analysis of storm water that leaves the property, and employee training. Continued compliance with applicable federal, State, and local regulations, Code requirements, and permit provisions would ensure that no significant impacts related to potential discharge into surface water or changes in water quality occur as a result of the proposed project. In addition, no additional water beyond that included in the 1998 project will be discharged as part of the proposed project, so no additional wastewater would be generated that has the potential to violate water quality standards or waste discharge requirements. Therefore, no water quality impacts were identified as a result of implementing the proposed project.

Additionally, the Safe Drinking Water Act was enacted in 1974, and amended in 1986 and 1996. In 1980, H.R. 8117 added Section 1425 to the act dealing with underground injection wells related to the production of oil and gas, allowing programs that effectively protect groundwater to continue their regulatory programs in compliance with the Safe Water Drinking Act. In 1981, California applied for, and in 1982 was granted primacy in regulating the underground injection wells. A peer review was conducted in the mid 1980's by the Ground Water Protection Council and the programs were found to be effective in protecting drinking water.

The SHP oil operations in Signal Hill are in secondary recovery, the previous operators having established waterflood operations in the mid-1970's. SHP continues this operation today, under

the primary regulatory authority of the State of California Division of Oil, Gas & Geothermal Resources (DOGGR). SHP's operations are subject to a number of regulatory authorities at the local, State, and federal levels, with regulators having authority over the operations and influencing the permitting, monitoring and reporting process; refer to [Figure 6, Regulatory Matrix](#), of this Initial Study which identifies the affected agencies and regulatory processes relative to SHP operations.

The DOGGR oversees oil and natural gas facilities, pipelines, and gas wells. Such oversight includes operations under AB1960 Facilities Program requirements, active/idle oil well and lease management; active/idle work-overs; well drilling/re-drilling; idle well management and testing; and, injection well management, in addition to testing, management and inspections, and permit issuance activities. The DOGGR has substantial regulations governing how water injection wells must be constructed as they pass through freshwater aquifer zones (DOGGR Regs. 1721, 1722.2 through 1722.4, 1723.2 and 1724.6). These requirements are currently applicable to operations at the SHWU Facility.

Produced water, water associated with the production of oil, is re-injected into the formations at depths ranging from 2,500 to 6,000 feet at a maximum pressure of 1,800 pounds per square inch (psi). Every injection well is monitored daily for injection rate and pressure. The data is compiled and reimported monthly to DOGGR. DOGGR conducts annual inspections, and all injection wells and operations are subject to unscheduled, surprise inspections. Within the operations, whether it be well work-overs or maintenance, no freshwater is used in the field for any oil production related activities. Freshwater is used for the drip irrigations system associated with landscaping and for restrooms and safety equipment for the field employees. .

As already noted above, the proposed project does not increase demand for additional water; none of the equipment associated with the proposed modifications to the gas processing plant require water for operation. Re-injected water is generated as a result of the existing crude extraction process and is supplemented only with stormwater. As a result, no additional wastewater will be discharged as part of the proposed project beyond that which already exists and was previously analyzed. Produced water from the existing onsite drilling operations is collected and injected back into the oil zones, thereby reducing the amount of water runoff from the SHWU Facility.

Additionally, in order to determine potential impacts of oil field operations on groundwater quality in the Signal Hill - Long Beach area, the City of Signal Hill recently retained Flow Science, Incorporated (Flow Science) to prepare a technical study. This study, entitled *Impacts of Oil Field Operations on Groundwater Quality in Signal Hill-Long Beach Area* (February 25, 2014), is available under separate cover at the City of Signal Hill and is not attached as an appendix to this Final Subsequent MND as it is not project-specific.

This study considered information from public sources (e.g., drinking water quality information, public reports on subsurface geology) and information provided by SHP, Inc. (e.g., well logs from oil wells in the field, information on water flood operations). Additionally, information on subsurface geology, including the locations of drinking water aquifers and hydrocarbon production zones, information on water quality in drinking water aquifers, and information

related to oil field operations and the potential of those operations to impact groundwater quality was reviewed.

The Los Angeles Basin includes over 30 mapped oil fields and 9,700 oil/gas wells. The subsurface geology is complex, and the aquifer zones and hydrocarbon zones within the LA Basin are highly folded and faulted. Therefore, the depth of drinking water aquifers and hydrocarbon zones is variable and depends on one's location within the basin.

In the Signal Hill area, drinking water aquifers typically occur within the top 1,400 feet or less below ground surface (bgs), while hydrocarbon zones within the Long Beach Field typically occur below this level and may extend to a depth of a few miles bgs. Drinking water aquifers are generally separated from hydrocarbon zones by layers of low permeability. Low permeability layers also exist between drinking water aquifers (“aquitards”) and between hydrocarbon zones at different depths. In addition, oil/gas wells are constructed with solid casings that extend through drinking water aquifers; oil/gas wells are not screened or perforated in drinking water zones. Drinking water wells typically terminate well above hydrocarbon zones.

The City of Signal Hill and the surrounding area overlie two main groundwater basins: the West Coast Basin and the Central Basin. These two basins are separated by the Newport-Inglewood Fault Zone, a geologic structural feature that partially restricts groundwater flow. Historical over-pumping of groundwater 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. Multiple Superfund sites are located throughout the LA Basin, but these sites are located far from the Signal Hill-Long Beach area and do not currently affect groundwater quality in the Signal Hill-Long Beach area. The Signal Hill-Long Beach area, however, has been impacted by numerous contamination events and subsequent cleanups.

Contamination from these local events appears to have been limited to soil and to shallow aquifers that are not used for drinking water production. Data was reviewed by Flow Science from groundwater samples collected from both monitoring and production wells to characterize groundwater quality. The City of Signal Hill Water Department confirmed that groundwater quality from City-owned production wells have consistently met State water quality standards.<sup>22</sup>

This data demonstrates that constituent concentrations in groundwater production zones have, to date, been below applicable regulatory thresholds, 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). Water level data collected by the WRD indicate that, except in Central Basin recharge areas located six or more miles from Signal Hill, groundwater levels in the West Coast and Central Basins are below sea level.

The “base of freshwater” (BFW) is a term used to describe the level below which salinity rises to relatively high levels and to distinguish between more saline water (such as exists within hydrocarbon zones) and fresher groundwater overlying saline waters. Because changes in the base of freshwater could potentially indicate changes in groundwater quality, Flow Science

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<sup>22</sup> Flow Science. Impacts of Oil Field Operations on Groundwater Quality in Signal Hill-Long Beach Area. February 25, 2014.

reviewed well logs provided by SHP that show the location of the BFW within the Signal Hill-Long Beach area. Flow Science’s review of well logs from pairs of wells located near each other but logged decades apart shows that the BFW does not appear to have changed significantly over time. As shown by one pair of wells separated by a fault, the depth to the BFW can vary significantly across faults and other discontinuities within the area.

SHP employs an oil/gas production technique known as “waterflood” to enhance oil recovery within the Long Beach Oil Field. Waterflood involves the use of wells to inject fluid (primarily water with minor concentrations of additives) into the oil/gas reservoir to re-pressurize the sandstone and flush oil into recovery (extraction) wells. The DOGGR establishes limits and monitoring requirements for waterflood operations within California. For example, DOGGR requires that injection pressures in waterflood operations be maintained below the fracture pressure of the formation; this fracture pressure was established for the Long Beach field decades ago by DOGGR and is now required to be confirmed in the field using step-rate tests. DOGGR also requires monitoring on a regular basis to confirm the mechanical integrity of oil well casings and the tubing and packers used in waterflood operations. Flow Science reviewed limited waterflood well and test information, which was characterized by SHP as representative of its waterflood operations, which SHP states are conducted consistent with DOGGR’s requirements and industry standard practices. Flow Science concluded that waterflood operations, as currently conducted, have little potential to adversely impact water quality in overlying drinking water aquifers.

The Flow Science study therefore concluded that subsurface operations within the Signal Hill-Long Beach area to date have had no impact on water quality within drinking water aquifers. Refer to the Flow Science technical study for a more in-depth discussion and technical data supporting such findings.<sup>23</sup>

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<sup>23</sup> Ibid.

Air					
Agency Name	Area of Oversight	Examples of Area Coverage	Oversight Methods	Training Requirements	Recordkeeping Requirements
South Coast Air Quality Management District	Stationary Air Emission Sources, Criteria and Hazardous Air Pollutants	Natural gas turbine emission; Minor combustion device (lawn care equipment, small fenerators, water heaters) emissions; Internal combustion engines emissions, Process heater emissions; Storage tank emissions; Fugitive gas leaks from pipelines, compressors, valves, fittings, flanges	Unannounced and annual inspections; Permit program; Breakdown reports; Daily, quarterly and annual emission reports submitted to Air District		Quarterly and annual emission reports and fees; Submitted self-inspection reports; RECLAIM recordkeeping & daily reports
California Air Resources Board	Mobile Source Emissions, Criteria and Hazardous Air Pollutants	On-road vehicle emissions; Off-road vehicle emissions; Portable equipment emissions	Periodic submitted reports; Inspections of portable equipment; Annual Periodic Smoke Inspection Program; Vehicle labeling		Portable equipment usage logs; Initial and periodic vehicle records; Inspection records
California Air Resources Board	Greenhouse Gas Emissions	Facility and Mobile Source Greenhouse Gas Emissions	Annual emission reports with verification by independent third party		GHG monitoring plan; Test results
U.S. Environmental Protection Agency	Greenhouse Gas Emissions	Facility Greenhouse Gas Emissions	Annual emission reports		GHG monitoring plan; Test results
Nonair					
Agency Name	Area of Oversight	Examples of Area Coverage	Oversight Methods	Training Requirements	Recordkeeping Requirements
California EPA (California Unified Program Agencies - CUPA)	Manages local CUPAs (See LACoFD and LBFD)	Local CUPA have oversight Jurisdiction (see LACoFD and LBFD)	Local CUPA have oversight Jurisdiction (see LACoFD and LBFD)	Local CUPA have oversight Jurisdiction (see LACoFD and LBFD)	Local CUPA have oversight Jurisdiction (see LACoFD and LBFD)
Los Angeles County Fire Department (LACoFD - CUPA for City of Signal Hill)	Hazardous Materials Handler; Hazardous Waste Generator; Aboveground Storage Tank Program; California Accidental Release Prevention (CalARP) Program; California Uniform Fire Code	Consolidated Contingency (Business Emergency) plan and Hazardous Materials Inventory program (CCP/HMI); CalARP plan and program	Annual CCP/HMI submittals; CalARP plan & report submittals; Aboveground storage tank inventory; Annual and unannounced inspections; Permit program and fees; Spill response	24-hr & 8-hr hazardous waste responder; CCP/HMI specific; Spill response; CalARP	Plans; Training documents; Certifications
City of Long Beach Fire Department (LBFD - CUPA for City of Long Beach)	Hazardous Materials Handler; California Uniform Fire Code	Consolidated Contingency (Business Emergency) plan and Hazardous Materials Inventory program (CCP/HMI)	Annual CCP/HMI submittals; Annual and unannounced inspections; Permit program and fees; Spill response	24-hr & 8-hr hazardous waste responder; CCP/HMI specific; Spill response	Plans; Training documents; Certifications
Department of Toxic Substance Control	Hazardous Wastes	Hazardous Waste Accumulation, Storage and Disposal; Regular disposal of solvents, used oil (milkruns), antifreeze, automotive batteries; Universal and Electronic Waste Disposal	Universal hazardous waste manifest submittals; Annual questionnaire, Waste manifest summary & fee submittals	24-hr hazardous waste responder; 8-hr annual hazardous waste responder refresher	Self-inspections; Training documents
Department of Oil and Gas	Oil and Natural Gas Facilities and Pipelines;	AB1960 Facilities Program requirements;	Spill plan; Pipeline management plan; Tank design & regular inspection program; Leak reporting; Annual inspections	Spill response	Tank inspection results; Spill response forms; Training documents; Records retained up to "life-of-the facility"
Department of Oil and Gas	Oil and Natural Gas Wells	Active/Idle Oil Well & Lease Management; Active/Idle Workovers; Well Drilling/Redrilling; Idle Well Management/Testing; Injection Well Management	Annual oil/injection well equipment/signage/containment/area inspections (picture documentation); Well work plan review & permit issuance; Idle well inspections & testing reports; Injection well 3rd party surveys/annual rate/pressure inspections with monthly record; submittals		Annual reports; permit applications and issuance; well history submittals; daily well visual inspections
DOT, Pipeline and Hazardous Materials Safety Administration	Oil and Natural Gas Facilities and Pipelines (OPA 90)	Facility Response Plans and Spill Equipment; Incident Command System	Unannounced and announced inspections; Spill response	Spill response; Spill drills; Notification drills	Training; Drills; Spill response forms
U.S. EPA (& U.S. Coast Guard)	All Environmental Activities, Oil Spills	Facility Response Plans, Spill Prevention, Containment and Countermeasure Plans	Spill plan; Spill reporting; Visual inspections of tanks, pipelines, facilities; Unannounced inspections; Spill response	Spill response	Plans; Spill response forms; Training documents; Certifications; Inspection records
U.S. OSHA	Health and Safety Requirements	Injury and Illness Prevention Program; Confined Space; Hazmat Communication; Emergency Response; Electrical Safety; Hot Work; Lock-Out/Tag-Out; Heat Stress; Hazwaste; Fire Prevention; equipment safety and certifications	Monthly safety meetings; Tailgate meetings; Annual reporting; Annual and periodic training; Self-inspections	All Health and Safety require training	Annual reports; self-inspections; training; Records are required to be kept up to 30 years beyond termination of employees
Mobile (Vehicles)					
Agency Name	Area of Oversight	Examples of Area Coverage	Oversight Methods	Training Requirements	Recordkeeping Requirements
California Department of Motor Vehicles	Commercial Motor Vehicles	State Registration/License requirements; Motor Carrier Program	Annual registration/license renewals; Annual permit report/renewal, certificates and annual fees; Drug and alcohol testing (CSAT) program; Employer Pull Notice program with security checks (driver record review)	(see DOT reqts)	Vehicle information; Employee information; Insurance information; Drug and alcohol testing; Hours of Service information
California Highway Patrol	Commercial Motor Vehicles	Biennial Inspection of Terminal Program	Biennial facility and vehicle inspections; Roadside vehicle inspections	(see DOT reqts)	Vehicle information; Employee information; Commercial driver information; Drug and alcohol testing; Hours of service information; Insurance information
U.S. DOT, Federal Motor Carrier Safety Administration	Commercial Motor Vehicles	Commercial Vehicles	Hazmat registrations; Special permit registrations; Security plans; Unannounced and triennial inspections of facilities, vehicles and records	General awareness; Safety; Function specific; Security; Hazardous material specific	Vehicle information; Employee information; Commercial driver information; Drug and alcohol testing; Hours of service information; Insurance information; Shipping papers

Notes: Except as noted, all records must be kept for at least 3 or 5 years.  
Most reports are submitted online  
Spill Response means agency representative is present at an actual spill response to review SHP procedures

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	<b>Potentially Significant Impact</b>	<b>Less Than Significant With Mitigation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
Would the project:				
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g. the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**X.b.).** The City of Signal Hill is located within the Long Beach Plain groundwater basin. Groundwater on the project site is encountered under shallow water table conditions within relatively low permeability sediments. This groundwater does not provide enough water to be utilized as a water supply resource, and deeper aquifers north of Signal Hill are used for groundwater supply.

Water is presently injected/extracted at the CUP sites into/from deeper oil bearing zones which does not directly affect the shallower aquifers associated with drinking water. No new freshwater will be used in the project operations. No change in site operations will occur with the proposed project that will influence direction or rate of flow of groundwater. Further, the project site is currently paved/developed and will remain as such once the modifications are complete. Therefore, the project will not increase the potential to interfere substantially with groundwater recharge as compared to the existing setting. No significant impacts will result with the proposed project.

	<b>Potentially Significant Impact</b>	<b>Less Than Significant With Mitigation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
Would the project:				
c) Substantially alter the existing drainage pattern of the site or area, including alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**X.c) and .d).** Refer also to X.b) above. The site is located in a dense urbanized area, and no stream or river courses are located in the immediate vicinity. The closest water body to the facility is the Pacific Ocean, approximately three miles to the south. The proposed project site and vicinity are relatively flat. The currently proposed project does not include additional paving that would increase the rate or amount of surface runoff, nor will the improvements result in a change to absorption rates, drainage patterns, or the rate or amount of runoff; refer to [Figure 4A, Project Disturbance](#). Substantial erosion or siltation on- or offsite, or a substantial increase in the amount of runoff, are therefore not anticipated.

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**X.e).** Refer to X.c) and X.d), above. Minor disturbance to the existing paved surface within the project boundaries will be required to implement the proposed modifications, The currently proposed project does not include additional paving that will increase the rate or amount of surface runoff, nor will the improvements result in a change to the rate, amount, or quality of runoff; refer to [Figure 4A, Project Disturbance](#). Less than significant impacts with regard to runoff from the site will occur.

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
f) Otherwise substantially degrade water quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**X.f.).** Refer also to X.a), above. As discussed in Chapter 1, the proposed modifications will result in installation of modern technology and equipment that will allow for fewer equipment leaks and mechanical upsets in the gas plant itself, as well as more effective and efficient gathering and processing of produced gas that will result in less back-pressure and reduced potential for leaks in the upstream gathering system. Additionally, active injection/extraction wells located within project CUP sites extend through water bearing zones into oil bearing zones, and are encased to prevent leaks and contamination to aquifers used as sources of drinking water. It is expected that any contamination would be immediately reported and remediated in accordance with federal, State, and local standards. Potential effects on groundwater quality are addressed by the State of California DOGGR rather than the NPDES (stormwater discharge) program. CUP Site No. 2 (which includes the project site) operates under DOGGR Waterflood Project Permits. These permits set forth guidelines whereby water injection into oil bearing zones is regulated, and the isolation of groundwater intervals is strictly enforced. As such, the proposed improvements will not substantially degrade water quality.

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Place within 100-year flood hazard area structures which would impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**X.g) and .h).** The project site is located within the Zone "C" Flood Hazard Zone, identified in the (FEMA) flood insurance study as an area of moderate or minimal hazard from the principal source of flooding in the area. Buildings in this Zone could be flooded by severe, concentrated rainfall coupled with recognized inadequate local drainage systems. The project does not propose any housing or structures that will impede or redirect flows. Due to the existing industrialized uses of the proposed project site and surrounding facilities, potential flood impacts are not expected to be significant.

Would the project:	<b>Potentially Significant Impact</b>	<b>Less Than Significant With Mitigation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dike?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**X.i).** Refer to X.d), above. The project site is located within the Zone "C" Flood Hazard Zone; however, due to the existing industrialized uses of the proposed project site and surrounding facilities, potential flood impacts are not expected to be significant. The proposed project does not involve new construction that could expose people to new risks of loss, injury, or death involving flooding. The site is not located within an area subject to inundation in the event of a dam failure, and there are no levees near the facility that could fail. Therefore, no significant adverse impacts from flooding are anticipated as a result of the proposed project.

Would the project:	<b>Potentially Significant Impact</b>	<b>Less Than Significant With Mitigation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
j) Inundation of seiche, tsunami, or mudflow?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**X.j).** The facility is located approximately three miles north of the nearest body of water (Pacific Ocean). As such, there is minimal potential that the facility could be affected by seiches or tsunamis. The facility is on relatively flat land in a built-out area, so the possibility of mudflows is also remote. Therefore, no significant adverse impacts from flooding are anticipated as a result of the proposed project.

**Mitigation Measures**

Based on the above information relative to hydrology and water quality, no significant adverse impacts were identified. Therefore, no mitigation measures are required for the construction or operation of the proposed project.

**XI. LAND USE AND PLANNING**

**Significance Criteria**

Land use and planning impacts will be considered significant if the proposed project conflicts with the land use and/or zoning designations established by the City of Signal Hill.

**Environmental Setting and Impacts**

***Impacts Analyzed in Previous 1998 Project MND***

The 1998 MND analyzed the impacts of continued operation of seven oil production facilities operated by SHP (CUP Sites No. 1-7) with no proposed change to the physical site boundaries or type of operations, with the exception of a new natural gas processing facility at CUP Site No.2 (current proposed project site). The new natural gas processing plant included a vapor recovery system, natural gas dehydration system, and production of NGL and fuel gas.

The changes from the 1998 project compared to the proposed project are: 1) modification of the existing vapor recovery system (additional compression capacity); 2) modification of the existing natural gas dehydration system (upgrade of propane refrigeration and glycol dehydration equipment); 3) addition of a new CO<sub>2</sub> filtration system to produce gas that meets City of Long Beach specifications; and, 4) delivery of pipeline quality sales gas to the local gas distribution system. Further, the plant was modified in 2008 by adding compression capacity at the plant inlet; such improvements are part of the current baseline conditions and are not analyzed in this Final Subsequent MND. As applicable, any existing terms, conditions, or requirements previously imposed by the City of Signal Hill in their former determinations for the gas processing plant will remain in effect during construction and operation of the proposed project (if not already in place) in order to further avoid and/or reduce potential effects of the proposed project relative to hydrology and water quality.

The 1998 MND did not identify any potentially significant adverse impacts for any of the land use and planning checklist items.

	<b>Potentially Significant Impact</b>	<b>Less Than Significant With Mitigation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
Would the project:				
a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	<b>Potentially Significant Impact</b>	<b>Less Than Significant With Mitigation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
mitigating an environmental effect?				
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**XI.a), .b), and .c).** The modifications involved in the proposed project will be developed entirely within the existing boundaries of CUP Site No. 2. As such, the proposed project will not physically divide any established communities or affect adjacent properties. The site is currently designated Light Industrial on the City of Signal Hill General Plan Land Use Map and is zoned GI (General Industrial). The proposed project is consistent with these designations and will not require a General Plan amendment or rezone to allow for implementation. The project site is not located within the boundaries of a habitat or natural community conservation plan and is within CUP Site No. 2 which is fully developed and highly industrialized; no sensitive biological resources are present onsite. Therefore, the proposed project is consistent with the existing land use designation, is consistent with uses permitted within the zone, and will not conflict with any applicable land use plan. No impacts will occur, and no mitigation measures are required.

### **Mitigation Measures**

Based on the above information relative to land use impacts, no significant adverse impacts were identified. Therefore, no mitigation measures are required for the construction or operation of the proposed project.

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## **XII. MINERAL RESOURCES**

### **Significance Criteria**

Potential impacts on mineral resources will be considered significant if any of the following conditions are met:

- The proposed project would result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State.
- The proposed project would result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan.

### **Environmental Setting and Impacts**

#### ***Impacts Analyzed in Previous 1998 Project MND***

The 1998 MND analyzed the impacts of continued operation of seven oil production facilities operated by SHP (CUP Sites No. 1-7) with no proposed change to the physical site boundaries or

type of operations, with the exception of a new natural gas processing facility at CUP Site No.2 (current proposed project site). The new natural gas processing plant included a vapor recovery system, natural gas dehydration system, and production of NGL and fuel gas.

The changes from the 1998 project compared to the proposed project are: 1) modification of the existing vapor recovery system (additional compression capacity); 2) modification of the existing natural gas dehydration system (upgrade of propane refrigeration and glycol dehydration equipment); 3) addition of a new CO<sub>2</sub> filtration system to produce gas that meets City of Long Beach specifications; and, 4) delivery of pipeline quality sales gas to the local gas distribution system. Further, the plant was modified in 2008 by adding compression capacity at the plant inlet; such improvements are part of the current baseline conditions and are not analyzed in this Final Subsequent MND. As applicable, any existing terms, conditions, or requirements previously imposed by the City of Signal Hill in their former determinations for the gas processing plant will remain in effect during construction and operation of the proposed project (if not already in place) in order to further avoid and/or reduce potential effects of the proposed project relative to mineral resources.

The 1998 MND did not identify any potentially significant adverse impacts for any of the mineral resources checklist items. Mineral Resources were evaluated in the 1998 MND in combination with Energy Resources; however, with the current checklist format, Mineral Resources are evaluated separately herein in Section XII using the significance criteria identified above.

	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**XII.a).** and **b).** The proposed project does not change the natural gas processing activities currently approved and operating at the site. The proposed project would allow for improvements to enhance the efficiency and reliability of SHP’s ability to provide continued operation of natural gas recovery and processing-related facilities already present onsite and within the surrounding City of Signal Hill. Such operations have been active for over 85 years and are an important part of the region’s petroleum resource recovery operations.

Oil and gas extraction and processing will continue at the SHWU Facility and other area oil and gas drilling and recovery operations, even in the absence of the proposed project. Continued extraction of resources from the Long Beach Oil Field is not considered to represent a loss in the availability of important mineral resources in the same way that building a development project over a mineral resource such as gravel, asphalt, bauxite, or gypsum (which are commonly used for construction activities or industrial processes) would make these resources unavailable for other uses.

Natural gas processing activities within the confines of the existing SHWU Facility will continue to be regulated by the City's previous determinations. No other mineral resources are present at the SHWU Facility, and no significant impacts will occur.

### **Mitigation Measures**

Based on the above information relative to impacts on mineral resources, no significant adverse impacts were identified. Therefore, no mitigation measures are required for the construction or operation of the proposed project.

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## **XIII. NOISE**

### **Significance Criteria**

Impacts on noise will be considered significant if:

- Construction noise levels exceed the local noise ordinance or, if the noise threshold is currently exceeded, project noise sources increase ambient noise levels by more than three decibels (dBA) at the site boundary. Construction noise levels will be considered significant if they exceed federal Occupational Safety and Health Administration (OSHA) noise standards for workers.
- The proposed project operational noise levels exceed any of the local noise ordinances at the site boundary or, if the noise threshold is currently exceeded, project noise sources increase ambient noise levels by more than three dBA at the site boundary.

### **Environmental Setting and Impacts**

#### ***Impacts Analyzed in Previous 1998 Project MND***

The 1998 MND analyzed the impacts of continued operation of seven oil production facilities operated by SHP (CUP Sites No. 1-7) with no proposed change to the physical site boundaries or type of operations, with the exception of a new natural gas processing facility at CUP Site No.2 (current proposed project site). The new natural gas processing plant included a vapor recovery system, natural gas dehydration system, and production of NGL and fuel gas.

The changes from the 1998 project compared to the proposed project are: 1) modification of the existing vapor recovery system (additional compression capacity); 2) modification of the existing natural gas dehydration system (upgrade of propane refrigeration and glycol dehydration

equipment); 3) addition of a new CO<sub>2</sub> filtration system to produce gas that meets City of Long Beach specifications; and, 4) delivery of pipeline quality sales gas to the local gas distribution system. Further, the plant was modified in 2008 by adding compression capacity at the plant inlet; such improvements are part of the current baseline conditions and are not analyzed in this Final Subsequent MND. As applicable, any existing terms, conditions, or requirements previously imposed by the City of Signal Hill in their former determinations for the gas processing plant will remain in effect during construction and operation of the proposed project (if not already in place) in order to further avoid and/or reduce potential effects of the proposed project relative to noise.

The 1998 MND identified potentially significant adverse impacts relative to noise for the checklist items. The 1998 MND identified mitigation (Mitigation Measures #5a to #5e of the 1998 MND) to reduce construction and operational noise impacts to a level of less than significant. In accordance with the 1998 MND, these mitigation measures have been implemented with the existing facilities onsite. Additionally, Mitigation Measure #5d required that a noise study be performed after project installation to confirm that operation of the gas processing plant would not exceed the City noise standard of 70 dB as measured at the property line. This mitigation measure has been implemented, and the results of testing indicated a sound level of below 70 dBA for each of the two sites where measurements were taken at the property line (adjacent to Orange Avenue); refer to [\*Appendix D, Signal Hill Sound Level Survey\*](#), of this Final Subsequent MND. The 1998 mitigation measures will continue to be implemented.

### ***Enforcement of Noise Reduction Measures***

All existing operations that were part of the 1998 project and any future activities (operation or construction) that are included in the proposed project will be subject to OSHA and NIOSH standards and enforced by OSHA. In addition, all construction activities are limited by the City of Signal Hill to the hours of 7:00 a.m. to 6:00 p.m. Monday through Friday (Municipal Code, Chapter 9.16, Noise).

Additionally, the Conditions of Approval for the City's extension of CUP 97-03 to December 31, 2014 included conditions pertaining to potential noise effects from continued operation of CUP Sites No. 1-7 and operation of the existing gas processing plant. Conditions 12.a) to 12.d) were added to reduce the level of noise from operation of the Consolidated Drilling and Production sites. Such measures addressed the following: 1) 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; 2) the operator shall use electric motors to power equipment. Vehicle motors, including portable service or drilling rigs, may use internal combustion engines; 3) 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; and, 4) 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. Additionally, Condition 16 required that, 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, the operator shall prepare and submit a Noise Mitigation Plan to the Director of Community

Development for review and approval. The plan may including 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 shall, within three months, design and successfully install measures to mitigate noise levels to 70 dB or below. This measure has been implemented and the results of noise level testing for operation of the existing gas processing plant are provided in [Appendix D, Signal Hill Sound Level Survey](#), of this Final Subsequent MND and discussed in greater detail below.

These existing regulations and conditions are currently applicable to the SHWU Facility and will also continue to apply during construction and operation of the proposed project. The City of Signal Hill is responsible for enforcement of such requirements.

	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**XIII.a.), c.), and d.).** The existing gas processing plant is an industrial-type use located within the Long Beach Oil Field which supports extensive oil/gas extraction wells and associated processing facilities. Land uses surrounding the parcel on which the project site is located include a self-storage operation to the north, across E. Spring Street, with an auto-oriented commercial retail business to the northwest, and equipment/collision repair businesses to the northeast. A retail car sales business borders the site to the east. To the south, the parcel is bordered by E. 29<sup>th</sup> Street. Across E. 29<sup>th</sup> Street are various commercial retail businesses (e.g. real estate office) and a chapel, and a commercial office park is located just to the south/southeast. To the west is Orange Avenue, with a generally vacant and highly-disturbed parcel that supported the former gas processing facility bordering the street to the west.

The ambient noise environment in the proposed project area is comprised of contributions from equipment and operations within the surrounding industrial and commercial areas, and from traffic on roads within the vicinity of the site, including I-405 just to the north. Drilling and oil

production operations are part of the existing condition and contribute to the baseline ambient noise conditions.

Noise would be generated from both construction and operational activities associated with the proposed project. Noise impacts from construction will occur during demolition, excavation, and construction required for the proposed equipment modifications. The construction equipment associated with the proposed project may include backhoes, welding machines, trucks, cranes and/or compactors. Examples of noise levels from construction equipment are presented in [Table XIII-1, Construction Noise Sources](#). Such noise will be generated intermittently over the approximately two-month construction period. In addition, the largest construction equipment will not always be operating simultaneously or on the same days.

**Table XIII-1 Construction Noise Sources**

Equipment	Typical Noise Levels (decibels) <sup>[1],[2][3]</sup>
Truck	88
Air Compressor	81
Flatbed Truck	84
Pickup	70
Tractor Trailer	75
Cranes	83
Pumps	76
Welding Machines	72

1. Data are modified from the City of Los Angeles, 1998. Levels are in dBA at a 50-foot reference distance. These values are based on a range of equipment and operating conditions.
2. Values are intended to reflect noise levels from equipment in good condition, with appropriate mufflers, air intake silencers, etc. In addition, these values assume averaging the sound level over all directions from the listed piece of equipment.
3. As construction is temporary and typical of urban environments, the City of Signal Hill does not have specific noise limits for construction activities. Instead, the City limits the hours that construction can occur to 7:00 a.m. to 6:00 p.m. Monday through Friday.

Construction activities for the proposed project will occur within the boundaries of the existing SHWU Facility. The closest receptor is located adjacent to the southwest of the site; refer to [Figure 1B, Local Vicinity Map](#). Due to distance, the noise level from construction activities is not anticipated to adversely affect this or other adjacent locations. In addition, the noise generated from construction activities will be located near ground level, with all construction activities occurring behind permanent masonry walls. As a result, the noise levels are expected to attenuate over distance to a greater extent.

Project construction activities shall comply with City of Signal Hill Noise Ordinance Section 9.16.050 relating to construction noise. Construction activities at the project site are limited by the City of Signal Hill noise ordinance to the hours of 7:00 a.m. to 6:00 p.m. Monday through Friday. These limitations will remain in effect during construction of the currently proposed project. Because of the nature of the construction activities, the type, number, operation time, and loudness of construction equipment will vary throughout the construction period. The sound level associated with construction will change as construction progresses, and construction noise sources will be temporary and intermittent and will cease following construction activities; however, mitigation is proposed (MM NOI-1a to NOI-1c) to ensure project construction does not result in a significant noise impact. Such measures will include ensuring that all construction

equipment, fixed or mobile, be equipped with properly operating and maintained mufflers. Stationary construction equipment will also be placed onsite such that emitted noise is directed away from sensitive noise receivers.

Based on the noise levels anticipated for the proposed project, noise producing equipment at the SHWU Facility is not expected to exceed maximum noise levels identified in the City of Signal Hill noise ordinance. Operation of the new equipment installed as part of the proposed project is not expected to generate a significant increase in noise levels over existing conditions. Further contributing to the reduction in noise is the distance of the facilities (within the interior) from the exterior parcel boundary and the perimeter block wall, particularly along Spring Street where it is combined with a landscaped berm; no changes to the wall (or berm) will occur with the proposed project.

As required by the City, a sound level survey was conducted at the site in February 2012 to assess noise generated by operation of the existing gas plant; refer to [Appendix D, Signal Hill Sound Level Survey](#), of this Final Subsequent MND. Measurements were taken at two locations along the western property boundary (near Orange Avenue). Both readings were below a level of 70 dBA and therefore in compliance with City noise thresholds for the land use. Therefore, it is anticipated that little additional noise will be generated during operation of the proposed project.

Based on the fact that the proposed equipment will be placed within a concrete block wall, and the fact that the new equipment will have noise ratings similar to existing equipment, significant noise impacts from operation of the proposed project are not anticipated to occur; however, the project will be subject to CUP Condition #16 and mitigation measures (MM NOI-2a to NOI-2b) which will require noise level testing following installation of the proposed improvements to ensure that operational noise levels are less than significant and that no additional measures are required to reduce substantial noise generated. Additionally, all future servicing, reworking, and/or re-drilling at any of the CUP sites shall occur in compliance with Section 9.16.070 of the Signal Hill Municipal Code.

	<b>Potentially Significant Impact</b>	<b>Less Than Significant With Mitigation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
Would the project result in:				
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**XIII.b).** Construction activities that will occur at the facility have the potential to generate low levels of groundborne vibration onsite. The only activity that may generate low levels of groundborne vibration is construction of the foundations for the new equipment. Such onsite groundborne vibration activity would be temporary and intermittent and is not anticipated to result in a significant noise impact.

Operation of the proposed project will not involve any new drilling or other similar activities that would have the potential to increase groundborne vibration. The proposed equipment does not have parts or processes that exert mechanical energy to any appreciable extent that would contribute to groundborne vibrations. Operation of the proposed project is therefore not anticipated to cause significant adverse groundborne vibration or noise impacts.

	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
Would the project result in:				
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public use airport or private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**XIII.e). and f.).** The proposed project is not located within an airport land use plan or within the vicinity of a private airstrip. Furthermore, the SHWU Facility is not located within the normal flight pattern of any airport. As noise impacts from the proposed project are concluded to be less than significant, and because the facility is not located within an airport land use plan or within the vicinity of a private airstrip, no significant noise impacts to people living or working in an airport land use plan, or within the vicinity of a private airstrip, are expected.

**Mitigation Measures**

Based on the above information relative to impacts with regard to noise, mitigation measures are required for the construction or operation of the proposed project.

With regard to noise, the following mitigation measures are proposed to reduce impacts resulting from potential construction and operational noise to a level of less than significant. The 1998 mitigation measures will continue to be implemented.

**Short-Term Construction**

**MM NOI-1**

In order to reduce construction noise, the following measures shall be implemented during construction of the proposed natural gas processing facility to the satisfaction of the SCAQMD or designee:

- a. Construction activities shall comply with City of Signal Hill Noise Ordinance Section 9.16.050 relating to construction noise. Construction is permitted only between the hours of 7:00 a.m. to 6:00 p.m. Monday through Friday.
- b. All construction equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers, to the satisfaction of the SCAQMD or designee.
- c. Stationary construction equipment shall be placed such that emitted noise is directed away from sensitive noise receivers to the satisfaction of the SCAQMD or designee.

### ***Long-Term Operation***

#### **MM NOI-2**

In order to reduce long-term operational noise, the following measures shall be implemented for the proposed natural gas processing facility to the satisfaction of the SCAQMD or designee:

- a. Within thirty (30) days of installation of the proposed equipment modifications at the existing gas processing facility at Site No. 2, the operator shall measure the noise at the property line and submit said readings to the SCAQMD for review. The SCAQMD shall require the construction of sound barriers around the facility, or any other mitigation both feasible and appropriate, should the gas processing equipment not meet noise standards found in the Signal Hill Municipal Code Chapter 9.16, entitled “Noise,” for industrial areas.
- b. On an annual basis (once yearly), the operator shall measure the noise at the property line and submit said readings to the Planning Director for review. The Planning Director shall require the construction of sound barriers around the facility or any other mitigation both feasible and appropriate, should the gas processing equipment not meet noise standards found in Signal Hill Municipal Code Chapter 9.16, entitled “Noise,” for industrial areas.

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## **XIV. POPULATION AND HOUSING**

### **Significance Criteria**

The impacts of the proposed project on population and housing will be considered significant if the following criteria are exceeded:

- The demand for temporary or permanent housing exceeds the existing supply.
- The proposed project produces additional population, housing, or employment inconsistent with adopted plans either in terms of overall amount or location.

### **Environmental Setting and Impacts**

#### ***Impacts Analyzed in Previous 1998 Project MND***

The 1998 MND analyzed the impacts of continued operation of seven oil production facilities operated by SHP (CUP Sites No. 1-7) with no proposed change to the physical site boundaries or

type of operations, with the exception of a new natural gas processing facility at CUP Site No.2 (current proposed project site). The new natural gas processing plant included a vapor recovery system, natural gas dehydration system, and production of NGL and fuel gas.

The changes from the 1998 project compared to the proposed project are: 1) modification of the existing vapor recovery system (additional compression capacity); 2) modification of the existing natural gas dehydration system (upgrade of propane refrigeration and glycol dehydration equipment); 3) addition of a new CO<sub>2</sub> filtration system to produce gas that meets City of Long Beach specifications; and, 4) delivery of pipeline quality sales gas to the local gas distribution system. Further, the plant was modified in 2008 by adding compression capacity at the plant inlet; such improvements are part of the current baseline conditions and are not analyzed in this Final Subsequent MND. As applicable, any existing terms, conditions, or requirements previously imposed by the City of Signal Hill in their former determinations for the gas processing plant will remain in effect during construction and operation of the proposed project (if not already in place) in order to further avoid and/or reduce potential effects of the proposed project on population and housing.

The 1998 MND did not identify any potentially significant adverse impacts for any of the population and housing checklist items.

	<b>Potentially Significant Impact</b>	<b>Less Than Significant With Mitigation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
Would the project:				
a) Induce substantial growth in an area either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Displace substantial numbers of people, necessitating the construction of replacement housing everywhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**XIV.a), .b), and .c).** The proposed project will require modifications to the existing equipment at the SHWU Facility and will not involve an increase, decrease, or relocation of population. No existing housing or residents are present onsite, and therefore, the displacement of housing or people is not required. As construction labor needs will be limited, personnel for construction activities is expected to come from the existing labor pool in southern California. Further, operation of the proposed project is not expected to require any new permanent employees at the SHWU Facility. Additionally, the increased availability of gas supply resulting with the

proposed project is not considered to be growth inducing. The proposed improvements will result in enhancement of local gas supplies available for public sale and consumption through the proposed improvements at the natural gas plant. The proposed project will allow for the transfer of pipeline quality gas to the local gas distribution system for sale to third party(s) for beneficial use; however, the availability of such supplies as a result of the project will not be directly growth-inducing. The gas made available for sale by the proposed project will meet area demand for such resources and displace gas currently being transported from greater distances away from Long Beach; such demand will be influenced by economic conditions at the time that the gas is purchased.

Therefore, construction and operation of the proposed project are not expected to have a significant adverse impact on population or housing, induce substantial population growth, or exceed the growth projections contained in any adopted plans.

### **Mitigation Measures**

Based on the above information relative to impacts relative to population and housing, no significant adverse impacts were identified, and therefore, no mitigation measures are required for the construction or operation of the proposed project.

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## **XV. PUBLIC SERVICES**

### **Significance Criteria**

Impacts on public services will be considered significant if a proposed project would result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered government facilities (the construction of which could cause significant environmental impacts) in order to maintain acceptable service ratios, response times, and/or other performance objectives.

### **Environmental Setting and Impacts**

#### ***Impacts Analyzed in Previous 1998 Project MND***

The 1998 MND analyzed the impacts of continued operation of seven oil production facilities operated by SHP (CUP Sites No. 1-7) with no proposed change to the physical site boundaries or type of operations, with the exception of a new natural gas processing facility at CUP Site No.2 (current proposed project site). The new natural gas processing plant included a vapor recovery system, natural gas dehydration system, and production of NGL and fuel gas.

The changes from the 1998 project compared to the proposed project are: 1) modification of the existing vapor recovery system (additional compression capacity); 2) modification of the existing natural gas dehydration system (upgrade of propane refrigeration and glycol dehydration equipment); 3) addition of a new CO<sub>2</sub> filtration system to produce gas that meets City of Long Beach specifications; and, 4) delivery of pipeline quality sales gas to the local gas distribution system. Further, the plant was modified in 2008 by adding compression capacity at the plant

inlet; such improvements are part of the current baseline conditions and are not analyzed in this Final Subsequent MND. As applicable, any existing terms, conditions, or requirements previously imposed by the City of Signal Hill in their former determinations for the gas processing plant will remain in effect during construction and operation of the proposed project (if not already in place) in order to further avoid and/or reduce potential effects of the proposed project on public services.

The 1998 MND did not identify any potentially significant adverse impacts for any of the public services checklist items.

	<b>Potentially Significant Impact</b>	<b>Less Than Significant With Mitigation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
<p>Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services:</p> <p>a) Fire protection?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**XV.a).** The SHWU Facility will continue to be served by the City of Signal Hill Fire Department, primarily from Los Angeles County Fire Department (Signal Hill) Station No. 60, located at 2300 E. 27<sup>th</sup> Street, approximately 0.7 miles to the northwest of the proposed project site. The station currently serves the existing facilities. The proposed project will not increase the requirements or need for additional or altered fire protection services as the modifications proposed are not expected to generate significant adverse hazards, including risks of fires or explosions, in part because the proposed project would not use or generate new hazardous materials onsite that would require fire department services in the event of an accidental release. No new fire hazards are anticipated, and therefore, no significant adverse impacts to fire protection services will occur.

	<b>Potentially Significant Impact</b>	<b>Less Than Significant With Mitigation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services:				
b) Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**XV.b).** The City of Signal Hill Police Department is the responding agency for law enforcement needs at the SHWU Facility. A pass-coded security gate is presently at the facility, so there is no need to have a security guard onsite, as the entrance to the site is controlled. Therefore, no impacts to the local police department services are expected from the proposed project during construction or operation. Additionally, all modifications will occur within the confines of the existing boundaries of the SHWU Facility, with no additional workers required for operation of the proposed facility improvements. No components of the proposed project are expected to increase the need for police protection services, as new or modified equipment and operational procedures are generally anticipated to be similar to those occurring under existing conditions. No significant impacts with regard to police protection services will occur.

	<b>Potentially Significant Impact</b>	<b>Less Than Significant With Mitigation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services:				
c) Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**XV.c), .d), and .e).** The proposed project will involve modifications at the existing SHWU Facility, currently in operation. The local workforce in southern California is expected to fill the short-term construction positions required for the proposed project, and no increase in the number of permanent workers is expected at the SHWU Facility as the result of project implementation. The proposed project will not result in an increase in the local population that could cause adverse physical impacts or adversely affect service ratios. Therefore, the proposed project is not expected to generate significant adverse impacts to schools, parks, or other public facilities within the Signal Hill or Long Beach communities.

### **Mitigation Measures**

Based on the above information relative to impacts on public services, no significant adverse impacts were identified. Therefore, no mitigation measures are required for the construction or operation of the proposed project.

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## **XVI. RECREATION**

### **Significance Criteria**

The impacts to recreation will be considered significant if:

- The proposed project results in an increased demand for neighborhood or regional parks or other recreational facilities.
- The proposed project adversely affects existing recreational opportunities.

### **Environmental Setting and Impacts**

#### ***Impacts Analyzed in Previous 1998 Project MND***

The 1998 MND analyzed the impacts of continued operation of seven oil production facilities operated by SHP (CUP Sites No. 1-7) with no proposed change to the physical site boundaries or type of operations, with the exception of a new natural gas processing facility at CUP Site No.2 (current proposed project site). The new natural gas processing plant included a vapor recovery system, natural gas dehydration system, and production of NGL and fuel gas.

The changes from the 1998 project compared to the proposed project are: 1) modification of the existing vapor recovery system (additional compression capacity); 2) modification of the existing natural gas dehydration system (upgrade of propane refrigeration and glycol dehydration equipment); 3) addition of a new CO<sub>2</sub> filtration system to produce gas that meets City of Long Beach specifications; and, 4) delivery of pipeline quality sales gas to the local gas distribution system. Further, the plant was modified in 2008 by adding compression capacity at the plant inlet; such improvements are part of the current baseline conditions and are not analyzed in this Final Subsequent MND. As applicable, any existing terms, conditions, or requirements previously imposed by the City of Signal Hill in their former determinations for the gas processing plant will remain in effect during construction and operation of the proposed project

(if not already in place) in order to further avoid and/or reduce potential effects of the proposed project with regard to recreation.

The 1998 MND did not identify any potentially significant adverse impacts for any of the recreation checklist items.

	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**XVI.a) and .b).** As indicated in Section XIV, Population and Housing, the existing labor pool in southern California is sufficient to fulfill the labor requirements for the construction of the proposed project. Operation of the facilities affected by the proposed project will not require any additional permanent workers onsite following installation. Therefore, there will be no changes in population densities as the result of project implementation. No substantial increase in the use or degradation of existing neighborhood and regional parks or other recreational facilities is expected with the proposed modifications to the existing gas processing plant.

The proposed project does not include recreational facilities or require the construction or expansion of existing recreational facilities. No significant adverse impacts to recreational facilities will occur.

### Mitigation Measures

Based on the above information relative to impacts on public services, no significant adverse impacts were identified. Therefore, no mitigation measures are required for the construction or operation of the proposed project.

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## XVII. TRANSPORTATION / TRAFFIC

### Significance Criteria

The impacts on transportation and traffic will be considered significant if any of the following criteria apply:

- Peak period levels on major arterials are disrupted to a point where the level of service (LOS) is reduced to D, E, or F for more than one month.
- An intersection's volume to capacity ratio increases by 0.02 (two percent) or more when the LOS is already at D, E, or F.
- A major roadway is closed to all through traffic, and no alternate route is available.
- The project conflicts with applicable policies, plans, or programs establishing measures of effectiveness, thereby decreasing the performance or safety of any mode of transportation.
- There is an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system.
- The demand for parking facilities is substantially increased.
- Water borne, rail car or air traffic is substantially altered.
- Traffic hazards to motor vehicles, bicyclists, or pedestrians are substantially increased.
- The need for more than 350 employees.
- An increase in heavy-duty transport truck traffic to and/or from the facility by more than 350 truck round trips per day.
- Increase customer traffic by more than 700 visits per day.

## **Environmental Setting and Impacts**

### ***Impacts Analyzed in Previous 1998 Project MND***

The 1998 MND analyzed the impacts of continued operation of seven oil production facilities operated by SHP (CUP Sites No. 1-7) with no proposed change to the physical site boundaries or type of operations, with the exception of a new natural gas processing facility at CUP Site No.2 (current proposed project site). The new natural gas processing plant included a vapor recovery system, natural gas dehydration system, and production of NGL and fuel gas.

The changes from the 1998 project compared to the proposed project are: 1) modification of the existing vapor recovery system (additional compression capacity); 2) modification of the existing natural gas dehydration system (upgrade of propane refrigeration and glycol dehydration equipment); 3) addition of a new CO<sub>2</sub> filtration system to produce gas that meets City of Long Beach specifications; and, 4) delivery of pipeline quality sales gas to the local gas distribution system. Further, the plant was modified in 2008 by adding compression capacity at the plant inlet; such improvements are part of the current baseline conditions and are not analyzed in this Final Subsequent MND. As applicable, any existing terms, conditions, or requirements previously imposed by the City of Signal Hill in their former determinations for the gas processing plant will remain in effect during construction and operation of the proposed project (if not already in place) in order to further avoid and/or reduce potential effects of the proposed project with regard to transportation/traffic.

The 1998 MND did not identify any potentially significant adverse impacts for any of the transportation and traffic checklist items.

Additionally, the Conditions of Approval for the City’s extension of CUP 97-03 to December 31, 2014 included Condition 11.c), which requires that the operator 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 16.20.050, entitled “Off-Street Parking.”

These existing regulations and conditions are currently applicable to the SHWU Facility and will also continue to apply during construction and operation of the proposed project, as appropriate. The City of Signal Hill is responsible for enforcement of such requirements.

	<b>Potentially Significant Impact</b>	<b>Less Than Significant With Mitigation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
Would the project:				
a) Conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**XVII.a) and b).** Operation of the proposed project will not require any new permanent employees, and therefore, no additional commuter or maintenance trips will occur as compared to existing conditions. Vehicle trips for maintenance purposes will also not increase substantially with the proposed modifications. Thus, the project will not adversely affect the existing LOS at nearby intersections or roadways, or result in conflict with any congestion management plans or applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system.

Construction of the modifications proposed with the project will require a limited number of construction workers on any given day; refer to [Table III-2](#) for anticipated construction requirements. Additionally, the project would generate a limited number of trips required to haul

any existing equipment that is removed onsite to an approved offsite location for proper disposal. It is estimated that implementation of the proposed improvements will result in a limited number of vehicle trips per day during construction, including vehicle trips generated by workers travelling to and from the site on a daily basis for purposes of work; however, this scenario is conservative. Sufficient parking for these workers is readily available onsite, and availability of such onsite parking was conditioned with prior approval of CUP 97-03 for CUP Sites No. 1-7, as described above.

Would the project:	<b>Potentially Significant Impact</b>	<b>Less Than Significant With Mitigation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**XVII.c).** The proposed project includes modifications to the existing gas plant facilities. The proposed project would not involve the delivery of materials via air, so no change or increase in air traffic is expected.

Would the project:	<b>Potentially Significant Impact</b>	<b>Less Than Significant With Mitigation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
d) Substantially increase hazards due to a design feature (e.g. sharp curves or dangerous intersections) or incompatible uses (e.g. farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**XVII.d).** The proposed project does not involve construction of roads or use of incompatible equipment on roads (e.g., farm equipment). Therefore, no increased hazards due to a design feature or incompatible use is expected.

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
e) Result in inadequate emergency access or access?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**XVII.e).** The proposed modifications will occur within the boundaries of the existing SHWU Facility, at the location of the existing gas processing plant. Although a minor increase in local traffic due to equipment and workers going to and from the site will occur, such effects are not expected to result in inadequate emergency access at or adjacent to the SHWU Facility because the exits and entrances to the site will remain unchanged and the existing emergency access gates to the SHWU Facility will be maintained. Therefore, the project will not result in inadequate emergency access or access, and no impacts will occur.

Parking for the proposed project construction workers will be provided within the confines of the existing boundaries of the SHWU Facility or on adjacent streets. As a limited number of construction workers is expected to be required to modify the existing equipment, sufficient parking will be available. No new workers are required for operation of the facilities as modified by the proposed project, and therefore, no additional parking will be necessary. Therefore, the proposed project will not result in a significant impact with regard to parking.

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such features?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**XVII.f).** The proposed project will be constructed within the confines of the existing SHWU Facility and is not expected to conflict with adopted policies, plans, or programs supporting alternative transportation modes (e.g., bus turnouts, bicycle racks). Therefore, no impacts will occur.

### Mitigation Measures

Based on the above information relative to impacts on traffic and transportation, no significant adverse impacts were identified. Therefore, no mitigation measures are required for the construction or operation of the proposed project.

**XVIII. UTILITIES AND SERVICES**

**Significance Criteria**

The impacts on solid and hazardous waste will be considered significant if the following occur:

- The generation and disposal of hazardous and non-hazardous waste exceeds the capacity of designated landfills.

**Environmental Setting and Impacts**

***Impacts Analyzed in Previous 1998 Project MND***

The 1998 MND analyzed the impacts of continued operation of seven oil production facilities operated by SHP (CUP Sites No. 1-7) with no proposed change to the physical site boundaries or type of operations, with the exception of a new natural gas processing facility at CUP Site No.2 (current proposed project site). The new natural gas processing plant included a vapor recovery system, natural gas dehydration system, and production of NGL and fuel gas.

The changes from the 1998 project compared to the proposed project are: 1) modification of the existing vapor recovery system (additional compression capacity); 2) modification of the existing natural gas dehydration system (upgrade of propane refrigeration and glycol dehydration equipment); 3) addition of a new CO<sub>2</sub> filtration system to produce gas that meets City of Long Beach specifications; and, 4) delivery of pipeline quality sales gas to the local gas distribution system. Further, the plant was modified in 2008 by adding compression capacity at the plant inlet; such improvements are part of the current baseline conditions and are not analyzed in this Final Subsequent MND. As applicable, any existing terms, conditions, or requirements previously imposed by the City of Signal Hill in their former determinations for the gas processing plant will remain in effect during construction and operation of the proposed project (if not already in place) in order to further avoid and/or reduce potential effects of the proposed project on utilities and services.

The 1998 MND did not identify any potentially significant adverse impacts for any of the utilities and services checklist items.

	<b>Potentially Significant Impact</b>	<b>Less Than Significant With Mitigation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
Would the project:				
a) Exceed wastewater treatment requirements of applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Require or result in the construction of new water or wastewater treatment facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**XVIII.a). to e).** The proposed project will result in modifications to the existing onsite gas processing plant to improve reliability and efficiency of operations and to enable SHP to ultimately treat and deliver pipeline quality gas to the local gas distribution system that meets the required specifications of the City of Long Beach. No improvements are proposed that would adversely affect current operating conditions with regard to demand for public wastewater or water treatment services or facilities or water supplies will occur with the proposed modifications. No impacts will occur, and no mitigation measures are required.

	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
Would the project:				
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
g) Comply with federal, state, and local statutes and regulations related to solid and hazardous waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**XVIII.f). and .g).** The removal of existing equipment onsite during the construction phase will generate a limited amount of waste materials such as asphalt, structural steel, copper, and/or stainless steel. Metals with economic value will be routed to authorized recyclers for recovery and reuse (i.e., sold as valuable scrap) or sold for spare part recovery, as appropriate.

The disposal of construction-related waste could contribute to the diminishing available landfill capacity; however, sufficient landfill capacity currently exists in the Signal Hill area to handle disposal of the minimal amount of construction waste that will be generated by the proposed improvements. Any solid waste produced (i.e. packaging) will be taken to a local facility operated by EDCO Disposal.

Clean soil excavated to provide new foundations will be reused onsite as backfill where possible. Any excess soils will be diverted to the existing market as clean reusable soil. All soil excavation work, especially any contaminated soil related to either the proposed project or related to other onsite maintenance work, is managed under SHP's Soil Mitigation Plan required by SCAQMD Rule 1166. The 1166 AQMD permit applies to various locations within SHP's oil field. All soils excavated as part of the proposed project will be monitored under the conditions required by the *Various Locations Rule 1166 Contaminated Soil Mitigation Plan*. This Mitigation Plan was approved by the AQMD and is actively renewed on an annual basis. The permit allows for the removal of a total of 2,000 cubic yards (c.y.) of soil. As shown in [Figure 4A, Project Surface Disturbance](#), approximately 24 c.y. of soil will be excavated and removed with the proposed project, well under the City of Signal Hill's requirement for a grading permit and well within the 2,000 c.y. standard. Any contaminated soils will be isolated, stockpiled, and taken to the Coleman Stockpile Facility located near California Avenue and Spring Street and eventually transported to a Waste Management Thermal Remediation Solutions facility for disposal. Soils determined to be non-hazardous will be transported to SHP's soil stockpile for reuse in the field. This facility is located adjacent to Drill Site #2 at Walnut Avenue and Willow Street in the City of Signal Hill. The asphaltic concrete (a.c.) paving removed from the site (approximately 30 c.y.) will be taken to the Blue Diamond Recycling Facility located at California Avenue and Spring Street in Signal Hill. As such, construction impacts of the proposed project on waste treatment and disposal facilities are expected to be less than significant. During operation, the proposed project is expected to generate only small volumes of solid waste, primarily from administrative or office activities, e.g., waste paper. The proposed project will not result in an increase in the number of permanent employees at the SHWU Facility, so no other types of substantial increase in solid waste is expected. Consequently, the proposed project is not expected to generate significant adverse non-hazardous waste impacts.

The existing site operations do not generate or require disposal of a substantial amount of hazardous wastes or soils. Operation of the new equipment installed with the proposed project will not use or generate new hazardous materials onsite. Any excavated soils determined to be contaminated during demolition or excavation activities would be documented, containerized, properly manifested, and shipped to proper treatment and disposal in compliance with applicable local, State, and/or federal laws pertaining to hazardous materials. Any amount of spent lubrication oils from maintenance activities will be collected and recycled, as appropriate, and therefore, such materials are considered to be a recycled material and not a waste. Therefore, no significant hazardous waste impacts will occur.

### Mitigation Measures

Based on the above information relative to impacts on utilities and services, no significant adverse impacts were identified. Therefore, no mitigation measures are required for the construction or operation of the proposed project.

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## XIX. MANDATORY FINDINGS OF SIGNIFICANCE

	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
Would the project:				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**XIX.a).** The 1998 MND analyzed the impacts of continued operation of seven oil production facilities operated by SHP (CUP Sites No. 1-7) with no proposed change to the physical site boundaries or type of operations, with the exception of a new natural gas processing facility at CUP Site No.2 (current proposed project site). The new natural gas processing plant included a vapor recovery system, natural gas dehydration system, and production of NGL and fuel gas.

The changes from the 1998 project compared to the proposed project are: 1) modification of the existing vapor recovery system (additional compression capacity); 2) modification of the existing natural gas dehydration system (upgrade of propane refrigeration and glycol dehydration equipment); 3) addition of a new CO<sub>2</sub> filtration system to produce gas that meets City of Long Beach specifications; and, 4) delivery of pipeline quality sales gas to the local gas distribution system. Further, the plant was modified in 2008 by adding compression capacity at the plant inlet; such improvements are part of the current baseline conditions and are not analyzed in this Final Subsequent MND. As applicable, any existing terms, conditions, or requirements previously imposed by the City of Signal Hill in their former determinations for the gas processing plant will remain in effect during construction and operation of the proposed project (if not already in place) in order to further avoid and/or reduce potential effects of the proposed project.

The proposed project does not have the potential to adversely affect the environment, reduce or eliminate any plant or animal species, or destroy prehistoric records of the past. The proposed project would occur in an existing industrial facility that has been previously disturbed, graded,

and developed and, therefore, does not support any habitat of fish or wildlife species. Further, the proposed project site is in an area that is generally developed with land uses comprised of commercial and industrial uses. The proposed project will not extend into environmentally sensitive areas, but will remain within the confines of an existing, operating facility. For additional information, see Section IV, Biological Resources and Section V, Cultural Resources.

	<b>Potentially Significant Impact</b>	<b>Less Than Significant With Mitigation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
Would the project:				
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, other current projects, and probable future projects)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**XIX.b).** As the Lead Agency under CEQA, the SCAQMD uses the same significance thresholds for project-specific and cumulative impacts for all environmental topics analyzed. Projects that exceed the project-specific significance thresholds are considered by the SCAQMD to be cumulatively considerable; conversely, projects that do not exceed the project-specific thresholds are generally not considered to be cumulatively significant.”<sup>24</sup>

With respect to aesthetics, no cumulative impacts are expected, as all project components will be visually similar in nature to the existing industrial-type equipment located within the confines of the existing SHWU Facility, which is surrounded by a perimeter wall. Additionally, mitigation is proposed to require landscaping which will enhance the visual setting and reduce views into the site from offsite public vantage points. Therefore, no significant change in visual characteristics is expected at the project site, and no cumulative aesthetic impacts are expected.

With respect to air quality, no cumulative impacts are anticipated. The proposed project will increase the efficiency of the onsite equipment, and a substantial change in operations will not occur with the proposed modifications. Emissions resulting with implementation of the proposed project will be below the SCAQMD’s thresholds for all criteria air pollutants. Although the project will contribute additional air pollutants to an existing nonattainment area, these increases are below the SCAQMD air quality significance criteria. Therefore, the proposed project will not

<sup>24</sup> SCAQMD Cumulative Impacts Working Group White Paper on Potential Control Strategies to Address Cumulative Impacts From Air Pollution, August 2003, Appendix D, Cumulative Impact Analysis Requirements Pursuant to CEQA, at D-3. <http://www.aqmd.gov/hb/2003/030929a.html>

cause a significant environmental effect, nor result in an unavoidable cumulatively considerable contribution to an air quality impact.<sup>25</sup>

With respect to geology, no cumulative geology impacts are expected because all of the structures associated with the proposed project will be built in conformance with the UBC. Therefore, no significant change in impacts to geology is expected at the project site, and no cumulative geology impacts will occur.

Emissions relative to GHG from the proposed project will be below the SCAQMD's cumulatively considerable significance threshold for GHGs. No significant adverse impacts are expected, either individually or cumulatively.

With respect to hazards, no cumulative hazard impacts are expected because no new hazardous materials will be used at the site. The amount of hazardous materials generated is not expected to increase and any materials will continue to be handled according to all regulations. Therefore, no significant increase in hazards is expected at the project site, and no cumulative hazard or hazardous materials impacts are expected.

With respect to hydrology, no cumulative impacts are expected because the proposed project does not require the use of additional water at the facility or increase the amount of runoff. The proposed project will not have any impact on either water quantity or water quality. Therefore, no significant impacts to hydrology and water quality are expected at the project site, and no cumulative hydrology and water quality impacts are expected.

With respect to noise, no cumulative impacts are expected because the proposed project will not cause a significant increase in noise during construction or operation. Construction activities will generate noise onsite, but the impacts will be reduced to below significance outside the facility's boundaries. The operation of the proposed project is not expected to generate significant levels of noise. In addition, all applicable conditions imposed by the City of Signal Hill associated with extension of the CUP (97-03) will remain in effect for the proposed project, as appropriate. Therefore, no significant impacts to noise are expected at the SHWU Facility, and no cumulative noise impacts are expected.

With respect to traffic, no cumulative impacts are expected because the proposed project will not cause a significant increase in the vehicle trips during construction or operation. Construction activities will generate a limited number of trips on the peak traffic day, whereas operation will not result in any additional trips. This small number of truck trips will not cause a significant impact to the capacity of nearby intersections. Therefore, no significant impacts to traffic are expected at the project site, and no cumulative noise impacts are expected.

Consistent with CEQA Guidelines §15064.7, a “lead agency may rely on a threshold of significance standard to determine whether a project will cause a significant environmental effect.” Further, CEQA Guidelines §15064(h)(1) requires that a “lead agency consider whether the cumulative impact is significant and whether the effects of the project are cumulatively

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<sup>25</sup> Refer also to *Citizens for Responsible Equitable Environmental Development v. City of Chula Vista* (2011) 197 Cal. App. 4<sup>th</sup> 327, 334 and *Rialto Citizens for Responsible Growth v. City of Rialto* (2102) 208 Cal. App. 4<sup>th</sup> 899 pertaining to the determination of significant impacts and whether a project is considered to be cumulatively considerable.

considerable.” Where a lead agency is examining a project with an incremental effect that is not cumulatively considerable, a lead agency need not consider the effect significant, but must briefly describe the basis for concluding that the incremental effect is not cumulatively considerable. As stated above, projects that exceed the project-specific significance thresholds are considered by the SCAQMD to be cumulatively considerable; projects that do not exceed the project-specific significance thresholds are not considered to be cumulatively considerable. Therefore the proposed project’s contribution to air quality, aesthetics, geology/soils, hazards, and noise are not cumulatively considerable, and thus not significant. This conclusion is consistent with CEQA Guidelines §15064(h)(4), which states, “The mere existence of cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed project’s incremental effects are cumulatively considerable.”

	<b>Potentially Significant Impact</b>	<b>Less Than Significant With Mitigation</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
Would the project:				
c) Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**XIX.c).** All existing terms, conditions, or requirements previously imposed by the City of Signal Hill in their former determinations for the gas processing plant will remain in effect during construction and operation of the proposed project in order to further avoid and/or reduce potential effects of the proposed project. The proposed project will not significantly increase criteria pollutant emissions as compared to existing conditions, and all emissions will remain below the SCAQMD’s operational significance thresholds. Further, health impacts relative to the proposed project are less than all SCAQMD significance thresholds; refer to Section III, Air Quality. As a result, the proposed project is not expected to significantly increase the potential impacts due to air quality, health risk, hazards and hazardous materials, or other impacts related to human health. Therefore, no significant health impacts or other adverse impacts to humans are expected due to the operation of the proposed project.

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## ACRONYMS

ABBREVIATION	DESCRIPTION
°F	Degrees Fahrenheit
AB	Assembly bill
AB 32	Assembly bill 32: California’s Global Warming Solutions Act of 2006
AHM	acutely hazardous material
AQMP	Air Quality Management Plan
Basin	South Coast Air Basin
BACT	Best Available Control Technology
BFW	Base of Freshwater
Bgs	below ground surface
BMP	Best Management Practice
CAAQS	California Ambient Air Quality Standards
CalARP	California Accidental Release Program
CalEEMod™	California Emissions Model™
CARB	California Air Resources Board
CEQA	California Environmental Quality Act
CFC	chlorofluorocarbon
CFR	Code of Federal Regulations
CH <sub>4</sub>	Methane
CO	Carbon monoxide
CO <sub>2</sub>	Carbon dioxide
CO <sub>2</sub> eq	CO <sub>2</sub> equivalent
CPUC	California Public Utilities Commission
CUP	Conditional Use Permit
CUPA	California Uniform Program Agency
dba	A-weighted noise level measurement in decibels
DOG	Division of Oil and Gas
DOGGR	Department of Oil, Gas, and Geothermal Resources
DOT	Department of Transportation
DPM	Diesel particulate matter
DTSC	(California) Department of Toxic Substances Control
EPA	U.S. Environmental Protection Agency
ERPG	Emergency Response Planning Guideline
FEMA	Federal Emergency Management Agency
Gal	gallons
GHG	greenhouse gas
GI	General Industrial
GMC	Growth Management Chapter
GWP	Global Warming Potential
H <sub>2</sub> O	water vapor
H <sub>2</sub> SO <sub>4</sub>	hydrogen sulfate
HCFC	hydrochlorofluorocarbon
HFC	hydrofluorocarbon
HIA	Acute Hazard Index
HIC	Chronic Hazard Index
HRA	Health Risk Assessment

IRP	Integrated Resource Plan
IS	Initial Study
ISCST3	Industrial Source Complex Model Short Term Version 3
LADWP	Los Angeles Department of Water and Power
lbs	pounds
lbs/hr	pounds per hour
LCFS	Low Carbon Fuel Standard
LOS	Level of Service
LST	Localized Significance Threshold
LTS	(existing natural gas dehydration system)
MCL	Maximum Contaminant Level
MEIR	Maximum exposed individual resident
MEIW	Maximum exposed individual worker
mi	miles
MICR	Maximum individual cancer risk
mm/yr	millimeters per year
MMscf	Million Standard Cubic Feet
MND	Mitigated Negative Declaration
MT	metric ton
N <sub>2</sub> O	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards
NGL	Natural Gas Liquid
NIOSH	National Institute of Occupational Safety and Health
NO <sub>x</sub>	nitrogen oxide
NO <sub>2</sub>	nitrogen dioxide
NPDES	National Pollutant Discharge Elimination System
O <sub>3</sub>	ozone
OEHHA	Office of Environmental Health Hazard Assessment
OSHA	Occupational Safety and Health Administration
PFC	perfluorocarbon
PM	particulate matter
PM <sub>2.5</sub>	particulate matter less than 2.5 microns in diameter, fine particulates
PM <sub>10</sub>	particulate matter less than 10 microns in diameter
PPE	Personal Protective Equipment
ppm	parts per million
psig	pounds per square inch gauge
PSM	Process Safety Management
PTE	(need definition – air quality section)
RCPG	Regional Comprehensive Plan and Guide
RECLAIM	REgional CLean Air Incentives Market Program
RMP	Risk Management Program
RPS	Renewables Portfolio Standard
RWQCB	Regional Water Quality Control Board
s.f.	Square Foot
SB	Senate bill
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SF <sub>6</sub>	sulfur hexafluoride

SHP	Signal Hill Petroleum, Inc.
SHWU	Signal Hill West Unit
SMND	Subsequent Mitigated Negative Declaration
SNMP	Salt and Nutrient Management Plan
SO <sub>x</sub>	sulfur oxide
SO <sub>2</sub>	sulfur dioxide
SPCC Plan	Spill Prevention, Control, and Countermeasure Plan
SUSMP	Standard Urban Stormwater Mitigation Plan
SWPPP	Stormwater Pollution Prevention Plan
TAC	toxic air contaminant
TDS	Total Dissolved Solids
UBC	Uniform Building Code
ug/m <sup>3</sup>	micrograms per cubic meter
US DOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VOC	volatile organic compounds
WRD	Water Replenishment District of Southern California

## GLOSSARY

TERM	DEFINITION
Ambient Noise	The background sound of an environment in relation to which all additional sounds are heard.
dBA	The decibel (dB) is one tenth of a <i>bel</i> where one bel represents a difference in noise level between two intensities $I_1$ , $I_0$ where one is ten times greater than the other. (A) indicates the measurement is weighted to the human ear.
Natural Gas	A mixture of hydrocarbon gases that occurs with petroleum deposits, principally methane together with varying quantities of ethane, propane, butane, and other gases.
Seiche	A vibration of the surface of a lake or landlocked sea that varies in period from a few minutes to several hours and which may change in intensity.
Water Flood	The use of wells to re-inject fluid (primarily water with minor concentrations of additives) into the oil/gas reservoir to re-pressurize the sandstone and flush oil into recovery (extraction) wells.

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## APPENDICES

to the Draft Subsequent Mitigated Negative Declaration for:

Signal Hill Petroleum, Inc.; Signal Hill West Unit (SHWU)

Gas Plant Modification Project

SCAQMD ID 101977

February 2015

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**Appendix A**  
**Draft Initial Study/Mitigated**  
**Negative Declaration**  
(adopted June 16, 1998  
City of Signal Hill  
Resolution 98-06-4831)



***DRAFT***  
**INITIAL STUDY/NEGATIVE DECLARATION**

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**SIGNAL HILL PETROLEUM  
CONDITIONAL USE PERMIT (SITE NOS. 1 - 7)**

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**Lead Agency:**

**City of Signal Hill**

**Prepared By:**



**September 18, 1997**

JN 33973

***DRAFT***  
**INITIAL STUDY/NEGATIVE DECLARATION**

**SIGNAL HILL PETROLEUM  
CONDITIONAL USE PERMIT (SITE NOS. 1 - 7)**

Lead Agency:

**CITY OF SIGNAL HILL**  
**Community Development & Services Department**  
2175 Cherry Avenue  
Signal Hill, California 90806  
Contact: Mr. Gary Jones, Director  
(562) 989-7345

Consultant:

**ROBERT BEIN, WILLIAM FROST & ASSOCIATES**  
14725 Alton Parkway  
Irvine, CA 92718  
Contact: Mr. Kevin Thomas, Environmental Services Manager  
(714) 855-3659

September 18, 1997

JN 33973

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**APPENDIX**

- A. Notice of Intent to Adopt and Distribution List
- B. CUP Site Plans

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## ABSTRACT

**PROJECT:** The proposed Signal Hill Petroleum Conditional Use Permit project would allow for the issuance of a single Conditional Use Permit (CUP) for the continued operation of seven oil production facilities operated by Signal Hill Petroleum, Inc. The CUP will permit continued operation of the seven sites with no proposed change in the physical site boundaries or the type of operations, with the exception of a new natural gas processing facility at Site No. 2 (which is a proposed modernized 7,000 square foot facility to replace an existing 200,000 square foot facility built in the 1920s). Activities at the CUP sites involve a variety of petroleum-related operations (all of which are presently occurring on these CUP sites or immediately adjacent sites). CUP site activities primarily consist of continued operation of production and drilling facilities, as well as gathering sites for oil, gas and water production and distribution sites for water injection, in connection with the Signal Hill West, Central, and East Units of the Long Beach Oil Field. These sites have active oil, gas and water injection wells, are designed for consolidated well drilling activities, and provide material storage for daily operations (refer to Table 1-1, Summary of CUP Sites). These sites are currently operating under CUPs that were originally issued in the early/mid 1970s.

Site No. 2 - Natural Gas Processing Facility. The project also proposes the construction and operation of a 7,000 square foot (sf) natural gas processing facility to be entirely located within the boundaries of CUP Site No. 2. The new facility would replace an existing approximately 200,000 sf facility, which was constructed in the early 1920s, and is located across Orange Avenue from Site No. 2 in the City of Long Beach (demolition of this facility is not addressed in this Negative Declaration, as it is not a requirement for the new facility, and existing facility demolition will require separate approvals from the City of Long Beach). (Signal Hill Petroleum has already secured permits from the City of Long Beach Fire Department and the South Coast Air Quality Management District for the new facility, which will have substantially reduced impacts relative to air quality, noise, safety, vibration and aesthetics.)

**APPLICANT:** Signal Hill Petroleum, Inc., 2901 Orange Avenue, Long Beach, California 90807.  
Mr. Thomas S. Turner, Senior Engineer  
(562) 595-6440

**LOCATION:** The proposed CUP Site Nos. 1-7 are situated throughout the City of Signal Hill within the Long Beach Oil Field, adjacent to areas designated for industrial, commercial and residential uses. The Long Beach Oil field encompasses all of the City of Signal Hill and nearby areas of Long Beach to the northwest and southeast of the City (see Exhibit 2, Site Vicinity Map). The City of Signal Hill is completely surrounded by Long Beach and is regionally accessible by Interstate 405 which crosses the northern part of the City.

**APN:** Various

**CITY STAFF:** Mr. Gary Jones, AICP  
Director of Community Development & Services  
(562) 989-7345



## 1.1 PURPOSE

Implementation of the proposed Signal Hill Petroleum Conditional Use Permit project has been determined by the City of Signal Hill to be a “project” under the California Environmental Quality Act (CEQA) and, therefore, is subject to environmental review under the State CEQA Guidelines and City of Signal Hill environmental review procedures. The project consists of the issuance of a single Conditional Use Permit (CUP) for seven oil production-related facilities operated by Signal Hill Petroleum, Inc. The proposed project is described in detail in Section 2.0, Project Description.

The intent of this Mitigated Negative Declaration is to provide the general public, City decision-makers and other interested parties with a full disclosure of the potential environmental impacts of the project, as well as identification of recommended mitigation measures. The City Planning Commission, City Council and other Responsible Agencies will use this Initial Study/Negative Declaration as part of the project review process. The Negative Declaration is intended to provide all necessary environmental review required under CEQA for implementation of the seven CUP sites, including ongoing operation and periodic maintenance and/or facility modifications as permitted in the CUP.

## 1.2 CEQA PROCESS

Based on review of the CUP application booklet submitted by Signal Hill Petroleum on July 31, 1997, and several subsequent conversations with the applicant, City staff has determined that all potentially significant impacts associated with the proposed project can be mitigated to less than significant levels, and has recommended adoption of a Mitigated Negative Declaration for this project. The City Council will consider the proposed Negative Declaration and any written comments received during the 21-day public review period, as part of the project review and approval process, prior to making a decision on the project.

### **Public Review Process**

In accordance with CEQA Guidelines Section 15073, a 21-day public review period is provided for Responsible Agencies and interested parties to review and comment on the proposed Negative Declaration, as stated in the Notice of Intent (NOI) to adopt which accompanies this Negative Declaration.

CEQA requires the following minimum public review requirements for a proposed Negative Declaration (see Appendix A, NOI and Distribution List):

- 1) NOI with attached Initial Study/Negative Declaration to be provided to all Responsible Agencies, as well as any Trustee agencies or Federal agencies with authority over resources affected by the project;
- 2) NOI to be posted with the County Clerk;

- 3) NOI with attached Initial Study/Negative Declaration be provided to any agency or other party that has requested such notice on the project;
- 4) NOI with attached Initial Study/Negative Declaration to be available for public review at the Lead Agency's office;
- 5) NOI to be distributed at least by one of the additional following methods:
  - a) Posting the NOI on site and off-site in the project area;
  - b) Direct mailing the NOI to affected owners and occupants of contiguous property; and
  - c) Publication of the NOI in a local newspaper of general circulation.

This project has complied with all of the above minimum public noticing requirements of CEQA, including the following additional notification provided by City staff:

- 1) NOI with attached Initial Study/Negative Declaration available at the City Hall and library;
- 2) NOI mailed to all land-owners within 300 feet of all seven sites, as well as;
- 3) NOI published in the local newspaper.

### 1.3 SUMMARY OF SIGNIFICANT ENVIRONMENTAL EFFECTS

As discussed in Section 4, Discussion of Environmental Evaluation, the proposed Signal Hill Petroleum CUP project is not anticipated to result in any significant environmental impacts, in consideration of the existing environmental regulations governing the sites (particularly the City of Signal Hill's Oil Code), and following implementation of the recommended mitigation measures. As Site Nos. 1 and 3-7 will have no substantive change in operations or facilities, and the proposed new natural gas processing facility at Site No. 2 will result in a substantial reduction in environmental impacts as compared to the existing facility located across Orange Avenue, the primary potentially significant effects identified for the project (prior to mitigation) are as follows:

- 1) Short-term construction-related impacts for construction of a new natural gas processing facility at Site No. 2; and
- 2) Noise, light and glare, and aesthetic effects of ongoing operation of the facilities, although these are adequately regulated by the City's Oil Code.

These issues are addressed in Section 4, Environmental Analysis. Recommended mitigation measures and the associated monitoring requirements are provided in Section 6, Mitigation Measures.

### 1.4 INCORPORATION BY REFERENCE

This Initial Study is based in part on the information and analysis contained in the following documents, which are hereby incorporated by reference in their entirety into this Initial Study, in accordance with CEQA Guidelines Section 15150 (Incorporation by Reference) and Section 15148 (Citation), and are available for review at the City of

Signal Hill Community Development and Services Department, 2175 Cherry Avenue, Signal Hill, California 90806:

Signal Hill General Plan and Associated EIR (1986): This document was drafted to delineate policy and to provide a guide for land use. Signal Hill's official position on development and resource management were expressed in goals, policies, and actions regarding the physical, social, and economic environments, both now and in the long-range future. The Land Use Element (revised 1989), section "Major Centralized Extraction Areas", describes areas where major and centralized oil, gas, and hydrocarbon substances are being extracted or drilled for, including centralized facilities for the maintenance and operation of equipment and structures for drilling and production operations. Four general objectives are included to guide operations. The Environmental Resources Element addresses hydrology, land resources, open space resources and more. The Petroleum Reserves section in land resources discusses relevant information to this project. Basic background data for the City and general information for the project sites, as well as policy measures relevant to the project were used.

Signal Hill Petroleum CUP Application (July 31, 1997): The application is a request by Signal Hill Petroleum, Inc. for a CUP to continue existing oil production activities. Seven CUP sites are described, with information including the intended use, concept, hours of operation, zoning district, property location, legal description, and justification. Exhibits are also included.

Signal Hill Amended Redevelopment Plan EIR (Fourth Amendment, Redevelopment Project Area No. 1, 1987): This plan amendment was prepared in response to changes in the City's General Plan land use categories and land use designations, and to amendments to state redevelopment law. This plan was drafted to bring the Redevelopment Plan Map into conformance with the new General Plan Generalized Land Use Plan and to ensure consistency between the two documents. The amendment serves to control growth and development as outlined in the General Plan Land Use Element. This EIR provides necessary information for review of the discretionary actions required to implement projects.

City of Signal Hill Oil Code: Current City regulations include, but are not limited to, landscaping; weed abatement; fencing; painting; signage; pipelines; pumping units; tanks; redrilling, reworking and servicing of wells; hours and days of operation, bonding requirements and inspections.

Hilltop Specific Plan Final EIR (February 18, 1992): This project was proposed by the City of Signal Hill to provide a Specific Plan to guide the development of the Hilltop area with single-family and multi-family houses. The FEIR addressed compliance with the City's General Plan and Redevelopment Plan, the consolidation or eventual phasing out of oil production activities, the relocation and/or consolidation of production/extraction wells, and antenna relocation and/or consolidation.

Final Environmental Impact Report (FEIR), Fourth Amendment to the Redevelopment Plan for Redevelopment Project Area No. 1 (adopted December 15, 1987): The FEIR analyzed the environmental impacts associated with the Redevelopment Project Area as currently approved by the City, including air quality, noise, land use, population, housing, circulation, public services, utilities, and human health.

Town Center East Specific Plan and FEIR, prepared by Parsons Brinkerhoff: The FEIR for Town Center East was certified July 2, 1991 and build-out was completed in late 1994. The Specific Plan FEIR includes discussion of adjacent oil production activities at CUP site No. 4.

Unit Agreement, Signal Hill Central Unit, Long Beach Field (1971): This agreement was drafted on December 1, 1971 to promote conservation, prevent unreasonable waste and increase the ultimate economic recovery of oil, gas and associated hydrocarbon substances. It was deemed necessary and desirable at the time to provide for the cooperative development and operation as a unit in order to conduct secondary recovery, pressure maintenance and other recovery programs.

Unit Agreement, Signal Hill West Unit, Long Beach Field (1969): This agreement was drafted on April 1, 1969 to promote conservation, prevent unreasonable waste and increase the ultimate economic recovery of oil, gas and associated hydrocarbon substances. It was deemed necessary and desirable at the time to provide for the cooperative development and operation as a unit in order to conduct secondary recovery, pressure maintenance and other recovery programs.

Unit Agreement, Signal Hill East Unit, Long Beach Field (1971): This agreement was drafted on June 1, 1971 to promote conservation, prevent unreasonable waste and increase the ultimate economic recovery of oil, gas and associated hydrocarbon substances. It was deemed necessary and desirable at the time to provide for the cooperative development and operation as a unit in order to conduct secondary recovery, pressure maintenance and other recovery programs.

## 2.1 PROJECT LOCATION

The proposed CUP Site Nos. 1-7 are situated throughout the City of Signal Hill within the Long Beach Oil Field, adjacent to areas designated for industrial, commercial and residential uses. The Long Beach Oil field encompasses all of the City of Signal Hill and nearby areas of Long Beach to the northwest and southeast of the City (see Exhibit 1, Regional Vicinity and Exhibit 2, Site Vicinity Map). The City of Signal Hill is completely surrounded by Long Beach and is regionally accessible by Interstate 405 which crosses the northern part of the City. Detailed CUP site locations can be seen in the CUP Site Plans (contained in Appendix B) and in the CUP site descriptions contained in Table 1, Summary of CUP Sites.

## 2.2 ENVIRONMENTAL SETTING

Each of the seven CUP sites are presently operating as oil production-related sites, which are generally absent of any significant sensitive resources such as native habitat, cultural resources, historic resources or other features (see Exhibit 3, Site Photos). Due to equipment and work area requirements, the CUP sites are generally absent of any substantial landscaping of the interior areas, although perimeter landscaping and/or decorative concrete block walls surround each of the sites. Although these sites are all in areas zoned for oil-related uses and most are adjacent to industrial areas, several of the CUP sites are adjacent to existing or future commercial or residential areas. The CUP Sites are primarily governed by the City's Oil Code and Zoning Ordinance. A detailed discussion of each site's condition is provided in Section 2.5, Project Characteristics.

## 2.3 BACKGROUND AND HISTORY

The City of Signal Hill consists of a mix of industrial, commercial, residential, and oil production/extraction uses. At present, there are approximately 600 active oil wells in the City. These wells include oil and gas production wells in addition to wells related to unitization and water flooding programs. Water flooding is a type of secondary oil recovery operation, involving injecting water or brine into the oil-bearing material to allow more efficient recovery of crude oil. Unitization refers to consolidation of a portion of the Long Beach Oil Field activities into major drilling/processing sites (including the seven CUP sites) and establishment of the West, Central and East units. The following are current conditions associated with oil production/extraction facilities:

### Long Beach Oil Field

The Long Beach Oil Field was discovered in 1921, and over 2,400 wells have since been drilled.<sup>1</sup> The Field currently produces approximately 1.6 million barrels a year, which is 4% of the annual Los Angeles/Orange County production of 40.8 million barrels. Current reserves are estimated at 23.5 million barrels.<sup>2</sup> The City's 1970 Zoning Ordinance allowed oil well drilling in any non-residential area with a CUP. However, wells operating prior to the first zoning ordinance in 1964, some of which were located in residential areas, were exempt from the 1970 requirements.

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<sup>1</sup> Oil Production Activities in Signal Hill - A Policy Direction," page 5 (available at the Signal Hill Community Development and Services Department).

<sup>2</sup> According to Mr. John Jepson, Area Engineer, Division of Oil and Gas, September 28, 1995.

TABLE 1  
SUMMARY OF CUP SITES

CUP <sup>1</sup> SITE #	LOCATION	P.C. <sup>2</sup> RES. #	ORIGINAL <sup>3</sup> APPLICANT	EXPIR. DATE	ACTIVITIES <sup>4,5</sup>
<b>West Unit</b>					
#1	California/Spring 3033 California Ave. 0.72 Gross Acres	225-75	Texaco	5/19/95	North West Drill Site "A" (6 water injection and 3 oil production)
#2	Orange/29th/Spring 1215 E. 29th Street 8.76 Gross Acres	224-75	Texaco	5/19/95	Central Processing Facility/Drill Site "B" (oil, water and gas)
#3	27th/Rose 1.65 Gross Acres	226-75	Texaco	5/19/95	South East Drill Site "D" (10 water injection and 2 oil production)
<b>Central Unit</b>					
#4	NW of Panorama (behind Home Depot) 1.23 Gross Acres	147-71	Shell	4/12/91	North Drill Site (3 water injection and 5 oil production)
#5	Panorama/Temple 2700 Combellack Dr. 7.35 Gross Acres	153-71	Shell	8/9/91	Central Drill Site (2 water injection and 7 oil production) and Central Processing Facility
<b>East Unit</b>					
#6	Redondo/Grant 3365 Grant Street 1.07 Gross Acres	210-73	ARCO	12/11/93	Central Water Plant
#7	3290 Grant Street 0.59 Gross Acres	211-73	ARCO	12/11/93	Drill Site #1 (1 oil production)

<sup>1</sup> "CUP SITE #": These numbers were established solely for use in this Negative Declaration, as shown in Exhibit 2, Vicinity Map.

<sup>2</sup> "P.C. RES#": Planning Commission Resolution approving original CUP.

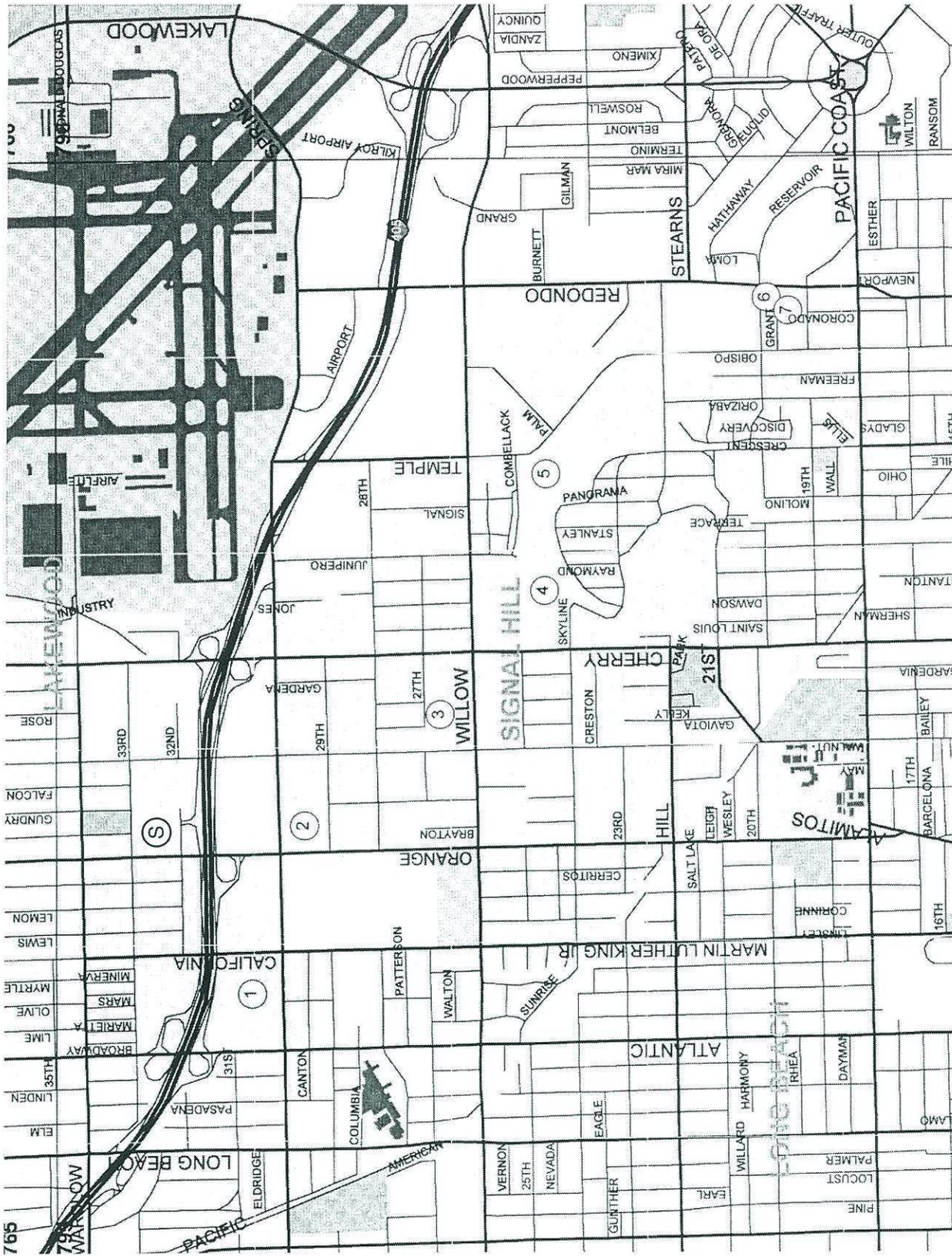
<sup>3</sup> All sites are currently owned and operated by Signal Hill Petroleum. Excludes numerous wells operated by Signal Hill Petroleum that were in operation prior to 1971, as well as all oil wells operated by companies other than SHP.

<sup>4</sup> *Drill Site*: Drill sites typically include water-injection wells and producing wells. The CUP sites serve as gathering locations for oil, gas and water production, distribution sites for water injection, and control centers for the electrical system.

<sup>5</sup> *Central Processing Facility*: This facility serves as the centralized operation point for oil production and water-injection operations. All production (oil, water and gas) from Unit wells are received at the Central Processing Facility where it is separated, treated, and shipped to various purchasers (applies to CUP sites #2, #5 and #6).

Source: Signal Hill Redevelopment Agency, Signal Hill Petroleum



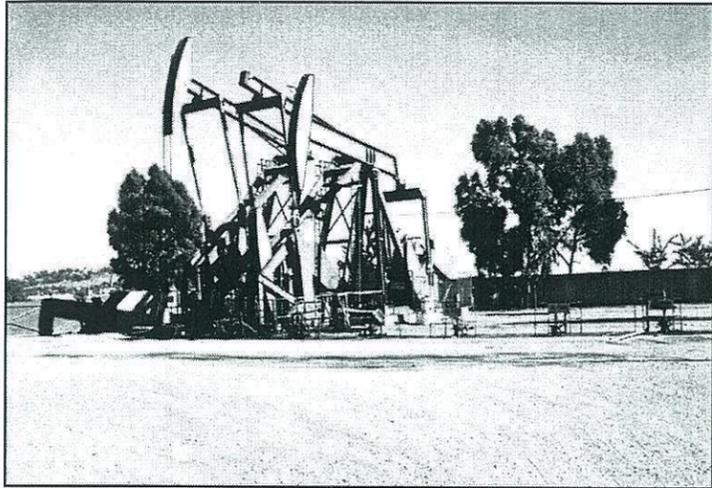


SIGNAL HILL PETROLEUM  
 CONDITIONAL USE PERMIT PROJECT  
**Vicinity Map**

- ① Approximate Location of CUP Sites
- ⑤ School Site within 1/4 Mile of CUP Site

NO SCALE

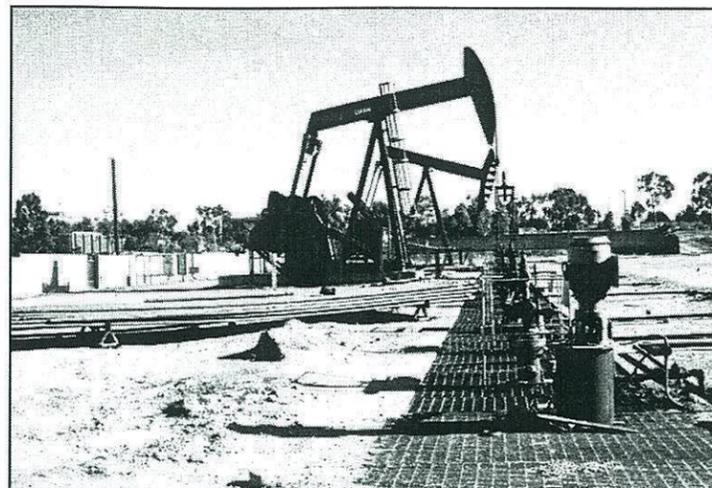




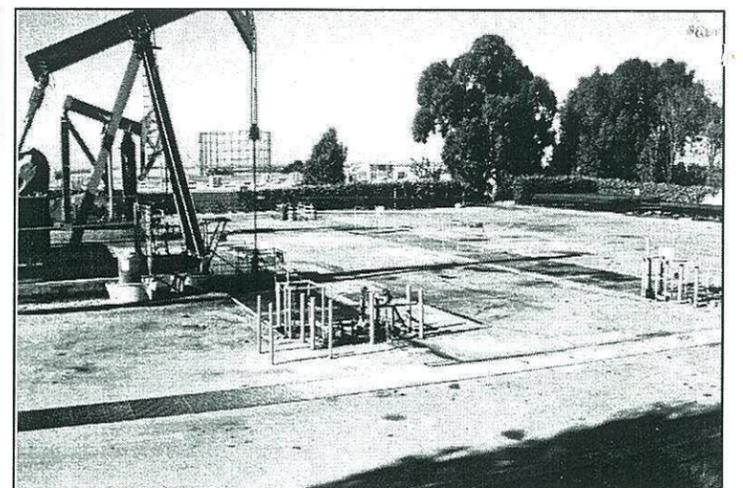
CUP Site No. 1  
"A" Drill Site  
Signal Hill West Unit



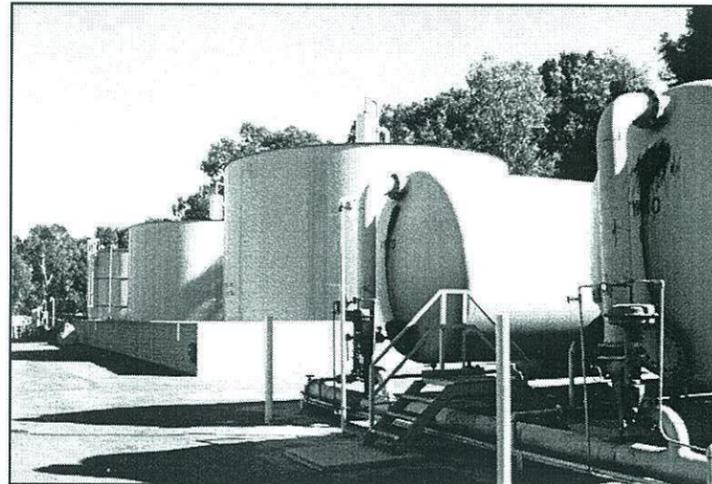
CUP Site No. 2  
"B" Drill Site  
Signal Hill West Unit



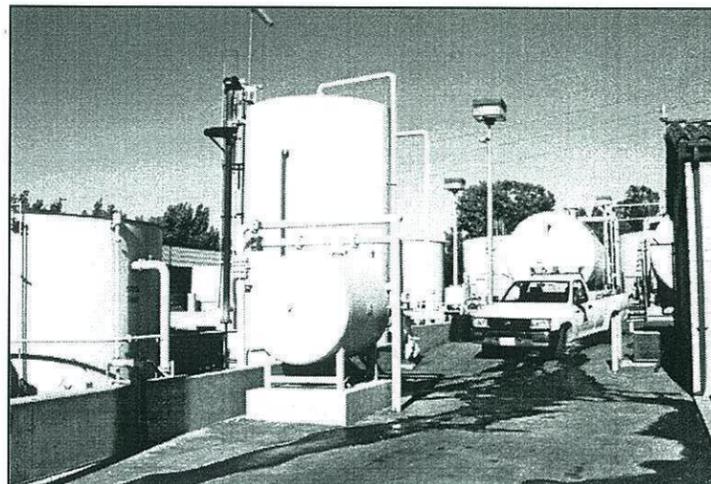
CUP Site No. 3  
"D" Drill Site  
Signal Hill West Unit



CUP Site No. 4  
North Drill Site  
Signal Hill Central Unit



CUP Site No. 5  
Central Drill Site  
Signal Hill Central Unit



CUP Site No. 6  
Central Water Plant  
Signal Hill East Unit



CUP Site No. 7  
Drill Site No. 1  
Signal Hill East Unit



### **Original Conditional Use Permits**

To allow major oil companies to proceed with the unitization plan, the City approved CUPs for six drill sites, some of which also included treatment/ processing functions, and three central processing facilities. These CUPs specifically included a condition that the CUPs expire in 20 years, and that the City could revoke the CUPs for non-compliance with conditions.

In November 1971, Shell Oil Company formed the Central Unit and initiated secondary recovery operations by implementing a water flooding program. Texaco and ARCO initiated secondary recovery operations in the West and East Units in 1974 and 1975, respectively. Signal Hill Petroleum (SHP) acquired Shell Oil Company oil wells, including three drill sites in the Central Unit, one of which included a Central Processing Facility. SHP also acquired Atlantic Richfield Corporation facilities, which included a Central Processing Facility and two drill sites in the East Unit. In addition to these CUP sites, SHP and others operate numerous additional wells and other oil-related facilities throughout the City.

### **Current CUP Application History**

In early 1992, the City advised SHP and Texaco that their CUPs had expired (see Table 1-1, Summary of CUP Sites). SHP submitted preliminary applications to renew their CUPs on October 15, 1991, for the East and Central Units. SHP recently acquired Texaco's West Unit sites, which include a Central Processing Facility and two consolidated drill sites, for which CUP applications had not been submitted. On July 31, 1997, SHP submitted a consolidated application package for the seven sites, for which City staff are now processing a single CUP, which is the subject of this Initial Study/Negative Declaration.

## **2.4 PURPOSE AND NEED FOR THE PROJECT**

The stated purpose of the originally approved CUP sites was to consolidate oil production activities, begin secondary petroleum recovery operations, and free up encumbered land for other urban uses. The original CUP approvals were based, in a large part, on the anticipated completion of secondary petroleum recovery operations within 20 years, and the removal of 150 oil wells to accommodate development. Since unitization of the Central Unit, for example, there has been a net abandonment of 93 wells with 129 remaining; 131 tanks with 9 remaining; and 30,000 feet of pipeline.<sup>5</sup> As the City continues its ongoing effort in redeveloping underutilized areas, key portions of which are constrained by various oil-related operations outside of the CUP sites (and operated by a variety of private parties), the CUP for these seven sites is necessary to allow the continued consolidation of SHP activities, in order to free up additional land for residential, commercial and industrial development, in accordance with the Amended Redevelopment Plan and General Plan.

Key relevant policies of the Amended Redevelopment Plan and General Plan (Major Extraction Areas) are as follows:

Amended Redevelopment Plan. The Plan Amendment encourages the timely and logical development of vacant lands formerly devoted to oil related uses, although the Plan does allow for the continued extraction of oil and natural gas.

General Plan Objectives (Land Use Element, “Major Centralized Extraction Areas”)

1. Development activities within major centralized extraction areas shall be subject to review procedures for the purpose of ensuring compatibility with continuing extraction operations and imposing controls to protect access to major facilities.
2. All development activities within major centralized extraction areas shall be conducted in harmony with continuing extraction or production operations and be authorized by the oil surface owner leaseholder or operator.
3. Development activity within major centralized extraction areas shall be provided with adequate buffering and screening.
4. Drilling and production within major centralized extraction areas shall be consolidated as much as possible.

## 2.5 PROJECT CHARACTERISTICS

The proposed Signal Hill Petroleum Conditional Use Permit project would allow for the continuing operation of seven oil production, drilling and processing facilities, which were originally built in the early 1970s to consolidate various independent oil operators and their facilities into more centralized areas. These sites include six consolidated drill sites (two of which have central processing facilities) and a central water plant used for the recovery of petroleum hydrocarbons, as well as a proposed natural gas processing facility at CUP Site No. 2. (See preceding Table 1 and following discussion for definitions of these terms).

The following is a detailed description of each CUP site (for additional detail, refer to the CUP Site Plans contained in Appendix B and to the CUP Application package submitted by SHP on July 31, 1997):

### CUP Site No. 1 - “A” Drill Site, Signal Hill West Unit

Address/Location: The “A” Drill Site is located at 3033 California Avenue, north of Spring Street between California and Atlantic Avenues. The surrounding area is

primarily commercial/office uses in the City of Signal Hill, and residential uses to the west of the site in the City of Long Beach (across Atlantic Avenue).

Zoning District: CG (Commercial General).

Description: The “A” Drill Site is used for the recovery of petroleum hydrocarbons through the continued operation of production and drilling facilities in connection with the Signal Hill West Unit of the Long Beach Oil Field. The site has no buildings and the hours of operation conform to the City Oil Code (Title 16). The “A” Drill Site serves as a gathering site for oil, gas and water production and a distribution site for water injection. In addition, the site has active oil, gas and water injection wells, is designed for well drilling activities, and provides material storage for daily operations.

**CUP Site No. 2 - “B” Drill Site, Signal Hill West Unit**

Address/Location: The “B” Drill Site is located at 1215 East 29th Street, south of Spring Street between Orange and Gundry Avenues. Surrounding areas are primarily industrial (General Industrial zoning). Burroughs Elementary School is located approximately 1/4-mile north of the site, across the I-405 freeway.

Zoning District: GI (General Industrial).

Description: The “B” Drill Site is used for the recovery of petroleum hydrocarbons through the continued operation of production and drilling facilities in connection with the Signal Hill West Unit of the Long Beach Oil Field. The site has two (2) buildings: a field office and water injection plant (both reinforced block). The hours of operation conform to the City Oil Code (Title 16). The “B” Drill Site serves as the primary operating plant for the West Unit. The main components of the site include a fluid dehydration plant, a water injection plant, gas processing/dehydration equipment, oil and gas shipping equipment, and an Edison electrical substation. The site also serves as a gathering site for oil, gas and water production, a distribution site for water injection, and a control center for electrical systems. In addition, the site has active oil, gas and water injection wells, is designed for well drilling activities, and provides material storage for daily operations. As discussed below, this site is also proposed for a new natural gas processing facility to replace an existing facility located across Orange Avenue.

**Natural Gas Processing Facility**

Existing Facility. The existing 200,000 square foot (sf) natural gas processing facility is located at 2901 Orange Avenue in the City of Long Beach. It was constructed and placed into operation in the early 1920s to meet the expanding needs of the newly discovered Long Beach Oil Field. The facility is out-dated, over-sized and very inefficient. It uses processed dry gas as fuel for the internal combustion engines which drive the compressors. As a result, a large quantity of emissions are continuously

exhausted into the atmosphere. The facility's aesthetics are undesirable, as it contains five large cooling towers of  $50 \pm$  feet, two stacks of  $70 \pm$  feet and miscellaneous other equipment and several old buildings. The perimeter of the site is bounded by chain link fence with no landscaping and is easily visible from the surrounding street network. In addition, the existing facility operates at noise levels in excess of 80 dB at its property line, and generates ground-born vibration in the area as a result of fuel gas combustion engines. This facility is ultimately planned for demolition and redevelopment, although no specific development plans have been approved at this time.

New Facility. The new proposed 7,000 sf natural gas processing facility would allow the replacement of the existing facility and would be located across from the existing site, within CUP Site No. 2 (see Table 2, Natural Gas Processing Facility). The new gas facility equipment would be much smaller and would integrate well with the existing West Unit processing facility. In contrast to the existing facility, the new facility would include one 12" diameter stabilizer, 34 feet in height, located behind an existing 24 foot high water tank. General equipment height would be 10 feet, mostly located 3 feet below ground in the new facility's containment area. The facility would be visually screened from the surrounding area by a six foot block wall and mature landscaping, in accordance with the City's Oil Code. In addition, the new facility is anticipated to operate at noise levels of less than 70 dB at the property line, according to the compressor manufacturer and the applicant. The new compressors would be driven by two (2) 150 horsepower electric motors. (The new facility would also allow for the eventual abandonment of the existing site which would benefit the proposed development of the area by the Signal Hill/Long Beach Joint Powers Authority.) A partial listing of gas processing facility equipment is as follows (refer to the CUP Application package for additional detail, which is available for review at the City of Signal Hill Community Development and Services Department):

- Gas Duster and Suction Scrubber (scrubbers)
- Compressors
- Low Temperature Separation (LTS) Unit (propane-cooled, producing Natural Gas Liquids that are shipped via pipeline or truck).
- Surge Vessels (short-term holding tanks)
- Glycol Heater (vaporizes water out of the glycol)
- Electric Control System/Transformer
- Gas Sales Meter (odorizes prior to transmission of dry natural gas)

**CUP Site No. 3** - "D" Drill Site, Signal Hill West Unit

Address/Location: The "D" Drill Site is located north of Willow Street between Gaviota and Rose Avenues, in the "Town Center North" area. Surrounding areas are primarily commercial and industrial uses, with two non-conforming residences to the northeast, vacant commercial property to the southwest, and Town Center East to the southeast.

Zoning District: CTC (Commercial Town Center).

Description: The “D” Drill Site is used for the recovery of petroleum hydrocarbons through the continued operation of production and drilling facilities in connection with the Signal Hill West Unit of the Long Beach Oil Field. The site has no buildings and the hours of operation conform to the City Oil Code (Title 16). The “D” Drill Site serves as a gathering site for oil, gas and water production and a distribution site for water injection. In addition, the site has active oil, gas and water injection wells, is designed for well drilling activities, and provides material storage for daily operations.

CUP Site No. 4 - North Drill Site, Signal Hill Central Unit

Address/Location: The north Drill Site is located north of Panorama Drive between Cherry and Temple Avenues, in the “Town Center East” area. Current landmarks include the Price Club to the north and the Home Depot to the west. Surrounding areas are primarily commercial to the north and west, and residential to the east and south. The site immediately borders the northwest portion of the Hilltop Specific Plan area (SP-2).

Zoning District: SP-1 (Town Center Specific Plan).

Description: The north Drill Site is used for the recovery of petroleum hydrocarbons through the continued operation of production and drilling facilities in connection with the Signal Hill Central Unit of the Long Beach Oil Field. The site has no buildings and the hours of operation conform to the City Oil Code (Title 16). The north Drill Site serves as a gathering site for oil, gas and water production, a distribution site for water injection, and a control center for electrical systems. In addition, the site has active oil, gas and water injection wells, is designed for well drilling activities, and provides material storage for daily operations.

CUP Site No. 5 - Central Drill Site, Signal Hill Central Unit

Address/Location: The Central Drill Site is located at 2700 Combella Drive, and is bounded by Combella Drive to the north and Temple Avenue to the east. Surrounding areas primarily consist of residential to the north and south, and industrial uses to the east across Temple Avenue/Hathaway Avenue.

Zoning District: PD-2 (Planned Development District).

Description: The Central Drill Site is used for the recovery of petroleum hydrocarbons through the continued operation of production and drilling facilities in connection with the Signal Hill Central Unit of the Long Beach Oil Field. The site has two (2) buildings: a modular office occupied by Global Solutions, Inc. and a water injection plant (reinforced block). The hours of operation conform to the City Oil Code (Title 16). The Central Drill Site serves as the primary operating plant for the Central Unit.

The main components of the site include a fluid dehydration plant, a water injection plant, oil and gas shipping equipment, and an Edison electrical substation. The site also serves as a gathering site for oil, gas and water production, a distribution site for water injection, and a control center for electrical systems. In addition, the site has active oil, gas and water injection wells, is designed for well drilling activities, and provides material storage for daily operations.

**CUP Site No. 6** - *Central Water Plant, Signal Hill East Unit*

Address/Location: The Central Water Plant is located at 3365 Grant Street, and is bounded by Grant Street to the south and Redondo Avenue to the east. Surrounding land uses consist primarily of industrial areas.

Zoning District: LI (Light Industrial).

Description: The Central Water Plant is used for the recovery of petroleum hydrocarbons through the continued operation of production facilities in connection with the Signal Hill East Unit of the Long Beach Oil Field. The site has one reinforced block building used as a field office and electrical control room. The hours of operation conform to the City Oil Code (title 16). The Central Water Plant serves as the primary operating plant for the East Unit. The main components of the site include a fluid dehydration plant, a water injection plant, oil and gas shipping equipment, and an Edison electrical substation. The site also serves as a gathering site for oil, gas and water production, a distribution site for water injection, and a control center for electrical systems. In addition, the site has active oil and gas wells and provides material storage for daily operations.

**CUP Site No. 7** - *Drill Site No. 1, Signal Hill East Unit*

Address/Location: Drill Site No. 1 is located at 3290 Grant Street (south side), between Obispo and Redondo Avenues. Surrounding areas are primarily industrial uses.

Zoning District: LI (Light Industrial).

Description: Drill Site No. 1 is used for the recovery of petroleum hydrocarbons through the continued operation of production and drilling facilities in connection with the Signal Hill East Unit of the Long Beach Oil Field. The site has no buildings and the hours of operation conform to the City Oil Code (Title 16). Drill Site No. 1 serves as a gathering site for oil, gas and water production, a distribution site for water injection, and a control center for electrical systems. In addition, the site has active oil, gas and water injection wells, is designed for well drilling activities, and provides material storage for daily operations. This site is also used for vehicle storage by Platt Security Systems.

## 2.6 AGREEMENTS, PERMITS AND APPROVALS REQUIRED

The following list represents the known or anticipated permits or approvals required for the CUP project:

Permit/Approval	Agency
Conditional Use Permit	City Planning Commission City Council
Facility Permit to Operate	South Coast AQMD ( <i>already issued</i> )
Site Plan Approval (fire codes)	City of Long Beach Fire Department ( <i>already issued</i> )
Waterflood Project Permit	State of California, Division of Oil, Gas, and Geothermal Resources ( <i>already issued</i> )

## 2.7 RELATED PROJECTS

The Signal Hill Petroleum CUP project is related to several other projects in the City of Signal Hill and Long Beach, as follows:

**Town Center North EIR.** The City of Signal Hill has released a Notice of Preparation for this EIR, which addresses development of a portion of the Town Center North area that borders CUP Site No. 3. The Town Center North EIR discusses, among other issues, the project's effects on petroleum operations and the land use compatibility issues associated with commercial development adjacent to an oil production area. The Town Center North Draft EIR public review period is planned to occur between mid September and mid October of 1997.

**Demolition of Existing Natural Gas Processing Facility.** CUP Site No. 2 proposes a new natural gas processing facility to replace an existing facility located in the City of Long Beach. This Initial Study/Negative Declaration does not address permits or environmental clearance associated with the existing facility, or potential redevelopment of this site, as these are independent actions that do not affect the ability of CUP Site No. 2 to operate, and are within another agency's jurisdiction.

## 3.0 ENVIRONMENTAL CHECKLIST FORM

### Evaluation of Environmental Impacts

The preceding Form has been used by the City to review the environmental effects of the proposed Signal Hill Petroleum Conditional Use Permit project of with respect to the following issue areas:

Land Use and Planning	Transportation/Circulation	Public Services
Population and Housing	Biological Resources	Utilities Service Systems
Geologic Problems	Energy/Mineral Resources	Aesthetics
Water	Hazards	Cultural Resources
Air Quality	Noise	Recreation

Within each of these issue areas, a series of questions are asked about the project. A brief explanation is then provided for each answer. There are four possible responses to each of the questions:

1. **No Impact.** This response is used when the proposed project does not have any measurable environmental impact.
2. **Less Than Significant Impact.** This response is used when the potential impact of the project is determined to be below known or measurable thresholds of significance and would not require mitigation.
3. **Potentially Significant Unless Mitigated.** This response is used when the project has the potential to have a significant impact, which is not expected to occur because:
  - A. Mitigation measures have been incorporated into the project design to reduce the impact to a less than significant level; or
  - B. Adherence to existing policies, regulations, and/or design standards would reduce the impact of the project to a less than significant level.
4. **Potentially Significant Impact.** This response is used when the project has the potential to have an effect on the environmental which is considered to be significant and adverse.

	Potentially Significant Impact	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
<b>3.1 LAND USE AND PLANNING.</b> <i>Would the proposal:</i>				✓
a) Conflict with general plan designation or zoning?				✓
b) Conflict with applicable environmental plans or policies adopted by agencies with jurisdiction over the development?				✓
c) Be incompatible with existing land use in the vicinity?				✓
d) Affect agricultural resources or operations (e.g. impacts to soils or farmlands, or impacts from incompatible land uses)?				✓
e) Disrupt or divide the physical arrangement of an established community (including a low-income or minority community)?				✓
<b>3.2 POPULATION AND HOUSING.</b> <i>Would the proposal:</i>				
a) Cumulatively exceed official regional or local population projections?				✓
b) Induce substantial growth in an area either directly or indirectly (e.g. through developments in an undeveloped area or extension of major infrastructure)?				✓
c) Displace existing housing, especially affordable housing?				✓
<b>3.3 GEOPHYSICAL.</b> <i>Would the proposal result in or expose people to potential impacts involving:</i>				
a) Seismicity: fault rupture?			✓	
b) Seismicity: groundshaking and liquefaction?			✓	
c) Seiche, tsunami, or volcanic hazard?				✓
d) Landslides or mudflows?			✓	
e) Erosion, changes in topography or unstable soil conditions from excavation, grading or fill?			✓	
f) Subsidence of the land?			✓	
g) Expansive soils?			✓	
h) Unique geologic or physical features?			✓	
<b>3.4 WATER.</b> <i>Would the proposal result in:</i>				

	Potentially Significant Impact	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
a) Changes in absorption rates, drainage patterns, or the rate and amount of surface runoff?			✓	
b) Exposure of people or property to water related hazards such as flooding?			✓	
c) Discharge into surface waters or other alteration of surface water quality (e.g., temperature, dissolved oxygen, or turbidity)?			✓	
d) Changes in the amount of surface water in any water body?				✓
e) Changes in currents, or the course or direction of water movements?			✓	
f) Change in the quantity of groundwater, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations or through substantial loss of groundwater recharge capability?			✓	
g) Altered direction or rate of flow of groundwater?			✓	
h) Impacts to groundwater quality?			✓	
I) Substantial reduction in the amount of groundwater otherwise available for public water supplies?				✓
<b>3.5 AIR QUALITY.</b> <i>Would the proposal:</i>				
a) Violate any air quality standard or contribute to an existing or projected air quality violation?			✓	
b) Expose sensitive receptors to pollutants?			✓	
c) Alter air movement, moisture, or temperature, or cause any change in climate?				✓
d) Create objectionable odors?			✓	
<b>3.6 TRANSPORTATION/CIRCULATION.</b> <i>Would the proposal result in:</i>				
a) Increased vehicle trips or traffic congestion?				✓
b) Hazards to safety from design features (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g. farm equipment)?				✓
c) Inadequate emergency access or access to nearby uses?				✓
d) Insufficient parking capacity on-site or off-site?				✓

	Potentially Significant Impact	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
e) Hazards or barriers for pedestrians or bicyclists?				✓
f) Conflicts with adopted policies supporting alternative transportation (e.g. bus turnouts, bicycle racks)?				✓
g) Rail, waterborne, or air traffic impacts?				✓
<b>3.7 BIOLOGICAL RESOURCES.</b> <i>Would the proposal result in impacts to:</i>				
a) Endangered, threatened, or rare species or their habitats (including but not limited to plants, fish, insects, animals, and birds)?				✓
b) Locally designated species (e.g. heritage trees)?				✓
c) Locally designated natural communities (e.g., oak forest, coastal habitat, etc.)?				✓
d) Wetland habitat (e.g. marsh, riparian and vernal pool)?				✓
e) Wildlife dispersal or migration corridors?				✓
<b>3.8 ENERGY AND MINERAL RESOURCES.</b> <i>Would the proposal:</i>				
a) Conflict with adopted energy conservation plans?			✓	
b) Use non-renewable resources in a wasteful and inefficient manner?			✓	
c) Result in the loss of availability of a known mineral resource that would be of future value to the region and the residents of the state?			✓	
<b>3.9 HAZARDS.</b> <i>Would the proposal involve:</i>				
a) A risk of accidental explosion or release of hazardous substances (including, but not limited to: oil, pesticides, chemicals, or radiation)?		✓		
b) Possible interference with an emergency response plan or emergency evacuation plan?			✓	
c) The creation of any health hazard or potential health hazard?		✓		
d) Exposure of people to existing sources of potential health hazards?		✓		
e) Increased fire hazard in areas with flammable brush, grass, or trees?				✓
<b>3.10 NOISE.</b> <i>Would the proposal result in:</i>				

	Potentially Significant Impact	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
a) Increases in existing noise levels?			✓	
b) Exposure of people to severe noise levels?			✓	
<b>3.11 PUBLIC SERVICES.</b> <i>Would the proposal have an effect upon, or result in a need for new or altered government services in any of the following areas:</i>				
a) Fire Protection?				✓
b) Police Protection?				✓
c) Schools?				✓
d) Maintenance of public facilities, including roads?				✓
e) Other governmental services?				✓
<b>3.12 UTILITIES AND SERVICE SYSTEMS.</b> <i>Would the proposal result in a need for new systems, or substantial alterations to the following utilities:</i>				
a) Power or natural gas?				✓
b) Communications systems?				✓
c) Local or regional water treatment or distribution facilities?				✓
d) Sewer or septic tanks?				✓
e) Storm water drainage?				✓
f) Solid waste disposal?				✓
g) Local or regional water supplier?			✓	
<b>3.13 AESTHETICS.</b> <i>Would the proposal:</i>				
a) Affect a scenic vista or scenic highway?			✓	
b) Have a demonstrable negative aesthetic effect?			✓	
c) Create light or glare?			✓	
<b>3.14 CULTURAL RESOURCES.</b> <i>Would the proposal:</i>				
a) Disturb paleontological resources?				✓
b) Disturb archeological resources?				✓

	Potentially Significant Impact	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
c) Affect historical resources?				✓
d) Have the potential to cause a physical change which would affect unique cultural values?				✓
e) Restrict existing religious or sacred uses within the potential impact area?				✓
<b>3.15 RECREATION.</b> <i>Would the proposal:</i>				
a) Increase the demand for neighborhood or regional parks or other recreational facilities?				✓
b) Affect existing recreational opportunities?				✓
<b>3.16 MANDATORY FINDINGS OF SIGNIFICANCE.</b>				
a) Does the proposal have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?				✓
b) Does the project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals?				✓
c) Does the proposal have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a development are considerable when viewed in connection with the effects of past developments, the effects of other current developments, and the effects of probable future developments.)			✓	
d) Does the proposal have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?			✓	

### 3.17 EARLIER ANALYSES

Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, one or more effects have been adequately analyzed in an earlier EIR or negative declaration. (CEQA Guidelines Section 15063(c)(3)(D).) In this case, a discussion should identify the following on attached sheets:

- a) **Earlier analyses used.** Identify earlier analyses and state where they are available for review.

Refer to Section 1.4, Incorporation by Reference.

- b) **Impacts adequately addressed.** Identify which effects from the above checklist were within the scope of and adequately analyzed in the earlier document pursuant to applicable legal standards and state whether such effects were addressed by mitigation measures based on the earlier analysis.

Refer to Section 1.4, Incorporation by Reference.

- c) **Mitigation measures.** For effects that are "potentially significant unless mitigated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the proposal.

Refer to Section 6, Mitigation Measures.

**Authority:** Public Resources Code Sections 21083 and 21087.

**Reference:** Public Resources Code Sections 21080(e), 21080.1, 21080.3, 21082.1, 21083, 21083.3, 21093, 21094, 21151; *Sundstrom v. County of Mendocino*, 202 Cal. App. 3d 296 (1988); *Leonoff v. Monterey Board of Supervisors*, 222 Cal. App. 3d 1337 (1990).

### 3.18 REFERENCES

Air Quality Management Plan (1997 Final), SCAQMD, January 1997.

CEQA Air Quality Handbook, SCAQMD, April 1993.

CEQA: The California Environment Quality Act - Law and Guidelines. OPR, June 1986 (as amended).

Fourth Amendment to the Redevelopment Plan for Redevelopment Project Area 1 EIR (Final), prepared by Cotton-Beland Associates for the Signal Hill Redevelopment Agency, December 1987.

Hilltop Specific Plan EIR (Final), prepared by the Signal Hill Redevelopment Agency with LSA Associates, Inc., February 1992.

"Oil Production Activities in Signal Hill - A Policy Direction" (Undated).

Redevelopment of Oil Production Facilities (West Unit) Environmental Impact Study, Envista for the City of Signal Hill, May 9, 1975.

Regional Comprehensive Plan and Guide (Final), SCAG, May 1995.

Signal Hill Central Unit - Oil Production Analysis for Conditional Use Permits, Signal Hill Petroleum, Inc., February 25, 1994.

Signal Hill General Plan (Circulation, Environmental Resources, Safety and Noise Elements), City of Signal Hill, February 1986.

Signal Hill General Plan (Updated Housing and Land Use Elements), City of Signal Hill, March 1989.

Signal Hill Oil Code (Title 16). City of Signal Hill, April 1991.

Summary of Air Quality in California's South Coast Air Basin, South Coast Air Quality Management District, 1982.

Thomas Guide, Los Angeles/Orange County, Thomas Brothers Map, 1997..

Unitization Plan for the Signal Hill East Unit of the Long Beach Oil Field Draft EIR E-8-74, ARCO, 1974.

USGS Topographic Map, Long Beach Quadrangle, Revised 1981.

Various correspondence received from Signal Hill staff:

- Preliminary Initial Study for Conditional Use Permits
- Expired Conditional Use Permit Files
- Signal Hill Petroleum Correspondence (Mr. Craig Barto and Mr. Thomas Turner)
- Evans & Associates Correspondence (Mr. Barry Evans)

## **4.0 ENVIRONMENTAL ANALYSIS**

The following discussion is intended to identify the potentially significant effects which may occur with implementation of the proposed Signal Hill Petroleum Conditional Use Permit project. The potential impacts within the City of Signal Hill, as well as cumulative and regional impacts associated with the proposed project, will be evaluated in the following Section.

As noted in Section 2.0, the proposed project will allow for the continuing operation of oil production/recovery related activities already present within the City of Signal Hill and previously analyzed in numerous planning and environmental documents (see Section 1.4, Incorporate by Reference). The project is not expected to introduce any new impacts to the project site or surrounding vicinity, as facilities are established, currently operating, and have been in operation for over 20 years.

The proposed addition of a 7,000 square foot (sf) natural gas processing facility is intended to replace the existing 200,000 square foot facility constructed and placed in operation in the 1920's. Impacts to Land Use, Noise, Air Quality, Aesthetics, and Health and Safety associated with this aspect of the project are considered beneficial as existing conditions would be improved with implementation of the proposed project. Please refer to Section 2.0, Project Description for more detailed information.

An analysis of the possible environmental effects of the proposed project will include a discussion of the significance determination for each impact and, if necessary, mitigation measure(s). The significance determinations will be based on factors explained in each impact section. The factors will include those set forth in Appendix G of the CEQA Guidelines, as well as those set forth in the General Plan or other policies, ordinances, standards, and established thresholds used by the City or other agencies.

#### 4.1 LAND USE AND PLANNING.

a) **Would the proposal: Conflict with general plan designation and zoning?**

*No Impact:* Use of the seven CUP sites is authorized under Title 20 of the Signal Hill Municipal Code, Zoning Ordinance. Approval of the proposed project would bring the sites into compliance with the Municipal Code, including the Oil Code, and General Plan requirements, allowing continued operation of these facilities. The General Plan Land Use Element has several goals relative to the “Major Extraction Areas”, including a requirement that all new development provide adequate buffering from the CUP sites, as well as encouraging continued consolidation of oil production areas which is made possible by the CUP sites.

Proposed Gas Processing Facility: The proposed 7,000 square foot natural gas processing facility would be located entirely within CUP Site No. 2. This facility allows for the abandonment of the existing 200,000 square foot facility put into use in the 1920s. As discussed in Section 2.5, Project Description the new facility will have substantially reduced impacts relative to air emissions, noise, vibration, aesthetics and public safety. As CUP uses are authorized under the above cited Zoning Ordinance and the proposed facility would have a positive impact on land use, conflicts with general plan designations or zoning would not be considered significant.

b) **Conflict with applicable environmental plans or policies adopted by agencies with jurisdiction over the development?**

*No Impact:* The seven CUP facilities associated with the proposed project are part of the unitization program initiated by the City of Signal Hill in the late 1960s and 1970s. This program was implemented to ensure beneficial use of land within the City through the centralization of drilling operations. The project will comply with all applicable provisions of the City’s Oil Code, as well as other relevant planning documents. As a result, the proposed project does not conflict with plans or policies adopted by the City of Signal Hill (see Section 2.3, Background and History and 2.4, Purpose and Need for the Project, for additional discussion).

Proposed Gas Processing Facility: Construction of the natural gas processing facility would be consistent with the City’s unitization program; natural gas is a typical product of the field. The proposed facility would also be consistent with the South Coast Air Quality Management District (SCAQMD) 1997 Air Quality Management Plan (AQMP) which includes policies and measures to achieve federal and state standards for healthful air quality in the South Coast Basin. The project would serve to meet these standards by allowing the abandonment of the existing facility with its annual air emissions of approximately 150 tons/year, as compared to approximately 4 tons/year with the proposed facility. The Natural Gas Processing Facility has already received a Facility Permit to Operate from SCAQMD. The

proposed natural gas processing facility would not conflict with any environmental plans or policies.

c) **Be incompatible with existing land use in the vicinity?**

No Impact: As previously stated, the proposed project would allow for the continuing operation of oil production/extraction activities that have been in operation for over 20 years in the City of Signal Hill. No new land use impacts beyond those considered in previous environmental and planning documents would be introduced with project implementation. The proposed project would not be incompatible with existing land uses. Also refer to Section 2.5, Project Characteristics, which provides an overview of land uses in the vicinity of each CUP site, and to Exhibit 3, Site Photos.

Proposed Gas Processing Facility: Locating an approximately 7,000 square foot natural gas processing facility at its proposed location, within CUP Site No. 2, would be consistent with the City's unitization program. In addition, the new facility would allow for the abandonment of a current facility located across Orange Avenue. This will make the natural gas processing facility more compatible with future uses.

d) **Affect agricultural resources or operations (e.g. impacts to soils or farmlands, or impacts from incompatible land uses)?**

No Impact: No impacts to agricultural resources or operations will occur with implementation of the proposed project, as no such resources are within or near the CUP site boundaries.

e) **Disrupt or divide the physical arrangement of an established community (including a low income or minority community)?**

No Impact: The seven CUP facilities associated with the proposed project have been in operation for over 20 years. The project does not involve changes to existing conditions and, as a result, the project would not disrupt or divide the physical arrangement of any established community.

Proposed Gas Processing Facility: Construction of the 7,000 square foot gas processing facility would be entirely within CUP Site No. 2. As a result, no impacts would occur to disrupt or divide the physical arrangement of an established community.

4.2 **Population and Housing. Would the proposal:**

a) **Cumulatively exceed official regional or local population projections?**

No Impact: The proposed project will allow for the continuing operation of local and regionally significant oil production/recovery related activities already present within the City of Signal Hill. There would be no changes beyond existing conditions that

would induce growth in population or housing, as the CUP Site operations will not be changing. As a result, no impacts would occur to population or housing with implementation of the proposed project.

Proposed Gas Processing Facility: The proposed natural gas facility is a substantially down-scaled version of the existing facility. No impacts would occur to population or housing.

- b) **Induce substantial growth in an area either directly or indirectly (e.g. through developments in an undeveloped area or extension of major infrastructure)?**

No Impact: See discussion above.

- c) **Displace existing housing, especially affordable housing?**

No Impact: See discussion above.

**4.3 Geophysical.** *Would the proposal result in or expose people to potential impacts including:*

- a) **Seismicity: Fault rupture?**

Less Than Significant Impact: The proposed project lies within a seismically active region of Southern California. Faults traversing the project site and located in close proximity to the City of Signal Hill present areas of potential fault rupture. The most significant exposed seismic feature in the Signal Hill area is the northwest trending Newport-Inglewood fault zone which trends diagonally across the City.<sup>3</sup> Also of significance, though not exposed at the surface, is the Compton Thrust fault, a buried fault similar in nature to the fault which produced the 1994 Northridge earthquake, which underlies the City at a depth of about eight miles.

However, the proposed project involves oil production sites that are currently established and operating, which were constructed in the early 1970s to conform with all applicable State and Local Building and Safety Codes. A mitigation measure has been added requiring any future structure to be designed to current seismic safety standards. Site No. 2 is not within the Alquist-Priolo Special Studies Zone.

Proposed Gas Processing Facility: The proposed gas processing facility would be required to comply with the standards set forth in the Uniform Building Code edition adopted by the City to provide seismic safety. In addition, an engineer experienced with earthquake-resistant design would need sign off on all building plans to determine the adequacy of seismic criteria for project structures, and to ensure incorporation of necessary design changes. These recommended measures would reduce potential seismic impacts to less than significant levels.

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<sup>3</sup> City of Signal Hill General Plan, February 1986, p. 5.24.

b) **Seismicity: Groundshaking and liquefaction?**

*Less Than Significant Impact:* Strong ground shaking could damage CUP site facilities and/or equipment such as storage tanks, pipelines or service structures. However, the proposed project addresses oil production sites that are currently established and operating and proposes no new changes from existing conditions (other than CUP Site No. 2, discussed below). These sites were constructed in the early 1970s to conform with all applicable State and local Building and Safety Codes. Thus, impacts related to groundshaking and liquefaction have been mitigated to the extent possible and are considered less than significant.

Proposed Gas Processing Facility: Refer to discussion in 4.3(a), above.

c) **Seismicity: Seiche, tsunami or volcanic hazard?**

*No Impact:* Due to the location of the proposed project, the project is not expected to be impacted by seiche, tsunami or volcanic hazards.

d) **Landslides and/or mudflows?**

*Less Than Significant Impact:* There has been no known or recorded history of landslides or mudflows and the potential for landslide and/or mudflows has not been addressed as an issue of major concern in previous environmental documentation. In addition, the proposed project addresses oil production sites that are currently established and operating that were constructed in the early 1970s to conform with all applicable State and Local Building and Safety Codes. It is considered that potential impacts of landslides and/or mudflows caused by construction of sites have been mitigated to the extent possible and are therefore less than significant.

Proposed Gas Processing Facility: The relocation site for the proposed natural gas processing facility is relatively flat and potential impacts from landslides and/or mudflows are not considered significant. However, prior to issuance of building permit(s), a Building Official shall review and approve all building plans to ensure compliance with the Uniform Building Code as adopted by the City of Signal Hill (also refer to discussion in 4.3(a), above).

e) **Erosion, changes to topography or unstable soil conditions from excavation, grading or fill?**

*Less than Significant Impact:* The proposed project involves oil production sites that are currently established and operating that were constructed in the early 1970s. As no changes to these sites would occur from existing conditions, potential impacts from erosion, changes to topography or unstable soil conditions from excavation, grading or fill would not be significant.

**Proposed Gas Processing Facility:** The proposed gas processing facility would require minor site preparation for the construction of the 7,000 square foot facility. Because the site is already graded and covered with gravel, no grading or additional drainage facilities are required.

**f) Subsidence of Land?**

*Less Than Significant Impact:* Subsidence is associated with relatively strong seismic shaking, shallow groundwater, and the presence of loose, fine, sandy soils. These conditions are not expected to exist simultaneously within the project site and potential impacts from land subsidence are considered slight.<sup>4</sup> There are no documented incidents or known reports of ground subsidence within the Long Beach Oil Field during more than 75 years of oil production (most prior to water injection). The strength of the geologic structure prevents subsidence as fluids are removed from the pore space of the rock. If the oil field was susceptible to subsidence, it would have likely occurred long ago as the field reached a peak production of 87 million barrels per year in 1923 (compared to current production of 1.6 million barrels per year).

**g) Expansive soils?**

*Less Than Significant Impact:* Soils within the project CUP sites are composed of weathered alluvium and are classified as silts and sands. These soils generally range in composition from non-expansive to slightly expansive; fill materials may also be encountered. These soils would not present potential impacts from soil expansion to project facilities.

**h) Unique geologic or physical features?**

*Less Than Significant Impact:* Southern California is in a region of high seismic activity and is subject to risks and hazards associated with potentially destructive earthquakes. Groundshaking during an earthquake is a substantial regional hazard. Standard engineering practices shall be implemented to mitigate these impacts to the extent possible.

**4.4 Water.** *Would the proposal result in:*

**a) Changes in absorption rates, drainage patterns, or the rate and amount of surface runoff?**

*Less Than Significant Impact:* The proposed project does not involve the alteration or modification of any of the seven CUP sites except for installation of an approximately 7,000 square foot gas processing facility at Site No. 2. As such, no impacts beyond

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<sup>4</sup> City of Signal Hill General Plan, February 1986.

existing conditions would occur with project implementation. No changes in absorption rates, drainage patterns, or the rate and amount of surface runoff are expected.

Proposed Gas Processing Facility: The proposed gas processing facility would result in a relatively minimal addition of impervious surfaces. All associated drainage with the new facility would be implemented pursuant to City code and standards. Changes in absorption rates, drainage patterns, or the rate and amount of surface runoff would be minimal and would not be considered significant.

**b) Exposure of people or property to water related hazards such as flooding?**

Less Than Significant Impact: The proposed CUP sites are located within the Zone “C” Flood Hazard Zone. This Zone has been identified in the FEMA flood insurance study as an area of moderate or minimal hazard from the principal source of flooding in the area. Buildings in this Zone could be flooded by severe, concentrated rainfall coupled with recognized inadequate local drainage systems. However, due to the existing industrialized uses of the proposed project facilities, potential flood impacts are not expected to be significant.

**c) Discharge into surface waters or other alteration of surface water quality (e.g., temperature, dissolved oxygen, or turbidity)?**

Less Than Significant Impact: The proposed project does not involve the modification or alteration of any of the seven sites other than Site No. 2. Pursuant to 40CFR, Part 122 (NPDES Guidelines), storm water run-off at the sites does not come into contact with any products and/or pollutants located at the sites and therefore the sites are not required to have NPDES permits. Furthermore, all potential discharges related to accidents, spills or otherwise are addressed by Signal Hill Petroleum’s Approved Oil Spill Response Plan (Federal requirement under the 1990 Oil Pollution Act).

Proposed Gas Processing Facility: Grading for the construction of the proposed gas processing facility will increase the potential for erosion; however, implementation of erosion control measures as required by the City and adherence to all applicable requirements set forth in the National Pollutant Discharge Elimination System (NPDES) permit will reduce these impacts to less than significant levels.

**d) Changes in the amount of surface water in any water body?**

No Impact: The proposed project will not affect the amount of surface water in any water body.

**e) Changes in currents, or the course or direction of water movements?**

Less Than Significant Impact: Refer to Response 4.4(a), above.

- f) **Change in the quantity of groundwater, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavation, or through substantial loss of groundwater recharge capability?**

*Less Than Significant Impact:* The City of Signal Hill is located within the Long Beach Plain groundwater basin. Groundwater in the project site is encountered under shallow water table conditions within relatively low permeability sediments. This groundwater, however, does not provide enough water to be utilized as a water supply resource, therefore, deeper aquifers north of Signal Hill are used for a groundwater supply. Water is injected/extracted at the CUP sites into/from deeper oil bearing zones which does not directly affect the shallower aquifers associated with drinking water. Therefore, impacts are considered less than significant.

- g) **Altered direction or rate of flow of groundwater?**

*Less Than Significant Impact:* CUP site operations are not expected to influence direction or rate of flow of groundwater. Water is injected/extracted into/from deeper oil bearing zones which does not directly affect the shallower aquifers associated with drinking water. Therefore impacts are considered less than significant.

- h) **Impacts to groundwater quality?**

*Less Than Significant Impact:* Active injection/extraction wells located within project CUP sites extend through the water bearing zones into the oil bearing zones, and are encased to prevent leaks and contamination to aquifers used as sources of drinking water. It is expected that any contamination would be immediately reported and remediated in accordance with federal, state and local standards. Potential effects on ground water quality are addressed by the State of California, Division of Oil, Gas, and Geothermal Resources (DOGGR) rather than the NPDES (storm water discharge) program. Each of the three (3) operating Units, of which the CUP sites are a part, operate under DOGGR Waterflood Project Permits. These permits set forth guidelines whereby water injection into oil bearing zones is regulated and the isolation of ground water intervals is strictly enforced.

- i) **Substantial reduction in the amount of groundwater otherwise available for public water supplies?**

*No Impact:* The proposed project would not reduce the amount of groundwater available for public water supplies above current conditions.

#### 4.5 Air Quality. *Would the proposal:*

- a) **Violate any air quality standard or contribute to an existing or projected air quality violation?**

*Less Than Significant Impact:* The project is located in the SoCAB and, jurisdictionally, is governed by the SCAQMD and the California Air Resources Board

(CARB). The proposed project involves oil production sites that are currently established and operating. As project implementation would not produce any changes from existing conditions, potential impacts to air quality standards are considered to be less than significant.

Proposed Gas Processing Facility: The proposed natural gas processing facility would be consistent with the South Coast Air Quality Management District (SCAQMD) 1997 Air Quality Management Plan (AQMP) which includes policies and measures to achieve federal and state standards for healthful air quality in the South Coast Basin. The project would serve to meet these standards by potentially reducing annual air emissions from approximately 150 tons/year at their current level to approximately 4 tons/year (See Table 2, Gas Processing Facility Improvements)<sup>5</sup>. The proposed natural gas processing facility would have a beneficial impact on air quality, and has already received a Facility Permit to Operate from the SCAQMD (which includes conditions for facility operation).

**b) Expose sensitive receptors to pollutants?**

Less Than Significant Impact: The proposed CUP facilities are not located in proximity to residential uses, schools, or hospitals, which are considered sensitive air quality receptors by the SCAQMD, other than Site No. 4 and Site No. 5. Site No. 4 and Site No. 5 have adequate buffers between the equipment and residential property to mitigate potential impacts. This is shown in the fact that the City has not received any complaints regarding pollutant emissions at Site No. 5 and Site No. 4 from the adjoining residential areas. This proposal is consistent with the Signal Hill Redevelopment Plan and adopted General Plan. Therefore, no potential impacts to sensitive receptors are expected from project implementation.

Proposed Gas Processing Facility: The proposed gas processing facility would be located more than 1/4-mile from Burroughs Elementary School (approximately 1,450 feet). The gas processing facility meets AQMD standards for emissions and has been permitted by AQMD accordingly; no significant impact is anticipated.

**c) Alter air movement, moisture, or temperature, or cause any change in climate?**

No Impact: Given the nature of the proposed project, it does not have the potential to alter air movements moisture, or temperature, or cause any change in climate.

**d) Create objectionable odors?**

Less Than Significant Impact: The use of chemicals during site operations would be strictly controlled by local, regional, state and federal requirements. These activities would be permitted under the CUP at the project facilities and would not exceed

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<sup>5</sup> Letter from Signal Hill Petroleum dated August 14, 1997.

existing conditions. Issuance of a SCAQMD operating permit has been provided to the City for the CUP site operations. Thus, the potential creation of objectionable odors is considered a less than significant impact.

Proposed Gas Processing Facility: Construction activities associated with the Proposed Gas Processing Facility may generate detectable odors from heavy-duty equipment exhaust immediately next to the equipment. This impact would be short-term in nature, and would not cause SCAQMD thresholds to be exceeded and would not be noticeable off-site. However, compliance with recommended SCAQMD construction mitigation would be required to reduce potential impact to less than significant levels.

**4.6 Transportation/Circulation. *Would the proposal result in:***

**a) Increased vehicle trips or traffic congestion?**

No Impact: The proposed project would allow for the continuing operation of oil production/recovery related activities already present within the City of Signal Hill. Implementation of the proposed project would not present any changes beyond existing conditions that would create impacts to transportation/circulation. Therefore, potential impacts to transportation/circulation would not be significant. The CUP application package contains information on present truck traffic activity at each CUP site.

Proposed Gas Processing Facility: Construction of the proposed gas processing facility would create a slight increase in local traffic due to equipment and workers going to and from the construction site. However, this impact would be small due to the limited size of the new facility (7,000 square feet) and would be short-term in nature (ending with completion of the facility). Potential impacts to transportation/circulation would not be significant.

**b) Hazards to safety from design features (e.g. sharp curves or dangerous intersections) or incompatible uses (e.g. farm equipment)?**

No Impact: See discussion above.

**c) Inadequate emergency access or access to nearby uses?**

No Impact: See discussion above.

**d) Insufficient parking capacity on-site or off-site?**

No Impact: See discussion above.

**e) Hazards or barriers for pedestrians or bicyclists?**

No Impact: See discussion above.

- f) **Conflicts with adopted policies supporting alternative transportation (e.g. bus turnouts, bicycle racks)?**

No Impact: See discussion above.

- g) **Rail, waterborne or air traffic impacts?**

No Impact: See discussion above.

**4.7 Biological Resources. Would the proposal result in impacts to:**

- a) **Endangered, threatened or rare species or their habitats (including but not limited to plants, fish, insects, animals, and birds)?**

No Impact: The project area has historically been utilized for the recovery of petroleum hydrocarbons and has been subject to at least 20 years of oil-related activities. The proposed project would not require the alteration of existing topography or vegetation and is not expected to affect endangered, threatened, or rare species or their habitats. Therefore no impacts to biological resources would occur with project implementation.

- b) **Locally designated species (e.g. heritage trees)?**

No Impact: See discussion above. The City's Oil Code requires each CUP site to have adequate landscaping, including use of trees.

- c) **Locally designated natural communities (e.g. oak forest, coastal habitat, etc.)?**

No Impact: See discussion above.

- d) **Wetland Habitat (e.g., marsh, riparian and vernal pools)?**

No Impact: See discussion above.

- e) **Wildlife dispersal or migration corridors?**

No Impact: See discussion above.

**4.8 Energy and Mineral Resources. Would the proposal result in impacts to:**

- a) **Conflict with adopted energy conservation plans?**

Less Than Significant Impact: Operations associated with the proposed project would not result in an additional energy demand above and beyond the existing rate of consumption. Facilities would be subject to applicable energy performance requirements that the City follows and implements.

Proposed Gas Processing Facility: The proposed gas processing facility would use two 150 hp electric motors. Power is already supplied to the site. This facility would be consistent with all adopted City planning documents and would result in a reduction of energy consumption.

b) **Use non-renewable resources in a wasteful and inefficient manner?**

Less Than Significant Impact: See discussion above.

c) **Results in the loss of availability of a known mineral resource that would be of future value to the region and the residents of the state?**

Less Than Significant Impact: The proposed project would allow for the continuing operation of oil production/recovery related activities already present within the City of Signal Hill. These operations have been active for over 75 years and are an important part of the region's petroleum resource recovery operations.

**4.9 Hazards. Would the proposal result in impacts to:**

a) **A risk of accidental explosion or release of hazardous substances (including but not limited to oil, pesticides, chemicals, asbestos or radiation)?**

Potentially Significant Unless Mitigated: The proposed CUP application package includes information demonstrating anticipated compliance with applicable hazardous materials rules and regulations. SHP shall also provide an Emergency Response Plan as required by the Fire Department addressing spill, fire, and explosion hazards, and relative risk of upset to adjacent land uses. Risks typically associated with oil production, treatment, storage and distribution facilities include, mechanical failure, operator error and accidents. In the event of a major storm occurrence or earthquake, project facilities would have the potential risk of being damaged and releasing hazardous materials. However, with implementation of standard design features, incorporation of standard engineering practices, adherence to regulatory standards regarding the handling of hazardous materials and waste, and the limited amounts and type of hazardous materials anticipated to be used and stored within the improvements at any one time, potential impacts would be reduced to less than significant levels.

Proposed Gas Processing Facility: Implementation of the proposed gas processing facility would result in the remote possibility for explosions. Gas-producing equipment would be installed with automatic shut-down devices as well as instrumentation to detect explosion levels in the gas stream. New facility system piping would be installed and portions of the system would be under vacuum pressure, which precludes leakage into the atmosphere and the chance for explosion. The piping system would be constructed with minimal screwed and flange connections to minimize leakage. This facility has already received a permit from the Long Beach City Fire Department, and is a substantial

improvement over conditions at the existing facility. Therefore, the risk is reduced to less than significant.

**b) Possible interference with an emergency response plan or emergency evacuation plan?**

*Less Than Significant Impact:* The proposed project would need to submit a revised Emergency Response Plan, as required by the Fire Department, addressing spill, fire, and explosion hazards, and relative risk of upset to adjacent land uses to include the gas processing facility.

**c) The creation of any health hazard or potential health hazard?**

*Potentially Significant Unless Mitigated:* Improvements and the long-term operation of the proposed facilities could cause potential health hazards. However, worker safety would be subject to requirements of Cal OSHA. Operation of the facilities shall comply with applicable Federal, State and County regulations, in addition to measures imposed by the City of Signal Hill and local agencies in order to reduce potential health hazards to less significant levels.

**d) Exposure of people to existing sources of potential health hazards?**

*Potentially Significant Unless Mitigated:* While present technology has minimized many serious hazards associated with drilling, production, and storage such as blow-outs, there are a number of potential hazards associated with oil-related activities within a rapidly urbanizing area such as Signal Hill. These potential hazards include: Noise, aesthetics, hazardous abandon wells and sumps, oil spills, potential fire hazards and explosion, and construction and servicing hazards. As previously discussed, compliance with applicable Federal, State and County regulations, in addition to measures imposed by the City of Signal Hill and local agencies would reduce potential health hazards to less than significant levels. See to discussions above.

**e) Increased fire hazards in areas with flammable brush, grass or trees?**

*No Impact:* Given the developed nature of the facilities, implementation of the proposed project would not result an increased fire hazard in areas of flammable brush, grass or trees.

**4.10 Noise. Would the proposal result in impacts to:**

**a) Increases in existing noise levels?**

*Less Than Significant Impact:* The proposed project involves oil production sites that are currently established and operating. Hours of operation for all CUP facilities conform to the City Oil Code (Title 16). As project implementation would not produce any changes from existing conditions and would be subject to provision within the City's

Noise Ordinance, potential impacts to noise levels are considered to be less than significant.

Proposed Gas Processing Facility: During construction of the proposed gas processing facility, noise would be generated by the transport of workers and equipment to the construction site, as well as site grading and construction activities. However, construction-related noise would only be a temporary nuisance which would cease with project completion. The limited size of the project (7,000 square feet) and compliance with the City's hours of construction, would reduce potential noise impacts to less than significant levels.

The proposed gas processing facility is anticipated to operate at noise levels of less than 70 dB at the property line. Consistent with Signal Hill Municipal Code Chapter 9.16, "Noise", Standards for Industrial Areas, a noise reading will be taken after installation to confirm compliance with City Standards. A mitigation measure has been included to ensure compliance if the noise reading does not confirm compliance.

b) **Exposure of people to severe noise levels?**

Less Than Significant Impact: See discussion above.

4.11 **Public Services.** *Would the proposal result in impacts to:*

a) **Fire protection?**

No Impact: The proposed project would not place a significant additional demand on fire services.

b) **Police Department?**

No Impact: The proposed project would not place a significant additional demand on police services.

c) **Schools?**

No Impact: The proposed project would not generate students either directly or indirectly and would, therefore, not create significant impacts to school services.

d) **Maintenance of public facilities including roads?**

No Impact: The streets and highways are adequately designed for the limited quantity of traffic and the vehicle loads generated by the on-going use of the CUP sites (detailed traffic information is provided in the CUP application package). Therefore the proposed project would not result in adverse impacts to public facilities, including roads.

e) **Other governmental services?**

No Impact: No increase to governmental services beyond current services (inspection and emergency response teams) are anticipated to be required as a result of the proposed project. Therefore, the project is not expected to result in significant impacts in this regard.

4.12 **Utilities and Service Systems.** *Would the proposal result in impacts to:*

a) **Power or natural gas?**

No Impact: Due to the nature of the proposed project, no additional power or natural gas services would be required; therefore, impacts in this regard are not anticipated.

Proposed Gas Processing Facility: The proposed gas processing facility would operate on electricity and would therefore create an additional demand. On-site equipment is sufficient to handle the minor increase in electrical consumption. SCE, the electricity provider for the City of Signal Hill, has indicated that it has the capacity for the project-related demand. Therefore, the slight increase in energy consumption would not be considered significant.

b) **Communications systems?**

No Impact: Due to the nature of the proposed project, no additional communications systems would be required; therefore, potential impacts in this regard are not anticipated.

c) **Local or regional water treatment or distribution?**

No Impact: The proposed Conditional Use Permit would not result in impacts to local or regional water treatment or distribution systems, as no change in water demand or wastewater generation is expected due to similar operations at each CUP site.

d) **Sewer or septic tanks?**

No Impact: The proposed would not alter the existing sewer services as it does not involve improvements to the water supply storage and distribution system.

e) **Storm water drainage?**

No Impact: The proposed project would not result in the alteration of the existing storm water drainage system.

f) **Solid waste disposal?**

*No Impact:* Due to the nature of the proposed project, no additional solid waste disposal would be required; therefore, potential impacts in this regard are not anticipated.

g) **Local or regional water supplier?**

*Less Than Significant Impact:* The City of Signal Hill Water Department operates the City's water system and supplies water to all users in the City. As the proposed project would not result in an increase in water consumption beyond existing conditions, potential impacts to the water supplier would not be considered significant.

4.13 **Aesthetics.** *Would the proposal result in impacts to:*

a) **Affect a scenic vista or scenic highway?**

*Less Than Significant Impact:* Site No. 4 and Site No. 5 are visible from designated trails. However, the sites are landscaped around the exterior, which adequately reduces the impact to less than significant.

b) **Have a demonstrable negative aesthetic effect?**

*Less Than Significant Impact:* The overall aesthetic quality of the facilities is considered to be low due to its history of petroleum-related activities. Most of these sites are at least partially screened from public view due to existing topography and landscaping. The sites include landscaping and fences pursuant to the City Oil Code. The overall aesthetic quality of the facilities are anticipated to remain the same under the proposed project resulting in no impacts to aesthetics.

*Proposed Gas Processing Facility:* This facility would consist of general operational equipment measuring 10 feet in height, a single 12 inch diameter stabilizer measuring 34 feet high, in addition to a six foot high masonry wall and landscaping to provide adequate screening of the proposed facility. Since the facility is in an industrial area, the impact is deemed less than significant.

c) **Create light or glare?**

*Potentially Significant Unless Mitigated:* The proposed project would allow for the continuing operation of oil production/recovery related activities already present within the City of Signal Hill. These operations have been active for over 75 years and are an important part of the region's petroleum resource recovery operations. In addition, the CUP Sites will comply with the City's Oil Code and site design standards as set forth in the CUP conditions of approval. A mitigation measure has been added to reduce the impact of the light and glare from the sites.

**4.14 Cultural Resources.** *Would the proposal result in impacts to:*

**a) Disturb Paleontological resources?**

*No Impact:* The proposed project would not result in impacts to paleontological resources, as no substantial site grading is proposed.

**b) Disturb archaeological resources?**

*No Impact:* The proposed project would not result in impacts to archaeological resources, as no substantial site grading is proposed.

**c) Affect historical resources?**

*No Impact:* The proposed project would not result in impacts to historical resources, as no such resources are within the CUP site boundaries.

**d) Have the potential to cause a physical change which would affect unique ethnic cultural values?**

*No Impact:* As the CUP sites would not be changing operations, there is no known potential to affect unique ethnic cultural values .

**e) Restrict existing religious or sacred uses within the potential impact area?**

*No Impact:* No known religious or sacred uses occur within the project site or project vicinity. Therefore, no impacts are anticipated.

**4.15 Recreation.** *Would the proposal result in impacts to:*

**a) Increase the demand for neighborhood or regional parks or other recreational facilities?**

*No Impact:* Due to the industrial nature of the proposed project and developed nature of the CUP sites, the demand for neighborhood or regional parks or other recreational facilities would not be impacted.

**b) Affect existing recreational opportunities?**

*No Impact:* The proposed project would not impact any existing recreational opportunities.

**4.16 Mandatory Findings of Significance.**

**a) Does the proposal have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife**

population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

*No Impact:* Implementation of the proposed project would not have the potential to significantly alter the quality of the environment or to substantially reduce the habitat of a fish or wildlife species, due to the highly disturbed nature of the CUP sites. In addition, the project would not cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of California history or pre-history.

- b) **Does the project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals?**

*No Impact:* The proposed project is not considered to have the potential to achieve short-term goals to the disadvantage of long-term goals, as a primary objective of the project is to allow continued operation of petroleum recovery activities, which is consistent with City and federal resource recovery plans.

- c) **Does the proposal have impacts that are individually limited, but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a development are considerable when viewed in connection with the effects of past developments, the effects of other current development, and the effects of probable future development.)**

*Less Than Significant Impact:* The proposed project would not result in significant local and/or regional cumulative effects, as the CUP sites are not proposed for any substantial change in operations, other than a change in Signal Hill Petroleum’s natural gas processing facility. Potential future redevelopment of the existing natural gas facility site, which could be abandoned with approval of this project, is within the jurisdiction of the City of Long Beach, and would require separate CEQA review.

- d) **Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?**

*Less Than Significant Impact:* The proposed project would not be anticipated to produce environmental impacts which would cause significant adverse effects upon human beings, following implementation of the required mitigation measures set forth in Section 6.0, Mitigation Measures.

## 5.0 DETERMINATION

On the basis of this initial evaluation:

I find that the proposed use COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared. \_\_\_\_\_

I find that although the proposal could have a significant effect on the environment, there will not be a significant effect in this case because the mitigation measures described on an attached sheet have been added. A NEGATIVE DECLARATION will be prepared. ✓

I find that the proposal MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required. \_\_\_\_\_

I find that the proposal MAY have a significant effect(s) on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets, if the effect is a “potentially significant impact” or “potentially significant unless mitigated.” An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed. \_\_\_\_\_

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

Scott Charney  
Senior Planner

## 6.0 MITIGATION MEASURES

The following mitigation measures have been required for the Signal Hill Petroleum CUP project, and will be reflected in Conditions of Approval. It should be noted that these measures may be modified following the public review period, and that additional project conditions may be imposed by City staff.

### GEOPHYSICAL

#### Seismicity

- #1a. A structural engineer, civil engineer or architect, experienced with earthquake-resistant design, shall sign off on all building plans to determine the adequacy of seismic criteria for project structures, and to ensure incorporation of necessary design changes, prior to issuance of building permits.
- #1b. Prior to issuance of building permit(s), the Building Official shall review and approve all building plans to ensure compliance with the Uniform Building Code as adopted by the City of Signal Hill.

#### Erosion

- #1c. All site preparation and operation shall be in compliance with the City's grading and paving standards (no further mitigation is required).

### WATER QUALITY

None required.

### AIR QUALITY

#### Short-Term Construction

- #2. In order to reduce fugitive dust emissions, the following measures shall be implemented during construction of the proposed natural gas processing facility to the satisfaction of the City Engineering Services Department.
  - a. The project shall comply with State, City, and UBC dust control regulations, so as to prevent the soil from being eroded by wind, creating dust, or blowing onto a public road or roads or other public or private property.
  - b. Adequate watering techniques shall be employed to partially mitigate the impact of construction-generated dust particulates. Unpaved construction roads shall be watered at least two times a day.

- c. SCAQMD Rule 403, as amended, shall be adhered to, ensuring the cleanup of the construction-related dirt on approach routes to the site, and the application of water and/or chemical dust retardants that solidify loose soils shall be implemented for construction vehicle access, as directed by the City Engineer. This shall include covering, watering or otherwise stabilizing all inactive soils piles (left more than 10 days) and inactive graded areas (left more than 10 days).

### **Long-Term Operation**

- #3. Prior to approval of the proposed project, the applicant shall demonstrate SCAQMD compliance or provide Agency staff with a copy of the preliminary application for an SCAQMD operating permit. Upon issuance of the CUP, the applicant shall provide evidence of issuance of a SCAQMD operating permit.

### **HAZARDS**

- #4a. Prior to CUP approval SHP shall demonstrate compliance with applicable hazardous materials rules and regulations, to include, at minimum, an Emergency Response Plan as required by the Fire Department addressing spill, fire, and explosion hazards, and relative risk of upset to adjacent land uses.

### **NOISE**

#### **Short-Term Construction**

- #5a. Construction activities shall comply with City of Signal Hill Noise Ordinance Section 9.16.050 relating to construction noise. Construction is permitted only between the hours of 7:00 a.m. to 6:00 p.m. Monday through Friday.
- #5b. All construction equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers, to the satisfaction of the City Inspector.
- #5c. Stationary construction equipment shall be placed such that emitted noise is directed away from sensitive noise receivers, to the satisfaction of the City Inspector.

#### **Long-Term Operation**

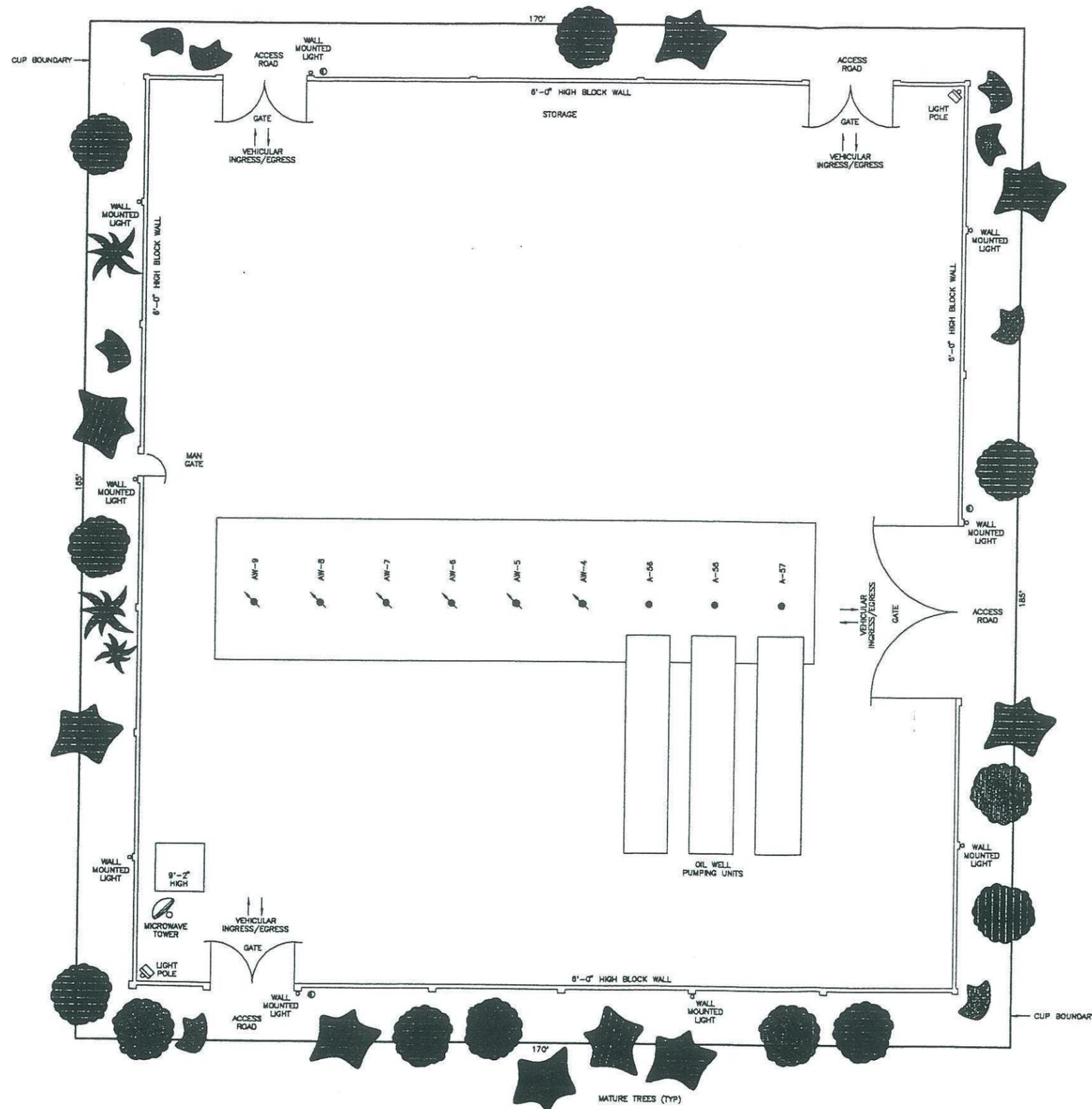
- #5d. Within thirty (30) days of installation of the gas processing facility at Site No. 2, the operator shall measure the noise at the property line and submit said readings to the Planning Director for review. The Planning Director shall require the construction of sound barriers around the facility or any other mitigation both feasible and appropriate, should the gas processing equipment not meet noise standards found in Signal Hill Municipal Code Chapter 9.16, entitled "Noise", for industrial areas.

- 5e. All servicing, reworking and redrilling at the CUP sites shall comply with Section 9.16.070 of the Signal Hill Municipal Code.

**AESTHETICS**

- #6. CUP site landscaping shall comply with the landscaping concept as shown on the site plans and conditions of approval for additional landscape enhancement and maintenance requirements.





**SIGN LEGEND**

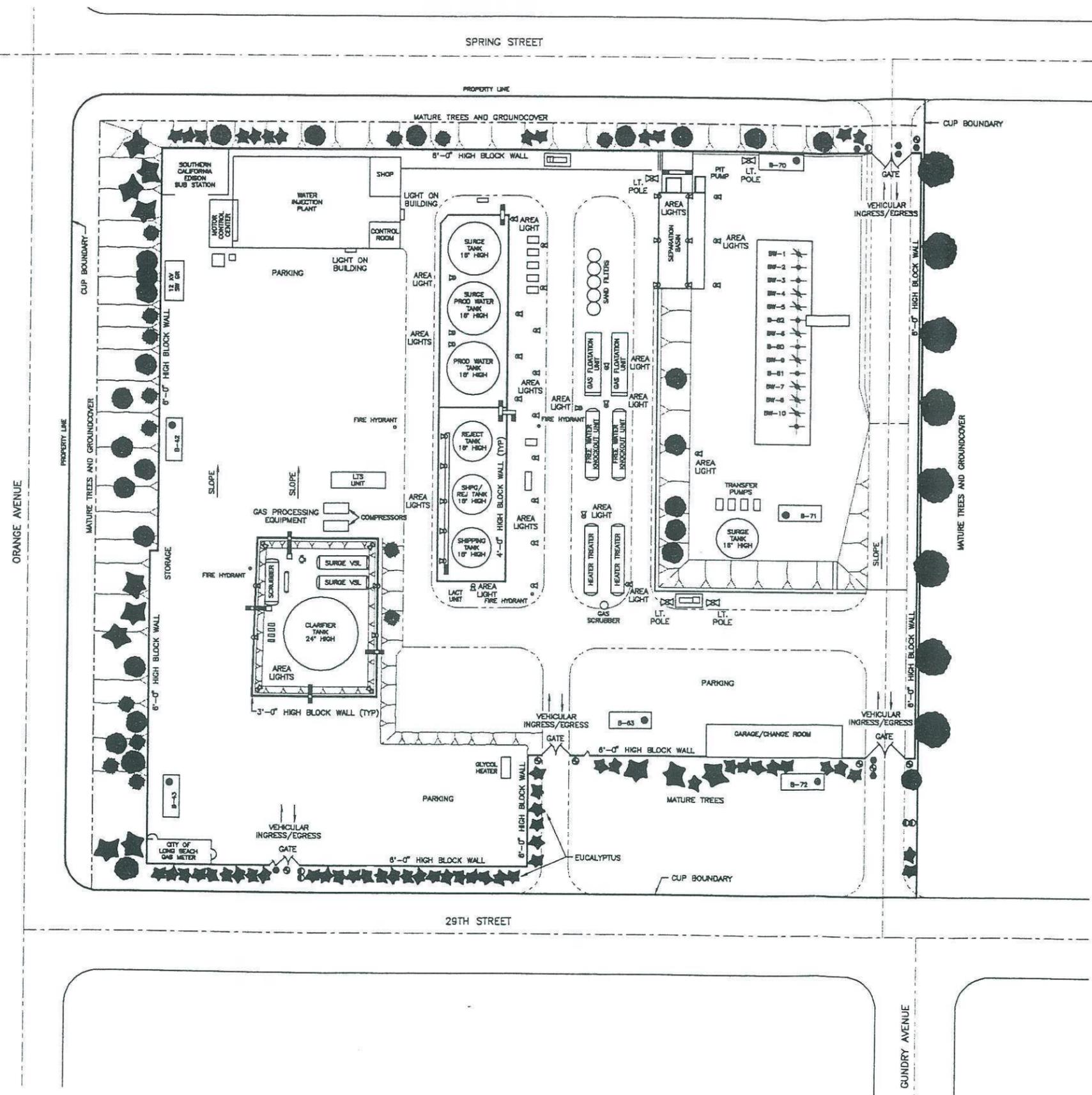
- ⊙ 12" X 30" SITE IDENTIFICATION SINGLE SIDED

**WELL LEGEND**

- OIL WELL
- ⊙ WATER INJECTION WELL
- ⊙ OPEN CONDUCTOR (FUTURE WELL)

 Not to Scale





**NOTES**

- 1. ALL VEHICULAR ACCESS AREAS PAVED WITH ASPHALT CONCRETE.

**SIGN LEGEND**

- ⊙ 24" X 45" WARNING SINGLE SIDED
- ⊙ 12" X 30" SITE IDENTIFICATION SINGLE SIDED
- 21" X 17" WARNING SINGLE SIDED
- ▲ 24" X 30" WARNING SINGLE SIDED
- 10" X 12" NOTICE SINGLE SIDED

**WELL LEGEND**

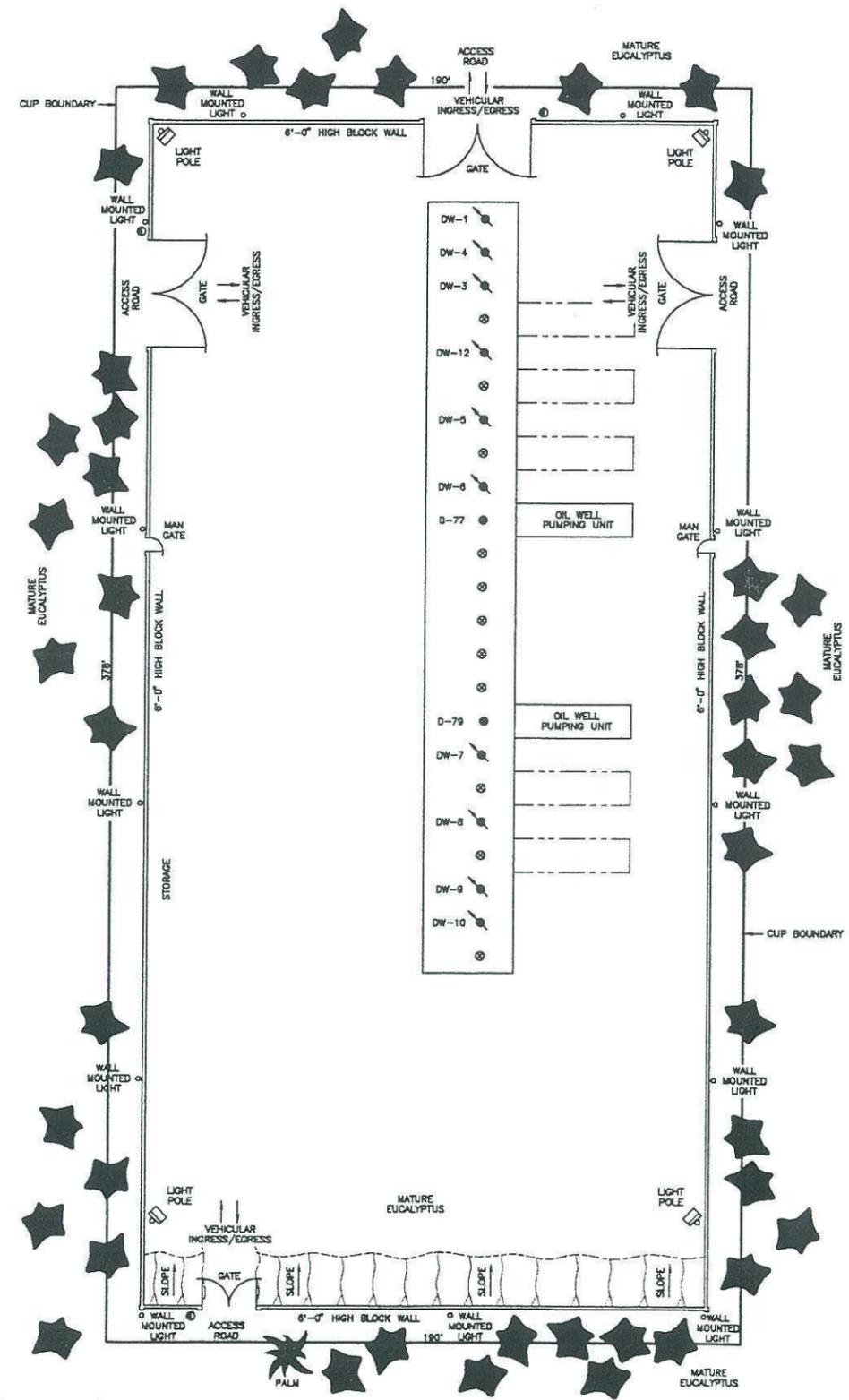
- OIL WELL
- ⊙ WATER INJECTION WELL
- ⊙ OPEN CONDUCTOR (FUTURE WELL)

Not to Scale



TERMINATION OF GAVOTA AVENUE

TERMINATION OF ROSE AVENUE



**SIGN LEGEND**

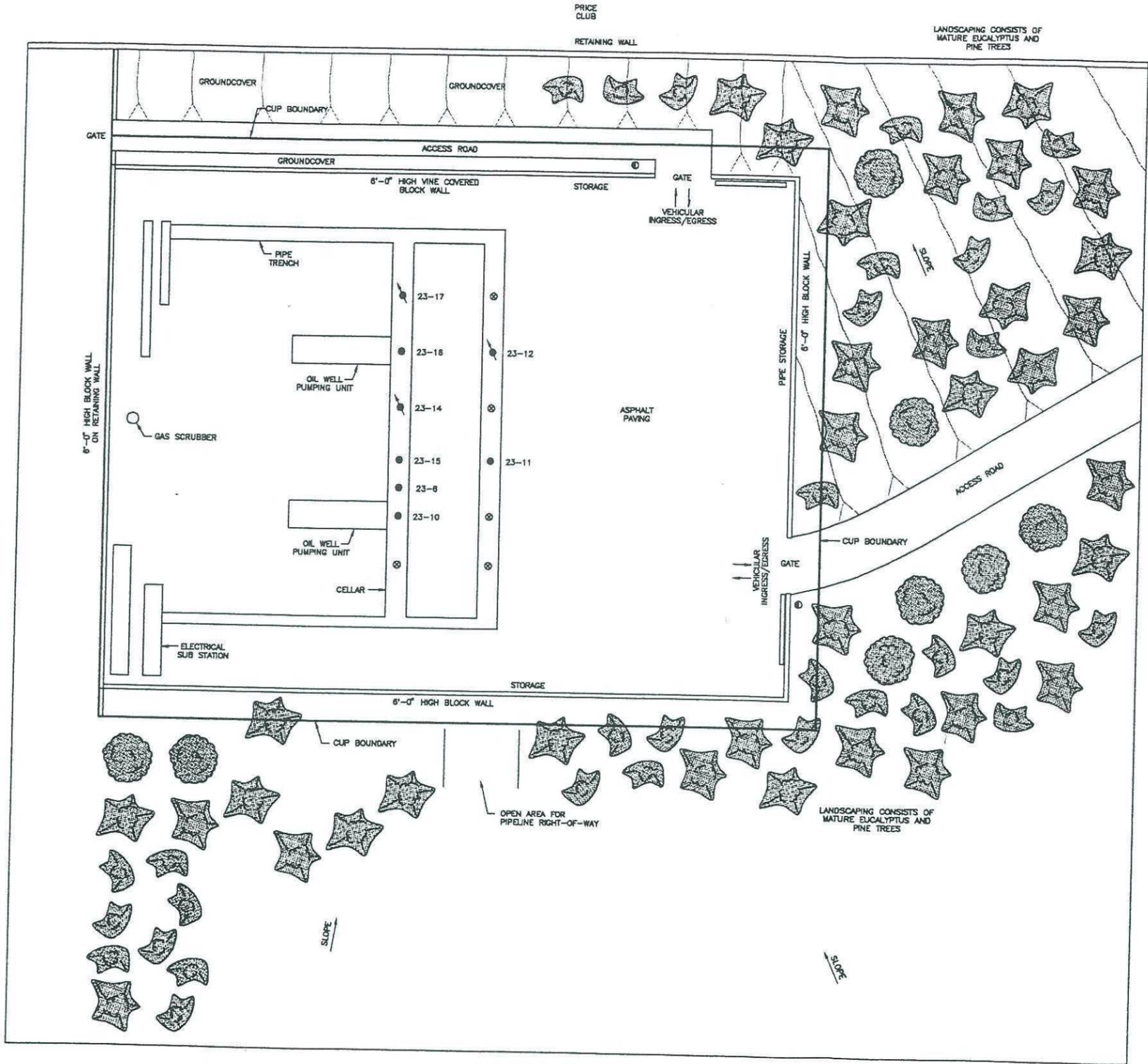
- 12" X 30" SITE IDENTIFICATION SINGLE SIDED

**WELL LEGEND**

- OIL WELL
- ◌ WATER INJECTION WELL
- ⊙ OPEN CONDUCTOR (FUTURE WELL)

Not to Scale





**SIGN LEGEND**

- ⊙ 12" X 30" SITE IDENTIFICATION SINGLE SIDED

**WELL LEGEND**

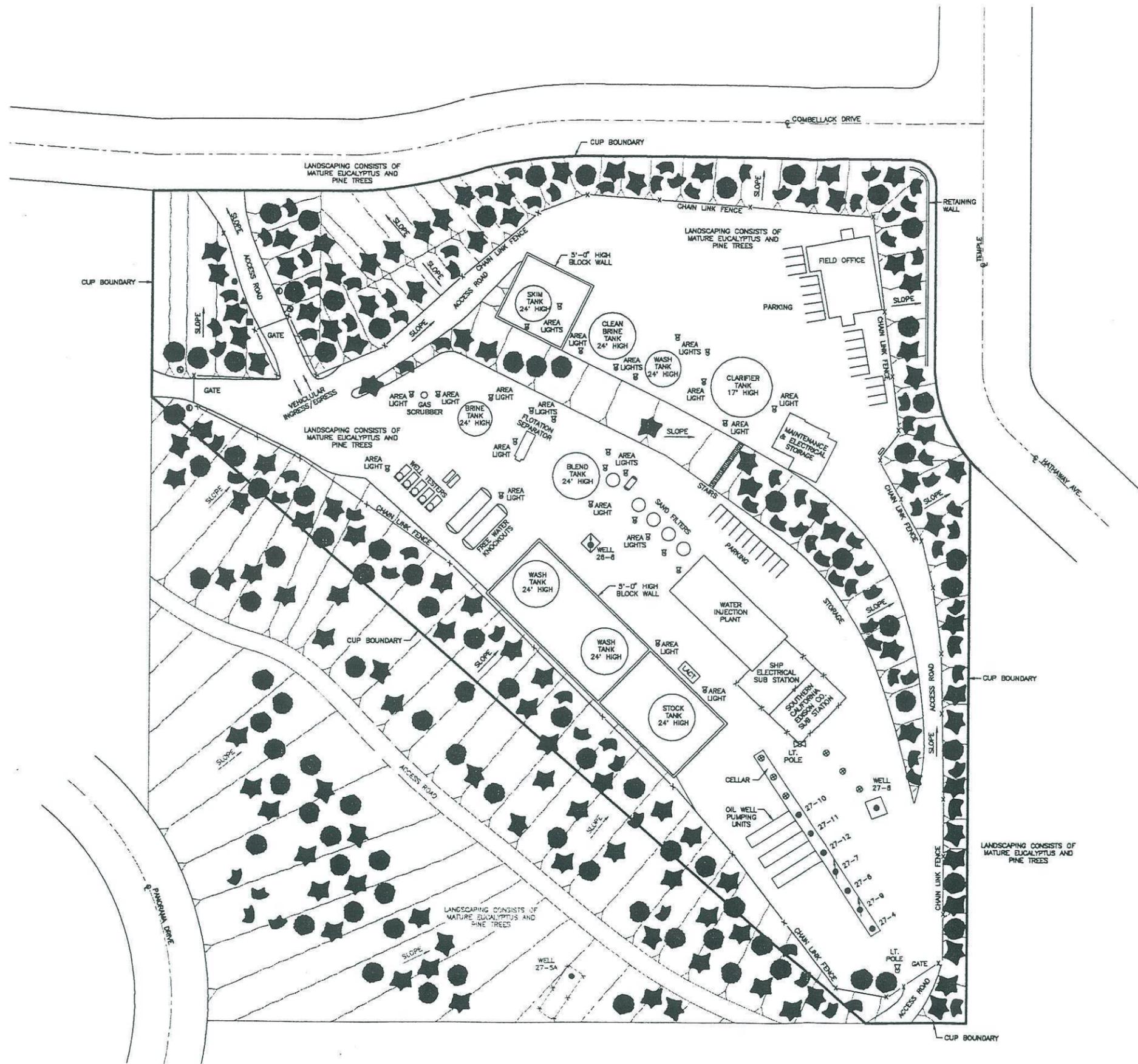
- OIL WELL
- ⊙ WATER INJECTION WELL
- ⊙ OPEN CONDUCTOR (FUTURE WELL)

**NOTES**

1. ALL VEHICULAR ACCESS AREAS PAVED WITH ASPHALT CONCRETE.

Not to Scale





**NOTES**

1. ALL VEHICULAR ACCESS AREAS PAVED WITH ASPHALT CONCRETE.
2. ALL CHAIN LINK FENCE IS SIX (6) FEET HIGH WITH THREE (3) STRANDS OF BARBED WIRE.

**SIGN LEGEND**

- ⊙ 24" X 45" WARNING SINGLE SIDED
- ⊙ 12" X 30" SITE IDENTIFICATION SINGLE SIDED
- 21" X 17" WARNING SINGLE SIDED
- ▲ 24" X 30" WARNING SINGLE SIDED
- ⊙ 10" X 12" NOTICE SINGLE SIDED

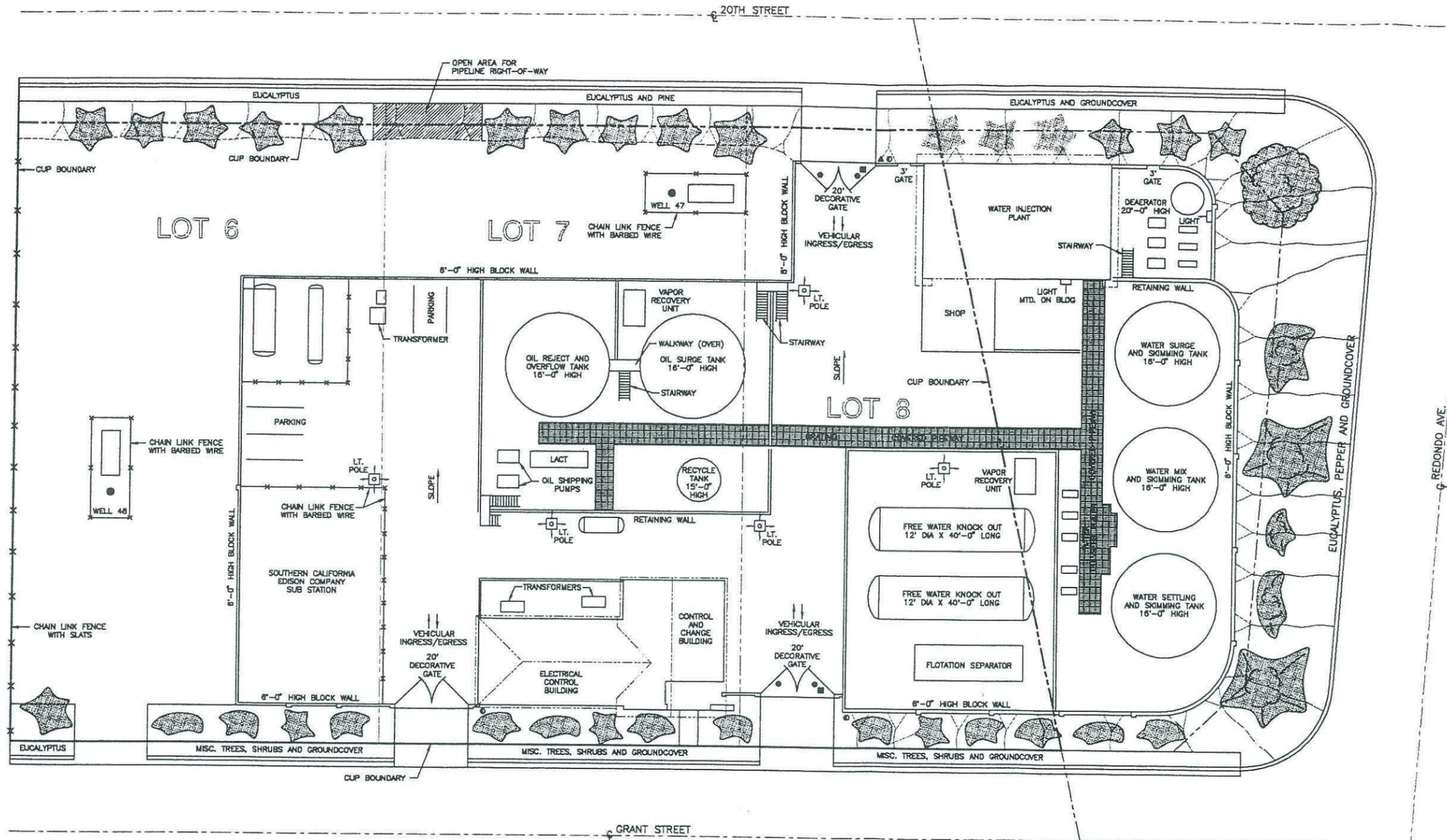
**WELL LEGEND**

- OIL WELL
- ⊙ WATER INJECTION WELL
- ⊙ OPEN CONDUCTOR (FUTURE WELL)



Not to Scale





**NOTES**

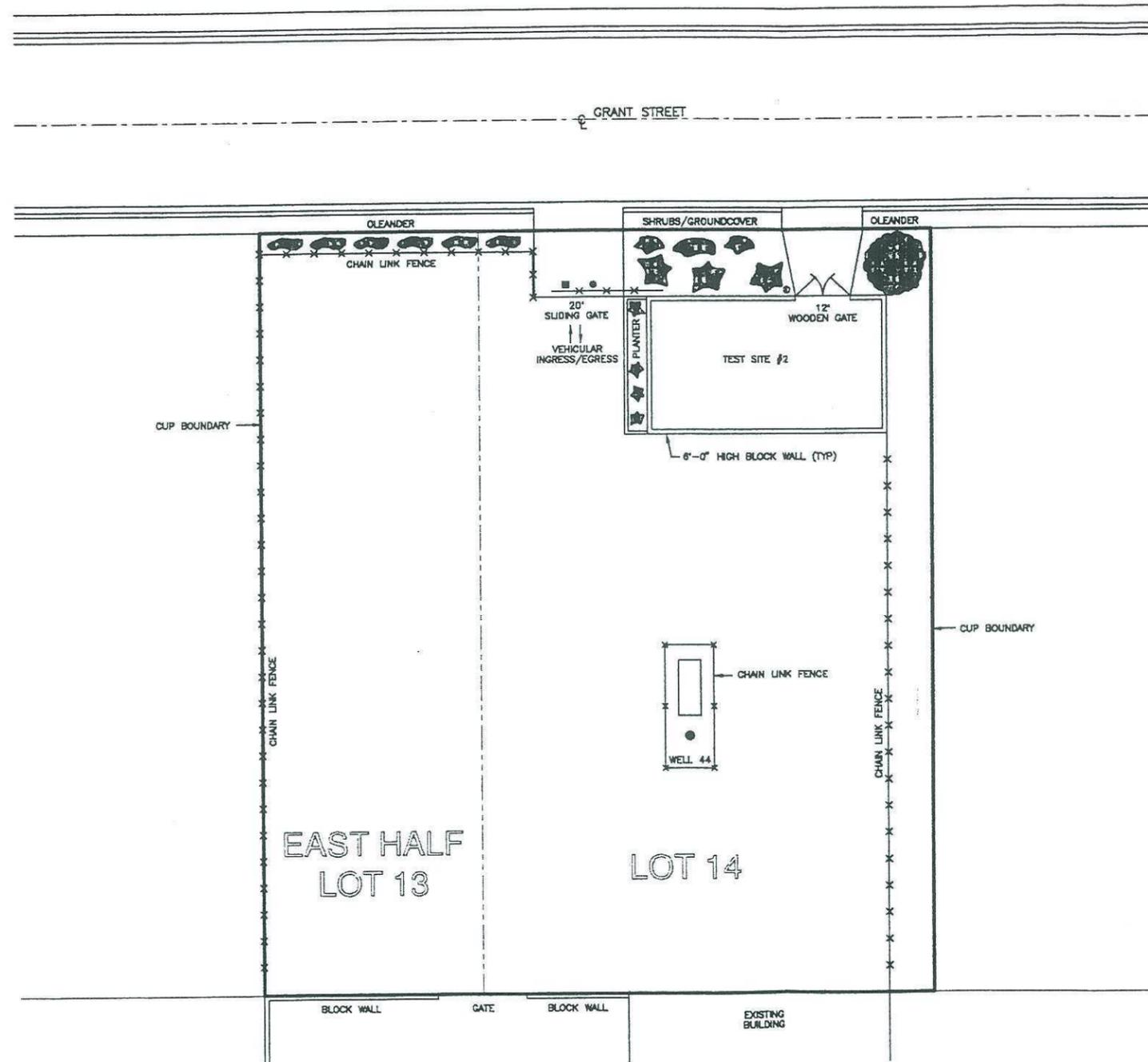
1. ALL VEHICULAR ACCESS AREAS PAVED WITH ASPHALT CONCRETE.

**SIGN LEGEND**

- 30" X 18" WARNING SINGLE SIDED
- 12" X 30" SITE IDENTIFICATION SINGLE SIDED
- 12" X 18" WARNING SINGLE SIDED
- ▲ 10" X 10" WARNING SINGLE SIDED

Not to Scale





**NOTES**

1. ALL VEHICULAR ACCESS AREAS PAVED WITH ASPHALT CONCRETE.
2. ALL CHAIN LINK FENCE IS SIX (6) FEET HIGH WITH THREE (3) STRANDS OF BARBED WIRE AND WOOD SLATS.

**SIGN LEGEND**

- 30" X 18" WARNING SINGLE SIDED
- 12" X 30" SITE IDENTIFICATION SINGLE SIDED
- 12" X 18" WARNING SINGLE SIDED
- ▲ 10" X 10" WARNING SINGLE SIDED



Not to Scale



**Appendix B**  
**SCAQMD Permit Application**  
**(February 2014)**



**AQMD PERMIT APPLICATION PACKAGE**  
**SIGNAL HILL PETROLEUM, INC. – FACILITY ID 101977**  
**MODIFICATIONS TO GAS PROCESSING PLANT**

**COMPANY NAME AND MAILING ADDRESS:**

Signal Hill Petroleum, Inc.  
2633 Cherry Avenue  
Signal Hill, CA 90755

**EQUIPMENT LOCATION ADDRESS:**

1215 E. 29<sup>th</sup> Street  
Signal Hill, CA 90755

**BACKGROUND:**

Signal Hill Petroleum, Inc. (SHP), operates approximately 200 active oil production wells in the Long Beach / Signal Hill area. SHP also operates several processing facilities that process the crude oil, associated gas, and water produced from these wells. The two largest of these processing facilities are: Signal Hill West Unit (SHWU, ID 101977) and Signal Hill Central Unit (SHCU, ID 045086). The SHWU facility (see annotated aerial photo in Appendix 8) includes a gas processing plant that processes (i.e., removes liquids from) the produced gas from most of SHP's wells in the area as well as produced gas from wells operated by third parties. The gas plant was originally constructed in 2000 as a replacement for an aging plant at a nearby location. The plant was modified in 2008 by adding additional compression capacity at the inlet to the plant. The gas exiting the gas processing facility currently cannot be sold to a third party, primarily because of naturally occurring CO<sub>2</sub> in the gas (which is not removed by the existing gas processing facility). Instead, a combustion turbine (Device D115) at the facility uses 100% of the processed gas as fuel to generate electricity for use within SHP's operations.

Due to various improvements being made to the gas gathering system serving the SHWU gas processing plant and to the third party facilities which it serves, the volume of gas processed at the SHWU gas processing plant is increasing. The existing gas processing plant and the combustion turbine are currently operating near capacity. Thus, modifications to the existing gas processing plant are necessary to process (i.e., remove CO<sub>2</sub> from) the produced gas to meet specifications to sell excess gas that cannot be used as fuel in the combustion turbine. The proposed modifications will also enable the field gathering system to operate at a lower pressure, which will improve the gas plant's ability to reliably perform its function as the vapor recovery / control system for SHP and third party oil wells and processing facilities in the area. In addition, the proposed modifications will enable the gas plant to continue operating (at less than full capacity) even when the combustion turbine is out of service (e.g., for maintenance) because it will be possible to sell processed gas. This, again, improves the reliability of the gas plant as a vapor recovery / control system for SHP and third party oil wells and facilities. Finally, the proposed modifications will enable SHP to deliver pipeline quality gas to the local gas distribution system.

**PROPOSAL:**

The proposed modifications to SHP's existing gas processing plant are to:

- (1) modify the existing vapor recovery system by adding additional compression capacity;
- (2) modify the existing natural gas dehydration (LTS) system by upgrading the propane refrigeration and glycol dehydration equipment; and
- (3) add a new CO<sub>2</sub> filtration system.

The application forms required to permit these changes are included in Appendix 1.

**AQMD PERMIT APPLICATION PACKAGE**  
**SIGNAL HILL PETROLEUM, INC. – FACILITY ID 101977**  
**MODIFICATIONS TO GAS PROCESSING PLANT**

**PROPOSED EQUIPMENT DESCRIPTIONS AND PERMIT CONDITIONS:**

Proposed equipment descriptions and permit conditions are presented in Appendix 2. As discussed with District staff during a meeting on October 10, 2013, the information in Appendix 2 also reflects changes requested to the facility permit issued March 27, 2009, via:

- Letter from Mr. Jim Lee to Mr. Chandra Bhatt dated April 21, 2009;
- Letter from Mr. Jim Lee to Mr. Chandra Bhatt dated March 17, 2010;
- Letter from Mr. Milan Steube to Mr. Hamilton Stoddard dated January 17, 2013; and
- A/N 512158 submitted by SHP in June 2010 requesting revisions to Permit Condition F30.1 (exempting the facility from the requirements of Title V) and a new Permit Condition (to exempt the facility from the requirements of Rule 1178).

Copies of the April 21, 2009, March 17, 2010, and January 17, 2013, letters are also included in Appendix 2.

**FEES FOR PERMIT PROCESSING:**

In accordance with Rule 301, a check is enclosed for permit processing fees as follows:

• Modify Vapor Recovery System (Schedule D)	\$ 4,842.82
• Modify Natural Gas Dehydration System (Schedule C)	\$ 3,508.86
• Add new CO <sub>2</sub> Removal/Filtration System (Schedule C)	\$ 3,508.86
Subtotal – Base Processing Fees	\$ 11,860.54
• Expedited Processing per Rule 301(v) (50% of base processing fees)	\$ 5,930.27
• Amend RECLAIM Facility Permit (per Rule 301(l)(5))	\$ 912.44
<b>Total</b>	<b>\$ 18,703.25</b>

# ***AQMD PERMIT APPLICATION PACKAGE***

**SIGNAL HILL PETROLEUM, INC. – FACILITY ID 101977**

**MODIFICATIONS TO GAS PROCESSING PLANT**

## **EMISSIONS - CRITERIA POLLUTANTS (VOC, NOX, SOX, CO, PM10)**

The only emissions of criteria pollutants associated with the project are fugitive emissions from component leaks. Incremental criteria emissions from fugitive components (i.e., the net increase in fugitive components) were determined in accordance with methodology prescribed by the District for oil and gas production facilities. This methodology utilizes Rule 1173 screening data from the prior eight calendar quarters to calculate site-specific emission factors by component category (i.e., the highest weighted average leaking / non-leaking factor in any one quarter). These factors are then multiplied by a factor of 1.2 and by the incremental component counts associated with the project to determine incremental fugitive emissions by permit unit. Representative gas analytical data for the facility is used to convert the incremental fugitive emissions from TOG to VOC. Rule 1173 screening data and gas analytical data associated with the gas processing plant portion of SHP's SHWU facility (ID 101977) were used. Details are included in Appendix 3 (with supporting data in Appendix 8).

## **EMISSIONS - TOXIC AIR CONTAMINANTS (TAC)**

The proposed project will result in changes to emissions of toxic air contaminants (TACs) in a manner consistent with changes in criteria emissions. TAC emissions from fugitive components (i.e., the net increase in fugitive components) were determined using criteria fugitive emissions calculated as described above and TAC concentrations in the SHWU facility produced gas based on a recent representative sample. Details are included in Appendix 4.

## **HEALTH RISK:**

The health risks associated with increased TAC emissions from the project were determined for each permit unit in accordance with the District's "Risk Assessment Procedures for Rules 1401 and 212, Version 7.0, July 1, 2005." Tier 3 analyses were required to demonstrate compliance with Rule 1401 for all three permit units. Details are included in Appendix 5.

# ***AQMD PERMIT APPLICATION PACKAGE***

**SIGNAL HILL PETROLEUM, INC. – FACILITY ID 101977**

**MODIFICATIONS TO GAS PROCESSING PLANT**

## **REGULATORY ANALYSIS:**

### **Rules 201 and 203 – Permit to Construct and Permit to Operate**

These rules require a permit to construct, modify, alter, replace or operate equipment that may cause the issuance of air contaminants. This application package is being submitted to comply with these requirements.

### **Rule 212 – Standards for Approving Permits and Issuing Public Notice**

Generally, this rule requires notification of the public when there is:

1. an increase in emissions of air contaminants from a new or modified permit that is located within 1000 feet of a school,
2. an increase in emissions of air contaminants from a new or modified facility that exceeds threshold amounts stated in the rule, or
3. an increase in emissions of toxic air contaminants from a new or modified permit unit that causes the incremental maximum individual cancer risk (MICR) to be greater than or equal to one in one million or causes the permit unit to create a potential risk of nuisance.

The facility is not be located within 1000 feet of a school, the emissions increases associated with the project do not exceed the threshold amounts stated in the rule, and the MICR for each new or modified permit unit is less than one in one million. And, because the system is expected to operate in compliance with all applicable regulatory requirements, there is not likely to be a risk of nuisance. Thus, notification of the public is not required.

### **Rule 301 – Permit Fees**

See the above “Fees for Permit Processing” section of this document.

### **Rule 401 – Visible Emissions**

This rule prohibits the discharge of emissions for more than three minutes that are as dark or darker than Ringelmann 1. No visible emissions are expected during normal operations.

### **Rule 402 – Nuisance**

This rule prohibits the discharge of air contaminants in amounts that cause a public nuisance. During normal operations, none of the equipment items affected by this project are expected to discharge air contaminants in amounts that might create a public nuisance.

# ***AQMD PERMIT APPLICATION PACKAGE***

**SIGNAL HILL PETROLEUM, INC. – FACILITY ID 101977**

**MODIFICATIONS TO GAS PROCESSING PLANT**

## **Rule 403 – Fugitive Dust**

This rule prohibits (a) visible fugitive dust beyond the property line, (b) fugitive dust created by a vehicle that exceeds 20% opacity, and (c) track-out that extends more than 25 feet from an active operation. The rule also requires the use of BACT measures as defined in Table 1 of the rule. SHP will implement the BACT measures in Table 1 of the rule while making the proposed modifications and during continued operation of the equipment to ensure compliance with these requirements.

## **Rule 404 – Particulate Matter – Concentration**

This rule prohibits the discharge of particulate matter in concentrations that exceed those shown in the rule. There are no sources of particulate matter associated with this project.

## **Rule 407 – Liquid and Gaseous Air Contaminants**

This rule prohibits (a) CO emissions in excess of 2000 ppmv, dry, averaged over 15 minutes and (b) sulfur emissions in excess of 500 ppmv averaged over 15 minutes. There are no sources of CO emissions associated with this project.

## **Rule 409 – Combustion Contaminants**

This rule prohibits the discharge of “combustion contaminants” that exceed 0.1 grain per cubic foot of gas calculated at 12% CO<sub>2</sub> at standard conditions averaged over at least 15 minutes. Rule 102 defines “combustion contaminants” as “particulate matter”. There are no sources of combustion contaminants associated with this project.

## **Rule 431.1 – Sulfur Content of Gaseous Fuels**

This rule prohibits the use of gaseous fuel that contains more than 40 ppmv sulfur (as H<sub>2</sub>S) averaged over four hours. The rule also requires continuous monitoring of the sulfur content of gaseous fuels. There are no sources of combustion associated with this project.

## **Rule 462 – Organic Liquid Loading**

The proposed project will not affect the existing permitted NGL loading system.

## **Rule 463 – Storage of Organic Liquids**

This rule requires that tanks used to store organic liquids in amounts and with vapor pressures in excess of certain thresholds to be equipped with vapor control. The proposed project will not affect the existing permitted storage tanks at the facility.

# ***AQMD PERMIT APPLICATION PACKAGE***

**SIGNAL HILL PETROLEUM, INC. – FACILITY ID 101977**

**MODIFICATIONS TO GAS PROCESSING PLANT**

## **Rule 466 – Pumps and Compressors**

The requirements of this rule are not applicable to facilities that are subject to the requirements of Rule 1173.

## **Rule 466.1 – Valves and Flanges**

The requirements of this rule are not applicable to facilities that are subject to the requirements of Rule 1173.

## **Rule 1147 – NO<sub>x</sub> Reductions from Miscellaneous Sources**

This rule imposes NO<sub>x</sub> emissions limits on gaseous and liquid fuel fired combustion equipment that requires a District permit and are not specifically required to comply with a NO<sub>x</sub> emissions limit by other District rules. There are no sources of NO<sub>x</sub> emissions associated with this project.

## **Rule 1149 – Storage Tank and Pipeline Cleaning and Degassing**

This rule imposes specific requirements on storage tank and pipeline cleaning and degassing activities. The proposed project is not affected by these requirements.

## **Rule 1173 – Control of VOCs and Releases from Components at Petroleum Facilities and Chemical Plants**

This rule requires an I&M Plan to control fugitive leaks and releases from components. SHP currently complies with the requirements of this rule and will meet all requirements of the rule, including identification, monitoring, repair, and reporting as it applies to the proposed modifications.

## **Rule 1176 – VOC Emissions from Wastewater Systems**

This rule imposes certain requirements on wastewater systems. The requirements include covers on wastewater separators and quarterly monitoring of separators, closed vent systems, and drain system components. The existing wastewater handling system complies with these requirements and will not be significantly affected by the proposed project.

## **Rule 1178 – Further Reductions of VOCs from Storage Tanks at Petroleum Facilities**

This rule imposes requirements to reduce VOC emissions from storage tanks located at facilities that have emitted more than 20 tons of VOCs in any year starting with emission inventory year 2000. The proposed project has no effect on the requirements of this rule.

**AQMD PERMIT APPLICATION PACKAGE**  
**SIGNAL HILL PETROLEUM, INC. – FACILITY ID 101977**  
**MODIFICATIONS TO GAS PROCESSING PLANT**

**Regulation XIII –New Source Review for Nonattainment Air Contaminants**

Rule 1303(a) and (b) define three requirements – BACT, modeling, and offsets - for permitting actions that result in an increase of emissions of nonattainment air contaminants (i.e., VOC, NO<sub>x</sub>, and PM<sub>10</sub>), ozone depleting compounds, or ammonia. As shown in Appendix 3, there is an increase in emissions of VOC from the existing vapor recovery and natural gas dehydration systems and from the proposed CO<sub>2</sub> filtration system. Thus, the requirements of Rule 1303(a) and (b) must be satisfied for these three permit units.

BACT (Rule 1303(a)):

BACT is required for a permit unit if the increase in emissions of any nonattainment air contaminant, ozone depleting compound, or ammonia is greater than one pound per day.

The increase of VOC emissions (all of which are fugitive emissions from potential equipment leaks) exceeds one pound per day for each of the three permit units. Because the facility's PTE for VOC (including fugitives) exceeds 10 tons per year (see Appendix 6), major source BACT is applicable. Major source BACT in SCAQMD is defined as Federal LAER. A search of EPA's RACT/BACT/LAER Clearinghouse (RBLC) database was completed to determine current LAER for fugitive components. The database was searched using the following criteria:

- USA
- Permits issued between 1/1/2003 and 11/27/2013
- Pollutant = VOC
- All process names containing the word "fugitive"

The search yielded 49 facilities and 68 processes for which RACT/BACT/LAER determinations have been made. Only one of the 49 facilities was an oil and gas production facility. A listing of the facilities and processes is included in Appendix 6. The RACT/BACT/LAER determinations for these 49 facilities can be summarized as follows:

- 23 facilities – unspecified or unclear
- 13 facilities – Federal MACT standards (including LDAR)
- 9 facilities – Federal NSPS standards (including LDAR)
- 4 facilities – Other standards similar to Federal NSPS (e.g., LDAR)

The facilities for which Federal MACT standards were applied are refineries and similar large industrial complexes. Thus, they are likely major sources of HAP. The SHWU facility is not a major source of HAP, so is not subject to any Federal MACT standards.

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Based on this review, we conclude that the fugitive components in the proposed project will satisfy SCAQMD BACT by complying with the requirements of:

- Rule 1173 (see discussion above);
- 40 CFR 60 Subpart OOOO (see discussion below); and
- SCAQMD's Part D (non-major source) BACT guideline for "Fugitive Emission Sources at Natural Gas Plants and Oil and Gas Production Fields", which specifies the following:
  - Compressors, Rotary Type: Enclosed Seal System Connected to a Closed Vent System.
  - Pressure Relief Valves: Connected to a Closed Vent System or Equipped with Rupture Discs;
  - Pumps in Light Liquid Service: Sealless Type if Available and Compatible or Equipped with Double or Tandem Seals and Vented to a Closed Vent System.
  - Sampling Connections: Closed-Purge, Closed-Loop, or Vented to a Closed Vent System.

Modeling (Rule 1303(b)(1)):

Modeling (or screening per Appendix A of Rule 1303) is required to demonstrate the emission increase will not cause a violation of any state or national ambient air quality standards at any receptor location in the District. However, per Rule 1303, Appendix A, modeling is not required for VOC, so no modeling is required for this project.

Offsets (Rule 1303(b)(2)):

Unless exempt from offset requirements per Rule 1304, offsets are required at a ratio of 1.2 to 1.0 for any unit for which there is an increase of 0.50 pounds per day or more in emissions of any nonattainment air contaminant. The increased VOC emissions from the project are not exempt from offset requirements, so must be offset at a ratio of 1.2 to 1.0. SHP will provide the required offsets upon notification from AQMD.

**Rule 1401 – New Source Review of Toxic Air Contaminants**

This rule requires the health risk associated with projects that result in increases of toxic air contaminants to meet specific requirements. Specifically, the incremental MICR for a permit unit must not exceed one in one million and the non-cancer chronic and acute hazard indices must not exceed a value of one. Health risk analyses were performed for each permit unit in accordance with the District's "Risk Assessment Procedures for Rules 1401 and 212, Version 7.0, July 1, 2005." For each permit unit, the results of Tier 3 analyses indicate the requirements of the rule are satisfied. Copies of the (Tier 1, Tier 2, and Tier 3) analyses are included in Appendix 5.

**Rule 1402 – Control of Toxic Air Contaminants from Existing Sources**

This rule requires facility-wide health risk assessments and risk reduction plans for facilities that exceed certain threshold levels of emissions and risk. The facility does not exceed any of these thresholds.

# ***AQMD PERMIT APPLICATION PACKAGE***

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**MODIFICATIONS TO GAS PROCESSING PLANT**

## **Regulation XX -- RECLAIM**

The facility is a Cycle 1 NO<sub>x</sub> RECLAIM facility. The proposed project does not affect NO<sub>x</sub> (or SO<sub>x</sub>) emissions.

## **Regulation XXX-- Title V**

Per Condition F30.1 of the facility permit, the SHWU facility is exempt from the requirements of Title V as long as it demonstrates that current NO<sub>x</sub> and VOC emissions (excluding fugitives) remain below ten tons per year each. The proposed project does not affect NO<sub>x</sub> emissions and will not increase the facility's VOC emissions (excluding fugitives) to more than ten tons per year.

# ***AQMD PERMIT APPLICATION PACKAGE***

**SIGNAL HILL PETROLEUM, INC. – FACILITY ID 101977**

**MODIFICATIONS TO GAS PROCESSING PLANT**

## **40 CFR Part 60 Subpart OOOO – NSPS for Crude Oil and Natural Gas Production, Transmission, and Distribution**

This new federal regulation establishes emission standards for the control of VOC and SO<sub>2</sub> emissions from “affected facilities” that commence construction, modification, or reconstruction after August 23, 2011. “Affected facilities” are:

- gas wells;
- centrifugal compressors with wet seals;
- reciprocating compressors;
- natural gas driven pneumatic controllers;
- storage vessels;
- fugitive components (process equipment);
- sweetening units; and
- hydraulically re-fractured gas wells.

Of these “affected facilities”, the proposed project includes (1) fugitive components and (2) a sweetening unit (i.e., the CO<sub>2</sub> filtration unit). However, because the acid gas removed by the sweetening unit will not be released to the atmosphere (it will be combined with fuel gas consumed in the existing combustion turbine), the sweetening unit is exempt from the requirements of the regulation (see 40 CFR 60.5365(g)(4)).

So the only equipment specific requirements of this regulation applicable to the proposed project are the portions applicable to fugitive components. Specifically, the applicable portions are found at 40 CFR 60.5400. In general, 40 CFR 60.5400 requires that fugitive components comply with the requirements of 40 CFR Part 60 Subpart VVa (Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry). However, 40 CFR 60.5401(c) and (d) provide exemptions from some of these requirements that are applicable to this project. 40 CFR 60.5401(c) provides an exemption for “sampling connection systems”. And 40 CFR 60.5401(d) provides an exemption for (1) pumps in light liquid service, (2) valves in gas-vapor service, and (3) PRD’s in gas-vapor service when such equipment is located at a non-fractionating gas plant with throughput less than 10 mmscf per day. Taking into account these exemptions, the applicable requirements of 40 CFR 60.5400 to this project can be summarized as follows:

- **For pumps, valves, and connectors in heavy liquid service and PRD’s in light liquid or heavy liquid service:**
  - If visual, audible, olfactory, or other method indicates a potential leak:
    - Eliminate the potential leak within 5 days or monitor via Method 21 (leak = 10,000 ppmv) within 5 days; and
    - If leaks are indicated via Method 21, make 1<sup>st</sup> attempt repair within 5 days and complete repair within 15 days.

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**MODIFICATIONS TO GAS PROCESSING PLANT**

- For closed vent systems and control devices:
  - Achieve 95% VOC reduction or 20 ppmv, whichever is less stringent;
  - Conduct annual visual, audible, or olfactory inspections of closed vent systems; and
  - If a leak (500 ppmv per Method 21) is identified, make 1<sup>st</sup> attempt repair within 5 days and complete repair within 15 days.
- For connectors in gas-vapor and light liquid service:
  - Monitor via Method 21 within 12 months of startup;
  - Subsequent monitoring frequency determined by % leaks determined in initial inspection (but all frequencies are less stringent than required by AQMD Rule 1173); and
  - For leaks of 500 ppmv via Method 21:
    - Make a 1<sup>st</sup> attempt repair within 5 days and complete repair within 15 days.

40 CFR 60.5400(e) specifies that the above fugitive components must comply with the recordkeeping and reporting requirements at 40 CFR 60.486a and 60.487a (Subpart VVa) except as provided at 40 CFR 60.5421 (Subpart OOOO). In addition, 40 CFR 60.5420 and 60.5422 specify additional reporting requirements for an affected facility subject to the VOC requirements for onshore natural gas processing plants. These requirements can be summarized as follows:

- 40 CFR 60.486a (Subpart VVa Recordkeeping requirements) requires:
  - For pumps in light liquid service, compressors, valves and connectors in either gas or light liquid service, and pumps, valves, and connectors in heavy liquid service:
    - Records of monitoring (e.g., instrument used, operator, equipment monitored, date of monitoring, instrument reading);
    - Physical identification of components found leaking during inspections;
    - Dates of leak detection, repair attempts, and repair methods;
    - Instrument reading at the time of successful repair; and
    - Specified information if repairs are delayed beyond 15 days.
  - For closed vent systems and control devices, records of:
    - Design schematics, design specifications, and P&ID's;
    - Dates and descriptions of any changes in design specifications;
    - Description of parameter(s) monitored to ensure control devices are operating properly;
    - Periods when a closed vent system or control device is not operating properly; and
    - Dates of startups and shutdowns of closed vent systems and control devices.

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**MODIFICATIONS TO GAS PROCESSING PLANT**

- 40 CFR 60.487a (Subpart VVa Reporting requirements) requires:
  - **Semiannual reports to EPA** beginning six months after initial startup date to include:
    - Process unit identification;
    - For each month during the semiannual reporting period:
      - Number of valves for which were detected;
      - Number of valves for which leaks were not repaired;
      - Number of pumps for which leaks were detected;
      - Number of pumps for which leaks were not repaired;
      - Number of compressors for which leaks were detected;
      - Number of compressors for which leaks were not repaired;
      - Number of connectors for which leaks were detected;
      - Number of connectors for which leaks were not repaired;
    - Facts explaining any delayed repairs and any infeasible process shutdowns; and
    - Dates of process unit shutdowns.
  - Inclusion of the following in the initial semiannual report to EPA:
    - Number of valves subject to 60.482-7a;
    - Number of pumps subject to 60.482-2a;
    - Number of compressors subject to 60.482-3a; and
    - Number of connectors subject to 60.482-11a.
- 40 CFR 60.5420 requires submittal of the **notifications** required in 40 CFR 60.7(a)(1) and (4):
  - 40 CFR 60.7(a)(1) requires notification (to EPA) of the date construction of an affected facility is commenced within 30 days after such date.
  - 40 CFR 60.7(a)(4) requires notification (to EPA) of any planned physical or operational change to an existing facility which may increase emissions of a covered pollutant. This notification must be made at least 60 days prior to commencement of the change.
- 40 CFR 60.5422 requires, in addition to the requirements of 40 CFR 60.487a(a), (b), and (c)(2)(ii) through (vii), reporting as follows:
  - Inclusion of the following additional information in the initial semiannual report required by 60.487a(b)(1) through (4):
    - Number of PRD's subject to the alternative monitoring specified in 60.5401(b) except for those PRD's designated for no detectable emissions under the provisions of 60.482-4a(a) and those PRD's complying with 60.482-4a(c).
  - Inclusion of the following additional information in all semiannual reports required by 60.487a(c)(2)(i) through (vii):
    - Number of PRD's for which leaks were detected as required in 60.5401(b)(2); and
    - Number of PRD's for which leaks were not repaired as required in 60.5401(b)(3).

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**SIGNAL HILL PETROLEUM, INC. – FACILITY ID 101977**

**MODIFICATIONS TO GAS PROCESSING PLANT**

## **40 CFR Part 63 Subpart HH – NESHAP for Hazardous Air Pollutants from Oil and Natural Gas Production Facilities**

This federal regulation establishes emission standards for the control of hazardous air pollutants (HAP) from facilities that are either major sources or area sources of HAP as defined in the regulation:

- Major sources of HAP. The regulation defines major sources of HAP in the same manner as 40 CFR 63.2 (i.e., 10 tons per year or more of a single HAP or 25 tons per year or more of total HAP), except that, for “production field facilities”, the affected source is comprised only of (1) glycol dehydration units, (2) storage vessels with the potential for flash emissions, (3) “ancillary equipment” (i.e., fugitive components) except compressors located at natural gas processing plants, and (4) compressors located at natural gas processing plants.
  - The SHP facility is a “production field facility” as defined in the regulation. But even the total facility (i.e., wells, oil/water separation, and oil/water storage in addition to the gas processing plant) does not have HAP emissions that exceed the major source thresholds noted above. So, the SHP facility is not a major source of HAP subject to the requirements of this regulation.
- Area sources of HAP. The affected source for an area source of HAP is comprised only of triethylene glycol (TEG) dehydration units located at a single facility.
  - The current and proposed dehydration systems at the SHP facility do not utilize TEG. Thus, the SHP facility is not an area source of HAP subject to the requirements of this regulation.

**AQMD PERMIT APPLICATION PACKAGE  
SIGNAL HILL PETROLEUM, INC. – FACILITY ID 101977  
MODIFICATIONS TO GAS PROCESSING PLANT**

**APPENDIX 1**

**Permit Application Forms**

- Vapor Recovery System (A/N 494140)
  - Form 400-A
  
- Natural Gas Dehydration System (A/N 362338)
  - Form 400-A
  
- CO2 Filtration System (New)
  - Form 400-A
  
- Project
  - Form 400-A (Amend RECLAIM Facility Permit)
  - Form 400-XPP
  - Form 400-CEQA
    - Copy of City of Signal Hill's February 4, 2014 Approval to Extend CUP 97-03 Pertaining to Signal Hill Petroleum's Seven Consolidated Drill Sites (with reference to Initial Study and Mitigated Negative Declaration dated September 18, 1997)



South Coast Air Quality Management District

Form 400-A

Application Form for Permit or Plan Approval

List only one piece of equipment or process per form.

Mail To: SCAQMD, P.O. Box 4944, Diamond Bar, CA 91765-0944, Tel: (909) 396-3385, www.aqmd.gov

Section A - Operator Information
1. Facility Name (Business Name of Operator to Appear on the Permit): Signal Hill Petroleum, Inc.
2. Valid AQMD Facility ID (Available On Permit Or Invoice Issued By AQMD): 101977
3. Owner's Business Name (If different from Business Name of Operator):

Section B - Equipment Location Address
4. Equipment Location Is: Fixed Location Various Location
1215 E. 29th St.
Signal Hill, CA 90755
James Lee, Regulatory Specialist
(562) 595-6440 (562) 426-4695
E-Mail: jslee@shpi.net
Section C - Permit Mailing Address
5. Permit and Correspondence Information:
2633 Cherry Avenue
Signal Hill, CA 90755
James Lee, Regulatory Specialist
(562) 595-6440 (562) 426-4695
E-Mail: jslee@shpi.net

Section D - Application Type
6. The Facility Is: In RECLAIM
7. Reason for Submitting Application (Select only ONE):
7a. New Equipment or Process Application:
7b. Facility Permits:
7c. Equipment or Process with an Existing/Previous Application or Permit:
7d. Existing or Previous Permit/Application
8a. Estimated Start Date of Construction (mm/dd/yyyy): 03/31/2014
8b. Estimated End Date of Construction (mm/dd/yyyy): 06/01/2014
8c. Estimated Start Date of Operation (mm/dd/yyyy): 06/01/2014

9. Description of Equipment or Reason for Compliance Plan (list applicable rule): Vapor Recovery System
10. For identical equipment, how many additional applications are being submitted with this application?
11. Are you a Small Business as per AQMD's Rule 102 definition?
12. Has a Notice of Violation (NOV) or a Notice to Comply (NC) been issued for this equipment?

Section E - Facility Business Information
13. What type of business is being conducted at this equipment location? Oil & Gas Production
14. What is your business primary NAICS Code? 21111
15. Are there other facilities in the SCAQMD jurisdiction operated by the same operator?
16. Are there any schools (K-12) within 1000 feet of the facility property line?

Section F - Authorization/Signature
17. Signature of Responsible Official: Sean McDaniel
18. Title of Responsible Official: Vice President
19. I wish to review the permit prior to issuance.
20. Print Name: Sean McDaniel
21. Date: 2/26/14
22. Do you claim confidentiality of data?
I hereby certify that all information contained herein and information submitted with this application are true and correct.

23. Check List: Authorized Signature/Date, Form 400-CEQA, Supplemental Form(s) (ie., Form 400-E-xx), Fees Enclosed
AQMD USE ONLY
APPLICATION TRACKING #, CHECK #, AMOUNT RECEIVED \$, PAYMENT TRACKING #, VALIDATION
DATE, APP REJ, DATE, APP REJ, CLASS I III, BASIC CONTROL, EQUIPMENT CATEGORY CODE, TEAM, ENGINEER, REASON/ACTION TAKEN



South Coast Air Quality Management District

Form 400-A

Application Form for Permit or Plan Approval

List only one piece of equipment or process per form.

Mail To: SCAQMD, P.O. Box 4944, Diamond Bar, CA 91765-0944. Tel: (909) 396-3385, www.aqmd.gov

Section A - Operator Information. 1. Facility Name (Business Name of Operator to Appear on the Permit): Signal Hill Petroleum, Inc. 2. Valid AQMD Facility ID (Available On Permit Or Invoice Issued By AQMD): 101977. 3. Owner's Business Name (If different from Business Name of Operator):

Section B - Equipment Location Address and Section C - Permit Mailing Address. 4. Equipment Location Is: Fixed Location (1215 E. 29th St., Signal Hill, CA 90755). 5. Permit and Correspondence Information: 2633 Cherry Avenue, Signal Hill, CA 90755. Contact: James Lee, Regulatory Specialist, (562) 595-6440.

Section D - Application Type. 6. The Facility Is: In RECLAIM. 7. Reason for Submitting Application (Select only ONE): 7a. New Equipment or Process Application: Streamlined Standard Permit.

7b. Facility Permits: RECLAIM Facility Permit Amendment. 7c. Equipment or Process with an Existing/Previous Application or Permit: Alteration/Modification. Existing or Previous Permit/Application Number: 362338. 8a. Estimated Start Date of Construction: 03/31/2014. 8b. Estimated End Date of Construction: 06/01/2014. 8c. Estimated Start Date of Operation: 06/01/2014.

9. Description of Equipment or Reason for Compliance Plan (list applicable rule): Natural Gas Dehydration System. 10. For identical equipment, how many additional applications are being submitted with this application? 11. Are you a Small Business as per AQMD's Rule 102 definition? No. 12. Has a Notice of Violation (NOV) or a Notice to Comply (NC) been issued for this equipment? No.

Section E - Facility Business Information. 13. What type of business is being conducted at this equipment location? Oil & Gas Production. 14. What is your business primary NAICS Code? 211111. 15. Are there other facilities in the SCAQMD jurisdiction operated by the same operator? Yes. 16. Are there any schools (K-12) within 1000 feet of the facility property line? No.

Section F - Authorization/Signature. 17. Signature of Responsible Official: Sean McDaniel. 18. Title of Responsible Official: Vice President. 19. I wish to review the permit prior to issuance. Yes. 20. Print Name: Sean McDaniel. 21. Date: 2/26/14. 22. Do you claim confidentiality of data? No.

23. Check List: [X] Authorized Signature/Date, [X] Form 400-CEQA, [ ] Supplemental Form(s) (ie., Form 400-E-xx), [X] Fees Enclosed. Table with columns: AQMD USE ONLY, APPLICATION TRACKING #, CHECK #, AMOUNT RECEIVED, PAYMENT TRACKING #, VALIDATION, DATE, APP REJ, DATE, APP REJ, CLASS I III, BASIC CONTROL, EQUIPMENT CATEGORY CODE, TEAM, ENGINEER, REASON/ACTION TAKEN.



South Coast Air Quality Management District

Form 400-A

Application Form for Permit or Plan Approval

List only one piece of equipment or process per form.

Mail To: SCAQMD P.O. Box 4944 Diamond Bar, CA 91765-0944

Tel: (909) 396-3385 www.aqmd.gov

Section A - Operator Information

1. Facility Name (Business Name of Operator to Appear on the Permit): Signal Hill Petroleum, Inc. 2. Valid AQMD Facility ID (Available On Permit Or Invoice Issued By AQMD): 101977 3. Owner's Business Name (If different from Business Name of Operator):

Section B - Equipment Location Address

4. Equipment Location Is: Fixed Location Various Location 1215 E. 29th St. Street Address Signal Hill, CA 90755 City State Zip James Lee Regulatory Specialist Contact Name Title (562) 595-6440 (562) 426-4695 Phone # Ext. Fax # E-Mail: jslee@shpi.net

Section C - Permit Mailing Address

5. Permit and Correspondence Information: Check here if same as equipment location address 2633 Cherry Avenue Address Signal Hill, CA 90755 City State Zip James Lee Regulatory Specialist Contact Name Title (562) 595-6440 (562) 426-4695 Phone # Ext. Fax # E-Mail: jslee@shpi.net

Section D - Application Type

6. The Facility Is: Not In RECLAIM or Title V In RECLAIM In Title V In RECLAIM & Title V Programs 7. Reason for Submitting Application (Select only ONE): 7a. New Equipment or Process Application: New Construction (Permit to Construct) Equipment On-Site But Not Constructed or Operational Equipment Operating Without A Permit \* Compliance Plan Registration/Certification Streamlined Standard Permit 7b. Facility Permits: Title V Application or Amendment (Refer to Title V Matrix) RECLAIM Facility Permit Amendment 7c. Equipment or Process with an Existing/Previous Application or Permit: Administrative Change Alteration/Modification Alteration/Modification without Prior Approval \* Change of Condition Change of Condition without Prior Approval \* Change of Location Change of Location without Prior Approval \* Equipment Operating with an Expired/Inactive Permit \* Existing or Previous Permit/Application If you checked any of the items in 7c., you MUST provide an existing Permit or Application Number.

8a. Estimated Start Date of Construction (mm/dd/yyyy): 03/31/2014 8b. Estimated End Date of Construction (mm/dd/yyyy): 06/01/2014 8c. Estimated Start Date of Operation (mm/dd/yyyy): 06/01/2014

9. Description of Equipment or Reason for Compliance Plan (list applicable rule): CO2 filtration system. 10. For identical equipment, how many additional applications are being submitted with this application? (Form 400-A required for each equipment / process) 11. Are you a Small Business as per AQMD's Rule 102 definition? (10 employees or less and total gross receipts are \$500,000 or less OR a not-for-profit training center) No Yes 12. Has a Notice of Violation (NOV) or a Notice to Comply (NC) been issued for this equipment? If Yes, provide NOV/NC#: No Yes

Section E - Facility Business Information

13. What type of business is being conducted at this equipment location? Oil & Gas Production 14. What is your business primary NAICS Code? (North American Industrial Classification System) 21111 15. Are there other facilities in the SCAQMD jurisdiction operated by the same operator? No Yes 16. Are there any schools (K-12) within 1000 feet of the facility property line? No Yes

Section F - Authorization/Signature I hereby certify that all information contained herein and information submitted with this application are true and correct.

17. Signature of Responsible Official: Sean McDaniel 18. Title of Responsible Official: Vice President 19. I wish to review the permit prior to issuance. (This may cause a delay in the application process.) No Yes 20. Print Name: Sean McDaniel 21. Date: 2/26/14 22. Do you claim confidentiality of data? (If Yes, see instructions.) No Yes

23. Check List: [X] Authorized Signature/Date [X] Form 400-CEQA [ ] Supplemental Form(s) (ie., Form 400-E-xx) [X] Fees Enclosed

Table with columns: AQMD USE ONLY, APPLICATION TRACKING #, CHECK #, AMOUNT RECEIVED \$, PAYMENT TRACKING #, VALIDATION, DATE, APP REJ, DATE, APP REJ, CLASS I III, BASIC CONTROL, EQUIPMENT CATEGORY CODE, TEAM, ENGINEER, REASON/ACTION TAKEN



South Coast Air Quality Management District

Form 400-A

Application Form for Permit or Plan Approval

List only one piece of equipment or process per form.

Mail To: SCAQMD, P.O. Box 4944, Diamond Bar, CA 91765-0944, Tel: (909) 396-3385, www.aqmd.gov

Section A - Operator Information

1. Facility Name (Business Name of Operator to Appear on the Permit): Signal Hill Petroleum, Inc. 2. Valid AQMD Facility ID (Available On Permit Or Invoice Issued By AQMD): 101977 3. Owner's Business Name (If different from Business Name of Operator):

Section B - Equipment Location Address

4. Equipment Location Is: Fixed Location Various Location (For equipment operated at various locations, provide address of initial site.) 1215 E. 29th St. Street Address Signal Hill, CA 90755 City Zip James Lee Regulatory Specialist Contact Name Title (562) 595-6440 (562) 426-4695 Phone # Ext. Fax # E-Mail: jslee@shpi.net

Section C - Permit Mailing Address

5. Permit and Correspondence Information: Check here if same as equipment location address 2633 Cherry Avenue Address Signal Hill, CA 90755 City State Zip James Lee Regulatory Specialist Contact Name Title (562) 595-6440 (562) 426-4695 Phone # Ext. Fax # E-Mail: jslee@shpi.net

Section D - Application Type

6. The Facility Is: Not In RECLAIM or Title V In RECLAIM In Title V In RECLAIM & Title V Programs

7. Reason for Submitting Application (Select only ONE):

7a. New Equipment or Process Application: New Construction (Permit to Construct) Equipment On-Site But Not Constructed or Operational Equipment Operating Without A Permit \* Compliance Plan Registration/Certification Streamlined Standard Permit 7b. Facility Permits: Title V Application or Amendment (Refer to Title V Matrix) RECLAIM Facility Permit Amendment 7c. Equipment or Process with an Existing/Previous Application or Permit: Administrative Change Alteration/Modification Alteration/Modification without Prior Approval \* Change of Condition Change of Condition without Prior Approval \* Change of Location Change of Location without Prior Approval \* Equipment Operating with an Expired/Inactive Permit \* Existing or Previous Permit/Application If you checked any of the items in 7c., you MUST provide an existing Permit or Application Number: \* A Higher Permit Processing Fee and additional Annual Operating Fees (up to 3 full years) may apply (Rule 301(c)(1)(D)(i)).

8a. Estimated Start Date of Construction (mm/dd/yyyy): 03/31/2014 8b. Estimated End Date of Construction (mm/dd/yyyy): 06/01/2014 8c. Estimated Start Date of Operation (mm/dd/yyyy): 06/01/2014

9. Description of Equipment or Reason for Compliance Plan (list applicable rule): RECLAIM Facility Permit Amendment 10. For identical equipment, how many additional applications are being submitted with this application? (Form 400-A required for each equipment / process) 11. Are you a Small Business as per AQMD's Rule 102 definition? (10 employees or less and total gross receipts are \$500,000 or less OR a not-for-profit training center) No Yes 12. Has a Notice of Violation (NOV) or a Notice to Comply (NC) been issued for this equipment? If Yes, provide NOV/NC#: No Yes

Section E - Facility Business Information

13. What type of business is being conducted at this equipment location? Oil and Gas Production 14. What is your business primary NAICS Code? (North American Industrial Classification System) 211111 15. Are there other facilities in the SCAQMD jurisdiction operated by the same operator? No Yes 16. Are there any schools (K-12) within 1000 feet of the facility property line? No Yes

Section F - Authorization/Signature I hereby certify that all information contained herein and information submitted with this application are true and correct.

17. Signature of Responsible Official: Sean McDaniel 18. Title of Responsible Official: Vice President 19. I wish to review the permit prior to issuance. (This may cause a delay in the application process.) No Yes 20. Print Name: Sean McDaniel 21. Date: 2/26/14 22. Do you claim confidentiality of data? (If Yes, see instructions.) No Yes

23. Check List: Authorized Signature/Date Form 400-CEQA Supplemental Form(s) (i.e., Form 400-E-xx) Fees Enclosed

Table with columns: AQMD USE ONLY, APPLICATION TRACKING #, CHECK #, AMOUNT RECEIVED \$, PAYMENT TRACKING #, VALIDATION, DATE, APP REJ, DATE, APP REJ, CLASS I III, BASIC CONTROL, EQUIPMENT CATEGORY CODE, TEAM, ENGINEER, REASON/ACTION TAKEN



South Coast Air Quality Management District

**Form 400 - XPP**

**Express Permit Processing Request**

Form 400-A, Form 400-CEQA and one or more 400-E-xx form(s) must accompany all submittals.

Mail To:  
SCAQMD  
P.O Box 4944  
Diamond Bar, CA 91765-0944  
Tel: (909) 396-3385  
www.aqmd.gov

**Section A - Operator Information**

1. Facility Name (Business Name of Operator To Appear On The Permit): Signal Hill Petroleum, Inc. 2. Valid AQMD Facility ID (Available On Permit Or Invoice Issued By AQMD): 101977

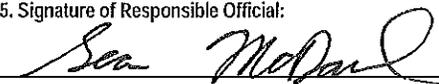
**Section B - Equipment Location Address**      **Section C - Permit Mailing Address**

3.  Fixed Location       Various Location  
(For equipment operated at various locations, provide address of initial site.)  
1215 E. 29th St.  
Street Address  
Signal Hill, CA 90755  
City State Zip  
James Lee Regulatory Specialist  
Contact Name Title  
(562) 595-6440 (562) 426-4695  
Phone # Ext. Fax #  
jslee@shpi.net  
E-Mail

4. Permit and Correspondence Information:  
 Check here if same as equipment location address  
2633 Cherry Avenue  
Address  
Signal Hill, CA 90755  
City State Zip  
James Lee Regulatory Specialist  
Contact Name Title  
(562) 595-6440 (562) 426-4695  
Phone # Ext. Fax #  
jslee@shpi.net  
E-Mail

**Section D - Authorization/Signature**

I understand that the Expedited Permit Processing fees must be submitted at the time of application submittal, and that the application may be subject to additional fees per Rule 301. I understand that requests for Express Permit Processing neither guarantees action by any specific date nor does it guarantee permit approval; that Express Permit Processing is subject to availability of qualified staff; and that once Express Permit Processing has commenced, the expedited fees will not be refunded. I hereby certify that all information contained herein and information submitted with the application are true and correct.

5. Signature of Responsible Official:  6. Title of Responsible Official: Vice President  
7. Print Name of Responsible Official: Sean McDaniel 8. Date: 2/26/14  
9. Phone #: (562) 595-6440 10. Fax #: (562) 426-4587

AQMD USE ONLY		APPLICATION TRACKING #		TYPE	EQUIPMENT CATEGORY CODE:	FEE SCHEDULE:		VALIDATION
ENG. DATE	A R	ENG. DATE	A R	B C	ASSIGNMENT	CHECK/MONEY ORDER #	AMOUNT \$	TRACKING #
				CLASS I III	Unit Engineer			



Form 400-CEQA

California Environmental Quality Act (CEQA) Applicability

Mail To: SCAQMD, P.O. Box 4944, Diamond Bar, CA 91765-0944. Tel: (909) 396-3385, www.aqmd.gov

The SCAQMD is required by state law, the California Environmental Quality Act (CEQA), to review discretionary permit project applications for potential air quality and other environmental impacts. This form is a screening tool to assist the SCAQMD in clarifying whether or not the project has the potential to generate significant adverse environmental impacts that might require preparation of a CEQA document [CEQA Guidelines §15060(a)]. Refer to the attached instructions for guidance in completing this form. For each Form 400-A application, also complete and submit one Form 400-CEQA. If submitting multiple Form 400-A applications for the same project at the same time, only one 400-CEQA form is necessary for the entire project. If you need assistance completing this form, contact Permit Services at (909) 396-3385 or (909) 396-2668.

Section A - Facility Information

1. Facility Name (Business Name of Operator To Appear On The Permit): Signal Hill Petroleum, Inc. 2. Valid AQMD Facility ID (Available On Permit Or Invoice Issued By AQMD): 101977

3. Project Description: Modify existing gas processing plant by (1) adding additional compression, (2) upgrading the existing refrigeration / dehydration system and (3) adding a CO2 filtration system.

Section B - Review For Exemption From Further CEQA Action

Table with 3 columns: Yes, No, Is this application for: 1. A CEQA and/or NEPA document previously or currently prepared... 2. A request for a change of permittee only... 3. A functionally identical permit unit replacement... 4. A change of daily VOC permit limit... 5. Equipment damaged as a result of a disaster... 6. A Title V (i.e., Regulation XXX) permit renewal... 7. A Title V administrative permit revision? 8. The conversion of an existing permit into an initial Title V permit?

If "Yes" is checked for any question in Section B, your application does not require additional evaluation for CEQA applicability. Skip to Section D - Signatures on page 2 and sign and date this form.

Section C - Review of Impacts Which May Trigger CEQA

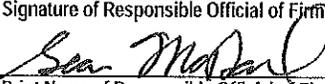
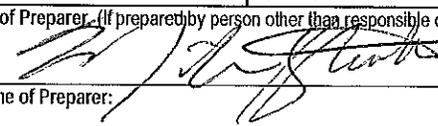
Complete Parts I-VI by checking "Yes" or "No" as applicable. To avoid delays in processing your application(s), explain all "Yes" responses on a separate sheet and attach it to this form.

Table with 3 columns: Yes, No, Part I - General, Part II - Air Quality. 1. Has this project generated any known public controversy... 2. Is this project part of a larger project? 3. Will there be any demolition, excavating, and/or grading construction activities... 4. Does this project include the open outdoor storage of dry bulk solid materials...

1 A "project" means the whole of an action which has a potential for resulting in physical change to the environment, including construction activities, clearing or grading of land, improvements to existing structures, and activities or equipment involving the issuance of a permit. For example, a project might include installation of a new, or modification of an existing internal combustion engine, dry-cleaning facility, boiler, gas turbine, spray coating booth, solvent cleaning tank, etc.

2 To download the CEQA guidelines, visit http://ceres.ca.gov/env\_law/state.html.

3 To download this form and the instructions, visit http://www.aqmd.gov/ceqa or http://www.aqmd.gov/permit

Section C - Review of Impacts Which May Trigger CEQA (cont.)			
	Yes	No	Part II - Air Quality (cont.)
5.	<input type="radio"/>	<input type="radio"/>	Would this project result in noticeable off-site odors from activities that may not be subject to SCAQMD permit requirements? For example, compost materials or other types of greenwaste (i.e., lawn clippings, tree trimmings, etc.) have the potential to generate odor complaints subject to Rule 402 - Nuisance.
6.	<input type="radio"/>	<input type="radio"/>	Does this project cause an increase of emissions from marine vessels, trains and/or airplanes?
7.	<input type="radio"/>	<input type="radio"/>	Will the proposed project increase the QUANTITY of hazardous materials stored aboveground onsite or transported by mobile vehicle to or from the site by greater than or equal to the amounts associated with each compound on the attached Table 1? <sup>4</sup>
Part III - Water Resources			
8.	<input type="radio"/>	<input type="radio"/>	Will the project increase demand for water at the facility by more than 5,000,000 gallons per day? The following examples identify some, but not all, types of projects that may result in a "yes" answer to this question: 1) projects that generate steam; 2) projects that use water as part of the air pollution control equipment; 3) projects that require water as part of the production process; 4) projects that require new or expansion of existing sewage treatment facilities; 5) projects where water demand exceeds the capacity of the local water purveyor to supply sufficient water for the project; and 6) projects that require new or expansion of existing water supply facilities.
9.	<input type="radio"/>	<input type="radio"/>	Will the project require construction of new water conveyance infrastructure? Examples of such projects are when water demands exceed the capacity of the local water purveyor to supply sufficient water for the project, or require new or modified sewage treatment facilities such that the project requires new water lines, sewage lines, sewage hook-ups, etc.
Part IV - Transportation/Circulation			
10.	Will the project result in (Check all that apply):		
	<input type="radio"/>	<input type="radio"/>	a. the need for more than 350 new employees?
	<input type="radio"/>	<input type="radio"/>	b. an increase in heavy-duty transport truck traffic to and/or from the facility by more than 350 truck round-trips per day?
	<input type="radio"/>	<input type="radio"/>	c. increase customer traffic by more than 700 visits per day?
Part V - Noise			
11.	<input type="radio"/>	<input type="radio"/>	Will the project include equipment that will generate noise GREATER THAN 90 decibels (dB) at the property line?
Part VI - Public Services			
12.	Will the project create a permanent need for new or additional public services in any of the following areas (Check all that apply):		
	<input type="radio"/>	<input type="radio"/>	a. Solid waste disposal? Check "No" if the projected potential amount of wastes generated by the project is less than five tons per day.
	<input type="radio"/>	<input type="radio"/>	b. Hazardous waste disposal? Check "No" if the projected potential amount of hazardous wastes generated by the project is less than 42 cubic yards per day (or equivalent in pounds).
**REMINDER: For each "Yes" response in Section C, attach all pertinent information including but not limited to estimated quantities, volumes, weights, etc.**			
Section D - Signatures			
I HEREBY CERTIFY THAT ALL INFORMATION CONTAINED HEREIN AND INFORMATION SUBMITTED WITH THIS APPLICATION IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE. I UNDERSTAND THAT THIS FORM IS A SCREENING TOOL AND THAT THE SCAQMD RESERVES THE RIGHT TO CONSIDER OTHER PERTINENT INFORMATION IN DETERMINING CEQA APPLICABILITY.			
1. Signature of Responsible Official of Firm: 		2. Title of Responsible Official of Firm: Vice President	
3. Print Name of Responsible Official of Firm: Sean McDaniel		4. Date Signed: 2/26/14	
5. Phone # of Responsible Official of Firm: (562) 595-6440	6. Fax # of Responsible Official of Firm: (562) 426-4587	7. Email of Responsible Official of Firm: smcdaniel@shpi.net	
8. Signature of Preparer (if prepared by person other than responsible official of firm): 		9. Title of Preparer: Environmental Consultant	
10. Print Name of Preparer: Milan Steube, CPP # C7803		11. Date Signed: 2-26-2014	
12. Phone # of Preparer: (949) 309-9310	13. Fax # of Preparer: (949) 588-7669	14. Email of Preparer: milans@cox.net	

THIS CONCLUDES FORM 400-CEQA. INCLUDE THIS FORM AND ANY ATTACHMENTS WITH FORM 400-A.

<sup>4</sup> Table 1 - Regulated Substances List and Threshold Quantities for Accidental Release Prevention can be found in the Instructions for Form 400-CEQA.

**RESOLUTION NO. 2014-02-6058**

**A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF SIGNAL HILL, CALIFORNIA, APPROVING AN EXTENSION OF CONDITIONAL USE PERMIT 97-03 THROUGH DECEMBER 31, 2014 COVERING SEVEN EXISTING CONSOLIDATED DRILLING SITES WITH OIL & GAS STORAGE, PROCESSING AND SHIPPING OPERATIONS AND A GAS TURBINE FACILITY**

**WHEREAS**, oil was discovered in the City of Signal Hill (City) in 1919 in the Signal Hill Oil Field, which is a subsection of the Long Beach Field, and the area soon became one of the largest active oil fields in the world with some 1 billion barrels of oil extracted to date. Over 1,719 wells were drilled of which some 20% are currently active; and

**WHEREAS**, the City originally adopted regulations concerning oil wells in 1962 and after periodic updating, the City in 1990 created an Oil Code Committee and completed a comprehensive planning process to update its Oil Code (Title 16 of the SHMC the "Oil Code") concerning well drilling and re-drilling, water injection, drill sites, noise standards, surface mitigation measures, venting, access, property maintenance, landscaping, development constraints, and other issues; and

**WHEREAS**, pursuant to Signal Hill Municipal Code Section 16.16.010, entitled, "Drilling Prohibited," new wells are only allowed within approved drill sites and drill sites are no longer allowed in residential zoning districts; and

**WHEREAS**, on June 16, 1998, the City approved a request submitted by Signal Hill Petroleum, Inc. (SHP) to approve Conditional Use Permit (CUP) 97-03 and Mitigated Negative Declaration (MND) 09/18/97(1) for a five year term to continue the operation of seven existing consolidated oil and gas drilling, production, storage,

processing, and shipping facilities and to construct a new 7,000-square foot natural gas processing facility at 1215 E. 29<sup>th</sup> Street; and

**WHEREAS**, on October 1, 2002, the City approved amendments to CUP 97-03 and MND 08/12/02(1) for a ten year term to continue the operation of the seven existing consolidated oil and gas drilling, production, storage, processing, and shipping facilities and to construct a simple cycle gas turbine power plant at 1215 E. 29<sup>th</sup> Street to work in conjunction with the gas processing facility to generate electric power for oil operations; and

**WHEREAS**, on October 1, 2012, the ten year approval for CUP 97-03 would expire, unless it was extended or renewed, and SHP indicated that a current Conditional Use Permit is required by the State Division of Oil Gas and Geothermal Resources (DOGGR) for their drilling operations; and

**WHEREAS**, the stated purpose of the original CUP was to consolidate oil production activities onto approved drill sites, allow for secondary petroleum recovery operations, and free up encumbered lands for other urban uses; and

**WHEREAS**, the continued operation of the seven consolidated drilling, petroleum and gas processing facilities is necessary for the uninterrupted production of petroleum and gas; and

**WHEREAS**, the Signal Hill General Plan anticipates the continuation of petroleum and gas production; and

**WHEREAS**, on June 12, 2012, in anticipation of SHP's request to renew the CUP for a ten year period, the Planning Commission conducted an introductory workshop with an overview of the CUP approvals and the history of oil operations in the City; and

**WHEREAS**, on June 28, 2012, the Planning Commission held a noticed meeting that consisted of a tour of the seven drill sites; and

**WHEREAS**, on July 10, 2012, the Planning Commission conducted a second noticed workshop covering the topic of two secondary mineral extraction methods known as water injection and fracking and received input from the public who expressed interest in a second tour and outside consultant review of the CUP prior to a ten year approval; and

**WHEREAS**, representatives of SHP testified at the workshop that they do not utilize fracking in local operations, that they do use the water injection method of secondary recovery, and that DOGGR approvals do not allow SHP to frack; and

**WHEREAS**, on August 28, 2012, the City Council held a public meeting that consisted of a second tour of the seven drill sites and council members and members of the public attended; and

**WHEREAS**, SHP requested on September 4, 2012, the City Council approved a one year extension of CUP 97-03; and

**WHEREAS**, the one year extension was expected to allow sufficient time to complete additional and updated analysis of the seven drill sites, but the time required to collect, digitize, manage and analyze the data was much greater than expected; and

**WHEREAS**, on June 18, 2013 a third tour of the seven drill sites was conducted, notices were posted, the public was invited and the newest council member, a member from the parks and recreation commission, the field representative from Senator Lara's office, a reporter from the Signal Tribune and members of the public attended; and

**WHEREAS**, the one year extension of the CUP would expire on September 4, 2013, and although the majority of data collection and management was complete, more time was needed for the data analysis and to determine the scope and establish the roadmap for the environmental review, and DOGGR requires a current CUP for operations to continue, therefore staff requested a six month extension. No new construction or expansion of existing facilities or operations was being proposed; and

**WHEREAS**, on August 13, 2013, at a duly noticed public hearing the Planning Commission recommended that the City Council approve a six month extension of CUP 97-03 subject to conditions which included three new landscape and maintenance conditions; and

**WHEREAS**, on August 20, 2013, the City Council approved a six month extension of CUP 97-03; and

**WHEREAS**, at the time of approval it was noted that additional extensions were anticipated to complete the environmental review and the time frame could be more accurately estimated once the scope of work for the environmental analysis was established; and

**WHEREAS**, the six month extension will expire in February 2014, and although the draft water and oil operations reports have been prepared, additional time is needed to finalize the reports which are necessary to establish the scope of work for the environmental analysis; and

**WHEREAS**, SHP is requesting an additional extension for CUP 97-03; and

**WHEREAS**, the legal descriptions and map of said consolidated oil and gas drilling, production, storage, processing, and shipping facilities are shown on Attachments "A" and "B" attached hereto; and

**WHEREAS**, in accordance with Signal Hill Municipal Code Section 20.64, entitled, "Uses Subject to Conditional Use Permits," the subject request is properly a matter for Planning Commission review and recommendation to the City Council for City Council approval; and

**WHEREAS**, pursuant to Article 19, Section 15301, Existing Facilities, of the California Environmental Quality Act Guidelines (CEQA), approval of an extension of CUP 97-03 is a Class 1 Categorical Exemption from the provisions of CEQA in that it involves no expansion of an existing use; and

**WHEREAS**, CUP 97-03 and all material relevant to CUP 97-03 including the previously approved Mitigated Negative Declarations were made available for public review and comments; and

**WHEREAS**, on January 14, 2014, a public hearing was held before the Planning Commission and all interested parties were given an opportunity to be heard regarding the request, and the Planning Commission recommended approval of the project; and

**WHEREAS**, on January 24, 2014, notice of a City Council public hearing to be held on February 4, 2014 on the requested extension of CUP 97-03 was mailed to all property owners within 300 feet of the seven drill sites, was published in the Signal Tribune newspaper and posted according to SHMC 01.08.010; and

**WHEREAS**, on February 4, 2014, the City Council held a public hearing regarding the proposed revisions to the Housing Element, all interested parties were given the opportunity to be heard and the Commission recommended City Council adoption of the revisions; and

WHEREAS, the City Council has considered all comments received and responses thereto.

NOW, THEREFORE, BE IT RESOLVED, that the City Council of the City of Signal Hill, California, does hereby find as follows:

1. That the above recitals are true and correct.
2. That the proposed extension to CUP 97-03, subject to the attached conditions is in conformance with the zoning ordinance, oil code, and other ordinances and regulations of the City, and following goals and policies of the General Plan:

**LAND USE ELEMENT  
Goal 1**

Manage growth to achieve a well balanced land use pattern that accommodates existing and future needs for housing, commercial and industrial land, open space, and community facilities and services, while maintaining a healthy, diversified economy adequate to provide future City revenues.

Land Use Policy 1.6 - Ensure an adequate supply of commercial and industrial land for potential commercial and industrial expansion and development.

*Finding Regarding Policy 1.6 - By limiting the number of drill sites, CUP 97-03 frees up land in the City for other urban development and the extension continues that option.*

**Goal 2**

Ensure that new development is consistent with the City's circulation system, availability of public facilities, existing development constraints, and the City's unique characteristics and natural resources.

Land Use Policy 2.5 - Ensure an orderly extension of essential services and facilities and the preservation of a free-flowing circulation system, by requiring the provision of essential services and facilities at the developer's cost where these systems do not exist or are not already a part of the City's financed annual Capital Improvement Program.

*Finding Regarding Policy 2.5 - The extension does not change the fact that each consolidated drilling site has an existing access road to accommodate vehicular access and work areas within the fences*

*or walled area to accommodate oil well drilling and petroleum and gas production and processing operations.*

### **Goal 3**

Assure a safe, healthy and aesthetically pleasing community for residents and businesses.

Land Use 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 urban areas.

*Finding Regarding Policy 3.2 - The extension considers that each consolidated drilling site is enclosed with a fence or wall which clearly defines the size and shape of the operation areas and allows adequate access. Drill site perimeters are required to be landscaped and maintained.*

Land Use 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.

*Finding Regarding Policy 3.3 - CUP 97-03 limits the number of drill sites allowed in the City to the seven existing consolidated sites, and has conditions for screening and landscaping the sites. A noise study was conducted for certain operations which were found to operate within established noise limits and the sites have been in operation under CUP 97-03 since 1998. These conditions will continue with the extension.*

Land Use Policy 3.11 - Maintain and improve, where necessary, the City's infrastructure and facilities.

*Finding Regarding Policy 3.11 - The drill sites and associated power facilities have been in operation since the unitization program in the 1970s and 1980s and will continue under the extension. The gas turbine facility approved in 2002 efficiently generates electricity to power the facilities which previously had been purchased from major power producers.*

## **ENVIRONMENTAL RESOURCES ELEMENT**

### **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.

Environmental Resources Element Policy 4.1 - Improve the interface between oil production activities and urban development, both for existing and new projects.

Environmental Resources Element Policy 4.2 - Encourage the development and production of natural resources that are demanded by the market, and that release land for urban uses is at a reasonable and controlled rate.

Environmental Resources Element Policy 4.3 - Require the restoration and reuse of land no longer necessary or economical for oil-production activities.

Environmental Resources Element 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.

Finding Regarding Policies 4.1 – 4.4 - *The following conditions will remain under the extension:*

1. *The sites for the use are adequate in size and shape to accommodate the existing consolidated drilling and petroleum and gas processing facilities.*
2. *The consolidated drilling, petroleum and gas processing facilities, including the newer gas processing equipment, are located on or near major roadways adequate to carry the service, transport and delivery trucks required for the proposed operations.*
3. *Continued operation of the seven consolidated drilling, petroleum and gas processing facilities and the addition of the new gas processing and turbine facilities have no adverse effects on abutting properties or the permitted uses. The DOGGR and the Signal Hill Oil Code regulate the drilling of oil wells and establish standards to regulate noise and other effects associated with such operations, including the production and processing of petroleum and gas.*
4. *Existing fences, walls and landscaped areas around the perimeters of the consolidated drilling sites provide an effective buffer between existing surrounding uses and uses permitted by the existing zoning.*
5. *The Conditions of Approval attached hereto are deemed necessary to protect the public health, safety and general welfare.*

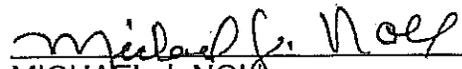
3. The seven drill sites relate to the streets and highways element of the general plan and are adequate in width and pavement type to carry the quantity and kind of traffic generated by the proposed use.

4. The proposed use will have no adverse effect on abutting properties or the permitted use thereof in that they have been in operation under the CUP since 1998.

5. The attached conditions of approval are deemed necessary to protect the public health, safety, and general welfare.

**NOW, THEREFORE, BE IT FURTHER RESOLVED**, that the City Council of the City of Signal Hill does hereby approve an extension of CUP 97-03 through December 31, 2014 subject to the conditions attached hereto as Attachment "C."

**PASSED, APPROVED, AND ADOPTED**, at a regular meeting of the City Council of the City of Signal Hill, California, on this 4<sup>th</sup> day of February, 2014.

  
MICHAEL J. NOLLA  
MAYOR

ATTEST:

  
KATHLEEN L. PACHECO  
CITY CLERK

STATE OF CALIFORNIA        )  
COUNTY OF LOS ANGELES    ) ss.  
CITY OF SIGNAL HILL         )

I, KATHLEEN L. PACHECO, City Clerk of the City of Signal Hill, California, hereby certify that Resolution No. 2014-02-6058 was adopted at a regular meeting of the City Council of the City of Signal Hill held on the 4th day of February 2014, by the following vote:

AYES:           MAYOR MICHAEL J. NOLL, VICE MAYOR EDWARD H.J. WILSON, COUNCIL MEMBERS LARRY FORESTER, TINA L. HANSEN, LORI Y. WOODS

NOES:           NONE

ABSENT:         NONE

ABSTAIN:        NONE

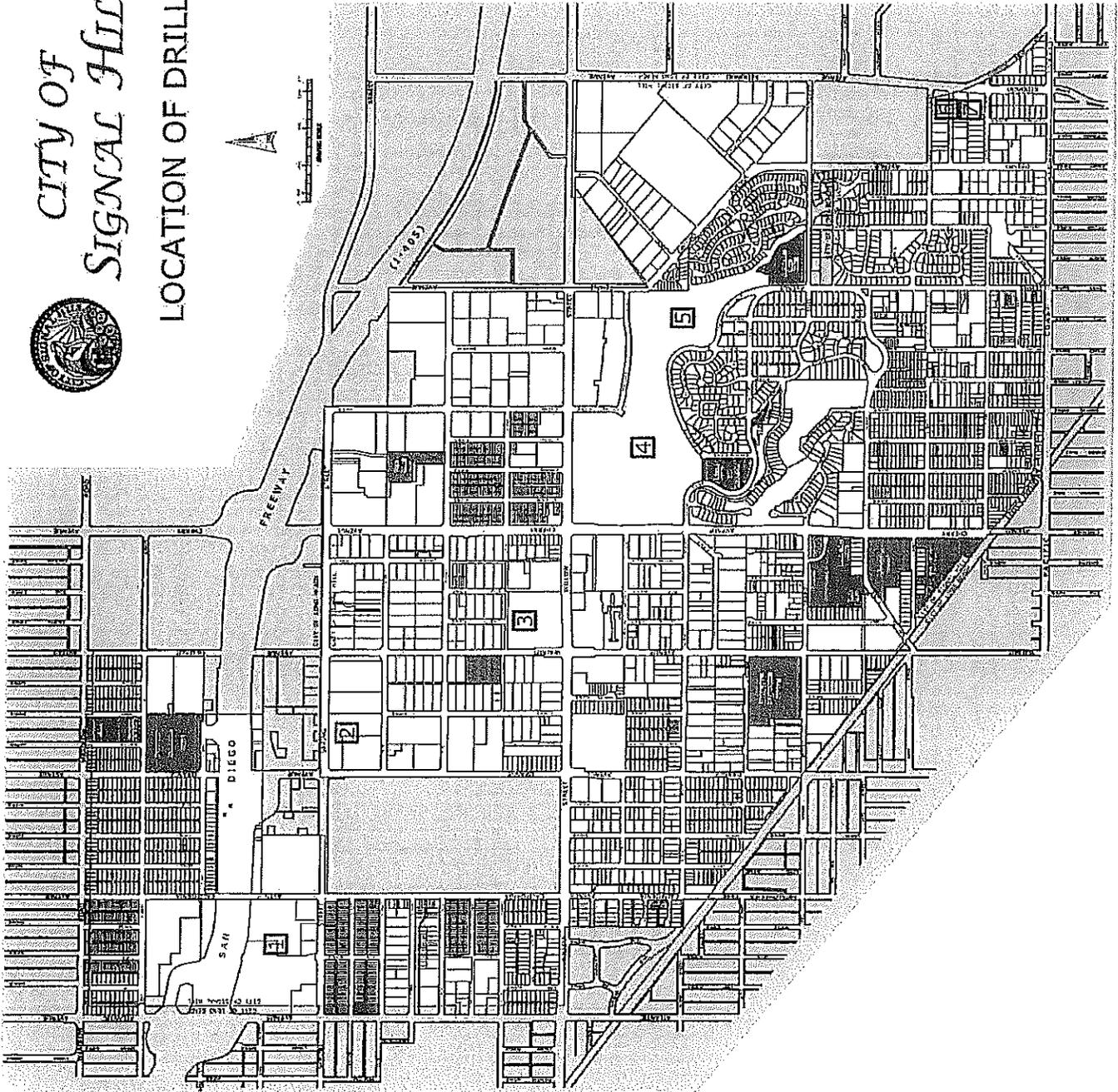
  
KATHLEEN L. PACHECO  
CITY CLERK



CITY OF

SIGNAL HILL

LOCATION OF DRILL SITES



**Location of Drill Sites 1-7  
CUP 97-03**

**Drill Site No. 1 - Signal Hill West Unit**

Property Address/Location: The drill site is located north of Spring Street between California and Atlantic Avenues. The mailing address is 3051 California Avenue, Signal Hill.

Legal Description: A portion of the east one-half of Farm Lot 33 of the American Colony Tract, in the City of Signal Hill, County of Los Angeles, State of California as per map recorded in Book 19, Page(s) 89 and 90 of miscellaneous records, in the office of the County Recorder of said county, described as follows: Beginning on the west line of said east one-half of Farm Lot 33, the true point of beginning being 320 feet north of the center line of Spring Street; thence east parallel to the south line of Lot 33, 170 feet; thence north parallel to the west line of said east one-half of Lot 33, 185 feet; thence west parallel to the said south line 170 feet; thence south parallel to the said west line 185 feet to the true point of beginning.

**Drill Site No. 2 - Signal Hill West Unit**

Property Address/Location: The drill site is located south of Spring Street between Orange and Gundry Avenues. The mailing address is 1251 E. 29<sup>th</sup> Street, Signal Hill.

Legal Description: The west half of Farm Lot 42 of the American Colony Tract, in the City of Signal Hill, County of Los Angeles, State of California, as per map recorded in Book 19, Page(s) 89 and 90 of miscellaneous records, in the office of the County Recorder of said county; excepting therefrom: Beginning at the intersection of the southerly line of Spring Street 60 feet wide, with the easterly line of Orange Avenue, 60 feet wide, as shown on said map of the American Colony Tract; thence easterly 10 feet along said southerly line of Spring Street; thence southwesterly 14.4 feet in a direct line to a point in the easterly line of Orange Avenue, a distance 10 feet southerly of point of beginning; thence northerly 10 feet along the easterly line of Orange Avenue to the point of beginning.

**Drill Site No. 3 - Signal Hill West Unit**

Property Address/Location: The drill site is located north of Willow Street, south of 27<sup>th</sup> Street, between Walnut and Gardena Avenues.

Legal Description: A portion of the west one-half of Farm Lot 66 of the American Colony Tract, in the City of Signal Hill, County of Los Angeles, State of California, as per map recorded in Book 19, Page(s) 89 and 90 of miscellaneous records, in

the office of the County Recorder of said county, described as follows: Beginning on the east line of said west one-half of Farm Lot 66, said point being south 35 feet from the north line; thence west parallel to the said north line 70 feet to the true point of beginning; thence continuing west parallel to the said north line 190 feet; thence south parallel to the said east 378 feet; thence east parallel to the said north line 190 feet; thence north parallel to the said east line 378 feet to the true point of beginning.

#### **Drill Site No. 4 - Signal Hill Central Unit**

Property Address/Location: The drill site is located south of Combella Drive between Cherry and Junipero Avenues.

Legal Description: A portion of Farm Lot 83 as shown on the map of the American Colony Tract, in the City of Signal Hill, County of Los Angeles, State of California, as per map recorded in Book 19, Page(s) 89 and 90 of miscellaneous records, in the office of the County Recorder of said county, described as follows: Beginning at the center line intersection of Cherry Avenue and 25<sup>th</sup> Street; thence 705 feet east along the north line of Farm Lot 83; thence 28 feet south parallel to the west line of Farm Lot 83 to the true point of beginning; thence continuing south parallel to said west line 210 feet; thence east parallel to said north line 260 feet; thence north parallel to said west line 210 feet; thence west parallel to said north line 260 feet to the true point of beginning.

#### **Drill Site No. 5 - Signal Hill Central Unit**

Property Address/Location: The drill site is located southwest of Junipero Avenue and Combella Drive behind Home Depot.

Legal Description: Parcel 1: Farm Lot 82 of the American Colony Tract, in the City of Signal Hill, County of Los Angeles, State of California, as per map recorded in Book 19, Page(s) 89 and 90 of miscellaneous records, in the office of the County Recorder of said county. Excepting that portion of Farm Lot 82 conveyed to Jane Lang, by the deed recorded in Book 315, Page 132 of deeds, described in said deed as follows: The west half of Farm Lot 82, contained 10 acres. Also excepting that portion of the east half of Farm Lot 82 lying to the west of a line extending across said east half of Farm Lot 82 described as follows: Beginning at the center line intersection of Temple and Hathaway Avenues; thence 452 feet southwest along the south line of said east half of Farm Lot 82 to the true point of beginning; thence northwest parallel to the center line of Hathaway Avenue to the west line of said half of Farm Lot 82. Also excepting that portion of said portion of Farm Lot 82 included within the limits of Panorama Drive, as per map of Signal Hill Tract, recorded in Book 9, Page(s) 2 and 3 of maps, in the office of the County Recorder of said county. Parcel 2: Lot 1 of Tract No. 105, in the City of Signal Hill, County of Los Angeles, State of California, per map recorded in Book 14, Page 18 of maps, in the office of the

County Recorder of said county. Excepting that portion of said Lot 1 lying to the west of a line extending across said Lot 1 described as follows: Beginning at the center line intersection of Temple and Hathaway Avenues; thence 452 feet southwest along the north line of said Lot 1 to the true point of beginning; thence southeast parallel to the center line of Hathaway Avenue to the south line of said of Lot 1.

**Drill Site No. 6 - Signal Hill East Unit**

Property Address/Location: The drill site is located south of 20<sup>th</sup> Street between Redondo and Obispo Avenues.

Legal Description: Lots 6, 7 and 8 of the Palm Vista Tract, in the City of Signal Hill, County of Los Angeles, State of California, as per map recorded in Book 6, Page 191 of maps, in the office of the County Recorder of said county.

**Drill Site No. 7 - Signal Hill East Unit**

Property Address/Location: The drill site is located south of Grant Street between Redondo and Obispo Avenues.

Legal Description: The east half of Lot 13 and all of Lot 14 of the Palm Vista Tract, in the City of Signal Hill, County of Los Angeles, State of California, as per map recorded in Book 6, Page 191 of maps, in the office of the County Recorder of said county.

**APPROVED EXTENSION OF CONDITIONAL USE PERMIT 97-03  
THROUGH DECEMBER 31, 2014  
CONDITIONS OF APPROVAL**

**TYPE OF BUSINESS:** CONSOLIDATED DRILLING AND OIL PRODUCTION SITE

**LOCATION:** SEVEN CONSOLIDATED DRILLING AND OIL  
PRODUCTION SITES AND GAS PROCESSING FACILITY  
(LEGALLY DESCRIBED IN ATTACHMENTS A & B)

**APPLICANT:** SIGNAL HILL PETROLEUM

**TERM:** FEBRUARY 20, 2014 THROUGH DECEMBER 31, 2014

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

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, redrilling, 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. In the event that a violation is found, the Coordinator shall provide the operator written notice to correct the violation. The operator shall have thirty (30) days to correct the violation, unless the violation is a health or safety concern, in which case, the order shall require correction in such time as may be appropriate. The Coordinator may grant an extension to complete corrections if the operator shows good cause and has made progress toward compliance. Failure to correct violations may be grounds to revoke the CUP. In the event of a violation of any of the items hereof, or failure to comply with any provision of the Signal Hill Municipal Code, in lieu of commencing a revocation proceeding, the Director of Community Development may impose a penalty for each day the violation continues. The penalty shall be twenty-five dollars (\$25) per day, unless the violation is deemed a major violation, in which case, the penalty shall be seventy-five dollars (\$75) per day. A major violation shall be one which affects adjacent property or health and safety of persons. In the event City proposes to assess a penalty for a violation under this condition, then following the initial notice and the operator's failure to cure, a second 30-day notice shall be given which shall specify that the violator shall be subject to the penalty following a failure to timely cure the violation. Applicant may appeal the assessment of any penalty to the City Council, who may reverse, modify, or uphold the decision of the Director of Community Development. In making this decision, the City Council shall determine whether the violation exists and whether the amount of the penalty is appropriate under the circumstances. The City Council may direct the commencement of a revocation process in the alternative pursuant to Condition 10.
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 Planning Commission regarding revocation of the Conditional Use Permit may be appealed to the City Council.

### Operating Conditions

11. The following conditions apply to the operations of Consolidated Drilling and Oil Production Sites:

- a) 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.
- b) 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."
- c) 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."
- d) 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."
- e) 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."
- f) 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.
- g) 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."

- h) 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."
- i) 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

12. The following conditions have been added to mitigate the level of noise from operation of the Consolidated Drilling and Production sites.

- a) 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.
- b) The operator shall use electric motors to power equipment. Vehicle motors, including portable service or drilling rigs, may use internal combustion engines.
- c) 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.
- d) 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.

### 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 this Conditional Use Permit. All construction and landscaping shall be review and approved by the Director of Community Development.

- a) 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.
- b) 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 29<sup>th</sup> Street including an automatic irrigation system.
- c) 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 irrigation system.
- d) 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.
- e) 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.
- f) 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.
- g) 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 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 ten (10) 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. In accordance with the City's General Plan, the City and operator desire to maintain essential access to oil resources (Policy 2.10, Land Use Element) while attracting commercial and industrial development to the City, which will provide economic and employment benefits to the community (Policy 1.10, Land Use Element). It is understood that the Consolidated Drilling and Oil Production Sites are a critical component in maintaining essential access to oil resources. In addition, these sites provide measures by which development can be made compatible with existing oil operations (Policy 1.17, Land Use Element). Specifically, the sites allow for the consolidation of certain oil wells and facilities to assist with making land available for development and help to ensure a compatible interface between oil operations and development.

However, the City finds that the continued operation of the Drill Sites does impose development constraints on surrounding property, not only due to impacts on adjacent property emanating from the Drill Sites themselves, but also because several of the Drill Sites are the center of a network of wells which spread across the City, affecting the properties immediately adjacent. 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.

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.

23. The operator agrees to continue to cooperate with the City's efforts to establish an electrical utility including:

- 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.

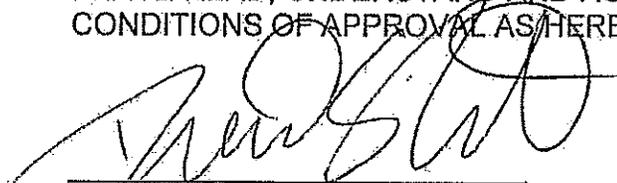
Landscape Maintenance and Upgrade:

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.

End of conditions.

I HAVE READ, UNDERSTAND AND AGREE TO ABIDE BY THE AFOREMENTIONED CONDITIONS OF APPROVAL AS HEREIN STATED.

  
\_\_\_\_\_  
Applicant

G.N

02/11/14  
\_\_\_\_\_  
Date

**AQMD PERMIT APPLICATION PACKAGE  
SIGNAL HILL PETROLEUM, INC. – FACILITY ID 101977  
MODIFICATIONS TO GAS PROCESSING PLANT**

**APPENDIX 2**

**Proposed Equipment Descriptions and Permit Conditions**

- Proposed Equipment Descriptions
  - Modified Vapor Recovery System (Modification of Existing A/N 494140)
  - Modified Natural Gas Dehydration System (Modification of Existing A/N 362338)
  - CO2 Filtration System (New A/N)
  
- Proposed Permit Conditions:
  - Related to the currently proposed gas plant modifications
  - Related to A/N 512158 submitted in June 2010
    - Proposed Revised Condition F30.1 (Title V Exemption)
    - Proposed New Condition (Rule 1178 Exemption)
  
- Copies of the Following Correspondence:
  - Letter from SHP to Mr. Chandra Bhatt dated April 21, 2009, requesting changes to recently issued facility permit;
  - Letter from SHP to Mr. Chandra Bhatt dated March 17, 2010, addressing revisions to the previously requested changes to the facility permit; and
  - Letter from Mr. Milan Steube to Mr. Hamilton Stoddard dated January 17, 2013, providing copies of the above two letters.

**DRAFT FACILITY PERMIT TO OPERATE – GAS PLANT MODIFICATIONS  
SIGNAL HILL PETROLEUM, INC. – ID 101977**

Equipment	ID No.	Connected To	RECLAIM Source Type/Monitoring Unit	Emissions and Requirements	Conditions
<b>Process 9: Field Gas Processing</b>					<b>Px.x</b>
<b>System 1: Vapor Recovery</b>					
Vessel, V-33, Under Vacuum, Length: 6 ft; Diam: 2 ft	D93				
Vessel, V-22, Under Vacuum, Length: 17 ft 5 in; Diam: 6 ft	D91				
Vessel, V-24, Under Vacuum, Length: 15 ft; Diam: 3 ft 6 in	D92				
Vessels, Suction Scrubbers, 1 <sup>st</sup> Stage, Height: 5 ft; Diam: 2 ft. 4 total, V-01, V-100, V-300, V-500	D129, D130, New, New				
<del>Compressors, Rotary Screw, 1<sup>st</sup> Stage Vapor Recovery, Leroi, with 150 HP Electric Motor, 4 Total, C-01, C-03, C-05, C-07</del>	<del>Existing, Existing, New, New</del>	Assume compressors do not need to be listed here as they are listed as Device D52 in Process 6: Fugitive Emissions.			
Vessels, Blowcases, 1st Stage, Length: 1 ft 6 in; Diam: 6 ft 8 in. 4 total, V-03, V-102, V-302, V-602	D133, New, New, New				
Vessels, Discharge Scrubbers / Oil Separators, 1 <sup>st</sup> Stage, Height: 3 ft 6 in; Diam: 3 ft. 4 total, V-02, V-101, V-303, V-305	D131, D132, New, New				
Heat Exchangers, Finned Tube, 1 <sup>st</sup> Stage, with 5 HP Fan Motor 8 total, E-01A/B, E-03A/B, E-04A/B, E-06A/B	D138, D139, New, New				
<del>Compressors, Rotary Screw, 2nd Stage Vapor Recovery, Leroi, with 150 HP Electric Motor, 4 Total, C-02, C-04, C-06, C-08</del>	<del>Existing, Existing, New, New</del>	Assume compressors do not need to be listed here as they are listed as Device D52 in Process 6: Fugitive Emissions.			

**DRAFT FACILITY PERMIT TO OPERATE – GAS PLANT MODIFICATIONS  
SIGNAL HILL PETROLEUM, INC. – ID 101977**

Vessels, Suction Scrubbers, 2 <sup>nd</sup> Stage, Height: 5 ft; Diam; 1 ft 2 in 4 total, V-04, V-200, V-400, V-600	D134, D135, New, New				
Vessels, Blowcases, 2nd Stage, Length: 1 ft 6 in; Diam: 6 ft 8 in. 4 total, V-06, V-202, V-502, V-702	New, New, New, New				
Vessels, Discharge Scrubbers / Oil Separators, 2 <sup>nd</sup> Stage, Height: 3 ft; Diam: 1 ft 8 in. 4 total, V-05, V-201, V-304, V-306	D136, D137, New, New				
Heat Exchangers, Finned Tube, 2 <sup>nd</sup> Stage, with 5 HP Fan Motor 8 total, E-02A/B, E-200/201, E-05A/B, E-07A/B	D140, D141, New, New				

NOTE: Suggest assigning one Device ID to each line item above.

**DRAFT FACILITY PERMIT TO OPERATE – GAS PLANT MODIFICATIONS  
SIGNAL HILL PETROLEUM, INC. – ID 101977**

Equipment	ID No.	Connected To	RECLAIM Source Type/Monitoring Unit	Emissions and Requirements	Conditions
<b>Process 9: Field Gas Processing</b>					<b>Px.x</b>
<b>System 2: Natural Gas Dehydration</b>					
Heat Exchanger, A-201,					
Heat Exchanger, E-10, Gas/Gas, Shell/Tube, Length: 11 ft, Diam: 1 ft 4 in	New				
Vessel, E-20, Chiller, Shell/Tube, Length: 16 ft; Diam: 2 ft	New				
Vessel, V-30, Cold Separator, Length: 10 ft, Diam: 2 ft	New				
Vessel, E-20A, Surge Drum, Length: 20 ft, Diam: 2 ft	New				
Vessel, V-402, Oil Still, Length: 3 ft, Diam: 1 ft	New				
Pump, P-102, Oil Still / Fill, with 2 HP Motor	New				
Vessel, T-40, Stabilizer Reboiler, Length: 12 ft 8 in, Diam: 2 ft with Electric Heater	New				E57.3
Vessel, T-40A, NGL Stabilizer Column Top, Height: 2 ft 8 in, Diam: 1 ft	New				E57.3
Vessel, T-40B, NGL Stabilizer Column Bottom, Height: 13 ft 4 in, Diam: 1 ft	New				E57.3
Compressors, C-300A/B, Propane, 2-Stage Rotary Screw, Mycom, Model P2016LMC-MBL-1, with 400 HP Electric Motor, 2 Total	New	Assume compressors do not need to be listed here as they are listed as Device D52 in Process 6: Fugitive Emissions.			
Vessel, V-401, Bulk Oil Separator, Length: 16 ft, Diam: 2 ft	New				
Vessel, V-403, Propane Receiver, Length: 15 ft, Diam: 2 ft	New				

**DRAFT FACILITY PERMIT TO OPERATE – GAS PLANT MODIFICATIONS  
SIGNAL HILL PETROLEUM, INC. – ID 101977**

Vessel, AX-200 / AX-350, Propane Condensor / Oil Cooler, Length: 24 ft, Diam: 8 ft 9 in, with 2 – 20 HP Fan Motors	New				
Vessel, V-404, Propane Flash Economizer, Length: 8 ft, Diam: 2 ft	New				
Vessel, V-405, EG Still Column, Length: 12 ft, Diam: 10 in	New				
Vessel, V-410, EG Reboiler, with Electric Heater, Length: 8 ft, Diam: 2 ft	New				E57.3
Pumps, P-545A/B, EG Pumps, 2 total, with 1 HP Motors	New				
Vessel, V-409, EG After-Filter, Length: 2 ft, 6 in, Diam: 6 in	New				
Vessel, V-408, EG Charcoal Adsorber, Length: 3 ft 4 in, Diam: 6 in	New				
Heat Exchanger, HX-103, EG Exchanger, Plate and Frame, Length: 3 ft, Diam: 20 in	New				
Vessel, V-407, EG Pre-Filter, Length: 2 ft 6 in, Diam: 6 in	New				
Vessel, V-406, EG Flash Drum, Length: 6 ft, Diam: 1 ft	New				
Heat Exchanger, Glycol Vapor Condensor, HZZ-1100	New				
Vessel, V-26, 20,000 Gallons Capacity, NGL Liquid, Pressure Vessel, Vented to Vapor Recovery System, Length: 35 ft; Diam: 10 ft	D113				E127.1
Vessel, V-27, 20,000 Gallons Capacity, NGL Liquid, Pressure Vessel, Vented to Vapor Recovery System, Length: 35 ft; Diam: 10 ft	D114				E127.1

**DRAFT FACILITY PERMIT TO OPERATE – GAS PLANT MODIFICATIONS  
SIGNAL HILL PETROLEUM, INC. – ID 101977**

Equipment	ID No.	Connected To	RECLAIM Source Type/Monitoring Unit	Emissions and Requirements	Conditions
<b>Process 9: Field Gas Processing</b>					<b>Px.x</b>
<b>System 3: CO2 Filtration</b>					
Vessel, T-10, Demister, Length: 5 ft 3 in; Diam: 2 ft 6 in	New				
Filter, F-11, Coarse Coalescing, Length: 4 ft 3 in; Diam: 10.75 in	New				
Filter, F-12, Fine Coalescing, Length: 4 ft 3 in; Diam: 10.75 in	New				
Heat Exchanger, HX-14, Length: 6 ft; Diam: 6.6 in	New				
Vessel, F-16, Carbon Filter, Length: 5 ft 7 in; Diam: 2 ft 6 in	New				
Filter, F-18, Particulate, Length: 4 ft 3 in; Diam: 10.75 in	New				
Vessel, MM-19, Membrane Module, Generon Model 6150-HHP-H, Length: 4 ft 4 in; Diam: 6.625 in	New				
Vessel, T-1, Buffer Tank, 200 Gallons	New				
Compressor, C-1, Recycle, Rotary Screw, Leroi	New	Assume compressors do not need to be listed here as they are listed as Device D52 in Process 6: Fugitive Emissions.			
Filter, F-1, Particulate, Leroi	New				
Vessel, OS-1, Oil/Gas Separator, Leroi	New				
Vessel, OC/GC-1, Oil Cooler/Gas Cooler, Leroi	New				
Vessel, T-2, Buffer Tank, 100 Gallons	New				
Compressor, C-2, Reject, Rotary Screw, Leroi	New	Assume compressors do not need to be listed here as they are listed as Device D52 in Process 6: Fugitive Emissions.			
Filter, F-2, Particulate, Leroi	New				
Vessel, OS-2, Oil/Gas Separator, Leroi	New				

**DRAFT FACILITY PERMIT TO OPERATE – GAS PLANT MODIFICATIONS  
SIGNAL HILL PETROLEUM, INC. – ID 101977**

Vessel, OC/GC-2, Oil Cooler/Gas Cooler, Leroi	New				
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**DRAFT FACILITY PERMIT TO OPERATE – GAS PLANT MODIFICATIONS  
SIGNAL HILL PETROLEUM, INC. – ID 101977**

**PROPOSED CONDITIONS RELATED TO CURRENTLY PROPOSED GAS PLANT MODIFICATIONS:**

Px.x The applicable requirements of the following regulations are applicable to all devices listed under this process:

Rule 1173

40 CFR Part 60 Subpart OOOO

**[Rule 1173, 5-13-1994; Rule 1173 12-6-2002; 40 CFR Part 60 Subpart OOOO, 8-16-2012]**

E57.3 The operator shall vent this equipment to vapor recovery system whenever this equipment is in operation.

**[Rule 1303(a)(1)-BACT, 5-10-1996; Rule 1303(a)(1)-BACT, 12-6-2002]**

[Devices subject to this condition: New Vessel T-40 / T-40A / T-40B, New Vessel V-410]

E127.1 The operator shall keep gauge/sample hatches closed except during actual gauging/sampling operations.

**[Rule 463, 3-11-1994]**

[Devices subject to this condition: D113, D114]

**Proposed Revision of Permit Condition F30.1**

F30.1 For the purpose of exemption from Title V requirements, the total emissions from this facility as defined in this condition shall not equal or exceed the following specified amounts:

<b>Pollutant</b>	<b>Emission Limit (Tons in any 12 consecutive calendar-month period)</b>
NOx	10
VOC	10

a). If the total facility emissions for any of the specified pollutant amounts are ~~in exceedance in any 12 consecutive calendar-month period~~, or if the facility operator fails to comply with the following requirements, the Facility Permit holder shall submit a Title V Permit application package and obtain a Title V permit pursuant to the requirements specified in Rule 3003. To ensure ~~demonstrate~~ compliance with the above emission limit(s) of this condition, the facility operator shall:

1. ~~i):~~ determine, and report NOx and SOx emissions in accordance with the requirements of Rule 2011 for SOx emissions and Rule 2012 for NOx emissions, Regulation XX as applicable;

2. ~~ii):~~ in addition to complying with all applicable monitoring, recordkeeping and reporting requirements of Regulation XX, monitor and determine and record on a monthly basis the total facility emissions, monthly and twelve month rolling average facility emissions for the pollutants limited by this condition, including emissions from all equipment and operations required to have written permits or exempt from written permits pursuant to Rule 219, but excluding emissions identified in Rule 3000(b)(258)(DA) and through (E), for each 12 consecutive month period;; and

3. ~~iii):~~ for any 12 consecutive month period in which emissions do not comply with an emission limit in this condition, submit to AQMD within 15 days a report of noncompliance and the total subject emissions from the facility for the preceding 12 consecutive calendar month period. Within 30 days after the end of each calendar month, have the facility's highest ranking individual responsible for compliance with District rules sign and certify the monthly and twelve month rolling average

emissions of the pollutants limited by this condition for the facility, including any pertinent procedures used to account for control system efficiencies and/or waste disposal. If total facility emissions as defined in this condition are less than 50% of the Title V major source threshold for a pollutant limited by this condition for a consecutive twelve month period, the certification of monthly and twelve month rolling average emissions for that pollutant may be documented within 30 days after the end of each calendar quarter. Documentation and certification must revert to the monthly frequency if emissions return to a level equal to or exceeding 50% of the Title V major source threshold.

b). ~~For the purpose of determining compliance with the emission limit(s), the total emissions from this facility shall be equal to the emissions recorded each month by the facility, including any corrections as allowed by Rule 2004, and including any corrections resulting from an AQMD audit of this facility. If fugitive emissions of VOC are not excluded from Title V applicability for this facility (i.e., if the facility belongs to one of categories listed in paragraph 2 of the definition of major source in 40 CFR Part 70, Section 70.2), then the facility operator must also do the following to demonstrate compliance with this condition:~~

1. Comply with Rule 109 (Recordkeeping for Volatile Organic Compound Emissions);
2. Maintain a single list which includes only the name and address of each person from whom the facility acquired VOC-containing material regulated by the District that was used or stored at the facility during the preceding 12 months; and
3. Retain all purchase invoices for all VOC-containing material used or stored at the facility, and all waste manifests for all waste VOC-containing material removed from the facility.

c). ~~The provisions of this condition are the sole method of determining compliance with the facility emission limit(s) of this condition.~~

- ~~1. Comply with Rule 109 (Recordkeeping for Volatile Organic Compound Emissions);~~
- ~~2. Within 14 calendar days after the end of each calendar month, total and record VOC emissions for the calendar month and for the previous 12 calendar month period from all equipment and operations that are required to have written permits or are exempt from written permits~~

~~pursuant to Rule 219. The record shall include any procedures used to account for control device efficiencies and/or waste disposal. It shall be signed and certified for accuracy by the highest ranking individual responsible for compliance with District rules.~~

- ~~3. Maintain a single list which includes only the name and address of each person from whom the facility acquired VOC-containing material regulated by the District that was used or stored at the facility during the preceding 12 months.~~
- ~~4. Retain all purchase invoices for all VOC-containing material used or stored at the facility, and all waste manifests for all waste VOC-containing material removed from the facility.~~
- ~~5. By July 1 of each year, total and record VOC emissions from the facility for the emission inventory year.~~

If total facility emissions during any consecutive twelve month period calculated in accordance with this condition exceed one or more of the limits in this condition, the facility operator shall:

1. Submit written notification of the noncompliance to the District within 30 days of discovery of the noncompliance; and
2. Submit an application to obtain a Title V Permit to the District in accordance with the requirements of Rule 3001 and timeline specified in Rule 3003.

**Proposed Permit Condition to Exempt a Facility from Rule 1178**

For the purpose of exemption from the requirements of District Rule 1178, the total emissions reported from this facility during any one reporting year pursuant to Rule 301 shall not exceed the following amounts:

Pollutant	Emission Limit (tons in any reporting year)
----- VOC	----- 20

- a) To demonstrate compliance with the above emission limit, the facility operator shall:
  - 1. Determine and report annual VOC emissions for the facility in accordance with all applicable permit conditions and District rule requirements.
  - 2. Comply with the requirements of District Rule 109 (Recordkeeping for Volatile Organic Compound Emissions);
  
- b) If facility emissions reported in accordance with the requirements of Rule 301 (including any corrections resulting from a District audit of the facility) exceed the above emission limit in any one reporting year, the facility operator shall:
  - 1. Submit written notification of noncompliance to the District within 30 days of discovery of the noncompliance; and
  - 2. Comply with the requirements of Rule 1178 in accordance with paragraph (d)(5) of the rule.



April 21, 2009

Chandra Bhatt  
South Coast Air Quality Management District  
21865 Copley Drive  
Diamond Bar, CA 91765

**RE: SIGNAL HILL PETROLEUM INC., SCAQMD FACILITY ID #101977,  
RECLAIM FACILITY PERMIT CORRECTIONS**

Dear Mr. Bhatt:

Signal Hill Petroleum (SHP) reviewed the recently revised South Coast Air Quality Management District (SCAQMD) facility permit sections for SHP's West Unit/Gas Plant, ID #101977 and has found some discrepancies that need correction. These discrepancies are included in a table attached to this letter (Attachment I). Also included are the redlined sections of the newly released permit sections (Attachment II). Finally, included is the previous version of the permit sections for your reference (Attachment III). If you have any questions or comments regarding this issue, please call me at (562) 595-6440, ext 5214.

Yours truly,

Jim Lee  
Signal Hill Petroleum, Inc.

Attachment: I: Table of Revisions  
II: New SHP Permit Sections – Redlined  
III: Previous SHP Permit Sections

cc: Sean McDaniel, file (SHP), Mike Shaffer (Shaffer Environmental), Ivan Tether (Tether Law)

Corrections to Permit Revision, dated March 27, 2009

No.	Location In Permit	Discrepancy Description	Correction	Comments
1	Section D: Facility Description; pg 1; Process 2: Internal Combustion; System 1: Electrical Power Generation	Turbine (Device ID No. D115) Maximum Heat Input Rating has not been revised.	Correct maximum heat input rating from "62.68 MMBTU/HR" to "76.20 MMBTU/HR"	Request and reason for change included with permit application.
2	Section D: Facility Description; pg 7; Process 9: Field Gas Processing; System 1: Vapor Recovery System	Revise Vessel V-01A dimensions (Device ID No. D130)	Revise "HEIGHT: 5 FT" to "HEIGHT 6 FT 8 IN"	Vessel functions identically to Vessel V-01, but has slight different dimensions.
3	Section D: Facility Description; pg 7; Process 9: Field Gas Processing; System 1: Vapor Recovery System	Revise Vessel V-03 dimensions (Device ID No. D133)	Revise "DIAMETER: 6 FT 8 IN" to "DIAMETER 6.625 IN"	Vessel was listed as DIAMETER: 7 IN on previous permit.
4	Section D: Facility Description; pg 7; Process 9: Field Gas Processing; System 1: Vapor Recovery System	Revise Vessel V-04A dimensions (Device ID No. D135)	Revise "HEIGHT: 5 FT; DIAMETER 1 FT 2 IN" to "HEIGHT 6 FT 10 IN; DIAMETER 2 FT"	Vessel functions identically to Vessel V-04, but has slightly different dimensions.
5	Section D: Facility Description; pg 9; Process 9: Field Gas Processing; System 2: Natural Gas Dehydration	Vessel V-01 (Device ID No. D94) needs to be removed	Remove Device ID No. 94 from System 2	Vessel V-01 has been moved to System 1: Vapor Recovery System, and reidentified as ID No. D129
6	Section D: Facility Description; pg 9; Process 9: Field Gas Processing; System 2: Natural Gas Dehydration	Vessel V-03 (Device ID No. D95) needs to be removed	Remove Device ID No. 95 from System 2	Vessel V-03 has been moved to System 1: Vapor Recovery System, and reidentified as ID No. D130
7	Section D: Facility Description; pg 9; Process 9: Field Gas Processing; System 2: Natural Gas Dehydration	Vessel V-04 (Device ID No. D96) needs to be removed	Remove Device ID No. 96 from System 2	Vessel V-04 has been moved to System 1: Vapor Recovery System, and reidentified as ID No. D131
8	Section D: Facility Description; pg 9; Process 9: Field Gas Processing; System 2: Natural Gas Dehydration	Heat Exchanger E-01B (Device ID No. D97) needs to be removed	Remove Device ID No. 97 from System 2	Heat Exchanger E-01B has been moved to System 1: Vapor Recovery System, and reidentified as ID No. D132
9	Section D: Facility Description; pg 9; Process 9: Field Gas Processing; System 2: Natural Gas Dehydration	Heat Exchanger E-02B (Device ID No. D98) needs to be removed	Remove Device ID No. 98 from System 2	Heat Exchanger E-02B has been moved to System 1: Vapor Recovery System, and reidentified as ID No. D133
10	Section D: Device ID Index; pg 13	Device ID Nos. D94, D95, D96, D97, & D98 need to be removed from the list	Remove Device ID Nos. D94, D95, D96, D97 & D98 from Index List	See above corrections

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SIGNAL HILL PETROLEUM

(3/17/2010)

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**CHANDRA BHATT SCAQMD**  
Street, Apt. No.,  
or PO Box No. **21865 COPLEY DRIVE**  
City, State, ZIP+4  
**DIAMOND BAR, CA 91765**

District

S Form 3800, August 2006 See Reverse for Instructions

**RE: SIGNAL HILL PETROLEUM INC., SCAQMD FACILITY ID #101977,  
RECLAIM FACILITY PERMIT CORRECTIONS**

Dear Mr. Bhatt:

Signal Hill Petroleum (SHP) is awaiting revisions to discrepancies found in the RECLAIM facility permit revision for SHP's West Unit facility, SCAQMD ID#101977, released on March 27, 2009. Attached is the letter dated April 21, 2009 that SHP sent to the District detailing the discovered discrepancies. Included with that letter was a summary table of the discrepancies, redlined items in the revised permit sections and the previous released permit.

In order to hasten the revision process, SHP withdraws the request to correct vessels V-01A and V-04A dimensions, listed as item numbers 2 and 4 in the summary table. SHP will fabricate and install these vessels as listed in the permit revision. However, the other items in the summary table do not reflect changes requested in the permit application and need to be revised as soon as possible.

Also note, that SHP has deactivated Device Number D121, a diesel powered emergency generator and wishes to remove it from the RECLAIM facility permit. As noted in the SHP's Cycle 1 2009 APEP recently submitted to the District, this emergency generator was last operated before May 1, 2009. Please call me if you have any questions or comments regarding this request at (562) 595-6440, ext 5214.

Yours truly,



Jim Lee

Signal Hill Petroleum, Inc.

- Attachment A Updated Summary Table of Revisions
- B Letter requesting changes dated April 21, 2009

cc: Sean McDaniel file (SHP)

Signal Hill Petroleum, Inc.  
2655 Cherry Avenue  
Signal Hill, CA 90755  
(562) 595-6440

ATTACHMENT A

Corrections to Permit Revision, dated March 27, 2009

No.	Location In Permit	Discrepancy Description	Correction	Comments
1	Section D: Facility Description; pg 1; Process 2: Internal Combustion; System 1: Electrical Power Generation	Turbine (Device ID No. D115) Maximum Heat Input Rating has not been revised.	Correct maximum heat input rating from "62.68 MMBTU/HR" to "76.20 MMBTU/HR"	Request and reason for change included with permit application.
3	Section D: Facility Description; pg 7; Process 9: Field Gas Processing; System 1: Vapor Recovery System	Revise Vessel V-03 dimensions (Device ID No. D133)	Revise "DIAMETER: 6 FT 8 IN" to "DIAMETER 6.625 IN"	Vessel was listed as DIAMETER: 7 IN on previous permit - no dimensional change was requested in permit application.
5	Section D: Facility Description; pg 9; Process 9: Field Gas Processing; System 2: Natural Gas Dehydration	Vessel V-01 (Device ID No. D94) needs to be removed	Remove Device ID No. 94 from System 2	Vessel V-01 has been moved to System 1: Vapor Recovery System, and reidentified as ID No. D129
6	Section D: Facility Description; pg 9; Process 9: Field Gas Processing; System 2: Natural Gas Dehydration	Vessel V-03 (Device ID No. D95) needs to be removed	Remove Device ID No. 95 from System 2	Vessel V-03 has been moved to System 1: Vapor Recovery System, and reidentified as ID No. <del>D133</del> 133
7	Section D: Facility Description; pg 9; Process 9: Field Gas Processing; System 2: Natural Gas Dehydration	Vessel V-04 (Device ID No. D96) needs to be removed	Remove Device ID No. 96 from System 2	Vessel V-04 has been moved to System 1: Vapor Recovery System, and reidentified as ID No. <del>D134</del> 134
8	Section D: Facility Description; pg 9; Process 9: Field Gas Processing; System 2: Natural Gas Dehydration	Heat Exchanger E-01B (Device ID No. D97) needs to be removed	Remove Device ID No. 97 from System 2	Heat Exchanger E-01B has been moved to System 1: Vapor Recovery System, and reidentified as ID No. <del>D139</del> D139
9	Section D: Facility Description; pg 9; Process 9: Field Gas Processing; System 2: Natural Gas Dehydration	Heat Exchanger E-02B (Device ID No. D98) needs to be removed	Remove Device ID No. 98 from System 2	Heat Exchanger E-02B has been moved to System 1: Vapor Recovery System, and reidentified as ID No. <del>D141</del> D141
10	Section D: Device ID Index; pg 13	Device ID Nos. D94, D95, D96, D97, & D98 need to be removed from the list	Remove Device ID Nos. D94, D95, D96, D97 & D98 from Index List	See above corrections - District moved these devices from Process 9, System 2, Natural Gas Dehydration to Process 9, System 1, Vapor Recovery System
<b>Withdrawn Corrections to Permit Revision, dated March 27, 2009</b>				
2	Section D: Facility Description; pg 7; Process 9: Field Gas Processing; System 1: Vapor Recovery System	Revise Vessel V-01A dimensions- (Device ID No. D130)	Revise "HEIGHT: 5 FT" to "HEIGHT- 6 FT-8 IN"	SHP will fabricate vessel to size listed in the permit revision
4	Section D: Facility Description; pg 7; Process 9: Field Gas Processing; System 1: Vapor Recovery System	Revise Vessel V-04A dimensions- (Device ID No. D136)	Revise "HEIGHT: 5 FT; DIAMETER 4 FT 2 IN" to "HEIGHT 6 FT 10 IN; DIAMETER 2 FT"	SHP will fabricate vessel to size listed in the permit revision



**Milan Steube, Environmental Consultant**  
8 Rimani Drive, Mission Viejo, CA 92692

January 17, 2013

Mr. Hamilton Stoddard, Air Quality Engineer II  
South Coast Air Quality Management District  
Stationary Source Compliance  
21865 E. Copley Drive  
Diamond Bar, CA 91765-4182

**RE: SIGNAL HILL PETROLEUM, INC. – FACILITY ID #101977**

Mr. Stoddard:

On behalf of Signal Hill Petroleum, Inc., and as you requested, please find enclosed copies of letters addressed to Mr. Chandra Bhatt dated April 21, 2009, and March 17, 2010, regarding corrections to the subject Facility Permit. If you have further questions regarding these documents, please call me at (949) 309-9310.

Sincerely,

Milan Steube

Enclosures: Letters from Mr. Jim Lee of Signal Hill Petroleum, Inc. to Mr. Chandra Bhatt of SCAQMD dated April 21, 2009, and March 17, 2010.

cc: file (SHP)

**AQMD PERMIT APPLICATION PACKAGE  
SIGNAL HILL PETROLEUM, INC. – FACILITY ID 101977  
MODIFICATIONS TO GAS PROCESSING PLANT**

**APPENDIX 3**

**Criteria Emissions**

- Summary
- Vapor Recovery System
- Natural Gas Dehydration System
- CO<sub>2</sub> Filtration System

# Criteria Pollutant Emissions Summary (ΔPTE) - Summary

Signal Hill Petroleum, Inc. - West Unit Facility (ID 101977)  
Gas Plant Modification Project

<b>lbs per day</b>		VOC	NOx	SOx	CO	PM10
<b>Fugitive Emissions</b>						
Vapor Recovery		5.65				
Nat Gas Dehy		7.29				
CO2 Filtration		5.19				
<b>Total Project</b>		<b>18.13</b>				

<b>lbs per year</b>		VOC	NOx	SOx	CO	PM10
<b>Fugitive Emissions</b>						
Vapor Recovery		2062.87				
Nat Gas Dehy		2659.24				
CO2 Filtration		1895.67				
<b>Total Project</b>		<b>6617.78</b>				

<b>lbs per hour</b>		VOC	NOx	SOx	CO	PM10
<b>Fugitive Emissions</b>						
Vapor Recovery		0.235				
Nat Gas Dehy		0.304				
CO2 Filtration		0.216				
<b>Total Project</b>		<b>0.755</b>				

<b>tons per year</b>		VOC	NOx	SOx	CO	PM10
<b>Fugitive Emissions</b>						
Vapor Recovery		1.03				
Nat Gas Dehy		1.33				
CO2 Filtration		0.95				
<b>Total Project</b>		<b>3.31</b>				

# Criteria Pollutant Emissions ( $\Delta$ PTE) from Fugitives Signal Hill Petroleum, Inc. - West Unit Facility (ID 101977) Gas Plant Modification Project

## Vapor Recovery System

PTE for Fugitives VOC for New Components (based on Maximum Weighted Average Quarterly Emission Factors)									
Category	CAPCOA Count	lbs VOC / hour		lbs VOC / day		lbs VOC / year		factor	lbs VOC / year
		factor	lbs/hr	factor	lbs/day	factor	lbs/yr		
Compr Seals - Gas / Lt Liq	4	1.73E-04	0.00069	4.15E-03	0.017	1.51E+00	6.1	1.51E+00	6.1
Compr Seals - Lt Crude	0	0.00E+00	0.00000	0.00E+00	0.000	0.00E+00	0.0	0.00E+00	0.0
Compr Seals - Hvy Crude	0	0.00E+00	0.00000	0.00E+00	0.000	0.00E+00	0.0	0.00E+00	0.0
Connectors - Gas / Lt Liq	1782	2.47E-05	0.04394	5.92E-04	1.054	2.16E-01	384.9	2.16E-01	384.9
Connectors - Lt Crude	0	0.00E+00	0.00000	0.00E+00	0.000	0.00E+00	0.0	0.00E+00	0.0
Connectors - Hvy Crude	0	0.00E+00	0.00000	0.00E+00	0.000	0.00E+00	0.0	0.00E+00	0.0
Flanges - Gas / Lt Liq	135	3.35E-05	0.00452	8.04E-04	0.109	2.93E-01	39.6	2.93E-01	39.6
Flanges - Lt Crude	0	0.00E+00	0.00000	0.00E+00	0.000	0.00E+00	0.0	0.00E+00	0.0
Flanges - Hvy Crude	0	0.00E+00	0.00000	0.00E+00	0.000	0.00E+00	0.0	0.00E+00	0.0
Other - Gas / Lt Liq	152	6.49E-04	0.09864	1.56E-02	2.367	5.68E+00	864.1	5.68E+00	864.1
Other - Lt Crude	0	0.00E+00	0.00000	0.00E+00	0.000	0.00E+00	0.0	0.00E+00	0.0
Other - Hvy Crude	0	0.00E+00	0.00000	0.00E+00	0.000	0.00E+00	0.0	0.00E+00	0.0
PRDs - Gas / Lt Liq	0	1.73E-04	0.00000	4.15E-03	0.000	1.51E+00	0.0	1.51E+00	0.0
PRDs - Lt Crude	0	0.00E+00	0.00000	0.00E+00	0.000	0.00E+00	0.0	0.00E+00	0.0
PRDs - Hvy Crude	0	0.00E+00	0.00000	0.00E+00	0.000	0.00E+00	0.0	0.00E+00	0.0
Pump Seals - Gas / Lt Liq	0	1.19E-03	0.00000	2.85E-02	0.000	1.04E+01	0.0	1.04E+01	0.0
Pump Seals - Lt Crude	0	0.00E+00	0.00000	0.00E+00	0.000	0.00E+00	0.0	0.00E+00	0.0
Pump Seals - Hvy Crude	0	0.00E+00	0.00000	0.00E+00	0.000	0.00E+00	0.0	0.00E+00	0.0
Valves - Gas / Lt Liq	189	4.64E-04	0.08770	1.11E-02	2.105	4.06E+00	768.3	4.06E+00	768.3
Valves - Lt Crude	0	0.00E+00	0.00000	0.00E+00	0.000	0.00E+00	0.0	0.00E+00	0.0
Valves - Hvy Crude	0	0.00E+00	0.00000	0.00E+00	0.000	0.00E+00	0.0	0.00E+00	0.0
<b>Total</b>	<b>2262</b>		<b>0.23549</b>		<b>5.652</b>		<b>2062.9</b>		<b>2062.9</b>

**Criteria Pollutant Emissions (ΔPTE) from Fugitives  
Signal Hill Petroleum, Inc. - West Unit Facility (ID 101977)  
Gas Plant Modification Project**

**Criteria Pollutant Emissions (ΔPTE) from Fugitives  
Signal Hill Petroleum, Inc. - West Unit Facility (ID 101977)  
Gas Plant Modification Project**

**Natural Gas Dehydration System**

PTE for Fugitives VOC for New Components (based on Maximum Weighted Average Quarterly Emission Factors)									
Category	CAPCOA Count	lbs VOC / hour factor	lbs/hr	lbs VOC / day factor	lbs/day	lbs VOC / year factor	lbs/yr		
Compr Seals - Gas / Lt Liq	0	1.73E-04	0.00000	4.15E-03	0.000	1.51E+00	0.0		
Compr Seals - Lt Crude	0	0.00E+00	0.00000	0.00E+00	0.000	0.00E+00	0.0		
Compr Seals - Hvy Crude	0	0.00E+00	0.00000	0.00E+00	0.000	0.00E+00	0.0		
Connectors - Gas / Lt Liq	1767	2.47E-05	0.04357	5.92E-04	1.046	2.16E-01	381.6		
Connectors - Lt Crude	0	0.00E+00	0.00000	0.00E+00	0.000	0.00E+00	0.0		
Connectors - Hvy Crude	172	0.00E+00	0.00000	0.00E+00	0.000	0.00E+00	0.0		
Flanges - Gas / Lt Liq	21	3.35E-05	0.00070	8.04E-04	0.017	2.93E-01	6.2		
Flanges - Lt Crude	0	0.00E+00	0.00000	0.00E+00	0.000	0.00E+00	0.0		
Flanges - Hvy Crude	0	0.00E+00	0.00000	0.00E+00	0.000	0.00E+00	0.0		
Other - Gas / Lt Liq	327	6.49E-04	0.21220	1.56E-02	5.093	5.68E+00	1858.9		
Other - Lt Crude	0	0.00E+00	0.00000	0.00E+00	0.000	0.00E+00	0.0		
Other - Hvy Crude	18	0.00E+00	0.00000	0.00E+00	0.000	0.00E+00	0.0		
PRDs - Gas / Lt Liq	4	1.73E-04	0.00069	4.15E-03	0.017	1.51E+00	6.1		
PRDs - Lt Crude	0	0.00E+00	0.00000	0.00E+00	0.000	0.00E+00	0.0		
PRDs - Hvy Crude	0	0.00E+00	0.00000	0.00E+00	0.000	0.00E+00	0.0		
Pump Seals - Gas / Lt Liq	0	1.19E-03	0.00000	2.85E-02	0.000	1.04E+01	0.0		
Pump Seals - Lt Crude	0	0.00E+00	0.00000	0.00E+00	0.000	0.00E+00	0.0		
Pump Seals - Hvy Crude	2	0.00E+00	0.00000	0.00E+00	0.000	0.00E+00	0.0		
Valves - Gas / Lt Liq	100	4.64E-04	0.04640	1.11E-02	1.114	4.06E+00	406.5		
Valves - Lt Crude	0	0.00E+00	0.00000	0.00E+00	0.000	0.00E+00	0.0		
Valves - Hvy Crude	8	0.00E+00	0.00000	0.00E+00	0.000	0.00E+00	0.0		
<b>Total</b>	<b>2419</b>		<b>0.30357</b>		<b>7.286</b>		<b>2659.2</b>		

**Criteria Pollutant Emissions (ΔPTE) from Fugitives**  
**Signal Hill Petroleum, Inc. - West Unit Facility (ID 101977)**  
**Gas Plant Modification Project**

**Criteria Pollutant Emissions (ΔPTE) from Fugitives**  
**Signal Hill Petroleum, Inc. - West Unit Facility (ID 101977)**  
**Gas Plant Modification Project**

**CO2 Filtration System**

PTE for Fugitives VOC for New Components (based on Maximum Weighted Average Quarterly Emission Factors)									
Category	CAPCOA Count	lbs VOC / hour		lbs VOC / day		lbs VOC / year			lbs VOC / year
		factor	lbs/hr	factor	lbs/day	factor	lbs/yr		
Compr Seals - Gas / Lt Liq	2	1.73E-04	0.00035	4.15E-03	0.008	1.51E+00	3.0		1.51E+00
Compr Seals - Lt Crude	0	0.00E+00	0.00000	0.00E+00	0.000	0.00E+00	0.0		0.00E+00
Compr Seals - Hvy Crude	0	0.00E+00	0.00000	0.00E+00	0.000	0.00E+00	0.0		0.00E+00
Connectors - Gas / Lt Liq	1200	2.47E-05	0.02959	5.92E-04	0.710	2.16E-01	259.2		2.16E-01
Connectors - Lt Crude	0	0.00E+00	0.00000	0.00E+00	0.000	0.00E+00	0.0		0.00E+00
Connectors - Hvy Crude	0	0.00E+00	0.00000	0.00E+00	0.000	0.00E+00	0.0		0.00E+00
Flanges - Gas / Lt Liq	60	3.35E-05	0.00201	8.04E-04	0.048	2.93E-01	17.6		2.93E-01
Flanges - Lt Crude	0	0.00E+00	0.00000	0.00E+00	0.000	0.00E+00	0.0		0.00E+00
Flanges - Hvy Crude	0	0.00E+00	0.00000	0.00E+00	0.000	0.00E+00	0.0		0.00E+00
Other - Gas / Lt Liq	209	6.49E-04	0.13563	1.56E-02	3.255	5.68E+00	1188.1		5.68E+00
Other - Lt Crude	0	0.00E+00	0.00000	0.00E+00	0.000	0.00E+00	0.0		0.00E+00
Other - Hvy Crude	0	0.00E+00	0.00000	0.00E+00	0.000	0.00E+00	0.0		0.00E+00
PRDs - Gas / Lt Liq	6	1.73E-04	0.00104	4.15E-03	0.025	1.51E+00	9.1		1.51E+00
PRDs - Lt Crude	0	0.00E+00	0.00000	0.00E+00	0.000	0.00E+00	0.0		0.00E+00
PRDs - Hvy Crude	0	0.00E+00	0.00000	0.00E+00	0.000	0.00E+00	0.0		0.00E+00
Pump Seals - Gas / Lt Liq	0	1.19E-03	0.00000	2.85E-02	0.000	1.04E+01	0.0		1.04E+01
Pump Seals - Lt Crude	0	0.00E+00	0.00000	0.00E+00	0.000	0.00E+00	0.0		0.00E+00
Pump Seals - Hvy Crude	0	0.00E+00	0.00000	0.00E+00	0.000	0.00E+00	0.0		0.00E+00
Valves - Gas / Lt Liq	103	4.64E-04	0.04779	1.11E-02	1.147	4.06E+00	418.7		4.06E+00
Valves - Lt Crude	0	0.00E+00	0.00000	0.00E+00	0.000	0.00E+00	0.0		0.00E+00
Valves - Hvy Crude	0	0.00E+00	0.00000	0.00E+00	0.000	0.00E+00	0.0		0.00E+00
<b>Total</b>	<b>1580</b>		<b>0.21640</b>		<b>5.194</b>		<b>1895.7</b>		<b>1895.7</b>

**AQMD PERMIT APPLICATION PACKAGE  
SIGNAL HILL PETROLEUM, INC. – FACILITY ID 101977  
MODIFICATIONS TO GAS PROCESSING PLANT**

**APPENDIX 4**

**Toxic Emissions**

- Summary
- Vapor Recovery System
- Natural Gas Dehydration System
- CO<sub>2</sub> Filtration System

# Toxic Emissions - Summary

## Signal Hill Petroleum, Inc. - West Unit Facility (ID 101977)

### Gas Plant Modification Project

TAC	Max Hourly TAC Emissions (lb/hour)				Total
	Vapor Recovery	Natural Gas Dehy	CO2 Filtration		
Acetaldehyde	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acrolein	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzene	6.80E-04	8.77E-04	6.25E-04	2.18E-03	2.18E-03
Cresols	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene	1.09E-04	1.35E-04	9.62E-05	3.36E-04	3.36E-04
Formaldehyde	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hexane	4.92E-03	6.34E-03	4.52E-03	1.58E-02	1.58E-02
Hydrogen Sulfide	7.37E-06	9.50E-06	6.77E-06	2.36E-05	2.36E-05
Naphthalene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PAHs(non-naphthalene)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenol	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Propylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene	3.14E-04	4.05E-04	2.88E-04	1.01E-03	1.01E-03
Xylene	2.09E-04	2.70E-04	1.92E-04	6.71E-04	6.71E-04

TAC	Max Annual TAC Emissions (lb/year)				Total
	Vapor Recovery	Natural Gas Dehy	CO2 Filtration		
Acetaldehyde	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acrolein	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzene	5.96E+00	7.68E+00	5.47E+00	1.91E+01	1.91E+01
Cresols	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene	9.47E-01	1.18E+00	8.42E-01	2.94E+00	2.94E+00
Formaldehyde	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Hexane	4.31E+01	5.55E+01	3.96E+01	1.38E+02	1.38E+02
Hydrogen Sulfide	6.46E-02	8.32E-02	5.93E-02	2.07E-01	2.07E-01
Naphthalene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PAHs(non-naphthalene)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenol	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Propylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene	2.75E+00	3.54E+00	2.53E+00	8.82E+00	8.82E+00
Xylene	1.83E+00	2.36E+00	1.68E+00	5.88E+00	5.88E+00

# Toxic Emissions from Fugitives

## Signal Hill Petroleum, Inc. - West Unit Facility (ID 101977)

### Gas Plant Modification Project

#### Vapor Recovery System

TAC	CAS	MW	CONCENTRATION		FUGITIVE EMISSIONS LB/HR <sup>d</sup>	FUGITIVE EMISSIONS LB/YR <sup>c</sup>
			PPMV	PPMW <sup>a</sup>		
ACETALDEHYDE	75-07-0	44.05			0.00E+00	0.00E+00
ACROLEIN	107-02-8	56.10			0.00E+00	0.00E+00
BENZENE	71-43-2	78.11		1300	6.80E-04	5.96E+00
CRESOLS	1319-77-3	108.14			0.00E+00	0.00E+00
ETHYLBENZENE	100-41-4	106.16		200	1.05E-04	9.17E-01
FORMALDEHYDE	50-00-0	30.03			0.00E+00	0.00E+00
HEXANE	110-54-3	86.17		9400	4.92E-03	4.31E+01
HYDROGEN SULFIDE <sup>b</sup>	7783-06-4	34.08	10	14	7.37E-06	6.46E-02
NAPHTHALENE	91-20-3	128.16			0.00E+00	0.00E+00
PAHs (excl. NAPHTHALENE)	1150&1151				0.00E+00	0.00E+00
PHENOL	108-95-2	94.11			0.00E+00	0.00E+00
PROPYLENE	115-07-1	42.08			0.00E+00	0.00E+00
TOLUENE	108-88-3	92.13		600	3.14E-04	2.75E+00
XYLENE	1330-20-7	106.16		400	2.09E-04	1.83E+00
<b>Total TOG Emissions from new equipment =</b>			<b>0.3500</b>	<b>(VOC fract) =</b>	<b>4583</b>	<b>lbs TOG / yr</b>
			<b>MOLECULAR WEIGHT OF PRODUCED GAS = 24.19</b>			

<sup>a</sup> PPMW for TACs other than H<sub>2</sub>S were calculated by TANKS 4.09d based on 5/13/2004 sample of SHWU crude oil analyzed by Zalco Laboratories, inc. - Lab ID 0405186-002A

<sup>b</sup> PPMW for H<sub>2</sub>S = PPMV x (MW<sub>TAC</sub> / MW<sub>(feed gas)</sub>)

<sup>c</sup> H<sub>2</sub>S PPMV assumed to be the highest typically observed in SWHU produced gas

<sup>d</sup> LB/YR = PPMW x (Total Fugitive TOG emissions increase in lbs/yr)

<sup>e</sup> LB/HR = LB/YR / 8760

# Toxic Emissions from Fugitives

## Signal Hill Petroleum, Inc. - West Unit Facility (ID 101977)

### Gas Plant Modification Project

#### Natural Gas Dehydration System

TAC	CAS	MW	CONCENTRATION		FUGITIVE EMISSIONS LB/HR <sup>d</sup>	FUGITIVE EMISSIONS LB/YR <sup>c</sup>
			PPMV	PPMW <sup>a</sup>		
ACETALDEHYDE	75-07-0	44.05			0.00E+00	0.00E+00
ACROLEIN	107-02-8	56.10			0.00E+00	0.00E+00
BENZENE	71-43-2	78.11		1300	8.77E-04	7.68E+00
CRESOLS	1319-77-3	108.14		200	0.00E+00	0.00E+00
ETHYLBENZENE	100-41-4	106.16			1.35E-04	1.18E+00
FORMALDEHYDE	50-00-0	30.03			0.00E+00	0.00E+00
HEXANE	110-54-3	86.17		9400	6.34E-03	5.55E+01
HYDROGEN SULFIDE <sup>b</sup>	7783-06-4	34.08	10	14	9.50E-06	8.32E-02
NAPHTHALENE	91-20-3	128.16			0.00E+00	0.00E+00
PAHs (excl. NAPHTHALENE)	1150&1151				0.00E+00	0.00E+00
PHENOL	108-95-2	94.11			0.00E+00	0.00E+00
PROPYLENE	115-07-1	42.08			0.00E+00	0.00E+00
TOLUENE	108-88-3	92.13		600	4.05E-04	3.54E+00
XYLENE	1330-20-7	106.16		400	2.70E-04	2.36E+00
<b>Total TOG Emissions from new equipment =</b>			<b>0.3500</b>	<b>(VOC fract) =</b>	<b>5908</b>	<b>lbs TOG / yr</b>
			<b>MOLECULAR WEIGHT OF PRODUCED GAS = 24.19</b>			

<sup>a</sup> PPMW for TACs other than H<sub>2</sub>S were calculated by TANKS 4.09d based on 5/13/2004 sample of SHWU crude oil analyzed by Zalco Laboratories, Inc. - Lab ID 0405186-002A

<sup>b</sup> H<sub>2</sub>S PPMW assumed to be the highest typically observed in SWHU produced gas

<sup>c</sup> LB/YR = PPMW x (Total Fugitive TOG emissions increase in lbs/yr)

<sup>d</sup> LB/HR = LB/YR / 8760

# Toxic Emissions from Fugitives

## Signal Hill Petroleum, Inc. - West Unit Facility (ID 101977)

### Gas Plant Modification Project

#### CO2 Filtration System

TAC	CAS	MW	CONCENTRATION		FUGITIVE EMISSIONS LB/HR <sup>d</sup>	FUGITIVE EMISSIONS LB/YR <sup>e</sup>	
			PPMV	PPMW <sup>a</sup>			
ACETALDEHYDE	75-07-0	44.05			0.00E+00	0.00E+00	
ACROLEIN	107-02-8	56.10			0.00E+00	0.00E+00	
BENZENE	71-43-2	78.11		1300	6.25E-04	5.47E+00	
CRESOLS	1319-77-3	108.14			0.00E+00	0.00E+00	
ETHYLBENZENE	100-41-4	106.16		200	9.62E-05	8.42E-01	
FORMALDEHYDE	50-00-0	30.03			0.00E+00	0.00E+00	
HEXANE	110-54-3	86.17		9400	4.52E-03	3.96E+01	
HYDROGEN SULFIDE <sup>b</sup>	7783-06-4	34.08	10	14	6.77E-06	5.93E-02	
NAPHTHALENE	91-20-3	128.16			0.00E+00	0.00E+00	
PAHs (excl. NAPHTHALENE)	1150&1151				0.00E+00	0.00E+00	
PHENOL	108-95-2	94.11			0.00E+00	0.00E+00	
PROPYLENE	115-07-1	42.08			0.00E+00	0.00E+00	
TOLUENE	108-88-3	92.13		600	2.88E-04	2.53E+00	
XYLENE	1330-20-7	106.16		400	1.92E-04	1.68E+00	
<b>Total TOG Emissions from new equipment =</b>			<b>1474.20</b>	<b>0.3500</b>	<b>(VOC fract) =</b>	<b>4211</b>	<b>lbs TOG / yr</b>

MOLECULAR WEIGHT OF PRODUCED GAS = 24.19

<sup>a</sup> PPMW for TACs other than H<sub>2</sub>S were calculated by TANKS 4.09d based on 5/13/2004 sample of SHWU crude oil analyzed by Zalco Laboratories, Inc. - Lab ID 0405186-002A

<sup>b</sup> PPMW for H<sub>2</sub>S = PPMW x (MW<sub>TAC</sub> / MW<sub>feed gas</sub>)

<sup>c</sup> H<sub>2</sub>S PPMW assumed to be the highest typically observed in SWHU produced gas

<sup>d</sup> LB/HR = PPMW x (Total Fugitive TOG emissions increase in lbs/yr)

<sup>e</sup> LB/YR = LB/HR / 8760

**AQMD PERMIT APPLICATION PACKAGE  
SIGNAL HILL PETROLEUM, INC. – FACILITY ID 101977  
MODIFICATIONS TO GAS PROCESSING PLANT**

**APPENDIX 5**

**Rule 1401 Health Risk Analyses**

- Target Organs Affected by Toxic Air Contaminants
- Vapor Recovery System
  - Tier 1
  - Tier 2
  - Tier 3 (including AERSCREEN Output File)
- Natural Gas Dehydration System
  - Tier 1
  - Tier 2
  - Tier 3 (including AERSCREEN Output File)
- CO<sub>2</sub> Filtration System
  - Tier 1
  - Tier 2
  - Tier 3 (including AERSCREEN Output File)
- Project Summary

# Target Organs Affected by Toxic Air Contaminants

Signal Hill Petroleum, Inc. - West Unit Facility (ID 101977)  
Gas Plant Modification Project

Toxic Air Contaminant	CHRONIC TOXICITY												
	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Acetaldehyde												X	
Acrolein						X						X	
Benzene				X			X			X			
Cresols										X			
Ethylbenzene	X			X				X					
Formaldehyde						X						X	
Hexane									X				
Hydrogen Sulfide												X	
Naphthalene												X	
PAHs (non-naphthalene)												X	
Phenol	X		X						X				
Propylene													X
Toluene				X						X		X	
Xylenes										X		X	

Toxic Air Contaminant	ACUTE TOXICITY												
	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Acetaldehyde													
Acrolein						X						X	
Benzene				X			X	X			X		
Cresols													
Ethylbenzene													
Formaldehyde						X		X				X	
Hexane													
Hydrogen Sulfide										X			
Naphthalene													
PAHs (non-naphthalene)													
Phenol						X						X	
Propylene													
Toluene				X		X				X	X	X	
Xylenes						X						X	

AL = Alimentary System (Liver)      DEV = Developmental      HEM = Hematopoietic System      REP = Reproductive System  
 BN = Bones and Teeth      END = Endocrine System      IMM = Immune system      RESP = Respiratory System  
 CV = Cardiovascular System      EYE = Eye      KID = Kidney      SKIN = Skin  
 NS = Nervous System

# Health Risk Analysis (Tier 1) - Fugitive Emissions

## Signal Hill Petroleum, Inc. - West Unit Facility (ID 101977)

### Gas Plant Modification Project

#### Vapor Recovery System

TAC	Screening Levels		Emissions		Pollutant Screening Index	
	Cancer/Chronic lbs/yr @ 100 Meters	Acute lbs/hr @ 100 Meters	lbs/yr	lbs/hr	Cancer/Chronic	Acute
	Acetaldehyde	8.92E+01		0.00E+00	0.00E+00	0.0000
Acrolein	1.56E+01	5.09E-04	0.00E+00	0.00E+00	0.0000	0.0000
Benzene	8.92E+00	3.96E+00	5.96E+00	6.80E-04	0.6679	0.0002
Cresols	1.55E+05		0.00E+00	0.00E+00	0.0000	0.0000
Ethylbenzene	1.02E+02		9.17E-01	1.05E-04	0.0090	
Formaldehyde	4.25E+01	2.52E-01	0.00E+00	0.00E+00	0.0000	0.0000
Hexane	1.81E+06		4.31E+01	4.92E-03	0.0000	0.0000
Hydrogen Sulfide	2.58E+03	1.12E-01	5.96E-02	6.80E-06	0.0000	0.0001
Naphthalene	7.44E+00		0.00E+00	0.00E+00	0.0000	0.0000
PAHs (non-naphthalene)	7.69E-03		0.00E+00	0.00E+00	0.0000	0.0000
Phenol	5.17E+04	1.55E+01	0.00E+00	0.00E+00	0.0000	0.0000
Propylene	7.75E+05		0.00E+00	0.00E+00	0.0000	0.0000
Toluene	7.75E+04	9.91E+01	2.75E+00	3.14E-04	0.0000	0.0000
Xylene	1.81E+05	5.89E+01	1.83E+00	2.09E-04	0.0000	0.0000
			Application Screening Index =		0.6770	0.0002

Because the Application Screening Index for cancer / chronic exposure is less than one, the requirements of Rule 1401 are satisfied.

**Health Risk Analysis (Tier 2)**  
**Signal Hill Petroleum, Inc. - West Unit Facility (ID 101977)**  
**Gas Plant Modification Project**

Dispersion Factors	Annual Average <sup>a</sup> (ug/m3 per ton/yr)	Peak 1-Hour Concentration <sup>b</sup> (ug/m3 per lb/hr)
Residential	0.41	24.1
Off Site Worker	7.18	309.0
Nearrest Acute		1532.1

<sup>a</sup> From Table 5A of AQMD Risk Guidance Document  
<sup>b</sup> From Table 7 of AQMD Risk Guidance Document

**Volume Source - 50 ft long x 25 ft wide (1250 sq ft) x 6 ft high**  
**Vapor Recovery System - Compressors, Scrubbers, etc.**  
**(Emissions: Fugitives)**

500 meters to nearest residential receptor  
 100 meters to nearest off site worker receptor  
 25 meters to nearest acute exposure

DBR Resident = 302  
 DBR Worker = 149  
 EVF Resident = 0.96  
 EVF Worker = 0.38  
 MET (Long Beach) = 1.00

TAC	Maximum Individual Cancer Risk				Chronic Hazard Index (HIC)				Acute Hazard Index (HIA)							
	CP	AF <sub>ann</sub>	MP Res	MP Wkr	MICR Res	MICR Wkr	REL (ug/m3)	MP Res	MP Wkr	HIC Residential	HIC Worker	REL (mg/m3)	AAF	HIA Residential	HIA Worker	HIA Nearest Acute
Acetaldehyde	1.00E-02	1.0	1.00	1.00	0.00E+00	0.00E+00	9.00E+00	1.00	1.00	0.00E+00	0.00E+00					
Acrolein		1.0					6.00E-02	1.00	1.00	0.00E+00	0.00E+00					
Benzene	1.00E-01	1.0	1.00	1.00	3.54E-08	1.21E-07	6.00E+01	1.00	1.00	2.04E-05	3.56E-04	0.19	1.00	0.00E+00	0.00E+00	0.00E+00
Cresols		1.0					6.00E+02	1.00	1.00	0.00E+00	0.00E+00	1300	0.87	1.10E-05	1.41E-04	6.97E-04
Ethylbenzene		1.0					2.00E+03	1.00	1.00	9.39E-08	1.65E-06					
Formaldehyde	2.10E-02	1.0	1.00	1.00	0.00E+00	0.00E+00	3.00E+00	1.00	1.00	0.00E+00	0.00E+00	94	1.00	0.00E+00	0.00E+00	0.00E+00
Hexane		1.0					7.00E+03	1.00	1.00	1.28E-06	2.21E-05					
Hydrogen Sulfide		1.0					1.00E+01	1.00	1.00	1.22E-06	2.14E-05					
Naphthalene	3.90E+00	1.0	29.78	14.92	0.00E+00	0.00E+00	9.00E+00	1.00	1.00	0.00E+00	0.00E+00					
PAHs (non-naphthalene)		1.0					2.00E+02	1.00	1.00	0.00E+00	0.00E+00					
Propylene		1.0					3.00E+03	1.00	1.00	0.00E+00	0.00E+00					
Toluene		1.0					3.00E+02	1.00	1.00	1.88E-06	3.29E-05					
Xylene		1.0					7.00E+02	1.00	1.00	5.37E-07	9.40E-06					
MAC = Maximum Annual Controlled Emission Rate, lb/yr																
MHC = Maximum Hourly Controlled Emission Rate, lb/hr																
<b>Totals</b>					<b>3.54E-08</b>	<b>1.21E-07</b>										

**Calculation of Maximum Individual Cancer Risk:**

$$MICR = X/Q \times Q \times CP \times AF_{ann} \times MET \times DBR \times EVF \times 10^{-6} \times MP$$

Where:  
 X/Q = dispersion factor - ug / m3 per ton/yr  
 Q = the emission rate - ton/yr  
 CP = Cancer Potency - mg / kg / day  
 AF<sub>ann</sub> = Annual concentration adjustment factor - unitless  
 MET = Meteorological correction factor - unitless  
 DBR = Daily Breathing Rate - L / kg body weight / day ( = 302 for Resident; 149 for Worker)  
 EVF = Exposure Value Factor - unitless ( = 0.96 for Resident; 0.38 for Worker)  
 MP = Multi-Pathway factor (if applicable)

**Calculation of Chronic and Acute Hazard Index:**

$$HIC = [(Q) \times (X/Q_{ann}) \times MP] / (\text{Chronic REL}) \text{ for each TAC}$$

$$HIA = [(Q_{hd}) \times (X/Q_{hd}) \times AAF] / (\text{Acute REL}) \text{ for each TAC}$$

Where:  
 HIC = Chronic Hazard Index  
 HIA = Acute Hazard Index  
 Q = Max controlled annual emission rate, ton/yr  
 Q<sub>hd</sub> = Max controlled hourly emission rate, lb/hr  
 X/Q = the dispersion factor, ug/m3/ton/yr (for HIC) or ug/m3/lb/hr (for HIA)  
 REL = Reference Exposure Level, ug/m3  
 MP = multipathway adjustment factor  
 AAF = Acute Adjustment Factor (if risk based on averaging time other than one hour)

Health Risk Analysis (Tier 2)  
Signal Hill Petroleum, Inc. - West Unit Facility (ID 101977)  
Gas Plant Modification Project

Vapor Recovery System

Chronic Risk Calculation (HIC)

Residential Maximum HIC for Nearest Resident = 2.40E-05

Toxic Air Contaminant	Chronic Risk by Target Organ												
	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Acetaldehyde												0.00E+00	
Acrolein						0.00E+00						0.00E+00	
Benzene				2.04E-05			2.04E-05						
Cresols										2.04E-05			
Ethylbenzene	9.39E-08												
Formaldehyde					9.39E-08								
Hexane												0.00E+00	
Hydrogen Sulfide													
Naphthalene												1.22E-08	
PAHs (non-naphthalene)												0.00E+00	
Phenol	0.00E+00		0.00E+00										
Propylene													
Toluene				1.88E-06								0.00E+00	
Xylenes										1.88E-06		1.88E-06	
Total HIC	9.39E-08	0.00E+00	0.00E+00	2.23E-05	9.39E-08	0.00E+00	2.04E-05	0.00E+00	9.39E-08	2.40E-05	0.00E+00	3.64E-06	0.00E+00

Off Site Worker Maximum HIC for Nearest Off Site Worker = 4.21E-04

Toxic Air Contaminant	Chronic Risk by Target Organ												
	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Acetaldehyde												0.00E+00	
Acrolein						0.00E+00						0.00E+00	
Benzene				3.56E-04			3.56E-04						
Cresols										3.56E-04			
Ethylbenzene	1.65E-06												
Formaldehyde					1.65E-06								
Hexane												0.00E+00	
Hydrogen Sulfide													
Naphthalene												2.14E-05	
PAHs (non-naphthalene)												0.00E+00	
Phenol	0.00E+00		0.00E+00										
Propylene													
Toluene				3.29E-05								0.00E+00	
Xylenes										3.29E-05		3.29E-05	
Total HIC	1.65E-06	0.00E+00	0.00E+00	3.91E-04	1.65E-06	0.00E+00	3.56E-04	0.00E+00	1.65E-06	4.21E-04	0.00E+00	6.37E-05	0.00E+00

Health Risk Analysis (Tier 2)  
Signal Hill Petroleum, Inc. - West Unit Facility (ID 101977)  
Gas Plant Modification Project

Vapor Recovery System

Acute Risk Calculation (HIA)

Residential Maximum HIA for Nearest Resident = 1.12E-05

Toxic Air Contaminant	Acute Risk by Target Organ											
	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	RESP	SKIN
Acetaldehyde						0.00E+00						
Acrolein				1.10E-05			1.10E-05	1.10E-05		1.10E-05	0.00E+00	
Benzene												
Cresols												
Ethylbenzene						0.00E+00		0.00E+00			0.00E+00	
Formaldehyde												
Hexane										3.90E-06		
Hydrogen Sulfide												
Naphthalene												
PAHs (non-naphthalene)												
Phenol						0.00E+00					0.00E+00	
Propylene												
Toluene				2.04E-07						2.04E-07	2.04E-07	
Xylenes				2.29E-07							2.29E-07	
Total HIA	0.00E+00	0.00E+00	0.00E+00	1.12E-05	0.00E+00	4.34E-07	1.10E-05	1.10E-05	0.00E+00	4.11E-06	1.12E-05	0.00E+00

Off Site Worker Maximum HIA for Nearest Off Site Worker = 1.43E-04

Toxic Air Contaminant	Acute Risk by Target Organ											
	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	RESP	SKIN
Acetaldehyde												
Acrolein				1.41E-04		0.00E+00	1.41E-04	1.41E-04		1.41E-04	0.00E+00	
Benzene												
Cresols												
Ethylbenzene						0.00E+00		0.00E+00			0.00E+00	
Formaldehyde												
Hexane										5.00E-05		
Hydrogen Sulfide												
Naphthalene												
PAHs (non-naphthalene)												
Phenol						0.00E+00					0.00E+00	
Propylene												
Toluene				2.62E-06						2.62E-06	2.62E-06	
Xylenes				2.94E-06							2.94E-06	
Total HIA	0.00E+00	0.00E+00	0.00E+00	1.43E-04	0.00E+00	5.55E-06	1.41E-04	1.41E-04	0.00E+00	5.27E-05	1.43E-04	0.00E+00

Nearest Acute Exposure Maximum HIA for Nearest Acute Exposure = 7.10E-04

Toxic Air Contaminant	Acute Risk by Target Organ											
	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	RESP	SKIN
Acetaldehyde												
Acrolein				6.97E-04		0.00E+00	6.97E-04	6.97E-04		6.97E-04	0.00E+00	
Benzene												
Cresols												
Ethylbenzene						0.00E+00		0.00E+00			0.00E+00	
Formaldehyde												
Hexane										2.48E-04		
Hydrogen Sulfide												
Naphthalene												
PAHs (non-naphthalene)												
Phenol						0.00E+00					0.00E+00	
Toluene				1.30E-05						1.30E-05	1.30E-05	
Xylenes				1.46E-05							1.46E-05	
Total HIA	0.00E+00	0.00E+00	0.00E+00	7.10E-04	0.00E+00	2.76E-05	6.97E-04	6.97E-04	0.00E+00	2.61E-04	7.10E-04	0.00E+00

SHP VRU Volume Source.out

AERSCREEN 11126 / AERMOD 1234

01/20/14  
12:37:51

TITLE: SHP Gas Plant Vapor Recovery System

\*\*\*\*\* VOLUME PARAMETERS \*\*\*\*\*

SOURCE EMISSION RATE: 1.0001 g/s 7.937 lb/hr  
VOLUME HEIGHT: 0.91 meters 3.00 feet  
INITIAL LATERAL DIMENSION: 15.24 meters 50.00 feet  
INITIAL VERTICAL DIMENSION: 1.83 meters 6.00 feet  
RURAL OR URBAN: URBAN  
POPULATION: 100000  
  
INITIAL PROBE DISTANCE = 1000. meters 3281. feet

\*\*\*\*\* BUILDING DOWNWASH PARAMETERS \*\*\*\*\*

BUILDING DOWNWASH NOT USED FOR NON-POINT SOURCES

\*\*\*\*\* PROBE ANALYSIS \*\*\*\*\*

25 meter receptor spacing: 34. meters - 1000. meters

Zo SECTOR	ROUGHNESS LENGTH	1-HR CONC (ug/m3)	DIST (m)	TEMPORAL PERIOD
1*	1.000	1382.	33.8	WIN

\* = worst case flow sector

\*\*\*\*\* MAKEMET METEOROLOGY PARAMETERS \*\*\*\*\*

MIN/MAX TEMPERATURE: 249.8 / 310.9 (K)

MINIMUM WIND SPEED: 0.5 m/s

SHP VRU Volume Source.out

ANEMOMETER HEIGHT: 10.000 meters

SURFACE CHARACTERISTICS INPUT: AERMET SEASONAL TABLES

DOMINANT SURFACE PROFILE: Urban  
 DOMINANT CLIMATE TYPE: Dry Conditions  
 DOMINANT SEASON: Winter

ALBEDO: 0.35  
 BOWEN RATIO: 2.00  
 ROUGHNESS LENGTH: 1.000 (meters)

METEOROLOGY CONDITIONS USED TO PREDICT OVERALL MAXIMUM IMPACT

YR MO DY JDY HR

10 01 12 12 01

H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS
-1.30	0.043	-9.000	0.020	-999.	208.	6.0	1.000	2.00	0.35	0.50

HT	REF TA	HT
10.0	310.9	2.0

METEOROLOGY CONDITIONS USED TO PREDICT AMBIENT BOUNDARY IMPACT

YR MO DY JDY HR

10 01 12 12 01

H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS
-1.30	0.043	-9.000	0.020	-999.	208.	6.0	1.000	2.00	0.35	0.50

HT	REF TA	HT
10.0	310.9	2.0

SHP VRU Volume Source.out

\*\*\*\*\* AERSCREEN AUTOMATED DISTANCES \*\*\*\*\*

OVERALL MAXIMUM CONCENTRATIONS BY DISTANCE

DIST (m)	MAXIMUM 1-HR CONC (ug/m3)	DIST (m)	MAXIMUM 1-HR CONC (ug/m3)
33.77	1382.	525.00	29.33
50.00	691.6	550.00	28.35
75.00	340.6	575.00	27.47
100.00	207.0	600.00	26.69
125.00	141.0	625.00	25.98
150.00	103.2	650.00	25.33
175.00	79.32	675.00	24.73
200.00	72.36	700.00	24.17
225.00	65.57	725.00	23.60
250.00	58.81	750.00	23.02
275.00	53.12	775.00	22.48
300.00	48.79	800.00	21.97
325.00	45.08	825.00	21.49
350.00	41.90	850.00	21.04
375.00	39.18	875.00	20.62
400.00	36.86	900.00	20.21
425.00	34.88	925.00	19.82
450.00	33.18	950.00	19.45
475.00	31.71	975.00	19.09
500.00	30.44	1000.00	18.75

\*\*\*\*\* AERSCREEN MAXIMUM IMPACT SUMMARY \*\*\*\*\*

CALCULATION PROCEDURE	MAXIMUM 1-HOUR CONC (ug/m3)	SCALED 3-HOUR CONC (ug/m3)	SCALED 8-HOUR CONC (ug/m3)	SCALED 24-HOUR CONC (ug/m3)	SCALED ANNUAL CONC (ug/m3)
FLAT TERRAIN	1382.	1382.	1243.	829.0	138.2
DISTANCE FROM SOURCE		33.77 meters			

IMPACT AT THE

AMBIENT BOUNDARY	1382.	SHP VRU Volume	Source.out		
		1382.	1243.	829.0	138.2
DISTANCE FROM SOURCE		33.77 meters			

# Health Risk Analysis (Tier 3) Signal Hill Petroleum, Inc. - West Unit Facility (ID 101977) Gas Plant Modification Project

# Vapor Recovery System

Dispersion Factors	Annual Average* (ug/m3 per gm/sec)	PEAK 1-HOUR Concentration <sup>b</sup> (ug/m3 per gm/sec)
Residential	2.44	30.44
Off Site Worker	16.56	207.00
Maximum Acute		1382.00

Volume Source - 50 ft long x 25 ft wide (1250 sq ft) x 6 ft high  
Vapor Recovery System - Compressors, Scrubbers, etc.  
(Emissions: Fugitives)

- 500 meters to nearest residential receptor
- 100 meters to nearest off site worker receptor
- 25 meters to nearest acute exposure
- DBR Resident = 302
- DBR Worker = 149
- EVF Resident = 0.96
- EVF Worker = 0.38

\* Equal to 0.08 x Peak 1-Hour Concentration  
\* Per AERSCREEN, Max GLC is 1382 ug/m3 at 33.77m.

TAC	Maximum Individual Cancer Risk				Chronic Hazard Index (HIC)				Acute Hazard Index (HIA)					
	CP	AF <sub>ann</sub>	MP Wkr Res	MICR Wkr Res	REL (ug/m3)	MP Res	MP Wkr	HIC Residential	HIC Worker	REL (mg/m3)	AAF	HIA Residential	HIA Worker	HIA Nearest Acute
Acetaldehyde	1.00E-02	1.0	1.00	0.00E+00	0.00E+00	1.00	1.00	0.00E+00	0.00E+00	9.00E+00				
Acrolein	1.0	1.0	1.00	0.00E+00	0.00E+00	1.00	1.00	0.00E+00	0.00E+00	6.00E-02	1.00	0.00E+00	0.00E+00	0.00E+00
Benzene	1.00E-01	1.0	1.00	6.05E-09	8.03E-09	1.00	1.00	3.48E-06	2.37E-06	6.00E+01	1900	0.87	1.75E-06	7.93E-05
Cresols	1.0	1.0						0.00E+00	0.00E+00	6.00E+02	1.00			
Ethylbenzene	2.10E-02	1.0	1.00	0.00E+00	0.00E+00	1.00	1.00	1.61E-08	1.09E-07	2.00E+03	1.00			
Formaldehyde	1.0	1.0	1.00	0.00E+00	0.00E+00	1.00	1.00	0.00E+00	0.00E+00	3.00E+00	94	1.00	0.00E+00	0.00E+00
Hexane	1.0	1.0						2.16E-07	1.47E-06	7.00E+03	1.00			
Hydrogen Sulfide	1.20E-01	1.0	1.00	0.00E+00	0.00E+00	1.00	1.00	2.09E-07	1.42E-06	1.00E+01	42	1.00	6.21E-07	2.82E-05
Naphthalene	3.90E+00	1.0	29.76	0.00E+00	0.00E+00	1.00	1.00	0.00E+00	0.00E+00	9.00E+00				
PAHs (non-naphthalene)	1.0	1.0								2.00E+02	1.00	0.00E+00	0.00E+00	0.00E+00
Phenol	1.0	1.0								3.00E+03	1.00	0.00E+00	0.00E+00	0.00E+00
Propylene	1.0	1.0								3.00E+02	1.00	0.00E+00	0.00E+00	0.00E+00
Toluene	1.0	1.0								7.00E+02	1.00	0.00E+00	0.00E+00	0.00E+00
Xylene	1.0	1.0								2.00E+02	1.00	0.00E+00	0.00E+00	0.00E+00
Totals				6.05E-09	8.03E-09									

MAC = Maximum Annual Controlled Emission Rate, lb/hr  
MHC = Maximum Hourly Controlled Emission Rate, lb/hr

### Calculation of Maximum Individual Cancer Risk:

$$MICR = X/Q \times Q \times CP \times AF_{ann} \times DBR \times EVF \times 10^{-6} \times MIP$$

Where:  
 X/Q = dispersion factor for 1 g / s of emissions - ug / m3 per gm/sec  
 Q = the emission rate - gm/sec  
 CP = Cancer Potency - mg / kg / day  
 AF<sub>ann</sub> = Annual concentration adjustment factor - unitless  
 DBR = Daily Breathing Rate - L / kg body weight / day ( = 302 for Resident; 149 for Worker)  
 EVF = Exposure Value Factor - unitless ( = 0.96 for Resident; 0.38 for Worker)  
 MIP = Multi-Pathway factor (if applicable)

### Calculation of Chronic and Acute Hazard Index:

$$HIC = [(Q) \times (X/Q_{ann}) \times MIP] / (\text{Chronic REL}) \text{ for each TAC}$$

$$HIA = [(Q_{hr}) \times (X/Q_{hr}) \times AAF] / (\text{Acute REL}) \text{ for each TAC}$$

Where:  
 HIC = Chronic Hazard Index  
 HIA = Acute Hazard Index  
 Q = Max controlled annual emission rate, gm/sec  
 Q<sub>hr</sub> = Max controlled hourly emission rate, gm/sec  
 X/Q = the dispersion factor, ug/m3/gm/sec  
 REL = Reference Exposure Level, ug/m3  
 MIP = multipathway adjustment factor  
 AAF = Acute Adjustment Factor (if risk based on averaging time other than one hour)

**Health Risk Analysis (Tier 3)**  
**Signal Hill Petroleum, Inc. - West Unit Facility (ID 101977)**  
**Gas Plant Modification Project**

**Vapor Recovery System**

**Chronic Risk Calculation (HIC)**

Residential ..... Maximum HIC for Nearest Resident = 4.11E-06

Toxic Air Contaminant	Chronic Risk by Target Organ											
	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	RESP	SKIN
Acetaldehyde						0.00E+00	3.48E-06				0.00E+00	0.00E+00
Acrolein				3.48E-06						3.48E-06		0.00E+00
Benzene										0.00E+00		
Cresols	1.61E-08			1.61E-08	1.61E-08				1.61E-08			
Ethylbenzene												0.00E+00
Formaldehyde						0.00E+00				2.16E-07		
Hexane												2.09E-07
Hydrogen Sulfide												0.00E+00
Naphthalene												0.00E+00
PAHs (non-naphthalene)												0.00E+00
Phenol	0.00E+00							0.00E+00	0.00E+00			
Propylene				3.21E-07						3.21E-07		
Toluene										9.17E-08		
Xylenes										9.17E-08		
Total HIC	1.61E-08	0.00E+00	0.00E+00	3.82E-06	1.61E-08	0.00E+00	3.48E-06	0.00E+00	1.61E-08	4.11E-06	0.00E+00	6.21E-07

Off Site Worker ..... Maximum HIC for Nearest Off Site Worker = 2.79E-05

Toxic Air Contaminant	Chronic Risk by Target Organ											
	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	RESP	SKIN
Acetaldehyde						0.00E+00	2.37E-05				0.00E+00	0.00E+00
Acrolein				2.37E-05						2.37E-05		0.00E+00
Benzene										0.00E+00		
Cresols	1.09E-07			1.09E-07	1.09E-07				1.09E-07			
Ethylbenzene												0.00E+00
Formaldehyde						0.00E+00				1.47E-08		
Hexane												1.42E-06
Hydrogen Sulfide												0.00E+00
Naphthalene												0.00E+00
PAHs (non-naphthalene)												0.00E+00
Phenol	0.00E+00							0.00E+00	0.00E+00			
Propylene				2.18E-06						2.18E-06		
Toluene										6.24E-07		
Xylenes										6.24E-07		
Total HIC	1.09E-07	0.00E+00	0.00E+00	2.59E-05	1.09E-07	0.00E+00	2.37E-05	0.00E+00	1.09E-07	2.79E-05	0.00E+00	4.28E-06

Health Risk Analysis (Tier 3)  
Signal Hill Petroleum, Inc. - West Unit Facility (ID 101977)  
Gas Plant Modification Project

Vapor Recovery System

Acute Risk Calculation (HIA)

Residential

Maximum HIA for Nearest Resident = 1.78E-06

Toxic Air Contaminant	Acute Risk by Target Organ												
	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Acetaldehyde						0.00E+00						0.00E+00	
Acrolein				1.75E-06			1.75E-06	1.75E-06			1.75E-06		
Benzene													
Cresols													
Ethylbenzene													
Formaldehyde						0.00E+00		0.00E+00				0.00E+00	
Hexane										6.21E-07			
Hydrogen Sulfide													
Naphthalene													
PAHs (non-naphthalene)													
Phenol						0.00E+00						0.00E+00	
Propylene													
Toluene				3.25E-08		3.25E-08			3.25E-08		3.25E-08		
Xylenes						3.65E-08					3.65E-08		
Total HIA	0.00E+00	0.00E+00	0.00E+00	1.78E-06	0.00E+00	6.90E-08	1.75E-06	1.75E-06	0.00E+00	6.54E-07	1.78E-06	6.90E-08	0.00E+00

Off Site Worker

Maximum HIA for Nearest Off Site Worker = 1.21E-05

Toxic Air Contaminant	Acute Risk by Target Organ												
	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Acetaldehyde						0.00E+00						0.00E+00	
Acrolein				1.19E-05			1.19E-05	1.19E-05			1.19E-05		
Benzene													
Cresols													
Ethylbenzene													
Formaldehyde						0.00E+00		0.00E+00				0.00E+00	
Hexane										4.22E-06			
Hydrogen Sulfide													
Naphthalene													
PAHs (non-naphthalene)													
Phenol						0.00E+00						0.00E+00	
Propylene													
Toluene				2.21E-07		2.21E-07			2.21E-07		2.21E-07		
Xylenes						2.48E-07					2.48E-07		
Total HIA	0.00E+00	0.00E+00	0.00E+00	1.21E-05	0.00E+00	4.69E-07	1.19E-05	1.19E-05	0.00E+00	4.44E-06	1.21E-05	4.69E-07	0.00E+00

Maximum Acute Exposure

Maximum HIA for Nearest Acute Exposure = 8.07E-05

Toxic Air Contaminant	Acute Risk by Target Organ												
	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Acetaldehyde						0.00E+00						0.00E+00	
Acrolein				7.93E-05			7.93E-05	7.93E-05			7.93E-05		
Benzene													
Cresols													
Ethylbenzene													
Formaldehyde						0.00E+00		0.00E+00				0.00E+00	
Hexane										2.82E-05			
Hydrogen Sulfide													
Naphthalene													
PAHs (non-naphthalene)													
Phenol						0.00E+00						0.00E+00	
Propylene													
Toluene				1.48E-06		1.48E-06			1.48E-06		1.48E-06		
Xylenes						1.66E-06					1.66E-06		
Total HIA	0.00E+00	0.00E+00	0.00E+00	8.07E-05	0.00E+00	3.13E-06	7.93E-05	7.93E-05	0.00E+00	2.97E-05	8.07E-05	3.13E-06	0.00E+00

# Health Risk Analysis (Tier 1) - Fugitive Emissions

## Signal Hill Petroleum, Inc. - West Unit Facility (ID 101977)

### Gas Plant Modification Project

#### Natural Gas Dehydration System

	Screening Levels		Emissions		Pollutant Screening Index	
	Cancer/Chronic lbs/yr @ 100 Meters	Acute lbs/hr @ 100 Meters	lbs/yr	lbs/hr	Cancer/Chronic	Acute
TAC						
Acetaldehyde	8.92E+01		0.00E+00	0.00E+00	0.0000	0.0000
Acrolein	1.55E+01	5.09E-04	0.00E+00	0.00E+00	0.0000	0.0000
Benzene	8.92E+00	3.96E+00	7.68E+00	8.77E-04	0.8610	0.0002
Cresols	1.55E+05		0.00E+00	0.00E+00	0.0000	0.0000
Ethylbenzene	1.02E+02		1.18E+00	1.35E-04	0.0116	
Formaldehyde	4.25E+01	2.52E-01	0.00E+00	0.00E+00	0.0000	0.0000
Hexane	1.81E+06		5.55E+01	6.34E-03	0.0000	
Hydrogen Sulfide	2.58E+03	1.12E-01	7.68E-02	8.77E-06	0.0000	0.0001
Naphthalene	7.44E+00		0.00E+00	0.00E+00	0.0000	
PAHs (non-naphthalene)	7.69E-03		0.00E+00	0.00E+00	0.0000	
Phenol	5.17E+04	1.55E+01	0.00E+00	0.00E+00	0.0000	0.0000
Propylene	7.75E+05		0.00E+00	0.00E+00	0.0000	
Toluene	7.75E+04	9.91E+01	3.54E+00	4.05E-04	0.0000	0.0000
Xylene	1.81E+05	5.89E+01	2.36E+00	2.70E-04	0.0000	0.0000
Application Screening Index =					0.8727	0.0003

Because the Application Screening Index for cancer / chronic exposure is less than one, the requirements of Rule 1401 are satisfied.

# Health Risk Analysis (Tier 2)

## Signal Hill Petroleum, Inc. - West Unit Facility (ID 101977)

### Gas Plant Modification Project

Dispersion Factors	Annual Average <sup>a</sup> (ug/m3 per ton/yr)	Peak 1-Hour Concentration <sup>b</sup> (ug/m3 per lb/hr)
Residential	0.41	24.1
Off Site Worker	7.18	309.0
Nearest Acute		1532.1

<sup>a</sup> From Table 5A of AQMD Risk Guidance Document  
<sup>b</sup> From Table 7 of AQMD Risk Guidance Document

Volume Source - 64 ft long x 12 ft wide (768 sq ft) x 15 ft high  
 Natural Gas Dehydration System - Compressors, Chillers, etc.  
 (Emissions: Fugitives)

500 meters to nearest residential receptor  
 100 meters to nearest off site worker receptor  
 25 meters to nearest acute exposure

DBR Resident = 302  
 DBR Worker = 149  
 EVF Resident = 0.96  
 EVF Worker = 0.38  
 MET (Long Beach) = 1.00

TAC	Maximum Individual Cancer Risk				Chronic Hazard Index (HIC)				Acute Hazard Index (HIA)						
	CP	AF <sub>ann</sub>	MP Res	MP Wkr	MICR Res	MICR Wkr	REL (ug/m3)	MP Res	MP Wkr	HIC Residential	HIC Worker	REL (mg/m3)	AAF Residential	HIA Worker	HIA Nearest Acute
	Acetaldehyde	1.00E-02	1.0	1.00	1.00	0.00E+00	0.00E+00	9.00E+00	1.00	1.00	0.00E+00	0.00E+00	0.00E+00		
Acrolein		1.0					6.00E-02	1.00	1.00	0.00E+00	0.00E+00	0.00E+00	1.00	0.00E+00	0.00E+00
Benzene	1.00E-01	1.0	1.00	1.00	4.56E-08	1.56E-07	6.00E+01	1.00	1.00	2.62E-05	4.60E-04	1300	0.87	1.41E-05	8.99E-04
Cresols		1.0					6.00E+02	1.00	1.00	0.00E+00	0.00E+00				
Ethylbenzene		1.0					2.00E+03	1.00	1.00	1.21E-07	2.12E-06				
Formaldehyde	2.10E-02	1.0	1.00	1.00	0.00E+00	0.00E+00	3.00E+00	1.00	1.00	0.00E+00	0.00E+00	94	1.00	0.00E+00	0.00E+00
Hexane		1.0					7.00E+03	1.00	1.00	1.63E-06	2.85E-05				
Hydrogen Sulfide		1.0					1.00E+01	1.00	1.00	1.57E-06	2.76E-05	42	1.00	5.03E-06	6.45E-05
Naphthalene	1.20E-01	1.0	1.00	1.00	0.00E+00	0.00E+00	9.00E+00	1.00	1.00	0.00E+00	0.00E+00				
PAHs (non-naphthalene)	3.90E+00	1.0	29.76	14.62	0.00E+00	0.00E+00	2.00E+02	1.00	1.00	0.00E+00	0.00E+00	5800	1.00	0.00E+00	0.00E+00
Phenol		1.0					3.00E+03	1.00	1.00	0.00E+00	0.00E+00				
Propylene		1.0					3.00E+02	1.00	1.00	2.42E-06	4.24E-05	37000	1.00	2.64E-07	3.38E-06
Toluene		1.0					7.00E+02	1.00	1.00	6.92E-07	1.21E-05	22000	1.00	2.96E-07	3.79E-06
Xylene		1.0													
<b>Totals</b>															
													<b>4.56E-08</b>	<b>1.56E-07</b>	

MAC = Maximum Annual Controlled Emission Rate, lb/yr  
 MHC = Maximum Hourly Controlled Emission Rate, lb/hr

### Calculation of Maximum Individual Cancer Risk:

$$MICR = X/Q \times Q \times CP \times AF_{ann} \times MET \times DBR \times EVF \times 10^{-6} \times MP$$

Where:  
 X/Q = dispersion factor - ug / m3 per ton/yr  
 Q = the emission rate - ton/yr  
 CP = Cancer Potency - mg / kg / day  
 AF<sub>ann</sub> = Annual concentration adjustment factor - unitless  
 MET = Meteorological correction factor - unitless  
 DBR = Daily Breathing Rate - L / kg body weight / day ( = 302 for Resident; 149 for Worker)  
 EVF = Exposure Value Factor - unitless ( = 0.96 for Resident; 0.38 for Worker)  
 MP = Multi-Pathway factor (if applicable)

### Calculation of Chronic and Acute Hazard Index:

$$HIC = [(Q) \times (X/Q_{ann}) \times MP] / (\text{Chronic REL}) \text{ for each TAC}$$

$$HIA = [(Q_{hr}) \times (X/Q_{hr}) \times AAF] / (\text{Acute REL}) \text{ for each TAC}$$

Where:  
 HIC = Chronic Hazard Index  
 HIA = Acute Hazard Index

Q = Max controlled annual emission rate, ton/yr  
 Q<sub>hr</sub> = Max controlled hourly emission rate, lb/hr  
 X/Q = the dispersion factor, ug/m3/ton/yr (for HIC) or ug/m3/lb/hr (for HIA)  
 REL = Reference Exposure Level, ug/m3  
 MP = multipathway adjustment factor  
 AAF = Acute Adjustment Factor (if risk based on averaging time other than one hour)

Health Risk Analysis (Tier 2)  
Signal Hill Petroleum, Inc. - West Unit Facility (ID 101977)  
Gas Plant Modification Project

Natural Gas Dehydration System

Chronic Risk Calculation (HIC)

Residential Maximum HIC for Nearest Resident = 3.10E-05

Toxic Air Contaminant	Chronic Risk by Target Organ											
	AL	BN	CV	DEV	END	HEM	IMM	MD	NS	REP	RESP	SKIN
Acetaldehyde											0.00E+00	
Acrolein					0.00E+00	2.62E-05					0.00E+00	
Benzene			2.62E-05					2.62E-05				
Cresols								0.00E+00				
Ethylbenzene	1.21E-07			1.21E-07				1.21E-07			0.00E+00	
Formaldehyde					0.00E+00							
Hexane								1.69E-06				
Hydrogen Sulfide										1.57E-06		
Naphthalene										0.00E+00		
PAHs (non-naphthalene)												
Phenol	0.00E+00		0.00E+00					0.00E+00			0.00E+00	
Propylene				2.42E-06				2.42E-06			2.42E-06	
Toluene								6.92E-07			6.92E-07	
Xylenes												
Total HIC	1.21E-07	0.00E+00	0.00E+00	2.88E-05	1.21E-07	0.00E+00	2.62E-05	3.10E-05	0.00E+00	0.00E+00	4.69E-06	0.00E+00

Off Site Worker Maximum HIC for Nearest Off Site Worker = 5.43E-04

Toxic Air Contaminant	Chronic Risk by Target Organ											
	AL	BN	CV	DEV	END	HEM	IMM	MD	NS	REP	RESP	SKIN
Acetaldehyde											0.00E+00	
Acrolein					0.00E+00	4.60E-04					0.00E+00	
Benzene			4.60E-04					4.60E-04				
Cresols								0.00E+00				
Ethylbenzene	2.12E-06			2.12E-06				2.12E-06			0.00E+00	
Formaldehyde					0.00E+00							
Hexane								2.85E-05				
Hydrogen Sulfide										2.76E-05		
Naphthalene										0.00E+00		
PAHs (non-naphthalene)												
Phenol	0.00E+00		0.00E+00					0.00E+00			0.00E+00	
Propylene				4.24E-05				4.24E-05			4.24E-05	
Toluene								1.21E-05			1.21E-05	
Xylenes												
Total HIC	2.12E-06	0.00E+00	0.00E+00	5.04E-04	2.12E-06	0.00E+00	4.60E-04	5.43E-04	0.00E+00	0.00E+00	8.21E-05	0.00E+00

Health Risk Analysis (Tier 2)  
Signal Hill Petroleum, Inc. - West Unit Facility (ID 101977)  
Gas Plant Modification Project

Natural Gas Dehydration System

Acute Risk Calculation (HIA)

Residential

Maximum HIA for Nearest Resident = 1.44E-05

Toxic Air Contaminant	Acute Risk by Target Organ												
	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Acetaldehyde													
Acrolein				1.41E-05			1.41E-05	1.41E-05			1.41E-05	0.00E+00	
Benzene													
Cresols													
Ethylbenzene													
Formaldehyde							0.00E+00	0.00E+00				0.00E+00	
Hexane													
Hydrogen Sulfide									5.03E-06				
Naphthalene													
PAHs (non-naphthalene)													
Phenol							0.00E+00					0.00E+00	
Propylene													
Toluene				2.64E-07								2.64E-07	
Xylenes				2.96E-07								2.96E-07	
Total HIA	0.00E+00	0.00E+00	0.00E+00	1.44E-05	0.00E+00	1.41E-05	1.41E-05	0.00E+00	5.29E-06	1.44E-05	5.99E-07	0.00E+00	0.00E+00

Off Site Worker

Maximum HIA for Nearest Off Site Worker = 1.85E-04

Toxic Air Contaminant	Acute Risk by Target Organ												
	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Acetaldehyde													
Acrolein													
Benzene				1.81E-04			1.81E-04	1.81E-04			1.81E-04	0.00E+00	
Cresols													
Ethylbenzene													
Formaldehyde								0.00E+00				0.00E+00	
Hexane										6.45E-05			
Hydrogen Sulfide													
Naphthalene													
PAHs (non-naphthalene)													
Phenol							0.00E+00					0.00E+00	
Propylene													
Toluene				3.38E-06								3.38E-06	
Xylenes				3.79E-06								3.79E-06	
Total HIA	0.00E+00	0.00E+00	0.00E+00	1.85E-04	0.00E+00	7.17E-06	1.81E-04	1.81E-04	0.00E+00	6.79E-05	1.85E-04	7.17E-06	0.00E+00

Nearest Acute Exposure

Maximum HIA for Nearest Acute Exposure = 9.16E-04

Toxic Air Contaminant	Acute Risk by Target Organ												
	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Acetaldehyde													
Acrolein													
Benzene				8.99E-04			8.99E-04	8.99E-04			8.99E-04	0.00E+00	
Cresols													
Ethylbenzene													
Formaldehyde								0.00E+00				0.00E+00	
Hexane													
Hydrogen Sulfide										3.20E-04			
Naphthalene													
PAHs (non-naphthalene)													
Phenol							0.00E+00					0.00E+00	
Propylene													
Toluene				1.68E-05								1.68E-05	
Xylenes				1.88E-05								1.88E-05	
Total HIA	0.00E+00	0.00E+00	0.00E+00	9.16E-04	0.00E+00	3.55E-05	8.99E-04	8.99E-04	0.00E+00	3.37E-04	9.16E-04	3.55E-05	0.00E+00

SHP Gas Dehy Volume Source

AERSCREEN 11126 / AERMOD 1234

01/20/14

12:46:55

TITLE: SHP Gas Dehy Volume Source

\*\*\*\*\* VOLUME PARAMETERS \*\*\*\*\*

SOURCE EMISSION RATE: 1.0001 g/s 7.937 lb/hr  
VOLUME HEIGHT: 2.29 meters 7.50 feet  
INITIAL LATERAL DIMENSION: 19.51 meters 64.00 feet  
INITIAL VERTICAL DIMENSION: 4.57 meters 15.00 feet  
RURAL OR URBAN: URBAN  
POPULATION: 100000  
  
INITIAL PROBE DISTANCE = 1000. meters 3281. feet

\*\*\*\*\* BUILDING DOWNWASH PARAMETERS \*\*\*\*\*

BUILDING DOWNWASH NOT USED FOR NON-POINT SOURCES

\*\*\*\*\* PROBE ANALYSIS \*\*\*\*\*  
25 meter receptor spacing: 43. meters - 1000. meters

Zo SECTOR	ROUGHNESS LENGTH	1-HR CONC (ug/m3)	DIST (m)	TEMPORAL PERIOD
1*	1.000	839.5	42.9	WIN

\* = worst case flow sector

\*\*\*\*\* MAKEMET METEOROLOGY PARAMETERS \*\*\*\*\*

MIN/MAX TEMPERATURE: 249.8 / 310.9 (K)

MINIMUM WIND SPEED: 0.5 m/s

SHP Gas Dehy Volume Source

ANEMOMETER HEIGHT: 10.000 meters

SURFACE CHARACTERISTICS INPUT: AERMET SEASONAL TABLES

DOMINANT SURFACE PROFILE: Urban  
DOMINANT CLIMATE TYPE: Dry Conditions  
DOMINANT SEASON: Winter

ALBEDO: 0.35  
BOWEN RATIO: 2.00  
ROUGHNESS LENGTH: 1.000 (meters)

METEOROLOGY CONDITIONS USED TO PREDICT OVERALL MAXIMUM IMPACT

YR MO DY JDY HR

10 01 12 12 01

H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O	LEN	Z0	BOWEN	ALBEDO	REF	WS
-1.30	0.043	-9.000	0.020	-999.	208.	6.0	1.000	2.00	0.35	0.50		

HT	REF	TA	HT
10.0	310.9	2.0	

METEOROLOGY CONDITIONS USED TO PREDICT AMBIENT BOUNDARY IMPACT

YR MO DY JDY HR

10 01 12 12 01

H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O	LEN	Z0	BOWEN	ALBEDO	REF	WS
-1.30	0.043	-9.000	0.020	-999.	208.	6.0	1.000	2.00	0.35	0.50		

HT	REF	TA	HT
10.0	310.9	2.0	

SHP Gas Dehy Volume Source

\*\*\*\*\* AERSCREEN AUTOMATED DISTANCES \*\*\*\*\*  
 OVERALL MAXIMUM CONCENTRATIONS BY DISTANCE

DIST (m)	MAXIMUM 1-HR CONC (ug/m3)	DIST (m)	MAXIMUM 1-HR CONC (ug/m3)
42.94	839.5	525.00	22.80
50.00	652.0	550.00	22.01
75.00	330.0	575.00	21.30
100.00	203.0	600.00	20.67
125.00	139.1	625.00	20.10
150.00	102.2	650.00	19.58
175.00	78.78	675.00	19.10
200.00	62.88	700.00	18.66
225.00	54.27	725.00	18.21
250.00	47.81	750.00	17.76
275.00	42.99	775.00	17.33
300.00	39.00	800.00	16.94
325.00	35.79	825.00	16.56
350.00	33.12	850.00	16.21
375.00	30.86	875.00	15.88
400.00	28.94	900.00	15.56
425.00	27.32	925.00	15.26
450.00	25.93	950.00	14.97
475.00	24.73	975.00	14.69
500.00	23.70	1000.00	14.43

\*\*\*\*\* AERSCREEN MAXIMUM IMPACT SUMMARY \*\*\*\*\*

CALCULATION PROCEDURE	MAXIMUM 1-HOUR CONC (ug/m3)	SCALED 3-HOUR CONC (ug/m3)	SCALED 8-HOUR CONC (ug/m3)	SCALED 24-HOUR CONC (ug/m3)	SCALED ANNUAL CONC (ug/m3)
FLAT TERRAIN	839.5	839.5	755.5	503.7	83.95
DISTANCE FROM SOURCE		42.94 meters			

IMPACT AT THE

	SHP Gas Dehy Volume Source				
AMBIENT BOUNDARY	839.5	839.5	755.5	503.7	83.95
DISTANCE FROM SOURCE	42.94 meters				

# Natural Gas Dehydration System

## Health Risk Analysis (Tier 3) Signal Hill Petroleum, Inc. - West Unit Facility (ID 101977) Gas Plant Modification Project

Dispersion Factors	Annual Average* (ug/m3 per gm/sec)	Peak 1-Hour Concentration* (ug/m3 per gm/sec)
Residential	1.90	23.7
Off Site Worker	16.24	203.0
Maximum Acute		839.5

**Volume Source - 64 ft long x 12 ft wide (768 sq ft) x 15 ft high**  
**Natural Gas Dehydration System - Compressors, Chillers, etc.**  
**(Emissions: Fugitives)**

500 meters to nearest residential receptor  
 100 meters to nearest off site worker receptor  
 25 meters to nearest acute exposure

DBR Resident = 302  
 DBR Worker = 149  
 EVF Resident = 0.96  
 EVF Worker = 0.38

\* Equal to 0.08 x Peak 1-Hour Concentration  
 \* Per AERSCREEN, max GLC of 839.5 ug/m3 occurs at 42.94m.

TAC	Maximum Individual Cancer Risk					Chronic Hazard Index (HIC)					Acute Hazard Index (HIA)				
	AF <sub>ann</sub>	MP Res	MP Wkr	MICR Res	MICR Wkr	REL (ug/m3)	MP Res	MP Wkr	HIC Residential	HIC Worker	REL (mg/m3)	AAF	HIA Residential	HIA Worker	HIA Nearest Acute
Acetaldehyde	1.0	1.00	1.00	0.00E+00	0.00E+00	9.00E+00	1.00	1.00	0.00E+00	0.00E+00	0.19	1.00	0.00E+00	0.00E+00	0.00E+00
Acrolein	1.0	1.00	1.00	0.00E+00	0.00E+00	6.00E+02	1.00	1.00	0.00E+00	0.00E+00	0.19	1.00	0.00E+00	0.00E+00	0.00E+00
Benzene	1.0	1.00	1.00	6.07E-09	1.02E-08	6.00E+01	1.00	1.00	3.49E-06	2.99E-05	1300	0.87	1.75E-06	1.50E-05	6.21E-05
Cresols	1.0	1.00	1.00	0.00E+00	0.00E+00	6.00E+02	1.00	1.00	0.00E+00	0.00E+00					
Ethylbenzene	1.0	1.00	1.00	0.00E+00	0.00E+00	2.00E+03	1.00	1.00	1.61E-08	1.98E-07					
Formaldehyde	1.0	1.00	1.00	0.00E+00	0.00E+00	3.00E+00	1.00	1.00	0.00E+00	0.00E+00	94	1.00	0.00E+00	0.00E+00	0.00E+00
Hexane	1.0	1.00	1.00	0.00E+00	0.00E+00	7.00E+03	1.00	1.00	2.16E-07	1.85E-06					
Hydrogen Sulfide	1.0	1.00	1.00	0.00E+00	0.00E+00	1.00E+01	1.00	1.00	2.09E-07	1.79E-06	42	1.00	6.23E-07	5.34E-06	2.21E-05
Naphthalene	1.0	1.00	1.00	0.00E+00	0.00E+00	9.00E+00	1.00	1.00	0.00E+00	0.00E+00					
PAHs (non-naphthalene)	1.0	29.78	14.62	0.00E+00	0.00E+00	2.00E+02	1.00	1.00	0.00E+00	0.00E+00	5800	1.00	0.00E+00	0.00E+00	0.00E+00
Propylene	1.0	1.00	1.00	0.00E+00	0.00E+00	3.00E+03	1.00	1.00	0.00E+00	0.00E+00					
Toluene	1.0	1.00	1.00	0.00E+00	0.00E+00	3.00E+02	1.00	1.00	3.22E-07	2.76E-06	37000	1.00	3.27E-08	2.80E-07	1.16E-06
Xylene	1.0	1.00	1.00	0.00E+00	0.00E+00	7.00E+02	1.00	1.00	9.21E-08	7.89E-07	22000	1.00	3.66E-08	3.14E-07	1.30E-06
<b>Totals</b>				<b>6.07E-09</b>	<b>1.02E-08</b>										

MAC = Maximum Annual Controlled Emission Rate, lb/yr  
 MHC = Maximum Hourly Controlled Emission Rate, lb/hr

### Calculation of Maximum Individual Cancer Risk:

$$MICR = X/Q \times Q \times CP \times AF_{ann} \times DBR \times EVF \times 10^{-6} \times MP$$

Where:  
 X/Q = dispersion factor for 1 g / s of emissions - ug / m3 per gm/sec  
 Q = the emission rate - gm/sec  
 CP = Cancer Potency - mg / kg / day  
 AF<sub>ann</sub> = Annual concentration adjustment factor - unitless  
 DBR = Daily Breathing Rate - L / kg body weight / day ( = 302 for Resident; 149 for Worker)  
 EVF = Exposure Value Factor - unitless ( = 0.96 for Resident; 0.38 for Worker)  
 MP = Multi-Pathway factor (if applicable)

### Calculation of Chronic and Acute Hazard Index:

$$HIC = [(Q) \times (X/Q_{ann}) \times MP] / (\text{Chronic REL}) \text{ for each TAC}$$

$$HIA = [(Q_{hr}) \times (X/Q_{hr}) \times AAF] / (\text{Acute REL}) \text{ for each TAC}$$

Where:  
 HIC = Chronic Hazard Index  
 HIA = Acute Hazard Index

Q = Max controlled annual emission rate, gm/sec  
 Q<sub>hr</sub> = Max controlled hourly emission rate, gm/sec  
 X/Q = the dispersion factor, ug/m3/gm/sec  
 REL = Reference Exposure Level, ug/m3  
 MP = multipathway adjustment factor  
 AAF = Acute Adjustment Factor (if risk based on averaging time other than one hour)

**Health Risk Analysis (Tier 3)**  
**Signal Hill Petroleum, Inc. - West Unit Facility (ID 101977)**  
**Gas Plant Modification Project**

**Natural Gas Dehydration System**

**Chronic Risk Calculation (HIC)**

Residential: Maximum HIC for Nearest Resident = 4.12E-06

Toxic Air Contaminant	Chronic Risk by Target Organ										
	AL	BN	CV	DEV	END	EYE	HEA	IRM	KID	NS	SKIN
Acetaldehyde						0.00E+00	3.49E-06				0.00E+00
Acrolein									3.49E-06		0.00E+00
Benzene				3.49E-06							
Cresols									0.00E+00		
Ethylbenzene	1.61E-08			1.61E-08							0.00E+00
Formaldehyde								1.61E-08			
Hexane									2.16E-07		0.00E+00
Hydrogen Sulfide											2.09E-07
Naphthalene											0.00E+00
PAHs (non-naphthalene)											0.00E+00
Phenol	0.00E+00		0.00E+00					0.00E+00			0.00E+00
Propylene				3.22E-07					3.22E-07		0.00E+00
Toluene									9.21E-08		0.00E+00
Xylenes											9.21E-08
<b>Total HIC</b>	<b>1.61E-08</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>3.83E-06</b>	<b>1.61E-08</b>	<b>0.00E+00</b>	<b>3.49E-06</b>	<b>0.00E+00</b>	<b>1.61E-08</b>	<b>4.12E-06</b>	<b>0.00E+00</b>

Off Site Worker: Maximum HIC for Nearest Off Site Worker = 3.53E-05

Toxic Air Contaminant	Chronic Risk by Target Organ										
	AL	BN	CV	DEV	END	EYE	HEA	IRM	KID	NS	SKIN
Acetaldehyde						0.00E+00					0.00E+00
Acrolein							2.99E-05			2.99E-05	0.00E+00
Benzene				2.99E-05							
Cresols									0.00E+00		
Ethylbenzene	1.38E-07			1.38E-07							0.00E+00
Formaldehyde								1.38E-07			
Hexane									1.85E-06		0.00E+00
Hydrogen Sulfide											1.79E-06
Naphthalene											0.00E+00
PAHs (non-naphthalene)											0.00E+00
Phenol	0.00E+00		0.00E+00					0.00E+00			0.00E+00
Propylene				2.76E-06					2.76E-06		0.00E+00
Toluene									7.89E-07		0.00E+00
Xylenes											7.89E-07
<b>Total HIC</b>	<b>1.38E-07</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>3.28E-05</b>	<b>1.38E-07</b>	<b>0.00E+00</b>	<b>2.99E-05</b>	<b>0.00E+00</b>	<b>1.38E-07</b>	<b>3.53E-05</b>	<b>0.00E+00</b>

**Health Risk Analysis (Tier 3)  
Signal Hill Petroleum, Inc. - West Unit Facility (ID 101977)  
Gas Plant Modification Project**

**Natural Gas Dehydration System**

**Acute Risk Calculation (HIA)**

Maximum HIA for Nearest Resident = 1.78E-06

Toxic Air Contaminant	Acute Risk by Target Organ										
	AL	BN	CV	DEV	END	EYE	HEM	IMH	KID	NS	SKIN
Acetaldehyde											
Acrolein				1.75E-06		0.00E+00	1.75E-06	1.75E-06		1.75E-06	0.00E+00
Benzene											
Cresols											
Ethylbenzene											
Formaldehyde						0.00E+00	0.00E+00	0.00E+00			0.00E+00
Hexane									6.23E-07		
Hydrogen Sulfide											
Naphthalene											
PAHs (non-naphthalene)						0.00E+00					0.00E+00
Phenol											
Propylene				3.27E-08		3.27E-08			3.27E-08	3.27E-08	3.27E-08
Toluene				3.66E-08		3.66E-08			3.27E-08	3.66E-08	3.66E-08
Xylenes									6.56E-07	1.78E-06	6.93E-08
<b>Total HIA</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>1.78E-06</b>	<b>0.00E+00</b>	<b>6.93E-08</b>	<b>1.75E-06</b>	<b>1.75E-06</b>	<b>0.00E+00</b>	<b>6.56E-07</b>	<b>1.78E-06</b>

Maximum HIA for Nearest Off Site Worker = 1.53E-05

Toxic Air Contaminant	Acute Risk by Target Organ										
	AL	BN	CV	DEV	END	EYE	HEM	IMH	KID	NS	SKIN
Acetaldehyde											
Acrolein				1.50E-05		0.00E+00	1.50E-05	1.50E-05		1.50E-05	0.00E+00
Benzene											
Cresols											
Ethylbenzene											
Formaldehyde						0.00E+00	0.00E+00	0.00E+00			0.00E+00
Hexane									6.34E-06		
Hydrogen Sulfide											
Naphthalene											
PAHs (non-naphthalene)						0.00E+00					0.00E+00
Phenol											
Propylene				2.80E-07		2.80E-07			2.80E-07	2.80E-07	2.80E-07
Toluene				3.14E-07		3.14E-07			2.80E-07	3.14E-07	3.14E-07
Xylenes									5.62E-06	1.53E-05	5.93E-07
<b>Total HIA</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>1.53E-05</b>	<b>0.00E+00</b>	<b>5.93E-07</b>	<b>1.50E-05</b>	<b>1.50E-05</b>	<b>0.00E+00</b>	<b>5.62E-06</b>	<b>1.53E-05</b>

Maximum Acute Exposure = 6.32E-05

Toxic Air Contaminant	Acute Risk by Target Organ										
	AL	BN	CV	DEV	END	EYE	HEM	IMH	KID	NS	SKIN
Acetaldehyde											
Acrolein				6.21E-05		0.00E+00	6.21E-05	6.21E-05		6.21E-05	0.00E+00
Benzene											
Cresols											
Ethylbenzene											
Formaldehyde						0.00E+00	0.00E+00	0.00E+00			0.00E+00
Hexane									2.21E-05		
Hydrogen Sulfide											
Naphthalene											
PAHs (non-naphthalene)						0.00E+00					0.00E+00
Phenol											
Propylene				1.16E-06		1.16E-06			1.16E-06	1.16E-06	1.16E-06
Toluene				1.39E-06		1.39E-06			1.16E-06	1.39E-06	1.39E-06
Xylenes									2.32E-05	6.32E-05	2.45E-06
<b>Total HIA</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>6.32E-05</b>	<b>0.00E+00</b>	<b>2.45E-06</b>	<b>6.21E-05</b>	<b>6.21E-05</b>	<b>0.00E+00</b>	<b>2.32E-05</b>	<b>6.32E-05</b>

# Health Risk Analysis (Tier 1) - Fugitive Emissions

## Signal Hill Petroleum, Inc. - West Unit Facility (ID 101977)

### Gas Plant Modification Project

#### CO2 Filtration System

TAC	Screening Levels		Emissions		Pollutant Screening Index	
	Cancer/Chronic lbs/yr @ 100 Meters	Acute lbs/hr @ 100 Meters	lbs/yr	lbs/hr	Cancer/Chronic	Acute
Acetaldehyde	8.92E+01		0.00E+00	0.00E+00	0.0000	0.0000
Acrolein	1.55E+01	5.09E-04	0.00E+00	0.00E+00	0.0000	0.0000
Benzene	8.92E+00	3.96E+00	5.47E+00	6.25E-04	0.6138	0.0002
Cresols	1.55E+05		0.00E+00	0.00E+00	0.0000	
Ethylbenzene	1.02E+02		8.42E-01	9.62E-05	0.0083	
Formaldehyde	4.25E+01	2.52E-01	0.00E+00	0.00E+00	0.0000	0.0000
Hexane	1.81E+06		3.96E+01	4.52E-03	0.0000	
Hydrogen Sulfide	2.58E+03	1.12E-01	5.47E-02	6.25E-06	0.0000	0.0001
Naphthalene	7.44E+00		0.00E+00	0.00E+00	0.0000	
PAHs (non-naphthalene)	7.69E-03		0.00E+00	0.00E+00	0.0000	
Phenol	5.17E+04	1.55E+01	0.00E+00	0.00E+00	0.0000	0.0000
Propylene	7.75E+05		0.00E+00	0.00E+00	0.0000	
Toluene	7.75E+04	9.91E+01	2.53E+00	2.88E-04	0.0000	0.0000
Xylene	1.81E+05	5.89E+01	1.68E+00	1.92E-04	0.0000	0.0000
Application Screening Index =					0.6221	0.0002

Because the Application Screening Index for cancer / chronic exposure is less than one, the requirements of Rule 1401 are satisfied.

**Health Risk Analysis (Tier 2)**  
**Signal Hill Petroleum, Inc. - West Unit Facility (ID 101977)**  
**Gas Plant Modification Project**

Dispersion Factors	Annual Average <sup>a</sup> (ug/m3 per ton/yr)	Peak 1-Hour Concentration <sup>b</sup> (ug/m3 per lb/hr)
Residential	0.41	24.1
Off Site Worker	7.18	309.0
Nearest Acute		1532.1

<sup>a</sup> From Table 5A of AQMD Risk Guidance Document

<sup>b</sup> From Table 7 of AQMD Risk Guidance Document

**Volume Source - 25 ft long x 10 ft wide (250 sq ft) x 10 ft high**  
**CO2 Filtration System - Compressors, Filters etc.**  
**(Emissions: Fugitives)**

**500** meters to nearest residential receptor  
**100** meters to nearest off site worker receptor  
**25** meters to nearest acute exposure

DBR Resident = 302  
 DBR Worker = 149  
 EVF Resident = 0.96  
 EVF Worker = 0.38  
 MET (Long Beach) = 1.00

TAC	Maximum Individual Cancer Risk				Chronic Hazard Index (HIC)				Acute Hazard Index (HIA)							
	CP	AF <sub>ann</sub>	MP Res	MP Wkr	MICR Res	MICR Wkr	REL (ug/m3)	MP Res	MP Wkr	HIC Residential	HIC Worker	REL (mg/m3)	AAF	HIA Residential	HIA Worker	HIA Nearest Acute
Acetaldehyde	1.00E-02	1.0	1.00	1.00	0.00E+00	0.00E+00	9.00E+00	1.00	1.00	0.00E+00	0.00E+00	0.00E+00				
Acrolein		1.0					6.00E-02	1.00	1.00	0.00E+00	0.00E+00	0.19	1.00	0.00E+00	0.00E+00	0.00E+00
Benzene	1.00E-01	1.0	1.00	1.00	3.25E-08	1.11E-07	6.00E+01	1.00	1.00	1.87E-05	3.28E-04	1300	0.87	1.01E-05	1.29E-04	6.41E-04
Cresols		1.0					6.00E+02	1.00	1.00	0.00E+00	0.00E+00					
Ethylbenzene		1.0					2.00E+03	1.00	1.00	8.63E-08	1.51E-06					
Formaldehyde	2.10E-02	1.0	1.00	1.00	0.00E+00	0.00E+00	3.00E+00	1.00	1.00	0.00E+00	0.00E+00	94	1.00	0.00E+00	0.00E+00	0.00E+00
Hexane		1.0					7.00E+03	1.00	1.00	1.16E-06	2.03E-05					
Hydrogen Sulfide		1.0					1.00E+01	1.00	1.00	1.12E-06	1.97E-05	42	1.00	3.59E-06	4.60E-05	2.28E-04
Naphthalene	1.20E-01	1.0	1.00	1.00	0.00E+00	0.00E+00	9.00E+00	1.00	1.00	0.00E+00	0.00E+00					
PAHs (non-naphthalene)	3.90E+00	1.0	29.76	14.62	0.00E+00	0.00E+00										
Phenol		1.0					2.00E+02	1.00	1.00	0.00E+00	0.00E+00	5800	1.00	0.00E+00	0.00E+00	0.00E+00
Propylene		1.0					3.00E+03	1.00	1.00	0.00E+00	0.00E+00					
Toluene		1.0					3.00E+02	1.00	1.00	1.73E-06	3.02E-05	37000	1.00	1.88E-07	2.41E-06	1.19E-05
Xylene		1.0					7.00E+02	1.00	1.00	4.93E-07	8.64E-06	22000	1.00	2.11E-07	2.70E-06	1.34E-05
<b>Totals</b>					<b>3.25E-08</b>	<b>1.11E-07</b>										

MAC = Maximum Annual Controlled Emission Rate, lb/yr  
 MHC = Maximum Hourly Controlled Emission Rate, lb/hr

**Calculation of Maximum Individual Cancer Risk:**

$$MICR = X/Q \times Q \times CP \times AF_{ann} \times MET \times DBR \times EVF \times 10^{-6} \times MP$$

Where:

- X/Q = dispersion factor - ug / m3 per ton/yr
- Q = the emission rate - ton/yr
- CP = Cancer Potency - mg / kg / day
- AF<sub>ann</sub> = Annual concentration adjustment factor - unitless
- MET = Meteorological correction factor - unitless
- DBR = Daily Breathing Rate - L / kg body weight / day ( = 302 for Resident; 149 for Worker)
- EVF = Exposure Value Factor - unitless ( = 0.96 for Resident; 0.38 for Worker)
- MP = Multi-Pathway factor (if applicable)

**Calculation of Chronic and Acute Hazard Index:**

$$HIC = [(Q) \times (X/Q_{ann}) \times MP] / (\text{Chronic REL}) \text{ for each TAC}$$

$$HIA = [(Q_{hr}) \times (X/Q_{hr}) \times AAF] / (\text{Acute REL}) \text{ for each TAC}$$

Where:

- HIC = Chronic Hazard Index
- HIA = Acute Hazard Index

- Q = Max controlled annual emission rate, ton/yr
- Q<sub>hr</sub> = Max controlled hourly emission rate, lb/hr
- X/Q = the dispersion factor, ug/m3/ton/yr (for HIC) or ug/m3/lb/hr (for HIA)
- REL = Reference Exposure Level, ug/m3
- MP = multipathway adjustment factor
- AAF = Acute Adjustment Factor (if risk based on averaging time other than one hour)

Health Risk Analysis (Tier 2)  
Signal Hill Petroleum, Inc. - West Unit Facility (ID 101977)  
Gas Plant Modification Project

CO2 Filtration System

Chronic Risk Calculation (HIC)

Residential

Maximum HIC for Nearest Resident = 2.21E-05

Toxic Air Contaminant	Chronic Risk by Target Organ										
	AL	BN	CV	DEV	END	EYE	HEM	IMM	MD	NS	SKIN
Acetaldehyde						0.00E+00					0.00E+00
Acrolein							1.87E-05			1.87E-05	0.00E+00
Benzene				1.87E-05							
Cresols									0.00E+00		
Ethylbenzene	8.63E-08			8.63E-08							
Formaldehyde						0.00E+00					0.00E+00
Hexane									1.15E-06		
Hydrogen Sulfide										1.12E-06	
Naphthalene										0.00E+00	
PAHs (non-naphthalene)											
Phenol	0.00E+00		0.00E+00					0.00E+00			0.00E+00
Propylene											0.00E+00
Toluene				1.73E-06					1.73E-06		
Xylenes									4.93E-07		
Total HIC	8.63E-08	0.00E+00	0.00E+00	2.03E-05	8.63E-08	0.00E+00	1.87E-05	0.00E+00	3.63E-08	2.21E-05	0.00E+00

Off Site Worker

Maximum HIC for Nearest Off Site Worker = 3.87E-04

Toxic Air Contaminant	Chronic Risk by Target Organ										
	AL	BN	CV	DEV	END	EYE	HEM	IMM	MD	NS	SKIN
Acetaldehyde											0.00E+00
Acrolein						0.00E+00					0.00E+00
Benzene				3.28E-04			3.28E-04			3.28E-04	
Cresols										0.00E+00	
Ethylbenzene	1.51E-06			1.51E-06					1.51E-06		
Formaldehyde						0.00E+00					0.00E+00
Hexane										2.03E-06	
Hydrogen Sulfide											1.97E-05
Naphthalene											0.00E+00
PAHs (non-naphthalene)											
Phenol	0.00E+00		0.00E+00					0.00E+00			0.00E+00
Propylene											0.00E+00
Toluene				3.02E-05					3.02E-05		
Xylenes									8.64E-06		
Total HIC	1.51E-06	0.00E+00	0.00E+00	3.59E-04	1.51E-06	0.00E+00	3.28E-04	0.00E+00	1.51E-06	3.87E-04	0.00E+00

Health Risk Analysis (Tier 2)  
Signal Hill Petroleum, Inc. - West Unit Facility (ID 101977)  
Gas Plant Modification Project

CO2 Filtration System

Acute Risk Calculation (HIA)

Residential Maximum HIA for Nearest Resident = 1.03E-05

Toxic Air Contaminant	Acute Risk by Target Organ												
	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Acetaldehyde						0.00E+00						0.00E+00	
Acrolein				1.01E-05			1.01E-05	1.01E-05		1.01E-05			
Benzene													
Cresols													
Formaldehyde						0.00E+00		0.00E+00				0.00E+00	
Hexane													
Hydrogen Sulfide										3.59E-06			
Naphthalene													
PAHs (non-naphthalene)													
Phenol						0.00E+00						0.00E+00	
Propylene													
Toluene				1.88E-07						1.88E-07		1.88E-07	
Xylenes				2.11E-07								2.11E-07	
Total HIA	0.00E+00	0.00E+00	0.00E+00	1.03E-05	0.00E+00	3.99E-07	1.01E-05	1.01E-05	0.00E+00	3.77E-06	1.03E-05	3.99E-07	0.00E+00

Off Site Worker Maximum HIA for Nearest Off Site Worker = 1.85E-04

Toxic Air Contaminant	Acute Risk by Target Organ												
	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Acetaldehyde													
Acrolein						0.00E+00						0.00E+00	
Benzene				1.81E-04			1.81E-04	1.81E-04			1.81E-04		
Cresols													
Ethylbenzene													
Formaldehyde						0.00E+00		0.00E+00				0.00E+00	
Hexane													
Hydrogen Sulfide										6.45E-05			
Naphthalene													
PAHs (non-naphthalene)													
Phenol						0.00E+00						0.00E+00	
Propylene													
Toluene				3.38E-06						3.38E-06		3.38E-06	
Xylenes				3.79E-06								3.79E-06	
Total HIA	0.00E+00	0.00E+00	0.00E+00	1.85E-04	0.00E+00	7.77E-06	1.81E-04	1.81E-04	0.00E+00	6.79E-05	1.85E-04	7.17E-06	0.00E+00

Nearest Acute Exposure Maximum HIA for Nearest Acute Exposure = 6.53E-04

Toxic Air Contaminant	Acute Risk by Target Organ												
	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Acetaldehyde													
Acrolein						0.00E+00		6.41E-04	6.41E-04		6.41E-04	0.00E+00	
Benzene				6.41E-04									
Cresols													
Ethylbenzene													
Formaldehyde						0.00E+00		0.00E+00				0.00E+00	
Hexane													
Hydrogen Sulfide										2.26E-04			
Naphthalene													
PAHs (non-naphthalene)													
Phenol						0.00E+00						0.00E+00	
Propylene													
Toluene				1.19E-05						1.19E-05		1.19E-05	
Xylenes				1.34E-05								1.34E-05	
Total HIA	0.00E+00	0.00E+00	0.00E+00	6.53E-04	0.00E+00	2.53E-05	6.41E-04	6.41E-04	0.00E+00	2.40E-04	6.53E-04	2.53E-05	0.00E+00

SHP CO2 Filtration Volume Source

AERSCREEN 11126 / AERMOD 1234

01/20/14  
12:52:20

TITLE: SHP CO2 Filtration Volume Source

\*\*\*\*\* VOLUME PARAMETERS \*\*\*\*\*

SOURCE EMISSION RATE:	1.0001 g/s	7.937 lb/hr
VOLUME HEIGHT:	1.52 meters	5.00 feet
INITIAL LATERAL DIMENSION:	7.62 meters	25.00 feet
INITIAL VERTICAL DIMENSION:	3.05 meters	10.00 feet
RURAL OR URBAN:	URBAN	
POPULATION:	100000	
INITIAL PROBE DISTANCE =	1000. meters	3281. feet

\*\*\*\*\* BUILDING DOWNWASH PARAMETERS \*\*\*\*\*

BUILDING DOWNWASH NOT USED FOR NON-POINT SOURCES

\*\*\*\*\* PROBE ANALYSIS \*\*\*\*\*

25 meter receptor spacing: 17. meters - 1000. meters

Zo SECTOR	ROUGHNESS LENGTH	1-HR CONC (ug/m3)	DIST (m)	TEMPORAL PERIOD
1*	1.000	4041.	17.4	WIN

\* = worst case flow sector

\*\*\*\*\* MAKEMET METEOROLOGY PARAMETERS \*\*\*\*\*

MIN/MAX TEMPERATURE: 249.8 / 310.9 (K)

MINIMUM WIND SPEED: 0.5 m/s

SHP CO2 Filtration Volume Source

ANEMOMETER HEIGHT: 10.000 meters

SURFACE CHARACTERISTICS INPUT: AERMET SEASONAL TABLES

DOMINANT SURFACE PROFILE: Urban  
 DOMINANT CLIMATE TYPE: Dry Conditions  
 DOMINANT SEASON: Winter

ALBEDO: 0.35  
 BOWEN RATIO: 2.00  
 ROUGHNESS LENGTH: 1.000 (meters)

METEOROLOGY CONDITIONS USED TO PREDICT OVERALL MAXIMUM IMPACT

YR MO DY JDY HR

10 01 12 12 01

H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS
-1.30	0.043	-9.000	0.020	-999.	208.	6.0	1.000	2.00	0.35	0.50

HT	REF TA	HT
10.0	310.9	2.0

METEOROLOGY CONDITIONS USED TO PREDICT AMBIENT BOUNDARY IMPACT

YR MO DY JDY HR

10 01 12 12 01

H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS
-1.30	0.043	-9.000	0.020	-999.	208.	6.0	1.000	2.00	0.35	0.50

HT	REF TA	HT
10.0	310.9	2.0

SHP CO2 Filtration Volume Source

\*\*\*\*\* AERSCREEN AUTOMATED DISTANCES \*\*\*\*\*  
 OVERALL MAXIMUM CONCENTRATIONS BY DISTANCE

DIST (m)	MAXIMUM 1-HR CONC (ug/m3)	DIST (m)	MAXIMUM 1-HR CONC (ug/m3)
17.38	4041.	525.00	25.87
25.00	2217.	550.00	24.97
50.00	677.7	575.00	24.17
75.00	337.1	600.00	23.45
100.00	205.7	625.00	22.80
125.00	140.4	650.00	22.21
150.00	102.9	675.00	21.66
175.00	79.18	700.00	21.16
200.00	68.70	725.00	20.64
225.00	61.17	750.00	20.12
250.00	54.22	775.00	19.63
275.00	48.87	800.00	19.18
300.00	44.41	825.00	18.75
325.00	40.59	850.00	18.35
350.00	37.57	875.00	17.97
375.00	35.02	900.00	17.60
400.00	32.85	925.00	17.26
425.00	31.00	950.00	16.93
450.00	29.43	975.00	16.61
475.00	28.07	1000.00	16.31
500.00	26.90		

\*\*\*\*\* AERSCREEN MAXIMUM IMPACT SUMMARY \*\*\*\*\*

CALCULATION PROCEDURE	MAXIMUM 1-HOUR CONC (ug/m3)	SCALED 3-HOUR CONC (ug/m3)	SCALED 8-HOUR CONC (ug/m3)	SCALED 24-HOUR CONC (ug/m3)	SCALED ANNUAL CONC (ug/m3)
FLAT TERRAIN	4041.	4041.	3637.	2425.	404.1
DISTANCE FROM SOURCE		17.38 meters			

SHP CO2 Filtration Volume Source

IMPACT AT THE AMBIENT BOUNDARY	4041.	4041.	3637.	2425.	404.1
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DISTANCE FROM SOURCE	17.38 meters
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# CO2 Filtration System

## Health Risk Analysis (Tier 3) Signal Hill Petroleum, Inc. - West Unit Facility (ID 101977) Gas Plant Modification Project

Dispersion Factors	Annual Average* (ug/m3 per gm/sec)	Peak 1-Hour Concentration* (ug/m3 per gm/sec)
Residential	2.15	26.9
Off Site Worker	16.46	205.7
Maximum Acute		4041.0

Volume Source - 25 ft long x 10 ft wide (250 sq ft) x 10 ft high  
CO2 Filtration System - Compressors, Filters etc.  
(Emissions: Fugitives)

500 meters to nearest residential receptor  
100 meters to nearest off site worker receptor  
25 meters to nearest acute exposure

DBR Resident = 302  
DBR Worker = 149  
EVF Resident = 0.96  
EVF Worker = 0.38

\* Equal to 0.08 x Peak 1-Hour Concentration  
\* Per AERSCREEN, max GLO of 4041 ug/m3 occurs at 17.38ft.

TAC	Maximum Individual Cancer Risk				Chronic Hazard Index (HIC)				Acute Hazard Index (HIA)				
	CP	AF <sub>ann</sub>	MP Res	MICR Wkr	REL (ug/m3)	MP Res	MICR Wkr	HIC Residential	HIC Worker	REL (mg/m3)	HIA Residential	HIA Worker	HIA Nearest Acute
Acetaldehyde	1.00E-02	1.0	1.00	0.00E+00	9.00E+00	1.00	1.00	0.00E+00	0.00E+00	0.19	1.00	0.00E+00	0.00E+00
Atrazine	1.00E-01	1.0	1.00	4.91E-09	6.00E-02	1.00	1.00	0.00E+00	0.00E+00	1300	0.87	1.42E-06	2.13E-04
Benzene	1.00E-01	1.0	1.00	7.34E-09	6.00E+01	1.00	1.00	2.82E-06	2.16E-05	1300	0.87	1.42E-06	2.13E-04
Cresols	1.00E-01	1.0	1.00	0.00E+00	6.00E+02	1.00	1.00	0.00E+00	0.00E+00	94	1.00	0.00E+00	0.00E+00
Ethylbenzene	1.00E-01	1.0	1.00	0.00E+00	2.00E+03	1.00	1.00	1.30E-08	9.97E-08	42	1.00	5.04E-07	7.58E-05
Formaldehyde	2.10E-02	1.0	1.00	0.00E+00	3.00E+00	1.00	1.00	1.75E-07	1.34E-06	42	1.00	5.04E-07	7.58E-05
Hexane	4.52E-03	1.0	1.00	0.00E+00	7.00E+03	1.00	1.00	1.69E-07	1.30E-06	42	1.00	5.04E-07	7.58E-05
Hydrogen Sulfide	7.87E-07	1.0	1.00	0.00E+00	1.00E+01	1.00	1.00	0.00E+00	0.00E+00	42	1.00	5.04E-07	7.58E-05
Naphthalene	0.00E+00	1.0	1.00	0.00E+00	9.00E+00	1.00	1.00	0.00E+00	0.00E+00	42	1.00	5.04E-07	7.58E-05
PAHs (non-naphthalene)	0.00E+00	1.0	1.00	0.00E+00	2.00E+02	1.00	1.00	0.00E+00	0.00E+00	5800	1.00	0.00E+00	0.00E+00
Phenol	0.00E+00	1.0	1.00	0.00E+00	3.00E+03	1.00	1.00	0.00E+00	0.00E+00	37000	1.00	2.64E-08	3.97E-06
Propylene	0.00E+00	1.0	1.00	0.00E+00	3.00E+02	1.00	1.00	2.61E-07	1.99E-06	22000	1.00	2.96E-08	4.45E-06
Toluene	2.88E-04	1.0	1.00	0.00E+00	7.00E+02	1.00	1.00	7.45E-08	5.70E-07	22000	1.00	2.96E-08	4.45E-06
Xylene	1.92E-04	1.0	1.00	0.00E+00	7.00E+02	1.00	1.00	7.45E-08	5.70E-07	22000	1.00	2.96E-08	4.45E-06
<b>Totals</b>				<b>4.91E-09</b>									

MAC = Maximum Annual Controlled Emission Rate, lb/yr  
MHC = Maximum Hourly Controlled Emission Rate, lb/hr

### Calculation of Maximum Individual Cancer Risk:

$$MICR = X/Q \times Q \times CP \times AF_{ann} \times DBR \times EVF \times 10^{-6} \times MP$$

Where:  
X/Q = dispersion factor for 1 g / s of emissions - ug / m3 per gm/sec  
Q = the emission rate - gm/sec  
CP = Cancer Potency - mg / kg / day  
AF<sub>ann</sub> = Annual concentration adjustment factor - unitless  
DBR = Daily Breathing Rate - L / kg body weight / day ( = 302 for Resident; 149 for Worker)  
EVF = Exposure Value Factor - unitless ( = 0.96 for Resident; 0.38 for Worker)  
MP = Multi-Pathway factor (if applicable)

### Calculation of Chronic and Acute Hazard Index:

$$HIC = [(Q) \times (X/Q_{ann}) \times MP] / (\text{Chronic REL}) \text{ for each TAC}$$

$$HIA = [(Q_{ac}) \times (X/Q_{ac}) \times AAF] / (\text{Acute REL}) \text{ for each TAC}$$

Where:  
HIC = Chronic Hazard Index  
HIA = Acute Hazard Index

Q = Max controlled annual emission rate, gm/sec  
Q<sub>hr</sub> = Max controlled hourly emission rate, gm/sec  
X/Q = the dispersion factor, ug/m3/gm/sec  
REL = Reference Exposure Level, ug/m3  
MP = multipathway adjustment factor  
AAF = Acute Adjustment Factor (if risk based on averaging time other than one hour)

**Health Risk Analysis (Tier 3)**  
**Signal Hill Petroleum, Inc. - West Unit Facility (ID 101977)**  
**Gas Plant Modification Project**

CO2 Filtration System

**Chronic Risk Calculation (HIC)**

Residential Maximum HIC for Nearest Resident = 4.12E-06

Toxic Air Contaminant	Chronic Risk by Target Organ										
	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	SKIN
Acetaldehyde						0.00E+00	3.48E-06				0.00E+00
Acrolein				3.48E-06					3.48E-06		0.00E+00
Benzene				1.61E-08	1.61E-08				0.00E+00		
Ethylbenzene	1.61E-08							1.61E-08			0.00E+00
Formaldehyde						0.00E+00			2.16E-07		
Hexane											0.00E+00
Hydrogen Sulfide											2.09E-07
Naphthalene											0.00E+00
PAHs (non-naphthalene)											0.00E+00
Phenol	0.00E+00		0.00E+00					0.00E+00			0.00E+00
Propylene				3.22E-07					3.22E-07		0.00E+00
Toluene									9.21E-08		9.21E-08
Xylenes									4.12E-06		6.24E-07
<b>Total HIC</b>	<b>1.61E-08</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>3.93E-06</b>	<b>1.61E-08</b>	<b>0.00E+00</b>	<b>3.49E-06</b>	<b>0.00E+00</b>	<b>1.61E-06</b>	<b>0.00E+00</b>	<b>6.24E-07</b>

Off Site Worker Maximum HIC for Nearest Off Site Worker = 3.53E-05

Toxic Air Contaminant	Chronic Risk by Target Organ										
	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	SKIN
Acetaldehyde						0.00E+00	2.99E-05				0.00E+00
Acrolein				2.99E-05					2.99E-05		0.00E+00
Benzene				1.38E-07	1.38E-07				0.00E+00		
Ethylbenzene	1.38E-07							1.38E-07			0.00E+00
Formaldehyde						0.00E+00			1.85E-06		0.00E+00
Hexane											1.79E-06
Hydrogen Sulfide											0.00E+00
Naphthalene											0.00E+00
PAHs (non-naphthalene)											0.00E+00
Phenol	0.00E+00		0.00E+00					0.00E+00			0.00E+00
Propylene				2.76E-06					2.76E-06		2.76E-06
Toluene									7.89E-07		7.89E-07
Xylenes									3.53E-05		5.34E-06
<b>Total HIC</b>	<b>1.38E-07</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>3.28E-05</b>	<b>1.38E-07</b>	<b>0.00E+00</b>	<b>2.99E-05</b>	<b>0.00E+00</b>	<b>1.38E-07</b>	<b>0.00E+00</b>	<b>5.34E-06</b>

Health Risk Analysis (Tier 3)  
Signal Hill Petroleum, Inc. - West Unit Facility (ID 101977)  
Gas Plant Modification Project

CO2 Filtration System

Acute Risk Calculation (HIA)

Residential Maximum HIA for Nearest Resident = 1.78E-06

Toxic Air Contaminant	Acute Risk by Target Organ											
	AL	BN	CV	DEV	END	EYE	HEA	IMA	KD	NS	RESP	SKIN
Acetaldehyde						0.00E+00						
Acrolein				1.75E-06		1.75E-06		1.75E-06		1.75E-06	0.00E+00	
Benzene												
Cresols												
Ethylbenzene						0.00E+00		0.00E+00			0.00E+00	
Formaldehyde												
Hexane									6.23E-07			
Hydrogen Sulfide												
Naphthalene												
PAHs (non-naphthalene)												
Propylene						0.00E+00					0.00E+00	
Toluene				3.27E-08		3.27E-08			3.27E-08	3.27E-08	3.27E-08	
Xylenes						3.66E-08					3.66E-08	
Total HIA	0.00E+00	0.00E+00	0.00E+00	1.78E-06	0.00E+00	6.93E-08	1.79E-06	1.75E-06	0.00E+00	6.56E-07	1.78E-06	6.93E-08

Off Site Worker Maximum HIA for Nearest Off Site Worker = 1.53E-05

Toxic Air Contaminant	Acute Risk by Target Organ											
	AL	BN	CV	DEV	END	EYE	HEA	IMA	KD	NS	RESP	SKIN
Acetaldehyde						0.00E+00						
Acrolein				1.50E-05		1.50E-05		1.50E-05		1.50E-05	0.00E+00	
Benzene												
Cresols												
Ethylbenzene						0.00E+00		0.00E+00			0.00E+00	
Formaldehyde												
Hexane									5.34E-06			
Hydrogen Sulfide												
Naphthalene												
PAHs (non-naphthalene)												
Propylene						0.00E+00					0.00E+00	
Toluene				2.80E-07		2.80E-07			2.80E-07	2.80E-07	2.80E-07	
Xylenes				3.12E-07		3.12E-07					3.12E-07	
Total HIA	0.00E+00	0.00E+00	0.00E+00	1.53E-05	0.00E+00	5.93E-07	1.50E-05	1.50E-05	0.00E+00	5.62E-06	1.53E-05	5.93E-07

Maximum Acute Exposure Maximum HIA for Nearest Acute Exposure = 6.32E-05

Toxic Air Contaminant	Acute Risk by Target Organ											
	AL	BN	CV	DEV	END	EYE	HEA	IMA	KD	NS	RESP	SKIN
Acetaldehyde						0.00E+00						
Acrolein				6.21E-05		6.21E-05		6.21E-05		6.21E-05	0.00E+00	
Benzene												
Cresols												
Ethylbenzene						0.00E+00		0.00E+00			0.00E+00	
Formaldehyde												
Hexane												
Hydrogen Sulfide												
Naphthalene												
PAHs (non-naphthalene)												
Propylene						0.00E+00					0.00E+00	
Toluene				1.16E-06		1.16E-06			1.16E-06	1.16E-06	1.16E-06	
Xylenes				1.30E-06		1.30E-06					1.30E-06	
Total HIA	0.00E+00	0.00E+00	0.00E+00	6.32E-05	0.00E+00	2.49E-06	6.21E-05	6.21E-05	0.00E+00	2.32E-05	6.32E-05	2.45E-06

# Health Risk - Project Summary

## Signal Hill Petroleum, Inc. - West Unit Facility (ID 101977)

### Gas Plant Modification Project

(All values per Tier 3 analyses)

	Nearest Resident		Nearest Off Site Worker		Nearest Acute	
	MICR	HIC	MICR	HIC	HIA	HIA
Vapor Recovery System	6.05E-09	4.11E-06	8.03E-09	2.79E-05	1.21E-05	8.07E-05
Natural Gas Dehydration System	6.07E-09	4.12E-06	1.02E-08	3.53E-05	1.53E-05	6.32E-05
CO2 Filtration System	4.91E-09	4.12E-06	7.34E-09	3.53E-05	1.53E-05	6.32E-05

Total Project **1.70E-08**  
(0.0170 x 10<sup>-6</sup>)

Total Project **2.55E-08**  
(0.0255 x 10<sup>-6</sup>)

**AQMD PERMIT APPLICATION PACKAGE  
SIGNAL HILL PETROLEUM, INC. – FACILITY ID 101977  
MODIFICATIONS TO GAS PROCESSING PLANT**

**APPENDIX 6**

**New Source Review Info**

- Facility PTE
- RACT/BACT/LAER Search Results – List of 49 Facilities with 68 Processes for which Determinations Have Been Made for Sources of Fugitive Emissions of VOC Since January 1, 2003
- SCAQMD BACT Guideline (Non-Major Polluting Facilities) for “Fugitive Emission Sources at Natural Gas Plants and Oil and Gas Production Fields”

**PTE - Signal Hill West Unit (ID 101977)**  
**Total Facility**  
**Annual Emissions, tons/year**

**Facility PTE**

Equipment	VOC	NOx	SOx	CO	PM10
Crude Oil Storage Tanks <sup>a</sup>	5.31	0.00	0.00	0.00	0.00
Fugitives - Well Cellars <sup>b</sup>	3.08	0.00	0.00	0.00	0.00
Fugitives - Wellheads <sup>c</sup>	0.03	0.00	0.00	0.00	0.00
Fugitives - Equipment Leaks <sup>d</sup>	2.98	0.00	0.00	0.00	0.00
Fugitives - This Project <sup>e</sup>	2.57	0.00	0.00	0.00	0.00
Gas Fired Turbine <sup>f</sup>	0.76	5.42	0.58	3.97	2.17
NGL Loading Station <sup>g</sup>	0.08	0.00	0.00	0.00	0.00
Separation Basin <sup>h</sup>	0.68	0.00	0.00	0.00	0.00
Total for Title V (excl fugitives)	6.83	5.42	0.58	3.97	2.17
Total for NSR	15.49	5.42	0.58	3.97	2.17

<sup>a</sup> Based on facility design throughput of 50,000 bopd (25,000 each for Tanks T-1 and T-2)

<sup>b</sup> Actual 2012 reported emissions adjusted to updated EF of 1.77 lbs/sq-ft-yr (2010 and 2011 were less.)

<sup>c</sup> Actual 2012 reported emissions (equal to 2010 and 2011).

<sup>d</sup> Actual 2012 reported emissions (2010 and 2011 were less) multiplied by 1.2.

<sup>e</sup> Calculated increase in fugitive emissions from equipment leaks for the Gas Plant Modification Project

<sup>f</sup> Per District's evaluation of A/N 492565-66 (to correct certain turbine info) dated February 2009.

<sup>g</sup> Based on max allowed throughput of 5,714 gpd and 0.08 lbs/1000 gals per R462 for controlled loading.

<sup>h</sup> Per "Litchfield Equation" for API Separators with max inlet flow of 1.89 mmgd and max inlet VOC conc of 30 mg/l.

**New Source Review Major Facility (Rule 1302 - Definitions)**

	VOC	NOx	SOx	CO	PM10
Tons per Year PTE	10	10	100	50	70

**New Source Review Exemption Thresholds (Rule 1304, Table A)**

	VOC	NOx	SOx	CO	PM10
Tons per Year PTE	4	4	4	29	4

**Title V PTE Applicability Thresholds (Rule 3001, Table 2)**

	VOC	NOx	SOx	CO	PM10
Tons per Year PTE	10	10	100	50	70



http://cfpub.epa.gov/rbcl/index.cfm?action=Results.PermitSearchResults  
Last updated on Wednesday, November 27, 2013

Technology Transfer Network

Clean Air Technology Center | RACT/BACT/LAER Clearinghouse | Technology Center  
 ▶ RACT/BACT/LAER Clearinghouse ▶ RBLC Basic Search ▶ RBLC Search Results

**RBLC Search Results**

[List of Reports](#) [Help](#)

Your search has found **49** facilities and **68** processes that match your search criteria. You can view details for one or more facilities by clicking on the highlighted RBLC identifier or the process description in the list below. To create a report, select one of the standard output formats from the [list of reports](#) at the bottom of this page. Only facilities that are checked in the table below will be included in your report. Click on the check box next to any facility to switch between checked and unchecked or use the "Check" or "Un-Check" all facilities buttons at the top of the list to check or uncheck all records in the list.

Please note that the use of your browser's BACK button to change the search conditions may result in inaccurate results.

Matching Facilities for Search Criteria : [Tips](#)

Permit Date Between 01/01/2003 And 11/27/2013  
And Pollutant Name Like VOC  
And Process Contains 'fugitive'

**These results are for USA only.**

Check  Un-Check **ALL Facilities**

NOTE: Draft determinations are marked with a " \* " beside the RBLC ID.

RBLC ID	CORPORATE/COMPANY & FACILITY NAME	PROCESS CODE	PROCESS DESCRIPTION	PERMIT NUMBER & PERMIT DATE
<input type="button" value="Sort By"/>	<input type="button" value="Sort By"/>			<input type="button" value="Sort By"/>
<input checked="" type="checkbox"/> * <a href="#">OH-0358</a>	RUMPKE SANITARY LANDFILL, INC.	29.300	<a href="#">Fugitive emissions from 4 Gas Recovery Plants</a>	P0112732 09/24/2013
<input checked="" type="checkbox"/> * <a href="#">LA-0272</a>	RUMPKE SANITARY LANDFILL DYNO NOBEL LOUISIANA AMMONIA, LLC AMMONIA PRODUCTION FACILITY	62.999	<a href="#">FUGITIVE EMISSIONS (FUG)</a>	PSD-LA-768 03/27/2013
<input checked="" type="checkbox"/> <a href="#">TX-0613</a>	MAGELLAN PIPELINE TERMINALS, L.P.	42.009	<a href="#">Storage Tank Terminal Piping/Components Fugitives</a>	94433 AND N134 04/23/2012
<input checked="" type="checkbox"/> <a href="#">LA-0257</a>	EAST HOUSTON TERMINAL SABINE PASS LNG, LP & SABINE PASS LIQUEFACTION, LL	50.999	<a href="#">Fugitive Emissions</a>	PSD-LA-703 (M3) 12/06/2011
<input checked="" type="checkbox"/> <a href="#">FL-0332</a>	SABINE PASS LNG TERMINAL HIGHLANDS ENVIROFUELS (HEF), LLC	99.190	<a href="#">Fugitive Emissions - Equip Leaks</a>	PSD-FL-416, 0550063-001- AC 09/23/2011
<input checked="" type="checkbox"/> <a href="#">FL-0322</a>	HIGHLANDS BIOREFINERY AND COGENERATION PLANT SOUTHEAST RENEWABLE FUELS (SRF), LLC	64.002	<a href="#">Fugitive VOC Emission Leaks (facility-wide)</a>	PSD-FL-412 (0510032- 001-AC) 12/23/2010
<input checked="" type="checkbox"/> <a href="#">LA-0245</a>	SWEET SORGHUM-TO- ETHANOL ADVANCED BIOREFINERY VALERO REFINING - NEW ORLEANS, LLC	50.007	<a href="#">Hydrogen Plant Fugitives (FUG0030)</a>	PSD-LA-750 12/15/2010
<input checked="" type="checkbox"/> <a href="#">LA-0240</a>	HYDROGEN PLANT FLOPAM INC. FLOPAM INC.	69.999	<a href="#">Equipment Leaks (Fugitives)</a>	PSD-LA- 747/1280-

✓ <a href="#">VA-0313</a>	TRANSMONTAIGNE OPERATING COMPANY LP TRANSMONTAIGNE NORFOLK TERMINAL	42.009	<u>Truck Loading Fugitive Emissions from Loading Rack LR-1</u>	00141-V0 06/14/2010 60242 04/22/2010
✓ <a href="#">FL-0318</a>	VERENIUM HIGHLANDS ETHANOL FACILITY	42.009 49.999	<u>Fugitive emissions (valves, flanges, etc.) Facility-wide Fugitive VOC Equipment Leaks</u>	PSD-FL- 406 (0550061-001-AC) 12/10/2009 PSD-LA-619 (M5) 11/17/2009 PSD-LA-741 (M1) 11/02/2009 PSD-LA-696 (M1) 07/21/2009 08-DCF-313 07/21/2009
✓ <a href="#">LA-0213</a>	VALERO REFINING - NEW ORLEANS, LLC	50.007	<u>FUGITIVE EMISSIONS</u>	
✓ <a href="#">LA-0228</a>	COLONIAL PIPELINE COMPANY BATON ROUGE JUNCTION FACILITY	42.004	<u>FUG002 FUGITIVE EMISSIONS</u>	
✓ <a href="#">LA-0197</a>	CONOCOPHILLIPS CO ALLIANCE REFINERY	50.007	<u>UNIT FUGITIVES</u>	
✓ <a href="#">WI-0251</a>	ENBRIDGE ENERGY ENBRIDGE ENERGY	42.006	<u>F01 - NEW AND MODIFIED TANKS, NEW PIPELINES, AND ASSOCIATED FUGITIVE VOC</u>	
✓ <a href="#">LA-0225</a>	MOTIVA ENTERPRISES LLC NORCO REFINERY	50.003	<u>HYDROCRACKER UNIT FUGITIVE EMISSIONS 3011-95</u>	PSD-LA-730 03/25/2008
		50.003	<u>DIESEL HYDROTREATER UNIT FUGITIVE EMISSIONS 5011-99</u>	
		50.003	<u>DISTILLING UNIT FUGITIVE EMISSIONS 3004-95</u>	
		50.003	<u>CATALYTIC REFORMER NO. 2 UNIT FUGITIVE EMISSIONS 3010-95</u>	
		50.003	<u>HYDROGEN PLANT FUGITIVE EMISSIONS 5011-99</u>	
✓ <a href="#">NM-0050</a>	NAVAJO REFINING COMPANY LLC	50.007	<u>FUGITIVE EQUIPMENT COMPONENTS</u>	PSD-NM-195-M25 12/14/2007 PSD-LA-714 08/15/2007
✓ <a href="#">LA-0219</a>	ARTESIA REFINERY CREOLE TRAIL LNG, LP CREOLE TRAIL LNG IMPORT TERMINAL	99.999	<u>FUGITIVE EMISSIONS</u>	
✓ <a href="#">CA-1145</a>	BREITBURN ENERGY - NEWLOVE LEASE, ORCUTT HILL FIELD	13.390	<u>OIL AND GAS: FUGITIVE COMPONENTS</u>	ATC 12084B 06/05/2007
✓ <a href="#">LA-0211</a>	MARATHON PETROLEUM CO LLC GARYVILLE REFINERY	50.007	<u>HYDROGEN PLANT FUGITIVES (51-08)</u>	PSD-LA-719 12/27/2006
✓ <a href="#">OH-0303</a>	ASALLIANCE BIOFUELS, LLC	50.007	<u>FUGITIVE EMISSIONS</u>	
✓ <a href="#">IA-0082</a>	ASA BLOOMINGBURG, LLC GOLDEN GRAIN ENERGY GOLDEN GRAIN ENERGY	70.120 70.120	<u>FUGITIVE VOC EMISSIONS LEAKS FROM PROCESS UNITS</u> <u>FUGITIVE LEAKS</u>	01-01306 08/10/2006 03-A-600P-S2 04/19/2006 PSD-TX 1051 AND 56065 04/19/2006
✓ <a href="#">TX-0505</a>	CERTAINTTEED CORP. CERTAINTTEED INSULATION FIBER GLASS AND DUCTLINER MANUFACTURI	90.015	<u>BI/LI LINE FREHEAT FUGITIVES (8)</u>	
✓ <a href="#">TX-0515</a>	INTERNATIONAL PAPER COMPANY INTERNATIONAL PAPER COMPANY PULP AND PAPER MILL	30.219	<u>BATCH DIGESTOR FUGITIVES</u>	PSD-TX 778M2 AND 2975 01/11/2006
✓ <a href="#">OH-0294</a>	NUCOR STEEL MARION, INC.	30.219	<u>WASTE WATER TREATMENT FUGITIVES</u>	
✓ <a href="#">TX-0492</a>	NUCOR STEEL MARION, INC. VIRTEX PETROLEUM INC. VIRTEX PETROLEUM COMPANY DOERING RANCH GAS PLANT	81.310 50.007	<u>ELECTRIC ARC FURNACE (FUGITIVE EMISSIONS)</u> <u>FUGITIVES (4)</u>	03-16353 08/18/2005 P1041 05/05/2005
✓ <a href="#">TX-0478</a>	CITGO REFINING AND CHEMICALS COMAPNY LP CITGO CORPUS CHRISTI REFINERY - WEST PLANT	50.007 50.007	<u>MDHU FUGITIVES 2</u> <u>SRU PROCESS FUGITIVES (4)</u> <u>COKER UNIT FUGITIVES (4)</u>	PSD-TX-408M3 04/20/2005

<input checked="" type="checkbox"/>	<u>TX-0487</u>	ROHM AND HAAS TEXAS INCORPORATION ROHM AND HAAS CHEMICALS LLC LONE STAR PLANT	50.007 50.007 50.007	<u>WP MEROX FUGITIVES</u> <u>DHT FUGITIVES</u> <u>FUGITIVES (4)</u>	PSD-TX-828M1 03/24/2005
<input checked="" type="checkbox"/>	<u>OH-0292</u>	WHEELING PITTSBURGH STEEL CORPORATION WHEELING PITTSBURGH STEEL CORPORATION	81.370	<u>BASIC OXYGEN FURNACES (2 VESSELS), FUGITIVE EMISSIONS</u>	06-07507 01/06/2005
<input checked="" type="checkbox"/>	<u>LA-0208</u>	DEGUSSA ENGINEERED CARBONS, LP IVANHOE CARBON BLACK PLANT	69.015	<u>HOT FEEDSTOCK OIL FUGITIVES</u>	PSD-LA-585 (M-1) 12/09/2004
<input checked="" type="checkbox"/>	<u>TX-0479</u>	THE DOW CHEMICAL COMPANY DOW TEXAS OPERATIONS FREEPORT	50.007	<u>TURBINE LUBRICATION FUGITIVES</u>	PSD-TX-986M1 / 46306 12/02/2004
<input checked="" type="checkbox"/>	<u>LA-0194</u>	SABINE PASS LNG, LP SABINE PASS LNG TERMINAL	50.007 50.007 50.007 99.999	<u>PIPING FUGITIVES FOR BOILERS (5)</u> <u>PIPING FUGITIVES FOR TURBINES (5)</u> <u>TURBINE LUBRICATION FUGITIVES (5)</u> <u>FUGITIVE EMISSIONS</u>	PSD-LA-703 11/24/2004
<input checked="" type="checkbox"/>	<u>TX-0481</u>	AIR PRODUCTS LP AIR PRODUCTS BAYTOWN I I	99.999 50.007	<u>FUGITIVE EMISSIONS (ASSOCIATED W/ 528 AMBIENT AIR VAPORIZERS)</u> <u>FUGITIVES (4)</u>	PSD-TX-1044 / 35873 11/02/2004
<input checked="" type="checkbox"/>	<u>TX-0495</u>	BIO ENERGY TEXAS LLC NEW LANDFILL GAS (LFG) FUELED POWER GENERATION FACILITY	50.007	<u>FUGITIVES (4)</u>	56641/PSD-TX 1034 07/23/2004
<input checked="" type="checkbox"/>	<u>OH-0281</u>	RUMPKE SANITARY LANDFILL, INC RUMPKE SANITARY LANDFILL, INC	29.900	<u>FUGITIVE EMISSIONS FROM LANDFILL AND GAS COLLECTION SYSTEM</u>	14-05824, 14-05292 06/10/2004
<input checked="" type="checkbox"/>	<u>TX-0451</u>	DIAMOND SHAMROCK REFINING COMPANY LP DIAMOND SHAMROCK REFINING VALERO	19.900	<u>COMBUSTION UNITS, TANKS, PROCESS VENTS, LOADING, FLARES, FUGITIVES (4), WASTEWATER, COOLING TOWERS</u>	P1017 05/20/2004
<input checked="" type="checkbox"/>	<u>TX-0449</u>	UNION CARBIDE CORPORATION - A SUBSIDIARY OF DOW CC UCC SEADRIFT OPERATIONS	50.007	<u>RXN AND ETHYLENE PURIFICATION FUGITIVES (8)</u>	P118M4 04/03/2004
<input checked="" type="checkbox"/>	<u>OK-0097</u>	QUAD GRAPHICS INC QUAD GRAPHICS OKC FAC	64.002 41.023	<u>AREA FUGITIVES (4)</u> <u>PRINTING PRESS, OFFSET (FUGITIVE)</u>	2000-306-C M-1 PSD 02/03/2004
<input checked="" type="checkbox"/>	<u>TX-0440</u>	CORPUS CHRISTI LNG LP CORPUS CHRISTI LNG	41.023 50.007	<u>INK JET FUGITIVES</u> <u>FUGITIVES (4)</u>	P1038 01/20/2004
<input checked="" type="checkbox"/>	<u>TX-0454</u>	EL PASO NATURAL GAS COMPANY EL PASO NATURAL GAS CORNUDAS COMPRESSOR STATION	64.002	<u>FUGITIVES (4)</u>	P1030 10/31/2003
<input checked="" type="checkbox"/>	<u>TX-0453</u>	BAYPORT ENERGY CENTER LP BAYPORT ENERGY CENTER	64.002	<u>FUGITIVES</u>	P1031 10/20/2003
<input checked="" type="checkbox"/>	<u>IL-0073</u>	EXXONMOBIL OIL CORPORATION EXXONMOBIL OIL CORPORATION	50.007	<u>FUGITIVES</u>	03050050 08/19/2003
<input checked="" type="checkbox"/>	<u>WI-0204</u>	UNITED WISCONSIN GRAIN PRODUCERS UWGP - FUEL GRADE ETHANOL PLANT	64.002	<u>FUGITIVE VOC, FROM EQUIPMENT, F01</u>	03-DCF-048 08/14/2003
<input checked="" type="checkbox"/>	<u>LA-0195</u>	FIRESTONE POLYMERS LLC LAKE CHARLES FACILITY	63.039	<u>PROCESS FUGITIVES</u>	PSD-LA-672 07/30/2003
<input checked="" type="checkbox"/>	<u>TX-0457</u>	CITY PUBLIC SERVICE CITY PUBLIC SERVICE LEON CREEK PLANT	64.002	<u>PLANT FUGITIVES (4)</u>	P1027 06/26/2003
<input checked="" type="checkbox"/>	<u>OK-0089</u>		50.003	<u>CRUDE UNIT FUGITIVE EMISSIONS</u>	

<input checked="" type="checkbox"/> <a href="#">TX-0374</a>	TPI PETROLEUM INC. TPI PETROLEUM INC., VALERO ARDMORE REFINERY	19.900	<a href="#">NAT GAS &amp; FUEL GAS FUGITIVES</a>	98-172-C (M-12) (PSD) 06/09/2003
<input checked="" type="checkbox"/> <a href="#">TX-0364</a>	BP AMOCO CHEMICAL CO CHOCOLATE BAYOU PLANT	50.007	<a href="#">FUGITIVES, NGLFUG</a>	PSD-TX-983 03/24/2003
<input checked="" type="checkbox"/> <a href="#">TX-0465</a>	EXXON MOBIL CORPORATION SALT CREEK GAS PLANT	50.007 64.002	<a href="#">FUGITIVES, CO2FUG</a> <a href="#">FUGITIVES (4)</a>	PSD-TX- 795M2 01/31/2003
<input checked="" type="checkbox"/> <a href="#">OK-0092</a>	TPI PETROLEUM VALERO ARDMORE REFINERY	64.002 50.007	<a href="#">FUGITIVES</a> <a href="#">CRUDE UNIT FUGITIVE EMISSIONS</a>	795M2 01/31/2003
				98-172-C PSD 01/13/2003

**ALL Facilities**

Show All Records  Show Only Selected Records On This Page

Formatting your report may take a while, especially if your facility has a large number of processes and pollutants. The detail reports take the longest amount of time because they include the most information. Please be patient after you select "Create report"

- Process Index Report  TXT  pdf
- Process Type Summary(with Agency Contact Info)  TXT  pdf
- Comprehensive Report  TXT  pdf
- Free Form Report(Customizable Fields Selection)
- Free Form Report  TXT  pdf
- Export/Import Report(ASCII Delineated Text)

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT  
Best Available Control Technology (BACT) Guidelines for Non-Major Polluting Facilities\***

10-20-2000 Rev. 0  
12-5-2003 Rev. 1

Equipment or Process: Fugitive Emission Sources at Natural Gas Plants and Oil and Gas Production Fields

Subcategory/Rating/Size	Criteria Pollutants						
	VOC	NOx	SOx	CO	PM10	Inorganic	
Compressors, Centrifugal Type	Seal System with a Higher Pressure Barrier Fluid (04-10-98); and Compliance with AQMD Rule 1173 (12-5-2003)						
Compressors, Rotary Type	Enclosed Seal System Connected to Closed Vent System (04-10-98); and Compliance with AQMD Rule 1173						
Pressure Relief Valves	Connected to Closed Vent System or Equipped with Rupture Disc if Applicable (4-10-98); and Compliance with AQMD Rule 1173 (12-5-2003)						
Pumps – In Heavy Liquid Service	Single Mechanical (4-10-1998); and Compliance with AQMD Rule 1173 (12-5-2003)						
Pumps – In Light Liquid Service	Sealless Type if Available and Compatible, or Double or Tandem Seals and Vented to Closed Vent System (4-10-98); and Compliance with AQMD Rule 1173 (12-5-2003)						
Sampling Connections	Closed-Purge, Closed-Loop, or Closed-Vent System (4-10-98); and Compliance with AQMD Rule 1173 (12-5-2003)						
Valves, Fittings, Diaphragms, Hatches, Sight-Glasses, Open-Ended Pipes and Meters in VOC Service	Compliance with AQMD Rule 1173 (12-5-2003)						

\* Means those facilities that are not major polluting facilities as defined by Rule 1302 - Definitions

**AQMD PERMIT APPLICATION PACKAGE  
SIGNAL HILL PETROLEUM, INC. – FACILITY ID 101977  
MODIFICATIONS TO GAS PROCESSING PLANT**

**APPENDIX 7**

**Process Schematics and Manufacturer Data**

- Process Flow Diagram and Mass Balance of Proposed Overall Process
- Process & Instrumentation Diagrams for Vapor Recovery System
  - Existing Train 1 (Compressors CO-1 and CO-2)
  - Existing Train 2 (Compressors CO-3 and CO-4)

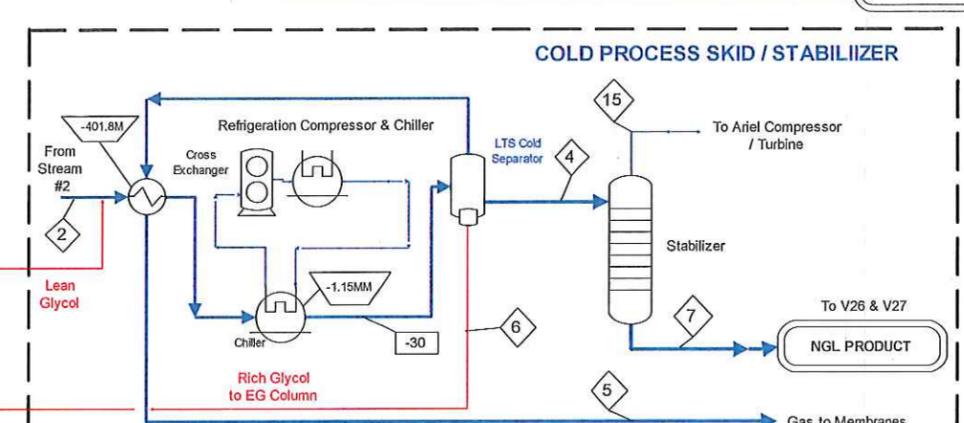
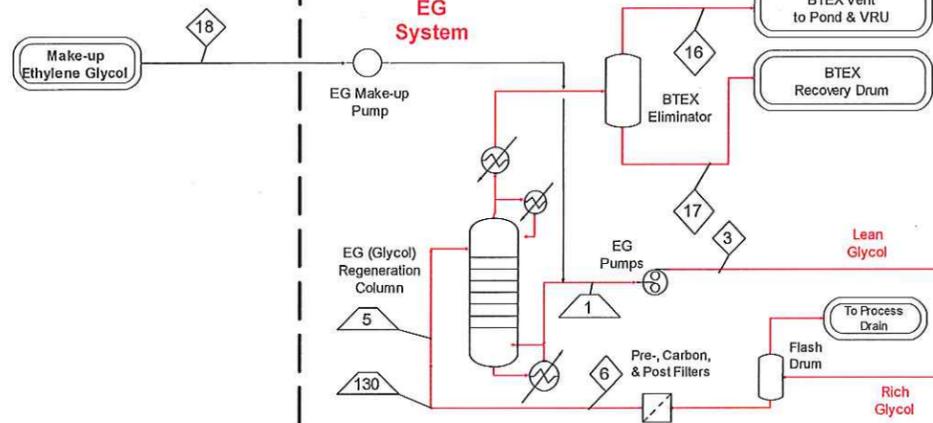
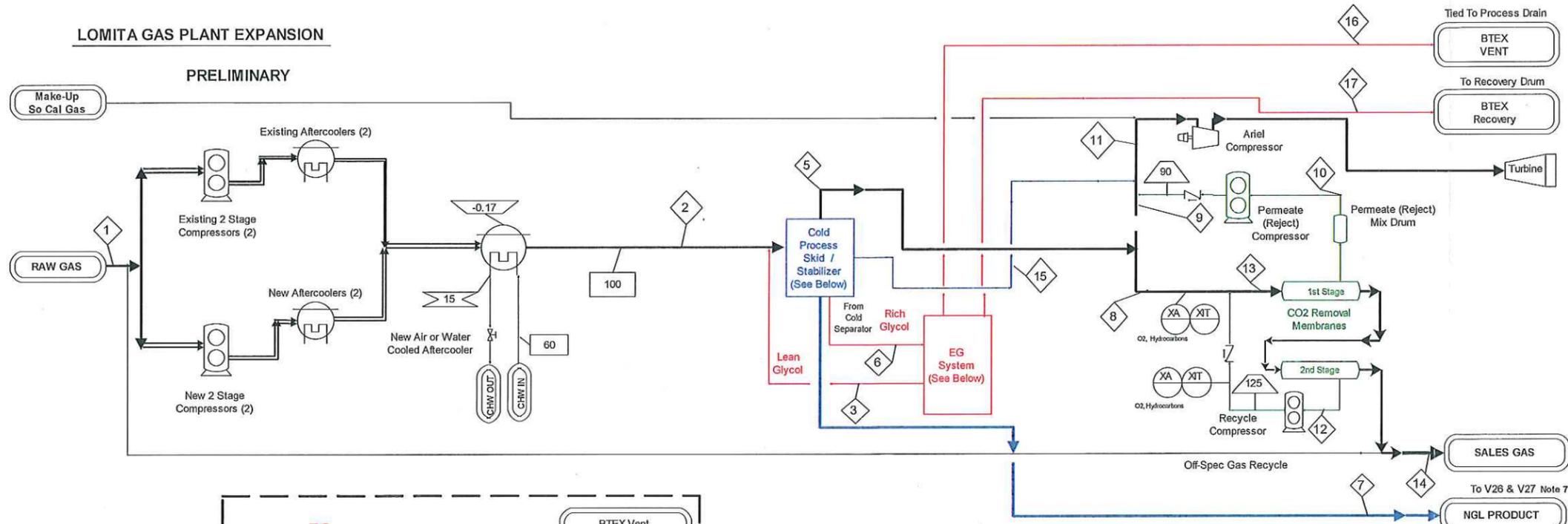
(NOTE: Proposed New Trains 3 and 4 will be identical to Existing Trains 1 and 2)
- Process Flow Diagrams (5) for Modified Natural Gas Dehydration System
- Process Flow Diagrams (3) for Proposed New CO<sub>2</sub> Filtration System
- Manufacturer Data
  - Control Philosophy for Refrigeration / Dehydration / NGL Stabilization (i.e., Natural Gas Dehydration) System (provided by Joule Processing)
  - Process Description for CO<sub>2</sub> Filtration System (provided by Generon IGS, Inc.)

LOMITA GAS PLANT EXPANSION

PRELIMINARY

Symbol Legend

- Stream No.
- Temperature (deg F)
- Pressure (psig)
- Flow (gpm)
- Q (MMBTU/hr)
- CTW Cooling Tower Water
- CHW Chilled Water
- Control Valve
- Backpressure Control Valve
- Reboiler
- Cooler or Chiller
- Distillation Column with Trays
- Screw Compressor
- Gear Pump
- Turbine
- Gas Membranes



Stream #	1	1	2	3	4	5	5	6	7	8	8	9	9	10	10	11	11	12	12	13	13	14	14	15	15	16	17	18	Stream #		
Component	(#/hr)	(Mole %)	(#/hr)	(#/hr)	(#/hr)	(#/hr)	(Mole %)	(#/hr)	(#/hr)	(Mole %)	(#/hr)	(Mole %)	(#/hr)	(Mole %)	(#/hr)	(Mole %)	(#/hr)	(Mole %)	(#/hr)	(Mole %)	(#/hr)	(Mole %)	(#/hr)	(Mole %)	(#/hr)	(#/hr)	(#/hr)	Component			
	Raw Gas	Raw Gas	After Comp.	Lean Glycol	FD to Stabilizer	LTS Out (Residue Gas)	LTS Out (Residue Gas)	Rich Glycol	NGL Product to Stg.	Product to Stg.	Membrane Fd (Residue Gas)	Membrane Fd (Residue Gas)	FD to Turbine (Residue Gas)	FD to Turbine (Residue Gas)	Permeate	Permeate	FD +Perm to Turbine	FD +Perm to Turbine	Recycle	Recycle	Memb Fd + Recycle	Memb Fd + Recycle	Sales Gas	Sales Gas	Stabilizer OVHDS to Turbine	Stabilizer OVHDS to Turbine	BTEX Elim OVHD	BTEX Recovery	EG Make-up		
	11612.4	100.0	11612.44	1079.28	4166.5	7394.7	100.0	1130.5	3886.0	100.0	4720.4	100.0	2674.3	100.0	579.0	100.0	3533.8	100.0	381.7	100.0	5102.1	100.0	4141.5	100.0	280.5	100.0	4.0	49.8	2.6		
	Note: This Mass Balance is based on 0% oxygen cases in Inprovals from Joule Processing and IGS Processing. Gross Heating Values are subject to fluctuation depending upon gas feed and upon equipment performance.																														
	Liquid Flowrate (GPM)	GPD		(2.0)	(14.7)			(2.1)	19006	19006						Constant Flow	Constant Flow											144	6.7	Liquid Flowrate (GPM)	
	Gas Flowrate (MMSCFD)	[MSCFD]				3.3	3.3				2.1	2.1	1.2	1.2	0.2	1.5	1.5	0.15	0.15	2.3	2.26	1.9	1.9	0.1	0.1	[0.9]				Gas Flowrate (MMSCFD)	
	Temperature (deg F)		100	100	91	-30	82	82	-20	120	120	82	82	104	104	85	85	103.5	103.5	104	104	103.1	103	-10	-10	100	100	100	100	100	Temperature (deg F)
	Pressure (psig)	[WC Vac]	[-10]	[-10]	150	1	140	135	135	140	115	115	125	125	2	2	120	120	2	2	125	125	100	100	100	100	0.2	0.2	0	Pressure (psig)	
	Est. Gross Heating Value (BTU/scf)		1414	1414	1414		3039	1085	1085		3348	3348	0	0	1,085	706	1039	1039	830	830	1068	1068	1068	1068	1170	197				Est. Gross Heating Value (BTU/scf)	

REV.	DESCRIPTION	DATE	BY																												

**SIGNAL PETROLEUM**

NATURAL GAS PROCESSING FACILITY  
ENVIRONMENTAL PROCESS FLOW DIAGRAM - 0.5% Oxygen  
With Stabilizer Overheads to Ariel Compressor & Turbine  
LOMITA GAS PLANT EXPANSION - 2013 & 2014

SIZE	FSO4 NO	DWG NO	REV
D		110313-PFD-01	1/24/14
SHEET	None	SHEET	1 OF 1



**V-01** SUCTION SCRUBBER  
24" DIA x 5'-0" S.S.  
DP = 50 PSIG  
& FULL VACUUM @ 300 F  
MDMT = -20 F @ 50 PSIG

**V-02** OIL SUMP/SEPARATOR  
36" DIA x 3'-8" S.S.  
DP = 175 PSIG @ 450 F  
MDMT = -20 F @ 175 PSIG  
LUBE OIL CAP. = 55 GAL.

**V-03** BLOWCASE VESSEL  
6.625 DIA x 1'-0" S.S.  
NONDOME  
PER ANSI B313

**C-01** GAS COMPRESSOR  
LEROI 62418H  
PART NO. A219-195-5G18  
ROTARY SCREW OIL COOLED  
1284 ICFM @ 7 PSIA (892 MSCFD)  
DISCHARGE PRESS = 35 PSIA  
TEST PRESSURE = 195 PSI  
DISCHARGE TEMP = 195 F  
GEAR RATIO = 1.881  
150 HP, 1780 RPM MOTOR (888HP)  
480/3/60, 169 AMPS FULL LOAD

**E-01A** GAS COOLER SIDE-AMERCOOL SERIAL #2011B0871A  
215,000 BTU/HR, FLOW RATE = 40 GPM  
INLET TEMP = 195 F, OUTLET TEMP = 173 F  
CARBON STEEL WITH ALUMINUM FINS  
ASME CODE DP = 150 PSI @ 300 F  
TEST PRESSURE = 195 PSI  
5 HP, 1160 RPM FAN MOTOR, 480/3/60  
6.9 AMPS FULL LOAD CURRENT

**E-01B** GAS COOLER SIDE-AMERCOOL SERIAL #2011B0872A  
102,400 BTU/HR, FLOW RATE = 829 MSCFD  
INLET TEMP = 195 F, OUTLET TEMP = 120 F  
CARBON STEEL WITH ALUMINUM FINS  
ASME CODE DP = 150 PSI @ 300 F  
TEST PRESSURE = 195 PSI  
SHARES MOTOR WITH E-01A

**V-04** SUCTION SCRUBBER  
14" DIA x 5'-0" S.S.  
DP = 175 PSIG @ 300 F  
MDMT = -20 F @ 175 PSIG  
LUBE OIL CAP. = 36 GAL.

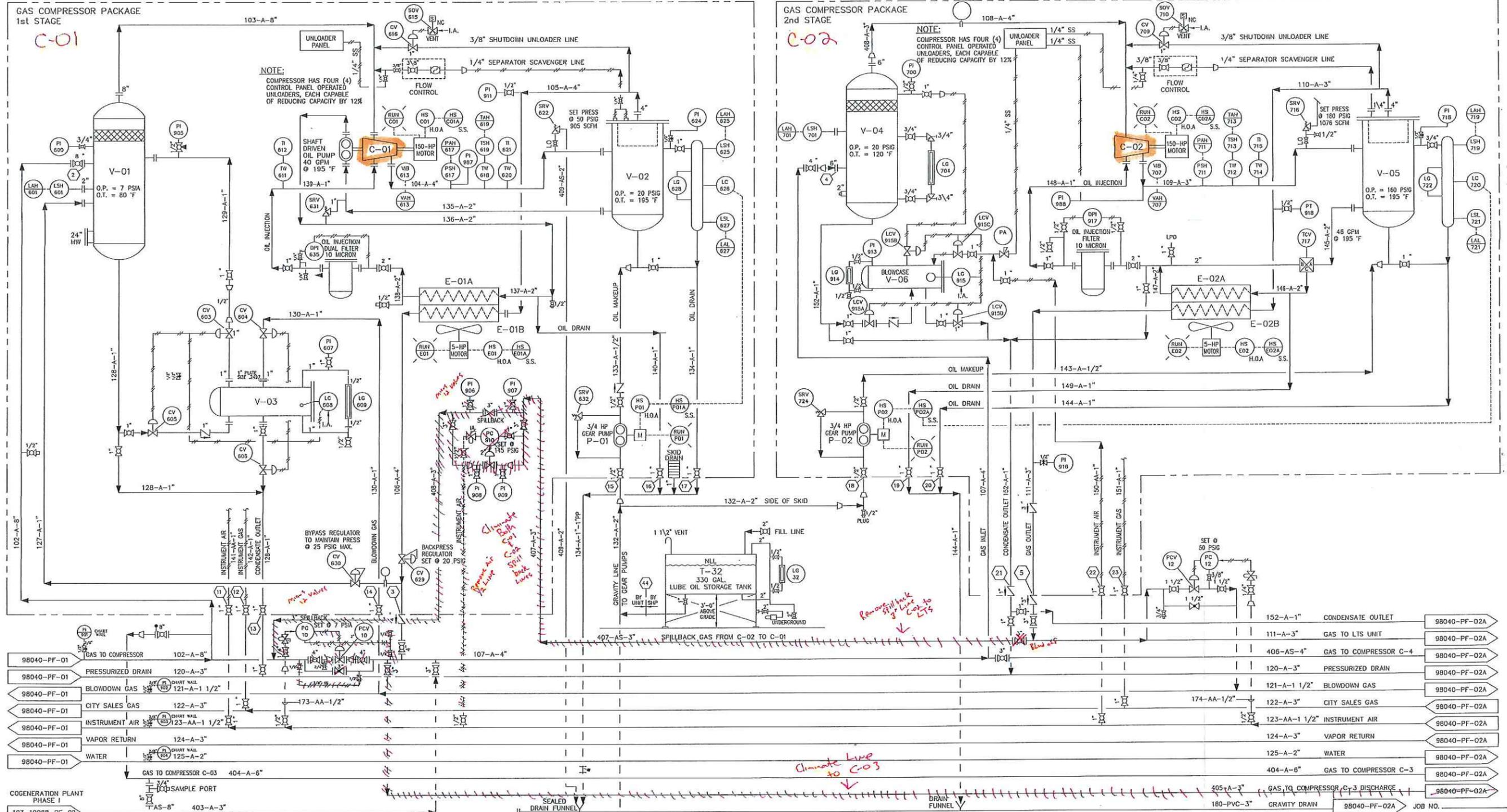
**V-05** OIL SUMP/SEPARATOR  
20" DIA x 3'-0" S.S.  
DP = 175 PSIG @ 650 F  
MDMT = -20 F @ 175 PSIG  
LUBE OIL CAP. = 36 GAL.

**V-06** BLOWCASE  
FABRICATED FROM SCH 80 CS PIPE  
WITH 8"-150# RF FLANGES

**C-02** GAS COMPRESSOR  
LEROI G1714H  
PART NO. A219-220-2G15  
ROTARY SCREW OIL COOLED  
316 ICFM @ 30 PSIA (897 MSCFD)  
DISCHARGE PRESS = 180 PSIA  
TEST PRESSURE = 195 PSI  
GEAR RATIO = 1.875  
150 HP, 1780 RPM MOTOR (1108HP)  
480/3/60, 169 AMPS FULL LOAD

**E-02A** GAS COOLER SIDE-AMERCOOL #2011B0881A  
86,530 BTU/HR, FLOW RATE = 46 GPM  
INLET TEMP = 195 F, OUTLET TEMP = 180 F  
CARBON STEEL WITH ALUMINUM FINS  
ASME CODE DP = 300 PSI @ 300 F  
MDMT = 30 F @ 300 PSIG  
5 HP, 1160 RPM FAN MOTOR, 480/3/60  
6.9 AMPS FULL LOAD CURRENT

**E-02B** GAS COOLER SIDE-AMERCOOL SERIAL #2011B0882B  
95,850 BTU/HR, FLOW RATE = 897 MSCFD  
INLET TEMP = 195 F, OUTLET TEMP = 120 F  
CARBON STEEL WITH ALUMINUM FINS  
ASME CODE DP = 300 PSI @ 300 F  
MDMT = 30 F @ 300 PSIG  
SHARES MOTOR WITH E-02A



REV	DATE	DESCRIPTION	BY	CHK	APP	SCALE
0	11/8/12	AS BUILT DRAWING	JSG	JPC	JPC	
1	8/13/99	ISSUED FOR CONSTRUCTION	MR	JPC	TR	

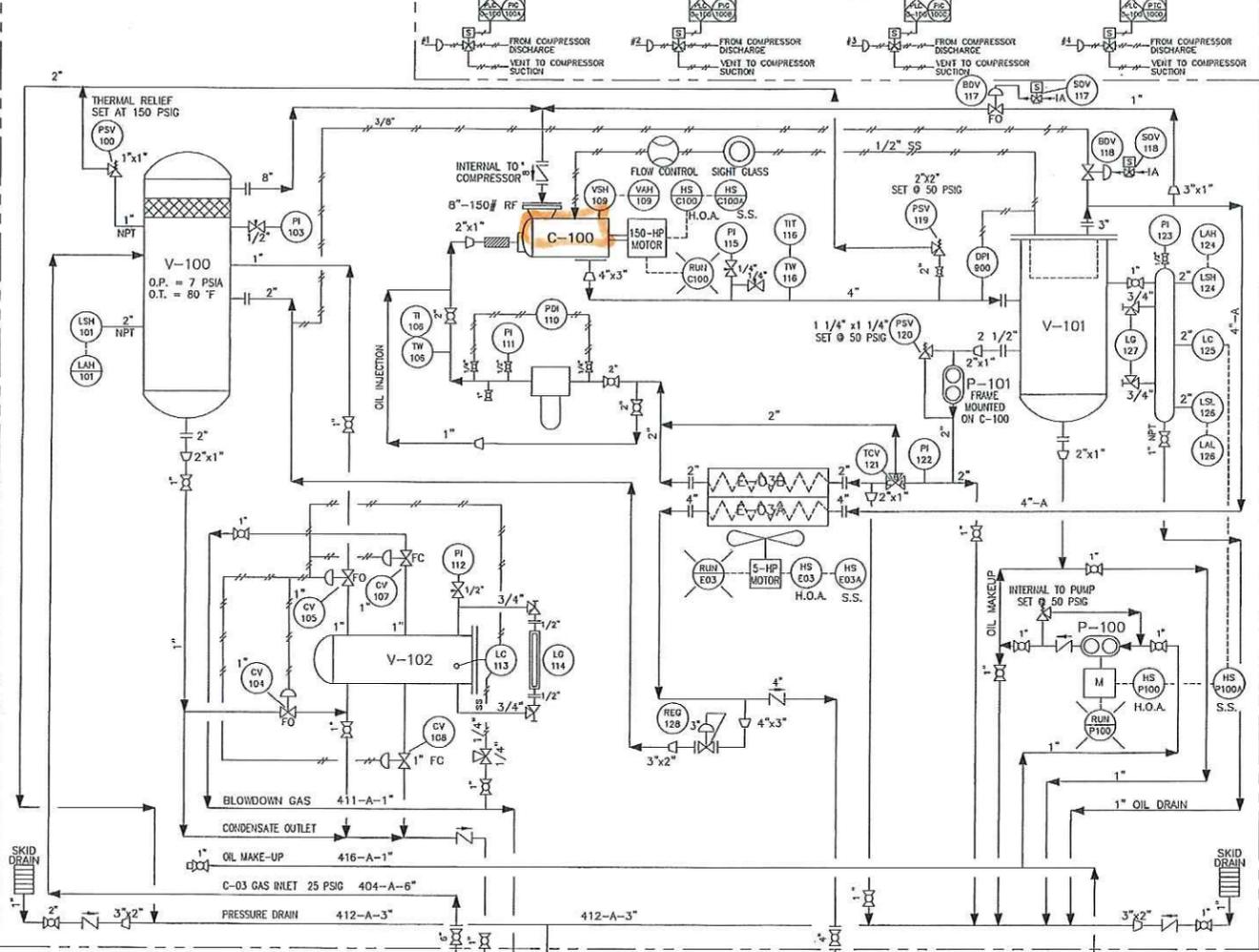
  

REV	DATE	DESCRIPTION	BY	CHK	APP	SCALE
1		Eliminate 24 Valves				
2		Remove 3" Spill back lines				

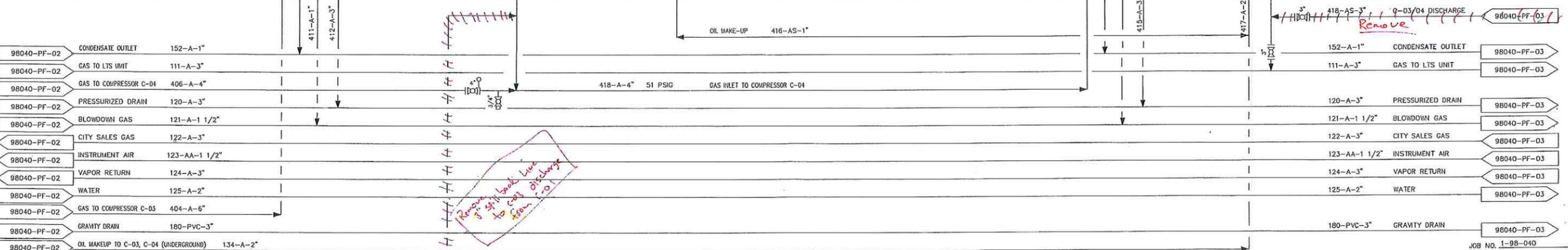
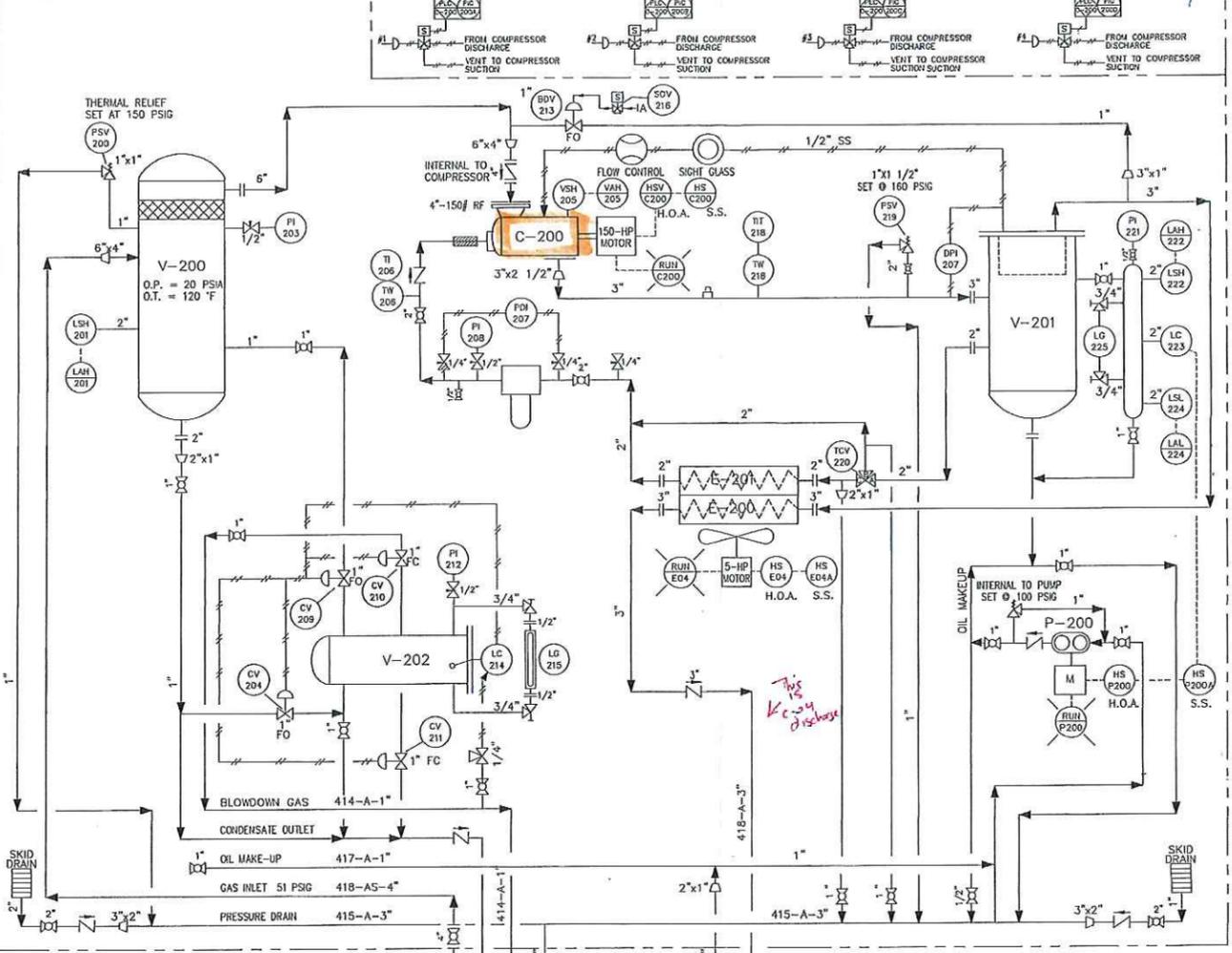


- V-100**  
1st STAGE SUCTION SCRUBBER  
24" DIA. CS.  
MAWP 100 PSIG @ 250° F  
ASME CODED AND STAMPED  
SS #9 DENSITY MESH PAD
- V-101**  
1st STAGE OIL/GAS SEPARATOR  
36" DIA. CS.  
MAWP 100 PSIG @ 250° F  
ASME CODED AND STAMPED  
W/ COALESCING ELEMENT
- V-200**  
2nd STAGE SUCTION SCRUBBER  
14" DIA. CS.  
MAWP 100 PSIG @ 250° F  
ASME CODED AND STAMPED
- V-201**  
2nd STAGE OIL/GAS SEPARATOR  
20" DIA. CS.  
MAWP 250 PSIG @ 250° F  
ASME CODED AND STAMPED  
W/ COALESCING ELEMENT
- V-202**  
BLOWCASE VESSEL  
8.625 DIA. CS.  
MAWP 100 PSIG @ 250° F  
ASME CODED AND STAMPED
- C-100**  
ROTARY SCREW GAS COMPRESSOR  
LEROI HG2418B  
150 HP, 460/3/60, 1800 RPM  
TEFC, SEVERE DUTY  
DIRECT DRIVE MOTOR
- C-200**  
ROTARY SCREW GAS COMPRESSOR  
LEROI HG1718B  
150 HP, 460/3/60, 1800 RPM  
TEFC, SEVERE DUTY  
DIRECT DRIVE MOTOR
- E-100**  
1st STAGE  
FINNED TUBE AIR COOLED  
HEAT EXCHANGERS  
CS HEADERS, CS TUBES  
DUTY: 95,949 BTU/HOUR
- E-101**  
1st STAGE  
OIL COOLER  
HEAT EXCHANGERS  
CS HEADERS, CS TUBES  
DUTY: 95,949 BTU/HOUR
- E-200**  
2nd STAGE  
FINNED TUBE AIR COOLED  
HEAT EXCHANGERS  
CS HEADERS, CS TUBES  
DUTY: 215,500 BTU/HOUR
- E-201**  
2nd STAGE  
OIL COOLER  
HEAT EXCHANGERS  
CS HEADERS, CS TUBES  
DUTY: 102,427 BTU/HOUR

**C-03 GAS COMPRESSOR PACKAGE**  
1st STAGE



**C-04 GAS COMPRESSOR PACKAGE**  
2nd STAGE



98040-PF-02	CONDENSATE OUTLET	152-A-1"
98040-PF-02	GAS TO LTS UNIT	111-A-3"
98040-PF-02	GAS TO COMPRESSOR C-04	406-A-4"
98040-PF-02	PRESSURIZED DRAIN	120-A-3"
98040-PF-02	BLOWDOWN GAS	121-A-1 1/2"
98040-PF-02	CITY SALES GAS	122-A-3"
98040-PF-02	INSTRUMENT AIR	123-AA-1 1/2"
98040-PF-02	VAPOR RETURN	124-A-3"
98040-PF-02	WATER	125-A-2"
98040-PF-02	GAS TO COMPRESSOR C-03	404-A-6"
98040-PF-02	GRAVITY DRAIN	180-PVC-3"
98040-PF-02	OIL MAKEUP TO C-03, C-04 (UNDERGROUND)	134-A-2"
98040-PF-02	GAS TO COMPRESSOR C-03 DISCHARGE	405-A-3"

98040-PF-03	CONDENSATE OUTLET	152-A-1"
98040-PF-03	GAS TO LTS UNIT	111-A-3"
98040-PF-03	PRESSURIZED DRAIN	120-A-3"
98040-PF-03	BLOWDOWN GAS	121-A-1 1/2"
98040-PF-03	CITY SALES GAS	122-A-3"
98040-PF-03	INSTRUMENT AIR	123-AA-1 1/2"
98040-PF-03	VAPOR RETURN	124-A-3"
98040-PF-03	WATER	125-A-2"
98040-PF-03	GRAVITY DRAIN	180-PVC-3"

**P-100**  
LUBE OIL MAKEUP PUMP  
4 GPM @ AMB  
VISCOSITY: 150 CP @ 60° F  
DISCHARGE PRESS = 150 PSIG MAX.  
SP. GR. = .9, OPER TEMP = AMB  
1 HP MOTOR, 1200 RPM, 460/3/60  
CASE MAT = C.S.

**P-101**  
LUBE OIL MAKEUP PUMP  
FRAME MOUNTED ON COMPRESSOR C-100

**P-200**  
LUBE OIL MAKEUP PUMP  
4 GPM @ AMB  
VISCOSITY: 150 CP @ 60° F  
DISCHARGE PRESS = 150 PSIG MAX.  
SP. GR. = .9, OPER TEMP = AMB  
1 HP MOTOR, 1200 RPM, 460/3/60  
CASE MAT = C.S.

**LINE LEGEND**

101-C-2"-1"C

INSULATION TYPE  
INSULATION THICKNESS  
LINE SIZE  
LINE SPEC  
LINE NUMBER

A = 150# ANSI CARBON STEEL  
AA = 125# ANSI GALVANIZED  
C = 300# ANSI CARBON STEEL  
F = 600# ANSI CARBON STEEL

**VALVE LEGEND**

◇ GATE VALVE  
⊞ PLUG VALVE  
⊞ BALL VALVE  
⊞ GLOBE VALVE  
⊞ CHECK VALVE  
CF CUSTOMER FURNISHED  
ISE CAD FILE: 98040PF2A

0	10/0/12	AS BUILT DRAWING	JSS	JPC	JPC
REV	DATE	DESCRIPTION	BY	CHK	APP
		Eliminate 3" Valve			
		Remove Spill back line			

DRAWN J. GRAMSTAD  
DATE 7/15/12  
CHECKED JSS  
APPROVED JPC  
APPROVED

**SIGNAL HILL PETROLEUM**  
SIGNAL HILL, CALIFORNIA

NATURAL GAS PROCESSING FACILITY  
PIPING AND INSTRUMENT DIAGRAM  
GAS COMPRESSOR C-03, C-04

HOBBS-BANNERMAN ENGINEERING, INC.  
CERRITOS, CALIFORNIA

DRAWING NO. 98040-PF-02A  
REV 0



**C-300A/C-300B  
COMPRESSORS**

MODEL: P2016LMC-MBL-1  
MFR: MYCOM  
SPEED: 3370  
DISPLACEMENT: 655/710 CFM  
CAPACITY: 85.3 TR  
BHP: 319 HP  
CASING: CAST IRON  
ROTOR: DUCTILE IRON  
SEAL: MECHANICAL  
DRINGS: VITON  
NO. OF STAGES: 2

**CM-300A/CM-300B  
COMPRESSOR MOTORS**

SIZE: 400 HP  
MFR: BALDOR  
SPEED: 3370  
ENCLOSURE: TEFC  
VOLTAGE: 480 VAC 3PH 60HZ  
INSULATION: F  
TEMP. RISE: B  
FRAME TYPE: 43RTS  
BALL TYPE  
BEARINGS: SPACE HEATERS  
ACCESSORIES: STATOR RINGS (2 PER PHASE)

**F-320  
OIL FILTER**

MODEL: OFD-0060-02-01-300-01  
MFR: ES  
CAPACITY: 80 GPM  
DP: 300 PSIG  
DT: -20/200°F  
MATERIAL: C.S.  
CA: 0826"  
CODE: ASME SECTION VIII, DIV. 1 (NON-STAMPED)  
NO. OF ELEMENT: ONE  
ELEMENT: 4" DIA x 38" OAL  
ELEMENT MODEL #: FG-0458-05-01-01

**P-33A/33B  
OIL PUMP**

MODEL: 3LS-45B  
MFR: SEM  
CAPACITY: 35 GPM  
BHP: 3.49  
DRINGS: VITON  
TYPE: SCREW  
SPEED: 1500  
CASING: CAST IRON  
SEAL: MECHANICAL  
RELIEF VALVE: BUILT-IN

**PM-33A/33B  
OIL PUMP MOTORS**

SIZE: 5 HP  
MFR: HYUNDAI  
SPEED: 1725 RPM  
ENCLOSURE: TEFC  
VOLTAGE: 480 VAC 3PH 60HZ  
SERFACTOR: C.S.  
INSULATION: F  
TEMP. RISE: B  
FRAME: 184TC

**V-401  
BULK OIL SEPARATOR**

SIZE: 24" DIA x 192" SM x SM  
MFR: IES  
DP: 300 PSIG  
DT: -20/200°F  
MATERIAL: C.S.  
CA: ASME SECTION VIII, DIV. 1 (STAMPED)  
C.A.L.: 00825"  
ELEMENTS: 3" CO x 18" OAL (5)  
ELEMENT MODEL #: GOC-0518-050-P/LF (5)

**V-403  
R-290 RECEIVER**

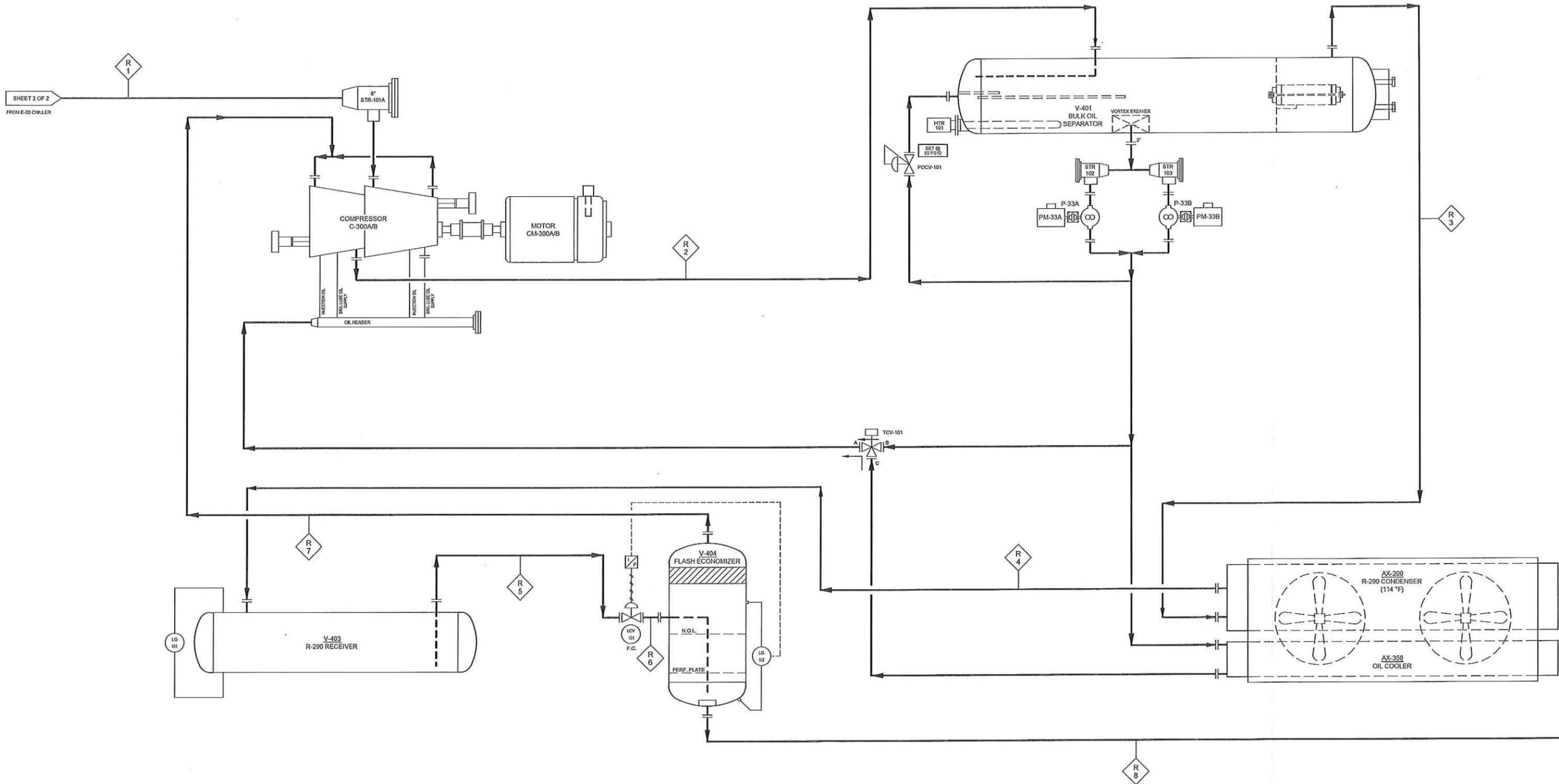
SIZE: 24" DIA x 15" SM x SM  
MFR: IES  
DP: 300 PSIG  
DT: -20/200°F  
MATERIAL: C.S.  
CA: ASME SECTION VIII, DIV. 1 (STAMPED)  
CODE:

**AX-200 / AX-350  
R-290 CONDENSER / OIL COOLER**

SIZE: 104.9" x 288"  
MFR: IES  
AMB. TEMP.: 100 F  
FAIS: QTY (2) 9"  
FAN MOTORS: QTY (2) 20 HP  
TYPE: AIR-COOLED  
AX-200 DUTY: 1,695,219 BTU/HR  
AX-350 DUTY: 411,859 BTU/HR  
ASME SECTION VIII, DIV. 1 (STAMPED)

**V-404  
FLASH ECONOMIZER**

SIZE: 24" DIA x 96" SM x SM  
MFR: ES  
DP: 300 PSIG  
DT: -20/200°F  
MATERIAL: C.S.  
CA: ASME SECTION VIII, DIV. 1 (STAMPED)  
CODE:



NOTES:

REV	DATE	REVISIONS	BY	CHKD	APP
0	01/15/14	PRELIMINARY ISSUE FOR APPROVAL	S.MALM		

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3200 SOUTHWEST FREEWAY, SUITE 2390, HOUSTON, TX 77027, USA PHONE: 1-713-481-1864

PROJECT TITLE			
PROCESS FLOW DIAGRAM MECHANICAL REFRIGERATION UNIT			
SCALE	DRAWING NUMBER	SHT	REV
NONE	D-13-1027-100	1 OF 4	0

SH *Sheet 2 of 2*  
TOWER CHILLER



**E-10  
GAS/GAS EXCHANGER**

SIZE: 16" x 132"  
MFR.: IES  
TYPE: BEM  
DUTY: 401,795 BTU/HR

	SHELLSIDE	TUBESIDE
DP (PSIG):	1,200	1,200
DT (°F):	-40/150	-40/150
CA (IN):	0	0
MOC:	304SS	304SS
CODE:	ASME SEC. VIII, DIV. 1 [STAMPED]	ASME SEC. VIII, DIV. 1 [STAMPED]
TEMA CLASS:	C	C

**V-30  
COLD SEPARATOR**

SIZE: 24" DIA x 10'-0" SM x SM  
MFR.: IES  
DP: 1200  
DT: -40/150  
CA: .5525"  
MOC: LTCS  
CODE: ASME SECTION VIII, DIV. 1 [STAMPED]

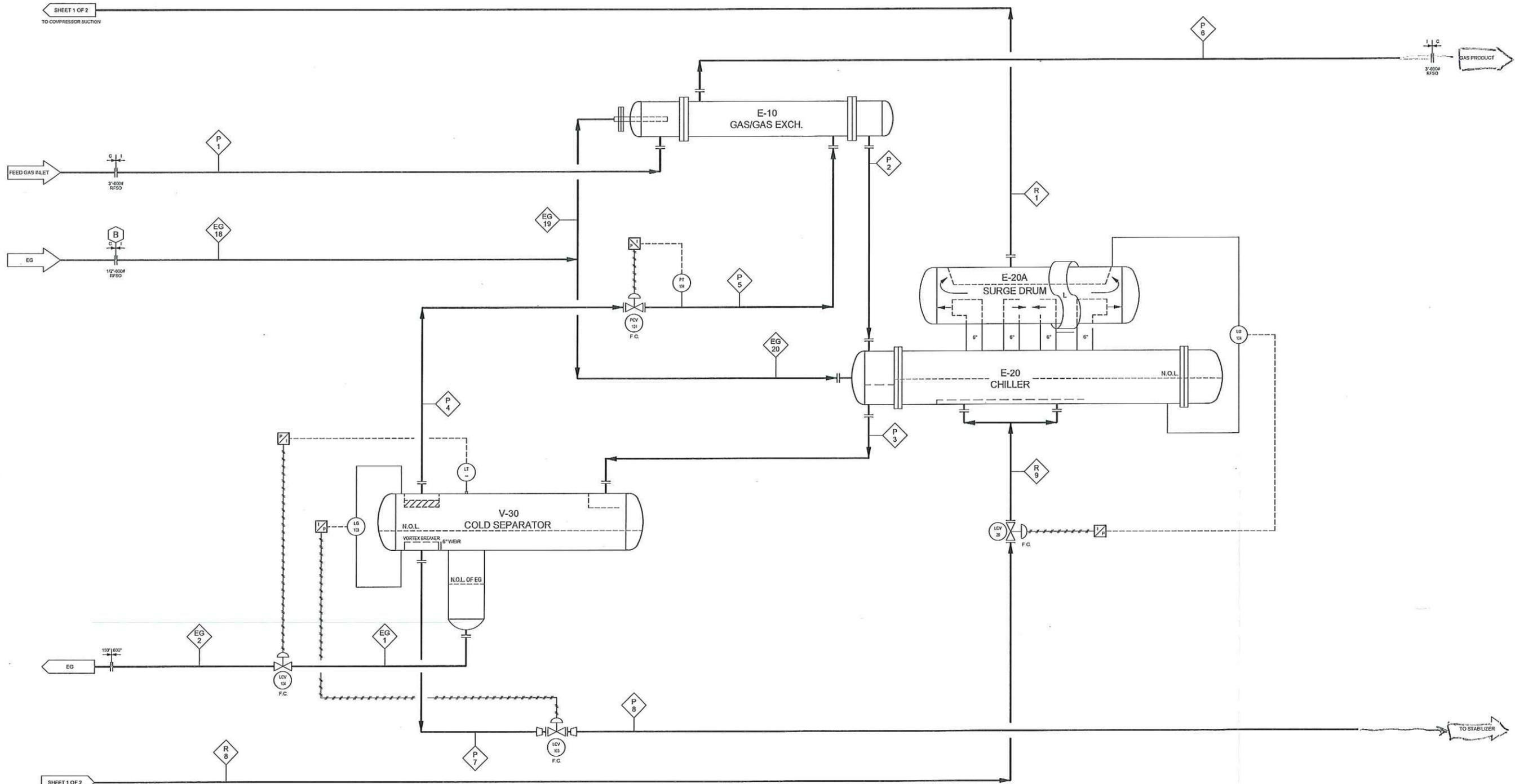
**E-20  
CHILLER**

SIZE: 24" OD x 192"  
MFR.: IES  
DUTY: 1,088,234 BTU/HR

	SHELLSIDE	TUBESIDE
DP (PSIG):	300	1,200
DT (°F):	-40/150	-40/150
PASSES:	1	2
CA (IN):	0	0
MOC:	304SS	304SS
CODE:	ASME SEC. VIII, DIV. 1 [STAMPED]	ASME SEC. VIII, DIV. 1 [STAMPED]
TEMA CLASS:	C	C

**E-20A  
SURGE DRUM**

SIZE: 24" OD x 240"  
MFR.: IES  
DP: 300 PSIG  
DT: -40/150  
CA: NONE  
MOC: 304SS  
CODE: ASME SECTION VIII, DIV. 1 [STAMPED]



NOTES:

REV	DATE	REVISIONS	BY	CHKD	APP
0	01/15/14	PRELIMINARY ISSUE FOR APPROVAL	S.MALM		

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Process Flow Diagram  
MAN SKID  
2 of 4 Rev 0

PROJEC



**HTR-201**  
RE-BOILER HEATER

SIZE: 120 KW  
MFR.: CCI THERMAL  
VOLTAGE: 480 VAC-3PH-60HZ  
WATT DENSITY: 12-14 WATTS/ IN

**T-40**  
STABILIZER RE-BOILER

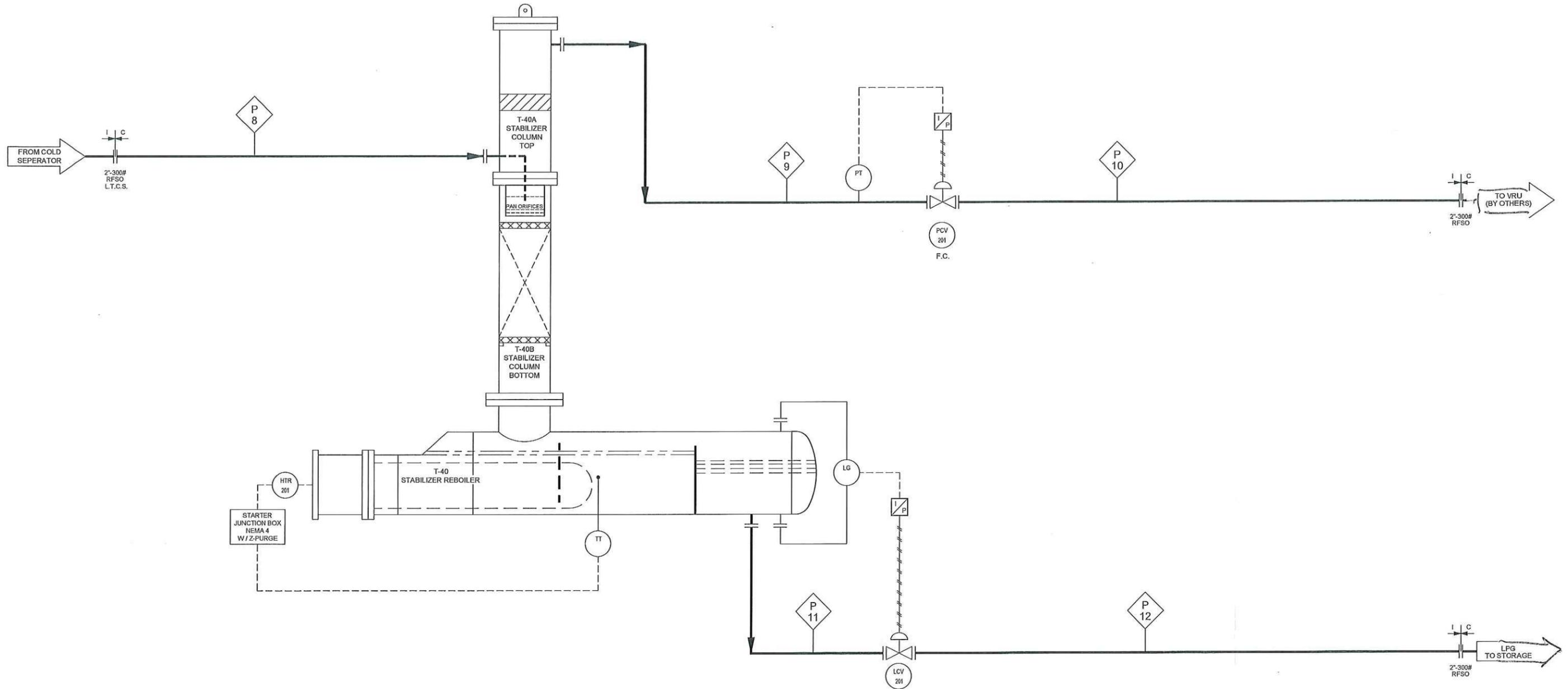
SIZE: 10" X 24" X 152" SM X SM  
MFR.: IES  
DP.: 300 PSIG  
DT.: -20°F/300°F  
CA.: 0.0625"  
MATL.: C.S.  
CODE.: ASME, SECT VIII. DIV 1. [STAMPED]

**T-40A**  
STABILIZER RE-BOILER TOP

SIZE: 12" DIA X 2'-8" FLG X FLG  
MFR.: IES  
DP.: 300 PSIG  
DT.: -20°F/300°F  
CA.: 0.0625"  
MATL.: L.T.C.S.  
CODE.: ASME, SECT VIII. DIV 1. [STAMPED]

**T-40B**  
STABILIZER COLUMN BOTTOM

SIZE: 12" DIA X 13'-4" FLG X FLG  
MFR.: IES  
DP.: 300 PSIG  
DT.: -20°F/300°F  
CA.: 0.0625"  
MATL.: C.S.  
CODE.: ASME, SECT VIII. DIV 1. [STAMPED]



NOTES:

REV	DATE	REVISIONS	BY	CHKD	APP
0	01/15/14	PRELIMINARY ISSUE FOR REVIEW	S.MALM		

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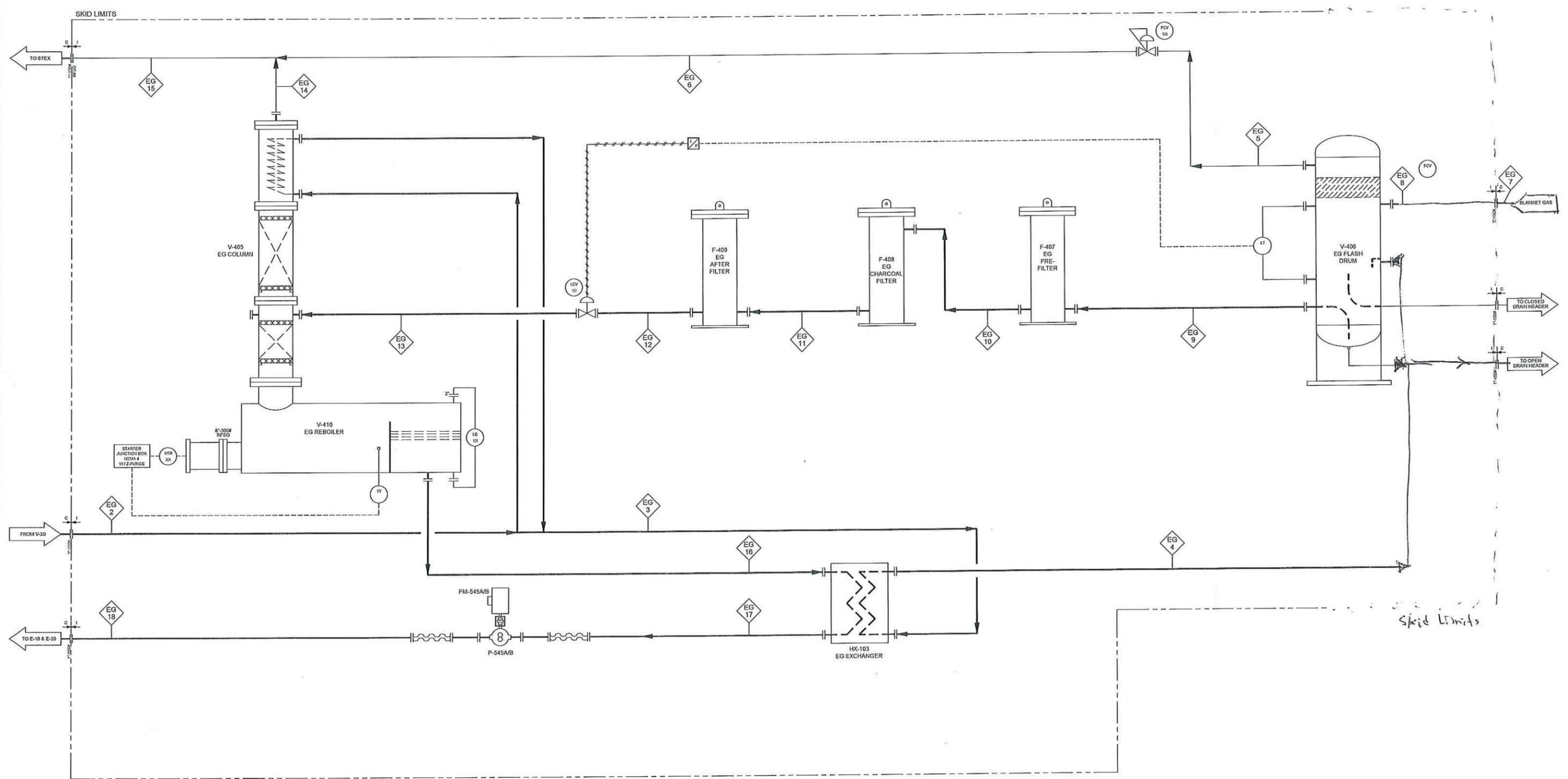
PROJEC

PROCESS FLOW DIAGRAM  
NGI Condensate Stabilizer

3 of 4 Rev0



HTR-301 EG REBOILER HEATER	V-405 EG COLUMN	V-410 EG REBOILER	P-545A/B EG PUMPS	PM-545A/B EG PUMP MOTORS	V-409 EG AFTER-FILTER	V-408 EG CHARCOAL ADSORBER	HX-103 EG EXCHANGER	V-407 EG PRE-FILTER	V-406 EG FLASH DRUM
SIZE: 60 KW MFR: CCI VOLTAGE: 480 VAC-3PH-60HZ WATT DENSITY: (LOW)	SIZE: 10" OD x 12'-0" MFR: IES DP.: ATMOSPHERIC DT.: -20/300°F CA: 0.0625" MATL.: C.S. CODE: NON-CODE	SIZE: 24" OD x 8'-0" SM x SM MFR: IES DP.: ATMOSPHERIC DT.: -20/300°F CA: 0.0625" MATL.: C.S. CODE: NON-CODE	MODEL: GA5-E1.0TEFC (1800) AC-3 MFR: ROTOR-TECH TYPE: GEAR CAPACITY: 2 GPM BHP: 0.78 SPEED: 1,800 RPM RELIEF VALVE: BUILT-IN	SIZE: 1 HP MFR: VEG SPEED: 1,800 RPM	SIZE: 6" OD x 30" OAH MFR: IES DP.: 150 PSIG DT.: -20/300°F CA: 0.0625" MATL.: C.S. CODE: ASME SECTION VIII, DIV. 1 [NON-STAMPED]	SIZE: 6" OD x 40" OAH MFR: IES DP.: 150 PSIG DT.: -20/300°F CA: 0.0625" MATL.: C.S. CODE: ASME SECTION VIII, DIV. 1 [NON-STAMPED]	SIZE: 5' x 20' x 3" MFR: GEA MODEL: FPASX20-20 TYPE: PLATE & FRAME DP.: 300 PSIG DT.: -20/350°F MATL.: STAINLESS STEEL CODE: ASME SECTION VIII, DIV. 1 [NON-STAMPED]	SIZE: 6" OD x 30" OAH MFR: IES DP.: 150 PSIG DT.: -20/300°F CA: 0.0625" MATL.: C.S. CODE: ASME SECTION VIII, DIV. 1 [NON-STAMPED]	SIZE: 12" OD x 6'-0" SM x SM MFR: IES DP.: 150 PSIG DT.: -20/200°F CA: 0.0625" MATL.: C.S. CODE:



NOTES:  
1. NO THREADED CONNECTIONS ON LIQUID SERVICE.  
SOCKET WELD OR FLANGED ACCEPTABLE

REV	DATE	REVISIONS	BY	CHKD	APP
0	01/15/14	PRELIMINARY ISSUE FOR REVIEW	S.MALM		

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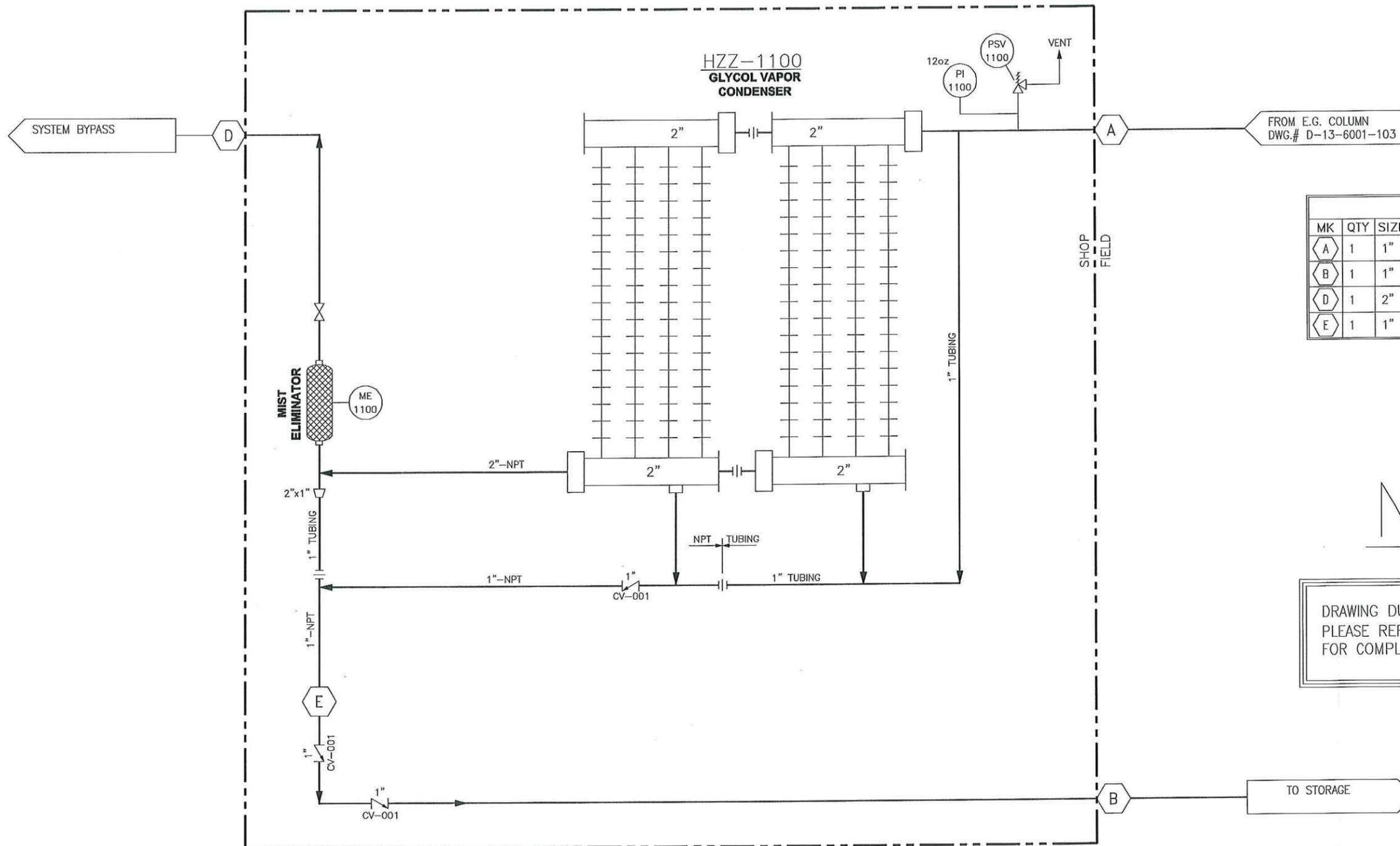
3200 SOUTHWEST FREEWAY, SUITE 2390, HOUSTON, TX 77027, USA PHONE: 1-713-481-1864

Process Flow Diagram  
Glycerol Regen Unit  
4 of 4 Rev 0



HZZ-1100  
 TYP: EXCHANGER  
 SERVICE: GLYCOL VAPOR CONDENSER

HZZ-1100  
 GLYCOL VAPOR  
 CONDENSER



LEGEND				
MK	QTY	SIZE	RATING	SERVICE
A	1	1"	NPT	VAPOR INLET FROM STILL
B	1	1"	NPT	CONDENSATE OUTLET
D	1	2"	NPT	BYPASS CONDENSER
E	1	1"	NPT	CONDENSER LIQUID OUTLET

NOTICE

DRAWING DUPLICATED FOR CUSTOMER CONVENIENCE  
 PLEASE REFER TO JATCO, INC. DWG. # 10203-B  
 FOR COMPLETE DIAGRAM

NOTES:

REV	DATE	REVISIONS	BY	CHKD	APP
A	01/30/14	DUPLICATED FOR CUSTOMER CONVENIENCE	S.MAJM		

NOTICE

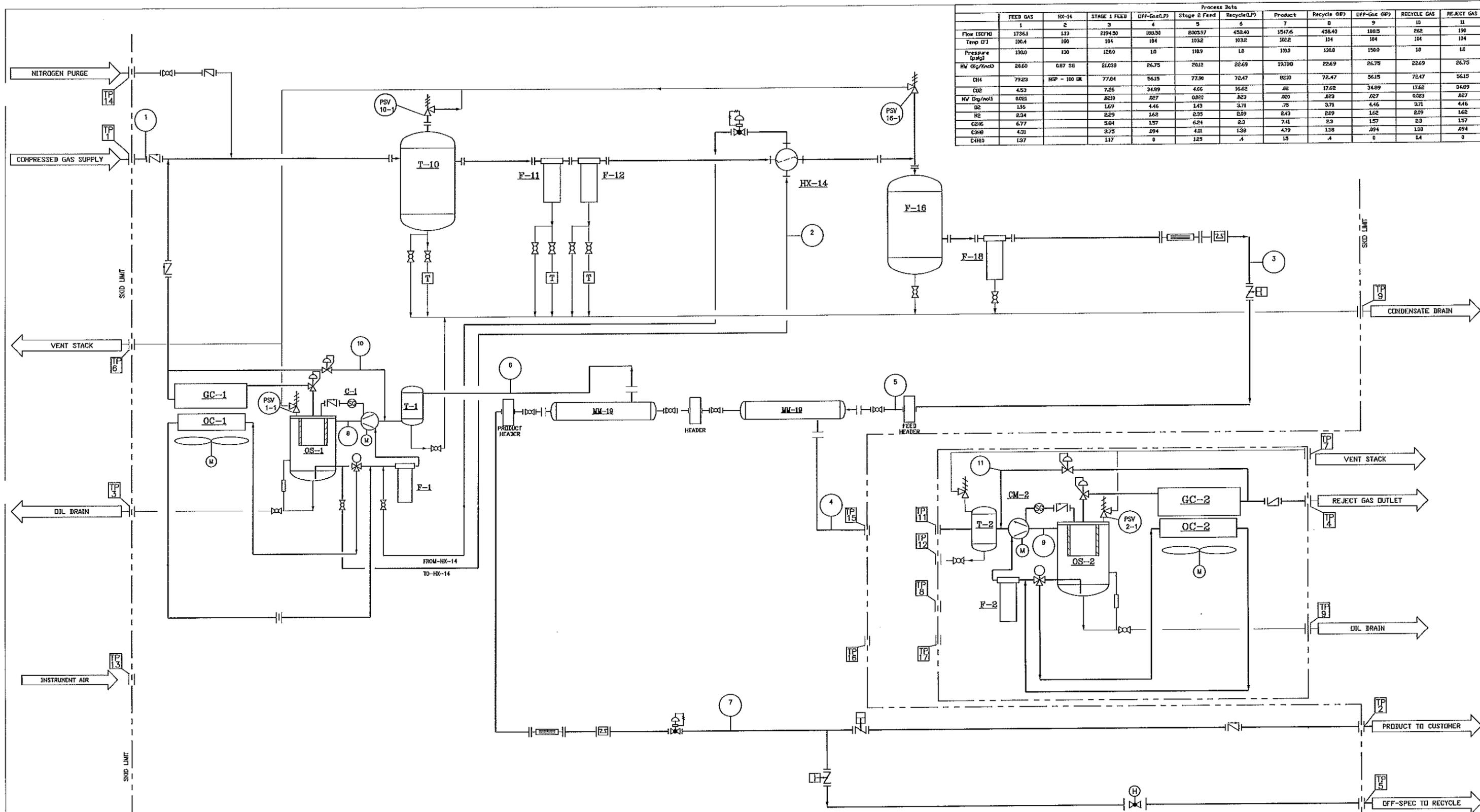
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PROJECT TITLE			
BOZCO ENGINEERING, INC CALIFORNIA PROCESS & INSTRUMENT DIAGRAM BTX ELIMINATOR SYSTEM 2			
SCALE	DRAWING NUMBER	SHT	REV
NONE	D-13-6001-103	1 OF 1	A





Process Data											
	FEED GAS	10K-14	STAGE 1 FEED	OFF-GAS(LP)	Stage 2 Feed	Recycle(LP)	Product	Recycle (OP)	OFF-Gas (OP)	RECYCLE GAS	REJECT GAS
Flow (SCFH)	1736.1	113	2194.50	188.30	2003.97	458.40	1547.6	438.40	188.5	262	190
Temp (F)	100.4	100	104	104	103.2	103.2	102.2	104	104	104	104
Pressure (psig)	1900	130	1200	10	110.9	1.0	190.0	130.0	150.0	10	10
HV Gg/Kmol	28.60	0.87 SG	21.038	26.75	20.12	22.69	19.788	22.69	26.75	22.69	26.75
CH4	79.23	NOP - 100 DR	77.84	56.15	77.90	78.47	82.10	72.47	56.15	72.47	56.15
CO2	4.53		7.26	34.89	4.66	16.62	.82	17.62	34.89	17.62	34.89
NV Drg/mol	0.021		.0210	.027	0.023	.023	.020	.023	.027	0.023	.027
H2	1.16		1.69	4.46	1.43	3.71	.75	3.71	4.46	3.71	4.46
H2	2.34		2.29	1.62	2.33	2.09	2.43	2.09	1.62	2.09	1.62
C2H6	6.77		5.64	1.57	6.24	2.3	7.41	2.3	1.57	2.3	1.57
C3H8	4.31		3.75	.794	4.21	1.38	4.79	1.38	.794	1.38	.794
C4H10	1.97		1.17	0	1.23	.4	1.5	.4	0	.4	0

TIE-IN	DESCRIPTION	CONNECTION	TIE-IN	DESCRIPTION	CONNECTION
TP8	INSTRUMENT AIR	1" 150# Flange	TP1	COMPRESSED GAS SUPPLY	4" 150# Flange
TP9	OIL DRAIN	1" 150# Flange	TP2	PRODUCT GAS TO CUSTOMER	4" 150# Flange
TP10	CONDENSATE DRAIN	1" 150# Flange	TP3	OIL DRAIN	1" 150# Flange
TP11	REJECT GAS INLET	4" 150# Flange	TP4	REJECT GAS OUTLET	1.5" 150# Flange
TP12	CONDENSATE DRAIN	1" 150# Flange	TP5	OFF-SPEC TO RECYCLE	4" 150# Flange
TP13	INSTRUMENT AIR	1" 150# Flange	TP6	VENT STACK	3" 150# Flange
TP14	NITROGEN PURGE	1" 150# Flange	TP7	VENT STACK	1.5" 150# Flange

TIE-IN	DESCRIPTION	CONNECTION
TP5	REJECT GAS	4" 150# Flange
TP6	GAS ANALYZER INLET	1/4" TUBING
TP7	GAS ANALYZER OUTLET	1/4" TUBING

**DIMENSION TOLERANCES**  
 UNLESS OTHERWISE NOTED:  
 1. FOR DIMENSIONS IN INCHES, (mm)  
 TOLERANCES: ± 1/8", (± 3mm)  
 X.X ± 0.010  
 X.XX ± 0.005  
 2. BREAK ALL SHARP CORNERS.

**WELDING PROCEDURES**  
 UNLESS OTHERWISE NOTED:  
 1. ALL WELDS ARE 3/16" CONTINUOUS FILLET WELD.

REV.	BY	COMMENTS	DATE	CHKD.	APPD.
A	PG	FOR INFORMATION			
B	UW	FOR INFORMATION	11/13/13		MS
C	UW	FOR INFORMATION	12/06/13	MS	
D	UW	FOR INFORMATION	12/12/13	MS	

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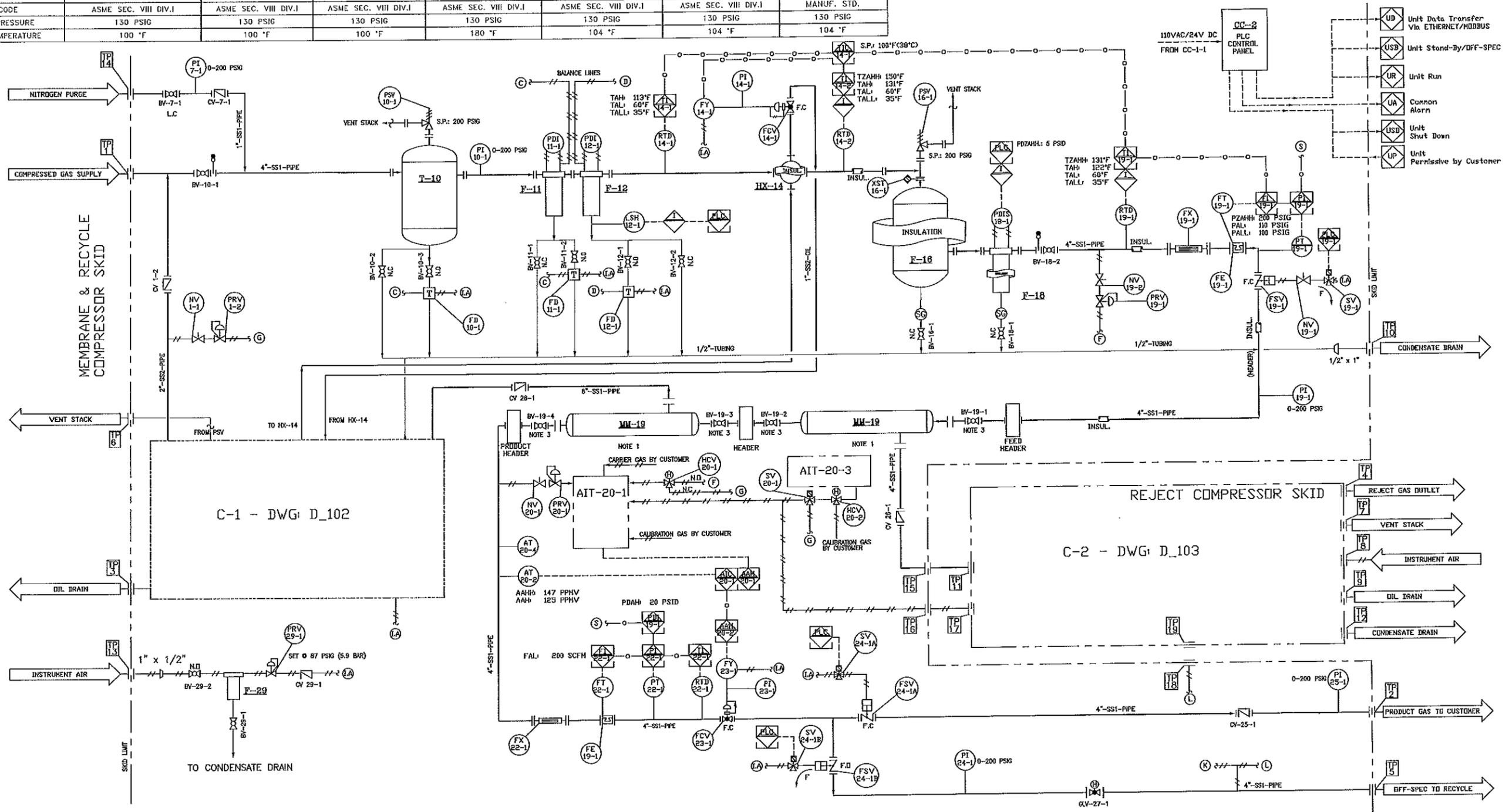
**BOZCO ENGINEERING**

**MEMBRANE BASED CO2-REMOVAL SYSTEM**  
**PROCESS FLOW DIAGRAM**

DRWN BY: UW DATE: 10-29-2013 SCALE: NTS SHEET No.: 1 OF 1  
 CHKD BY: MS DATE: 10-30-2013 PROJ. No.: CR13M0001  
 APPD BY: DATE: DWG. No.: CR13M0001-F-0101



ITEM No.	T-10	F-11	F-12	HX-14	F-16	F-18	MM-19
NAME	DEMISTER	COALESCER FILTER 1.0 MICRON	COALESCER FILTER 0.01 MICRON	HEAT EXCHANGER	CARBON FILTER VESSEL	PARTICULATE FILTER 0.01 MICRON	IGS MEMBRANE MODULE
DESIGN PRESSURE	235 PSIG	235 PSIG	235 PSIG	200 PSIG	235 PSIG	235 PSIG	200 PSIG
DESIGN TEMP. (MAX/MIN)	200/-20 °F	200/-20 °F	200/-20 °F	200/-20 °F	200/-20 °F	200/-20 °F	140/32 °F
SIZE	30" OD x 30" Seam-to-Seam Length	4"	4"	6" OD x 36" LENGTH	30" OD x 22" Seam-to-Seam Length	4"	6150 HHP-H
MATERIAL	SA516-70	SA516-70	SA516-70	304SS	SA516-70	SA516-70	SS
DESIGN CODE	ASME SEC. VIII DIV.I	ASME SEC. VIII DIV.I	ASME SEC. VIII DIV.I	ASME SEC. VIII DIV.I	ASME SEC. VIII DIV.I	ASME SEC. VIII DIV.I	MANUF. STD.
OPERATING PRESSURE	130 PSIG	130 PSIG	130 PSIG	130 PSIG	130 PSIG	130 PSIG	130 PSIG
OPERATING TEMPERATURE	100 °F	100 °F	100 °F	180 °F	104 °F	104 °F	104 °F



TIE-IN	DESCRIPTION	CONNECTION	TIE-IN	DESCRIPTION	CONNECTION	TIE-IN	DESCRIPTION	CONNECTION
TP7	GAS ANALYZER OUTLET	1/4" TUBING	TP9	OIL DRAIN	1" 150# Flange	TP1	COMPRESSED GAS SUPPLY	4" 150# Flange
TP8	T-2 BLEED-OFF INLET	1/2" TUBING	TP10	CONDENSATE DRAIN	1" 150# Flange	TP2	PRODUCT GAS TO CUSTOMER	4" 150# Flange
TP9	T-2 BLEED-OFF OUTLET	1/2" TUBING	TP11	REJECT GAS INLET	4" 150# Flange	TP3	OIL DRAIN	1" 150# Flange
			TP12	CONDENSATE DRAIN	1" 150# Flange	TP4	REJECT GAS OUTLET	1.5" 150# Flange
			TP13	INSTRUMENT AIR	1" 150# Flange	TP5	OFF-SPEC TO RECYCLE	4" 150# Flange
			TP14	NITROGEN PURGE	1" 150# Flange	TP6	VENT STACK	3" 150# Flange
			TP15	REJECT GAS	4" 150# Flange	TP7	VENT STACK	1.5" 150# Flange
			TP16	GAS ANALYZER INLET	1/4" TUBING	TP8	INSTRUMENT AIR	1" 150# Flange

- NOTES:
- QUANTITY MODULES VARIES ON DESIGN REQUIREMENT
  - SS1 -316SS - SCH.10 >= 3"
  - SS2 -316SS - SCH.40 < 3"
  - MULTIPLE BALL VALVES  
BV-19-1, BV-19-2, BV-19-3 AND BV-19-4

**DIMENSION TOLERANCES**  
 UNLESS OTHERWISE NOTED:  
 1. FOR DIMENSIONS IN INCHES, (mm)  
 TOLERANCES: ± 1/8", (± 3mm)  
 X.X ± 0.010  
 X.XX ± 0.005  
 2. BREAK ALL SHARP CORNERS.

**WELDING PROCEDURES**  
 UNLESS OTHERWISE NOTED:  
 1. ALL WELDS ARE 3/16" CONTINUOUS FILLET WELD.

REV.	BY	COMMENTS	DATE	CHKD.	APPD.
D	UW	FOR APPROVAL BY BOZCO	12/06/13	MS	
E	UW	FOR APPROVAL BY BOZCO	12/12/13	MS	
F	UW	FOR APPROVAL BY BOZCO	01/06/14	MS	
G	UW	FOR APPROVAL BY BOZCO	01/08/14	MS	
H	UW	FOR APPROVAL BY BOZCO	01/17/14	MS	

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**BOZCO ENGINEERING**

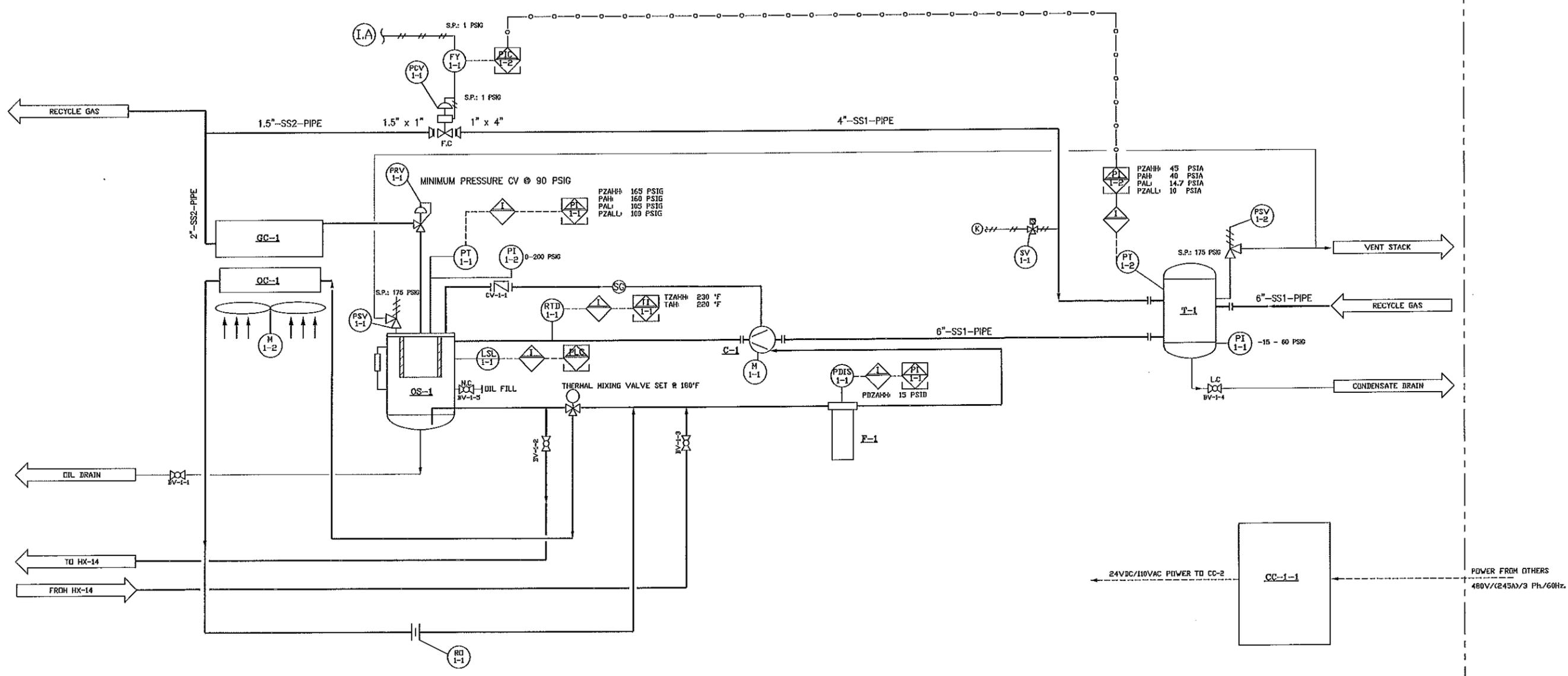
MEMBRANE BASED CO2-REMOVAL SYSTEM  
 PROCESS & INSTRUMENTATION DIAGRAM

DRWN. BY: UW DATE: 10-29-2013 SCALE: NTS SHEET No.: 1 OF 1  
 CHKD. BY: MS DATE: 10-30-2013 PROJ. No.: CR13M0001  
 APPD. BY: DATE: DWG. No.: CR13M0001-D-0101



ITEM No.	T-1	C-1	OS-1	OC/GC-1	F-1
NAME	RECIEVER TANK	ROTARY SCREW COMPRESSOR	OIL/GAS SEPERATOR	OIL/GAS COOLER	OIL FILTER
DESIGN PRESS. (MAX/MIN)	150/-5 PSIG	LEROI	250/0 PSIG	LEROI	LEROI
DESIGN TEMPERATURE	400 °F	LEROI	LEROI	LEROI	LEROI
SIZE	200 GAL, 30" OD x 72" L W/ BASE 8" L	LEROI	LEROI	LEROI	LEROI
MATERIAL	SA414-G	LEROI	LEROI	LEROI	LEROI
DESIGN CODE	ASME SEC. VIII DIV.1	LEROI	ASME SEC. VIII DIV.1	ASME SEC. VIII DIV.1	LEROI
OPERATING PRESSURE	1 PSIG	130 PSIG	130 PSIG	130 PSIG	130 PSIG
OPERATING TEMPERATURE	103.2 °F	104 °F	104 °F	104 °F	180 °F

MEMBRANE & RECYCLE  
COMPRESSOR SKID



**DIMENSION TOLERANCES**  
UNLESS OTHERWISE NOTED:  
1. FOR DIMENSIONS IN INCHES, (mm)  
TOLERANCES: ± 1/8", (± 3mm)  
X.X ± 0.010  
X.XX ± 0.005  
2. BREAK ALL SHARP CORNERS.

**WELDING PROCEDURES**  
UNLESS OTHERWISE NOTED:  
1. ALL WELDS ARE 3/16" CONTINUOUS FILLET WELD.

REFERENCE DRAWINGS

REV.	BY	COMMENTS	DATE	CHKD.	APPD.
D	UW	FOR APPROVAL BY BOZCO	12/08/13	MS	
E	UW	FOR APPROVAL BY BOZCO	12/12/13	MS	
F	UW	FOR APPROVAL BY BOZCO	01/08/14	MS	
G	UW	FOR APPROVAL BY BOZCO	01/08/14	MS	
H	UW	FOR APPROVAL BY BOZCO	01/17/14	MS	

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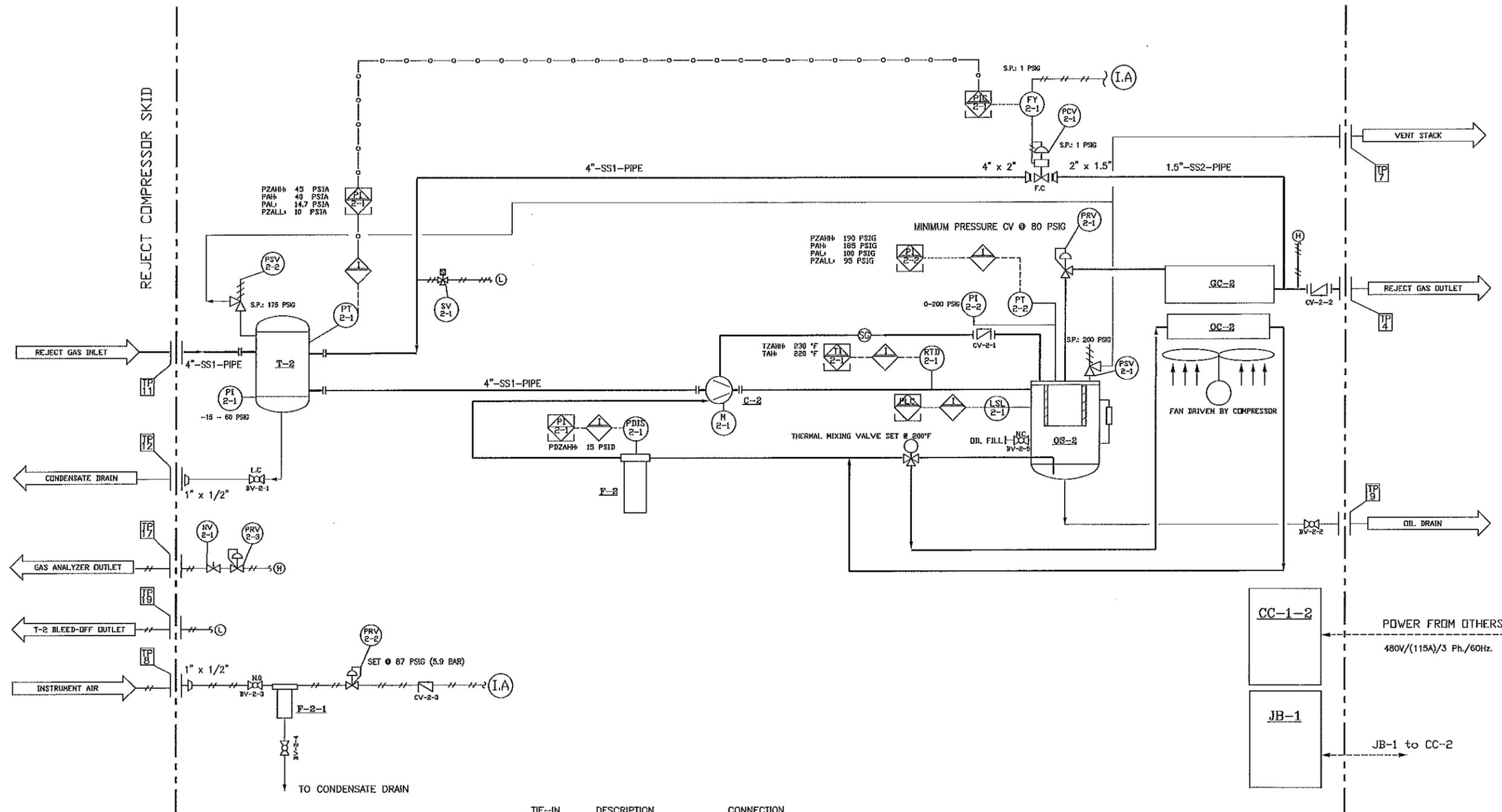
**BOZCO ENGINEERING**

RECYCLE COMPRESSOR - C - 1  
PROCESS & INSTRUMENTATION DIAGRAM

DRWN. BY: UW	DATE: 10-29-2013	SCALE: NTS	SHEET No.: 1 OF 1
CHKD. BY: MS	DATE: 10-30-2013	PROJ. No.: CR13M0001	REV.
APPD. BY:	DATE:	DWG. No.: CR13M0001-D-0102	H



ITEM No.	T-2	C-2	OS-2	OC/GC-2	F-2
NAME	RECIEVER TANK	ROTARY SCREW COMPRESSOR	OIL/GAS SEPERATOR	OIL/GAS COOLER	OIL FILTER
DESIGN PRESS. (MAX/MIN)	150/-5 PSIG	LEROI	250/0 PSIG	LEROI	LEROI
DESIGN TEMPERATURE	400 °F	LEROI	LEROI	LEROI	LEROI
SIZE	120 GAL. 24" OD x 67" L W/ BASE 8" L	LEROI	LEROI	LEROI	LEROI
MATERIAL	SA414-G	LEROI	LEROI	LEROI	LEROI
DESIGN CODE	ASME SEC. VIII DIV.I	LEROI	ASME SEC. VIII DIV.I	ASME SEC. VIII DIV.I	LEROI
OPERATING PRESSURE	1 PSIG	150 PSIG	150 PSIG	150 PSIG	150 PSIG
OPERATING TEMPERATURE	104 °F	104 °F	104 °F	104 °F	200 °F



TIE-IN	DESCRIPTION	CONNECTION
TP 4	REJECT GAS OUTLET	1.5" 150# Flange
TP 7	VENT STACK	1.5" 150# Flange
TP 8	INSTRUMENT AIR	1" 150# Flange
TP 9	OIL DRAIN	1" 150# Flange
TP 11	REJECT GAS INLET	4" 150# Flange
TP 12	CONDENSATE DRAIN	1" 150# Flange
TP 17	GAS ANALYZER OUTLET	1/4" TUBING

TIE-IN	DESCRIPTION	CONNECTION
TP 19	T-2 BLEED-OFF OUTLET	1/2" TUBING

**DIMENSION TOLERANCES**  
 UNLESS OTHERWISE NOTED:  
 1. FOR DIMENSIONS IN INCHES, (mm)  
 TOLERANCES: ± 1/8", (± 3mm)  
 X.X ± 0.010  
 X.XX ± 0.005  
 2. BREAK ALL SHARP CORNERS.

**WELDING PROCEDURES**  
 UNLESS OTHERWISE NOTED:  
 1. ALL WELDS ARE 3/16" CONTINUOUS FILLET WELD.

REV.	BY	COMMENTS	DATE	CHKD.	APPD.
D	UW	FOR APPROVAL BY BOZCO	12/06/13	MS	
E	UW	FOR APPROVAL BY BOZCO	12/12/13	MS	
F	UW	FOR APPROVAL BY BOZCO	01/06/14	MS	
G	UW	FOR APPROVAL BY BOZCO	01/08/14	MS	
H	UW	FOR APPROVAL BY BOZCO	01/17/14	MS	

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**BOZCO ENGINEERING**

REJECT COMPRESSOR - C - 2  
 PROCESS & INSTRUMENTATION DIAGRAM

DRWN. BY: UW DATE: 10-29-2013 SCALE: NTS SHEET No.: 1 OF 1  
 CHKD. BY: MS DATE: 10-30-2013 PROJ. No.: CR13M0001  
 APPD. BY: DATE: DWS. No.: CR13M0001-D-0103



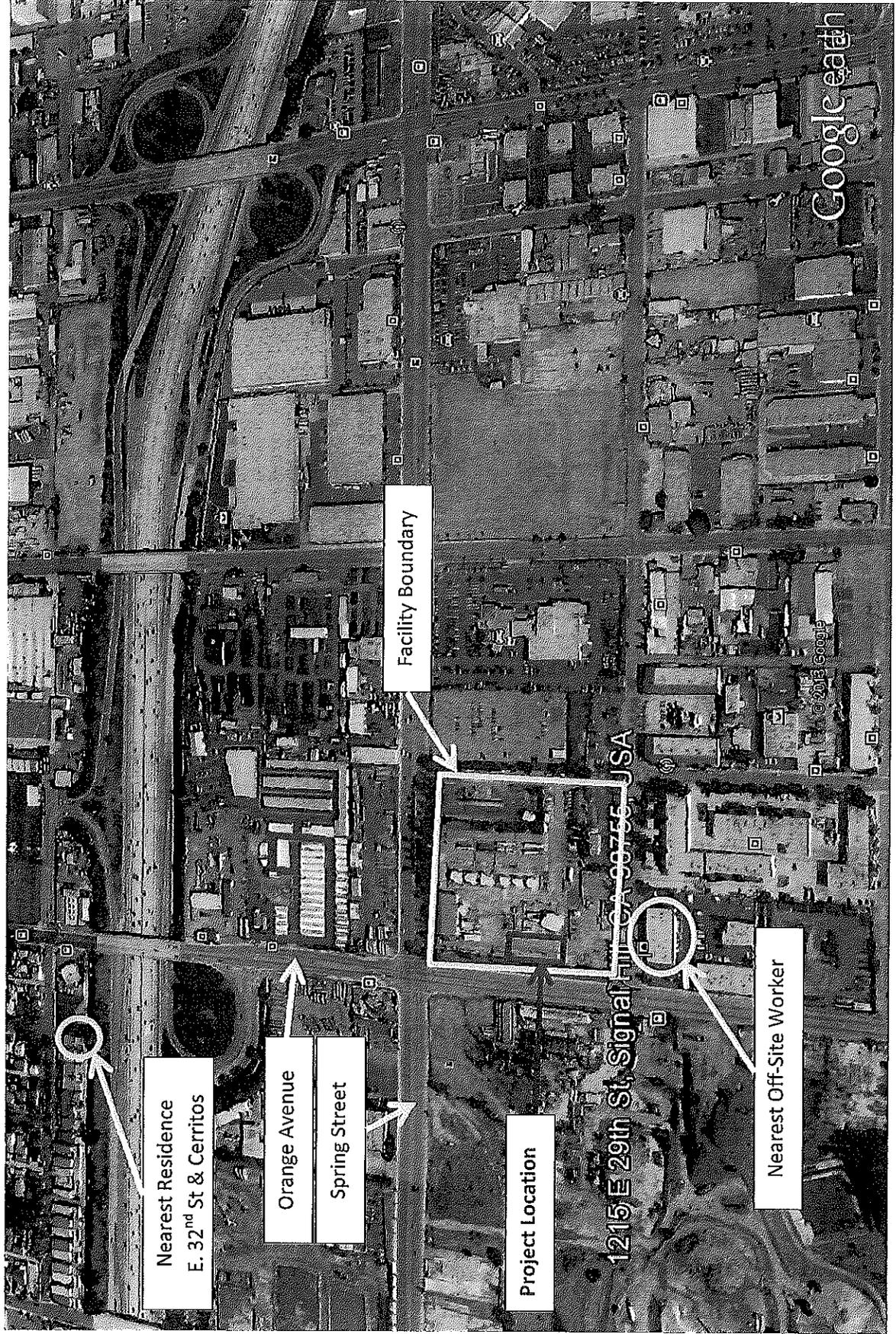
**AQMD PERMIT APPLICATION PACKAGE  
SIGNAL HILL PETROLEUM, INC. – FACILITY ID 101977  
MODIFICATIONS TO GAS PROCESSING PLANT**

**APPENDIX 8**

**Miscellaneous Supporting Data**

- Aerial Photo of Facility / Project Area
- Representative Facility Produced Gas
  - ASTM D1945 / GPA 2261 Analysis of 4/4/2013 Sample of “04-04-2013 West Unit LTS Skid In”
  - Calculated ROG/TOG Fraction for Facility Produced Gas (Based on Composition Used for Process Design)
- Rule 1173 Quarterly Monitoring Data
- Emission Factors for Fugitives (calculated based on Rule 1173 monitoring data per AQMD protocol)
- EPA 8260 (TAC) analysis of SHWU Crude Oil by Zalco Laboratories, Inc. (Lab ID 0405186-002A)
- Page from TANKS 4.09d showing calculated vapor mass fractions for TACs based on Zalco Laboratories, Inc. analysis of crude oil

**Signal Hill Petroleum, Inc. – West Unit Facility (ID 101977)  
1215 E. 29<sup>th</sup> Street, Signal Hill, CA 90755  
Gas Plant Modification Project**





Signal Hill Petroleum  
 2633 Cherry Ave  
 Signal Hill, CA 90755

Date Sampled: April 4, 2013  
 Date Reported: April 4, 2013

Attention: Sean McDaniel  
 CC:

Lab ID: 130382  
 File ID: 04-04-13 West Unit LTS Skid In.

Sample ID: West Unit  
 LTS Skid In

Pressure: psig  
 Temperature: Deg F.  
 Sample Time: 7:00 AM

**GC/TCD (ASTM D1945, GPA 2261)**

Analysis Results: (Detection Limit = 0.01)	Mole %	G/MCF	
OXYGEN	0.77		
NITROGEN	3.46		
CARBON DIOXIDE	6.03		
<b>TOTAL INERTS:</b>	<b>10.26</b>	(sum)	(sum)
METHANE	70.15		
ETHANE	6.49		
PROPANE	5.94	1.64	
iso-BUTANE	1.49	7.16	0.49
n-BUTANE	3.59		1.14
iso-PENTANE	1.04	2.08	0.38
n-PENTANE	0.76		0.28
HEXANE+	0.28		0.12
<b>Total:</b>	<b>100.00</b>		

<b>Specific Gravity*</b>	0.835	<b>Dew Point:</b>	Deg F.
<b>Hydrogen Sulfide:</b>	ppm (vol)	<b>Water Content:</b>	lbs/MMCF
<b>Mercaptan Sulfur:</b>	ppm (vol)		
<b>Gross BTU/ft<sup>3</sup></b>	1224 (dry gas)	<b>HHV:</b>	1224
	1202 (water vapor saturated)	<b>LHV:</b>	1112

Reviewed By:  
  
 Justin Stepanjan

# Composition of Produced Gas at Plant Inlet

## Signal Hill Petroleum, Inc. - West Unit Facility (ID 101977)

### Gas Plant Modification Project

Component	Mole % <sup>a</sup>	MW	Mole % x MW	Weight %
Oxygen	0.50%	32.00	0.16	0.61%
Nitrogen	0.60%	28.01	0.17	0.64%
Carbon Dioxide	4.80%	44.01	2.11	8.06%
Methane	68.20%	16.04	10.94	41.73%
Ethane	6.90%	30.07	2.07	7.91%
Propane	7.40%	44.10	3.26	12.45%
iso-Butane	1.80%	58.12	1.05	3.99%
n-Butane	4.50%	58.12	2.62	9.98%
iso-Pentane	1.50%	72.15	1.08	4.13%
n-Pentane	1.40%	72.15	1.01	3.85%
Hexane+	1.90%	86.18	1.64	6.24%
Water	0.60%	18.02	0.11	0.41%
Total	100.10%		26.22	100.00%

VOC Weight% = 40.64%  
ROG/TOG Wt. Fraction = 0.4501

<sup>a</sup> "Worst Case" composition used for design purposes. Analysis of "04-04-13 West Unit LTS Skid In" sample shows only 29.40 wt% VOC.

# Rule 1173 Monitoring Data Signal Hill Petroleum, Inc. - West Unit Facility (ID 101977) Gas Plant Modification Project

Total Components Leaking > or = 10,000 ppmv:	1Q2012		2Q2012		3Q2012		4Q2012		1Q2013		2Q2013		3Q2013		4Q2013	
	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Compr Seals - Gas / Lt Liq																
Compr Seals - Lt Crude																
Compr Seals - Hvy Crude																
Connectors - Gas / Lt Liq																
Connectors - Lt Crude																
Connectors - Hvy Crude																
Flanges - Gas / Lt Liq																
Flanges - Lt Crude																
Flanges - Hvy Crude																
Other - Gas / Lt Liq																
Other - Lt Crude																
Other - Hvy Crude																
PRDs - Gas / Lt Liq																
PRDs - Lt Crude																
PRDs - Hvy Crude																
Pump Seals - Gas / Lt Liq																
Pump Seals - Lt Crude																
Pump Seals - Hvy Crude																
Valves - Gas / Lt Liq																
Valves - Lt Crude																
Valves - Hvy Crude																

Total Components Not Leaking or Leaking < 10,000 ppmv:	1Q2012		2Q2012		3Q2012		4Q2012		1Q2013		2Q2013		3Q2013		4Q2013	
	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Compr Seals - Gas / Lt Liq																
Compr Seals - Lt Crude																
Compr Seals - Hvy Crude																
Connectors - Gas / Lt Liq																
Connectors - Lt Crude																
Connectors - Hvy Crude																
Flanges - Gas / Lt Liq																
Flanges - Lt Crude																
Flanges - Hvy Crude																
Other - Gas / Lt Liq																
Other - Lt Crude																
Other - Hvy Crude																
PRDs - Gas / Lt Liq																
PRDs - Lt Crude																
PRDs - Hvy Crude																
Pump Seals - Gas / Lt Liq																
Pump Seals - Lt Crude																
Pump Seals - Hvy Crude																
Valves - Gas / Lt Liq																
Valves - Lt Crude																
Valves - Hvy Crude																

**CAPCOA Screening Value Range Emission Factors - Oil and Gas Production Components Leaking > or = 10,000 ppmv (lbs THC / hr / source)**

3.00E-01	Compr Seals - Gas / Lt Liq
1.80E-02	Compr Seals - Lt Crude
	Compr Seals - Hvy Crude
5.70E-02	Connectors - Gas / Lt Liq
5.10E-02	Connectors - Lt Crude
	Connectors - Hvy Crude
1.30E-01	Flanges - Gas / Lt Liq
5.70E-01	Flanges - Lt Crude
	Flanges - Hvy Crude
3.00E-01	Other - Gas / Lt Liq
1.60E-02	Other - Lt Crude
	Other - Hvy Crude
3.00E-01	PRDs - Gas / Lt Liq
1.60E-02	PRDs - Lt Crude
	PRDs - Hvy Crude
2.00E-01	Pump Seals - Gas / Lt Liq
2.00E-01	Pump Seals - Lt Crude
	Pump Seals - Hvy Crude
3.00E-01	Valves - Gas / Lt Liq
1.60E-01	Valves - Lt Crude
	Valves - Hvy Crude

**CAPCOA Screening Value Range Emission Factors - Oil and Gas Production Components Not Leaking or Leaking < 10,000 ppmv (lbs THC / hr / source)**

3.20E-04	Compr Seals - Gas / Lt Liq
2.90E-04	Compr Seals - Lt Crude
1.30E-04	Compr Seals - Hvy Crude
2.60E-05	Connectors - Gas / Lt Liq
2.20E-05	Connectors - Lt Crude
1.80E-05	Connectors - Hvy Crude
6.20E-05	Flanges - Gas / Lt Liq
5.30E-05	Flanges - Lt Crude
5.10E-05	Flanges - Hvy Crude
3.20E-04	Other - Gas / Lt Liq
2.90E-04	Other - Lt Crude
1.30E-04	Other - Hvy Crude
3.20E-04	PRDs - Gas / Lt Liq
2.90E-04	PRDs - Lt Crude
1.30E-04	PRDs - Hvy Crude
2.20E-03	Pump Seals - Gas / Lt Liq
5.80E-04	Pump Seals - Lt Crude
	Pump Seals - Hvy Crude
7.70E-05	Valves - Gas / Lt Liq
4.20E-05	Valves - Lt Crude
3.10E-05	Valves - Hvy Crude

# Site Specific Emission Factors for Fugitive Emissions Signal Hill Petroleum, Inc. - West Unit Facility (ID 101977) Gas Plant Modification Project

	1Q2012	2Q2012	3Q2012	4Q2012	1Q2013	2Q2013	3Q2013	4Q2013	lbs THC / hr / source Avg	lbs THC / hr / source Max	lbs THC / day / source Avg	lbs THC / day / source Max	lbs THC / yr / source Avg	lbs THC / yr / source Max
<b>Weighted Average Quarterly Emission Factors (lbs TOG / hr / source)</b> (includes the 1.2 multiplier)														
Compr Seals - Gas / Lt Lq	3.84E-04	3.84E-04	0.00922	0.00922	3.364	3.364								
Compr Seals - Lt Crude														
Connectors - Hwy Crude	5.48E-05	3.12E-05	3.41E-05	6.48E-05	0.00082	0.00131	0.299	0.460						
Connectors - Lt Crude	7.44E-05	7.44E-05	0.00179	0.00179	0.652	0.652								
Flanges - Gas / Lt Lq	3.84E-04	1.44E-03	3.84E-04	3.84E-04	3.84E-04	3.84E-04	3.84E-04	3.84E-04	7.81E-04	1.44E-03	0.01874	0.03460	6.836	12.629
Flanges - Hwy Crude														
Other - Gas / Lt Lq	3.84E-04	3.84E-04	0.00922	0.00922	3.364	3.364								
Other - Hwy Crude														
PRDs - Gas / Lt Lq	2.64E-03	2.64E-03	0.06336	0.06336	23.126	23.126								
PRDs - Lt Crude														
Pump Seals - Hwy Crude	9.24E-05	4.44E-04	1.03E-03	0.01066	0.02474	3.892	9.031							
Pump Seals - Lt Crude														
Valves - Gas / Lt Lq														
Valves - Lt Crude														

	1Q2012	2Q2012	3Q2012	4Q2012	1Q2013	2Q2013	3Q2013	4Q2013	lbs VOC / hr / source Avg	lbs VOC / hr / source Max	lbs VOC / day / source Avg	lbs VOC / day / source Max	lbs VOC / yr / source Avg	lbs VOC / yr / source Max
<b>Weighted Avg Qtrly Emission Factors (lbs VOC / hr / source), assuming ROG/TOG fraction = 0.4501</b> (includes the 1.2 multiplier)														
Compr Seals - Gas / Lt Lq	1.73E-04	1.73E-04	0.004148	4.15E-03	1.514	1.51E+00								
Compr Seals - Lt Crude														
Connectors - Hwy Crude	2.47E-05	1.40E-05	1.54E-05	2.47E-05	0.000369	5.92E-04	0.135	2.16E-01						
Connectors - Lt Crude														
Flanges - Gas / Lt Lq	3.35E-05	3.35E-05	0.000804	8.04E-04	0.293	2.93E-01								
Flanges - Hwy Crude														
Other - Gas / Lt Lq	1.73E-04	6.49E-04	1.73E-04	1.73E-04	6.49E-04	1.73E-04	1.73E-04	1.73E-04	3.81E-04	6.49E-04	0.008433	1.56E-02	3.078	5.66E+00
Other - Hwy Crude														
PRDs - Gas / Lt Lq	1.73E-04	1.73E-04	0.004148	4.15E-03	1.514	1.51E+00								
PRDs - Lt Crude														
Pump Seals - Hwy Crude	1.19E-03	1.19E-03	0.028520	2.85E-02	10.410	1.04E+01								
Pump Seals - Lt Crude														
Valves - Gas / Lt Lq	4.16E-05	2.00E-04	4.64E-04	0.004800	1.11E-02	1.762	4.06E+00							
Valves - Lt Crude														

Weighted Average Quarterly Emission Factors (lbs TOG / hr / source):  
= 1.2 x [ (No. of Components Leaking in Qtr x Leaking EF) + (No. of Components Not Leaking in Qtr x Non-Leaking EF) ] / [ Total Components Inspected in Qtr ]  
Weighted Avg Qtrly Emission Factors (lbs VOC / hr / source):  
= [ Weighted Average Quarterly Emission Factor (lbs TOG / hr / source) ] x [ ROG / TOG Fraction ]

**ZALCO LABORATORIES, INC.**

Analytical and Consulting Services

4309 Armour Avenue  
Bakersfield, California 93308(661) 395-0539  
FAX (661) 395-3069**CLIENT:** Signal Hill Petroleum**Lab Order:** 0405186**Project:****Client Sample ID:** West Unit**Report Comment:** (A-54, A-58, B-80, B-81, C-18, DW-7)**Report Date:** 5/27/04**Lab ID:** 0405186-002A**Collection Date:** 5/13/04 9:00:00 AM**Matrix:** OIL

Analyses	Method	Result	Units	DLR	Date Analyzed	Qual.
<b>VOLATILE ORGANIC COMPOUNDS, EPA 8260</b>						
1,2,4-Trimethylbenzene	SW8260B	820	mg/Kg	50	5/21/04	
Benzene	SW8260B	330	mg/Kg	50	5/21/04	
Cyclohexane	SW8260B	960	mg/Kg	50	5/21/04	
Ethylbenzene	SW8260B	420	mg/Kg	50	5/21/04	
Iso-octane	SW8260B	ND	mg/Kg	50	5/21/04	
Isopropylbenzene	SW8260B	150	mg/Kg	50	5/21/04	
m,p-Xylene	SW8260B	710	mg/Kg	50	5/21/04	
n-Hexane	SW8260B	1500	mg/Kg	50	5/21/04	
o-Xylene	SW8260B	630	mg/Kg	50	5/21/04	
Toluene	SW8260B	580	mg/Kg	50	5/21/04	
Xylenes, Total	SW8260B	1340	mg/Kg		5/21/04	

Used for  
input to  
TANKS to  
calculate  
vapor mass  
fractions.

**Qualifiers /  
Abbreviations:**ND - Not Detected at the Reporting Limit  
J - Analyte detected below quantitation limits  
B - Analyte detected in the associated Method Blank  
\* - Value exceeds Maximum Contaminant Level  
H - Hold Time ExceededS - Spike Recovery outside accepted recovery limits  
R - RPD outside accepted recovery limits  
E - Value above quantitation range  
DLR: Detection Limit for Reporting  
NSS - Non-Sufficient Sample Amount

## TANKS 4.0.9d Emissions Report - Detail Format Liquid Contents of Storage Tank

**SHWUT1 - Vertical Fixed Roof Tank**  
Long Beach, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F)		Liquid Bulk Temp (deg F)	Vapor Pressure (psia)			Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg.	Min.		Max.	Avg.	Min.					
SHWU Crude	Dec	61.78	56.83	64.33	1.3536	1.1993	1.5241	48.8500	0.0008	0.0001	207.00	Option 2: A=7.04983, B=1573.267, C=208.58
1,2,4-Trimethylbenzene					0.0219	0.0180	0.0266	120.1900	0.0003	0.0013	78.11	Option 2: A=6.905, B=1211.033, C=220.78
Benzene					1.2262	1.0688	1.4023	78.1100	0.0010	0.0038	84.16	Option 2: A=6.841, B=1201.53, C=222.65
Cyclohexane					1.2705	1.1110	1.4485	84.1600	0.0004	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Ethylbenzene					0.1154	0.0971	0.1365	106.1700	0.0015	0.0084	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Hexane (n)					2.0030	1.7608	2.2718	86.1700	0.0002	0.0000	120.20	Option 2: A=6.93666, B=1460.793, C=207.78
Isopropyl benzene					0.0514	0.0427	0.0616	120.2000	0.0006	0.0006	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Toluene					0.3487	0.2989	0.4054	92.1300	0.8839	0.9842	208.50	Option 2: A=7.009, B=1462.266, C=215.11
Unidentified Components					1.3595	1.3551	1.3578	48.5151	0.0073	0.0004	106.17	
Xylenes (mixed isomers)					0.0861	0.0808	0.1140	106.1700				

TANKS  
Output

Input based on Zabo analysis  
of SHWU crude dated 5-13-04  
(Lab ID 0405186-002A)

Appendix C  
Commitment Letter from  
City of Long Beach  
Gas & Oil Department  
(September 2014)





September 18, 2014

Sean McDaniel  
Vice President Production Operations  
Signal Hill Petroleum  
2633 Cherry Avenue  
Signal Hill, CA 90755

RE: Air Quality Management District

Dear Sean:

This letter confirms that the City of Long Beach (City) through its Department of Gas and Oil intends to enter into a Natural Gas Delivery Agreement for Locally Produced Gas (Agreement) with Signal Hill Petroleum (SHP) for the delivery and purchase of locally produced natural gas processed by SHP to supply a portion of the City's gas requirements.

Under the Agreement, the City will purchase all locally produced gas delivered to City by SHP and such locally produced gas will displace an equivalent volume of far away gas delivered to the City.

We look forward to working with you. Please feel free to contact me with any questions.

Sincerely,

A handwritten signature in blue ink that reads "Tony Foster". The signature is fluid and cursive, with the first name "Tony" being more prominent than the last name "Foster".

Tony Foster  
Gas Supply Officer  
Long Beach Gas and Oil

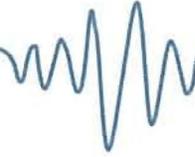


Appendix D  
Sound Level Survey  
(February 2012)



# **Behrens and Associates, Inc.**

*Acoustics, Noise and Vibration Consultants*



February 23, 2012

Signal Hill Petroleum, Inc.  
2633 Cherry Ave.  
Signal Hill, CA 90755

Attention: Keith Kerr

Subject: Signal Hill Sound Level Survey

Dear Mr. Kerr,

As requested, we have completed the sound level survey of the West Unit Gas Plant located in Signal Hill, California. The noise measurements were obtained in order to generate a current sound level analysis of the gas plant operation.

## **Measurement Instrumentation**

A Bruel & Kjaer Type 1 2250Light model Sound Level Analyzer was programmed to continuously measure and calculate 15-minute average ( $L_{eq}$ ) and hourly average ( $L_{eq}$ ) sound levels. The meter was calibrated prior deployment.

## **Results of Noise Measurements**

The continuous sound surveys were conducted from February 9, 2012 through February 12, 2012 at Location 2 and from February 20 through February 22, 2012 at Location 1. The sound level meter was placed at the westerly property line for location 1 and at the southwest fence for location 2 as shown in Figure 1. The sound level data selected for the 24 hour survey for Location 1 was from 12:00 am on Tuesday, February 21, 2012 through 12:00 am on Wednesday, February 22, 2012 and from 12:00 am on Friday, February 10, 2012 through Saturday 11, 2012 for Location 2. The data displays the results for 15 minute average sound levels(15 minute  $L_{Aeq}$ ) and hourly average sound levels(hourly  $L_{Aeq}$ ) as shown in "Attachment A" for location 1 and "Attachment B" for location 2. The weather reports for two measurement days were also attached as "Attachment C".

Very truly yours,

Carol Colby  
Acoustical Consultant

# Behrens and Associates, Inc.

Acoustics, Noise and Vibration Consultants

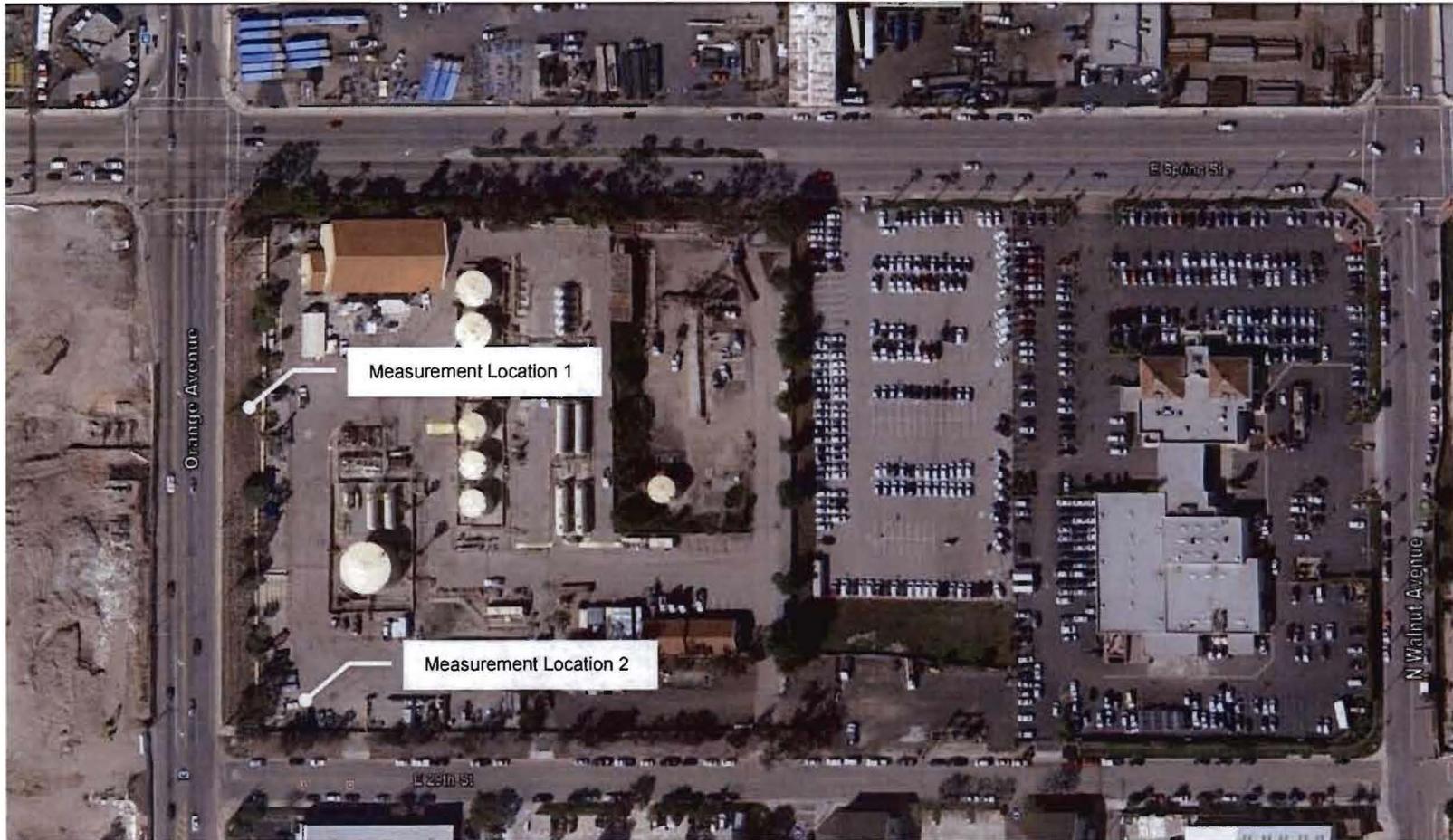
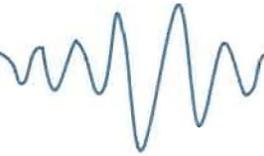
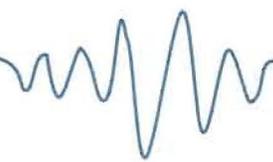


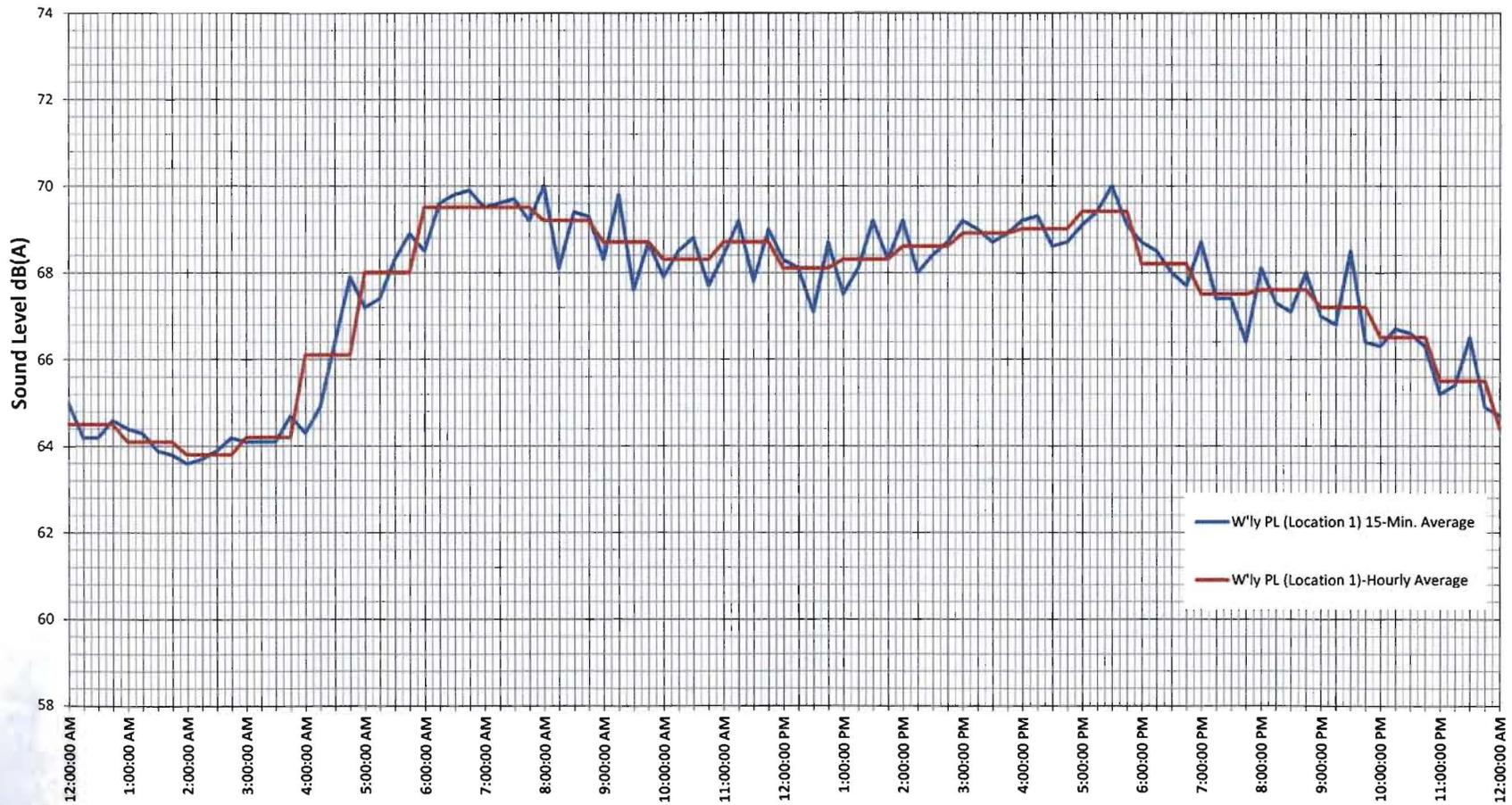
Figure 1 – Sound Level Survey Measurement Locations

# Behrens and Associates, Inc.

Acoustics, Noise and Vibration Consultants

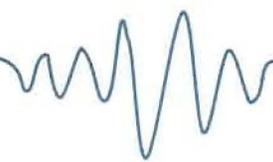


## Signal Hill Petroleum West Unit Gas Plant , Signal Hill, CA Westerly Property Line (Location 1) 15 Minute & 1-hour Average Sound Levels

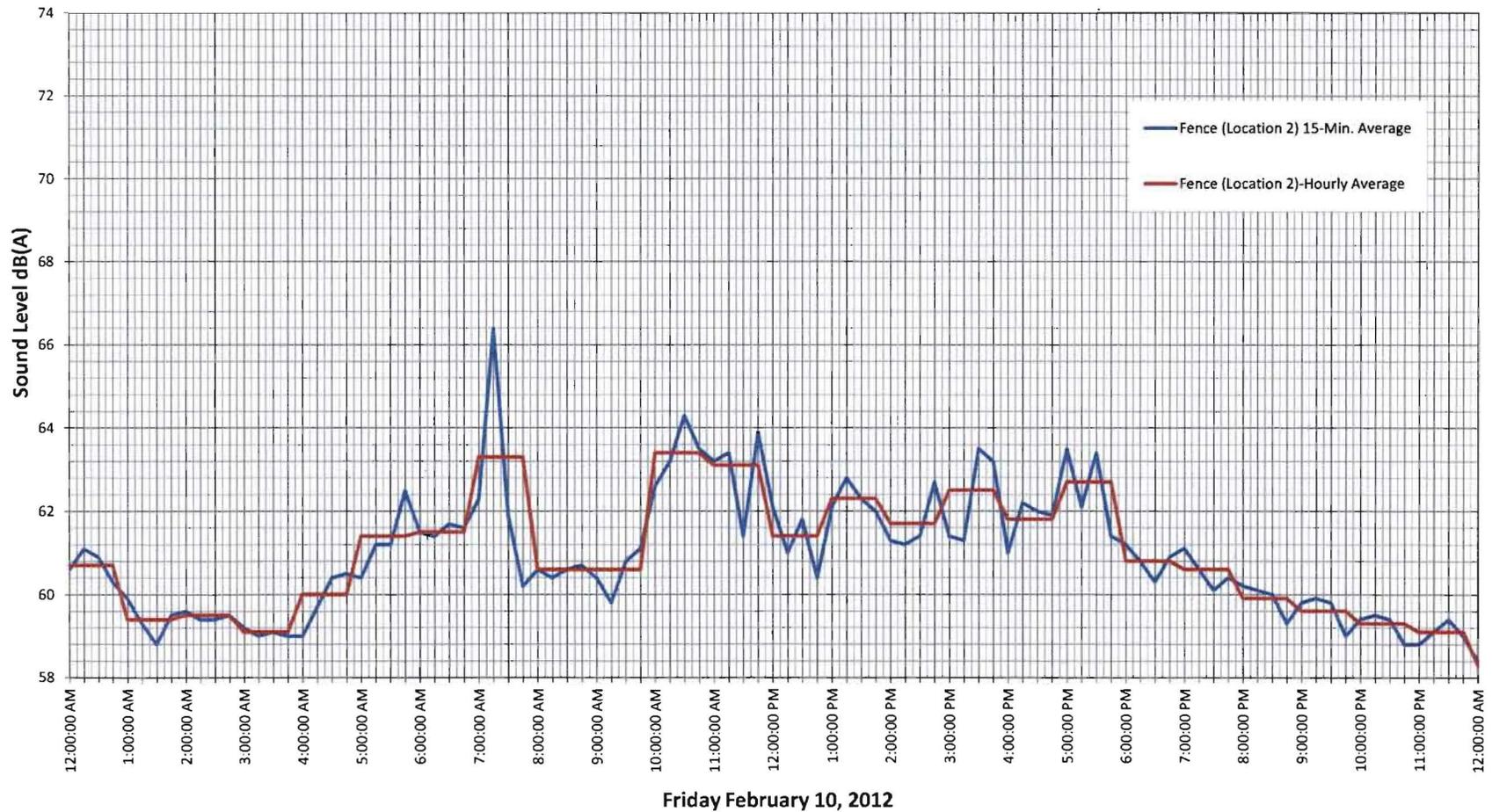


Tuesday February 21, 2012

Attachment A

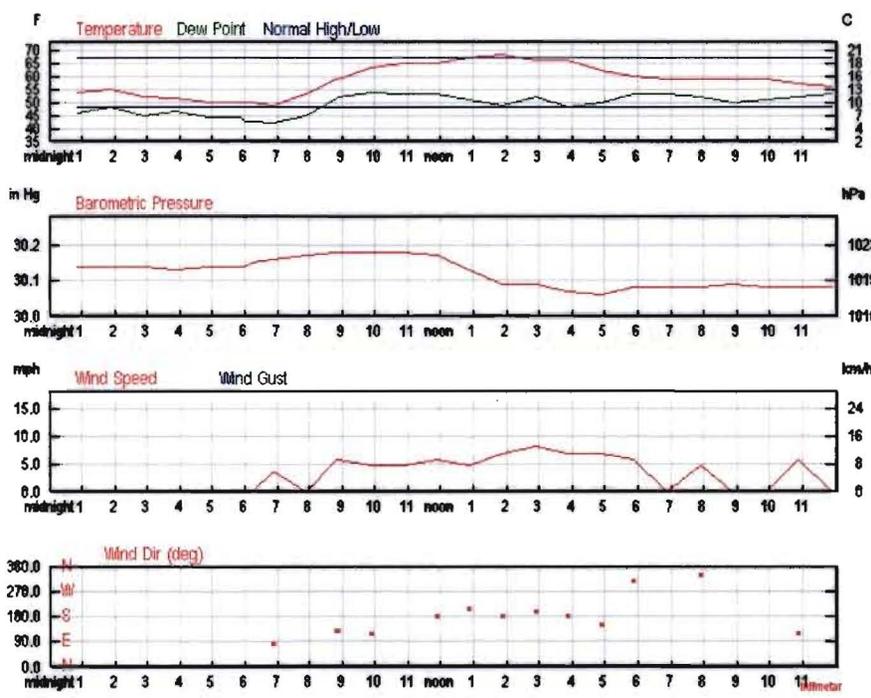


**Signal Hill Petroleum West Unit Gas Plant , Signal Hill, CA  
Southwest Fence (Location 2) 15 Minute & 1-hour Average Sound Levels**

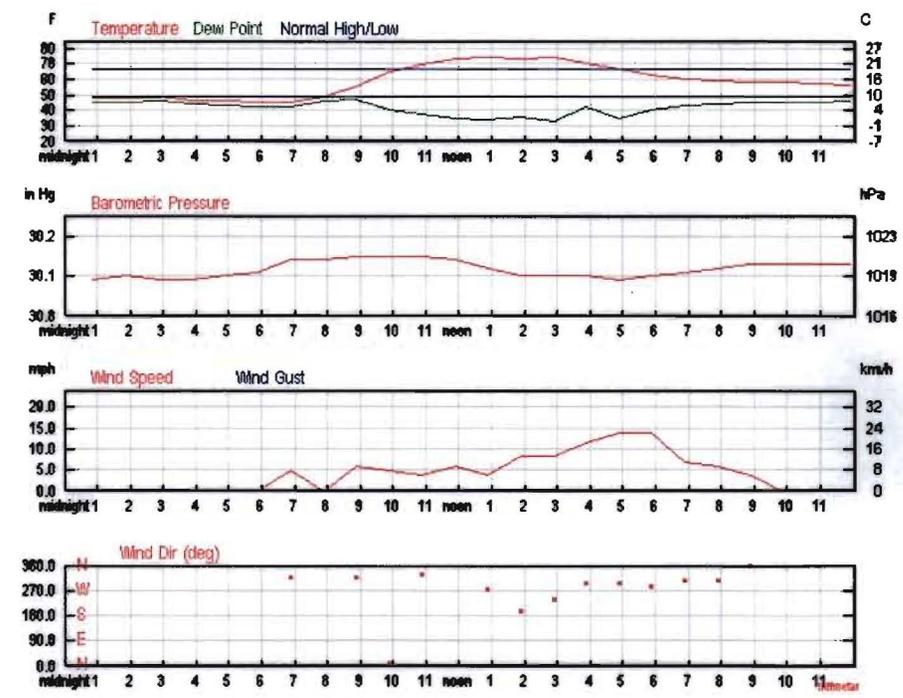


# Behrens and Associates, Inc.

Acoustics, Noise and Vibration Consultants



February 10, 2012



February 21, 2012

From [www.wunderground.com](http://www.wunderground.com)