

**UPDATE TO
DEVELOPMENT AND PRODUCTION PLAN AND
ENVIRONMENTAL REPORT
WELL STIMULATION: HYDRAULIC FRACTURING**

**PLATFORM GILDA
OFFSHORE VENTURA COUNTY**

Project No. 2502-2681

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LIST OF ACRONYMS

AOA	Aquaculture Opportunity Area
APCD	Air Pollution Control District
ATC	Authority to Construct
BACT	Best Available Control Technology
BIA	Biologically Important Area
BOEM	Bureau of Ocean Energy Management
BOP	Blowout Preventer
bbf	Barrel
bpm	Barrels per minute
CAAQS	California Ambient Air Quality Standards
CalEEMod	California Emissions Estimator Model
CARB	California Air Resources Control Board
CCA	California Coastal Act
CCAA	California Clean Air Act
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CDPH	California Department of Public Health
CESA	California Endangered Species Act
CFR	Code of Federal Regulation
CH ₄	Methane
CHC	Commercial Harbor Craft
CINMS	Channel Islands National Marine Sanctuary
CMP	Coastal Management Program
CO	Carbon monoxide
CO ₂	Carbon dioxide
CO ₂ E	Carbon dioxide equivalents
CPFV	Commercial Passenger Fishing Vessel
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
DFIT	Diagnostic Fracture Injection Test
DPM	Diesel particulate matter
DPP	Development and Production Plan
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
ESHA	Environmentally Sensitive Habitat Area
FCAA	Federal Clean Air Act
FMP	Fishery Management Plan

FR	Federal Register
GHG	Greenhouse Gas
GLEEM	Greenhouse Gas Lifecycle Energy Emissions Model
H ₂ S	Hydrogen sulfide
HAPC	Habitat Area of Particular Concern
HAZWOPER	Hazardous Waste Operations and Emergency Response
HHP	Hydraulic horsepower
IMT	Incident Management Team
IPCC	Intergovernmental Panel on Climate Change
JOFLO	Joint Oil Fisheries Liaison Office
kV	Kilovolt
kW / kWh	Kilowatt / Kilowatt-hour
kWh	Kilowatt-hour
LACT	Lease Automatic Custody Transfer
MD	Measured depth
MFDE	Marine Fisheries Data Explorer
mg/L	Milligrams per liter
MMPA	Marine Mammal Protection Act
MarketSim	Market Simulation Model
MTCO ₂ E	Metric Tons of Carbon Dioxide Equivalent
MMS	Minerals Management Service
MMscf	Million standard cubic feet
MSDS	Material Safety Data Sheet
MT	Metric ton
MW	Megawatt
MWh	Megawatt hour
N ₂ O	Nitrous oxide
NAAQS	National Ambient Air Quality Standards
NESHAPS	National Emission Standards for Hazardous Air Pollutants
NEPA	National Environmental Policy Act
nm	Nautical miles
NMFS	National Marine Fisheries Service
NMS	National Marine Sanctuary
NMSA	National Marine Sanctuaries Act
NO	Nitric oxide
NO ₂	Nitrogen dioxide
NO ₃	Nitrate
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service

NSPS	New Source Performance Standards
NSR	New Source Review
NWS	National Weather Service
O ₃	Ozone
OCS	Outer Continental Shelf
O&M	Operations & Maintenance
OSRO	On-site Spill Response Organization
OSRP	Oil Spill Response Plan
PERP	California Statewide Portable Engine Registration Program
PFMC	Pacific Fishery Management Council
pH	Potential of hydrogen (acidity/alkalinity)
PM	Particulate matter
PM ₁₀	Particulate matter with a diameter of 10 microns or less
PM _{2.5}	Particulate matter with a diameter of 2.5 microns or less
ppb	Parts per billion
ppm	Parts per million
PTC	Permit to Construct
PTO	Permit to Operate
ROG	Reactive Organic Compounds
ROV	Remote Operated Vehicle
SBPA	Santa Barbara Port Area
SCAQMD	South Coast Air Quality Management District
SCB	Southern California Bight
SCCAB	South Central Coast Air Basin
SCCWRP	Southern California Coastal Water Research Project
SCEDC	Southern California Earthquake Data Center
SEMS	Safety and Environmental Management System
SIP	State Implementation Plan
SMCA	State Marine Conservation Area
SMR	State Marine Reserve
SO ₂	Sulfur Dioxide
TAC	Toxic Air Contaminant
TSS	Traffic Separation Scheme
TVD	Total Vertical Depth
USCG	U.S. Coast Guard
USGS	U.S. Geological Survey
µg/m ³	Micrograms per Cubic Meter
VCAPCD	Ventura County Air Pollution Control District
WET	Whole-effluent toxicity

1.0 INTRODUCTION

1.1 PROGRAM TITLE

Platform Gilda Well Stimulation (Hydraulic Fracturing) Program

1.2 PROGRAM APPLICANT'S NAME AND ADDRESS

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1.3 PURPOSE AND NEED

The update to the Platform Gilda Development and Production Plan (DPP) is to incorporate the proposed Program with the purpose of performing well stimulation activities, specifically hydraulic fracturing, of 16 wells on Platform Gilda (OCS P-0216).

The Program is needed to maintain Platform Gilda's offshore production levels to support the national interest in reducing dependence on foreign energy sources, efficiently increasing domestic production and conserving resources in accordance with Executive Orders (EO) 14154 and EO 14156.

1.4 BACKGROUND

Platform Gilda (OCS P-0216) is located on the Pacific Outer Continental Shelf (OCS), approximately nine miles southwest of Ventura, California in the Santa Barbara Channel, and lies within the Santa Clara Unit of federal OCS leases (Figure 1.4-1). The Platform was installed in 1981 in approximately 205 feet of water and has operated continuously since its installation. The original DPP and Environmental Report were prepared by Union Oil Company of California in November 1979 and approved by the U.S. Geological Survey in December 1980. An update to the DPP was submitted in October 1985 and approved in July 1986. A list of past DPPs and Environmental Reports are detailed in Table 1.4-1.

Table 1.4-1. Previous DPPs and Environmental Reports for Platform Gilda

Document Title	Date Prepared	Date Approved
Santa Clara Unit OCS P-0216 – Amended Plan of Development (original DPP)	November 1979	December 18, 1980
Santa Clara Unit OCS P-0216 – DPP Environmental Report	November 1979	December 18, 1980
Santa Clara Unit OCS P-0216 – Update to Plan of Development	October 1985	July 29, 1986

Figure 1.4-1. Platform Gilda Location



These earlier documents supported the development and production of multiple geologic formations, including the Pico, Repetto, and Monterey Formations. This updated DPP and Environmental Report builds upon the existing documents (Unocal, 1979 and 1985) and incorporates new well stimulation activities, specifically hydraulic fracturing of 16 existing wells, designed to increase reservoir permeability in order to optimize hydrocarbon recovery. This updated DPP and Environmental Report is meant to be read in conjunction with the previously approved 1979 and 1985 DPP documents (Unocal, 1979 and 1985).

Previous DPPs were prepared by Union Oil Company of California (also known as Unocal Corporation). The 1979 DPP provided the requirements to develop the Repetto and Monterey formations on Lease OCS P-0216. Key components of the 1979 DPP included the installation of Platform Gilda, initial drilling design, reservoir evaluations and production systems, and a description of the pipelines and onshore facilities. In 1985, Unocal updated the DPP for Platform Gilda to expand the focus of reservoir development to the Lower Repetto and Monterey Formation and planned to fully utilize all 96 well conductor slots on the Platform (Unocal, 1985).

1.5 REGULATORY REQUIREMENTS

The updated DPP and Environmental Report follow regulatory requirements pursuant to the Bureau of Ocean Energy Management (BOEM) Post-Approval Requirements of a DPP under 30 CFR 550.250(a), 550.283(a), and 550.285(b). Table 1.5-1 provides a summary of the new information required to review and approve the DPP, as applicable, and where to find the details within the DPP. In addition, a summary of the anticipated federal, state, and local regulatory approvals and requirements is provided in Table 1.5-2.

Table 1.5-1. Summary of DPP Revision Requirements

Title 30 Code Section and Specification	Comment	Where to Find in DPP
550.250 (a) Oil Spill Response Planning		
1. An Oil Spill Response Plan (OSRP) for the facilities you will use to conduct your proposed development and production activities prepared according to the requirements of 30 CFR part 254, subpart B	DCOR has an approved regional OSRP, as detailed in 2(i) below.	N/A
2. Reference to your approved regional OSRP (see 30 CFR 254.3) to include:		
(i) A discussion of your regional OSRP	<p>The updated DPP does not include changes to the approved regional OSRP.</p> <p>DCOR maintains an approved regional OSRP that covers offshore and coastal operations in the Santa Barbara and San Pedro Channels of Southern California.</p>	Sections 2.1.4 and 2.8.2
(ii) The location of your primary oil spill equipment base and staging area	<p>Multiple staging areas and equipment bases are present, with several standby Fast Response Vessels stationed throughout Southern California. The contracted Oil Spill Response Organization (ORSO) Marine Spill Response Corporation (MSRC) has equipment and staging yard in Ventura as a key facility.</p>	Section 2.1.4
(iii) The name(s) of your oil spill removal organization(s) for both equipment and personnel	<p>The updated DPP does not include changes to DCOR's oil spill removal organization.</p> <p>DCOR will continue to contract with Marine Spill Response Corporation (MSRC) as an Oil Spill Response Organization (ORSO).</p>	Section 2.1.4

Title 30 Code Section and Specification	Comment	Where to Find in DPP
(iv) The calculated volume of your worst case discharge scenario (see 30 CFR 254.26(a)), and a comparison of the appropriate worst case discharge scenario in your approved regional OSRP with the worst case discharge scenario that could result from your proposed development and production activities	<p>Proposed activities in the updated DPP would not include changes to the Platform’s worst case discharge.</p> <p>The worst case discharge for the proposed activities is the same as Platform Gilda’s existing production well blowout scenario of 60 barrels (bbls) (DCOR, 2023), which is included in the existing approved DPP.</p>	Section 2.1.4
(v) A description of the worst case oil spill scenario that could result from your proposed development and production activities (see 30 CFR 254.26(b), (c), (d), and (e)).	<p>Proposed activities in the updated DPP would not affect the scenario that could result in a worst case discharge.</p> <p>As described in the existing OSRP (Section 11.2.3), the worst-case scenario specific to the proposed activity is a blowout or uncontrolled release from a production well of up to 60 bbl per day of oil.</p>	Section 2.1.4
550.283(a) Revisions or Supplements to the Approved DPP		
1. Change the type of drilling rig, production facility, or transportation mode	Proposed activities in the updated DPP do not include changes to the drilling rig, production facility or transportation mode	N/A
2. Change in the surface location of a well or production platform by a distance more than specified by the Regional Supervisor	Proposed activities in the updated DPP do not include a change in the surface location of a well or production platform.	N/A
3. Change the type of production or significantly increase the volume of production or storage capacity;	Proposed activities in the updated DPP do not include a change in the type of production nor would there be a significant increase in the volume of production or storage capacity.	N/A
4. Increase the emissions of a criteria air pollutant, VOC, or TSP to an amount that exceeds the amount specified in your approved EP, DPP, or DOCD	Proposed activities in the updated DPP would not increase the Platform emissions greater than the amount specified in the approved DPP. Emission would be consistent with the Platform’s approved Permit to Operate from the Ventura County Air Pollution Control District.	Section 2.6

Title 30 Code Section and Specification	Comment	Where to Find in DPP
5. Significantly increase the amount of solid or liquid wastes to be handled or discharged	Proposed activities in the updated DPP would create minor increases in the amount of solid or liquid wastes to be handled or discharged.	Section 2.5
6. Request a new H2S area classification, or increase the concentration of H2S to a concentration greater than that specified by the Regional Supervisor	Proposed activities in the updated DPP do not require a new H2S area classification or increase the concentration of H2S greater than that specified by the Regional Supervisor.	N/A
7. Change the location of your onshore support base either from one State to another or to a new base or a base requiring expansion	Proposed activities in the updated DPP do not require a change in the onshore support base.	N/A
8. Change any other activity specified by the Regional Supervisor	Proposed activities in the updated DPP include procedures for well stimulation utilizing hydraulic fracturing methods. As requested by the Regional Supervisor, the DPP details the proposed well stimulation activities and an environmental report.	Section 2.2 through Section 2.8, and Section 4.0.
550.285 How do I submit revised and supplemental EPs, DPPs, and DOCDs?		
(b) Information. Revised and supplemental EPs, DPPs, and DOCDs need include only information related to or affected by the proposed changes, including information on changes in expected environmental impacts.	As requested by the Regional Supervisor, DCOR has included details regarding the proposed activities that were not included in the original, approved DPP. Any new expected or potential environmental impacts have been included within the Environmental Report of the updated DPP.	Section 2.0 and Section 4.0

Table 1.5-2. Summary of Program Regulatory Requirements

Permitting Agency	Anticipated Approvals / Regulatory Requirements
Federal	
BOEM	Title 30 – Mineral Resources Part 550 Subpart B Oil and Gas and Sulphur Operation in the OCS Approval of Supplemental Environmental Report and DPP NEPA analysis
National Marine Fisheries Service	Section 7 Consultation – Endangered Species Act; Essential Fish Habitat – Magnuson-Stevens Act
U.S. Fish and Wildlife Service	Section 7 Consultation - Endangered Species Act
State Office of Historic Preservation (SHPO)	Section 106 Consultation
State	
California Coastal Commission	Federal Consistency Review for all Federal approvals and permits; Title 15 CFR 930 Subpart D Section 307(c)(3)(A) of the Coastal Zone Management Act
Local	
Ventura County Air Pollution Control District (VCAPCD)	Facility Permit to Operate (PTO) 01492. See Appendix A for copies of facility PTO

2.0 PROGRAM DESCRIPTION AND METHODOLOGY

2.1 DESCRIPTION OF EXISTING CONDITIONS

Platform Gilda (OCS P-0216) is located in the Santa Barbara Channel approximately nine miles southwest of Ventura, California, in federal OCS waters (Figure 1-1). The Platform lies within the Santa Clara Field, an active oil field, and sits in approximately 205 feet of water on lease block OCS P-0216.

Platform Gilda was installed in 1981 by Union Oil Company of California, with initial drilling commencing that same year and production beginning in 1982. Initial construction included 96 conductor slots. Since then, 70 wells, plus additional sidetracks and redrills, have been drilled from the Platform, with the most recent well drilled in 2014. DCOR has operated the Platform and its associated leases (P-0215 and P-0216) since 2005. Platform Gilda is currently the only producing facility in the Santa Clara Field. Platform Grace, located on the adjacent and now-relinquished Lease Block P-0217, is undergoing decommissioning.

2.1.1 Environmental Setting

The Santa Clara Field is located within the offshore portion of the Santa Barbara-Ventura Basin, a structural and sedimentary basin known for prolific oil and gas production (Galloway, 1998). The basin is characterized by a series of east-west trending folding and faulting resulting from compressional tectonics. Within this setting, the Santa Clara Field is situated along the crest and northern flank of a broad east-west trending anticline.

Platform Gilda is located within the Santa Barbara Channel which sits in an ecological transition zone with cooler, more nutrient rich waters to its northwest and warmer, more tropical waters to its southeast. This transition zone has resulted in the development of distinctive communities and foraging grounds for its resident and migrating wildlife.

2.1.2 Stratigraphy and Reservoir Characteristics

The Santa Clara Field produces from several formations, each exhibiting different lithologic and production characteristics. The proposed activity will not directly disturb the seafloor. No new seafloor penetrations, anchoring, pipeline laying, or conductor setting is proposed as part of this action; therefore, the shallow hazard assessment is focused on the subsurface geology. Also relevant is the shallow hazard assessment already conducted as part of the original DPP, which concluded that no shallow hazard existed with the approved activity (Unocal, 1979).

Pico Formation. The Pico Formation is Pliocene in age and is composed of gas-bearing sands deposited in submarine fan systems. While present across the field, the Pico has not been a primary focus of stimulation activity to date and is not the focus of the proposed Program.

Repetto Formation. Underlying the Pico Formation and also Pliocene in age, the Repetto Formation is subdivided into Upper and Lower intervals. Multiple proven confining shale layers exist between the Repetto Formation's target zones and the seafloor, proven by these zones being oil bearing while similar quality zones above the confining layers contain no hydrocarbons. The Repetto Formation is composed of sand-rich submarine fan deposits that prograde westward into the basin from the north and east. Together with the Pico Formation, the Repetto Formation can range between 5,000 and 10,000 feet thick. The Repetto Formation is the primary target of

the proposed stimulation program due to its extensive oil-bearing intervals and moderate to low permeability.

Within the Upper Repetto Formation, eight subzones have been identified (progressing deeper): LP-B, LP-B1, LP-B2, LP-C, LP-C1, LP-C2, LP-C4, and LP-C5. These subzones consist of sand-rich channels and fan-lobe deposits interbedded with mudstones. Deeper sandstone subzones thin and pinch out to the north, creating stratigraphic traps, while shallower subzones pinch out progressively farther south due to southward migration of submarine fan deposition. Where pinch-outs are absent, the World's End Fault system serves as the primary structural trap for hydrocarbons. The World's End Fault does not have a seafloor expression. Additionally, previous seismic interpretations do not provide evidence of extending the fault from depth to the seafloor or to shallow horizons. The average overburden-corrected core porosity is 24.3%, and permeability averages 88 millidarcies (md), with the best reservoir quality found in subzones LP-B and LP-C4.

The Lower Repetto Formation contains five subzones (progressing deeper): LP-K, LP-K1, LP-L, LP-M, and LP-N. These zones are composed of medium- to thinly-bedded sandstones and mudstones deposited in westward-prograding submarine fans. The deepest subzone, LP-N, consists of thicker, more amalgamated sands compared to the overlying subzones. The average overburden-corrected core porosity is 18.4%, and permeability averages 11.5 md. The Lower Repetto oil system that is targeted for stimulation is a stratigraphic pinch-out and does not rely on any faults.

A confining shale layer ranging 15 to 25 feet thick occurs above the Lower Repetto interval and has been identified in multiple wells across the field. This layer is located approximately 250 feet above the shallowest zone proposed for hydraulic fracturing. Additional overlying shale layers are present which provide seals to prevent vertical migration of well stimulation fluids.

Monterey Formation. Underlying the Repetto Formation is the Monterey Formation, a Miocene-age unit that is approximately 1,500 feet thick where it occurs in the Santa Clara Field. It is composed of deep-marine cherts, carbonates, and organic-rich siliceous shales. The Monterey Formation is naturally fractured due to silica diagenesis and tectonic compression and has been developed intermittently in the field with variable production performance. The Monterey formation is not the focus of the proposed stimulation Program.

Sespe Formation. The Sespe is an Oligocene-age unit and is the deepest formation penetrated in the field. It underlies the productive sequence but has not been developed for hydrocarbon production in the current lease area. The Sespe Formation is not the focus of the proposed stimulation Program.

2.1.3 Well Simulation History

To enhance recovery from low-permeability zones, the Operators conducted a series of well stimulation treatments, specifically hydraulic fracturing, between 1986 and 2014 (Table 2-1). These treatments primarily targeted the Upper and Lower Repetto intervals. Stimulation treatments during this period included 28 hydraulic fracturing treatments in 14 wells (Argonne National Laboratory, 2016). Of the hydraulic fracturing treatments, 12 were performed in the Upper Repetto and 15 in the Lower Repetto between 1994 and 2014. The largest treatment, conducted in 2014 on well S-33 RD2, involved the injection of approximately 102,000 gallons of

fracturing fluid combined in two stages. This volume is significantly lower than typical onshore hydraulic fracturing operations, which have used between 1.75 and 10 million gallons per well per year (Houseworth and Stringfellow, 2015).

No induced seismic events were reported during or following any of the offshore stimulation treatments. The proposed stimulation intervals remain located at considerable distances from mapped Quaternary faults. The World's End Fault lies approximately 2,500 feet from the closest planned treatment zone, while other regional faults, such as the Oakridge and Mid Channel Faults, are located more than two miles from the Platform. In addition, no well integrity induced events were reported during or following any of the prior stimulation treatments. The proposed stimulations would adhere to the current required well testing and assessment standards described in Section 2.8.

Table 2.1-1. Historical Hydraulic Fracturing Treatments on Platform Gilda

Year	Well ID	No. of treatments	Target Formation/Field
1986	S-59	1	Monterey
1994	S-60	2	Upper Repetto
1996	S-89	2	Upper Repetto
1996	S-62	2	Lower Repetto
1996	S-89	2	Upper Repetto
1997	S-87	2	Upper Repetto
1997	S-62	2	Lower Repetto
1998	S-28	2	Lower Repetto
1998	S-61	2	Lower Repetto
2001	S-65	2	Lower Repetto
2001	S-44	3	Lower Repetto
2001	S-62	2	Lower Repetto
2014	S-75	2	Upper Repetto
2014	S-33	2	Upper Repetto

2.1.4 Oil Spill Contingencies and Worst Case Discharge

DCOR's contracted Oil Spill Response Organization (OSRO) is Marine Spill Response Corporation (MSRC). MSRC provides spill response capabilities for the West Coast and is the largest oil spill response agency in the country. DCOR obtains an annual certificate of coverage with MSRC, which is renewed in January of each year. MSRC has multiple staging areas and equipment bases with several standby Fast Response Vessels stationed throughout Southern California. A key MSRC facility for Platform Gilda is located in Ventura.

The worst case discharge (WCD) for the proposed stimulation activity is the same as Platform Gilda's existing production well blowout scenario of 60 barrels (bbls) (DCOR, 2023). The current accepted Bureau of Safety and Environmental Enforcement (BSEE) WCD for Platform Gilda is 1,501 bbls, which includes the scenario of a well-blowout occurring simultaneously as a pipeline failure and process vessel failure; therefore, the WCD for the proposed well stimulation activity is less than the currently approved WCD volume for the Platform in the existing DPP.

As described in DCOR's approved OSRP, the worst case scenario specific to the proposed activity is a blowout or uncontrolled release from a production well of up to 60 bbl per day of oil. The example well provided as part of the previously approved WCD was a stimulated Lower Repetto production well in a cased hole scenario, which would be nearly identical to the activity proposed in the Program. This would require a loss of control sequence of events, such as a vessel striking the well conductor, combined with a failure of the subsurface safety valve. Per BSEE regulations, a blowout of this type shall be assumed to last for 30 days (7 days per California OSPR regulations), leading to a total well blowout WCD volume of 1,800 bbls.

2.2 WELL STIMULATION SCOPE

The purpose of the proposed well stimulation program is to improve hydrocarbon recovery from low-permeability zones by increasing effective reservoir permeability and bypassing near-wellbore formation damage. Each treatment will be preceded by a Diagnostic Fracture Injection Test (DFIT) to collect formation-specific pressure and fracture gradient data. This information is used to calibrate stimulation designs using reservoir modeling software. Additional operational and design details are provided in Section 2.3, while fluid composition and handling details are provided in Section 2.4.

Hydraulic fracturing, a method of well stimulation, achieves this by injecting fluids at high pressure into the target formation to create narrow, controlled fractures in the rock. Once the fractures are initiated, a proppant—typically sand or ceramic spheres—is carried into the formation by the fracturing fluid. The proppant remains in the fractures after pressure is released, holding them open to maintain improved flow paths for hydrocarbons. After a standard hydraulic fracturing treatment, all the equipment is removed from the well and the well produces directly through the casing and perforations. There is no downhole filter, no special sand-control hardware, and the goal is purely to create a conductive pathway for hydrocarbons to flow (Figure 2.2-1).

The proposed stimulation method involves “frac packing”, which has some key significant differences from standard hydraulic fracturing and combines hydraulic fracturing with gravel packing. Frac packing is used in reservoirs that produce loose formation sand, where the operator must prevent that sand from flowing into the wellbore. Due to the relatively low permeability and

unconsolidated nature of these sands, well stimulation via frac packing is required to achieve economic production rates and well longevity. During a frac pack, a permanent downhole sand-control system (sand screens) is installed and the fracturing fluid is injected to fracture the formation within the well casing across the perforated interval (Figure 2.2-2). Proppant is placed both in the fracture and in the annulus between the casing and immediately adjacent to the screen to form a stable gravel pack. Proppant will be pumped across the sand screen until the area around the screen becomes tightly packed—hence “frac-pack.” After pumping stops, the proppant pack is left behind as a stable, permeable barrier that keeps formation sand out while still allowing oil and gas to flow. This technique provides both productivity enhancement and sand control, making it well-suited to the unconsolidated sands of the Repetto intervals.

The key components in a frac-pack are:

- A screen (downhole filter in the form of a perforated pipe with a specially shaped wire wrapped around it with very tightly controlled gap between the wires) placed across the producing zone. This acts like a very strong, permanent “strainer.”
- A sand control packer above the zone, which seals off the annulus and forces the pumped fluid to go through the perforations and prevents production flow from bypassing the screen and flowing up through proppant pack.
- A specialized surface tool (crossover tool) that allows the crew to direct fluids in several flow paths: pumping down the tubing, returning up the annulus, and reversing out when needed.

Figure 2.2-1. Typical Frac Pack Completion

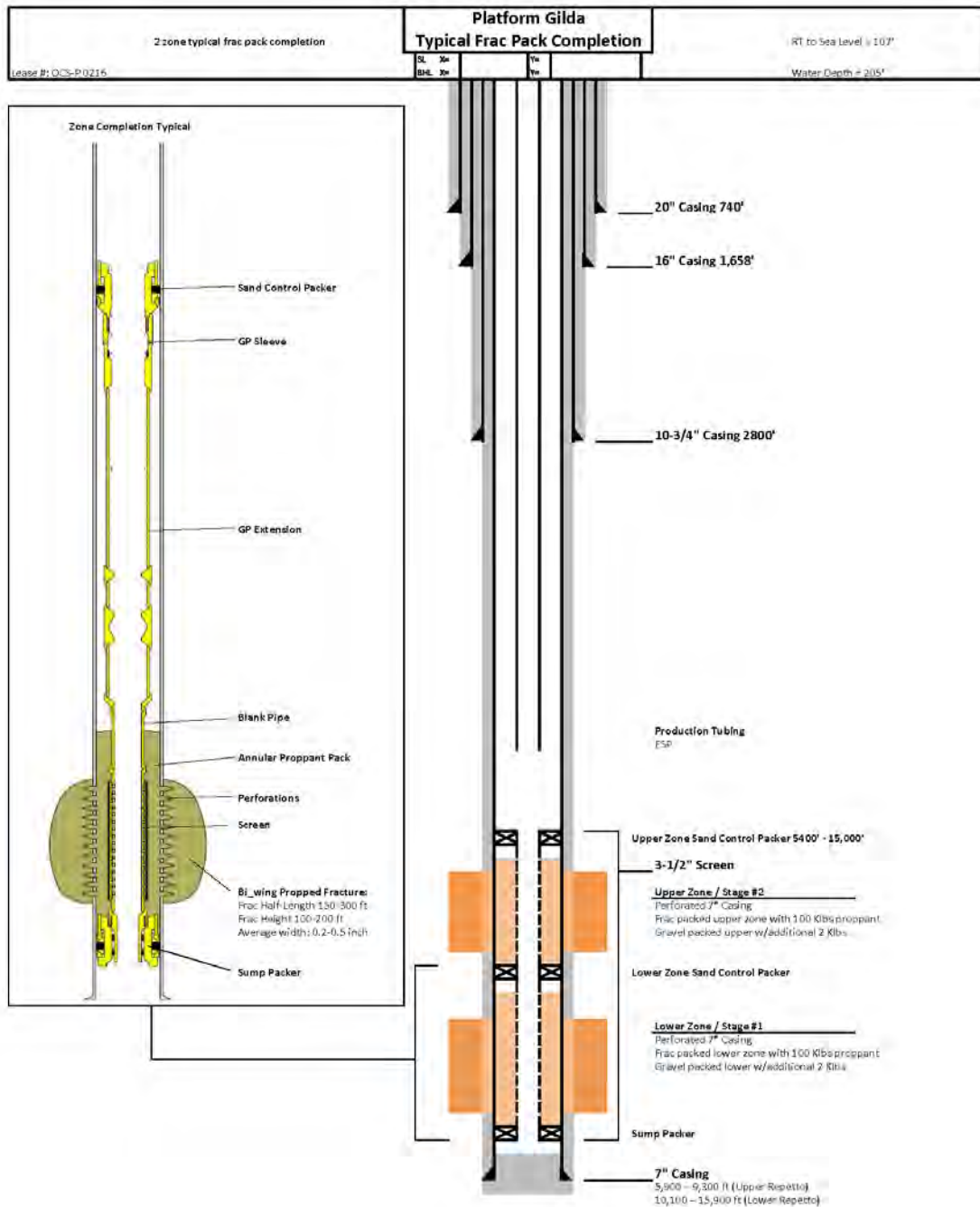
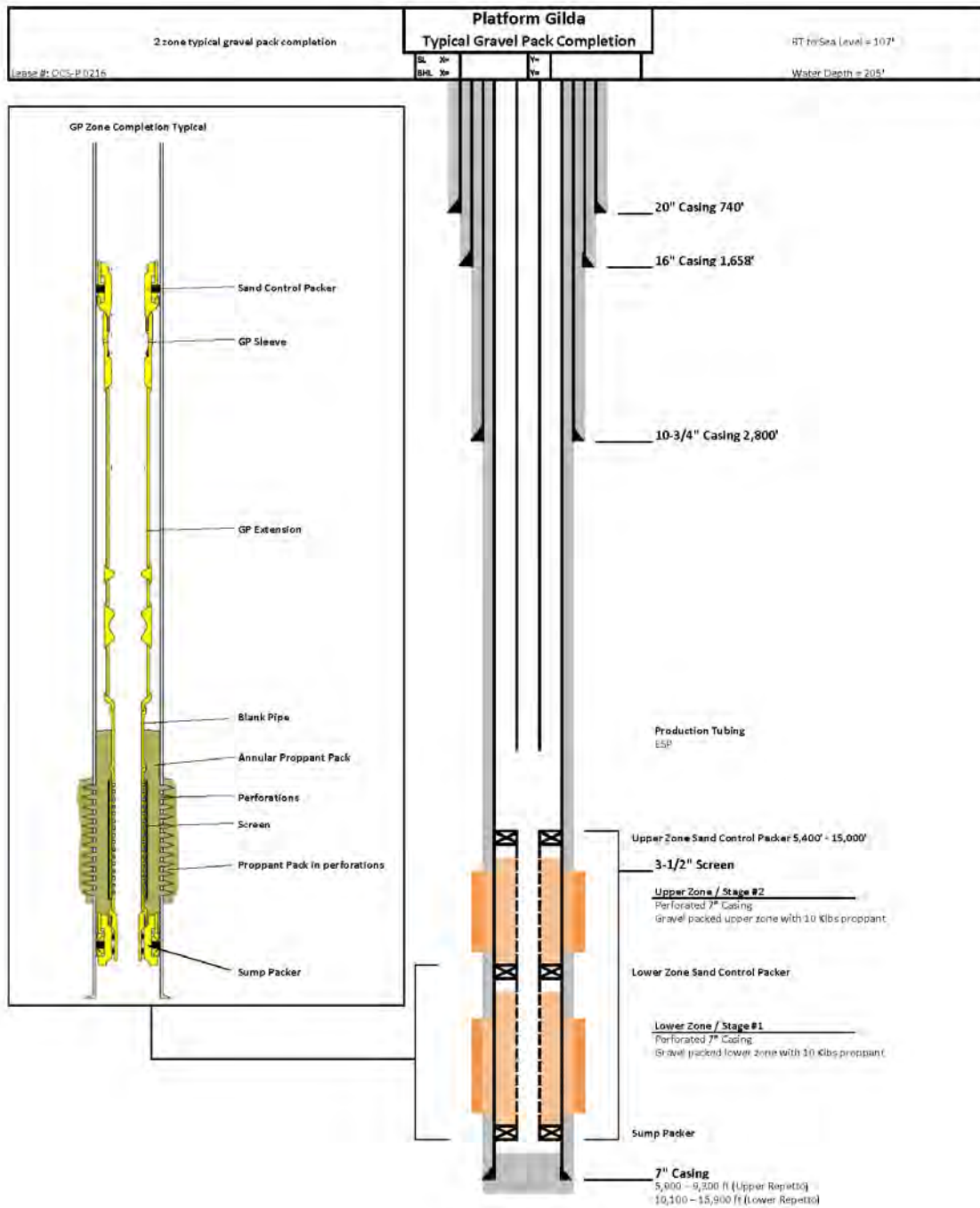


Figure 2.2-2. Typical Gravel Pack Completion



2.2.1 Well Selection

Past reservoir simulation studies and recent geologic interpretation have identified four well stimulation target locations in the Upper Repetto and 12 well stimulation target locations in the Lower Repetto, for a total of 16 locations.

The zones of interest in the Upper Repetto are the LP-B and LP-C subzones which are located approximately greater than 4,500 feet below the seafloor. In the Lower Repetto, the primary targets are the LP-M and LP-N subzones, while the LP-L subzone is considered more marginal and will be evaluated for potential completion based on open-hole log results. Table 2.1-1 summarizes the 16 well locations proposed for stimulation.

Table 2.2-1. Proposed Wells for Hydraulic Fracturing on Platform Gilda

Well ID	Target Formation	Target Subzone
1 UR	Upper Repetto	B, C
2 UR	Upper Repetto	B, C
3 UR	Upper Repetto	B, C
4 UR	Upper Repetto	B, C
1 LR	Lower Repetto	L, M, N
2 LR	Lower Repetto	M, N
3 LR	Lower Repetto	L, M, N
4 LR	Lower Repetto	M, N
5 LR	Lower Repetto	L, M, N
6 LR	Lower Repetto	M, N
7 LR	Lower Repetto	L, M, N
8 LR	Lower Repetto	M, N
9 LR	Lower Repetto	L, M, N
10 LR	Lower Repetto	M, N
11 LR	Lower Repetto	L, M, N
12 LR	Lower Repetto	M, N

2.3 FRAC PACK TREATMENT DESIGN

Combining historical data from prior stimulation treatments and proposed target zone data provides a basis for estimating the scope and scale of future frac pack treatments. The treatment design parameters summarized in Table 2.3-1 reflect the combined average of all expected treatments. Final designs will be developed using industry-standard fracture modeling software and tailored to each well using data from acquired open-hole logs.

Each treatment will be further refined following a DFIT. The DFIT involves a small-volume fluid injection at a sufficient rate and pressure to initiate a short fracture. Following injection, the well is shut in and pressure fall-off is monitored over a period of one to two hours. This test provides key information critical for calibrating the frac model and ensuring zone-specific design accuracy.

Table 2.3-1. Average Frac Pack Treatment Parameters

Design Parameter	Amount
Measured Depth (MD) Range	5,900 – 9,300 ft (Upper Repetto)
	10,100 – 15,900 ft (Lower Repetto)
Total Vertical Depth (TVD) Range	4,950 – 5,900 ft (Upper Repetto)
	7,900 – 8,600 ft (Lower Repetto)
Fracturing Half-Length	150 – 300 ft
Fracturing Height	100 – 200 ft
Water Depth	205 ft
RT to Sea Level	107 ft
Zone Length Range, MD	65 – 319 ft
Zone Length Average, MD	170 ft
Perforated Interval Range	24 – 160 ft
Perforated Interval Average	60 ft
BHST Range	140 – 155 degF (Upper Repetto)
	189 – 197 degF (Lower Repetto)
BHST Average	150 degF (Upper Repetto)
	193 degF (Lower Repetto)
Perforated Liner Size	5 in and 7 in (about 50/50 split)
Sand Control Screen Size	2-3/8 in for 5-in casing wells; 3-1/2 in for 7-in casing wells
Injection Rate Range	12 – 25 barrels per minute (BPM)
Injection Rate Average	18 BPM

Design Parameter	Amount
Proppant Volume Range	36,000 – 140,000 lb
Proppant Volume Average	75,000 lb
Clean Fluid Volume Average	1,300 barrels (bbl)
Proppant Slurry Volume Average	1,400 bbl
Maximum Surface Pressure Range	5,000 – 10,000 psi
Hydraulic Horsepower	Up to 5,500 HHP
Average Main Job Pump Time	Up to 2 hrs

A typical frac pack treatment (stage) will place approximately 75,000 pounds of proppant, although volumes may range from 36,000 to 140,000 pounds depending on reservoir characteristics. Treatment volumes include approximately 1,300 barrels of clean fluid, which equates to 1,400 barrels of slurry after proppant is added, pumped at rates ranging from 12 to 25 barrels per minute (BPM). Surface pressure during treatment is expected to range from 5,000 to 10,000 psi, with a total hydraulic horsepower requirement of up to 5,500 HHP.

Each frac pack stage is expected to take 6 hours from start to finish. Of this, 4 hours are dedicated to active pumping operations, and 2 hours of “standby” for engineering analysis and final redesign. The pumping sequence includes a step-rate test, the DFIT, and the main frac pack job. The main frac pack job typically lasts 40 to 120 minutes.

In approximately 50% of cases, if sand placement during the main frac job does not fully cover the screen, a secondary gravel pack will be necessary to ensure complete annular packing. This operation is typically conducted several hours after the main treatment, with an average pump time of 90 minutes. Gravel packs are performed at a lower pump rate than the frac job—typically around 5 BPM—using a single low-HHP pump and a smaller gravel pack blender. A gravel pack does not induce fracture in the reservoir.

In total, the full stimulation program may include up to 38 frac stages distributed across 16 wells, with each Upper Repetto well expected to require 2 frac pack stages, and each Lower Repetto well expected to require 2.5 stages, as only half of the Lower Repetto wells are anticipated to include the LP-L subzone. It is anticipated that up to 6 wells could be stimulated per year, depending on operational logistics, permitting timelines, and equipment availability.

2.4 FLUIDS, ADDITIVES, AND SOURCE MATERIALS

The base fluid for all treatments will be filtered seawater sourced directly from the surrounding marine environment using Platform Gilda’s existing seawater pumps. Seawater is the primary source of fluid for all drilling, completion and production needs offshore. Fracturing fluid is specifically selected on the basis of its compatibility with seawater; not all fluids are compatible with seawater. The fluid will be mixed with chemical additives to form a viscous gel capable of transporting proppant under high-pressure conditions. The primary gelling agent is guar, which will be crosslinked using a borate crosslinker to form a stable gel. An average frac pack treatment will use 1,300 bbls of seawater. Table 2.4-1 summarizes the key additives that will be used in a

frac pack treatment involving 100,000 pounds of proppant. The proppant used will be high-grade silica sand or ceramic proppant defined by an upper and lower grain diameter by sieve, such as 16/30 mesh or 20/40 mesh. All liquid additives will be transported in stainless steel marine-certified totes (typically 330–550-gallon capacity). Dry materials such as breakers and biocides will be delivered in sealed 5-gallon containers, palletized, and stored in a steel-bottom containment bin (5' x 10') on deck. Spill response materials and handling procedures will be in place per the Platform's operations management plans (see Section 2.8.2).

Material Safety Data Sheets (MSDSs) with the chemical constituents for each of the additives are provided in Appendix B.

Table 2.4-1. Additive Amounts and Functions for a 100,000-Pound Frac Pack Treatment

Additive	Product ID	Amount	Function
Environmental Guar Slurry	J564	500 gal	Increases fluid viscosity, allowing the proppant to remain suspended and uniformly transported into the formation.
Surfactant	F103	120 gal	Lowers surface and interfacial tension to improve the cleanup of fracturing fluid and facilitate flow of hydrocarbons
Emulsion Preventer	W054	55 gal	Prevents the formation of oil-water emulsions during treatment and early production, reducing flow assurance risks.
Scale Inhibitor	L065	55 gal	Mitigates the risk of scale precipitation from seawater components such as calcium or barium, helping to protect downhole equipment and reservoir permeability.
Borate Crosslinker	J532	350 gal	Chemically bonds to the guar polymer to enhance viscosity and thermal stability, creating a crosslinked gel suitable for deep, high-pressure formations.
Breaker (encapsulated)	J475	150 lb	Slowly dissolving oxidizer that reduces gel viscosity post-treatment, allowing fluid to break down and be recovered from the formation.
Breaker (raw)	J218	20 lb	Fast-acting oxidizer used for immediate gel breakdown typically used at the end of treatment and flush stages
Biocide	M275	20 lb	Controls microbial growth in seawater that could otherwise lead to corrosion, plugging, or biofilm development in the reservoir or equipment.

2.5 WASTE MANAGEMENT AND FLOWBACK FLUID HANDLING

All flowback fluid generated during stimulation activities will be routed through a closed-loop handling system and retained on the Platform. Returned stimulation fluids will be re-injected into existing approved injection wells on the Platform, and no open ocean discharge of flowback fluids will occur. The existing injection wells are completed in the same Repetto zones being fracture stimulated and provide reservoir pressure support to the oil producing wells. Well

stimulation treatment fluids are covered in the well treatment, completion, and workover fluids category of the National Pollutant Discharge Elimination System (NPDES) permit (EPA Permit No. CAG280000). All waste will be disposed of in accordance with the currently approved NPDES permit. The planned stimulation fluid volume of 1,300 bbls per stage for a possible 38 stages would be a total of 49,400 bbls of flowback fluid, or up to approximately 100,000 bbls over a 5-year period, if assuming an additional 100% contingency. This compares to recent injection of approximately 40,000 bbls per month or historical injection values of more than 300,000 bbls per month. Thus, there is ample injection capacity to reinject the stimulation flowback fluid without concern of induced seismicity from cumulative injection volumes. Current water production from the reservoir is also in excess of 50,000 bbls per month, thus the reservoir will not be over pressurized due to greater withdraw simultaneously occurring.

Solid waste, such as residual sand or other materials, will be separated and contained for transport to a licensed onshore disposal facility. Crude oil flowback, once achieved, will be separated out and be transported through existing sales pipelines.

2.6 EQUIPMENT, VESSELS, AND EMISSIONS

The proposed stimulation program will use skid-mounted mobile diesel-powered stimulation equipment rigged directly on Platform Gilda. Equipment emissions, power requirements, and operational runtime will vary depending on the final configuration. The Supply Vessel / Crew Transfer Vessel (*WMT*) proposed for this project is accounted for under the PTO based on its fuel usage.

Operations will be executed as separate campaigns to minimize mobilizations and optimize crew utilization. Well stimulation equipment¹ will be mobilized using the *WMT* (or equivalent permitted vessel) and standard transit routes to and from Platform Gilda. Each stimulation stage will be conducted over the course of one day, with approximately 3 days between each stimulation stage and several weeks between each well. The program is organized as one campaign per year, with all planned stages for that year completed in a single window approximately 6-7 months long. The skid-mounted spread will remain staged on the Platform for the duration of each campaign and will be demobilized once each campaign is completed.

Equipment and vessel types, power requirements, and operational runtime are summarized in Table 2.6-1.

Table 2.6-1. Equipment List

Equipment Type	Tier	Quantity	Horsepower	Total Operating Hours	Total Operating Days
Gel Hydration Unit	Tier 4	1	456 HP	304 hrs	13 days
POD Frac Blender	Tier 4	1	575 HP	228 hrs	10 days

¹ All portable equipment will be permitted under the California Statewide Portable Engine Registration Program (PERP).

Equipment Type	Tier	Quantity	Horsepower	Total Operating Hours	Total Operating Days
Gravel Pack Blender (optional)	Tier 4	1	575 HP	76 hrs	3 days
2,250 HHP Frac Pumps (frac)	Tier 4	3	1650 HP	684 hrs	29 days
600 HHP Gravel Pack Pump (gravel pack)	Tier 4	1	520 HP	76 hrs	3 days
Primary & Backup Diesel Generators (optional)	Tier 4	2	755 HP	608 hrs	25 days
Control Cabin	N/A	N/A	N/A	N/A	N/A
Sand/Proppant Storage Silos	N/A	N/A	N/A	N/A	N/A
Supply Vessel / Crew Transfer Vessel <i>WMT</i>	EPA Tier 3/IMO-2	4	803	880	88

2.7 PERSONNEL AND SCHEDULE REQUIREMENTS

Each stimulation job will require a crew of approximately 10 specialized personnel, including crew supervisors, equipment operators, engineers, and safety staff. Personnel will be mobilized to the Platform via crew transfer vessels in coordination with existing Platform logistics.

The stimulation program is planned over a 5-year period, with up to 6 wells stimulated during one campaign in a single year. The program schedule is expected to follow a batch completion model, wherein each year's group of wells is completed during a single annual campaign. Each stage will be performed over one day at the Platform, followed by a 3-day period before the next stage. Well stimulation equipment is expected to be active and operating for up to 14 days per year. When active well stimulation is occurring, work would be scheduled for 24/7 operations.

The estimated schedule of activities, including the number of stages, gravel packs, and total operational hours, is summarized in Table 2.6-1.

Table 2.7-1. Program Activity Schedule

Activity	Campaign 1	Campaign 2	Campaign 3	TOTAL
Dates	Jan 1, 2028 – Oct 17, 2028	Mar 8, 2030 – Dec 23, 2030	May 13, 2032 – Jan 1, 2033	Jan 1, 2028 – Jan 1, 2033
Number of Days	290 days	290 days	233 days	1,827 days

Activity	Campaign 1	Campaign 2	Campaign 3	TOTAL
Number of Upper Repetto Wells	2	2	0	4
Number of Lower Repetto Wells	4	4	4	12
Number of Frac Stages	14	14	10	38
Number of Gravel Packs	7	7	5	19
Frac Hours (6 hrs per stage)	84 hrs	84 hrs	60 hrs	228 hrs
Gravel Pack Hours (4 hrs per gravel pack)	28 hrs	28 hrs	20 hrs	76 hrs

2.8 IMPACT AVOIDANCE AND MINIMIZATION MEASURES

2.8.1 Well Integrity Monitoring and Safety

An independent registered professional engineer will verify and sign all planned casing programs for compliance with 30 CFR § 250.420, certifying that they are suitable under expected wellbore conditions and appropriate for permitting. Casing design, including liners, must withstand tensile, compressive, and buckling loads, burst and collapse pressures, thermal effects, and combinations of these stresses.

Production casing will be cemented with sufficient cement to isolate all hydrocarbon-bearing zones above the casing shoe. At a minimum, cement will extend 500 feet measured depth above the casing shoe and 500 feet above the uppermost hydrocarbon-bearing zone.

Prior to stimulation, casing and liners will undergo mechanical integrity testing in accordance with 30 CFR § 250.427, including pressure-testing to the maximum anticipated pressure. The specific nature of the frac packing operation requires the use of a dedicated workstring tubing. This workstring is not part of a well and does not remain in the well after the operation is complete. It is used to convey frac pack completion including sand control packer and screens (downhole sand exclusion filters) to intended depth. Typically, it is either a high-pressure tubing or drill pipe, but in all cases it has a high burst rating and high tensile strength. High pressure treatinglines are connected directly to this workstring. The fracturing injection pressure is contained within this workstring and does not act directly on the wellbore casings or surface wellhead.

During each treatment, real-time pressure monitoring will be conducted as required by 30 CFR § 250.724, with results recorded by the Platform's data acquisition system and reviewed for any abnormalities by on-site engineers and remote monitoring teams.

Emergency shutoff systems and well-control protocols are in place and will be activated in the event of a sudden pressure increase. These include blowout preventers (BOPs),

emergency shutdown valves, and access to well-kill materials and procedures. All personnel will receive pre-job safety briefings and training on response actions specific to hydraulic fracturing operations.

During hydraulic fracturing, high-pressure rated flowline connects the frac pumps to the workstring tubing, and the system is protected by multiple layers of overpressure safeguards. One of the primary safeguards is the automatic pump trip (pump shutdown) system, which continuously monitors pressure. If pressure rises rapidly—beyond a preset high-pressure limit or at a rate of increase that indicates a potential “screen-out”—the system initiates engineering controls and automatically shuts down the pumps. This rapid shutdown prevents further pressure escalation, protects surface flowlines from overstress, and reduces the likelihood of casing or tubular damage. Pump trips are controlled through pump control panels, and the thresholds are selected based on equipment pressure ratings, treatment design, and the expected maximum treating pressure.

In addition to electronic pump trips, mechanical overpressure protection valves are installed, the most common being nitrogen-charged pop-off valves installed on the high-pressure lines feeding the workstring tubing. These devices use a nitrogen-charged dome acting on a piston or diaphragm to hold the valve closed during normal operations. If the treating pressure exceeds the nitrogen dome pressure by a calibrated margin, the valve automatically opens, venting fluid to a designated safe discharge line connected to a holding tank. This provides a fail-safe pressure relief mechanism in case the electronic controls fail.

Nitrogen-charged pop-off valves are valued because they respond instantaneously to overpressure, and their cracking pressure can be tuned precisely by adjusting the nitrogen charge. They protect critical components such as flowlines, treatment head, workstring tubing and high-pressure pumps. In a severe pressure spike—such as a sudden sand-out - the pop-off relieves pressure fast enough to prevent equipment rupture. Mechanical pop-offs are also placed on the lines connected to the work string annulus to protect wellbore casing from overpressurization. All treating lines and pop-off valves follow periodic inspection and pressure testing and labeled with service tags indicating their ready-for-service status. Additionally, all treatment lines and pop-off valves are pressure tested immediately prior to performing fracturing operation to ensure actuation at a predetermined pressure and absence of leaks.

Together, pump trips and nitrogen-charged pop-off valves form a layered pressure-control strategy: electronics prevent most overpressure events, and mechanical relief devices provide last-resort protection. This combination is considered essential for safe and reliable high-pressure fracturing operations.

2.8.2 Operations Management Plans

DCOR currently maintains and implements the following management plans and impact minimization measures to protect environmental and public trust resources, including:

- Operations & Maintenance Pipeline Manual (O&M Manual).
- Well Integrity Monitoring and Testing Reports
- Regional Oil Spill Response Plan (OSRP) with site specific details including:

- Worst Case Discharge Volumes (30 CFR § 550.250(b)(iv))
- Worst Case Discharge Scenario (30 CFR § 550.250(b)(v))
- Coverage with an approved OSRO (MSRC)
- Perform tabletop spill drills as part of a coordinated Incident Management Team (IMT) and perform equipment deployment spill drills.
- Hazardous Waste Operations and Emergency Response (HAZWOPER) training for all employees who are part of an IMT or respond to a spill.
- Emission sources on Platform Gilda will maintain compliance with the requirements of the PTOs issued by the VCAPCD. PTO inspections will be conducted as required.

3.0 ALTERNATIVES ANALYSIS

The following alternatives analysis has been prepared to support the review of the Program under the National Environmental Policy Act (NEPA). This section provides an evaluation of the proposed action (well stimulation) and alternatives that meet the purpose and need of the Program (Section 1.3). The evaluation adopts the definitions of well stimulation activities included in the previous NEPA documents (Argonne National Laboratory, 2016; BOEM, 2023 and 2025). By adopting these definitions, there can be a straightforward and clear comparison of well stimulation treatment review between offshore operations and promotes a consistent cumulative effects analysis.

3.1 PROPOSED ACTION AND OTHER ALTERNATIVES CONSIDERED

3.1.1 Alternative 1: Proposed Action – Well Stimulation Program with Hydraulic Fracturing

Under this alternative, DCOR would implement well stimulation within 16 wells: four well stimulation target locations in the Upper Repetto and 12 well stimulation target locations in the Lower Repetto. Well stimulation would be achieved with hydraulic fracturing methods. Hydraulic fracturing is performed with injection pressures that exceed the formation fracture pressure and creates fractures in the formation, which increase the conductivity of the oil and gas from the reservoir through existing wellbores and production facilities. Each treatment will be preceded by a DFIT to collect formation-specific pressure data, fracture gradient, fluid efficiency and determine the most optimal treatment design required to safely and efficiently perform each well stimulation. Fracturing depths would be greater than 4,500 feet below the seafloor surface.

The proposed action would not include any open ocean disposal of well stimulation treatment fluids. All flowback fluid generated during stimulation activities will be routed through a closed-loop handling system and retained on the Platform. Returned stimulation fluids will be re-injected into existing injection wells on the Platform, and no offshore discharge of stimulation flowback fluids will occur. Solid waste, such as residual sand or other materials, will be separated and contained for transport to a licensed onshore disposal facility. All waste will be disposed of in accordance with the currently approved National Pollutant Discharge Elimination System (NPDES) permit.

Under this alternative, the stimulation Program is planned over a 5-year period, with up to 6 wells stimulated during one campaign in a single year. Active well stimulation activities would be performed for 14 days per year and would utilize existing crew and support vessels. The stimulation activities would occur in stages: Each stage will be performed over one day at the Platform, followed by a 3-day period before the next stage (Table 2.7-1). The well stimulation equipment would be temporarily mobilized to Platform Gilda and would operate with Tier 4 engines. The current fleet of Platform crew and support vessels would be used for equipment and crew transport; No additional vessels, including frack vessels, would be used for this Program. These proposed actions minimize the emissions to ensure the Platform emissions would not exceed permitted thresholds and the Program would operate under the existing APCD PTO.

3.1.2 Alternative 2: No Action

Under this alternative, DCOR would not perform well stimulation with hydraulic fracturing at Platform Gilda. DCOR would continue to operate Platform Gilda with routine well activity and approved enhanced oil recovery techniques, which will continue with or without the proposed Program. Without the Program, production at Gilda is expected to cease sooner than under the proposed action, as production continues to naturally decline and would not meet the need of domestic production goals.

3.1.3 Alternative 3: Development of New Production Wells

Under Alternative 3, DCOR would initiate a drilling program approved under the existing DPP. To meet the program's purpose and need—namely, the efficient development of identified hydrocarbon resources—DCOR would rely on drilling additional unstimulated production wells. Alternative 3 would not require an update to the DPP associated with well stimulation activities; however, it would necessitate the drilling of a substantially greater number of wells to achieve comparable recovery of the target reservoirs.

Because unstimulated wells are expected to exhibit significantly lower productivity relative to fracture-stimulated wells, it is anticipated that approximately twice the number of wells would be required to develop the same reserves. This increase in well count would result in a corresponding increase in drilling operations, well construction activities, and associated support services.

Additional resources required for Alternative 3 would create higher air emissions due to drilling units, support vessels, and associated equipment; increased vessel traffic to support extended drilling operations; and longer overall operational disturbances due to a longer program duration. Additional wells would also generate increased volumes of drilling waste, cuttings, and produced fluids requiring handling, transport, and disposal.

While Alternative 3 would avoid the use of well stimulation hydraulic fracturing, it would represent a less efficient development approach, requiring more infrastructure, longer operational timelines, and greater overall environmental disturbance to recover the same resource base. Consequently, this alternative would result in a higher cumulative environmental footprint compared to development using fracture-stimulated wells.

3.2 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER EVALUATION

Alternative well stimulation methods, including those evaluated in previous BOEM analyses (Argonne National Laboratory, 2016), were considered but eliminated from further evaluation because they would not meet the purpose and need of the Program or would not provide a reasonable or effective means of reservoir development. The alternatives considered but eliminated include the following:

1. Alternative Fracturing Methods (Acid Fracturing)

Acid fracturing was considered as an alternative well stimulation method; however, it was eliminated from further evaluation because it is not technically suitable for the target reservoirs. Acid fracturing is most effective in carbonate formations (e.g., limestone or dolomite), where acid

etches fracture faces to create conductive flow paths. The subject reservoirs are predominantly sandstone, where acid fracturing does not provide comparable or predictable stimulation benefits.

In sandstone formations, acid treatments may result in limited fracture conductivity, uneven etching, or formation damage due to clay and fines mobilization. Additionally, acid fracturing does not provide the proppant-supported fracture geometry required to maintain long-term fracture conductivity in unconsolidated or weakly consolidated sandstones. As a result, acid fracturing would not be expected to materially increase reservoir drainage area or improve sand control performance relative to frac-packing.

Because acid fracturing would likely result in lower well productivity, its use would necessitate drilling additional wells to recover the same reserves, leading to increased operational activity and environmental impacts (similar to Alternative 3). Therefore, acid fracturing was determined to be an unreasonable alternative for achieving the program's objectives.

2. Non-Fracturing Well Stimulation Methods (Matrix Acidizing)

Non-fracturing well stimulation treatments, such as matrix acidizing, were also considered and eliminated from further evaluation. Matrix acidizing is primarily intended to remove near-wellbore damage caused by drilling, completion, or production operations and typically affects only a limited radial distance from the wellbore. While such treatments can restore permeability in damaged zones, they do not significantly extend reservoir contact or increase effective drainage area.

For the subject reservoirs, matrix acidizing would not address the primary development challenges, including limited reservoir deliverability, fines migration, and sand production. These treatments would not provide the sustained productivity enhancement or sand control benefits associated with fracture-stimulated completions. As a result, wells completed using non-fracturing stimulation methods would be expected to exhibit substantially lower production rates and recoveries.

Reliance on non-fracturing stimulation would therefore require the drilling of additional wells to meet production objectives, resulting in increased drilling activity, vessel support, emissions, waste generation, and overall environmental disturbance. Accordingly, non-fracturing stimulation methods were eliminated because they would not meet the purpose and need of the program and would result in less efficient resource development.

3. Well Stimulation Above 4,500 Feet Below Seafloor Surface

Well stimulation treatments at depths shallower than 4,500 feet below the seafloor surface were also considered but eliminated from further evaluation. DCOR has established a minimum depth threshold for fracture stimulation to maintain a conservative safety margin between stimulation activities and shallow geologic features.

Limiting fracture stimulation to depths greater than 4,500 feet below the seafloor reduces the potential for unintended fracture propagation into shallow formations, existing faults, or natural fracture systems. This depth restriction also minimizes the risk of any pressure communication or surface expressions that could affect the seafloor or overlying strata.

By excluding fracture stimulation at shallower depths, the Program incorporates an additional protective measure beyond regulatory requirements, ensuring that stimulation activities

remain confined to deeper, well-characterized reservoir intervals. Consequently, fracture stimulation above 4,500 feet below the seafloor surface was eliminated from further consideration to enhance environmental protection and operational safety.

4.0 ENVIRONMENTAL REPORT

In accordance with 30 CFR 550.247 – 550.250, and 550.254, the following sections provide the biological, physical, and socioeconomic information to accompany the DPP and support NEPA review. In addition, Section 4.2 provides the environmental impact analysis required by 30 CFR 550.261 which integrates potential measures to minimize or mitigate potential impacts.

4.1 AFFECTED ENVIRONMENT

4.1.1 Geology and Seismicity

This section details the geologic setting of the Affected Environment, including existing geological and ocean-bottom conditions.

4.1.1.1 Regional Geology

The offshore Affected Environment is located on the Ventura Shelf and lies within the offshore extension of California's Transverse Range geomorphic province. The geology of southern Ventura County is dominated by the Ventura Basin, a sedimentary trough that extends westward into the Santa Barbara Channel. The Santa Barbara Channel is a partly submerged west-trending topographic and structural depression that is bounded by the Santa Ynez Mountains and the Santa Ynez Fault Zone to the north and by the California Channel Islands to the south (Vedder et al., 1969). Platform Gilda is situated on the Ventura Mainland Shelf, which, together with the Mugu Shelf to the south, forms the offshore extension of the Oxnard Plain.

Sedimentary strata underlying the Program area include fluvial and deltaic deposits ranging from Cretaceous to Holocene in age. Platform Gilda lies on Pleistocene and Holocene unconsolidated sands and mud, which overlie Pliocene marine sands, clays, and siltstones of the Pico and Repetto Formations. Deeper and older sediments, including the Miocene Monterey Formation, generally consist of interbedded marine sandstones, siltstones, and shales (Standard Oil Company of California Staff, 1976).

4.1.1.2 Faults and Seismicity

The Affected Environment is near significant structural features, all generally trending east-west within the Santa Barbara Channel (Standard Oil Company of California Staff, 1976). The Program area lies within the offshore portion of the Oak Ridge-Montalvo Trend, which is an anticlinal trapping structure that is bounded at depth by the Oak Ridge Fault to the north. The Oak Ridge Fault, which is the closest fault to Platform Gilda and lies approximately 2.5 miles north of the Platform, is a south-dipping thrust fault that stretches from Piru, California in the east to about 12.4 miles offshore, south of Santa Barbara in the west (SCEDC, 2025). As it moves offshore, the fault splits into two strands: the southerly Oak Ridge Fault, which slips about 1.2 inches per decade, and the northerly Oakridge-Midchannel Fault, which slips about 0.4 inches per decade (USGS, 2004). Since the offshore portion of the Oak Ridge Fault is a "blind" thrust fault, meaning its main strands are below ground and do not clearly reach the seafloor, surface rupture is unlikely; however, surface deformation may still occur (USGS, 2004).

Additional mapped faults in the vicinity of the Program area include the Mid Channel Fault and Montalvo Fault, both located over two miles south of the Platform and not intersecting the

zones proposed for stimulation. The Santa Ynez, Red Mountain, and Pitas Point Faults lie farther north and can produce magnitude 6.5 or greater earthquakes, causing ground shaking, surface breaks, liquefaction, landslides, and tsunamis. The Oak Ridge Fault can produce an earthquake up to magnitude 7.1. These faults also do not intersect zones proposed for stimulation.

Earthquakes are common in Ventura and Santa Barbara Counties, as well as in the Santa Barbara Channel. In 1812, an earthquake with an estimated magnitude of 7 struck the Santa Barbara Channel, causing significant destruction. Other notable earthquakes that have occurred in the Santa Barbara Channel between the period of 1925 and 1978 had magnitudes ranging from 5.1 to 6.3 and were documented to cause damage in Ventura (USGS, 2004).

4.1.1.3 Bathymetry and Seafloor Features

The seafloor beneath and surrounding Platform Gilda is located on a gently sloping continental shelf surface in approximately 200 feet of water on the Ventura Mainland Shelf. This area forms part of a low-gradient outer shelf that deepens gradually seaward into structurally controlled basins. Regional geologic mapping indicates that the natural seabed in this area is relatively smooth and gently dipping, consistent with a shelf setting (USGS, 1980).

Offshore oil and gas platforms commonly support fouling organisms that attach to platform structures. Periodic removal and natural detachment of these organisms can result in the accumulation of shell material on the seafloor, forming localized shell mounds. Shell material may accumulate beneath any platform with fouling organisms; however, in deeper waters, stronger currents and longer “fall times” of shells and fine sediments result in broader dispersion of material and lower-relief accumulations.

Several geophysical surveys have been conducted within the past 20 years in the vicinity of Platform Gilda, including multibeam surveys and investigations of seafloor shell mounds (MMS, 2001; MMS, 2003; MMS, 2005). These surveys indicate that the largest and most detectable seafloor shell talus areas are found under platforms that are located in shallow, flat bottom areas (generally less than 350 feet water depth and less than 1% slope). The seafloor at and around Platform Gilda is sedimentary, comprised of medium to fine grain sand and silts. Historic removal and deposition of fouling organisms on the seafloor has created mid- to low-relief habitat comprised primarily of fragments of mussel shells (*Mytilus* sp.). The Program activities do not include any components that would have an effect on the seafloor or sediments including shell mounds beneath and surrounding the Platform.

4.1.1.4 Submarine Landslides

High-resolution bathymetric mapping of the Santa Barbara Channel has identified several medium to very large submarine landslide deposits associated with steep slopes at shelf breaks and basin margins (USGS, 2004). However, Platform Gilda is situated on a uniform, gently sloping ocean floor where gradients are low, as described above. The seafloor underlying and surrounding Platform Gilda lacks steep slopes or other geomorphic features typically associated with large submarine landslides, and no mapped submarine landslides have been identified in the immediate vicinity of the Platform.

4.1.1.5 Tsunamis

Tsunamis are fast moving waves generated by large-scale, short duration submarine earthquakes, volcanic activity, and submarine landslides. Areas most susceptible to tsunamis are less than 50 ft above sea level and are within one mile of the shoreline. Historical records note that there has been a total of eight tsunami events recorded in Ventura County between the period of 1812 to 2023, including the tsunami resulting from the March 2011 earthquake that occurred in Japan. The largest tsunami event in Ventura County occurred in 1812 and reached heights of approximately 6.5 ft above sea level (Ventura County, 2020).

4.1.1.6 Oil and Gas Reservoirs and Seepage

Both structural and stratigraphic traps control hydrocarbon accumulation in the Santa Clara Field. The southern boundary of the field is defined by the World's End Reverse Fault system, which acts as a trapping structure for the field, specifically the Upper Repetto Formation, and exhibits up to 500 feet of vertical displacement based on seismic depth mapping conducted in 2015 (Redin and Hopps, 2016). Available seismic interpretations indicate that the World's End Fault does not exhibit a seafloor expression and does not extend upward into shallow sedimentary units or the seabed.

In addition to this structural trap, the lateral thinning and pinch-out of geologic units create stratigraphic traps within the Santa Clara Field. The Lower Repetto reservoir is characterized by a stratigraphic pinch-out and does not rely on faulting for hydrocarbon entrapment.

Natural hydrocarbon seepage occurs in portions of the Santa Barbara Channel; however, regional mapping indicates that seep fields are spatially clustered and are not uniformly associated with offshore oil and gas fields. Studies of seep distribution show that the most prominent seep areas are concentrated along the northern margin of the Channel, rather than in the vicinity of Platform Gilda (Quigley et al., 1999; Lorenson et al., 2009; USGS, 2011; WHOI, 2011). Based on available geologic and regulatory sources, no natural oil or gas seeps or seep-related seafloor features have been documented in the immediate vicinity of Platform Gilda (USGS, 2011; Love, 2019).

4.1.2 Air Quality

Platform Gilda is located within the South Central Coast Air Basin (SCCAB), which is under the jurisdiction of the Ventura County Air Pollution Control District (VCAPCD). The VCAPCD shares responsibility with the California Air Resources Board (CARB) for ensuring that all ambient air quality standards are attained within Ventura County. The Platform operates under existing Permit to Operate (PTO) Number 01492. The PTO establishes thresholds for allowable emissions and fuel throughput associated with Platform operations.

4.1.2.1 Regional Overview

The Program area has a Mediterranean climate that is characterized by mild winters and warm, dry summers. The influence of the Pacific Ocean causes mild temperatures year-round along the coast, while inland areas experience a wider range of temperatures.

The regional climate within the vicinity of the Program area is dominated by a strong and persistent high-pressure system, the Pacific High, which frequently lies off the Pacific Coast. The Pacific High shifts northward or southward in response to seasonal changes or the presence of

cyclonic storms. In its usual position to the west, the Pacific High produces an elevated temperature inversion.

An inversion is characterized by a layer of warmer air above cooler air near the ground surface. Normally, air temperatures decrease with altitude, however in an inversion the temperature of the air increases with altitude. The inversion acts like a lid on the cooler air mass near the ground, preventing pollutants in the lower air mass from dispersing upward beyond the inversion "lid." This phenomenon results in higher concentrations of pollutants trapped below the inversion. This weather pattern is intensified by mountain ranges that surround the SCAB which constrain the horizontal movement of air and inhibit the dispersion of air pollutants out of the region.

Airflow plays a significant role in the dispersal of pollutants. Local winds are normally controlled by the location of the Pacific High. Typical wind speeds in the area are generally light, which is another factor that contributes to higher concentrations of pollutants because low wind speeds minimize dispersion of pollutants. The sea breeze comes from the southwest, which blows air from the coastline eastward and inland. This weather pattern tends to blow pollution from the coastline inland, which then becomes trapped in the inversion discussed above, contributing to the poor air quality in the SCCAB. When the Pacific High weakens, a Santa Ana condition can develop with air traveling westward toward the coast from the warmer desert regions eastward. Santa Ana winds can flush the basin and inversion of pollution, however stagnant air often occurs following a Santa Ana condition, causing a buildup of pollutants offshore.

4.1.2.2 Air Contaminants

Criteria Pollutants

Criteria air pollutants are those contaminants for which ambient air quality standards have been established for the protection of public health and welfare. Criteria pollutants include ozone [O₃], oxides of nitrogen [NO_x], sulfur dioxide [SO₂], reactive organic compounds [ROG], carbon monoxide [CO], and particulate matter [PM] and Toxic Air Contaminants (TACs).

Ozone (O₃). O₃ is formed in the atmosphere through complex photochemical reactions involving NO_x, ROG (also known as reactive organic compounds), and sunlight that occur over several hours. Since O₃ is not emitted directly into the atmosphere but is formed as a result of photochemical reactions, it is classified as a secondary or regional pollutant. These O₃-forming reactions take time; therefore, peak ozone levels are often found downwind of major source areas. O₃ is considered a respiratory irritant and prolonged exposure can reduce lung function, aggravate asthma, and increase susceptibility to respiratory infections. Children and those with existing respiratory diseases are at the greatest risk from ozone exposure.

Carbon Monoxide (CO). CO is primarily formed through the incomplete combustion of organic fuels. Higher CO values are generally measured during winter when dispersion is limited by morning surface inversions. Seasonal and diurnal variations in meteorological conditions lead to lower values in summer and in the afternoon. CO is an odorless, colorless gas. CO affects red blood cells in the body by binding to hemoglobin and reducing the amount of oxygen that can be carried to the body's organs and tissues, which can cause health effects to those with cardiovascular disease and can affect mental alertness and vision.

Nitric Oxide (NO). NO is a colorless gas formed during combustion processes which rapidly oxidizes to form nitrogen dioxide (NO₂), a brownish gas. The highest nitrogen dioxide values are generally measured in urbanized areas with heavy traffic. Exposure to NO₂ may increase the potential for respiratory infections in children and cause difficulty in breathing even among healthy persons and especially among asthmatics.

Sulfur Dioxide (SO₂). SO₂ is a colorless, reactive gas that is produced from burning sulfur-containing fuels, such as coal and oil, as well as by other industrial processes. Generally, the highest concentrations of SO₂ are found near large industrial sources. SO₂ is a respiratory irritant that can cause the narrowing of the airways, leading to wheezing and shortness of breath. Long-term exposure to SO₂ can cause respiratory illness and aggravate existing cardiovascular disease.

Particulate Matter (PM). Ambient air quality standards have been set for particulate matter with a diameter of 10 microns or less (PM₁₀) and particulate matter with a diameter of 2.5 microns or less (PM_{2.5}). Both consist of different types of particles suspended in the air, such as metal, soot, smoke, dust and fine mineral particles. The particles' toxicity and chemical activity can vary, depending on the source. The primary source of PM₁₀ emissions appears to be from the soil via road use, construction, agriculture, and natural windblown dust; other sources include sea salt, combustion processes (such as those in gasoline or diesel vehicles), and wood burning. Primary sources of PM_{2.5} emissions come from construction sites, wood stoves, fireplaces, and diesel truck exhaust. Particulate matter is a health concern because when inhaled, it can cause permanent lung damage. While both sizes of particulates can be dangerous when inhaled, PM_{2.5} tends to be more damaging because it remains in the lungs.

Toxic Air Contaminants

Over 800 substances have been identified by the U.S. Environmental Protection Agency (U.S. EPA) and the CARB that are emitted into the air and may adversely affect human health. Due to the cancer risk associated with exposure to diesel particulate matter (DPM), this substance has been targeted for risk reduction by the CARB.

The combustion of diesel fuel in truck engines (as well as other internal combustion engines) produces exhaust containing a number of compounds that have been identified as hazardous air pollutants by U.S. EPA, and as TACs by the CARB. DPM from diesel exhaust has been identified as a TAC. The Multiple Air Toxics Exposure Study in the South Coast Air Basin (MATES IV) indicates DPM is a major contributor to cancer risk in southern California associated with TACs, accounting on average for 68 percent of the total risk (South Coast Air Quality Management District [SCAQMD], 2015). NO_x and DPM are currently controlled through the use of selective catalytic reduction control systems and diesel exhaust fluid, respectively on all new diesel trucks and heavy equipment. In addition, fleets of older trucks are required to phase in the installation of exhaust particulate filters. CARB maintains the Portable Equipment Registration Program (PERP). The program is a voluntary program that allows an equipment owner to register portable equipment such as drilling rigs and generators with CARB. Each air district determines the type of portable equipment that needs to obtain a permit. An owner or operator of portable equipment that needs a permit for the operation of the equipment at a given location may also register in PERP in lieu of having to get a permit from the air districts for operation at other locations.

Sources of TACs in the Project region onshore include mobile sources (motor vehicles, trains, equipment) and stationary sources such as dry cleaners (perchloroethylene emissions) and gasoline dispensing stations (vapor emissions of benzene and other components of gasoline). Source of TACs in the Program region offshore includes commercial marine vessel and recreational vessels.

Greenhouse Gases

Greenhouse Gases (GHGs), defined as any gas that absorbs infrared radiation in the atmosphere, include, but are not limited to, water vapor, carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and fluorocarbons. These GHGs trap and build up heat in the atmosphere near the earth's surface, commonly known as the Greenhouse Effect. The atmosphere and the oceans are reaching their capacity to absorb CO₂ and other GHGs, leading to significant global climate change in the future. Unlike criteria pollutants and TACs, which are pollutants of regional and local concern, GHGs and climate change are a local, regional, and global issue. There is widespread international scientific consensus that energy-use increases in GHGs have and will continue to contribute to climate change, although there is uncertainty concerning the magnitude and rate of warming. These energy-related activities generated 88% of the total U.S. emissions on a carbon-equivalent basis in 1990 and 90% in 2022. Fossil fuel combustion represents the vast majority of energy-related GHG emissions, with CO₂ being the primary GHG (USEPA, 2024).

Greenhouse Gas Lifecycle Emissions. The term lifecycle encompasses all emissions generated throughout oil and gas exploration, development, production, and end-use consumption. For hydrocarbon resources, these stages are conventionally categorized as upstream, midstream, and downstream as defined below.

- Upstream: Exploration, development and extraction of oil and gas
- Midstream: Refining, processing storage and transportation of oil and gas
- Downstream: Consumer consumption of resulting fuel

The BOEM report *OCS Oil and Natural Gas, Potential Lifecycle Greenhouse Gas Emissions and Social Cost of Carbon* by Wolvovsky and Anderson (2016) assessed the lifecycle GHG emissions of oil and gas produced from the OCS. The main key findings of the report are:

- Majority of GHG emissions result from consumer consumption (downstream emissions) of oil and gas products rather than oil and gas production in the U.S;
- The price of oil and gas and volume of production has a significant effect on the amount of oil and gas lifecycle GHG emissions; and
- The production of oil and gas from other global sources can be more carbon-intense relative to oil and gas produced from the OCS (Wolvovsky, 2016).

To estimate the impact of OCS oil and gas lease GHG emissions BOEM utilizes several GHG emissions models to estimate lifecycle emissions for OCS projects. Refer to Section 4.2.3 for details on GHG emissions models used to estimate Program GHG emissions.

4.1.2.3 Regulatory Setting

Federal and State

The U.S. EPA has jurisdiction under the Federal Clean Air Act (FCAA) and its amendments. The CARB has jurisdiction under the California Clean Air Act (CCAA) and California Health and Safety Code. The U.S. EPA and CARB classify an area as attainment, unclassified, or non-attainment, depending on whether the monitored ambient air quality data show compliance, insufficient data to determine compliance, or non-compliance with the National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS), respectively.

The U.S. EPA established NAAQS to protect public health (primary standards) and welfare (secondary standards). Air basins are classified by the U.S. EPA as in “attainment” or “non-attainment” based on meeting the NAAQS. The CARB established the more stringent CAAQS, which also requires air basins to be designated as in “attainment” or “non-attainment” based on meeting the CAAQS. NAAQS and CAAQS have been established for O₃, CO, NO₂, SO₂, suspended particulate matter (e.g., dust) and lead (refer to Table 4.1-2). In addition, California has standards for H₂S, sulfates and visibility-reducing particles. Table 4.1-1 lists applicable ambient air quality standards.

Table 4.1-1. Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	California Standard	Federal Standard
Ozone (O ₃)	1-Hour	0.09 ppm	--
Ozone (O ₃)	8-Hour	0.070 ppm	0.070 ppm
Carbon Monoxide (CO)	1-Hour	20 ppm	35 ppm
Carbon Monoxide (CO)	8-Hour	9.0 ppm	9 ppm
Nitrogen Dioxide (NO ₂)	Annual Arithmetic Mean	0.030 ppm	0.053 ppm
Nitrogen Dioxide (NO ₂)	1-Hour	0.18 ppm	100 ppb
Sulfur Dioxide (SO ₂)	Annual Arithmetic Mean	--	0.030 ppm
Sulfur Dioxide (SO ₂)	24-Hour	0.04 ppm	0.14 ppm
Sulfur Dioxide (SO ₂)	3-Hour	--	0.5 ppm (secondary)
Sulfur Dioxide (SO ₂)	1-Hour	0.25 ppm	75 ppb
Respirable Particulate Matter (PM ₁₀)	Annual Geometric Mean	20 µg/m ³	--
Respirable Particulate Matter (PM ₁₀)	24-Hour	50 µg/m ³	150 µg/m ³
Fine Particulate Matter (PM _{2.5})	Annual Geometric Mean	12 µg/m ³	12.0 µg/m ³
Fine Particulate Matter (PM _{2.5})	24-Hour	--	35 µg/m ³
Hydrogen Sulfide (H ₂ S)	1-Hour	0.03 ppm	--
Vinyl Chloride	24 Hour	0.01 ppm	--

Pollutant	Averaging Time	California Standard	Federal Standard
Sulfates	24 Hour	25 µg/m ³	--
Lead	30 Day Average	1.5 µg/m ³	--
Lead	Calendar Quarter	--	1.5 µg/m ³
Lead	Rolling 3-Month Average	--	0.15 µg/m ³
Visibility Reducing Particles	8-Hour	Extinction coefficient of 0.23 per kilometer – visibility of 10 miles or more due to particles when relative humidity is less than 70 percent	--

Notes: µg/m³ – micrograms per cubic meter
 ppm – parts per million
 Source: CARB 2024

Air Quality Regulation and Planning. The VCAPCD shares responsibility with the CARB for ensuring that all State and Federal ambient air quality standards are attained within the SCCAB. The Program area is located in the jurisdiction of the VCAPCD. The table below summarizes the current federal and state air quality attainment status within the SCCAB.

Table 4.1-2. Federal and State Air Quality Attainment Status Within the SCCAB

Criteria Pollutant	Standard	Status
1-Hour O ³	NAAQS	Attainment
1-Hour O ³	CAAQS	Non-attainment
8-Hour O ³	NAAQS	Non-attainment
8-Hour O ³	CAAQS	Non-attainment
1-Hour and 8-Hour CO	NAAQS	Attainment
1-Hour and 8-Hour CO	NAAQS	Attainment
1-Hour NO ₂	NAAQS	Attainment
1-Hour NO ₂	CAAQS	Attainment
Annual NO ₂	NAAQS	Attainment
Annual NO ₂	CAAQS	Attainment
1 Hour and 24 Hour SO ₂	NAAQS	Attainment
24 Hour PM _{2.5}	NAAQS	Attainment
Annual PM _{2.5}	NAAQS	Attainment
Annual PM _{2.5}	CAAQS	Attainment
24 Hour PM ₁₀	NAAQS	Attainment
24 Hour PM ₁₀	CAAQS	Non-attainment
Annual PM ₁₀	CAAQS	Non-attainment
3-Month Lead	NAAQS	Partial Attainment
1-Hour H ₂ S	CAAQS	Attainment

Criteria Pollutant	Standard	Status
24-Hour Sulfates	CAAQS	Attainment
24-Hour Vinyl Chloride	CAAQS	Attainment

Source: VCAPCD 2025, Unclassified status indicates that there is insufficient data to determine whether an air basin or county is in attainment or non-attainment.

The FCAA requires that the State prepare a State Implementation Plan (SIP) that outlines a plan for the State to reach attainment of NAAQS that the State is not in attainment. The most recent State SIP Strategy Statewide planning document identifies the strategies and controls under State authority that are needed to reduce emissions to reduce ground-level ozone, otherwise known as smog (CARB, 2022b). These measures are needed across the State of California for areas to meet the federal 70 parts per billion (ppb) 8-hour ozone standard (70 ppb O₃ standard) set by the U.S. EPA in 2015.

California Commercial Harbor Craft Regulations (13 CCR, SECTION 2299.5 and 17 CCR, SECTION 93118.5) In accordance with 13 CCR, Section 2299.5 (Fuel Requirements, Emission Limits and Other Requirements for Commercial Harbor Craft), CARB requires the use of at least 99 percent renewable diesel with a maximum sulfur content of 0.0015 percent or 15 ppm, in order to reduce emissions within Regulated California Waters out to 24 nautical miles (nm).

The California Commercial Harbor Craft² (CHC) Regulation was adopted by CARB in 2008 to reduce emissions of DPM, NO_x, and ROG from diesel engines used on CHCs operated in Regulated California Waters. The rule was then amended in 2010 and again in 2022, and has been fully implemented since 2023 (CARB, 2023). The CHC regulation defines California Regulated Waters as 24 nm seaward of the California coastline. No thresholds of significance for criteria pollutants are applicable to this Program within California Regulated Waters (CARB, 2011).

Greenhouse Gas Reporting Program. The Greenhouse Gas Reporting Program (GHGRP), regulated by the U.S. EPA, requires facilities that emit more than 25,000 metric tons of carbon dioxide equivalent (MTCO₂E) per year to report GHG data (CO₂, CH₄ and N₂O) from various sources, including leaks, flares, and fuel combustion.

New Source Performance Standards. New Source Performance Standards (NSPS) are regulated by the U.S. EPA and require new, modified, or reconstructed industrial facilities to use the "best demonstrated system" to control GHG emissions.

Cap-and-Trade Program. CARB approved the Cap-and-Trade Program (Cap-and-Trade) in late 2011. Cap-and-Trade sets a limit (cap) on the total emissions of GHG in the state, and this cap declines by approximately 5 percent per year through 2030. The program applies to emissions that cover approximately 80 percent of the State's GHG emissions. Covered entities³ are required to obtain GHG allowances to cover their GHG emissions. GHG allowances are issued by CARB or can be purchased from CARB or other entities subject to Cap-and-Trade. A

² Per California Commercial Harbor Craft regulation, a Commercial Harbor Craft is defined as but not limited to passenger ferries, excursion vessels, tugboats, ocean-going tugboats, towboats, push-boats, crew and supply vessels, work boats, pilot vessels, supply boats, fishing vessels, research vessels, hovercraft, emergency response harbor craft, and barge vessels that do not otherwise meet the definition of ocean-going vessels or recreational vessels.

³ Entities that emit 25,000 or more MTCO₂E per year.

GHG allowance is a tradable permit to emit 1 MTCO₂E of GHGs within the compliance year. These allowances are reduced each year, which requires the covered entity to reduce GHG emissions generated by their facility. In addition, covered entities can obtain GHG offset credits by implementing emissions reduction activities at other facilities. All covered entities in Cap-and-Trade are still subject to existing air quality permit limits for criteria HAPs and TACs.

VCAPCD Rules and Regulations

The VCAPCD currently evaluates project GHG emissions according to the GHG emissions thresholds recommended by the South Coast Air Quality Management District (SCAQMD). GHG emissions from industrial facilities are considered significant by SCAQMD if they exceed 10,000 MTCO₂E per year.

The following VCAPCD rules and regulations are applicable to the Program:

- **Rule 10 Permits Required:** This sets the rules for Authority to Construct (ATC)s and Permits to Operate (PTO)s.
- **Rule 23 Permitting Exemptions:** Provides the exemptions from permitting.
 - Portable internal combustion engines that are permitted under PERP are exempted from permitting.
- **Rules 26.1 – 26.11 New Source Review:** Specifies the New Source Review (NSR) rule provisions that are applicable to new, replacement, modified or relocated emissions units within Ventura County jurisdiction. The NSR rule provides specifications on permitting related mitigations such as Best Available Control Technology (BACT) and offsets based on the new source review (NSR) emissions thresholds (refer to Table 4.1-3). BACT requirements are defined in federal and state statutes, and the implementation of each air district's program varies across California. Federal BACT is less stringent than California specific BACT but both state and federal law are required. Federal BACT applies to major new and modified stationary sources. California BACT is the more stringent level of BACT but is only defined under state law for the SCAQMD. California BACT allows air districts to require controls beyond Lowest Achievable Emissions Rate if they are found to be both technologically feasible and cost-effective.

Table 4.1-3. VCAPCD NSR Emissions Thresholds

Criteria Pollutant	Threshold (tons/year)
NO _x	5
ROGs	5
PM ₁₀	15
SO _x	15

- **Rule 26.12 Federal Major Modifications:** Major modifications, as defined in Rule 26.1.17, are also federal major modifications, unless the applicant demonstrates that

the proposed major modification meets the criteria of at least one of the following exclusions:

- **Less-Than-Significant Emissions Increase Exclusion:** An emissions increase for the project, or a net emissions increase for the project that is not significant for a given regulated NSR pollutant, is not a federal major modification for that pollutant.
- **Plantwide Applicability Limit (PAL) Exclusion:** A major modification that does not cause emissions to exceed a pre-established PAL, for the respective pollutant, is not a federal major modification for that pollutant
- **Rule 26.13 Prevention of Significant Deterioration:** This Rule applies to any emission source and its owner or operator that is subject to the requirements of 40 CFR Section 52.21.
- **Rule 50 - Opacity:** This rule sets the opacity standards for the discharge of visible air contaminants. This rule regulates and prohibits emission discharge into the atmosphere for a period of time exceeding three (3) minutes in any one (1) hour which are:
 1. Emissions as dark or darker in shade as that designated as No. 1 on the Ringelmann Chart, as published by the United States Bureau of Mines, or,
 2. So opaque obscure an observer's view to a degree equal to or greater than does smoke described in subsection A.1 of this Rule.
- **Rule 51 – Nuisance:** Rule 51 indicates that no air contaminants shall be discharged that would cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public or which endangers the comfort, repose, health or safety of any such persons or the public or which would cause injury or damage to business or property.
- **Rule 64 – Sulfur Content of Fuels:** This rule sets the sulfur content requirements for gaseous and liquid fuels used in any combustion source. The rule is applicable to the burning of fuels containing sulfur compounds from any source whatsoever. This rule prohibits the burning at any time of gaseous fuel containing sulfur compounds in excess of 50 grains per 100 cubic feet of gaseous fuel, calculated as hydrogen sulfide at standard conditions. Additionally, the rule prohibits the burning at any time any liquid fuel, unless the emissions from the combustion of such fuel are reduced to a level less than the emissions which would occur from the uncontrolled combustion of liquid fuels with a sulfur content of 0.5 percent, by weight. Ocean Going Vessels are exempted.
- **Rule 72.1 - Outer Continental Shelf Regulations:** This rule applies to the owner or operator of any OCS source for which the VCAPCD is the corresponding onshore area as authorized under Section 328 of the FCAA Amendments (42 U.S.C. 7627) and 40 CFR Part 55.
- **Rule 73 - National Emission Standards for Hazardous Air Pollutants:** The VCAPCD has adopted the NESHAPS regulations (Title 40 CFR Part 61). This rule

applies to any owner or operator of a source that includes an affected facility subject to a prescribed standard under this regulation.

- **Rule 72.1 - Outer Continental Shelf Regulations:** This rule applies to the owner or operator of any OCS source for which the VCAPCD is the corresponding onshore area as authorized under Section 328 of the FCAA Amendments (42 U.S.C. 7627) and 40 CFR Part 55.

4.1.3 Water Quality

The Santa Barbara Channel, which stretches from Point Conception to Point Mugu within the Southern California Bight (SCB), generally exhibits good offshore water quality due to relatively low coastal population density and the lack of large industrial pollutant sources compared to areas farther south. Past regional surveys found that over 99% of SCB waters met California Ocean Plan objectives for dissolved oxygen and clarity, a trend that applies within the Santa Barbara Channel (MMS, 2005; SCCWRP, 1998). Since implementation of the NPDES program, SCB waters have experienced a significant reduction in pollutants despite population growth—about 50% for suspended solids, 90% for combined trace metals, and over 99% for chlorinated hydrocarbons (MMS, 2001), with over 65% reductions in major pollutant mass emissions since passage of the Clean Water Act (CWA) (Lyon and Stein, 2009). Ranges for key water quality parameters offshore Southern California, including the Santa Barbara Channel, are summarized in Table 4.1-4.

Table 4.1-4. Key Regional Water Quality Parameters Offshore Southern California

Parameter	Characteristics
Temperature	~12–13 °C at the surface in April, increasing to ~15–19 °C in July–October.
Salinity	~33.2–34.3 ppt.
Dissolved Oxygen	~5–6 mL/L at the surface; decreases with depth to ~2 mL/L at 200 m and to ~1 mL/L below ~350 m; upwelling can bring low-oxygen water toward the surface in late spring–summer.
pH	~7.8–8.1 from surface through the upper water column.
Nutrients	Nitrogen, phosphorus, silica (plus micronutrients such as Fe, Mn, Zn, Cu, Co, Mo, V, vitamins B12 and thiamin). Depleted near the surface, increase with depth; episodically elevated during upwelling.
Suspended Sediment (turbidity)	~1 mg/L in nearshore surface waters (higher near bottom and after storms); ~0.5 mg/L offshore. Highest turbidities during strong upwelling, high primary production, and river-runoff periods.
Metals & Organics	Trace metals/organics occur at low background levels; elevated concentrations can occur near outfalls, in embayments/marinas, or within natural seep influence.

Source: Argonne National Laboratory, 2019.

4.1.3.1 Non-Point Source Pollution

Non-point inputs are led by storm-season runoff and atmospheric deposition. The Santa Clara and Ventura Rivers provide the Santa Barbara Channel's largest freshwater inputs; they drain predominantly agricultural lands with additional urban storm-drain contributions. Runoff is largely untreated; plume events can extend across the Santa Barbara Channel and reach the Northern Channel Islands during major storms (MMS, 2001, 2005). Atmospheric fallout from metropolitan areas also contributes contaminants on a regional scale (Kaplan et al., 2010; Lyon and Stein, 2010).

4.1.3.2 Point Source Pollution

Point sources include municipal publicly owned treatment works (POTWs), industrial outfalls, and harbor/marina discharges. Six POTWs discharge to the Santa Barbara Channel; all are "small dischargers" (<25 mgd) providing at least secondary treatment (MMS, 2005). Other inputs include dredging and disposal activities, vessel traffic, military uses, and offshore oil and gas operations.

Offshore discharged from past and present oil and gas operations include cooling water, produced water, sanitary waste, fire control system test water, well completion fluids, and other miscellaneous liquids. Of these, produced water represents the greatest discharge of petroleum-related chemical constituents (Argonne National Laboratory, 2016). For drilling operations, oil platforms were reported to have discharged 12,128 and 41 2,955 metric tons (mt) of mainly drill cuttings to the SCB in 1996 and 2000, respectively (Argonne National Laboratory, 2016). Discharge of drill cuttings has declined since 2000, and there is no current discharge of drill cuttings on Platform Gilda.

Produced water is brought to the surface during oil and gas production. Produced water is a mixture (an emulsion) of oil, natural gas, and formation water (water naturally occurring in a formation), as well as any specialty chemicals that may have been added to the well for process purposes (e.g., biocides and corrosion inhibitors). The majority of produced water (58 percent) is reinjected into offshore injection wells while the remaining produced water is either discharged to the ocean or injected into onshore injection wells (Argonne National Laboratory, 2016). Platform Gilda's produced water goes to shore and is separated at the facility at Mandalay, which also receives fluid from nearby Platform Gina. The separated water from Gilda and Gina is then sent back offshore and is discharged into the ocean per allowances under the NPDES permit; however, the proposed Program would reinject all the well stimulation fluid flowback into injection wells on Platform Gilda.

While offshore oil and gas is a relatively small point-source contributor overall, hydrocarbons from those activities are proportionally higher than many other anthropogenic sources; however, the Santa Barbara Channel's dominant hydrocarbon source is natural oil and gas seepage, which produces localized surface sheens and tar-ball strandings after weathering (Hostettler et al., 2004; Farwell et al., 2009; MMS, 2001; Lyon and Stein, 2010).

4.1.3.3 Nutrients

Coastal waters of the SCB, including the Santa Barbara Channel, are generally nitrogen-limited. Four major sources deliver nitrogen: ocean upwelling (nitrate-dominated), POTW effluents (ammonium-dominated), riverine discharges (roughly 60% organic N and ~35% nitrate),

and atmospheric deposition (primarily nitrate) (Howard et al., 2012, 2014). At the SCB-wide scale, upwelling supplies the largest total nitrogen load by an order of magnitude; however, at local scales within the Santa Barbara Channel, anthropogenic inputs can be comparable to natural sources. In the Santa Barbara sub-region, net annual downwelling reduces natural nitrogen inputs, so effluent and atmospheric deposition represent the dominant sources; in the Ventura sub-region, effluent, atmospheric, and riverine contributions are of similar magnitude (Howard et al., 2014).

4.1.3.4 Harmful Algal Blooms

The frequency of harmful algal Blooms (HABs) has increased even as overall water quality has improved under NPDES controls. Blooms arise from natural upwelling cycles (Kaplan et al. 2010), with nutrient inputs from effluents and runoff potentially amplifying events locally (Howard et al., 2012). The Santa Barbara Channel is a recognized hotspot for domoic-acid-producing *Pseudo-nitzschia spp.* Notable events include: (1) a four-year lethal algal bloom in the SCB that ended in June 2025 with potential exacerbation from the January 2025 fires in Los Angeles; (2) a fall-2014 bloom that prompted prolonged CDPH seafood consumption advisories into early 2015 (Anderson et al., 2016), and (3) a May-2003 *P. australis* outbreak linked to marine-mammal mortality, apparently influenced by silicon limitation and a cyclonic eddy in the western Santa Barbara Channel (Anderson et al., 2006). Ongoing weekly monitoring by SCCOOS (since 2008) provides species/toxin data at multiple SCB piers (Howard et al., 2012).

4.1.3.5 Sediment Quality

Sediment quality integrates long-term contaminant exposure because many pollutants attach to fine particles, settle, and persist on the seafloor over years. As a result, sediments provide a historical record of inputs and, when resuspended by storms or currents, can act as a secondary source back to the water column.

The SCB Regional Monitoring Program's 2013 survey reported approximately 94% of the seafloor area un-impacted or likely un-impacted, 6% possibly impacted, and only 0.2% likely impacted; no areas were "highly impacted." Embayments show greater impacts than the open shelf (about 18% possibly/likely impacted in 2013), yet conditions have significantly improved since 1998 (SCCWRP, 2017). Targeted contaminants show similar patterns: copper is highest in marinas (antifouling paints), PAHs are elevated in embayments (runoff/atmospheric deposition), and pyrethroid insecticides are elevated in estuaries and marinas (Dodder et al., 2016). Within the Santa Barbara Channel, spatial patterns mirror the SCB overall, with generally lower concentrations than the Los Angeles region and a declining east-to-west gradient (Dodder et al., 2016).

4.1.4 Biological Resources

4.1.4.1 Climate

The local climate and waters of the Affected Environment, within the Santa Barbara Channel is influenced by both its coastal location and ocean currents. It has a Mediterranean climate characterized by mild, wet winters and warm, dry summers with temperatures typically moderate year-round due to the cooling effect of the Pacific Ocean, averaging 50° to 65° Fahrenheit (F) (10° to 18° Celsius [C]) in the winter and 60° to 75°F (15° to 24°C) in the summer. Most rainfall occurs during the winter months, with the region receiving an average of 14.8 inches

(37.6 centimeters [cm]) of rain annually (NWS, 2025). The California Current (which flows southward along the coast) and the California Countercurrent (which flows north along the coast) converge within the Santa Barbara Channel creating a relatively stable temperature in the area. The prevailing winds of the Santa Barbara Channel generally blow from the west to northwest and generally range from 5 to 15 knots (9 to 28 kilometers/hour), although seasonal variation does occur. Ecologically the Santa Barbara Channel sits in a transition zone with cooler, more nutrient rich waters to its northwest and warmer, more tropical waters to its southeast. This transition zone has resulted in the development of distinctive communities and foraging grounds for its resident and migrating wildlife.

4.1.4.2 Pelagic Habitat

Pelagic habitat refers to the open water habitat from the surface to the lower water column near the seafloor. Pelagic waters are classified by depth zones and include the epipelagic, mesopelagic, and bathypelagic zones. The epipelagic zone is the uppermost region of the water column. Within the epipelagic zone is the euphotic zone where light levels are high enough to support limited primary production in water as deep as 656 ft (200 m) (Eppley, 1992). Below this euphotic zone, light levels and consequently photosynthetic primary production is limited or nonexistent. In addition to low light levels, lower depth zones are characterized by increasingly cold temperatures and high pressure as well as low food availability. The bathypelagic zone in particular is a resource-poor habitat. Consequently, predators and scavengers dominate this zone and species have evolved adaptations to the harsh physical and chemical conditions (Miller, 2012).

4.1.4.3 Subtidal Benthic Habitats

Both soft and hard bottom habitats may be found in subtidal areas of the Affected Environment. Subtidal soft sediments of the Santa Barbara Channel are primarily sandy sediments with more silty sediments in deeper waters. There have been multiple comprehensive surveys of subtidal soft sediments in the Santa Barbara Channel (Blake and Lissner, 1993; Gillett et al., 2020). The subtidal hardbottom habitat of the Santa Barbara Channel consists of rocky reefs offshore of the mainland and the Channel Islands, as well as isolated rock outcrops scattered throughout the continental shelf (Blake and Lissner, 1993; Pondella et al., 2015); however, there are no rocky outcroppings near Platform Gilda.

4.1.4.4 Marine Flora and Fauna

The following sections provide an overview of the habitats and species that are likely to occur within the Affected Environment. Please refer to Appendix D (Biological Assessment) for a full analysis of federally protected species.

Plankton

Pelagic communities are dominated by plankton, which are defined as organisms that are primarily carried by currents with limited or no swimming ability (Eppley, 1992). Plankton includes a diverse array of organisms broken into two main categories, phytoplankton or plant-like plankton, and zooplankton, or animal-like plankton. Phytoplankton are unicellular and colonial photosynthetic organisms, which form the base of the ocean food web, providing food for zooplankton, which are then eaten by larger marine organisms like fish, whales, and seabirds. In addition to their role in supporting marine life, phytoplankton are crucial for oxygen production,

generating about 50-80% of the oxygen in Earth's atmosphere through photosynthesis (NOAA, 2024).

Zooplankton represent the trophic level above phytoplankton and perform the vital function of transferring energy, in a trophic sense, from phytoplankton to higher forms of marine life in the food chain (Lalli and Parsons, 1997). Many federally and California-managed species, including those afforded state and federal protections, undergo a planktonic larval phase as part of their early life history. The zooplankton communities include the permanent members (holoplankton), such as chaetognaths, copepods, euphausiids, and larvaceans, and temporary members (meroplankton) such as hydromedusae, fish eggs and larvae, and the larvae of many invertebrates that spend only a portion of their life cycle as plankton.

Invertebrates

Invertebrates within the Santa Barbara Channel may be classified broadly into pelagic and demersal assemblages. Pelagic assemblages are largely planktonic and are therefore dictated by the physical oceanographic qualities of the Santa Barbara Channel including current direction and water temperature. Depending on the season pelagic invertebrates could include zooplankton (discussed above), krill, squids, tunicates, sea jellies, or crabs. Demersal invertebrate assemblages consist of infauna and epifauna. The dominant infauna across most depth zones, including sediments around oil and gas platforms, are amphipod crustaceans, polychaetes, echinoderms, and bivalve mollusks (Gillett et al., 2020). The most abundant epifauna on sandy substrates were shrimp, echinoderms, octopods, and cnidarians. A variety of crab species, including the commercially important rock crabs (*Cancer* spp.) are also present around oil and gas platforms (Carroll and Winn, 1989).

Pacific Fishery Management Plan - Managed Invertebrates

Both krill and market squid are federally managed under the Coastal Pelagic Species Fishery Management Plan (FMP) implemented by the Pacific Fishery Management Council (PFMC). Krill serve as a critical trophic link in the Santa Barbara Channel, transferring energy from primary production to higher trophic levels. Among the krill assemblage, *Euphausia pacifica* and *Thysanoessa spinifera* dominate in terms of biomass and ecological importance, supporting predators such as fishes, seabirds, and baleen whales (Abraham and Sydeman, 2006). *E. pacifica* is most abundant offshore along the continental shelf break and slope, whereas *T. spinifera* primarily inhabits waters over the continental shelf. Essential fish habitat (EFH) for all species of krill extends the length of the West Coast from the shoreline seaward to the 6,000 ft (1,829 m) isobath and from the surface to a depth of 1,312 ft (400 m) (PFMC, 2024a). There are no designated Habitat Areas of Particular Concern (HAPC) for krill within the Santa Barbara Channel.

Market squid (*Doryteuthis opalescens*), also managed under the Coastal Pelagic Species FMP, are ecologically important both as predators and prey. They primarily consume zooplankton and small fishes, while providing a major food source for larger fishes, seabirds, and marine mammals (Zeidberg et al., 2006). EFH for market squid covers the marine and estuarine waters from the shoreline along the coasts of California offshore to the limits of the California EEZ and above the thermocline where sea surface temperatures range between 50°F and 78.8°F (10 and 26°C) (PFMC, 2024a). While the species supports California's largest fishery by tonnage and ex-

vessel value since 1993, there are no HAPC designations for market squid within the Santa Barbara Channel.

Special Status Species - Invertebrates

White Abalone (*Haliotis sorensen*). Following the closure of the fishery in 1996, the white abalone was listed as Endangered in 2001 on the Federal Endangered Species Act (FESA) (66 FR 29046; May 29, 2001). Critical Habitat has not been designated (NMFS, 2018b). White abalone is a deep-water mollusk, usually found in water depths from 80 to 200 ft (30 to 60 m), but can be found as shallow as 16 ft (5 m). White abalone is often found in open low and high relief rock or boulder habitat that is interspersed with sand channels. Sand channels may be important for the movement and concentration of drift macroalgae and red algae, which white abalone are known to feed (NMFS, 2008). While the Platform and pipeline habitats within the Affected Environment have suitable substrate to host white abalone, no biological survey to date has observed the species at Platform Gilda (Love et al., 2019b) and there are few surveys of abalone associated with oil and gas infrastructure (BOEM, 2023). White abalone are reported to feed less on drift algae and more on attached brown algae which is notably lacking on the Platforms or pipelines (Hobday and Tegner, 2000). This is partially due to a lack of light levels and substrate availability for brown algae on the majority of the Platform structure and pipelines as well as routine cleaning of the upper 60 ft (18m) of the Platform structure which regularly displaced any potential food source for white abalone.

Sunflower Sea Star (*Pycnopodia helianthoides*). The sunflower sea star is proposed for listing under the ESA as Threatened (88 FR 16212; March 16, 2023). Critical Habitat has not been designated. The species displays a diverse array of colors, including purple, pink, orange, brown, yellow, and red. Sunflower stars are omnivorous and opportunistic feeders, primarily preying on bivalves such as clams and oysters, as well as sea urchins and other invertebrates (NMFS, 2023). Sunflower sea stars reproduce sexually through broadcast spawning, releasing gametes into the water column for external fertilization, typically during May through June. Fertilized eggs develop into swimming larvae which spend two to ten weeks as plankton before settling down into juvenile benthic sea stars (Hodin et al., 2021). Current populations are mostly limited to the northern parts of their former range including Alaska and British Columbia, however historically they were common from Baja California to Alaska. Current and historical data collected within the Southern California Bight has found historically sunflower sea stars occurred in low densities but are now absent from the Southern California Oil and Gas Planning Area (BOEM, 2023). As a habitat generalist, sunflower stars inhabit a variety of marine environments, including kelp forests, rocky reefs, and sandy bottoms, usually at depths ranging from the intertidal zone to 656 ft (200 m) (NMFS, 2023). Juvenile individuals most commonly occur in the intertidal zone, while reproductive individuals inhabit subtidal zones. While the Platform habitat within the Affected Environment has suitable substrate to host sunflower sea star, no biological survey to date has observed the species (Love et al., 2019b).

Fish

The Santa Barbara Channel is a transition zone separating two distinctive fish faunal assemblages, with a warm-temperate southern component and a cool-temperate northern component. As a result, the majority (approximately 90 percent) of the over 550 species of marine fishes that inhabit or visit California waters can be found along the coast of central/southern

California in the region of the Affected Environment. Although there is the faunal boundary where cool-temperate waters can be found north of Point Conception and warm temperate waters to the south, fish species regularly overlap especially when warming and cooling surface conditions such as the El Niño-La Niña cycle draw in species that would typically occur on the opposite side of the faunal boundary (Kaplan et al., 2010). Special status fish species such as, Cowcod (*Sebastes levis*) and Bocaccio (*Sebastes paucispinis*) are commonly observed in ROV surveys at all levels of Platform Gilda, including the shell mound and benthic habitats (Love et al., 2019a).

Pacific Fishery Management Plan – Managed Fish

The PFMC manages commercial, recreational, and tribal fisheries within Federal waters of Washington, Oregon, and California under four Fishery Management Plans (FMPs): 1) Pacific Coast Groundfish FMP; 2) Pacific Salmon FMP; 3) Coastal Pelagic Species FMP; and 4) Highly Migratory Species FMP. These FMPs are used to identify EFHs and Habitat Areas of Particular Concern (HAPC) along the Pacific Coast and to recommend fishery management measures to National Marine Fisheries Service (NMFS). The NMFS EFH online mapper was utilized to identify which management units are located within the Affected Environment (NMFS, 2025).

A list of managed species that could be found during all or part of their life cycle within the Affected Environment is provided in The Essential Fish Habitat Assessment (Appendix E). This list was developed based on the EFH management units present in the region, species distribution, water depth range, and habitat types found within the Affected Environment (PFMC; 2024a; 2024b; 2024c; and 2025). At least 69 species listed under the Pacific Coast Groundfish FMP, eight species listed under the Coastal Pelagic Species FMP, and eight species under the Highly Migratory Species FMP could be present during some life stages in the Affected Environment. No Pacific Salmon EFH or HAPC are present within the Affected Environment. Pelagic species could be present for short time periods as schooling adults whereas many of the groundfish species could be present for longer time periods as both juveniles and adults. The juveniles of many rockfish species are known to utilize the anthropogenic habitat within the Affected Environment as nursery grounds.

Marine Turtles

Sea turtles observed within the Santa Barbara Channel are typically transient individuals whose occurrence reflects oceanographic and ecological conditions rather than the presence of resident populations. The Santa Barbara Channel is strongly influenced by seasonal upwelling and the northward transport of warm surface waters associated with the California Current and episodic El Niño events. These oceanographic features can entrain turtles, particularly juvenile and subadult individuals, into nearshore waters outside of their typical range. Turtles are generally encountered when anomalously warm water masses extend into the Southern California Bight, providing conditions suitable for their survival.

The primary driver for visitation is foraging opportunity rather than nesting, as no sea turtle species nests in California. Floating kelp mats, jellyfish aggregations, and pelagic red crabs, which periodically occur in the Santa Barbara Channel, represent important prey resources that attract turtles during favorable conditions. Additionally, the Santa Barbara Channel serves as a migratory corridor linking tropical and subtropical developmental habitats with more northerly foraging areas. Consequently, turtle presence in the Santa Barbara Channel is sporadic, seasonal, and strongly tied to warm-water intrusions and associated prey availability.

Three species of protected marine turtles could occur within the Affected Environment: loggerhead turtle (*Caretta caretta*), leatherback turtle (*Dermochelys coriacea*), and green turtle (*Chelonia mydas*). Olive Ridley and Pacific Hawksbill turtles are rarely observed within the Santa Barbara Channel; therefore, no further assessment of them is provided in this Report (California Herps, 2025).

Marine Birds

The Pacific Flyway is a major migratory route for all bird species that travel from the Northwestern US, Canada, and Alaska to Southern California and South America. A portion of the Pacific Flyway is located off the coast of California, but the exact location can vary depending on the weather. Migratory seabirds tend to fly at elevations between several hundred to several thousand feet above the ocean, however, weather conditions, such as wind and fog, influence flight altitude (Ainley et al., 2015). The Santa Barbara Channel and its associated coastlines are utilized by as many as 195 bird species for various purposes, including breeding, feeding, as non-breeding summer residents, winter residents or migrants (Baird, 1993). Because of species diversity in Central and Southern California, the timing of seasonal migrations can vary; however, most southward migration to wintering areas occurs from late September to late December. The fall migration generally occurs over a longer period compared to the spring migration, presumably because of variability in species egg incubation, nesting, and fledging times. Spring migration normally occurs from February through the beginning of June, and the fall migration route of coastal seabirds is usually further offshore than that used by the spring migrants. Annual and seasonal variation in the number of migrants is further correlated to the sea-surface temperature (Spear and Ainley, 1999).

Breeding species within the Affected Environment are those that nest on the Channel Islands and along the mainland of the Santa Barbara Channel. While offshore oil platforms provide roosting habitat for seabirds, no nesting sites have been recorded on Platform Gilda. Most of the seabirds which nest in southern California occur within the Channel Islands National Park, which affords a high level of protection to breeding birds (Aspen Environmental Group, 2005). Although breeding phenology varies from species to species, one or more species is generally conducting some aspect of reproduction (i.e. nest building, egg laying, or chick rearing) from April through August annually within the Channel.

Bird species occurring offshore in the Santa Barbara Channel may be afforded protection under federal law. At the federal level, the Migratory Bird Treaty Act (MBTA) prohibits the unauthorized take of migratory birds, their nests, and eggs, while the Endangered Species Act (ESA) provides additional protection for species federally listed as endangered or threatened. Species that may occur in the Affected Environment include the California least tern (*Sterna antillarum*), marbled murrelet (*Brachyramphus marmoratus*), and short-tailed albatross (*Phoebastria albatrus*). Please refer to Appendix D - Biological Assessment for full analysis of these federally protected species. In addition, the U.S. Fish and Wildlife Service identifies Birds of Conservation Concern to prioritize proactive management and conservation efforts. Together, these overlapping protections ensure varying degrees of legal and conservation status for bird species that utilize the offshore habitats of the Santa Barbara Channel.

Marine Mammals

The Santa Barbara Channel is recognized as one of the most important marine mammal habitats along the U.S. West Coast due to its unique oceanographic setting. The confluence of the California Current, strong seasonal upwelling, and complex bathymetry create highly productive foraging grounds that support an exceptional diversity and abundance of cetaceans and pinnipeds, including both migratory and resident species. Reflecting this ecological significance, the region has been designated a Whale Heritage Area, a recognition that carries no legal protections but emphasizes the Santa Barbara Channel's global biological importance for marine mammals including its role in important feeding and breeding behaviors.

Pinniped Haul-Outs and Rookeries

California sea lions frequently utilize platform loading decks as haul-outs, but there are no documented sea lion rookeries on Platform Gilda. California sea lions, Pacific harbor seals, northern elephant seals and northern fur seals are known to breed on the Channel Islands, primarily San Miguel Island which is located approximately 50 mi (80.4 km) from Platform Gilda. In addition, there is a Pacific harbor seal rookery adjacent to the Casitas Pier, Carpinteria, California. This rookery is known to host approximately 100 to 170 seals annually and is located approximately 14.5 mi (23.3 km) north of Platform Gilda (Carpinteria Seal Watch, 2025). There are no rookeries in the Affected Environment; however, Anacapa Island, approximately 11 mi (17.7 km) south of Platform Gilda hosts several Pacific harbor seal haul-outs and California sea lion rookeries.

Special Status Species – Marine Mammals

Marine mammals occurring within the Santa Barbara Channel are protected under a combination of federal and state regulations as well as spatial conservation designations. The Marine Mammal Protection Act (MMPA) prohibits the harassment, hunting, capture, or killing of all marine mammals in U.S. waters without authorization, providing broad baseline protection. Additional safeguards are conferred under the Federal ESA for species formally listed as Endangered or Threatened, while California state law provides parallel protection for species listed under the California Endangered Species Act (CESA) for species designated as threatened or endangered, as well as through special classifications including California Fully Protected species, and California Species of Special Concern. Please refer to Appendix D - Biological Assessment for full analysis of Federally Managed Species.

Beyond statutory protections, NOAA has designated Biologically Important Areas (BIAs) to highlight regions of particular significance to marine mammals for feeding, breeding, or migratory behaviors, thereby identifying habitats of elevated conservation concern. Collectively, these protections govern the management and conservation of marine mammals in the region. Table 4.1-5 includes all marine mammal species with any of these designations that have the potential to be present within the Affected Environment.

4.1.4.5 Marine Protected Areas and National Marine Sanctuaries

California Department of Fish and Wildlife (CDFW) Code Section 2853 establishes Marine Protected Areas (MPAs) to improve recreational, educational, and study opportunities provided by marine ecosystems that are subject to minimal human disturbance, and to manage these uses in a manner consistent with protecting biodiversity. The Anacapa Island State Marine Reserve

(SMR) and Anacapa Island State Marine Conservation Area (SMCA) are both approximately 7 mi (11.3 km) from the Program area. Anacapa SMR is one of the most restricted marine protected areas in the region and prohibits all fishing and collecting. Anacapa SMCA prohibits most collections and fishing but does allow take for lobster (commercial and recreational during the open season), and pelagic finfish. Combined, both MPAs encompass the entire northern coastline of Anacapa Island and make up 18.85 square miles (48.12 square kilometers) of protected ocean.

National Marine Sanctuaries (NMS), managed by NOAA under the National Marine Sanctuaries Act (NMSA), provides a suite of protections designed to conserve ecological, cultural, and historical resources within their boundaries. Within the Affected Environment of the Santa Barbara Channel there are two National Marine Sanctuaries. The Channel Islands National Marine Sanctuary (CINMS) is a protected area surrounding the northern four islands of Channel Island National Park, encompassing approximately 1,470 square miles (3,807.3 square kilometers) of ocean. The Chumash Heritage National Marine Sanctuary is located offshore of California's central coast, encompassing waters and submerged lands from just south of the Diablo Canyon Power Plant in San Luis Obispo County down to Naples Reef along the Gaviota Coast in Santa Barbara County, encompassing approximately 4,543 square miles (11,766 square kilometers), it extends roughly 60 mi (96.6 km) seaward and spans 116 mi (186.7 km) of coastline. Affected Environment does not overlap with any State MPAs or Federal Sanctuaries.

Table 4.1-5. Marine Mammal Populations with Potential to Occur within the Affected Environment

Common Name Scientific Name	Status ¹	Minimum Population Estimate (Stock)	Current Population Trend
MYSTICETI-CETACEANS			
Blue whale <i>Balaenoptera musculus</i>	FE	1,767 (Eastern North Pacific Stock)	Stable
California gray whale <i>Eschrichtius robustus</i>	FE	271 (Western North Pacific Stock)	Increasing
	MMPA	25,849 (Eastern North Pacific Stock)	Increasing
Fin whale <i>Balaenoptera physalus</i>	FE	7,970 (California/Oregon/Washington Stock)	Increasing
Humpback whale <i>Megaptera novaeangliae</i>	FT	3,185 (Mainland Mexico - California/Oregon/Washington Stock)	Unknown
	FE	1,284 (Central American/ Southern Mexico – California/Oregon/Washington Stock)	Increasing
Minke whale <i>Balaenoptera acutorostrata</i>	MMPA	509 (California/Oregon/Washington Stock)	No long-term trend suggested
North Pacific right whale <i>Eubalaena japonica</i>	FE, CFP	31 (Eastern North Pacific)	No long-term trend suggested
Sei whale <i>Balaenoptera borealis</i>	FE	625 (Eastern North Pacific Stock)	No long-term trend suggested
ODONTOCETI-CETACEANS			
Baird's beaked whale <i>Berardius bairdii</i>	MMPA	894 (California/Oregon/Washington Stock)	Increasing
Common bottlenose dolphin <i>Tursiops truncatus</i>	MMPA	2,048 (California/Oregon/Washington Offshore Stock)	No long-term trend suggested
	MMPA	346 (California Coastal Stock)	Increasing

Common Name Scientific Name	Status¹	Minimum Population Estimate (Stock)	Current Population Trend
Cuvier's beaked whale <i>Ziphius cavirostris</i>	MMPA	4,214 (California/Oregon/Washington Stock)	Stable
Dall's porpoise <i>Phocoenoides dalli dalli</i>	MMPA	10,286 (California/Oregon/Washington Stock)	Unable to determine
Dwarf sperm whale <i>Kogia sima</i>	MMPA	Unknown (California/Oregon/Washington Stock)	No long-term trend suggested
Killer whale <i>Orcinus orca</i>	MMPA	276 (Eastern North Pacific Offshore Stock)	Stable
	MMPA	349 (West Coast Transient Stock)	Unable to determine
Long-beaked common dolphin <i>Delphinus delphis bairdii</i>	MMPA	69,636 (California Stock)	Unable to determine
Mesoplodont beaked whales	MMPA	1,967 (California/Oregon/Washington Stocks)	Stable
Northern right whale dolphin <i>Lissodelphis borealis</i>	MMPA	17,024 (California/Oregon/Washington Stock)	No long-term trend suggested
Pacific white-sided dolphin <i>Lagenorhynchus obliquidens</i>	MMPA	29,090 (California/Oregon/Washington Northern and Southern Stocks)	No long-term trend suggested
Pygmy sperm whale <i>Kogia breviceps</i>	MMPA	1,924 (California/Oregon/Washington Stock)	No long-term trend suggested
Risso's dolphin <i>Grampus griseus</i>	MMPA	4,817 (California/Oregon/Washington Stock)	No long-term trend suggested
Short-beaked common dolphin <i>Delphinus delphis delphis</i>	MMPA	888,971 (California/Oregon/Washington Stock)	Increasing
Short-finned pilot whale <i>Globicephala macrorhynchus</i>	MMPA	466 (California/Oregon/Washington Stock)	No long-term trend suggested
Sperm whale <i>Physeter macrocephalus</i>	MMPA	2,011 (California/Oregon/Washington Stock)	Stable

Common Name Scientific Name	Status¹	Minimum Population Estimate (Stock)	Current Population Trend
Striped dolphin <i>Stenella coeruleoalba</i>	MMPA	23,448 (California/Oregon/Washington Stock)	No long-term trend suggested
PINNIPEDS			
California sea lion <i>Zalophus californianus</i>	MMPA	233,515 (U.S. Stock)	Increasing
Guadalupe fur seal <i>Arctocephalus townsendi</i>	FT	31,019	Increasing
Northern elephant seal <i>Mirounga angustirostris</i>	MMPA, CFP	85,369 (California Breeding Stock)	Increasing
Northern fur seal <i>Callorhinus ursinus</i>	MMPA	7,524 (California Stock)	Increasing
Pacific harbor seal <i>Phoca vitulina richardii</i>	MMPA	27,348 (California Stock)	Stable

¹Status Codes:

FE Federally listed Endangered Species

FT Federally listed Threatened Species

CFP California Fully Protected Species

Source: Carretta et al., 2024

4.1.5 Commercial and Recreational Fishing

The Santa Barbara Channel is located within the northern portion of the Southern California Bight and is a transition zone between the cool California current and the warmer Southern California countercurrent (NOAA, 2008). Due to this confluence of cool and warm waters and subsequent major upwelling of nutrient-rich waters, the Channel supports productive commercial and recreational fisheries. However, as ocean conditions such as temperature, nutrients, and habitat availability constantly shift, species composition within the Santa Barbara Channel is highly variable (NOAA, 2008).

4.1.5.1 Commercial Fishing

The Santa Barbara Channel supports a diverse range of biogeographic conditions that have fostered the development of a substantial commercial fishing industry. This region, designated as the Santa Barbara Port Area (SBPA), encompasses four primary commercial ports: Santa Barbara Harbor, Ventura Harbor, Oxnard/Channel Islands Harbor, and Port Hueneme. Each port differs in size, dominant fisheries, and the extent of infrastructure available to support commercial fishing operations. (Culver et al. 2007). Together, these ports have made the SBPA an important center for California's commercial fisheries economy. In 2024, the SBPA ranked first out of all California's port areas for annual landings value at \$65 million making up 34.3% of all landings value in California (CDFW, 2025a).

The California Department of Fish and Wildlife (CDFW) manages a fisheries data collection system by partitioning the ocean waters of the state into sections called Fish Blocks. Each fish block is approximately ten minutes of latitude by ten minutes of longitude, or approximately 100 nm², however, they can be smaller if land is located within the block. These Fish Blocks are used to describe the primary location of where a catch is harvested on a landing receipt. Landings receipts are created in the Marine Fisheries Data Explorer (MDFE), allowing the public to access reviewed and summarized California commercial landings data. The MFDE was used in this study to assess commercial fishing activity within the Program region. It should be noted that certain commercial fish landing data provided by the CDFW are labeled as "Confidential" in accordance with state and federal regulations designed to protect proprietary information. This confidentiality safeguard is intended to prevent the identification of individual fishers or operations, thereby protecting commercially sensitive information such as fishing locations, effort, and harvest volumes (CDFW 2025a).

The Program area is located in Fish Block 665 off the coast of Ventura County. A portion of the block is inaccessible to fishing activities due to the coastline overlapping this area. Over half of the water within the fish block is Federal waters while a small portion remains within State waters. However, there is no commercial fishing on vessels exceeding 100 ft (30 m) allowed within 1,640 ft (500 m) of the Platform structure's outer edge due to 33 CFR § 147.1102 which requires a safety zone around the radius of the Platform. Table 4.1-6 provides a summary of cumulative commercial landings in Fish Block 665 from 2015-2024.

Table 4.1-6. Cumulative Commercial Landings in Fish Block 665 from 2015-2024

Gear Type	Species Group	Pounds	Value	Pounds %	Value %
Traps	Total	978,650	\$5,193,805	20%	44%
	Crabs	763,809	\$1,387,907	16%	12%
	Lobster	201,856	\$3,757,988	4%	32%
	Mollusks	5,403	\$4,979	<1%	<1%
	Roundfish	1,513	\$6,092	<1%	<1%
	Sharks	1,148	\$1,662	<1%	<1%
	Shrimp/prawn	2,090	\$29,163	<1%	<1%
	Confidential	2,831	\$6,014	<1%	<1%
Gillnet	Total	812,097	\$3,112,160	16%	26%
	Crabs	28,379	\$25,728	<1%	<1%
	Flatfish	305,578	\$1,507,382	6%	13%
	Roundfish	349,000	\$1,398,586	7%	12%
	Sharks	123,246	\$178,639	2%	1%
	Skates & Rays	5,675	\$912	<1%	<1%
	Confidential	219	\$913	<1%	<1%
Trawl	Total	840,372	\$2,422,069	17%	20%
	Crabs	34,359	\$53,905	<1%	<1%
	Flatfish	196,999	\$859,844	4%	7%
	Mollusks	329	\$520	<1%	<1%
	Rockfish	533	\$972	<1%	<1%
	Roundfish	82,877	\$62,981	2%	<1%
	Sea Cucumber	12,176	\$38,362	<1%	<1%
	Sharks	12,782	\$19,417	<1%	<1%
	Shrimp/Prawn	475,047	\$1,366,660	10%	12%
	Skates & Rays	13,362	\$8,889	<1%	<1%
	Confidential	11,908	\$10,519	<1%	<1%
Seine	Total	2,266,194	\$1,074,267	46%	9%
	Roundfish	616,546	\$189,322	12.5%	1%
	Squid	1,649,648	\$884,945	33.5%	7%
Hook-and-Line	Total	14,407	\$66,024	<1%	<1%
	Flatfish	4,227	\$23,675	<1%	<1%
	Rockfish	1,471	\$5,642	<1%	<1%
	Roundfish	7,605	\$30,309	<1%	<1%
	Sharks	169	\$154	<1%	<1%
Dive	Confidential	935	\$6,244	<1%	<1%
	Total	10,643	\$18,565	<1%	<1%

Gear Type	Species Group	Pounds	Value	Pounds %	Value %
	Sea Urchin	9,571	\$15,963	<1%	<1%
	Confidential	1,072	\$2,602	<1%	<1%
Confidential	Deep-set Buoy Gear Harpoon/Spear Set Longline	1,641	9,611	<1%	<1%
Total		4,924,004	\$11,896,501	100%	100%

As shown in Table 4.1-6, a total of approximately 4,924,004 lbs. were reported from 2015-2024, at a value of \$11,896,501 within Fish Block 665. Trap fisheries were valued at \$5,193,805 within the 10-year period, accounting for 44% of overall landings value and making it the most lucrative fishery in Fish Block 665. The California spiny lobster trap fishery contributed 32% to the overall fish block value with \$3,757,988, making it the most valuable species during this period. The gillnet fishery was valued at \$3,112,160 and ranked second for contributing 26% of total fish block value. White seabass (Roundfish) and California halibut (Flatfish) accounted for the majority of landings within the gillnet fishery. The trawl fishery brought in 20% of total fish block value, with ridgeback prawn and California halibut as leading species. The seine fishery accounted for nearly half of total fish block weight, the most of any other fishery, accounting for 46% with 2,266,194 lbs; the majority coming from market squid. The hook-and-line, dive fisheries, and all confidential fisheries data reported weights and values contributing less than 1% to overall fish block landings.

4.1.5.2 Recreational Fishing

Recreational fishing in the Santa Barbara Channel is supported by diverse fishing methods, across many access points. Anglers commonly fish from shorelines, jetties, and piers, but the most productive methods are boat-based, including private vessels, rental boats, and commercial passenger fishing vessels (CPFV). These modes allow access to the Santa Barbara Channel's offshore reefs, kelp forests, and island waters, where a range of species are targeted. CPFVs typically operate full- or half-day trips and employ hook-and-line or drift fishing techniques, while private boat anglers often troll, bottom fish, or use live bait depending on target species and season.

Common target species in the Southern California region include various bottomfish such as rockfish, ocean whitefish, lingcod, basses, and California scorpionfish. Coastal migratory species include yellowtail, Pacific barracuda, Pacific bonito, and Pacific mackerel. Highly migratory species include yellowfin tuna, Pacific bluefin tuna, mahi-mahi, albacore tuna, skipjack tuna, thresher shark, and wahoo (PFMC, 2022). California halibut also represents an important component to Southern California's recreational fishery. Peak recreational fishing season for this region is May through September (PFMC, 2022). Offshore recreational fishing in waters greater than three miles from shore during the 2017 through 2021 period indicates that fishing trips along the California coast primarily targeted bottomfish species with 62% of recreational landings by weight, followed by coastal migratory species with 18% of recreational landings by weight, and finally highly migratory pelagic species also with 18% of recreational landings by weight.

Recreational fishing offshore of Santa Barbara and Ventura Counties, mainly takes place in State waters rather than Federal waters. For instance, from 2023-2024, the Pacific Coast Recreational Fisheries Information Network (RecFIN) reported approximately 155 metric tons (MT) of catch within Santa Barbara and Ventura Counties in Federal waters (RecFIN, 2025).

Bottomfish made up approximately 99% of that total weighted catch, with over half of bottomfish species being rockfish. Highly migratory species accounted for less than 1% of total catch within the Santa Barbara Channel region during 2023-2024 with 0.632 MT. Coastal migratory contributed the least to total catch within the given parameters with only 0.152 MT in catch. In contrast, total catch within State waters was reported as approximately 425 MT.

4.1.5.3 Aquaculture

Aquaculture is a key agricultural sector and one of the fastest growing forms of food production in the world. Aquaculture is defined as the propagation, rearing, and harvesting of aquatic organisms in a controlled or selected environment for any commercial, recreational, or public purpose. Reef-safe, low-trophic aquaculture is already established in the Santa Barbara Channel and poised to expand. In State waters off Santa Barbara, Santa Barbara Mariculture operates an approximately 73-acre longline shellfish lease (mussels/oysters); since 2021, research-only kelp cultivation by UCSB and a seaweed company has also been authorized inside that lease via a California Coastal Commission amendment.

There are no aquaculture sites located near Platform Gilda; however, in Federal waters, the Ventura Shellfish Enterprise has pursued pre-permitting of multiple 100-acre mussel plots. In parallel, NOAA has identified Aquaculture Opportunity Areas (AOAs) (eight candidate sites) to focus environmental analysis and streamline site selection in Federal waters. These efforts reflect the Santa Barbara Channel's favorable oceanography (productive upwelling, strong flow, and deep, unobstructed sites) and working-waterfront infrastructure in Santa Barbara and Ventura Harbors. In addition, a commercial-scale kelp aquaculture project in Federal waters now under U.S. Army Corps of Engineers review (Public Notice SPL-2022-00738-LPF). The application describes a 2,000-acre *Macrocystis* farm centered at 34.249, -119.4085, about 6.3 nautical miles (7.3 miles) from Ventura Harbor, within NOAA AOA option N2-D. The chosen site lies approximately four miles from Platform Gilda. The design uses anchored "backbone" lines with subsurface grow lines held between 15 to 30 ft (4.5 to 9 m) below the surface.

4.1.6 Recreation and Tourism

The Santa Barbara Channel and its coastline are recreation and tourism destinations in Southern California. Several parks, reserves, marine sanctuaries, and marine protected areas are frequented by visitors and residents alike, offering a unique outdoor experience in its exceptional natural landscape. Common recreational activities in the coastal zone include beach recreation, surfing, sightseeing, and kayaking. Offshore activities within the Santa Barbara Channel also include whale watching, diving, sailing, and fishing. While transit and recreational activities are prohibited within 500 m (1,640.4 ft) of the Platforms to all vessels greater than 100 ft in length, smaller vessels are allowed to recreate within the U.S. Coast Guard regulated "safety zone".

4.1.6.1 Onshore

Channel Islands National Park

Located just 6.0 mi (9.6 km) south of the Program area, Channel Islands National Park reported 281,232 visitors in 2024 (NPS, 2025). Visitors can enjoy hiking scenic trails, wildlife watching (with opportunities to see seals, sea lions, and the endangered island fox), kayaking and canoeing around coastal cliffs and sea caves, and snorkeling or scuba diving in rich marine ecosystems. Other recreational activities include boating, fishing, camping at several island

campgrounds, and ranger-led tours to learn about its natural and cultural history. Travel to and from the National Park typically utilizes specific routes, which when transiting to Anacapa or Santa Cruz Island would pass within eyesight of Platform Gilda.

Parks and Recreation Areas

Public beach access along the eastern Santa Barbara Channel is plentiful with state and local beaches making up much of the coastline from Oxnard to Carpinteria. Some of the larger or more popular beaches include Oxnard State Beach Park, Harbor Cove Beach and Marina Park, San Buenaventura State Beach, Rincon Point Beach, and Carpinteria State Beach to name a few. Coastline parks provide a broad range of recreational activities from beach access and surfing to hiking and camping. While no direct impact to access of coastline parks or coastal recreational activities will occur as part of Program activities.

Ports and Harbors

The ports and harbors in the Santa Barbara Channel are vital hubs for a wide range of recreational activities, supporting both visitors and residents. Santa Barbara Harbor, Ventura Harbor, and Oxnard Harbor are especially popular for activities such as recreational boating, fishing, kayaking, paddleboarding, and sightseeing. Santa Barbara Harbor contains approximately 1,143 slips. Ventura Harbor supports several marinas, and collectively the harbor provides roughly 1,500 to 1,600 boat slips. Channel Islands Harbor in Oxnard is the largest in the region, with approximately 2,150 slips distributed among multiple public and private marinas. These ports are common starting points for all the recreational and commercial activities which utilize the Santa Barbara Channel. Program vessels would utilize the existing transit routes to and from regional ports including Santa Barbara Harbor, Port Hueneme and Port of Long Beach, depending on where equipment would be mobilized.

4.1.6.2 Offshore

Whale Watching

Whale watching in the Santa Barbara Channel offers incredible opportunities to see migrating whales, including gray, humpback, and blue, along with dolphins, sea lions, and other marine life. Whale watching is possible year-round with gray whale migration from December to April, and larger species like blue and fin whales present during the warmer water months of late summer and early fall. Whale watching tours typically depart from harbors in Santa Barbara, Ventura, and Oxnard. Popular charter operators in the region, including Condor Express, Island Packers, and Santa Barbara Whale Watch, provide whale-watching trips on a near-daily basis for most of the year, with service frequencies increasing to two trips per day (per company) during the peak spring season. Whale watching boats in the Santa Barbara Channel are typically less than 100 ft in length. Whale watching around oil and gas platforms is often popular as they act as aggregators for schooling prey fish often targeted by cetaceans and pinnipeds.

Diving

Diving is a popular activity in the Santa Barbara Channel with several commercial dive boats available for charter out of both Ventura and Santa Barbara harbors. Notable dive sites include the Channel Islands, particularly Santa Cruz and Anacapa Island, which are renowned for their clear waters and rich biodiversity. SCUBA diving on oil and gas platforms, whether from a

boat or from the platform must be done with explicit permission and is typically only done for scientific purposes.

Fishing

Recreational fishing in the Santa Barbara Channel is popular due to its rich marine life, with anglers targeting species such as kelp bass, halibut, rockfish, and white sea bass. Fishing around oil and gas platforms, is a notable activity within the Program area. Platforms attract a wide variety of fish due to their structure, which provides a habitat for marine life. However, anglers must stay at least 1,640 ft (500 m) away from oil platforms are restricted to protect both the vessel and oil infrastructure. Detailed description of Recreational Fishing Provided in Section 4.1.7 above.

Sailing and Recreational Boating

Recreational sailing and boating in the Santa Barbara Channel are popular activities, with its favorable winds, and access to the Channel Islands. Sailboats, yachts, and powerboats frequently depart from the recreational harbors of Santa Barbara, Ventura, and Oxnard.

4.1.7 Socioeconomics

Program vessel contractors and crews would be based from the local workforce in Santa Barbara, Ventura and Los Angeles Counties. Program activities would create local but temporary job opportunities in the offshore oil and gas sector for marine contractors and specialized labor force. Program crews would reside on the Platform during each campaign and would not require housing or related services onshore.

In southern California, ocean industry employment is primarily focused within the tourism and recreation, and marine transportation sectors. Tourism and recreation are focused in Los Angeles, Orange, and San Diego Counties, and marine transportation is highest in Los Angeles County (NOEP, 2025).

4.2 ENVIRONMENTAL CONSEQUENCES

4.2.1 Geology and Seismicity

This section evaluates the potential effects of the proposed well stimulation program on geologic conditions and seafloor resources. As described in Section 4.1.1, Platform Gilda is located on a gently sloping continental shelf underlain by stable sediments, with no mapped submarine landslides or unstable seafloor features in the vicinity. The proposed Program would not create new wellbores in the seafloor and targets already producing deep subsurface formations that are not in proximity to regional fault systems and would be implemented entirely from an existing offshore platform without physical interaction with the seabed.

4.2.1.1 Shallow Hazards

Shallow geologic hazards evaluated for the Program include the potential for hydrocarbon seepage to the seafloor, migration of stimulation fluids outside the target interval, and induced seismicity. Each of these potential pathways is constrained by the depth of the target formations, the current geologic conditions, and the manner in which the Program would be implemented.

The proposed stimulation targets are Pliocene-age reservoir intervals within the Repetto Formation of the Santa Clara Field, located thousands of feet below the seafloor and separated from shallow sediments by multiple low-permeability confining units, as described in Section 4.1.1.6. Hydrocarbon accumulation within the Santa Clara Field is controlled by a combination of structural and stratigraphic traps. The southern boundary of the field is defined by the World's End Reverse Fault system, which acts as a trapping structure at depth for the Upper Repetto Formation. Available seismic interpretations indicate that the World's End Fault does not exhibit a seafloor surface expression and does not extend upward into shallow sedimentary units or the seabed. In addition to this deep structural trap, lateral thinning and pinch-out of geologic units create stratigraphic traps within the Santa Clara Field. The Lower Repetto reservoir is characterized by a stratigraphic pinch-out and does not rely on faulting for hydrocarbon entrapment. Because hydrocarbon accumulation in the Lower Repetto is not structurally controlled and because the World's End Fault does not provide a vertical migration pathway to the seafloor, there is no mechanism by which stimulation fluids or hydrocarbons could migrate along fault planes to shallow sediments or the seabed.

Regional studies further indicate that natural hydrocarbon seepage in the Santa Barbara Channel is concentrated along the northern margin of the Channel, away from the vicinity of Platform Gilda, and no natural oil or gas seeps or seep-related seafloor features have been documented near the Platform (Section 4.1.1.6). These conditions indicate that shallow migration pathways connecting deep reservoirs to the seafloor are not present in the Program area. In addition, shallow gas accumulations or shallow water flow conditions, typically associated with unconsolidated sediments encountered during new drilling, have not been identified in the vicinity of Platform Gilda. The proposed Program does not involve drilling new wells or penetrating shallow formations, and therefore would not encounter or activate shallow gas or shallow water flow hazards.

The proposed stimulation activities would occur entirely within existing wellbores and would not involve drilling new wells or creating new pathways through overlying geologic units. The intensity and duration of the proposed Program further limit the potential for subsurface pressure changes that could otherwise promote fluid migration. The short duration of individual stimulation stages (approximately two hours per stage) and relatively small stimulation treatment volumes (approximately 1,400 barrels of slurry per stage) limit subsurface pressure changes. The total stimulation fluid volume would be approximately 49,400 bbls of flowback fluid, or up to approximately 100,000 bbls over a 5-year period.

Considering typical injection volumes as well as water production volumes (refer to Section 2.5), there is ample injection capacity to reinject the stimulation flowback fluid without concern of induced seismicity from cumulative injection volumes. The size of the proposed injection volumes can be compared to unconventional onshore shale hydraulic fracturing operations, which involve fluid volumes one to two orders of magnitude greater and can inject up to approximately 40 million gallons per well.

Hydraulic fracturing can, in rare cases, induce seismic events if performed adjacent to critically stressed faults. In the Santa Barbara Channel, the proposed stimulation intervals are located at considerable distances from mapped Quaternary faults. The World's End Fault lies approximately 2,500 feet from the closest planned treatment zone, while other regional faults,

such as the Oak Ridge and Mid Channel Faults, are located more than two miles from Platform Gilda. In addition, the stimulation targets are not structurally connected and fracture distances would not intersect with these faults (fracturing half-length is 150 to 300 ft; fracturing height is 100 to 200 ft). Historical offshore stimulations conducted between 1986 and 2014, including multiple treatments on Platform Gilda, did not trigger detectable seismicity, demonstrating that similar operations under comparable geologic conditions have not produced seismic events (Argonne National Laboratory, 2016).

Standard well integrity practices incorporated into the proposed Program, including casing verification, cementing, and pressure testing (see Section 2.8), ensure that stimulation pressures are contained within the intended interval and do not compromise overlying formations. Based on the stratigraphic and structural trapping mechanisms, lack of fault connectivity to the seafloor, absence of documented natural seepage near the Platform, limited duration and scale of stimulation activities, and demonstrated operational history at Platform Gilda, the proposed Program would not result in stimulation fluid migration, hydrocarbon seepage to the seafloor, or induced seismicity.

4.2.1.2 Seafloor Disturbance

Potential impacts to seafloor conditions are limited since all stimulation activities would be conducted entirely from the existing Platform Gilda deck and within existing wellbores. The proposed Program would not involve anchoring, trenching, seabed excavation, pile driving, or installation or modification of seafloor infrastructure. No new wells would be drilled, and no activities would require direct contact with the seafloor.

Pipelines associated with Platform Gilda would remain unchanged and would not be accessed, modified, or disturbed as part of the proposed Program. Support vessels would operate in accordance with standard offshore practices and would not deploy anchors or equipment on the seabed. As a result, the proposed activities would have no spatial footprint on the seafloor.

As described in Sections 4.1.1.3 and 4.1.1.4, the seafloor underlying and surrounding Platform Gilda consists of gently sloping, sedimentary shelf deposits and lacks steep slopes, scarps, or geomorphic features typically associated with submarine slope instability. No mapped submarine landslide features have been identified in the immediate vicinity of the Platform (USGS, 2004). Existing seafloor features, including shell mounds formed from historic Platform operations, would not be altered by the proposed Program.

Because the proposed Program does not involve physical interaction with the seabed and relies entirely on existing platform infrastructure on stable seafloor conditions, it would not result in direct or indirect disturbance to seafloor sediments, bathymetry, shell mounds, or other seafloor features.

4.2.2 Air Quality

4.2.2.1 Criteria Pollutants Emissions

Proposed Program well stimulation activities would generate offshore emissions within the OCS due to the use of marine vessels and well stimulation equipment. Well stimulation activities are expected to operate temporarily, for approximately 14 days per year, over a three-year period.

Criteria pollutant emissions for the marine vessel and portable equipment utilized during the well stimulation activities were estimated using established emission factors from the CARB's California Emissions Estimator Model (CalEEMod) User's Guide, Appendix D, Default Data Tables (Trinity, 2021), CalEEMod 2022 User Guide Appendix G (CARB, 2022a), MARPOL Regulations and U.S. EPA Port Emissions Inventory Guidance (U.S. EPA, 2020). A tabulation of assumptions, references, and calculations for the Program emission estimates are provided in Appendix C. Marine vessel and portable equipment horsepower and hours of use per day were provided by DCOR.

Table 4.2-1 below provides a summary of the estimated annual and total emissions for the well stimulation activities.

Table 4.2-1. Estimated Annual and Total Well Stimulation Emissions

Work Task	Units	NO _x	ROG	PM ₁₀ *	PM _{2.5} *	CO	SO ₂
Campaign 1	tons/year	5.55	0.121	0.141	0.138	4.37	0.009
Campaign 2	tons/year	5.55	0.121	0.141	0.138	4.37	0.009
Campaign 3	tons/year	4.71	0.097	0.135	0.131	3.34	0.007
VCAPCD NSR Threshold (tons/year)		5	5	15	--	--	15
Exceed Thresholds?		Yes	No	No	No	No	No
Total Program Emissions ⁴	tons	15.8	0.338	0.417	0.406	12.1	0.026

Implementation of the well stimulation activities is estimated to result in exceedances of the NSR threshold of 5 tons/year for NO_x during Campaigns 1 and 2. No other criteria pollutants exceeded their respective NSR threshold. Emissions in Table 4.2-1 include emissions from the use of the existing Platform support vessel, the *WMT*. The use of the *WMT* and its resulting emissions are covered under the PTO, therefore these emissions can be removed from the total Program emissions. Table 4.2-2 below provides a summary of the estimated annual emissions for the well stimulation activities without the permitted emissions from the *WMT*.

In addition, the Platform Gilda PTO permits a total annual fuel throughput of 253,390 gallons for both crew boats and work boats, such as the *WMT*. A review of fuel consumption data from March 2025 to June 2025 indicates that the *WMT* averaged 360 gallons per day. Using this average, the *WMT* would use approximately 10,453 gallons per year during the well stimulation activities and is not expected to cause overall fuel consumption to exceed the throughput permitted in the PTO.

⁴ Represents three separate one-year campaigns over a five-years.

Table 4.2-2. Estimated Annual and Total Well Stimulation Emissions without WMT Emissions

Work Task	Units	NO _x	ROG	PM ₁₀ *	PM _{2.5} *	CO	SO ₂
Campaign 1	tons/year	2.92	0.084	0.022	0.022	3.60	0.007
Campaign 2	tons/year	2.92	0.084	0.022	0.022	3.60	0.007
Campaign 3	tons/year	3.09	0.060	0.015	0.015	2.57	0.005
VCAPCD NSR Threshold (tons/year)		5	5	15	--	--	15
Exceed Thresholds?		No	No	No	No	No	No
Total Emissions ⁴	tons	7.94	0.228	0.058	0.058	9.76	0.019

With the removal of emissions from the WMT, well stimulation activities would not exceed the NSRs threshold of 5 tons/year for NO_x during any of the three campaigns. In addition, the portable equipment used during the well stimulation activities is covered under PERP; therefore, no mitigation measures or additional permitting would be required.

The well stimulation activities will comply with CARB CHC regulations and APCD rules. In addition, power generation on Platform Gilda will be conducted in compliance with the requirements of the PTOs issued by the VCAPCD. PTO inspections will be conducted as required.

4.2.2.2 Greenhouse Gas Emissions

This section provides estimates of GHG emissions associated with the proposed well stimulation activities.

GHG emissions for the marine vessel and portable equipment utilized during the well stimulation portion of the Proposed Action were estimated by Padre using established emission factors from the CARB's CalEEMod User's Guide, Appendix D, Default Data Tables (Trinity, 2021), CalEEMod 2022 User Guide Appendix G (CARB, 2022a), MARPOL Regulations and U.S. EPA Port Emissions Inventory Guidance (U.S. EPA, 2020). A tabulation of assumptions, references, and calculations for the Program emission estimates are provided in Appendix C. Marine vessel and portable equipment horsepower and hours of use per day were provided by DCOR.

Table 4.2-3. Estimated Well Stimulation Activity GHG Emissions

Work Task	Units	N ₂ O	CH ₄	CO ₂	MTCO ₂ E
Campaign 1	Tons/year	0.019	0.022	1,060	967
Campaign 2	Tons/year	0.019	0.022	1,060	967
Campaign 3	Tons/year	0.017	0.016	833	760
VCAPCD Adopted GHG Significance Thresholds MTCO₂E/Year					10,000
Exceeds Threshold?					No
Total Emissions⁵	Tons	0.055	0.060	2,952	2,693

⁵ Represents three separate campaigns over a five-year Program.

GHG emissions from well stimulation activities are projected to remain below the VCAPCD significance threshold of 10,000 MTCO₂E during each of the three campaigns. Because GHG emissions from well stimulation activities would remain below the VCAPCD significance threshold and occur only temporarily, these activities are not expected to contribute meaningfully to climate change.

Lifecycle Greenhouse Gas Analysis

This section provides an analysis of lifecycle GHG emissions associated with the proposed Program as compared to a No Action alternative.

The analysis considers emissions across the entire lifecycle of oil and natural gas development and consumption. It analysis accounts for changes in oil consumption outside the U.S. driven by global price fluctuations from new production, as well as potential emissions from alternative energy sources that could be used if the proposed Program does not proceed. This GHG analysis is modeled on the assumption that existing laws, regulatory frameworks, and baseline supply and demand conditions remain constant. Should California, the United States and other nations adopt net-zero emissions objectives and implement significant policy reforms or technological innovations, substitution rates and the associated analytical outcomes could be substantially affected.

The proposed Program is anticipated to result in GHG emissions which primarily include CO₂, CH₄, and N₂O across all three stages. Upstream activities for this Program include well stimulation activities and associated vessel activities. Midstream and downstream activities pertain to onshore processing, transportation, and fuel consumption by the consumer.

Lifecycle Greenhouse Gas Emissions Estimating Methodology

The Greenhouse Gas Lifecycle Energy Emissions Model (GLEEM) was used to estimate the midstream and downstream emissions (Wolvovsky, 2025). Upstream GHG emissions were calculated based on emissions from marine vessels and portable equipment used during well stimulation activities (refer to Table 4.2-3). BOEM developed GLEEM to estimate midstream and downstream GHG emissions associated with oil, natural gas, and coal. GLEEM is distributed as a Microsoft Excel based GHG modeling tool, enabling users to calculate GHG emissions for various offshore oil and gas activity scenarios using the following user provided input:

- Lifetime projected oil production.
- Lifetime projected natural gas production.
- Upstream emissions estimates.
- No Action percentage of oil or natural gas to be replaced by other sources.

Lifecycle Greenhouse Gas Emissions Estimates

Over the next 20 years, Platform Gilda is projected to produce approximately 14 million barrels of oil and 13 million cubic feet of natural gas⁶; therefore, the GHGs emitted are estimated to total approximately 5,393,504 MTCO₂E of lifecycle emissions during upstream, midstream, and downstream activities. The oil and gas produced is not expected to affect overseas consumption. The lifecycle emissions estimate assumes that 100 percent of the emissions are from the produced oil and gas and that there are no substitutions from other energy sources. The largest portion of the reasonably foreseeable emissions comes from the downstream, with the least emissions coming from the upstream. This is because the proposed Program would utilize only existing facilities and equipment and would not require new infrastructure. Refer to Table 4.2-4 below for a summary of lifecycle GHG emissions. Copies of the GLEEM worksheets are provided in Appendix C.

Table 4.2-4. Estimated Proposed Program Lifecycle Total GHG Emissions

Emissions	CO₂ (metric tons)	CH₄ (metric tons)	N₂O (metric tons)	MTCO₂E
Upstream	2,678	0.054	0.049	2,693
Midstream	66,501	1,640	0.562	115,862
Downstream	5,257,631	207	40.7	5,274,949
Lifecycle	5,326,810	1,847	41.3	5,393,504

4.2.3 Water Quality

This section evaluates the potential effects of the proposed well stimulation Program on marine water quality within the Santa Barbara Channel. The Program would involve up to 38 frac-pack stages in 16 wells over a five-year period. Activities have the potential to affect water quality through accidental discharges from the Platform and support vessels, chemical handling on the Platform, a potential loss of well integrity during stimulation, and solid waste and debris associated with Platform operations. Because stimulation is conducted entirely from the Platform with no seabed contact, turbidity and seafloor disturbance do not occur. In addition, all stimulation fluids would be seawater based, and no fresh or potable water would be used for the stimulation treatments. Potential impacts are assessed below in relation to each pathway.

4.2.3.1 Routine Platform Discharges

Authorized Platform discharges, including produced water, deck drainage, sanitary waste, and non-contact cooling water, continue under the NPDES General Permit for Offshore Oil and Gas Exploration, Development, and Production Operations in Southern California (EPA Permit No. CAG280000). Under the Clean Water Act, the NPDES program is the federal permitting system that regulates point-source discharges to US waters by setting enforceable effluent limits, monitoring and reporting requirements, and best management practices to protect water quality.

Deck drainage on Platform Gilda is routed through containment and oil-water separation prior to any authorized discharge. The stimulation program does not create any new overboard

⁶ Production data provided by DCOR.

discharge; all stimulation flowback is retained on the Platform and reinjected through existing injection wells (closed-loop injection). The Program does not include open ocean discharge of well stimulation flowback fluids. Produced water remains subject to oil-and-grease limits (monthly average 29 mg/L; daily maximum 42 mg/L), a sheen prohibition, and whole-effluent toxicity (WET) requirements evaluated at the 100-meter mixing-zone point of compliance. All Platform personnel receive operational training in Safety and Environmental Management System (SEMS) procedures, Hazardous Waste Operations and Emergency Response (HAZWOPER) training, and emergency response drills. Given closed-loop handling of flowback fluids and unchanged discharge authorization, routine Platform discharges are not expected to change in character or load.

4.2.3.2 Accidental Releases from Vessels

Program activities require periodic support from crew and supply vessels. Vessel fueling occurs only in port; no boat-to-boat fueling will be conducted. DCOR would implement their approved OSRP which covers both Platform and vessel operations, with pre-staged response support and resources through approved On-site Spill Response Organizations (OSROs) in Ventura and Santa Barbara. These precautions ensure timely containment and recovery, so that any potential spill will be localized, short-lived, and effectively managed.

4.2.3.3 Accidental Releases Associated with Well Stimulation Activities

Stimulation treatments would require the use of several additives that serve various functions within the hydraulic fracturing process (Table 2.4-1). Chemical handling and containment on the Platform would be monitored and reported, as required by the EPA. Stimulation additives are handled on deck within covered secondary containment. Totes and drums are staged on steel-bottom containment pallets, and transfers use closed connections over contained deck areas that drain to the Platform's oily-water system, which remains subject to NPDES sheen prohibitions and oil-and-grease controls prior to any authorized discharge.

A typical stimulation stage is expected to use an average of 100,000 lbs of proppant; however, some stages would require closer to 75,000 lbs. Table 4.2-5 provides a conservative summary of additive amounts and chemical constituents for the 100,000-lb scenario. In the event of an accidental release, actual chemical volumes during most stages would be proportionally lower. The toxicity of well stimulation chemical constituents has the potential to affect marine organisms; however, due to the lack of toxicity data for many constituents of well stimulation chemicals, the effects within the pelagic mixing zone are not fully understood. Studies on marine life around producing platforms have shown that concentrations of pollutants (polycyclic aromatic hydrocarbons, polychlorinated biphenyls, dichloro diphenyl trichloroethane (DDT)) in fish were not elevated compared to those in natural areas (Argonne National Laboratory, 2016), suggesting that chemicals in discharged produced water and treated stimulation fluids may not be of high enough concentrations to adversely affect marine life around the platforms (Argonne National Laboratory, 2016).

Table 4.2-5. Additive Amounts and Chemical Constituents for a 100,000-Pound Frac Pack Treatment

Additive (Product ID)	Per-stage Amount	Program Total Amount*	Chemical Constituents (CAS #)
Environmental Guar Slurry (J564)	500 gal	19,000 gal	2-Butoxyethanol (111-76-2)
EZEFLO Surfactant (F103)	120 gal	4,560 gal	Propan-2-ol (67-63-0) 2-Butoxyethanol (111-76-2) Ethoxylated C11 Alcohol (34398-01-1) Ethoxylated Alcohol (68131-39-5) 1-undecanol (impurity; 112-42-5)
Emulsion Preventer (W054)	55 gal	2,090 gal	Methanol (67-56-1) Oxirane, Methyl-, polymer with Oxirane (9003-11-6) Alcohols, C7-9-iso-, C8-rich, ethoxylated (78330-19-5) Alcohols, C9-11-iso-, C10-rich, ethoxylated (78330-20-8) Alcohol, C11-14, ethoxylated (78330-21-9) N,N-Dimethyl-N-dodecyl benzylaminium chloride (139-07-1) Solvent naphtha (petroleum), heavy arom. (64742-94-5) 2-Propen-1-aminium, N,N-dimethyl-N-2-propen-1-yl-, chloride (1:1), homopolymer (26062-79-3) Naphthalene (impurity; 91-20-3)
Scale Inhibitor (L065)	55 gal	2,090 gal	Ethylene Glycol (107-21-1) Sodium chloride (7647-14-5) Calcium chloride (10043-52-4)
Borate Crosslinker (J532)	350 gal	13,300 gal	Sodium tetraborate decahydrate (1303-96-4)
EB-Clean Breaker (encapsulated; J475)	150 lb	5700 lb	Diammonium peroxodisulphate (7727-54-0) Aliphatic co-polymer (proprietary)
Breaker (raw; J218)	20 lb	760 lb	Diammonium peroxodisulphate (7727-54-0)
Biocide (M275)	20 lb	760 lb	reaction mass of: 5-chloro-2-methyl-4-isothiazolin-3-one [EC no. 247-500-7] and 2-methyl-2H-isothiazol-3-one [EC no. 220-239-6] (3:1) (55965-84-9)

Note: *Program totals assume 38 stages.

Accident scenarios associated with well stimulation activities have been evaluated in the *Programmatic Environmental Assessment of the Use of Well Stimulation Treatments on the Pacific Outer Continental Shelf* (Argonne National Laboratory, 2016), which identifies two general categories of accidental releases: sea-surface accidents and sub-seafloor releases resulting in a surface expression.

Sea-Surface Accidents. The most likely spill scenarios associated with well stimulation activities are small leaks during chemical transfer or equipment disconnections. Any liquids spilled on deck would be contained, recovered, and managed for reuse or onshore disposal. With these measures and closed-loop reinjection of all flowback, accidental stimulation-related releases would be localized to the deck and would not measurably affect receiving water quality. Consistent with the Well Stimulation Programmatic Environmental Assessment, sea-surface releases would result in short-term, localized water quality effects that would rapidly diminish with distance from the release point due to dilution in seawater (Argonne National Laboratory, 2016).

Sub-Seafloor Accidents. There is a low likelihood of a release during stimulation due to the target stimulation depths. Fracturing depths would be greater than 4,500 feet below the seafloor surface and the fracturing height and half-lengths would be a fraction of the stimulation depth (150 – 300 ft and 100 – 200 ft, respectively). Sub-seafloor releases resulting in a surface expression are therefore not reasonably foreseeable for the proposed Program, consistent with the conclusions of the Well Stimulation Programmatic Environmental Assessment (Argonne National Laboratory, 2016). In addition, implementation of several safe guards including well integrity monitoring and testing practices further minimize these risks. Prior to stimulation, an independent registered professional engineer will verify and sign planned casing programs for compliance with 30 CFR § 250.420 and certify that they are suitable under expected wellbore conditions. Casing design, including liners, is required to withstand tensile, compressive, and buckling loads, burst and collapse pressures, thermal effects, and combinations thereof. Production casing is cemented with sufficient cement to isolate all hydrocarbon-bearing zones above the shoe, with a minimum of 500 feet measured depth (MD) above the casing shoe and 500 feet MD above the uppermost hydrocarbon-bearing zone. Prior to stimulation, the production casing or liner above the sand-control packer will be pressure-tested to the maximum anticipated stimulation pressure, and the test results will be recorded and monitored for abnormalities during the treatment with the Platform's data acquisition system.

Worst case discharge (WCD) scenarios and spill response planning for Platform Gilda, including those applicable to well stimulation activities, are addressed in Section 2.1.4 above, as well as by DCOR's approved OSRP, which complies with 30 CFR §§ 550.243(h) and 550.250(a). The WCD specific to the proposed Program is less than or equal to the currently approved WCD for Platform Gilda under the existing DPP and is therefore already covered by existing spill response planning and response capabilities.

As described in the Well Stimulation Programmatic Environmental Assessment, even in the unlikely event of an accidental release, effects on water quality would be localized, temporary, and reduced through rapid dilution and implementation of spill response measures (Argonne National Laboratory, 2016).

4.2.3.4 Trash and Marine Debris

The proposed Program would generate small quantities of solid waste, including packaging materials, spent containers, and routine operational debris. All trash and debris would be managed in accordance with Platform waste management procedures, with materials collected, stored, and transported to shore for proper disposal or recycling. No disposal of solid waste to the ocean would occur. As a result, the proposed Program would not contribute to marine debris or adversely affect marine water quality.

4.2.3.5 Turbidity and Seafloor Disturbance

Stimulation activities would be conducted entirely from the existing Platform with no anchoring or seabed contact by construction assets, no conductor or jacket cutting, and no seabed excavation or jetting. Because anchoring is a primary cause of turbidity during offshore activities and anchoring would not occur, the proposed Program would not result in sediment resuspension or increased turbidity in the water column. Water clarity and suspended sediment concentrations would remain unchanged.

Design features of the proposed Program, including closed-loop handling of stimulation fluids, secondary containment for chemicals, continued compliance with NPDES permit requirements, and implementation of spill prevention and response plans, are integral components of the Program and serve to avoid or minimize potential water quality impacts. When considered together with the absence of seafloor disturbance, these measures ensure that impacts to water quality would not be adversely affected.

4.2.4 Biological Resources

Well stimulation activities, including hydraulic fracturing and related treatments and workover activities have been analyzed with respect to biological resources in multiple published documents, including: BOEM/BSEE *Biological Assessment of Offshore Oil and Gas Development and Production Activities in the Southern California Planning Area* (BOEM, 2023, and 2025); the USFWS *Biological Opinion on the Existing Outer Continental Shelf Oil and Gas Development and Production Activities in the Southern California Planning Area, San Luis Obispo, Santa Barbara, Ventura, and Los Angeles Counties, California* (USFWS, 2025); and NMFS's *Biological and Conference Opinion on the Development and Production of Oil and Gas Reserves and Beginning Stages of Decommissioning within the Southern California Planning Area of the Pacific Outer Continental Shelf Region* (NMFS, 2024c). These reports are incorporated by reference and summarized below.

The analyses evaluated well stimulation related risk pathways including platform and vessel noise, authorized liquid discharges, and spill risk. In consultation NMFS and USFWS concurred that well stimulation treatments are part of the routine drilling and production operations constrained by established discharge limits, handling and containment requirements, and species-protection measures, and therefore do not identify distinct, unmitigated exposure pathways unique to well stimulation treatments beyond those already analyzed for comparable operational phases. Furthermore, they determined that the reinjection of drilling fluids, limited quantity of releases, application of mixing zone monitoring requirements, and dilution by natural ocean currents reduce the concentrations of potential contaminants; therefore, discharges related to O&G operations are not likely to adversely affect ESA-listed species (BOEM, 2023; 2025).

Potential impacts due to Program activities analyzed in this report include an increase in vessel traffic, potential degradation of water quality and seafloor habitats from the discharge of contaminants in the event of an accidental spill from Program vessels or well casings and increased underwater noise. Over the proposed five-year Program, it is anticipated that up to six wells could be stimulated in a single year, with 16 wells total planned for stimulation, depending on operational logistics, permitting timelines, and equipment availability. These proposed stimulation wells will increase Platform Gilda's production above current volumes while still being

below both the historical maximum and the level approved in the original DPP. Potential impacts are described below.

4.2.4.1 Vessel Traffic

Each stimulation campaign will require a crew of approximately ten specialized personnel, including crew supervisors, equipment operators, engineers, and safety staff. Personnel will be mobilized to the Platform via crew transfer vessels in coordination with existing Platform logistics.

The stimulation Program is planned over a five-year period, with up to six wells stimulated during a single year campaign. The Program schedule is expected to follow a batch completion model, wherein each year's group of wells is completed during a single annual campaign. Each well stimulation will be performed over one day at the Platform, followed by a three-day standby period before the next stage. Equipment needed for well stimulation will be mobilized and demobilized every year over the five-year period, resulting in approximately 88 additional trips per year to Platform Gilda.

During these trips, Program vessels will utilize (or continue to utilize) the existing U.S. Coast Guard Traffic Separation Scheme (TSS) and Joint Oil Fisheries Liaison Office (JOFLO) corridors within the Santa Barbara Channel. During Program-related transit, captains will remain at least 100 m away from all sighted whale species, and 50 m away from dolphins and sea turtles. Transit vessel speed will be reduced when feasible to minimize the potential for vessel strikes with marine wildlife. Due to the small size of the proposed Program vessels, in combination with the use of established vessel traffic lanes, vessel strikes with marine wildlife are not expected to occur.

4.2.4.2 Underwater Noise

Increased noise levels affecting the pelagic environment would occur during vessel transit while mobilizing and demobilizing well stimulation equipment each year on Platform Gilda. Transiting vessels generate continuous sounds from their engines, propeller cavitation, onboard machinery, and hydrodynamics of water flow (Cooperman et al., 2024). The actual radiated sound depends on several factors, though generally vessel noise increases with ship size, power, speed, propeller blade size, number of blades, and rotations per minute. The faster the propeller rotates the more cavitation noise, and the higher the frequency of noise produced (i.e., a slowly rotating propeller generates low frequencies [below 10 Hz] and a faster spinning propeller can produce frequencies up to 20 kilohertz [kHz]). Program vessels will continue to utilize corridors within the Santa Barbara Channel and are not anticipated to increase underwater noise significantly within the Program region.

Well stimulation activities have the potential to create underwater noise similar to noise levels created during Platform drilling activities. The available data show that there is little to no increase in noise levels from fixed platforms during drilling operations as compared to non-drilling operations (Noise Control Engineering, 2007). Pressurized fluids would likely cause conductors to vibrate, creating indirect underwater noise sources; however, most of the noise source would be produced under the seafloor and would dissipate before reaching open water. In addition, equipment activity and Program operations originating on the Platform have the potential to create noise that may penetrate the water column; however, activities would be temporary and noise

levels are not expected to exceed the existing operation levels or hearing thresholds that would cause adverse effects to marine wildlife.

4.2.4.3 Water Quality

Accidental Release of Well Stimulation Fluid. Accidental release of well stimulation fluid could adversely affect water quality and associated marine biota. In general, field studies have shown that the concentrations of trace metals and hydrocarbons in the tissues of fish around production platforms are within background levels and that effects of produced water discharges on benthic organisms and fish species have not been observed and are not expected to affect the available prey base for ESA-listed marine mammals or sea turtles (Argonne National Laboratory, 2016; BOEM, 2023).

The proposed Program incorporates layered engineering and procedural controls that make such releases unlikely. All stimulation flowback is contained in a closed-loop fluids-management system in which returns are retained on the platform and reinjected, with no unauthorized discharge to the ocean. Chemical handling and containment are managed through covered secondary containment, closed-connection transfers over contained deck areas, and segregation of incompatible materials. Well integrity is verified by an independent registered professional engineer who reviews and certifies casing programs for compliance with 30 Code of Federal Regulations § 250.420; casing and liners are designed to withstand anticipated stresses, cemented to isolate hydrocarbon-bearing zones, and pressure-tested before stimulation to confirm mechanical integrity. Produced-water management will remain in compliance with, and subject to monitoring under, the active NPDES permit, including limits for oil and grease, whole-effluent toxicity, and a sheen prohibition. The base fluid for all treatments is filtered seawater sourced directly from the surrounding marine environment using Platform Gilda's existing seawater pumps; this fluid is mixed with chemical additives to form a viscous gel capable of transporting proppant (high-grade silica sand) under high-pressure conditions, with a full description of additives provided in Section 2.4 (Fluids, Additives, and Source Materials). While an accidental release would have the potential to cause significant impacts, the combination of mandated well-integrity testing conducted prior to and throughout stimulation (including pressure testing of casing and tubing to confirm the absence of leaks), robust containment and transfer practices, and permit-driven monitoring and discharge limits reduces the probability of occurrence to a low level; additional details on leak-prevention requirements are provided in Section 2.8.1 (Well Integrity Monitoring and Safety).

Oil Spill Potential. The unintentional release of petroleum into the marine environment from proposed Program activities is limited to Program vessels and equipment. A petroleum release could result in potential impacts to the marine biota, particularly avifauna and early life stage forms of fish and invertebrates, which are sensitive to those chemicals. Refined products (i.e., diesel, gasoline.) are more toxic than heavier crude or Bunker-type products, and the loss of a substantial amount of fuel or lubricating oil during survey operations could affect the water column, seafloor, and associated biota, resulting in their mortality or substantial injury, and in alteration of the existing habitat quality.

Although many marine organisms have created adaptive strategies to survive in their environment, when these marine organisms are introduced to oil, it adversely affects them physiologically. For example, physiological effects from oil spills on marine life could include the

contamination of protective layers of fur or feathers, loss of buoyancy, and loss of locomotive capabilities. Direct lethal toxicity or sub-lethal irritation and temporary alteration of the chemical make-up of the ecosystem could also occur.

Program activities are not expected to have long-term, significant effects on open water habitat or species. A regional OSRP has been developed and will be used to direct the containment and recovery of any Program-related vessel or equipment spills that would have the potential to be accidentally released into the marine waters. In addition, onboard and supporting equipment and the procedures specified in the spill plan are expected to reduce the effects of accidentally discharged petroleum by facilitating rapid response and cleanup operations. The Program vessels will adhere to a zero-discharge policy. Due to the small size of the proposed Program vessels, in combination with the use of established vessel traffic lanes, the potential release of fuel and its resulting impacts are not likely to affect marine wildlife.

4.2.5 Commercial and Recreational Fishing

Potential impacts due to Program activities include minor increases in vessel presence and a potential degradation of water quality and seafloor habitats from the incidental discharge of contaminants in the event of an accidental spill during Program activities. Potential impacts are described below.

4.2.5.1 Vessel Safety Zone

Impacts to commercial and recreational fishing operations are expected to be minor within the Affected Environment as proposed activities will occur within the existing platform safety zone, which extends out 1,640 ft (500 m) from the outer edge of Platform Gilda. This safety zone applies to all vessels over 100 ft (30.4 m), and is recommended for vessels less than 100 ft. Program activities would be centralized on the Platform during well stimulation and are not anticipated to impact commercial and recreational fishing access outside of the existing safety zones. To support Program activities, 88 vessel trips will be added to the existing supply and crew boats support schedule for Platform Gilda; however, Program vessels would utilize (or continue to utilize) established U.S. Coast Guard Traffic Separation Scheme (TSS) lanes and Joint Oil Fisheries Liaison Office (JOFLO) corridors within the Santa Barbara Channel. At all times, Program vessels would operate using the highest level of navigational safety and in accordance with applicable international and U.S. Coast Guard regulations and guidelines, thereby minimizing potential interference with ongoing fishing activities

4.2.5.2 Accidental Release of Contaminants

The unintentional release of well stimulation fluid into the marine environment from proposed Program activities could result in significant impacts to water quality and associated fisheries in the region. As discussed in Section 4.2.5.3 above, the proposed Program incorporates layered engineering and procedural controls that make such releases unlikely. Furthermore, the unintentional release of petroleum into the marine environment from proposed Program activities is limited to Program vessels and equipment. While a petroleum release could result in potential impacts to the marine biota, a regional OSRP has been developed and will be used to direct the containment and recovery of any Program-related vessel spills that would have the potential to be accidentally released into the marine waters.

4.2.5.3 Seafloor Habitats

All construction and support vessels associated with the well stimulation program would utilize pre-existing moorings and would not anchor or otherwise contact the seabed, thereby avoiding disturbance to benthic habitats.

4.2.6 Recreation and Tourism

Potential impacts due to Program activities include minor increases in vessel traffic in the Santa Barbara Channel for the duration of the Program. Potential impacts are described below.

4.2.6.1 Vessel Safety Zone

Recreation and tourism opportunities are limited within the Program area as proposed activities will occur within the existing Platform safety zone, which extends out 1,640 ft (500 m) from the outer edge of Platform Gilda. This safety zone applies to all vessels over 100 ft (30.4 m), and is recommended for vessels less than 100 ft. Program activities would be centralized on each Platform during well stimulation and are not anticipated to impact recreational activities outside of the existing safety zones. Furthermore, Program vessels will utilize (or continue to utilize) the existing U.S. Coast Guard Traffic Separation Scheme (TSS) and Joint Oil Fisheries Liaison Office (JOFLO) corridors within the Santa Barbara Channel. At all times, Program vessels will operate using the highest level of navigational safety and in accordance with International and USCG regulations and guidelines.

4.2.7 Socioeconomics

During Program activities, work would occur on Platform Gilda, within the existing safety zone and along established vessel transit routes. Tourism, recreation and commercial ocean industries that operate in the region would not be displaced during Program activities and would continue to have access to areas outside of the existing safety zone; therefore, there should be no direct effects to socioeconomics aside from goals of domestic production and the benefit of local oil and gas industry jobs.

The unintentional release of well stimulation fluid into the marine environment from proposed Program activities could result in significant impacts to water quality and ocean-dependent industry; however, impacts are not anticipated due to well integrity testing which will be conducted prior to and throughout any stimulation activity, including pressure testing of the casing and tubing to confirm the absence of abnormalities. Pre-stimulation wellbore verification would include well integrity reviews, including oversight by an independent registered professional engineer who reviews and certifies casing programs in compliance with 30 CFR § 250.420. Casing and liners are designed to withstand anticipated pressures, cemented to isolate hydrocarbon-bearing zones, and pressure-tested prior to stimulation to confirm mechanical integrity. A full discussion of the regulatory requirements of well stimulation testing and monitoring is detailed in Section 2.8. The Program does not propose to perform any open ocean releases and all stimulation flowback is retained on the Platform and reinjected.

Chemical handling and containment on the Platform would be monitored and reported, as required by the EPA, and would include covered secondary containment, closed-connection transfers over contained deck areas and segregation of incompatible materials. Unintentional releases of petroleum could occur from Program vessels and equipment. Program vessels will

utilize (or continue to utilize) the existing U.S. Coast Guard Traffic Separation Scheme (TSS) and Joint Oil Fisheries Liaison Office (JOFL) corridors within the Santa Barbara Channel. At all times, Program vessels will operate using the highest level of navigational safety and in accordance with International and USCG regulations and guidelines.

While a petroleum release could result in potential impacts to the marine biota, a regional OSRP has been developed and will be used to direct the containment and recovery of any Program-related vessel spills that would have the potential to be accidentally released into the marine waters. The OSRP includes detail on OSRO coverage and drills to ensure readiness for any vessel or Platform-related spill.

Although no effect on socioeconomics is anticipated, the following procedures will be instituted to further reduce the possibility of negative effects on the offshore industries.

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APPENDIX A

PERMIT TO OPERATE

**VENTURA COUNTY
AIR POLLUTION CONTROL DISTRICT**

669 County Square Drive
Ventura, CA 93003
805/645-1400

PART 70 PERMIT

Number 01492

Permit Term: Issue Date to December 31, 2022

Company Name / Address:

DCOR, LLC
290 Maple Court, Suite 290
Ventura, CA 93003

Facility Name / Address:

Platform Gilda
OCS Lease P-0216
Offshore of Ventura, CA

Responsible Official:

Mr. Robert L. Garcia
V.P. California Offshore Operations
805/535-2030

Title V Contact:

Ms. Claire Crocker
Air Compliance Coordinator
805/535-2060
ccrocker@dcorllc.com

The Part 70 permit consists of this page and the tables, attachments and conditions listed in the attached table of contents. The Part 70 permit application is included for reference only and is not a part of the Part 70 permit.

Pursuant to Rule 33.1, the Part 70 permit shall also serve as a permit to operate issued to fulfill the requirements of Rule 10.B.

For:

Michael Villegas
Air Pollution Control Officer



Kerby Zozula, Manager
Engineering Division

April 2, 2018

PART 70 PERMIT NO. 01492
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13. Part 70 Permit Application Package

Note: The Part 70 permit application is included for reference only and is not a part of the Part 70 permit.

1.a. PERMIT REVISIONS TABLE

Application No.	Issue Date	Description / Category	Revised Permit Sections
01492-161	11/17/98	Added three existing wells to the permit / Minor Part 70 Permit Modification	<ul style="list-style-type: none"> • Signature Cover Page • Table of Contents • Table No. 2 • Table No. 3 • Table No. 4 • Oil Well List • Attachment PO1492PC1
01492-171	06/30/99	Replaced Work Boat Engines / Minor Part 70 Permit Modification	<ul style="list-style-type: none"> • Signature Cover Page • Table of Contents • Permit Revisions Table • Table No. 2 • Table No. 3 • Table No. 4
01492-181	03/09/00	Additional Work Boat Engines / Minor Part 70 Permit Modification Change Responsible Official / Administrative Amendment	<ul style="list-style-type: none"> • Signature Cover Page • Table of Contents • Periodic Monitoring Summary • Permit Revisions Table • Table No. 2 • Table No. 3 • Table No. 4 • Attachment PO1492PC1
01492-191	08/23/00	Additional Crew Boat Engines / Minor Part 70 Permit Modification	<ul style="list-style-type: none"> • Signature Cover Page • Table of Contents • Permit Revisions Table • Periodic Monitoring Summary • Table No. 2 • Table No. 3 • Table No. 4 • Attachment PO1492PC1
01492-231	06/04/01	Change Title V Contact Person / Administrative Amendment	<ul style="list-style-type: none"> • Signature Cover Page • Permit Revisions Table

Application No.	Issue Date	Description / Category	Revised Permit Sections
01492-221	02/12/02	Permitting of Backup Utility Generators pursuant to District Rule 23 Policy Change / Minor Part 70 Permit Modification	<ul style="list-style-type: none"> • Signature Cover Page • Table of Contents • Permit Revisions Table • Periodic Monitoring Summary • Table No. 2 • Table No. 3 • Table No. 4 • Exempt Equipment List • Attachment PO1492PC1 • Attachment PO1492PC3
01492-241	01/13/03	Permit Reissuance for Term: January 1, 2003 to December 31, 2007	See "Stationary Source Description"
01492-251	06/09/03	Administrative Amendment to change the Title V Contact / District revised heater emission factors per EPA AP-42 changes	<ul style="list-style-type: none"> • Signature Cover Page • Permit Revisions Table • Table No. 4
01492-261	01/29/04	Administrative Amendment to change the Title V Contact	<ul style="list-style-type: none"> • Signature Cover Page • Permit Revisions Table
01492-271	06/28/04	Administrative Amendment to change the Responsible Official and Title V Contact	<ul style="list-style-type: none"> • Signature Cover Page • Permit Revisions Table
01492-281	09/09/04	Administrative Amendment to change the Company Name	<ul style="list-style-type: none"> • Signature Cover Page • Permit Revisions Table • Attachment PO01492PC1
01492-291	02/15/05	Administrative Amendment to change the Company Name (Transfer of Ownership)	<ul style="list-style-type: none"> • Signature Cover Page • Permit Revisions Table
01492-301	10/09/06	Administrative Amendment to change the company name and address	<ul style="list-style-type: none"> • Signature Cover Page • Permit Revisions Table
01492-311	08/14/07	Change of contact person Removing of Rule 71.5 Additional crew boat engines Addition of Boom Boat/gasoline engines Minor Part 70 Permit Modification Removing Glycol Reboiler	<ul style="list-style-type: none"> • Signature Cover Page • Table of Contents • Permit Revisions Table • Stationary Source Description • Periodic Monitoring Summary • Table No. 2 • Table No. 3 • Table No. 4 • Attachment PO1492PC1 • Attachment 71.5.N1 (remove)

Application No.	Issue Date	Description / Category	Revised Permit Sections
01492-321	01/24/08	Permit Reissuance for Term January 1, 2008 to December 31, 2012	See "Permit Summary and Statement of Basis"
01492-331	07/28/08	Additional work boat with 5 engines Minor part 70 permit Modification	<ul style="list-style-type: none"> • Signature Cover Page • Permit Revisions Table • Table No. 2 • Table No. 3 • Table No. 4 • Attachment PO1492PC1
01492-341	01/26/10	Additional two (2) Crew Boats with 9 engines Additional six (6) Work Boats with 32 engines	<ul style="list-style-type: none"> • Signature Cover Page • Permit Revisions Table • Table No. 2 • Table No. 3 • Table No. 4 • Attachment PO1492PC1
01492-351	01/11/11	Administrative Amendment to change the Responsible Official	<ul style="list-style-type: none"> • Signature Cover Page • Permit Revisions Table • Table No. 4
01492-371	07/24/12	Administrative Amendment to Add a Responsible Official	<ul style="list-style-type: none"> • Signature Cover Page • Permit Revisions Table
01492-361	08/28/13	Permit Reissuance for Five Year Term Ending December 31, 2017	See "Permit Summary and Statement of Basis"
01492-381	06/09/14	Permitted Catalyst at Two Crane Engines / Minor Part 70 Permit Modification	<ul style="list-style-type: none"> • Signature Cover Page • Permit Revisions Table • Periodic Monitoring Summary • Table No. 2 • Table No. 3 • Table No. 4 • Attachment 40CFR63ZZZN5 • Attachment 54.B.1-OCS • Attachment 54.B.2-OCS • Attachment 74.11.1

Application No.	Issue Date	Description / Category	Revised Permit Sections
01492-401	01/06/16	Administrative Amendment to change the Title V Contact. Remove Boom Boat	<ul style="list-style-type: none"> • Signature Cover Page • Table of Contents • Permit Revisions Table • Periodic Monitoring Summary Conditions • Table No. 2 • Table No. 3 • Table No. 4 • Attachment PO1492PC1
01492-411	04/13/16	Administrative Amendment to change the Title V Contact	<ul style="list-style-type: none"> • Signature Cover Page • Permit Revisions Table
01492-391	06/20/16	Replace an Existing 325 BHP Caterpillar Diesel Engine With a New 619 BHP Caterpillar Diesel Engine	<ul style="list-style-type: none"> • Signature Cover Page (Section No. 1) • Table of Contents (Section No. 1) • Permit Revisions Table (Section No. 1) • Permit Summary and Statement of Basis (Section No. 1) • Periodic Monitoring Summary (Section No. 1) • Table No. 2 (Section No. 2) • Table No. 3 (Section No. 3) • Table No. 4 (Section No. 4) • Remove 40CFR63 ZZZZN3 (Section No. 7) • Attachment PO 1492PC3 (Section No. 8)
01492-421	04/02/18	Permit Reissuance for Five Year Term Ending December 31, 2022	See "Permit Summary and Statement of Basis"

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1.b. PERMIT SUMMARY AND STATEMENT OF BASIS

Stationary Source Description

This stationary source is an oil platform, Platform Gilda, located offshore of Ventura, California. The source is a crude oil production facility and has a Standard Industrial Classification (SIC) Code of 1311, Crude Oil Production. The source operates various oil production and processing equipment, including wells, tanks, wipe cleaning, a flare, a 4.0 MMBTU/Hr heater, and two 325 BHP Caterpillar diesel engines and one 619 BHP Caterpillar diesel engine. The diesel engines on Platform Gilda are used for the operation of cranes and for backup electrical power. Other emission units on the permit include crew boat engines and work boat engines. The platform is powered by grid electricity via an undersea cable. This stationary source is subject to the Part 70 permit program based upon the potential to emit reactive organic compounds (ROC) and nitrogen oxides (NO_x).

As discussed in more detail throughout this Permit Summary and Statement of Basis, this permit applies to emissions units that are required to have a permit to operate pursuant to District Rule 10, "Permits Required", and District Rule 23, "Exemptions from Permit". These emissions units are listed in Table No. 2 in Section No. 2 of this permit. However, as discussed below, some equipment that is exempt from permit pursuant to District Rule 23, "Exemptions from Permit", may be subject to District rules such as District Rule 50, "Opacity". This includes "Insignificant Activities" as listed in Section No. 6 of the permit. In addition, "Short Term Activities" as listed in Section No. 10 of the permit are subject to certain rules and regulations. This permit does not shield the permittee from complying with any Federal, State, or District rule or regulation that is not specifically addressed in the permit or any rule or regulation that may come into effect during the term of the permit.

Stationary Source Emissions

In Ventura County, the Part 70 permit thresholds are 50 tons per year for ROC and NO_x and 100 tons per year for PM, SO_x, and CO as Ventura County is not in attainment with the federal ozone standard. This stationary source is subject to the Part 70 permit program based upon the potential to emit of nitrogen oxides (NO_x) in excess of these thresholds as shown in Table No. 4 in Section No. 4 of this Permit to Operate. The purpose of Table No. 4 is to document the permitted emissions of the criteria pollutants ROC, NO_x, PM, SO_x, and CO for this stationary source. District Rule 29, "Conditions on Permits", requires permitted emissions to be included on each Permit to Operate. District Rule 29 requires that annual permitted emissions be based on a 12 calendar month rolling period and be expressed in units of tons per year. Hourly permitted emissions are required to be expressed in units of pounds per hour. Permitted emissions for a stationary source are required to be determined by aggregating the permitted emissions for each emissions unit at the stationary source.

Criteria pollutant emissions (ROC, NO_x, PM, SO_x, and CO) result from the combustion of diesel fuel, natural gas, and produced gas in the engines, heater, and flare. Criteria pollutants are also emitted from the diesel and gasoline engines associated with the crew boats and work boats.

Reactive Organic Compound (ROC) emissions result from the production, storage and handling, of crude oil.

This stationary source is not a major source of federal Hazardous Air Pollutants (HAPs). The source is well below the HAP major source levels of 10 tons per year of a single HAP or 25 tons per year of combined HAPs. There are no Maximum Achievable Control Technology (MACT) major-source standards that apply to this facility. As described below, there are some applicable area-source MACT standards for this stationary source. The Part 70 Permit re-issuance application includes a summary of HAPs emissions (in the units of pounds per year). The purpose of the Air Toxics “Hot Spots” Information and Assessment Act of 1987 (California Health and Safety Code Section 44300) is to collect air toxics emission data, to identify facilities having localized adverse health impacts, to ascertain health risks, to notify nearby workers and residents of significant risks, and to reduce significant risks if they exist. Platform Gilda has not been subject to the State of California AB2588 Air Toxics “Hot Spot” Program because of its remote location.

The United States EPA has added greenhouse gases (GHGs) to the list of regulated air pollutants. As of January 2, 2011, EPA has required that GHGs be calculated for each Title V stationary source and included in the Part 70 Permit. However, in a Federal Register notice dated August 19, 2015, EPA ruled that GHG emissions alone cannot be used to determine Title V applicability. This ruling was based on the U.S. Supreme Court decision of June 23, 2015. Greenhouse gases are defined as the aggregate group of six greenhouse gases: carbon dioxide, nitrous oxide, methane, hydrofluorocarbons (by category), perfluorocarbons (by category), and sulfur hexafluoride. Carbon dioxide equivalent emissions (CO_{2e}) is the amount of greenhouse gases emitted relative to the global warming potential of each pollutant.

The CO_2 potential to emit for this stationary source has been calculated to be 8,626 tons per year. The District’s potential to emit is based on the permitted annual combustion and operational (hours per year) limits listed in Table No. 3 of the permit. The District has used emission factors of 10.14 kg CO_2 /gallon diesel (22.33 lb CO_2 /gallon diesel) and 53.02 kg CO_2 /MMBTU natural gas (116.78 lb CO_2 /MMBTU natural gas) from the *Regulation For The Mandatory Reporting of Greenhouse Gas Emissions*, California Code of Regulations, title 17, Subchapter 10, Article 2, sections 95100 to 95133; Appendix A, Table 4. This CO_2 potential to emit does not include insignificant activities or equipment exempt from permit pursuant to Rule 23, “Exemptions From Permit”.

Compliance History

Upon reissuance of this Part 70 permit, the facility was determined to be in compliance with all applicable requirements.

For the time period January 1, 1996 to September 25, 2017, the facility received ten (10) Notices of Violation (NOV) as detailed in the “NOV by Facility” report for Facility No. 01492 located at the end of this section of the Part 70 permit.

Equipment Description and Applicable Requirements - General

Applicable requirements for this stationary source are listed throughout the permit. The Table of Contents in the front of the permit summarizes the applicable requirements including the equipment specific requirements, the general applicable requirements, and the applicable requirements for short-term activities. Table No. 2 in Section No. 2 of this Permit to Operate details the applicable requirements for specific emissions units at the facility. Permit conditions that enforce these requirements are listed in Section No. 7, "Specific Applicable Requirements" and Section No. 8, "Permit Specific Conditions" of this permit.

In addition to the emission unit specific requirements in Section No. 7 and Section No. 8, there are additional general requirements that may apply to the emissions units listed in this table, or to the stationary source as a whole. Furthermore, some general requirements may apply to emissions units or short-term activities not required to be specifically listed on the permit. These general requirements are contained in the following sections of the Permit: Section No. 9, "General Applicable Requirements"; Section No. 10, "General Requirements for Short-Term Activities"; Section No. 11, "General Permit Conditions"; and Section No. 12, "Miscellaneous Federal Program Conditions". A detailed applicability discussion and additional legal basis for the permit condition(s) is included with each attachment or set of permit conditions.

Equipment Description and Applicable Requirements - Specific

The tanks at this facility are subject to Rule 71.1, "Crude Oil Production and Separation". The tanks are equipped with vapor recovery for Rule 71.1 compliance. The permitted pit is equipped with a cover in order to comply with Rule 71.4, "Petroleum Sumps, Pits, Ponds, and Well Cellars".

Rule 74.9, "Stationary Internal Combustion Engines", exempts diesel engines used to power cranes from the provisions of the rule. The backup diesel engine is exempt from Rule 74.9 because it is operated less than 200 hours per year and/or operated during an emergency. Other emergency diesel engines that are exempt from permit pursuant to Rule 23.D.7 are exempt from Rule 74.9 because they are only operated during an emergency. Therefore, both the permitted and exempt diesel engines on the platform are not required to meet the emission limits of Rule 74.9.

The diesel engines are subject to the California Airborne Toxic Control Measure (ATCM) For Stationary Compression Ignition Engines; however, the ATCM exempts engines operated on OCS Platforms from the emission standards of the ATCM. The engines are required to comply with the fuel and the recordkeeping requirements of the ATCM.

The 325 BHP Caterpillar diesel crane engines on the platform are required to comply with the "National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE MACT) and are subject to a carbon monoxide (CO) limit. The 325 BHP Crane engines are equipped with oxidation catalysts and diesel crankcase ventilation filters to comply with the RICE MACT.

The 619 BHP Caterpillar emergency back-up utility generator is subject to, and complies with, 40 CFR Part, Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines.

The heater is equipped with a low NOx burner to meet the NOx and CO emission concentration limits of Rule 74.15.1, “Boilers, Steam Generators, and Process Heaters.”

This stationary source is subject to the fugitive leak and inspection requirements of Rule 74.10, “Components at Crude Oil and Natural Gas Production and Processing Facilities.”

The stationary source is subject to 40 CFR Part 60, Subpart OOOO, “Standards of Performance (NSPS) for Crude Oil and Natural Gas Production, Transmission, and Distribution.” The NSPS applies to all applicable well completions, pneumatic controllers, equipment leaks from natural gas processing plants, reciprocating compressors, centrifugal compressors and storage vessels which are constructed, modified, or reconstructed after August 23, 2011. Applicable completions include the hydraulic fracturing of onshore gas wells; however, the NSPS does not apply to gas wells located on offshore oil platforms.

The oil platform is located in the Outer Continental Shelf; and therefore, is subject to 40 CFR Part 55, “Outer Continental Shelf Air Regulations.” 40 CFR Part 55 includes the District rules by reference, thereby making them federally enforceable. At the time of Application No. 01492-421 Part 70 Permit Reissuance, all applicable current VCAPCD rules for this Part 70 Permit are referenced in 40 CFR Part 55.

40 CFR Part 55 does not provide the authority to control the emissions from the vessels that service the platform, but does require that the vessel emissions be included in the permitted emissions for the OCS source. Therefore the engines on the crew boats and work boats servicing the platform and the permitted emissions for the engines are included in the Part 70 permit. The crew boat and work boat engines are subject to the California Airborne Toxic Control Measure (ATCM) For Diesel Engines On Commercial Harbor Craft Operated Within California Waters And 24 Nautical Miles Of The California Baseline. The permitted emissions for the crew boat and work boat engines are based on EPA Tier 2 Standards, per Table 2 of the ATCM.

This stationary source has stated that 40 CFR Part 68, “Chemical Accident Prevention Provisions”, is not an applicable requirement. Therefore, a federal Risk Management Plan, pursuant to section 112(r) of the federal Clean Air Act as amended, is not required.

This stationary source does not have any emission units subject to 40 CFR Part 64, “Compliance Assurance Monitoring”.

Permit Revisions Summary

The Permit Revisions Table (located in Section No. 1 of the permit) is a list of all permit revisions since Part 70 Permit No. 01492 was initially issued on January 1, 1998. A portion of

the permit revisions are described in further detail below. The District's Engineering Analysis for each application can also be consulted for further details.

Application No. 01492-241: Application No. 01492-241 is for the reissuance of Part 70 Permit No. 01492 for the period January 1, 2003 to December 31, 2007. The following items summarize the changes from the initial Part 70 Permit No. 01492 (January 1, 1998 to December 31, 2002):

- The number of "Responsible Officials" on the permit has been reduced to one. The previous Part 70 Permit No. 01492 named two individuals as "Responsible Officials".
- The "Title V Contact" has been changed.
- This "Stationary Source Description" has been added to the permit. It was not included in the initial Part 70 Permit No. 01492.
- An attachment detailing the requirements of Rule 74.9, "Stationary Internal Combustion Engines", that apply to emergency standby stationary internal combustion engines rated at 50 or more horsepower and operated during an emergency or maintenance operation has been added to the permit. These exempt units have been specifically listed in the Insignificant Activities Table and now are also generally listed in Tables 2, 3, and 4 of the permit.
- An attachment detailing the applicable requirements for Rule 74.11.1, "Large Water Heaters and Small Boilers", has been added to the permit.
- The following District rules have been revised and/or revisions of the rule have been adopted into the State Implementation Plan (SIP) since the initial issuance of Part 70 Permit No. 01492:
 - a) Rule 54, "Sulfur Compounds"
 - b) Rule 57, "Combustion Contaminants – Specific"
 - c) Rule 64, "Sulfur Content of Fuels"
 - d) Rule 68, "Carbon Monoxide"
 - e) Rule 74.1, "Abrasive Blasting"
 - f) Rule 74.2, "Architectural Coatings"
 - g) Rule 74.6, "Surface Cleaning and Degreasing"
 - h) Rule 74.9, "Stationary Internal Combustion Engines"
 - i) Rule 74.10, "Components at Crude Oil and Natural Gas Production and Processing Facilities"
 - j) Rule 74.15.1, "Boilers, Steam Generators, and Process Heaters (1 to 5 MMBTUs)"
 - k) Rule 74.16, "Oilfield Drilling Operations"

Application No. 01492-321: Application No. 01492-321 is for the reissuance of Part 70 Permit No. 01492 for the period January 1, 2008 to December 31, 2012. The following items summarize the changes due to this reissuance application:

- The 0.16 MMBTU/hr glycol reboiler has been removed from the permit along with all references to Rule 71.5, "Glycol Dehydrators".

- The wipecleaning operation has been removed from the permit due to changes in Rule 23, “Exemptions From Permit”. There is a reduction in the permitted emissions as a result of removing the wipecleaning operation from the permitted emissions table. Rule 74.6, “Surface Cleaning and Degreasing”, will remain part of the permit in the “General Requirements” section.
- Revisions have been made to the Insignificant Activities Table.
- Additional requirements have been added to Attachment 74.16 which lists the requirements of Rule 74.16, “Oilfield Drilling Operations”. Requirements for associated equipment are now included.
- The following District rules have been revised and/or revisions of the rule have been adopted into the State Implementation Plan (SIP) since the January 1, 2003 to December 31, 2007 reissuance:
 - a) Rule 23, “Exemptions From Permit”
 - b) Rule 50, “Opacity”
 - c) Rule 52, “Particulate Matter- Concentration (Grain Loading)”
 - d) Rule 57.1, “Particulate Matter Emissions From Fuel Burning Equipment”
 - e) Rule 68, “Carbon Monoxide”
 - f) Rule 74.2, “Architectural Coatings”
 - g) Rule 74.6, “Surface Cleaning and Degreasing”
 - h) Rule 74.9, “Stationary Internal Combustion Engines”

Application No. 01492-361: Application No. 01492-361 is for the reissuance of Part 70 Permit No. 01492 for the period that terminates on December 31, 2017. The following items summarize the changes due to this reissuance application:

- Removed the individual Crew Boats, Work Boats, and their respective engines from Tables 2, 3, and 4 and from Attachment PO1492PC1. Boat engines are now permitted more generically.
- A discussion of Greenhouse Gases (GHGs) has been included in the Permit Summary and Statement of Basis.
- Permit attachments have been added to the permit for the “National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE MACT).
- A permit attachment has been added to the permit for the California Air Toxic Control Measure (ATCM) for Stationary Compression Ignition (CI) Engines
- Permit condition language has been revised in Attachment PO01491PC2 to account for the changes to the flare permit exemption (Rule 23.A.4)
- Clarification has been added to Attachment PO01491PC3 regarding the definition of “emergency engine” in the RICE MACT verses the definition of “emergency engine” in other rules.
- An attachment summarizing the requirements of 40 CFR Part 60 Subpart OOOO, “Standards of Performance (NSPS) for Crude Oil and Natural Gas Production, Transmission and Distribution” has been added to the permit.

- The following rules have been revised and/or revisions of the District rule have been adopted into the State Implementation Plan (SIP) since the reissuance for the permit terminating December 31, 2012:
 - a) Rule 74.2, “Architectural Coatings”
 - b) Rule 74.9, “Stationary Internal Combustion Engines”
 - c) Rule 74.11.1, “Large Water Heaters and Small Boilers”
 - d) Rule 74.15.1, “Boilers, Steam Generators, and Process Heaters”

Application No. 01492-421: Application No. 01492-421 is for the reissuance of Part 70 Permit No. 01492 for the period that terminates on December 31, 2022. The following items summarize the changes due to this reissuance application:

- Reduced the permitted emissions for the crew boat and work boat engines to the EPA Tier 2 Standards as required by the California Airborne Toxic Control Measure (ATCM) For Diesel Engines On Commercial Harbor Craft Operated Within California Waters And 24 Nautical Miles Of The California Baseline.
- Reduced the maximum BHP requirement for the engines on the work boat from 7,456 BHP to 5,005 BHP. Now identical to maximum BHP work boat for Platform Gina. Resulted in a reduction in pounds per hour permitted emissions.
- The following rules have been revised and/or revisions of the District rule have been adopted into the State Implementation Plan (SIP) since the reissuance for the permit terminating December 31, 2012:
 - a) Rule 54, “Sulfur Compounds”
- The following rule or regulation attachments have been revised to clarify the applicability and / or monitoring requirements:
 - a) Rule 50, “Opacity”
 - b) Rule 74.1, “Abrasive Blasting”
 - c) Rule 74.2, “Architectural Coatings”
 - d) Rule 74.6, “Surface Cleaning and Degreasing”
 - e) Rule 74.9N9, “Stationary Internal Combustion Engines – Used to Power Cranes and Welding Equipment”
 - f) Rule 74.15.1, “Boilers, Steam Generators, and Process Heaters”
 - g) 40 CFR Part 82, “Protection of Stratospheric Ozone”

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NOV by Facility

Since January 1, 1996

Facility selected

01492

Facility No

01492

Platform Gilda

NOV Date	NOV No	Rule Number	Comment	Settlement	Date Closed
07/15/2002	019958	33.5 & 33.6	Failure To Reapply - Part 70 Permit	\$1,000.00	09/09/2002
02/11/2003	020141	29.C	Permit Condition Not Met - Exceeded Permitted Throughput	\$2,500.00	05/14/2003
03/26/2003	020150	29.C	Permit Condition Not Met - Failure To Conduct Sulfur Analysis	\$1,000.00	05/21/2003
10/17/2006	021662	10.A,B	Operating Without A Permit - Engines	\$500.00	12/13/2006
10/17/2006	021663	10.A,B	Operating Without A Permit - Crew Boat	\$500.00	12/13/2006
11/11/2009	022315	29.C	Permit Condition Not Met - Throughput Limits	\$1,500.00	02/10/2010
11/11/2009	022316	74.00	Exceeding leak Rate Threshold - Oilfield Components	\$5,000.00	02/10/2010
03/24/2011	022623	71.1.C.1	Produced Gas Requirements - Produced Gas Emissions AFS Key 00056	\$5,000.00	05/03/2011
04/15/2015	023405	74.05.1(B).1.a	Failure To Meet Boiler Emissions - Boiler	\$5,000.00	05/04/2015
03/15/2016	023422	29.C	Permit Condition Not Met - Flare Gas	\$5,000.00	04/10/2016
Total for 10 NOVs				\$27,000.00	

1.c. PERIODIC MONITORING SUMMARY

This periodic monitoring summary is intended to aid the permittee in quickly identifying key monitoring, recordkeeping, and reporting requirements. It is not intended to be used as a “stand alone” monitoring guidance document that completely satisfies the requirements specifically applicable to this facility. The following tables are included in the periodic monitoring summary:

- Table 1.c.1. - Specific Applicable Requirements
- Table 1.c.2. - Permit-Specific Conditions
- Table 1.c.3. - General Applicable Requirements
- Table 1.c.4. - General Requirements for Short-Term Activities

1.c.1. Specific Applicable Requirements

The Specific Applicable Requirements Table includes a summary of the monitoring requirements, recordkeeping requirements, reporting requirements, and test methods associated with the attachments contained in Section No. 7 of this permit.

Attachment No./ Condition No.	Applicable Rule or Requirement	Monitoring	Recordkeeping	Semi-annual Reports	Test Methods	Comments
71.1N1	Rules 71.1.B.1.a, 74.10	<ul style="list-style-type: none"> •Quarterly inspection of the following components for proper operation: gas compressor, hatches, relief valves, pressure regulators, flare, as applicable •Verbal notice of maintenance activities •Rule 74.10 inspections •Annual compliance certification including verification that tanks are equipped with a vapor recovery system 	<ul style="list-style-type: none"> •Records of quarterly inspections and tank maintenance activities •Rule 74.10 records 	None	None	
71.1N6	Rules 71.1tB.3, 71.1.D.1.c, 74.10	<ul style="list-style-type: none"> •Annual compliance certification including verification of the integrity of the roof and pressure-vacuum relief valve •Rule 74.10 inspections 	<ul style="list-style-type: none"> •Records of number of days the tank has stored or held crude oil during the maintenance operation, location of the tank relative to a tank battery, and whether tank was connected to vapor recovery •Records to show integrity of roof and PV valves for tanks not permanently located at facility •Rule 74.10 records 	None	None	

1.c.1. Specific Applicable Requirements (Continued)

Attachment No./ Condition No.	Applicable Rule or Requirement	Monitoring	Recordkeeping	Semi-annual Reports	Test Methods	Comments
71.4 N1	Rules 71.4.B.2 and 74.10	<ul style="list-style-type: none"> • Verbal notice of maintenance operations • Rule 74.10 inspections • Annual compliance certification including verifying the integrity of the cover 	<ul style="list-style-type: none"> • Records of maintenance • Rule 74.10 records 	None	None	
74.9N9	Rule 74.9.D.9	<ul style="list-style-type: none"> • Annual compliance certification • Daily visual inspection to ensure diesel-fired engine is used to power cranes and welding equipment only 	<ul style="list-style-type: none"> • Records of engine data including engine function (usage), manufacturer, model number, operator identification number, and engine location 	None	None	
74.15.1N1	Rule 74.15.1.B.1	<ul style="list-style-type: none"> • Annual compliance certification • Biennial Source Test (NO_x, CO) • Annual NO_x and CO screening 	<ul style="list-style-type: none"> • Records of source tests • Records of NO_x and CO screenings • Daily records of alternate fuel consumption 	None	<ul style="list-style-type: none"> • NO_x-ARB Method 100 • CO-ARB Method 100 	
ATCM Engine N3	ATCM for Stationary Compression Ignition Engines – OCS	<ul style="list-style-type: none"> • Fuel type records • Fuel use records 	<ul style="list-style-type: none"> • Fuel type records • Fuel use records 	None	None	Not federally enforceable
40CFR63ZZZN5	RICE MACT for non-emergency diesel engines > 300 HP & ≤ 500 HP, CO ppm limit	<ul style="list-style-type: none"> • Initial CO source testing • Maintain catalyst pressure / temperature • Annual compliance certification 	<ul style="list-style-type: none"> • Initial CO testing records 	As specified in Sections 63.6650(c)(1)-(6)	Portable analyzer, or EPA Methods 3, 4, and 10 or their designated alternatives	

1.c.2. Permit-Specific Conditions

The Permit-Specific Conditions Table includes a summary of the monitoring requirements, recordkeeping requirements, reporting requirements, and test methods associated with the attachments contained in Section No. 8 of this permit.

Attachment No./ Condition No.	Applicable Rule or Requirement	Monitoring	Recordkeeping	Semi-annual Reports	Test Methods	Comments
PO1492PC1 - Condition No. 1	Rule 29 General Recordkeeping	<ul style="list-style-type: none"> ●Annual compliance certification ●Monthly records of throughput and consumption 	<ul style="list-style-type: none"> ●Monthly records 	None	None	
PO1492PC1 - Condition No. 2	Rule 29 Maximum Number of Oil Wells	<ul style="list-style-type: none"> ●Annual compliance certification 	None	None	None	
PO 1492PC1t- Condition No. 3	Rule 26 Well Operations - BACT Requirements	<ul style="list-style-type: none"> ●Annual compliance certification 	None	None	None	
PO1492PC1 - Condition No. 4	Rule 29 Maximum Sulfur Content of Diesel Fuel	<ul style="list-style-type: none"> ●Fuel records or fuel supplier certification containing sulfur content of each diesel fuel delivery ●Annual compliance certification 	Fuel records	None	None	
PO1492PC1 - Condition No. 5	Rules 26 and 29 Crew Boat and Work Boat Fuel Use Limits	<ul style="list-style-type: none"> ●Rolling twelve month diesel fuel consumption for boats servicing Platforms Gina and Gilda ●75% of usage for both platforms is the Gilda usage ●Annual compliance certification 	<ul style="list-style-type: none"> ●Monthly records of diesel fuel consumption for both platforms; and 75% of total is for Gilda 	None	None	
PO1492PC1t- Condition No. 6	Boat engine permitted emissions information	<ul style="list-style-type: none"> ●Information only 	<ul style="list-style-type: none"> ●Information only 	None	None	
PO1492PC1t- Condition No. 7	Rule 29 Two Crew Boats Shall Not Be Used Simultaneously	<ul style="list-style-type: none"> ●Maintain a log book of hours and days of crew boat operation ●Maintain a log of boats and engines ●Annual compliance certification 	<ul style="list-style-type: none"> ●Maintain a log book of hours and days of crew boat operation ●Maintain a log of crew boats and engines 	None	None	
PO1492PC1t- Condition No. 8	Rule 29 Two Work Boats Shall Not Be Used Simultaneously	<ul style="list-style-type: none"> ●Maintain a log book of hours and days of work boat operation ●Maintain a log of boats and engines ●Annual compliance certification 	<ul style="list-style-type: none"> ●Maintain a log book of hours and days of work boat operation ●Maintain a log of work boats and engines 	None	None	
PO1492PC1 - Condition No. 9	Rules 23 and 29 Solvent Recordkeeping	<ul style="list-style-type: none"> ●Maintain a list of exempt solvents ●Annual compliance certification 	<ul style="list-style-type: none"> ●Maintain a list of exempt solvents 	None	None	
PO1492PC2 - Condition Nos. 1, 2, and 5	Rule 29 Flare Fuel Consumption	<ul style="list-style-type: none"> ●Fuel consumption ●Identify emergency vs. non-emergency usage ●Annual compliance certification 	<ul style="list-style-type: none"> ●Monthly records of fuel consumption 	None	None	

1.c.2. Permit-Specific Conditions (continued)

Attachment No./ Condition No.	Applicable Rule or Requirement	Monitoring	Recordkeeping	Semi-annual Reports	Test Methods	Comments
PO1492PC2 - Condition Nos. 3 and 4	Rules 71.1 Flare Ignition System Operation	<ul style="list-style-type: none"> •Monthly tests of flare's ignition system •Annual compliance certification 	<ul style="list-style-type: none"> •Records of ignition system •Maintenance records 	None	None	
PO1492PC3 - Condition Nos. 1, 4, and 5	Rule 74.9 and Section 61.421(f)(2)(ii) of 40 CFR Part 60, Subpart IIII	<ul style="list-style-type: none"> •Annual compliance certification •Monthly records of maintenance and testing hours •Monthly records of DRP hours 	<ul style="list-style-type: none"> •Monthly records of maintenance and testing hours •Monthly records of DRP hours 	None	None	
PO1492PC3 - Condition Nos. 2, 4 and 5	Rules 26 and 74.9 50 hours per year and 200 hours per year backup utility generator operation	<ul style="list-style-type: none"> •Annual compliance certification •Monthly records of backup utility generator hours of operation 	<ul style="list-style-type: none"> •Hours of operation log (non-resettable meter) differentiating non-emergency use and emergency use •Monthly and twelve month rolling records of hours of operation 	None	None	
PO1492PC3 - Condition No. 3	ATCM for Stationary Compression Ignition Engines - CS	<ul style="list-style-type: none"> •Fuel type records •Fuel use records 	<ul style="list-style-type: none"> •Fuel type records •Fuel use records 	None	None	Not federally enforceable

1.c.3. General Applicable Requirements

The General Applicable Requirements Table includes a summary of the monitoring requirements, recordkeeping requirements, reporting requirements, and test methods associated with the attachments contained in Section No. 9 of this permit.

Attachment No./ Condition No.	Applicable Rule or Requirement	Monitoring	Recordkeeping	Semi-annual Reports	Test Methods	Comments
50	Rule 50	<ul style="list-style-type: none"> •Daily visual inspections •Annual compliance certification, including a formal survey •Opacity readings upon request •Notification required for uncorrectable visible emissions 	<ul style="list-style-type: none"> •All occurrences of visible emissions for periods > 3min in any one hour •Annual formal survey of all emissions units 	None	•Opacity - EPA Method 9	
54.B.1 (OCS)	Rule 54.B.1	<ul style="list-style-type: none"> •Annual compliance certification •Identify planned vs. unplanned flaring event •Identify date, time, duration, flare volume, and estimated sulfur emissions per flare event •Upon request, source test for sulfur compounds at point of discharge 	<ul style="list-style-type: none"> •Representative fuel analysis or exhaust analysis and compliance demonstration •Flare records 	None	•Sulfur Compounds - EPA Test Method 6, 6A, 6C, 8, 15, 16A, 16B, or SCAQMD Method 307-941, as appropriate	
54.B.2 (OCS)	Rule 54.B.2	<ul style="list-style-type: none"> •Annual compliance certification •Identify planned vs. unplanned flaring event •Identify date, time, duration, flare volume, and estimated sulfur emissions per flare event •Determine ground or sea level concentrations of SO₂, upon request 	<ul style="list-style-type: none"> •Representative fuel analysis or exhaust analysis and modeling data or other compliance demonstration •Flare records 	None	•SO ₂ - BAAQMD Manual of Procedures, Vol. VI, Section 1, Ground Level Monitoring for H ₂ S and SO ₂ (July 20, 1994)	
57.d	Rule 57.d	<ul style="list-style-type: none"> •Annual compliance certification 	None	None	None	•Not required based on District analysis
64.B.d	Rule 64.B.d	<ul style="list-style-type: none"> •Annual compliance certification •None for PUC equality gas •Annual test for non PUC equality gas (submit with annual compliance certification) 	<ul style="list-style-type: none"> •Annual fuel gas analysis for non PUC equality gas 	None	•SCAQMD Method 307-94	
64.B.2	Rule 64.B.2	<ul style="list-style-type: none"> •Annual compliance certification •Fuel supplier's certification, or fuel test per each delivery (submit with annual compliance certification) 	<ul style="list-style-type: none"> •Fuel supplier's certification, or fuel test per each delivery 	None	•ASTM Method D4294-83 or D2622-87	

1.c.3. General Applicable Requirements (Continued)

Attachment No./ Condition No.	Applicable Rule or Requirement	Monitoring	Recordkeeping	Semi-annual Reports	Test Methods	Comments
71t1.C	Rules 71.1.C and 74.t0	<ul style="list-style-type: none"> •Annual compliance certification •Rule 74.10 inspections •Visual inspection to ensure collection system is closed •Quarterly inspection of flare to ensure proper operation 	<ul style="list-style-type: none"> •Records of inspections of flare •Rule 74.10 records 	None	None	<ul style="list-style-type: none"> •Compliance with Rule 74.10 ensures compliance with the gas collection system's maintenance requirements
71.4.B.t	Rule 71.4.B.1	<ul style="list-style-type: none"> •Annual compliance certification to ensure there are no first stage sumps 	None	None	None	
71.4.B.3	Rule 71t4.B.3	<ul style="list-style-type: none"> •Annual compliance certification •Visual inspections of well cellars 	<ul style="list-style-type: none"> •Records of maintenance or well workover activity during periods of crude oil storage 	None	None	
74.6	Rule 74.6	<ul style="list-style-type: none"> •Annual compliance certification •Maintain current solvent information •Monitor each solvent cleaning activity •Upon request, solvent testing 	<ul style="list-style-type: none"> •Records of current solvent information 	None	<ul style="list-style-type: none"> •ROC content-EPA Test Method 24 or 24A •Identity of solvent components-ASTM E168-67, ASTM E169-87, or ASTM E260-85 •True vapor pressure or composite partial pressure -ASTM D2879-86 •Initial boiling point-ASTM 1078-78 or published source •Spray gun active/passive solvent losses-SCAQMD Method (10-3-89) 	

1.c.3. General Applicable Requirements (Continued)

Attachment No./ Condition No.	Applicable Rule or Requirement	Monitoring	Recordkeeping	Semi-annual Reports	Test Methods	Comments
74d0	Rule 74.10	<ul style="list-style-type: none"> •Annual compliance certification •Identify leaking components •Inspections every shift or 8 hours at natural gas processing plants •Daily and/or weekly inspections for specified equipment •Quarterly inspections for specified components •Pressure relief valve inspections •Annual update to Operator Management Plan •Notification of major leaks in critical components •Notification of repeat leaks 	<ul style="list-style-type: none"> •Records of leak inspections in inspection log 	None	<ul style="list-style-type: none"> •Gas Leaks - EPA Method 21 •ROC Concentration of Gas Streams - ASTM E168-88, ASTM E169-87, or ASTM E260-85 •Weight percentage of evaporated compounds of liquids – ASTM Method D 86-82 •API Gravity - ASTM Method D287 	
74d1d	Rule 74.10.1	<ul style="list-style-type: none"> •Annual compliance certification •Maintain identification records of large water heaters and small boilers 	<ul style="list-style-type: none"> •Records of current information of large water heaters and small boilers 	None	None	<ul style="list-style-type: none"> •Rule only applies to future installation of large water heaters and small boilers
74d2	Rule 74d2	<ul style="list-style-type: none"> •Annual compliance certification •Maintain furnace identification records 	<ul style="list-style-type: none"> •Records of current furnace information 	None	None	<ul style="list-style-type: none"> •Rule only applies to future installation of natural gas-fired, fan-type furnaces

1.c.4. General Requirements for Short-Term Activities

The General Requirements for Short-Term Activities Table includes a summary of the monitoring requirements, recordkeeping requirements, reporting requirements, and test methods associated with the attachments contained in Section No. 10 of this permit.

Attachment No./ Condition No.	Applicable Rule or Requirement	Monitoring	Recordkeeping	Semi-annual Reports	Test Methods	Comments
74.1	Rule 74.1	<ul style="list-style-type: none"> •Annual compliance certification •Monitor each abrasive blasting operation •Abrasive blasting records 	<ul style="list-style-type: none"> •Abrasive blasting records 	None	<ul style="list-style-type: none"> •Visible emission evaluation-Section 92400 of CCR 	
74.2	Rule 74.2	<ul style="list-style-type: none"> •Annual compliance certification •Monitor each coating activity and specify compliant coatings •Maintain VOC records of coatings used 	<ul style="list-style-type: none"> •Maintain VOC records of coatings used 	None	<ul style="list-style-type: none"> •VOC content-EPA Method 24, CARB Method 432 • Acid content-ASTM Method D 1613-85, •Metal content-SCAQMD Method 311-91 	
74.16	Rule 74.16	<ul style="list-style-type: none"> •Annual compliance certification to ensure grid power being used, and/or •Annual compliance certification to ensure drilling engine has a valid APCD Permit to Operate, and meets NO_x limit,tor •Maintain cost analysis documentation as verification to grid power exemption, if applicable •Annual source tests (NO_x) or engine manufacturer certification 	<ul style="list-style-type: none"> •Records of source tests or engine manufacturer certification •Records of cost analysis documentation 	None	<ul style="list-style-type: none"> •NO_x-ARB Method 100 	

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2. PERMITTED EQUIPMENT AND APPLICABLE REQUIREMENTS TABLE

Purpose

The purpose of this table is to list the emissions units at this stationary source that are permitted to operate pursuant to Rule 10, "Permits Required" and Rule 23, "Exemptions From Permit". The table also provides a list of requirements that are specifically applicable to these emissions units. Permit conditions that enforce these requirements are listed in Section No. 7, "Specific Applicable Requirements" and Section No. 8, "Permit Specific Conditions" of this permit.

In addition to the emission unit specific requirements in Section No. 7 and Section No. 8, there are additional general requirements that may apply to the emissions units listed in this table, or to the stationary source as a whole. Furthermore, some general requirements may apply to emissions units or short-term activities not required to be specifically listed on the permit. These general requirements are contained in the following sections of the Permit: Section No. 9, "General Applicable Requirements"; Section No. 10, "General Requirements for Short-Term Activities"; Section No. 11, "General Permit Conditions"; and Section No. 12, "Miscellaneous Federal Program Conditions".

Equipment Description

This portion of the table provides a brief description of the permitted equipment at this stationary source. Attached to the table is a "Title V Equipment List Description Key" that contains definitions and explanations for some of the standard terminology used in the equipment description.

Applicable Requirements

The applicable requirements portion of the table is a matrix of applicability for the specific requirements that apply to the listed emissions units. The columns are labeled with APCD rule numbers or references to federal requirements. An "X" in the row corresponding to the emissions unit indicates the requirement is specifically applicable to that unit. For cases where a rule has multiple compliance options, a number appears instead of an "X". The number is a code key that corresponds to the "Title V Applicable Requirement Code Key" attached to the table. The code key table contains specific citations for the portions of the rule that are applicable. The code key is also used to identify the permit attachment in Section No. 7, "Specific Applicable Requirements", that contains the associated permit conditions. For example, code key "1" under Rule 71.1 is associated with Attachment 71.1N1 in Section No. 7.

Permit specific conditions are identified with a "PC" followed by a number in the column labeled "ADD REQ" (additional requirements). A "PC#" in the row corresponding to the emissions unit indicates that the permit specific condition is specifically applicable to that unit. For the purpose of the Annual Compliance Certification, the owner or operator can identify the conditions that

apply within the "PC#". The "PC#" also corresponds to the permit attachment in Section No. 8, "Permit Specific Conditions", that contains the permit specific requirements.

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TABLE NO. 2

VENTURA COUNTY AIR POLLUTION CONTROL DISTRICT								
Permit to Operate No. 01492								
Permitted Equipment and Applicable Requirements								
Equipment	71.1	71.4	74.6	74.9	74.15.1	ATCM	RICE MACT	Additional Requirements
OCS Platform Gilda								
1 - 101 BBL Waste Oil Tank (T-1) VR	1							
1 - 101 BBL Waste Oil Tank (T-2) VR	1							
1 - 343 BBL PWT (T-3) VRe	1							
1 - 2 ft diameter Covered Pit (Floor Drain)		1						
1 - 100 MMBTU/Hr Flare								PC1, PC2
1 - 325 BHP CAT Model 3406 Diesel Engine, equipped with a Clean Emission Products, Inc. Low Temperature Oxidation Catalyst, Part IC-10-600, and Parker Racor CCV4500 Closed Crankcase Ventilation Filter (North Crane)				9		3	5	PC1
1 - 325 BHP CAT Model 3406 Diesel Engine, equipped with a Clean Emission Products, Inc. Low Temperature Oxidation Catalyst, Part IC-10-600, and Parker Racor CCV4500 Closed Crankcase Ventilation Filter (South Crane)				9		3	5	PC1
1 - 400 MMBTU/Hr NG Uniflux Heater Lo-NOx					1			
1 - 619 BHP Caterpillar Diesel Engine, Model C15, S/N FTE02214 EPA Family Name ECPXL15.2NYS, Emergency/Backup Generator in Demand Response Program (DRP)				X		3		PC1, PC3
Crew Boat Engines								
Permittee is required to maintain a list of boats and engines								PC1
Work Boat Engines								
Permittee is required to maintain a list of boats and engines								PC1
For Use Throughout Platform								
54 - Oil Wells (48 Active)								PC1
2 - 500 BBL Closed Top Portable Tanks	6							
Exempt Equipment								
Emergency Engines, 50 BHP and Greater (Exempt - Rule 23.D.7)								
Wipe Cleaning Operation (Exempt Rule 23.F.10.b)			X					

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TITLE V EQUIPMENT LIST DESCRIPTION KEY

For Title V permits, the Permitted Equipment and Applicable Requirements Table contains a number of terms, abbreviations, and acronyms that have been standardized for oilfield facilities. The following list describes many of the terms on an oilfield equipment list:

BHP The output of an internal combustion engine as measured in brake horsepower.

BL A crude oil loading facility that is equipped with bottom loading capabilities.

Condensate Tank A tank that is used for the purpose of storing water and hydrocarbon liquids recovered from natural gas scrubbers. This tank is assumed to operate with a variable liquid level and has an associated throughput limit.

COST A crude oil storage tank that generally operates with a variable liquid level and has an associated throughput limit. An oil shipping tank that has a truck loading rack is a COST by definition. These tanks may also be known as shipping tanks.

Cover Indicates that a petroleum sump, pit, or pond is equipped with a properly installed and maintained cover which complies with Rule 71.4.

EXEMPT A tank, pit, or sump that processes produced water with an ROC content of less than 5 milligrams per liter and is exempt from Rule 71.1 or Rule 71.4.

Gauge or Test Tank A tank that is used for the purpose of production testing a well or group of wells. This tank is assumed to operate with a variable liquid level and has an associated throughput limit.

LACT Tank A Lease Automated Custody Transfer tank that operates at a constant or near constant liquid level and does not have an associated throughput limit. This tank is generally equipped with a LACT pump for pipeline oil shipping. A shipping tank with a truck loading rack is not by definition a LACT tank, but is a COST.

Loading Facility A crude oil loading rack or loading valve used for the transfer of crude oil from a storage tank or group of tanks to a delivery vessel.

Lo-NOx Device has equipment to control the emissions of NOx and CO to meet the requirements of Rules 74.15 or 74.15.1, or best available control technology requirements.

MMBTU/Hr The heat input of an external combustion device as measured in millions of British Thermal Units per hour.

NG Indicates that the equipment is permitted to be fired on natural gas only.

NG/FO Indicates that equipment is permitted to be fired on natural gas with fuel oil or diesel as a backup fuel.

NSCR Engine that is equipped with non-selective catalytic reduction to meet its Rule 74.9 compliance requirements.

Pit Device used to receive emergency or intermittent flows.

PSC Engine that is equipped with a pre-stratified charge to meet its Rule 74.9 compliance requirements.

PWT A produced water tank that generally operates with a constant liquid level and does not have an associated throughput limit. These tanks may also be known as free water knock out (FWKO) tanks.

Rich Burn or Lean Burn A designation associated with a gas-fired internal combustion engine that determines its Rule 74.9 compliance requirements.

SCR Engine or turbine that is equipped with selective catalytic reduction and ammonia injection to meet its Rule 74.9 or Rule 74.23 compliance requirements.

SF A crude oil loading facility that is equipped with submerged fill loading capabilities.

Sump Device used for separation, generally in constant use.

UNC Indicates that the equipment is uncontrolled. For example, a tank that is not equipped with a vapor recovery system, or an engine or heater that is not equipped with NOx controls are labeled UNC.

VR A vapor recovery system that is installed on a tank, loading rack or loading facility, glycol dehydrator, or other piece of process equipment.

Wash Tank A tank that stores and separates oil and water that generally operates with a constant liquid level. It does not have an associated throughput limit.

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TITLE V APPLICABLE REQUIREMENT CODE KEY

Rule 71.1, "Crude Oil Production and Separation"

1. Storage tanks shall be equipped with a vapor recovery system that directs all vapors to a gas gathering system or flare (71.1.B.1.a)
2. Storage tanks shall be equipped with a vapor recovery system that directs all vapors to some other control system with a minimum destruction or removal efficiency of 90% by weight (71.1.B.1.b)
3. Tank batteries installed prior to June 20, 1978 are exempt from vapor recovery when processing crude oil having a modified Reid vapor pressure of less than 0.5 psia. Solid roof and pressure-vacuum relief valve is required. (71.1.B.2/71.1.D.1.a)
4. Storage tanks are exempt from the solid roof and vapor recovery requirements if the ROC content of the liquid entering the tank is less than 5 milligrams per liter. (71.1.D.3)
5. Storage tanks are exempt from the solid roof and vapor recovery requirements if a BACT Cost Analysis indicates that maximum emission reduction has already taken place. (71.1.D.4)
6. Portable tanks shall be equipped with closed covers and pressure vacuum valves and have limited exemptions from vapor recovery requirements. (71.1.B.3/71.1.D.1.c)

Rule 71.4, "Petroleum Sumps, Pits, Ponds and Well Cellars"

1. Second and third stage sumps, pits, and ponds shall have an impermeable cover (71.4.B.2)
2. Exemption from cover requirement for emergency pits (71.4.C.1.b)
3. Exemption from cover requirement for sumps, pits, or pond if the ROC content of the liquid at the point of entry is less than 5 milligrams per liter (71.4.C.1.c)
4. Exemption from cover requirement for sumps, pits, or pond when a BACT Cost Analysis indicates that maximum emission reduction has already taken place. (71.4.C.1.d)

Rule 74.9, "Stationary Internal Combustion Engines"

1. Pre-January 1, 2002 emission limits and post-January 1, 2002 emission limits for natural gas rich burn engines with existing emission controls installed after September 5, 1989. (74.9.B.1 or 74.9.B.2, and 74.9.B.3)
2. Pre-January 1, 2002 emission limits and post-January 1, 2002 emission limits for natural gas lean burn engines with existing emission controls installed after September 5, 1989. (74.9.B.1 or 74.9.B.2, and 74.9.B.3)
3. Post-January 1, 1997 emission limits for natural gas rich burn engines with emission controls installed before September 5, 1989; or installed after March 5, 1992. (74.9.B.1 or 74.9.B.2)
4. Post-January 1, 1997 emission limits for natural gas lean burn engines with emission controls installed before September 5, 1989; or installed after March 5, 1992. (74.9.B.1 or 74.9.B.2) Post-January 1, 1997 emission limit for ammonia, if applicable. (74.9.B.5)
5. Post-January 1, 1997 emission limits for diesel engines. (74.9.B.1 or 74.9.B.2) Post-January 1, 1997 emission limit for ammonia, if applicable. (74.9.B.5)

Section No. 2

Title V Applicable Requirement Code Key

6. Exemption from Rule 74.9 for engines operated less than 200 hours per calendar year (74.9.D.2)
7. Exemption from Rule 74.9 for emergency standby engines operated during either an emergency or maintenance operation. (74.9.D.3)
8. Exemption from Rule 74.9 for diesel engines with a permitted capacity factor of less than or equal to 15%. (74.9.D.8)
9. Exemption from Rule 74.9 for diesel engines used to power cranes and welding equipment. (74.9.D.9)

Rule 74.15.1, "Boilers, Steam Generators and Process Heaters"

1. NOx and CO emission limits for units with heat input ratings > 2 MMBTU/hr and < 5 MMBTU/hr and an annual heat input greater than or equal to 1,800 MMBTU. (74.15.1.B.1)
2. Tuning and fuel metering requirements for units with an annual heat input rate of greater than or equal to 300 MMBTU and less than 1,800 MMBTU. (74.15.1.B.2 and 74.15.1.D.1)
3. Exemption from tuning requirements for units with an annual heat input rate less than 300 MMBTU and requirement for metering. (74.15.1.B.2 and 74.15.1.D.1)
4. Equipment is currently shut-down and not operating. Upon operation will install fuel meter (74.15.1.D.1). Based on annual heat input will perform tuning (74.15.1.B.2) or will comply with NOx and CO emission limits (74.15.1.B.1).

Section 93115, Title 17, California Code of Regulations California Airborne Toxic Control Measure For Stationary Compression Ignition (CI) Engines

1. In-use emergency fire pump assembly engines
2. In-use emergency engines operated not more than 20 hours per year for maintenance and testing purposes.
3. Engines operated solely on OCS Platforms.

40 CFR Part 63, Subpart ZZZZ, National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engine (RICE MACT)

1. Existing compression ignition and spark ignition engine compliance dates
2. Existing landfill gas engines – area source
3. Existing emergency diesel engines – area source
4. Existing non-emergency diesel engines ≤ 300 HP – area source
5. Existing non-emergency diesel engines $300 \text{ HP} < X \leq 500 \text{ HP}$ – area source
6. Existing non-emergency diesel engines $\leq 500 \text{ HP}$ – area source
7. Existing non-emergency spark-ignited four stroke remote rich burn engine $> 500 \text{ HP}$ – area source

3. PERMITTED THROUGHPUT AND CONSUMPTION LIMIT TABLE

Purpose

The purpose of this table is to list the emissions units at this stationary source that have limitations on throughput, fuel consumption, raw material usage, hours of operation, or other parameters that limit the potential to emit of the emissions unit. In some cases, the limit on the potential to emit is expressed directly as a set of pollutants and emission limits in tons per year.

These limitations are applied pursuant to Rule 26, "New Source Review" or Rule 29, "Conditions on Permits". Two sets of limits are listed in this table. The "Throughput Permit Limit" is the enforceable limit pursuant to this permit. Permit conditions that enforce these limits are listed in Section No. 8, "Permit Specific Conditions" of this permit.

The "Calculation Throughput" is used only to calculate permitted emissions pursuant to Rule 29, "Conditions on Permits".

Equipment Description

This portion of the table is the same as the equipment description in the "Permitted Equipment and Applicable Requirements Table".

Throughput Permit Limit

The throughput or consumption limit listed in this column of the table is an enforceable limit on the emissions unit's potential to emit. In the column labeled "District (D)/ Federal (F) Enforceable", a "D" or an "F" denotes whether the limit is only enforceable by the District or whether the limit is a federally-enforceable limit. District-enforceable limits are limits applied solely pursuant to Rule 29, "Conditions on Permits". Limits that have been applied pursuant to Rule 26, "New Source Review" are federally enforceable.

The throughput permit limit may apply to a single emissions unit or to a set of emission units. When the limit applies to set of emissions units, the set consists of the emissions unit with which the limit is listed and the emissions units which follow that have an asterisk in the throughput permit limit column.

Pursuant to Rule 26 and Rule 29, the throughput permit limit is an annual limit which is enforceable based on a period of any twelve (12) consecutive calendar months.

Note that when the calculation throughput (discussed below) corresponds to using the emissions unit full time (8760 hours per year) at maximum rated capacity, the throughput permit limit column contains the notation "No Limit". When District emission calculation procedures do not involve throughput or consumption data, both the throughput permit limit and the calculation throughput

column are left blank.

Calculation Throughput

The throughput or consumption limit listed in this column of the table is the throughput used in the District calculation procedures to calculate permitted emissions for the emissions unit. The calculation throughput may apply to a single emissions unit or to a set of emissions units denoted as discussed above. The calculation throughput is not an enforceable permit limit.

The "Calculation Procedure" column is reserved for future use. Emission calculations for the emissions units in this table are available in the District's permit files for this stationary source.

Abbreviations

The following abbreviations have been used in the "Permitted Throughput and Consumption Limit Table" for the "Throughput Permit Limit" column and for the "Calculation Throughput Limit" column:

BBL/Yr: barrels per year

Days/Yr: days per year

FO: fuel oil or diesel fuel

Gal/Yr: gallons per year

Hrs/Day: hours per day

Hrs/Yr: hours per year

Lbs ROC/Yr: pounds of reactive organic compounds per year

LPG: liquid petroleum gas (propane)

MBBL/Yr: thousands of barrels per year

MGal/Yr: thousands of gallons per year

MMBTU/Yr: million British Thermal Units of heat input per year

MMCF/Yr: million standard cubic feet of natural gas per year

MMGal/Yr: million gallons per year

NG: natural gas

TPY: tons per year

TABLE NO. 3

VENTURA COUNTY AIR POLLUTION CONTROL DISTRICT Permit to Operate No. 01492 Permitted Throughput/Consumption Limits				
Equipment	Throughput Permit Limit	District(D)/ Federal(F) Enforceable	Calculation Throughput	Calculation Procedure
<p align="center">OCS Platform Gilda</p> <p>1 - 101 BBL Waste Oil Tank (T-1) VR 1 - 101 BBL Waste Oil Tank (T-2) VR 1 - 343 BBL PWT (T-3) VR 1 - 2 ft diameter Covered Pit (Floor Drain) 1 - 100 MMBTU/Hr Flare 1 - 325 BHP CAT Model 3406 Diesel Engine, equipped with a Clean Emission Products, Inc. Low Temperature Oxidation Catalyst, Part IC-10-600, and Parker Racor CCV4500 Closed Crankcase Ventilation Filter (North Crane) 1 - 325 BHP CAT Model 3406 Diesel Engine, equipped with a Clean Emission Products, Inc. Low Temperature Oxidation Catalyst, Part IC-10-600, and Parker Racor CCV4500 Closed Crankcase Ventilation Filter (South Crane) 1 - 4.00 MMBTU/Hr NG Uniflux Heater Lo-NOx 1 - 619 BHP Caterpillar Diesel Engine, Model C15, S/N FTE02214 EPA Family Name ECPXL1.2NYS, Emergency/Backup Generator in Demand Response Program (DRP)</p> <p align="center">Crew Boat Engines Permittee is required to maintain a list of boats and engines</p> <p align="center">Work Boat Engines Permittee is required to maintain a list of boats and engines</p> <p align="center">For Use Throughout Platform</p> <p>54 - Oil Wells (48 Active) 2 - 500 BBL Closed Top Portable Tanks</p> <p align="center">Exempt Equipment</p> <p>Emergency Engines, 50 BHP and Greater (Exempt - Rule 23.D.7) Wipe Cleaning Operation (Exempt Rule 23.F.40.b)</p>				
	50.51 MMCF/Yr 19,250 Gal/Yr	F F	50.51 MMCF/Yr 19,250 Gal/Yr	
	17,200 Gal/Yr	F	17,200 Gal/Yr	
	No Limit 100 Hrs/Yr	F	36.6 MMCF/Yr 100 Hrs/Yr	
	253,390 Gal/Yr		217,440 Gal/Yr	
	*		35,950 Gal/Yr	
<p>* - Included in Limit or Calculation Throughput Above</p>				

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4. PERMITTED EMISSIONS TABLE

Purpose

The purpose of this table is to document the permitted emissions for this stationary source. Rule 29, “Conditions on Permits”, requires permitted emissions to be included on each Permit to Operate. Rule 29 is federally enforceable on OCS Platforms, pursuant to 40 CFR Part 55, “Outer Continental Shelf Air Regulations”.

The permitted emissions table also characterizes the amount and type of criteria air pollutants emitted by this stationary source.

Rule 29 requires that annual permitted emissions be based on a 12 calendar month rolling period and be expressed in units of tons per year. Hourly permitted emissions are required to be expressed in units of pounds per hour. Permitted emissions for a stationary source are required to be determined by aggregating the permitted emissions for each emissions unit at the stationary source.

In general, permitted emissions are calculated based on throughput or consumption data for an emission unit, specific physical characteristics of the emission unit, and emission factors. The emission factors may be standard published emission factors or they may be derived from source test data or specific emission limits that apply to the emissions unit. In some cases, permitted emissions are expressed directly as a set of pollutants and emission limits in tons per year without reference to any calculation method.

Section No. 3, “Permitted Throughput and Consumption Limit Table”, contains information on the throughput and consumption limits that are enforceable at this stationary source. In addition, other sections of this permit contain conditions that act to enforce specific portions of the permitted emissions table.

Equipment Description

This portion of the table is the same as the equipment description in the "Permitted Equipment and Applicable Requirements Table".

Tons Per Year

This column of the table represents the permitted emissions in units of tons per year for ROC (reactive organic compounds), NO_x (nitrogen oxides), PM (particulate matter), SO_x (sulfur oxides), and CO (carbon monoxide). In some cases, emissions of non-criteria pollutants of interest may also be listed. Pursuant to Rule 29, annual permitted emissions shall be the annual emissions used to determine compliance for issuance of any new or revised permit issued after October 22, 1991. For emissions units for which no new or revised permit has been issued since

October 22, 1991, annual permitted emissions generally reflect actual historical emissions from the emissions unit.

The permitted emissions limit may apply to a single emissions unit or to a set of emission units. When the limit applies to set of emissions units, the set consists of the emissions unit with which the limit is listed and the emissions units which follow that have an asterisk in the pollutant columns.

Pounds Per Hour

This column of the table represents the permitted emissions in units of pounds per hour for ROC (reactive organic compounds), NO_x (nitrogen oxides), PM (particulate matter), SO_x (sulfur oxides), and CO (carbon monoxide). Pursuant to Rule 29, hourly permitted emissions shall be calculated based on the maximum quantity of each air pollutant which may be emitted from the emissions unit during a one hour period, as limited by any applicable rules or permit conditions.

Hazardous Air Pollutants

This permit does not provide information that characterizes the emissions of hazardous air pollutants (HAPS) from this facility. This information can be obtained from the reissuance application or the facility's AB-2588, Air Toxics "Hot Spots", Report referenced at the bottom of the "Permitted Emissions Table". For Outer Continental Source (OCS) sources, not subject to AB-2588, HAP emissions information is included in the permit reissuance application and is maintained by the stationary source.

TABLE NO.4

VENTURA COUNTY AIR POLLUTION CONTROL DISTRICT										
Permit to Operate No. 01492										
Permitted Emissions										
Equipment	TONS PER YEAR					POUNDS PER HOUR				
	ROC	NOx	PM	SOx	CO	ROC	NOx	PM	SOx	CO
OCS Platform Gilda										
1 - 101 BBL Waste Oil Tank (T-1) VR	0.00					0.00				
1 - 101 BBL Waste Oil Tank (T-2) VR	0.00					0.00				
1 - 343 BBL PWT (T-3) VR	0.01					0.00				
1 - 2 ft diameter Covered Pit (Floor Drain)										
1 - 100 MMBTU/Hr Flare	1.37	1.80	0.13	1.80	9.81	5.18	6.80	0.50	6.80	36.99
1 - 325 BHP CAT Model 3406 Diesel Engine, equipped with a Clean Emission Products, Inc. Low Temperature Oxidation Catalyst, Part IC-10-600, and Parker Racor CCV4500 Closed Crankcase Ventilation Filter (North Crane)	0.32	4.51	0.32	0.07	0.15	0.76	10.79	0.77	0.17	0.36
1 - 325 BHP CAT Model 3406 Diesel Engine, equipped with a Clean Emission Products, Inc. Low Temperature Oxidation Catalyst, Part IC-10-600, and Parker Racor CCV4500 Closed Crankcase Ventilation Filter (South Crane)	0.29	4.03	0.29	0.06	0.06	0.76	10.79	0.77	0.17	0.36
1 - 4.00 MMBTU/Hr NG Uniflux Heater Lo-NOx	0.10	0.69	0.14	0.01	1.54	0.02	0.14	0.03	<0.01	0.32
1 - 619 BHP Caterpillar Diesel Engine, Model C15, S/N FTE02214 EPA Family Name ECPXL15.2NYS, Emergency/Backup Generator in Demand Response Program (DRP)	0.01	0.16	0.01	0.02	0.14	0.17	3.24	0.18	0.33	2.86
Crew Boat Engines										
Permittee is required to maintain a list of boats and engines										
Tons Per Year Permitted Emissions based on 217,440 gallons diesel	1.38	26.30	1.25	0.82	12.49					
Pounds Per Hour Permitted Emissions based on boat with the following engines:										
4 - 567 BHP Diesel Engines, Main Engines						2.05	38.92	1.85	1.21	18.49
2 - 40 BHP Diesel Engines, Generator Engines						0.07	1.37	0.07	0.04	0.65
Total= 2,348 BHP										
Work Boat Engines										
Permittee is required to maintain a list of boats and engines										
Tons Per Year Permitted Emissions based on 35,950 gallons diesel	0.23	4.35	0.21	0.13	2.07					
Pounds Per Hour Permitted Emissions based on boat with the following engines:										
2 - 2,000 BHP Diesel Engines, Main Engines						3.61	68.65	3.26	1.70	32.60
2 - 245 BHP Diesel Engines, Generator Engines						0.44	8.46	0.40	0.26	3.99
1 - 515 BHP Diesel Engine, Bow Thruster Engine						0.47	8.84	0.42	0.27	4.20
Total= 5,005 BHP										
For Use Throughout Platform										
54 - Oil Wells (48 Active)	19.71					4.50				
2 - 500 BBL Closed Top Portable Tanks	0.43					0.10				
Exempt Equipment										
Emergency Engines, 50 BHP and Greater (Exempt - Rule 23.D.7)										
Wipe Cleaning Operation (Exempt Rule 23.F.10.b)										
* - Included in Emissions Above										
Total Permitted Emissions	23.85	41.84	2.35	2.91	26.33	18.13	157.95	8.25	10.95	100.82
HAP Emissions Ref.: OCS HAP Emission Estimation Techniques and Calculations are included in the Reissuance Application and are maintained at the facility										

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5. OIL WELL LIST

This permit authorizes the operation of a maximum number of wells for the production of oil or natural gas. This section of the permit contains a list of the wells currently authorized to be operated. When changes to the list are desired, the permit holder is required to submit an application to modify the Part 70 Permit.

An Authority to Construct is also required prior to adding a well that is newly drilled to the oil well list or prior to increasing the number of wells on the oil well list.

Section No. 8, "Permit Specific Conditions", includes a condition that limits the maximum number of producing wells at this stationary source. If applicable, Section No. 8 also includes a condition that requires best available control technology (BACT) on specific wells that were subject to Rule 26, "New Source Review".

Ventura County Air Pollution Control District

OIL WELL LIST

Part 70 Permit No. 01492

The following oil wells are on permit:

Santa Clara Field Wells

Total Active Wells: 48

<u>Slot Number</u>	<u>Well Number</u>	<u>Slot Number</u>	<u>Well Number</u>
3	S-25	46	S-39
5	S-27	49	S-48
6	S-89	53	S-4
8	S-75	54	S-7
9	S-71	55	S-36
10	S-15	57	S-26
13	S-17	58	S-28
14	S-23	62	S-8
19	S-13	63	S-9
20	S-19	64	S-62
21	S-21	67	S-14
23	S-61	68	S-24
24	S-65	69	S-18
27	S-63	70	S-60
28	S-87	75	S-46
30	S-77	77	S-1
32	S-79	79	S-58
33	S-85	81	S-44
36	S-59	85	S-2
37	S-33	89	S-42
39	S-35	92	S-64
41	S-57	93	S-50
43	S-91	94	S-54
44	S-55	95	S-3

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6. EXEMPT EQUIPMENT LIST

Rule 33.2.A.3 (Part 70 Permits - Application Contents) requires the applicant to provide a list of all emissions units located at the stationary source that are exempt pursuant to Rule 23 based on size or production rate. Pursuant to Rule 33.2.A.3, emissions from insignificant activities do not need to be included in the permit application.

This section of the permit contains a table entitled "Insignificant Activities (Exempt Equipment)". This table is a list of insignificant activities (exempt equipment) at the facility that are exempt from permit based on a size or production rate exemption in Rule 23, "Exemptions From Permit". Insignificant Activity is defined in Rule 33.1 (Part 70 Permits – Definitions). The permittee shall provide calculations, usage records, emission records, and/or operational data as necessary to substantiate an activity as insignificant.

This table is presented for informational purposes only. Any changes to this list are not considered to be permit modifications, nor is the list considered to be enforceable. As detailed in Rule 33.2.A.3, this list is required to be submitted with an application for permit reissuance. The general requirements listed in Section No. 9 of this permit may apply to these insignificant activities.

Ventura County Air Pollution Control District
INSIGNIFICANT ACTIVITIES (EXEMPT EQUIPMENT)
 Part 70 Permit No. 01492

INSIGNIFICANT ACTIVITIES (EXEMPT EMISSION UNITS)	BASIS FOR EXEMPTION (Size/Production Rate)	RULE 23 CITATION
Portable Emergency Drilling Generator	Portable Emergency Engine (Portable is defined as residing at a stationary source for less than 12 consecutive months)	23.D.7
Skimmer Power Pack	Portable engine used for emergency purposes, engine maintenance operation \leq 50 hours per year	23.D.7
Wipecleaning Operation	ROC content \leq 25 grams per liter	23.F.10.b

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7. SPECIFIC APPLICABLE REQUIREMENTS (ATTACHMENTS)

As discussed in Section No. 2, “Permitted Equipment and Applicable Requirements Table”, the emissions units at this stationary source listed in the table have requirements that are specifically applicable to them. The applicable requirements are based on the District's prohibitory rules, federal NSPS (40 CFR Part 60), federal NESHAPS (40 CFR Part 61), and federal NESHAPS/MACT (40 CFR Part 63).

In this section of the permit, the permit conditions that are associated with each specific applicable requirement are listed in an individual attachment. The attachment is identified with the label “Attachment (APCD Rule No. or CFR No.)#” in the lower left corner. Each attachment has an applicability section that describes how and why this attachment applies to the specific emissions unit. The attachment may apply to one or more of the emissions units listed in the Permitted Equipment and Applicable Requirements Table in Section No. 2.

Ventura County Air Pollution Control District
Rule 71.1.B.1.a Applicable Requirements
Tanks Equipped with Vapor Recovery

Rule 71.1, "Crude Oil Production and Separation"
Adopted 06/16/92, Federally-Enforceable

Rule 74.10, "Components at Crude Oil and Natural Gas Production and Processing Facilities"
Adopted 03/10/98, Federally-Enforceable

Applicability:

This attachment applies to tanks at this stationary source equipped with a vapor recovery system which directs all vapors to a fuel gas system, a sales gas system, or to a flare. Specifically, this attachment applies to all storage tanks in a tank battery including wash tanks, produced water tanks, and wastewater separators, that are used in the production, gathering, storage, processing, and separation of crude oil and natural gas from any petroleum production permit unit prior to custody transfer. This attachment does not apply to portable tanks or other tanks not equipped with vapor recovery.

A tank is defined as a container, constructed primarily of nonearthen materials, used for the purpose of storing or holding petroleum material, or for the purpose of separating water and/or gas from petroleum material. A tank battery is defined as any tank or aggregation of tanks. An aggregation of tanks is considered a tank battery only if the tanks are located so that no one tank is more than 150 feet from any other tank, edge to edge.

The tank's hatches and other inlet and outlet liquid and gas piping connections are considered to be components subject to the leak requirements of APCD Rule 74.10, "Components at Crude Oil and Natural Gas Production and Processing Facilities".

Conditions:

1. Pursuant to Rule 71.1.B.1.a, all tanks shall be equipped with a properly installed, maintained and operated vapor recovery system. The vapor disposal portion of the vapor recovery system shall consist of either a system which directs all vapors to a fuel gas system, a sales gas system, or to a flare that combusts reactive organic compounds.
2. Pursuant to Rule 71.1.D.2, the vapor recovery provisions of Rule 71.1.B.1.a shall not apply during maintenance operations on vapor recovery systems or tank batteries, including wash tanks, produced water tanks and wastewater separators, if the Air Pollution Control District is notified verbally at least 24 hours prior to the maintenance operation and if the maintenance operation will take no more than 24 hours to complete.

3. The tank's hatches and other inlet and outlet gas and liquid piping connections are components subject to the leak requirements of Rule 74.10, "Components at Crude Oil and Natural Gas Production and Processing Facilities".
4. On a quarterly basis, permittee shall monitor the storage tank vapor recovery system to ensure that compliance with Rule 71.1.B.1.a is being maintained. This shall include an inspection of the following components, as applicable, for proper operation: gas compressor, hatches, relief valves, pressure regulators, flare. Permittee shall keep dated records of the quarterly inspections and tank maintenance activities. These records shall be maintained at the facility and submitted to the District upon request.
5. On an annual basis, permittee shall certify that storage tanks at the facility are complying with Rule 71.1.B.1.a. This annual compliance certification shall include verifying that the tanks are equipped with a vapor recovery system.

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Ventura County Air Pollution Control District
Rule 71.1.B.3 Applicable Requirements
Portable Tank Requirements

Rule 71.1, "Crude Oil Production and Separation"
Adopted 06/16/92, Federally-Enforceable

Rule 74.10, "Components at Crude Oil and Natural Gas Production and Processing Facilities"
Adopted 03/10/98, Federally-Enforceable

Applicability:

This attachment applies to tanks designated on the Permit to Operate as portable, and used in the production, gathering, storage, processing, and separation of crude oil and natural gas from any petroleum production permit unit prior to custody transfer. A portable tank is defined as a tank that can be moved from one location to another by attachment to a motor vehicle without having to be dismantled. A tank is further defined as a container, constructed primarily of nonearthen materials, used for the purpose of storing or holding petroleum material, or for the purpose of separating water and/or gas from petroleum material. A tank battery is defined as any tank or aggregation of tanks. An aggregation of tanks is considered a tank battery only if the tanks are located so that no one tank is more than 150 feet from any other tank, edge to edge.

The tank's hatches and other inlet and outlet liquid and gas piping connections are considered to be components subject to the leak requirements of APCD Rule 74.10, "Components at Crude Oil and Natural Gas Production and Processing Facilities".

Conditions:

1. Pursuant to Rule 71.1.B.3, portable tanks used to store or hold crude oil shall be equipped with both a closed cover that is impermeable to ROC vapors and a pressure-vacuum valve set by the manufacturer or according to the manufacturer's recommendations. A portable tank shall be defined as a tank that can be moved from one location to another by attachment to a motor vehicle without having to be dismantled.
2. Pursuant to Rule 71.1.D.1.c, the vapor recovery provisions of Rule 71.1.B.1 shall not apply to portable tanks if all of the following conditions are met:
 - a. The portable tank is not used to increase the storage capacity of an existing tank battery.

- b. The portable tank is not located within 150 feet of a tank battery that is subject to the vapor recovery provisions of Rule 71.1.B.1.
 - c. The portable tank is being used during maintenance activity at a tank battery or well and has not held or stored crude oil for more than 60 days.
3. The tank's hatches and other inlet and outlet gas and liquid piping connections are components subject to the leak requirements of Rule 74.10, "Components at Crude Oil and Natural Gas Production and Processing Facilities".
4. On an annual basis, permittee shall certify that portable tanks at the facility are complying with Rule 71.1.B.3. This compliance certification shall include verifying the integrity of the roof and pressure-vacuum relief valve.

For portable tanks that are not permanently located at the facility, permittee shall maintain records to show that the integrity of the roof and pressure-vacuum relief valve were verified when the tank was brought to the facility.

5. Pursuant to Rule 71.1.E.3, any person claiming the exemption of Rule 71.1.D.1.c for any portable tank shall maintain records indicating the number of days the tank has stored or held crude oil during the maintenance operation. In addition, the location of the portable tank relative to a tank battery, and whether the tank was connected to vapor recovery shall be indicated. These records shall be submitted to the District upon request.

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Ventura County Air Pollution Control District
Rule 71.4.B.2 Applicable Requirements
Sumps, Pits, and Ponds With Covers

Rule 71.4, "Petroleum Sumps, Pits, Ponds, and Well Cellars"
Adopted 06/08/93, Federally-Enforceable

Rule 74.10, "Components at Crude Oil and Natural Gas Production and Processing Facilities"
Adopted 03/10/98, Federally-Enforceable

Applicability:

This attachment applies to second or third stage sumps, pits, and ponds at facilities where crude oil or petroleum material is produced, gathered, separated, processed, or stored. The cover's sealing mechanism and other inlet and outlet piping connections are considered to be components subject to the leak requirements of APCD Rule 74.10, "Components at Crude Oil and Natural Gas Production and Processing Facilities".

A sump, pit, or pond is a receptacle, formed primarily of earthen materials, although it may be lined with artificial materials. A sump is further defined as "in continuous use for separating oil, water, sand or other material in petroleum production operations". A pit is further defined as "used to receive intermittent flows of petroleum material or crude oil. Neither a sample box of less than two (2) square feet in horizontal surface area nor a containment berm shall be considered a pit". A pond is further defined as "used to contain produced water from petroleum production processes for disposal or re-use. Ponds are not used for oil/water separation or evaporation".

Conditions:

1. Pursuant to Rule 71.4.B.2, no person shall use a second or third stage sump, pit, or pond unless it is equipped with a properly installed and maintained cover which does not leak, which is impermeable to ROC vapors, and which covers at least 90 percent of the liquid surface area of the sump, pit, or pond. All covers shall be closed at all times except during sampling or attended maintenance operations.
2. Pursuant to Rule 71.4.C.2, the cover requirements of Rule 71.4.B.2 shall not apply during maintenance operations on sumps or pits if the Air Pollution Control District is notified verbally at least 24 hours prior to the maintenance operation, and if the maintenance operation will take no more than 24 hours to complete. Pursuant to Rule 71.4.D.3, any person claiming an exemption from the cover requirements of Rule 71.4.B.2, based on Rule 71.4.C.2, shall maintain records of maintenance to justify the exemption and submit these records to the District upon request.

3. The cover's sealing mechanism and other inlet and outlet-piping connections are components subject to the leak requirements of Rule 74.10, "Components at Crude Oil and Natural Gas Production and Processing Facilities". Compliance with Rule 74.10 at sumps, pits, and ponds ensures compliance with the maintenance and leak-free requirements of Rule 71.4.B.2.
4. On an annual basis, permittee shall certify that sumps, pits, and ponds at the facility are complying with Rule 71.4.B.2. This annual compliance certification shall include verifying the integrity of the cover.

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Ventura County Air Pollution Control District
Rule 74.9.D.9 Applicable Requirements
Stationary Diesel-Fired Internal Combustion Engines
Used to Power Cranes and Welding Equipment

Rule 74.9, "Stationary Internal Combustion Engines"
Adopted 11/08/05, Federally-Enforceable

Applicability:

This attachment describes the requirements of APCD Rule 74.9, "Stationary Internal Combustion Engines", and applies to stationary diesel-fired internal combustion engines rated at 50 or more horsepower, and not subject to the provisions of APCD Rule 74.16, "Oilfield Drilling Operations".

As detailed in Rule 74.9.D.9, stationary diesel-fired internal combustion engines used to power cranes and welding equipment are exempt from Sections B, C, and E of Rule 74.9.

Specifically, this attachment applies to diesel engines that are exempt because they are used to power cranes and welding equipment.

Conditions:

1. Pursuant to Rule 74.9.D.9, the provisions of Section B (Requirements), Section C (Engine Operator Inspection Plan), and Section E (Recordkeeping Requirements) of Rule 74.9 shall not apply to stationary internal combustion diesel engines used to power cranes and welding equipment.
2. The engine shall only be used to power a crane or welding equipment.
3. The operator shall maintain data for each engine including the function (usage) of the engine, manufacturer, model number, operator identification number, and location of each engine.
4. Permittee shall perform daily visual inspections of the diesel-fired engine to ensure that compliance with Rule 74.9.D.9 is being maintained.

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Ventura County Air Pollution Control District
Rule 74.15.1.B.1 Applicable Requirements
Boilers, Heater Treaters, Steam Generators, and Process Heaters
Heat Inputs \geq 1 MMBTU/hr and $<$ 5 MMBTU/hr
NO_x and CO Emission Limits
Annual Heat Input \geq 1,800 MMBTU

Rule 74.15.1, "Boilers, Steam Generators, and Process Heaters"
Adopted 06/23/15, Federally-Enforceable

Applicability:

This attachment applies to boilers, heater treaters, steam generators and process heaters with a rated heat input capacity equal to or greater than 1 MMBTU/Hr and less than 5 MMBTU/Hr that have operated with an annual heat input rate of greater than or equal to 1,800 MMBTU during any twelve (12) calendar month rolling period. This attachment also applies to any unit operated with an annual heat input rate of less than 1,800 MMBTU that is equipped with low NO_x burners or other such equipment to comply with the NO_x and CO requirements of Rule 74.15.1.B.1. A heat input of 1,800 MMBTU is equivalent to 18,000 therms and equivalent to 1.71 million cubic feet of natural gas at a higher heating value of 1,050 BTU/cf. This attachment specifically applies to units installed prior to January 1, 2013 for units with a heat input capacity of equal to or greater than 1 MMBTU/hr and less than or equal to 2 MMBTU/hr; and installed prior to January 1, 2016 for units with a heat input capacity of greater than 2 MMBTU/hr and less than 5 MMBTU/hr. These units have a Rule 74.15.1.B.1 limit of 30 ppmvd NO_x at 3% oxygen.

A boiler, steam generator or process heater is any external combustion equipment fired with liquid and/or gaseous fuel. A boiler or a steam generator is further defined as equipment used to produce steam or to heat water. Boiler or steam generator does not include any unfired waste heat recovery boiler that is used to recover sensible heat from the exhaust of any combustion equipment. A process heater is further defined as equipment that transfers heat from combustion gases to water or process streams. A process heater does not include any of the following combustion sources: kiln, oven, open heated tank, dehydrator, dryer, crematory, incinerator, calciner, cooker, roaster, furnace; unfired waste heat recovery heater that is used to recover sensible heat from the exhaust of any combustion equipment; fuel-fired degreasing or metal finishing equipment including parts washers and metal heat treating or metal furnaces; afterburner, vapor incinerator, thermal or catalytic oxidizers used as an emission control device; glass melting furnace; tenter frame, fabric, or carpet dryer. Annual heat input is defined as the actual amount of heat released by fuels burned in a unit during a twelve (12) calendar month rolling period, based on the higher heating value of the fuel. The annual heat input shall be calculated as the sum of the previous 12 monthly fuel use rates multiplied by the higher heating value of the fuel.

Conditions:

1. Pursuant to Rule 74.15.1.B.1, emissions from an applicable emission unit shall not exceed the following limits:
 - a. Oxides of Nitrogen (NO_x expressed as NO₂): 30 ppmvd
 - b. Carbon Monoxide (CO): 400 ppmvd

These limits shall be referenced at three (3) percent volume stack gas oxygen on a dry basis averaged over 15 consecutive minutes. Compliance with this condition shall be verified by source testing as detailed below.

2. Source testing:
 - a. Pursuant to Rule 74.15.1.B.4.a, units with a rated heat input capacity greater than 2 MMBTU/hr shall be source tested for compliance not less than once every 24 months.
 - b. Pursuant to Rule 74.15.1.B.4.c, units with a rated heat input capacity of less than or equal to 2 MMBTU/hr shall be source tested for compliance not less than once every 48 months.
3. Required source testing shall utilize the following methods as detailed in Rule 74.15.1.E:
 - a. NO_x ARB Method 100
 - b. CO ARB Method 100
 - c. Stack Gas Oxygen ARB Method 100

Pursuant to Rule 74.15.1.E.2, emission tests shall be conducted on units in "As-found" operating condition. Prior to conducting a required emissions test, permittee shall notify the District Compliance Division. Written notification shall be received no less than 15 calendar days prior to the test. The emissions test report and results shall be submitted to the District Compliance Division within 45 days after the test.

4. Pursuant to Rule 74.15.1.B.4.d, an annual screening analysis of NO_x and CO emissions shall be performed on the unit. The screening analysis is not required if the source testing required by Rule 74.15.1.B.4.a or 74.15.1.B.4.c (Condition No. 2) is required that year. The permittee shall notify the VCAPCD Compliance Division by telephone, fax, or email 24 hours prior to any screening analysis. Pursuant to Rule 74.15.1.D.3, the permittee shall submit a report to the District Compliance Division within 45 days after each screening analysis.
5. Pursuant to Rule 74.15.1.C.1, the emission limits of Rule 74.15.1.B.1 shall not apply to any unit operated on alternate fuel under the following conditions:

- a. Alternate fuel is required due to curtailment of natural gas service to the individual unit by the natural gas supplier. Alternate fuel use in this case shall not exceed the period of natural gas curtailment.
 - b. Alternate fuel use is required to maintain the alternate fuel system. Alternate fuel use in this case shall not exceed 50 hours per year.
6. The permittee shall record and maintain the following information:
- a. Daily records of alternate fuel consumption as required by Rule 74.15.1.D.4. Each record shall include the type of fuel, the quantity of fuel, and the duration of the occurrence; and
 - b. Required source test reports.
 - c. Annual screening analysis logs and reports as required by Rule 74.15.1.D.3.

This information shall be submitted to the District upon request.

**Ventura County Air Pollution Control District
California Airborne Toxic Control Measure For
Stationary Compression Ignition Engines
Engines Used Solely on OCS Platforms**

**Section 93115, Title 17, California Code of Regulations, Airborne Toxic Control Measure
For Stationary Compression Ignition (CI) Engines
Effective 05/19/11**

The District is required to implement and enforce the state ATCM. The ATCM is not federally-enforceable.

Applicability:

This attachment describes the requirements of California Airborne Toxic Control Measure (ATCM) For Stationary Compression Ignition (CI) Engines that apply to stationary diesel-fueled CI engines that are operated solely on OCS Platforms. Section 93115.3(h) of the ATCM exempts such engines from the operating requirements and emission standards for new and in-use engines as listed in Sections 93115.6 and 93115.7 of the ATCM. Pursuant to Section 93115.4(a)(8) CARB Diesel Fuel means any diesel fuel that meets the specifications of vehicular diesel fuel, as defined in title 13, CCR, sections 2281 and 2282. The Verification Procedure is defined in Section 93115.4(a)(78).

Conditions:

1. Pursuant to subsection 93115.5(a), as of January 1, 2006, the permittee shall not fuel the engine with any fuel unless the fuel is one of the following:
 - a. CARB Diesel Fuel, or
 - b. An alternative diesel fuel that is:
 - 1) biodiesel;
 - 2) a biodiesel blend that does not meet the definition of CARB diesel Fuel
 - 3) a Fischer-Tropsch fuel; or
 - 4) an emulsion of water in diesel fuel; or
 - c. any alternative diesel fuel that is not identified in section 93115.5(a)(2) and meets the requirements of the Verification Procedure; or
 - d. an alternative fuel; or
 - e. CARB Diesel Fuel used with fuel additives that meets the requirements of the Verification Procedure; or
 - f. any combination of the above.

2. Pursuant to subsection 93115.10(f)(1), the permittee shall keep records and prepare a monthly summary that shall list and document the nature of use for each of the following:

- a. Emergency use hours of operation;
- b. Maintenance and testing hours of operation;
- c. Type of fuel use in the engines. For engines operated exclusively on CARB Diesel Fuel, the owner or operator shall document the use of CARB Diesel Fuel through the retention of fuel purchase records indicating that the only fuel purchased for supply to an emergency standby engine was CARB Diesel Fuel; or for engines operated on any fuel other than CARB Diesel Fuel, the fuel records demonstrating that the only fuel purchased and added to an emergency standby engine or engines, or to any fuel tank directly attached to an emergency standby engine or engines, meets the requirements of section 93115.5(b).

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**Ventura County Air Pollution Control District
National Emission Standards for Hazardous Air Pollutants
for Stationary Reciprocating Internal Combustion Engines
Existing Non-Emergency Diesel Engines
Greater Than 300 HP and Less Than or Equal to 500 HP
at an Area Source of HAPs**

**40 CFR Part 63, Subpart ZZZZ, “National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines” (RICE MACT)
Last revised 01/30/13**

Applicability:

The NESHAP for Stationary Reciprocating Internal Combustion Engines is applicable to all stationary reciprocating internal combustion engines (RICE) at both major and area sources of hazardous air pollutants. The NESHAP is applicable to both compression ignition (CI – diesel) engines and spark ignition (SI – natural gas, landfill gas, gasoline, propane, etc.) engines. The specific conditions below are for existing non-emergency diesel engines rated greater than 300 HP (horsepower) and less than or equal to 500 HP at an area source. An engine is defined as “existing” if it was constructed before June 12, 2006. A stationary source is defined as an “area source” if it is not a major source of HAP (Hazardous Air Pollutants) emissions; meaning the stationary source does not emit or have the potential to emit any single HAP at a rate of 10 tons or more per year or any combination of HAP at a rate of 25 tons or more per year.

A non-emergency engine is any engine whose operation does not meet the definition of an “emergency engine” as defined in Section 63.6675. Pursuant to Section 63.6675, an “emergency engine” is any engine whose operation is limited to emergency situations and required testing and maintenance. An emergency can be the loss of grid power or the stationary source’s own power production. Stationary RICE used for peak shaving or as part of a financial arrangement to supply power into the grid, or as a part of a non-emergency demand response program may not be considered emergency stationary RICE under most circumstances.

Conditions:

1. Pursuant to Section 63.6603(a), Table 2d, and Section 63.6625(h), during periods of startup, the permittee shall minimize the engine’s time spent at idle and minimize the engine’s startup time at startup to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the non-startup emission limitations listed in the conditions below apply.
2. Pursuant to Section 63.6603(a), Table 2d, the permittee shall comply with the following operating requirements for non-emergency, non-black start (i.e., black start means to only

start up a combustion turbine) CI stationary RICE \geq 300 HP and \leq 500 HP, except during periods of startup:

- a. Limit concentration of CO in the stationary RICE exhaust to 49 ppmvd at 15 percent O₂; or
 - b. Reduce CO emissions by 70 percent or more.
3. Pursuant to Section 63.6604, the permittee shall use diesel fuel that meets the requirements in 40 CFR 80.510(b) for nonroad diesel.
 4. Pursuant to Sections 63.6612 and 63.6630, the permittee has conducted initial performance tests according to Tables 4 and 5. This included testing pursuant to EPA Method 10 for meeting the CO ppmvd limit or testing with a portable CO and oxygen analyzer for meeting the CO percent reduction limit. The testing was required by October 30, 2013, 180 days after the compliance date of May 3, 2013.
 5. Pursuant to Section 63.6625(g), the unit is equipped with a closed crankcase ventilation system.
 6. Pursuant to Section 63.6650 and Table 7, the permittee shall submit semiannual compliance reports. The compliance report shall contain the information specified in Sections 63.6650(c)(1) through (6).
 7. Pursuant to Section 63.6655, the permittee shall maintain all applicable records described in Sections 63.6655(a)(1) through (a)(5) and (b)(1) through (b)(3).
 8. On an annual basis, the permittee shall certify that all engines at this stationary source are operating in compliance with 40 CFR Part 63, Subpart ZZZZ, "National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Engines" (RICE MACT).

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8. PERMIT SPECIFIC CONDITIONS (ATTACHMENTS)

As discussed in Section No. 2, “Permitted Equipment and Applicable Requirements Table”, the emissions units at this stationary source listed in the table have requirements that are specifically applicable to them. The applicable requirements are primarily based on Rule 26, “New Source Review” requirements (e.g., BACT and offset requirements), or Rule 29, “Conditions on Permits” requirements (e.g., throughput recordkeeping requirements, specific requirements that limit emissions, etc.). These requirements are in addition to the specific applicable requirements listed in Section No. 7.

In this section of the permit, the permit conditions that are associated with each specific applicable requirement are listed in an individual attachment. The attachment is identified with the label “Attachment PO (Title V Permit No.)PC#” in the lower left corner. Each attachment has an applicability section that describes how and why this attachment applies to the specific emissions unit. The attachment may apply to one or more of the emissions units listed in the Permitted Equipment and Applicable Requirements Table in Section No. 2.

**Ventura County Air Pollution Control District
Additional Permit Requirements
Platform Gilda Additional Requirements**

Rule 26, “New Source Review”

Rule 29, “Conditions on Permits”

For OCS sources, conditions applied pursuant to Rule 26 or Rule 29 are federally enforceable.

**Section 93118.5, Title 17, California Code of Regulations, Airborne Toxic Control Measure for Diesel Engines on Commercial Harbor Craft Operated within California Waters and 25 Nautical Miles of the California Baseline
Effective 07/20/11**

The District does not implement and enforce this state ATCM. The ATCM is not federally-enforceable.

Applicability:

This attachment applies to Platform Gilda. These requirements are in addition to any other specific or general requirements referenced in this permit.

Conditions:

1. In order to comply with the throughput and consumption limits of this permit, the permittee shall maintain monthly records of throughput and consumption as detailed in Section No. 3, “Permitted Throughput and Consumption Limit Table”, of this permit. The monthly records shall be summed for the previous 12 months. Throughput or consumption totals for any of these 12 calendar month rolling periods in excess of the specified limit shall be considered a violation of this permit. This is a general throughput and consumption recordkeeping condition and applies unless another throughput and consumption recordkeeping condition appears in this section of the permit. (Rule 29)
2. The permitted emissions authorized by this permit are based in part on the fugitive emissions from 54 oil wells. This platform currently has 48 slots with oil well completions. An Authority to Construct is required to be obtained from the District prior to drilling in a slot that does not contain an active or shut-in oil well. Emission offsets must also be provided with the submittal of any application to increase the number of wells beyond 54 wells. (Rule 29)
3. The following wells shall be free flowing, operated on gas lift, or operated with electric motor driven artificial lift equipment:

<u>Slot Number</u>	<u>Well Number</u>
6	S-89
28	S-87
58	S-28

This condition is applied as BACT (Best Available Control Technology). (Rule 26)

4. All diesel fuel consumed in the crane engines, backup generator engines, and boats shall contain 0.05% sulfur by weight, or less. In order to comply with this condition, permittee shall maintain fuel records, or certification from the fuel supplier, documenting the sulfur content of each diesel fuel delivery. (Rule 29)
5. The total diesel fuel consumption by all crew boats, work boats, and specialty vessels (as defined below) servicing Platform Gilda shall not exceed 253,390 gallons per year.

In order to comply with this condition, the permittee shall maintain monthly records of diesel fuel consumption for all crew boats, work boats, and specialty vessels servicing OCS Platforms Gina and Gilda. Boats not owned by the permittee that are providing emergency oil spill response or training shall not be included in these records. The crew boat and work boat fuel usage, in gallons, shall be allocated 25% to Platform Gina and 75% to Platform Gilda. Specialty vessel fuel usage shall be allocated to the platform at which the service is being provided. The total fuel usage for all crew boat and work boat engines servicing both platforms shall be summed for the previous twelve months. Seventy-five percent of the total fuel usage from the crew and work boat engines servicing both platforms and the specialty vessel usage servicing Platform Gilda shall not exceed the above limit over any of these twelve month periods.

Specialty vessels are any vessels that are used for temporary projects at the platforms other than the crew boats, work boats, emergency oil spill response vessels, or training vessels. These vessels include, but are not limited to, derrick and/or crane barges and acidizing and/or cementing vessels. When such services are required, the permittee shall provide the APCD Compliance Division with a description of the vessel and its intended use, including the service to be performed and approximate days on site, at least 24 hours prior to such use. The vessel description shall include the name of the vessel and a description of all engines with a maximum rating of greater than or equal to 50 BHP, including make, model, and rated capacity (BHP). The permittee shall maintain a log showing the days and hours that each specialty vessel is in service at the platform. (Rules 26 and 29)

6. Crew boat and work boat engine Permitted Emissions for Platform Gilda are based on the annual limit of 253,390 gallons diesel fuel per year and the worst case U.S. EPA Tier 2 Marine Engine Standards as found in Table 2 of the California Air Toxic Control

Measure For Diesel Engines On Commercial Harbor Craft Operated Within California Waters And 24 Nautical Miles Of The California Baseline. These emission standards are: 8.2 g NO_x+HC/BHP-hr; 0.37 g PM/BHP-hr; and 3.7 g CO/BHP-hr. This ATCM is not federally enforceable and is not implemented by the VCAPCD. 40 CFR Part 55, "Outer Continental Shelf Air Regulations," does not provide the VCAPCD the authority to control emissions from the vessels that service the platform, but does require that the vessel emissions be included in the permitted emissions for the OCS source.

7. As shown in Table 4, this permit allows the use of a Crew Boat with combined engine horsepower up to 2,348 brake horsepower. Only one Crew Boat at a time shall be used for servicing Platform Gilda. The permittee shall maintain a log showing the days and hours that each crew boat is in service to Platform Gilda. The permittee shall maintain a log of all Crew Boats that may be used for servicing Platform Gilda. The log shall include the boat name and a list of all engines on board, including the engines' make, model, and brake horsepower. (Rule 29)
8. As shown in Table 4, this permit allows the use of a Work Boat with combined engine horsepower up to 5,005 brake horsepower. Only one Work Boat at a time shall be used for servicing Platform Gilda. The permittee shall maintain a log showing the days and hours that each crew boat is in service to Platform Gilda. The permittee shall maintain a log of all Work Boats that may be used for servicing Platform Gilda. The log shall include the boat name and a list of all engines on board, including the engines' make, model, and brake horsepower. (Rule 29)
9. Pursuant to Rule 23.F.7, the use of solvents, in addition to the use of coatings, adhesives, lubricants, and sealants, for facility and building maintenance and repair is exempt from permit. However, the use of such materials by contractors for the maintenance and repair of process and industrial equipment is not exempt from permit pursuant to Rule 23.F.7, unless the material is exempted under another specific section of Rule 23. Pursuant to Rule 23.F.6, the use of non-refillable aerosol cans is exempt from permit. Pursuant to Rule 23.F.10, the use of cleaning agents certified by the SCAQMD as Clean Air Solvents (Rule 23.F.10.a) and the use of cleaning agents that contain no more than 25 grams per liter of ROC as used or applied, and no more than 5 percent by weight combined of methylene chloride, perchloroethylene, trichloroethylene, 1,1,1-trichloroethane, carbon tetrachloride, and chloroform (Rule 23.F.10.b), is also exempt from permit. This permit does not limit the usage of acetone. Acetone is exempt from permit and record keeping requirements, as it is not defined as a reactive organic compound.

In order to substantiate the solvent use exemptions listed above, the permittee shall maintain a list of all exempt solvents used at the stationary source and a reference to the specific permit exemption status. (Rule 29)

**Ventura County Air Pollution Control District
Additional Permit Requirements
100 MMBTU/Hr Flare**

Rule 29, “Conditions on Permits”

Rule 71.1, “Crude Oil Production and Separation”

Adopted 06/16/92, Federally-Enforceable

For OCS sources, conditions applied pursuant to Rule 29 are federally enforceable.

Applicability:

This attachment applies to the 100 MMBTU/Hr flare located on Platform Gilda. These requirements are in addition to any other specific or general requirements referenced in this permit.

Conditions:

1. Gas consumption at the 100 MMBTU/hr flare shall not exceed 50.51 million cubic feet per year for any planned flaring events. This is the same limit listed in Table 3 of this permit.

There is no limit for emergency use. Emergency use is defined as disposal of process gases in the event of unavoidable process upsets. A planned flaring event includes, but is not limited to, routine flaring to comply with Rule 71.1; or flaring due to planned maintenance performed on wells, equipment, or pipeline by the operator or performed by another operator accepting the produced gas. If a process upset (emergency use) cannot be rectified in a reasonable amount of time, the use of the flare may be determined to be a planned flaring event.

In order to demonstrate compliance with this condition, the permittee shall maintain records of flare gas consumption. The permittee shall maintain monthly records which differentiate between emergency usage and planned flaring events. The monthly records shall be summed for the previous 12 months. Flare gas combustion totals for planned flaring events for any of these 12 month rolling periods in excess of the specified limit shall be considered a violation of this permit.

2. The flare shall have an individual fuel meter installed to record the amount of natural gas consumed. (Rule 29)
3. The flare shall be equipped and maintained with a continuous pilot or autoignition system to ensure combustion disposal of all excess produced or recovered gases. (Rule 71.1)

4. Permittee shall test the flare's ignition system monthly and shall maintain a monthly record of the flare's ignition system tests and maintenance activities, including the test date and operator's initials. (Rule 71.1)
5. The permittee shall maintain monthly and rolling twelve month records of the total volume (MMCF or MCF) of gas combusted in the flare. Monthly and twelve month rolling records shall be maintained for total flare usage and for planned flaring events (non-emergency use). Emergency usage and planned flaring are defined above. The permittee shall maintain records which differentiate between emergency use and planned flaring events. (Rule 29)

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**Ventura County Air Pollution Control District
Additional Permit Requirements
619 BHP Caterpillar Backup Utility Generator**

Rule 26, "New Source Review"

Conditions applied pursuant to Rule 26 are Federally Enforceable

Rule 74.9, "Stationary Internal Combustion Engines"

Adopted 11/08/05, Federally-Enforceable

40 CFR Part 60, Subpart IIII, Standards of Performance for Stationary Compression Ignition Combustion Engines

Applicability:

This attachment applies to the 619 BHP Caterpillar Backup Utility Generator located on Platform Gilda. These requirements are in addition to any other specific or general requirements referenced in this permit.

Conditions:

1. Annual hours of operation for maintenance and testing usage of the 619 BHP Caterpillar engine shall not exceed 50 hours per year. In addition, annual maintenance and testing usage and emergency demand response usage shall not exceed 100 hours per year. These limits do not include emergency operation when electrical line service has failed. When not being operated for maintenance, testing, or emergency demand response usage, the emergency engine shall only be used during a failure or loss of all or part of normal electrical power service to the facility. This condition is applied pursuant to the 40 CFR Part 60, Subpart IIII, Standards of Performance for Stationary Compression Ignition Combustion Engines, Section 60.4211(f) and Rule 74.9, "Stationary Internal Combustion Engines", Section D.3. The emergency demand response usage of the engine shall comply with Section 61.4211(f)(2)(ii) of 40 CFR Part 60, Subpart IIII.

In order to comply with this condition, the engine shall be equipped with a non-resettable hour meter and the permittee shall maintain a log that differentiates operation during maintenance, testing, and emergency demand response usage from emergency use. These records shall be compiled into a monthly total. The monthly operating hour records shall be summed for the previous 12 months for each engine. Total operating hours for any of these 12 month periods, excluding emergency operation, in excess of the specified limit shall be considered a violation of this condition.

2. The 619 BHP Caterpillar emergency diesel engine shall comply with all applicable requirements of Rule 74.9, "Stationary Internal Combustion Engines".

- a. Pursuant to Section D.3, emergency engines operated during either an emergency or maintenance operation are exempt from the “Requirements”, “Engine Operator Inspection Plan”, and “Recordkeeping” sections of the rule. Maintenance operation is limited to 50 hours per calendar year.
 - b. Pursuant to Section D.2, engines operated less than 200 hours total per calendar year are exempt from the “Requirements”, “Engine Operator Inspection Plan”, and “Recordkeeping” sections of the rule.
 - c. Pursuant to Sections D.2 and D.3, the engine is required to be equipped with an operating, non-resettable, elapsed hour meter. In order to comply with this condition, the permittee shall maintain a usage log as required by Condition Nos. 2 and 6.
3. The 619 BHP Caterpillar emergency diesel engine shall be operated in compliance with all applicable requirements of the California ARB Airborne Toxic Control Measure (ATCM) for Stationary Compression Ignition Engines, California Code of Regulations, Sections 93115 through 93115.15.
- a. Section 93115.3(h) exempts stationary diesel-fueled engines that are operated solely on OCS platforms from the operating requirements and emission standards as detailed in Sections 93115.6 and 93115.7.
 - b. Pursuant to subsection 93115.5(a) of the ATCM for Stationary Compression Ignition Engines, the emergency standby stationary diesel-fueled engine shall only be fueled with CARB Diesel Fuel or another fuel that meets the requirements of subsection 93115.5(a).
 - c. The permittee shall keep records and prepare a monthly records summary as required by Section 93115.10(f)(1).
4. The 619 BHP Caterpillar emergency diesel engine shall comply with all applicable requirements of 40 CFR Part 60, Subpart IIII, “Standards of Performance for Stationary Compression Ignition Internal Combustion Engines”.
- a. Pursuant to Sections 60.4205(b) and 60.4202, the emergency engine shall meet the certification emission standards for new nonroad CI engines for the same model year and maximum engine power in 40 CFR 89.112 and 40 CFR 89.113 for all pollutants beginning in model year 2007.

The 619 BHP engine is EPA certified as a Tier 3 engine with certification documenting that the engine meets these standards. The permittee shall maintain documentation of such certification.
 - b. Pursuant to Section 60.4207(b), the permittee shall use diesel fuel that meets the requirements of 40 CFR 80.510(b). The Airborne Toxic Control Measure

(ATCM) for Stationary Compression Ignition Engines (Section 93115, Title 17, California Code of Regulations) requires the use of CARB Diesel Fuel. Therefore, the proposed emergency diesel engine is in compliance with this requirement because CARB Diesel Fuel meets the requirements of 40 CFR 80.510(b).

- c. Pursuant to Section 60.4211(f), annual hours of non-emergency operation of the engine shall not exceed 100 hours per calendar year. This non-emergency operation includes maintenance and testing, emergency demand response, and operation in non-emergency situations as described in Sections (f)(1) through (3). This limit does not include emergency operation when normal electrical power line service has failed. The emergency demand response usage of the engine shall comply with Section 61.4211(f)(2)(ii) of 40 CFR Part 60, Subpart III.

In order to comply with this condition, the engine shall be equipped with a non-resettable hour meter and the permittee shall maintain a usage log as required by Condition Nos. 2 and 5.

- 5. A log of engine operation for the emergency engine shall be maintained based on readings from a non-resettable hour meter. The log shall differentiate operation during maintenance, testing, emergency demand response, and from operation during an emergency. The hours of operation shall be totaled on a monthly basis and shall be summed for the previous 12 months.

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9. GENERAL APPLICABLE REQUIREMENTS (ATTACHMENTS)

The general applicable requirements are broadly applicable requirements that apply and are enforced in the same manner for all subject emissions units or activities. These requirements can normally be adequately addressed in the permit application with minimal or no reference to any specific emissions unit or activity, provided that the scope of the requirement and the manner of its enforcement are clear. Examples of such requirements include those that apply identically to all emissions units at a facility (e.g., source-wide opacity limits), general housekeeping requirements, and requirements that apply identical emissions limits to small units (e.g., process weight requirements).

As detailed in the Title V Permit Reissuance Application, general applicable requirements that apply to this facility were determined. The permit conditions associated with each generally applicable requirement are listed in an individual attachment. The attachment is identified with the label "Attachment (APCD Rule No.) ____" in the lower left corner of each attachment. Each attachment has an applicability section that describes the emissions units to which the attachment applies. Each attachment may apply to one or more of the emissions units listed in the Applicable Requirements Table of Section No. 2. Note that these general applicable requirements may also apply to emissions units not required to be listed in the permit, such as those that are short-term.

Ventura County Air Pollution Control District
Rule 50 Applicable Requirements
Opacity

Rule 50, "Opacity"

Adopted 04/13/04, Federally-Enforceable

Applicability:

This attachment applies to all emissions units at this stationary source.

Conditions:

1. Pursuant to Rule 50.A, permittee shall not discharge into the atmosphere from any single source whatsoever any air contaminants for a period or periods aggregating more than three (3) minutes in any one (1) hour which are as dark or darker in shade as that designated as No. 1 on the Ringelmann Chart, or equivalent to 20% opacity and greater, unless specifically exempted by Rule 50.
2. Permittee shall perform daily visual inspections to ensure that compliance with Rule 50 is being maintained. A record shall be kept of any occurrence of visible emissions other than uncombined water greater than zero percent for a period or periods aggregating more than three (3) minutes in any one (1) hour. These records shall include the date, time, and identity of emissions unit. If the visible emissions problem cannot be corrected within 24 hours, permittee shall provide verbal notification to the District within the subsequent 24 hours. These visible emissions records shall be maintained at the facility and submitted to the District upon request.
3. On an annual basis, permittee shall certify that all emissions units at the facility are complying with Rule 50. This annual compliance certification shall include a formal survey identifying the date, time, emissions unit, and verification that there are no visible emissions other than uncombined water greater than zero percent for a period or periods aggregating more than three (3) minutes in any one (1) hour. As an alternative, the annual compliance certification shall include a formal survey identifying the date, time, emissions unit, and verification that there are no visible emissions for a period or periods aggregating more than three (3) minutes in any one (1) hour which are as dark or darker in shade as that designated as No. 1 on the Ringelmann Chart, or equivalent to 20% opacity and greater, as determined by a person certified in reading smoke using EPA Method 9, or any other appropriate test method as approved in writing by the District, the California Air Resources Board, and the U.S. Environmental Protection Agency.
4. Upon District request, opacity shall be determined by a person certified in reading smoke using EPA Method 9 or a certified, calibrated monitoring system.

Ventura County Air Pollution Control District
Rule 54.B.1 Applicable Requirements
Sulfur Compounds - Sulfur Emissions at Point of Discharge - OCS

Rule 54, "Sulfur Compounds"
Adopted 01/14/14, Federally Enforceable

The 01/14/14 revision to the rule is referenced in 40 CFR Part 55, Outer Continental Shelf Air Regulations.”

Applicability:

This attachment applies to all emissions units at this OCS (Outer Continental Shelf) stationary source that emit sulfur compounds. This attachment addresses the requirements of Rule 54.B.1 for sulfur emissions at the point of discharge and includes the exemptions of Rule 54 for the unplanned burning of gas for emergency or safety concerns and for the planned burning of gas.

Conditions:

1. Pursuant to Rule 54.B.1.a, no person shall discharge sulfur compounds from any combustion operation, which would exist as a liquid or gas at standard conditions, in excess of the following limit at the point of discharge:

300 ppm by vol, on a dry basis, as sulfur dioxide (SO ₂), at 3% oxygen	For sources subject to: Rule 74.11, “Natural Gas-Fired Water Heaters” Rule 74.11.1, “Large Water Heaters and Small Boilers” Rule 74.15, “Boilers, Steam Generators, and Process Heaters” Rule 74.15.1, “Boilers, Steam Generators, and Process Heaters” (1 to 5 MMBTUs)
300 ppm by vol, on a dry basis, as sulfur dioxide (SO ₂), at 15% oxygen	For sources subject to: Rule 74.9, “Stationary Internal Combustion Engines” Rule 74.23, “Stationary Gas Turbines” Flares and all other combustion operations

2. Pursuant to Rule 54.B.1.b, no person shall discharge sulfur compounds, which would exist as a liquid or gas at standard conditions, in excess of 500 ppm by volume from any other operation, calculated as sulfur dioxide (SO₂) by volume at the point of discharge.
3. Pursuant to Rule 54.C.1 and 54.C.2, the sulfur dioxide emission limitations of Rule 54.B.1 do not apply to the unplanned burning of gas for emergency or safety concerns, or to the planned burning of gas, provided that all the conditions and requirements of Rule 54.C.1 for unplanned flaring, and Rule 54.C.2 for planned flaring events, have been met.

For unplanned flaring, Rule 54.C.1 requires notification, recordkeeping, and reporting as detailed below. For planned flaring events, Rule 54.C.2 requires notification, a planned flaring management plan, recordkeeping, excess emissions fees, and reporting as detailed below.

4. Pursuant to Rule 54.C.1, the sulfur dioxide emission limitations of Rule 54.B.1 do not apply to the unplanned burning of gas for emergency or safety concerns provided all of the conditions of Rule 54.C.1 have been met. These include, but are not limited to, the following conditions:
 - a. Permittee shall maintain records or logs of each flaring event as required by Rule 54.C.1ad.
 - b. Pursuant to Rule 54.C.1.f, the unplanned flaring event shall not exceed 24 hours in duration. If the flaring event exceeds one hour in duration, the operator shall:
 1. Notify the District Compliance Division as soon as reasonably possible, but no later than four hours after its detection by the operator.
 2. Within one week after the flaring event, submit a written report to the District Compliance Division which contains the records required by Rule 54.C.1.d, an estimate of the sulfur emissions, and pictures or descriptions of the equipment or controls that failed.
5. Pursuant to Rule 54.C.2, the sulfur dioxide emission limitations of Rule 54.B.1 do not apply to the planned burning of gas provided all of the conditions of Rule 54.C.2 have been met. These include, but are not limited to, the following conditions:
 - a. Permittee shall provide a 72 hour written notification to the District Compliance Division as required by Rule 54.C.2.a.
 - b. Permittee shall have a planned flare management plan in place and approved by the District Compliance Division as required by Rule 54.C.2.b.
 - c. Permittee shall maintain records of the date, time, duration, flare volume and estimated sulfur emissions (as pounds of SO₂) during the entire flaring event as required by Rule 54.C.2.c.
 - d. Pursuant to Rule 54.C.2.d, permittee shall notify the District Compliance Division in writing when work is completed. The notice shall include all updated information from the 72 hour notification as detailed in Rule 54.C.2.a.

- e. Pursuant to Rule 54.C.2.f, permittee shall provide a written report of excess emissions to the District Compliance Division no later than 15 days after the end of each calendar year. Permittee shall pay a fee pursuant to APCD Rule 42.N for any excess emissions of SO₂.
6. Permittee shall maintain a representative fuel analysis or exhaust analysis to ensure that compliance with Rule 54.B.1 is being maintained. This analysis shall be provided to the District upon request.
7. Upon District request, sulfur compounds at the point of discharge shall be determined by source testing using EPA Test Method 6, 6A, 6C, 8, 15, 16A, 16B, or South Coast AQMD Test Method 307-91 (Determination of Sulfur in a Gaseous Matrix), as appropriate.

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Ventura County Air Pollution Control District
Rule 54.B.2 Applicable Requirements
Sulfur Compounds - Sulfur Dioxide Concentration at Ground Level - OCS

Rule 54, "Sulfur Compounds"
Adopted 01/14/14, Federally Enforceable

The 01/14/14 revision to the rule is referenced in 40 CFR Part 55, "Outer Continental Shelf Air Regulations."

Applicability:

This attachment applies to all emissions units at this OCS (Outer Continental Shelf) stationary source that emit sulfur compounds. This attachment addresses the requirements of Rule 54.B.2 for sulfur emissions at ground or sea level at or beyond the property line of the stationary source and includes the exemptions of Rule 54 for the unplanned burning of gas for emergency or safety concerns and for the planned burning of gas.

Conditions:

1. Pursuant to Rule 54.B.2, no person shall discharge sulfur compounds, which would exist as a liquid or gas at standard conditions, as sulfur dioxide which results in average ground or sea level concentrations at any point at or beyond the property line in excess of 0.25 ppmv averaged over any one hour period, or 0.04 ppmv averaged over any 24 hour period.
2. Pursuant to Rule 54.B.2.a, no person shall discharge sulfur compounds, which would exist as a liquid or gas at standard conditions, as sulfur dioxide which results in ground or sea level concentrations at any point at or beyond the property line such that the 1-hour average design value exceeds 0.075 ppm (Vol).
 - a) For purposes of Subsection B.2.a, the design value is derived from the 3-year average of annual 99th percentile daily maximum 1-hour values. At the District's discretion, compliance with the ground or sea level concentration limit in Subsection B.2.a of this rule may be demonstrated using EPA-approved dispersion models or ambient air monitoring. If the District requires ambient air monitoring, the test method(s) listed in Subsection D.2 of this rule must be employed.
 - b) To demonstrate compliance using dispersion modeling, the annual 99th percentile daily maximum at each receptor is determined from model results as follows: for each year of meteorological data modeled, select from each day the maximum hourly modeled SO₂ concentration value and sort all these daily maximum hourly values by descending value. The 99th percentile is the 4th highest value for each

modeled year. Calculate the average of the 99th percentile values for three consecutive years of modeling data for each receptor. Compliance is demonstrated if this average value is less than or equal to the design value concentration limit in Subsection B.2.a of this Rule at each receptor.

- c) Compliance with the limit in subsection B.2.a may also be demonstrated using EPA-approved screen models. Compliance is demonstrated if the 1-hour SO₂ ground or sea level concentration does not exceed 0.075 ppm (Vol) at or beyond the property line.
 - d) If ambient air monitoring data is used to demonstrate compliance, the design value must be calculated in accordance with 40 CFR Part 50 Appendix T – Interpretation of the Primary National Ambient Air Quality Standards for Oxides of Sulfur (Sulfur Dioxide).
3. Pursuant to Rule 54.C.1 and 54.C.2, the sulfur dioxide emission limitations of Rule 54.B.2 do not apply to the unplanned burning of gas for emergency or safety concerns, or to the planned burning of gas, provided that all the conditions and requirements of Rule 54.C.1 for unplanned flaring, and Rule 54.C.2 for planned flaring events, have been met. For unplanned flaring, Rule 54.C.1 requires notification, recordkeeping, and reporting as detailed below. For planned flaring events, Rule 54.C.2 requires notification, a planned flaring management plan, recordkeeping, excess emissions fees, and reporting as detailed below.
4. Pursuant to Rule 54.C.1, the sulfur dioxide emission limitations of Rule 54.B.2 do not apply to the unplanned burning of gas for emergency or safety concerns provided all of the conditions of Rule 54.C.1 have been met. These include, but are not limited to, the following conditions:
- a. Permittee shall maintain records or logs of each flaring event as required by Rule 54.C.1.d.
 - b. Pursuant to Rule 54.C.1.f, the unplanned flaring event shall not exceed 24 hours in duration. If the flaring event exceeds one hour in duration, the operator shall:
 1. Notify the District Compliance Division as soon as reasonably possible, but no later than four hours after its detection by the operator.
 2. Within one week after the flaring event, submit a written report to the District Compliance Division which contains the records required by Rule 54.C.1.d, an estimate of the sulfur emissions, and pictures or descriptions of the equipment or controls that failed.

5. Pursuant to Rule 54.C.2, the sulfur dioxide emission limitations of Rule 54.B.2 do not apply to the planned burning of gas provided all of the conditions of Rule 54.C.2 have been met. These include, but are not limited to, the following conditions:
 - a. Permittee shall provide a 72 hour written notification to the District Compliance Division as required by Rule 54.C.2.a.
 - b. Permittee shall have a planned flare management plan in place and approved by the District Compliance Division as required by Rule 54.C.2.b.
 - c. Permittee shall maintain records of the date, time, duration, flare volume and estimated sulfur emissions (as pounds of SO₂) during the entire flaring event as required by Rule 54.C.2.c.
 - d. Pursuant to Rule 54.C.2.d, permittee shall notify the District Compliance Division in writing when work is completed. The notice shall include all updated information from the 72 hour notification as detailed in Rule 54.C.2.a.
 - e. Pursuant to Rule 54.C.2.f, permittee shall provide a written report of excess emissions to the District Compliance Division no later than 15 days after the end of each calendar year. Permittee shall pay a fee pursuant to APCD Rule 42.N for any excess emissions of SO₂.
6. Permittee shall maintain a representative fuel analysis or exhaust analysis, along with modeling data or other demonstration to ensure that compliance with Rule 54.B.2 is being maintained. This analysis and compliance demonstration shall be provided to the District upon request.
7. Upon District request, pursuant to Rule 54.D.2, ground or sea level concentrations of SO₂ shall be determined by Bay Area Air Quality Management District Manual of Procedures, Volume VI, Section 1, Ground Level Monitoring for Hydrogen Sulfide and Sulfur Dioxide (July 20, 1994) with the following amendments:
 - a. The wind direction shall be continuously measured and recorded to within 5 degrees of arc, and wind speed shall be continuously measured and recorded to within 0.25 miles per hour (mph) at wind speeds less than 25 mph and with a threshold no greater than 0.2 mph.
 - b. The meteorological instruments and siting requirements shall comply with the guidelines in "Quality Assurance Handbook for Air Pollution Measurements Systems, Volume IV, Meteorological Measurements Version 2.0," EPA-454/B-08-002, March 2008.

- c. The gas standards shall be restandardized against the reference wet chemical method at a minimum of once every 12 months, or be standardized using National Institute of Standards and Technology (NIST) standard gases.

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Ventura County Air Pollution Control District
Rule 57.1 Applicable Requirements
Particulate Matter Emissions From Fuel Burning Equipment

Rule 57.1, "Particulate Matter Emissions From Fuel Burning Equipment"
Adopted 01/11/05, Federally-Enforceable

Applicability:

This attachment applies to fuel burning equipment such as boilers, steam generators, process heaters, water heaters, space heaters, flares, and gas turbines. This attachment does not apply to internal combustion engines, jet engine test stands and rocket engine test stands, and rocket propellant testing devices and rocket fuel testing devices. This attachment also does not apply to exhaust gas streams containing particulate matter that was not generated by the combustion of fuel; such exhaust gas streams are subject to Rule 52 and Rule 53.

Conditions:

1. Pursuant to Section B of Rule 57.1, emissions of particulate matter shall not exceed 0.12 pounds per million BTU of fuel input.

Particulate matter is defined as any material, except uncombined water, that exists in a finely divided form as a liquid or solid at standard conditions. Standard conditions are: a gas temperature of 68 degrees Fahrenheit (20 degrees Celsius) and a gas pressure of 14.7 pounds per square inch (760 mm. Hg) absolute.

2. Upon request of the District Compliance Division, compliance shall be determined by independent source test using CARB Method 5. The total particulate catch shall include the filter catch, probe catch, impinger catch, and the solvent extract, as specified in CARB Method 5. Any other appropriate test method may be used with prior written approval by the District, the California Air Resources Board, and the U.S. Environmental Protection Agency.
3. Periodic monitoring is not necessary to certify compliance with Rule 57.1. To certify compliance, a reference to the Rule 57.B District analysis dated December 3, 1997 is sufficient.

Ventura County Air Pollution Control District
Rule 64 Applicable Requirements
Sulfur Content of Fuels - Gaseous Fuel Requirements

Rule 64, "Sulfur Content of Fuels"
Adopted 04/13/99, Federally-Enforceable

Applicability:

This attachment applies to all combustion emissions units at this stationary source while the emissions units are combusting gaseous fuels. Rule 64 shall not apply to any flare gas combustion, where no useful energy is produced and which is subject to Rule 54, "Sulfur Compounds".

Conditions:

1. Pursuant to Rule 64, no person shall burn at any time gaseous fuel containing sulfur compounds in excess of 50 grains per 100 cubic feet of gaseous fuel (788 ppmv), calculated as hydrogen sulfide at standard conditions, unless specifically exempted by Rule 64.
2. If only Public Utilities Commission-regulated natural gas, propane, or butane is combusted at this facility, it will be assumed that the permittee is complying with Rule 64 without additional periodic monitoring requirements. Any person claiming this exemption shall maintain records sufficient to substantiate the use of these fuels.
3. If other than Public Utilities Commission-regulated natural gas, propane, or butane is being combusted, the permittee shall analyze the sulfur content of the fuel on an annual basis using South Coast AQMD Method 307-94 - Determination of Sulfur in a Gaseous Matrix or by ASTM D1072-90 (1994), Standard Test Method for Total Sulfur in Fuel Gases.

Alternatively, when measuring the sulfur content of landfill or oilfield gaseous fuel, permittee may use the colorimetric method ASTM D 4810-88 (Reapproved 1994) or the ASTM D4084-94 (Lead Acetate Reaction Rate Method) and may assume that the hydrogen sulfide content of the fuel gas adequately represents the total sulfur content. However, if the sulfur content as measured by ASTM D4810-88 or ASTM D4084-94 equals or exceeds 200 ppmv, then only South Coast AQMD Method 307-94 or ASTM D1072-90 (1994) shall be used to determine compliance.

The applicable ranges of some ASTM methods mentioned above are not adequate to measure the levels of sulfur in some fuel gases. Dilution of samples before analysis may be used subject to the verification of the dilution ratio.

Permittee may use the colormetric method ASTM D 4810-88 (Reapproved 1994) for the measurement of the sulfur content of gaseous fuels other than landfill or oilfield gas only if written approval has been granted by the District and by US EPA.

4. Monitoring of the sulfur content of landfill or oilfield gaseous fuel by the permittee shall be at least quarterly if any of the following conditions apply:
 - a. Any sulfur measurement exceeds 394 ppmv, calculated as hydrogen sulfide at standard conditions.
 - b. A stationary source is new.
 - c. The permittee has not reported historical measurements of hydrogen sulfide of the landfill or oilfield gaseous fuel performed within the previous three years in writing to the District for a stationary source.

An operator may have the sulfur content of landfill or oilfield gaseous fuel monitored annually only, instead of quarterly, by satisfying the following provisions:

- a. During four consecutive calendar quarters, each sulfur content measurement shall not exceed 394 ppmv, calculated as hydrogen sulfide at standard conditions, and
- b. Submit a written request to the District for a reduction in monitoring frequency. This request shall contain backup documentation including monitoring reports that document the above provision. Requests for a reduction in monitoring frequency are not effective until written approval by the District is received by the operator.

This annual fuel analysis, and the quarterly analyses if applicable, shall be maintained at the facility and a copy of the annual analysis shall be provided to the District with the annual compliance certification.

Ventura County Air Pollution Control District
Rule 64 Applicable Requirements
Sulfur Content of Fuels - Liquid Fuel Requirements

Rule 64, "Sulfur Content of Fuels"
Adopted 04/13/99, Federally-Enforceable

Applicability:

This attachment applies to all combustion emissions units at this stationary source while the emissions units are combusting liquid fuels. This attachment does not apply to any combustion emission unit with sulfur emission controls.

Conditions:

1. Pursuant to Rule 64, no person shall burn any liquid fuels with a sulfur content in excess of 0.5 percent, by weight, unless specifically exempted by Rule 64.
2. If only ARB-quality reformulated gasoline or ARB-certified diesel fuel is combusted at this facility, it will be assumed that the permittee is complying with Rule 64 without additional periodic monitoring requirements. Any person claiming this exemption shall maintain records sufficient to substantiate the use of these fuels.
3. If other than ARB-quality reformulated gasoline or ARB-certified diesel fuel is being combusted, for each liquid fuel delivery permittee shall either obtain the fuel supplier's certification, or shall test the sulfur content of the fuel using ASTM Method D4294-98 or D2622-98, to ensure that compliance with Rule 64 is being maintained. For liquid fuels, operators of electric power generation units may use the sampling and analysis methods prescribed in Code of Federal Regulations 40CFR Part 75 Appendix D.2.2. The fuel supplier's certification may be provided once for each purchase lot, if records are kept of the purchase lot number of each delivery.

The fuel sulfur content by weight data shall be maintained at the facility and shall be provided with the annual compliance certification.

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**Ventura County Air Pollution Control District
Rule 71.1.C Applicable Requirements
Crude Oil Production and Separation - Produced Gas**

**Rule 71.1, "Crude Oil Production and Separation"
Adopted 06/16/92, Federally-Enforceable**

**Rule 74.10, "Components at Crude Oil and Natural Gas Production and Processing
Facilities"
Adopted 03/10/98, Federally-Enforceable**

Applicability:

This attachment applies to the emissions of produced gas from equipment used in the production, gathering, storage, processing, and separation of crude oil and natural gas from any petroleum production unit prior to custody transfer. Specifically, this attachment applies to gas collection systems that are hard-piped and closed systems that direct all produced gas to a fuel or sales gas system or to a flare.

Conditions:

1. Pursuant to Rule 71.1.C.1, the emissions of produced gas shall be controlled at all times using a properly maintained and operated closed system that directs all gas, except gas used in a tank battery vapor recovery system, to one of the following:
 - a. A fuel or sales gas system
 - b. A flare that combusts reactive organic compounds
2. Pursuant to Rule 71.1.C.2, the provisions of Rule 71.1.C.1 shall not apply to wells which are undergoing routine maintenance, or to exploratory wells (during the first two weeks of production) if the composition of the produced gas is unknown (i.e., new reservoir) and there are no existing gas handling systems within 150 feet of the well.
3. Permittee shall annually certify the produced gas collection system to ensure that compliance with Rules 71.1.C.1 is being maintained. This annual certification shall include a visual inspection assuring that the produced gas collection system is a closed system.
4. If a flare is used to control the produced gas, permittee shall inspect the flare on a quarterly basis to ensure that it is operating properly. A record of these inspections shall be maintained at the facility and shall be submitted to the District upon request.

5. The gas collection system's gas and liquid piping connections are components subject to the leak requirements of Rule 74.10, "Components at Crude Oil and Natural Gas Production and Processing Facilities". Compliance with Rule 74.10 at the gas collection system ensures compliance with the maintenance requirements of Rule 71.1.C.1.

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Ventura County Air Pollution Control District
Rule 71.4.B.1 Applicable Requirements
First Stage Sump Prohibition

Rule 71.4, "Petroleum Sumps, Pits, Ponds, and Well Cellars"
Adopted 06/08/93, Federally-Enforceable

Applicability:

This attachment applies to any first stage production sump at this stationary source. A first stage production sump is a sump that receives a stream of petroleum material directly from wells or a field gathering system. A sump is a receptacle, formed primarily of earthen materials, although it may be lined with artificial materials. A sump is further defined as "in continuous use for separating oil, water, sand, or other material in petroleum production operations".

Conditions:

1. Pursuant to Rule 71.4.B.1, no person shall install, maintain, or operate a first stage production sump. A first stage production sump is a sump that receives a stream of petroleum material directly from wells or a field gathering system.
2. In order to ensure that compliance with Rule 71.4.B.1 is being maintained, permittee shall annually certify that there are no first stage production sumps at the facility.

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Ventura County Air Pollution Control District
Rule 71.4.B.3 Applicable Requirements
Well Cellar Storage Prohibition

Rule 71.4, "Petroleum Sumps, Pits, Ponds and Well Cellars"
Adopted 06/08/93, Federally Enforceable

Applicability:

This attachment applies to any well cellar at this stationary source. This attachment addresses the requirements of Rule 71.4.B.3 which prohibits the storage of crude oil or petroleum material in a well cellar. Rule 71.4 applies to well cellars at facilities where crude oil or petroleum material is produced, gathered, separated, processed, or stored.

A well cellar is a lined or unlined area around one or more oil wells, allowing access to the wellhead components for servicing and/or installation of blowout prevention equipment.

Conditions:

1. Pursuant to Rule 71.4.B.3, no person shall store crude oil or petroleum material in a well cellar except during periods of equipment maintenance or well workover. In no case shall storage occur for more than five (5) calendar days.
2. Pursuant to Rule 71.4.C, the provisions of Rule 71.4 shall not apply to well cellars used in an emergency, if clean-up procedures are implemented within 24 hours after each emergency occurrence and if clean-up procedures are completed within fifteen (15) calendar days.
3. Pursuant to Rule 71.4.D.2, any person storing crude oil in a well cellar during periods of equipment maintenance or well workover shall maintain records, which may include but are not limited to, workover invoice documents, indicating the date(s) the material was stored in the well cellar or the date(s) of workover activity. These records shall be submitted to the District upon request.
4. Pursuant to Rule 71.4.D.3, any person claiming exemption to this rule pursuant to emergency use (Condition No. 2 above), shall maintain records to justify the exemption.

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Ventura County Air Pollution Control District
Rule 74.6 Applicable Requirements
Surface Cleaning and Degreasing

Rule 74.6, "Surface Cleaning and Degreasing"
Adopted 11/11/03, Federally-Enforceable

Applicability:

This attachment applies to all solvent cleaning activities at this stationary source, except those activities listed in Condition No. 11 that are exempt pursuant to Section E of Rule 74.6. This attachment does not apply to substrate surface preparation regulated by other APCD surface coating, adhesive, ink, resin, and solvent rules. "Solvent" is defined as any ROC-containing liquid used to perform solvent cleaning. "Solvent cleaning" is defined as the use of organic solvent to remove loosely held uncured adhesives, uncured inks, uncured coatings, uncured resins, and other contaminants which include, but are not limited to, dirt, soil, lubricants, coolant, moisture, grease, and fingerprints, from parts, tools, machinery, equipment, and general work areas.

This attachment also contains requirements, pursuant to Rule 74.6, for cold cleaners. A cold cleaner is defined in Rule 74.6 as any batch operated equipment designed to contain liquid solvent that is operated below the solvent's boiling point to carry out solvent cleaning operations. A specific type of cold cleaner is a "remote reservoir cold cleaner" which is a device in which solvent is moved through a sink-like work area for cleaning parts and drains immediately, without forming a pool, through a single drain hole less than 100 square centimeters (15.5 square inches) in area into an enclosed container that is not accessible for soaking parts. The freeboard height for remote reservoir cold cleaners is the distance from the top of the solvent drain to the top of the tank.

This attachment does not apply to solvent cleaning where an emission control system is used pursuant to Rule 74.6.B.5 or where an alternative cleaning system is used pursuant to Rule 74.6.B.6. Pursuant to APCD Rule 23.F.7, solvents used by the permittee for facility, ground, and building maintenance and repair are exempt from the requirement to have a permit. However, unless exempted by Rule 74.6.E, such solvents are required to comply with Rule 74.6.

Conditions:

1. Pursuant to Rule 74.6.B.1, no person shall perform solvent cleaning using solvent that exceeds the following limits:
 - a. Solvents used for application equipment cleanup, and all other cleanup of uncured coatings, adhesives, inks, or resins, shall not exceed an ROC content of 900 grams per liter and an ROC composite partial pressure of 33 mmHg at 20°C, as applied.

- b. Solvents used for cleaning of electronic components, electrical apparatus components, medical devices, or aerospace components shall not exceed an ROC content of 900 grams per liter and an ROC composite partial pressure of 33 mmHg at 20°C, as applied.
 - c. Solvents used for cleaning for purposes other than those listed in (a) and (b) above shall not exceed an ROC content of 25 grams per liter, as applied.
2. Pursuant to Rule 74.6.B.2, no person shall perform solvent cleaning using a solvent with an ROC content greater than 25 grams per liter unless one of the following cleaning devices or methods is used:
 - a. Wipe cleaning where solvent is dispensed to wipe cleaning materials from containers that are kept closed to prevent evaporation, except while dispensing solvent or replenishing the solvent supply;
 - b. Non-atomized solvent flow, dip, or flush method where pooling on surfaces being cleaned is prevented or drained, and all solvent runoff is collected in a manner that enables solvent recovery or disposal. The collection system shall be kept closed to prevent evaporation except while collecting solvent runoff or emptying the collection system;

If the cleaning method has a solvent capacity more than one gallon, a cold cleaner or remote reservoir cold cleaner meeting the equipment and operating requirements of Condition Nos. 8, 9, and 10 of this attachment (Sections C and D of Rule 74.6) shall be used to comply with this requirement.
 - c. Application of solvent from a hand held spray bottle, squirt bottle or other closed container with a capacity of one liter or less;
 - d. A properly used enclosed gun washer or low emission spray gun cleaner.
3. Pursuant to Rule 74.6.B.3.a, no person shall allow liquid cleaning solvent to leak from any equipment or container.
4. Pursuant to Rule 74.6.B.3.b, no person shall specify, solicit, supply, or require any cleaning solvent or solvent cleaning equipment intended for uses governed by Rule 74.6 if such use would violate Rule 74.6. This prohibition applies to all written and oral contracts under which solvent cleaning operations subject to Rule 74.6 are to be conducted at any location in Ventura County.
5. Pursuant to Rule 74.6.B.3.c, no person shall use more than one gallon per week of

solvents containing methylene chloride, perchloroethylene, trichloroethylene, 1,1,1-trichloroethane, carbon tetrachloride, or chloroform, or any combination of these solvents, in a total concentration greater than 5 percent by weight, for cold cleaning except in a cold cleaner operated in accordance with National Emission Standards for Halogenated Solvent Cleaning, 40 CFR Parts 9 and 63, Subpart T, Sections 63.460 through 63.469 (Degreasing MACT Standards). Any person that uses the above solvent in quantities less than one gallon per week shall maintain records of the volume and formulation of such solvent on an as-used basis (recording use each day such material is used). Records shall be saved for at least five (5) years from the date of each record and shall be made available to District personnel upon request.

6. Pursuant to Rule 74.6.B.4.a, all ROC-containing solvents shall be stored in non-absorbent, non-leaking containers that shall be kept closed at all times except when filling or emptying.
7. Pursuant to Rule 74.6.B.4.b, waste solvent and waste solvent residues shall be disposed of in a manner conforming with Division 20, Chapter 6.5 of the California Health and Safety Code.
8. Pursuant to Rule 74.6.C.1, all cold cleaners, except remote reservoir cold cleaners, shall be equipped with the following devices:
 - a. A drying rack suspended above the solvent, or other facility for draining cleaned parts such that the drained solvent is returned to the cleaner.
 - b. A cover that prevents the solvent from evaporating when not processing work in the cleaner. If high volatility solvent is used, the cover must be a sliding, rolling, or guillotine (bi-parting) type that is designed to easily open and close, or it must be designed to be easily operated with one hand. A high volatility solvent is an unheated solvent with an ROC composite partial pressure of greater than 2 mmHg @ 20°C.
 - c. A freeboard height of at least 6 inches (15.2 centimeters), if low volatility solvent is used. A low volatility solvent is an unheated solvent with an ROC composite partial pressure of 2 mmHg or less @ 20°C.
 - d. At least one of the following control devices, if high volatility solvent is used:
 1. A freeboard height such that the freeboard ratio is at least 0.75.
 2. A water cover if the solvent is insoluble in and heavier than water.
 - e. A permanent conspicuous mark locating the maximum allowable solvent level that conforms with the applicable freeboard height requirement in Condition No. 8.c or 8.d.1.

- f. A permanent conspicuous label or sign summarizing the applicable operating requirements appropriate for cold cleaning operations.
9. Pursuant to Rule 74.6.C.2, remote reservoir cold cleaners shall be equipped with the following devices:
- a. A permanent conspicuous label or sign summarizing the applicable operating requirements appropriate for cold cleaning operations.
 - b. A sink-like work area that is sloped sufficiently towards the drain to preclude pooling of solvent.
 - c. A single drain hole, less than 100 square centimeters (15.5 square inches) in area, for the solvent to flow from the sink into the enclosed reservoir.
 - d. A freeboard height of at least 6 inches (15.2 centimeters).
 - e. A cover for the drain when no work is being processed in the cleaner and high volatility solvent is used. If low volatility solvent is used, a cover is not required.
10. Pursuant to Rule 74.6.D, any person who operates a cold cleaner shall conform to the following operating requirements:
- a. The operator shall drain cleaned parts of all solvent until dripping ceases to ensure that the drained solvent is returned to the cleaner.
 - b. Solvent agitation, where necessary, shall be achieved using pump recirculation, a mixer, or ultrasonics. Air agitation shall not be used.
 - c. If a solvent flow is utilized, only a solid fluid stream (not a fine, atomized, or shower type spray) shall be used.
 - d. The pressure of the solvent flow system shall be such that liquid solvent does not splash outside the container.
 - e. No person shall remove or open any required device designed to cover the solvent unless work is being processed in the cleaner or maintenance is being performed on the cleaner.
 - f. The cleaning equipment and emission control equipment shall be operated and maintained in proper working order.
 - g. The cleaning of porous or absorbent materials such as cloth, leather, wood, or rope is prohibited. This provision shall not apply to paper gaskets or paper filters.
11. Pursuant to Rule 74.6.E.1, Rule 74.6 (all requirements of this permit attachment) shall not

apply to:

- a. Cleaning activities using Clean Air Solvent, or a solvent with an ROC-content no more than 25 grams per liter as applied. A "Clean Air Solvent" is a solvent certified by the South Coast Air Quality Management District as a Clean Air Solvent.
 - b. The use of up to 160 fluid ounces of non-refillable aerosol cleaning products per day, per facility.
 - c. Janitorial cleaning including graffiti removal.
 - d. Cleaning carried out in vapor degreasers or motion picture film cleaning equipment.
 - e. Any cleaning device or mechanism regulated by National Emission Standards for Halogenated Solvent Cleaning, 40 CFR Parts 9 and 63, Subpart T, Sections 63.460 through 63.469 (Degreasing MACT Standards).
 - f. Cleaning operations subject to any of the following rules:
 - Rule 74.3, Paper, Fabric and Film Coating Operations
 - Rule 74.5.1, Petroleum Solvent Dry Cleaning
 - Rule 74.5.2, Synthetic Solvent Dry Cleaning
 - Rule 74.19, Graphic Arts Operations
 - Rule 74.19.1, Screen Printing Operations
 - Rule 74.21, Semiconductor Manufacturing
 - g. Stripping of cured coating (e.g.; stripping), cured adhesive (e.g.; debonding, unglueing), cured ink, or cured resin.
 - h. The use of solvent for purposes other than solvent cleaning activities.
12. Pursuant to Rule 74.6.E.2, Rule 74.6.B.1 (Condition No. 1 of this attachment) shall not apply to:
- a. Cleaning operations required to comply with any ROC content and/or composite vapor pressure limit in any of the following rules:
 - Rule 74.12, Surface Coating of Metal Parts and Products
 - Rule 74.13, Aerospace Assembly and Component Manufacturing Operations
 - Rule 74.14, Polyester Resin Material Operations
 - Rule 74.18, Motor Vehicle and Mobile Equipment Coating Operations
 - Rule 74.20, Adhesives and Sealants
 - Rule 74.24, Marine Coating Operations

Rule 74.24.1, Pleasure Craft Coating Operations
Rule 74.30, Wood Products Coatings

- b. Cleaning of ultraviolet lamps used to cure ultraviolet inks coatings, adhesives or resins.
- c. Cleaning of solar cells, laser hardware, scientific instruments, or high-precision optics.
- d. Cleaning conducted in laboratory tests and analyses including quality assurance/quality control applications, or bench scale or short-term (less than 2 years) research and development programs.
- e. Removal of elemental sodium from the inside of pipes and lines.
- f. Cleaning of mold release compounds from molds.
- g. Cleaning of tools used to cut or abrade cured magnetic oxide coatings.
- h. Cleaning of aerospace assembly and subassembly surfaces that are exposed to strong oxidizers or reducers such as nitrogen tetroxide, liquid oxygen or hydrazine.
- i. Cleaning of paper gaskets.
- j. Cleaning of clutch assemblies where rubber is bonded to metal by means of an adhesive.
- k. Cleaning of hydraulic actuating fluid from filters and filter housings.
- l. Removal of explosive materials and constituents from equipment associated with manufacturing, testing or developing explosives.
- m. Manufacturing cleaning of nuts and bolts designed for automotive racing applications, in a cold cleaner complying with Sections C and D of Rule 74.6 using solvent with an ROC content no more than 900 grams per liter and a ROC composite partial pressure no more than 5 mm Hg @ 20C.
- n. Cleaning of precision-lapped mechanical seals in pumps that handle liquefied gasses, in a cold cleaner complying with Sections C and D of Rule 74.6 using solvent with an ROC content no more than 900 grams per liter and a ROC composite partial pressure no more than 5 mm Hg @ 20C.
- o. Facilitywide use of less than 1 gallon per week of non-compliant solvent where compliant solvents are not available. Any person claiming this exemption shall

maintain records of the volume and formulation of non-compliant solvent used on an as-used basis (recording use each day such material is used). Records shall be saved for at least five (5) years from the date of each record and shall be made available to District personnel upon request.

13. Pursuant to Rule 74.6.E.3, Rule 74.6 Sections B.1 and B.2 (Condition Nos. 1 and 2 of this attachment) shall not apply to aircraft engine gas path cleaning or stationary gas turbine gas path cleaning using solvent with an ROC content of 200 g/l or less, as applied.
14. Pursuant to Rule 74.6.F, the permittee shall maintain a current material list showing each ROC containing material used in solvent cleaning activities. The list shall summarize the following information:
 - a. Solvent name and manufacturer's description.
 - b. All intended uses of the solvent at the facility, classified as follows:
 1. Cleanup, including application equipment cleaning, or
 2. Cleaning of electronic components, electrical apparatus components, medical devices, or aerospace components, or
 3. Solvent used pursuant to an exemption in Rule 74.6.E (specify the exemption claimed).
 - c. The ROC content in units of grams per liter of material (and ROC composite partial pressure in units of mm Hg @ 20C, if applicable) of the solvent.
 - d. If the solvent is a mix of materials blended by the operator, a record of the mix ratio.

This information shall be made available to District personnel upon request.

15. Permittee shall maintain the above records and shall monitor each applicable solvent cleaning activity to ensure that compliance with Rule 74.6 is being maintained. Upon request of the District, compliance with Rule 74.6 shall be determined using the following methods:
 - a. Pursuant to Rule 74.6.G.1, the ROC content of materials shall be determined by EPA Test Method 24 (40 CFR Part 60, Appendix A).
 - b. Pursuant to Rule 74.6.G.4, the identity of components in solvents shall be determined using manufacturer's formulation data or by using ASTM E168-67, ASTM E169-87, or ASTM E260-85.

- c. Pursuant to Rule 74.6.G.5, ROC composite partial pressure of a solvent shall be calculated using a widely accepted published source such as: Boublik, T., V. Fried and E. Hala, "The Vapor Pressure of Pure Substances," Elsevier Scientific Publishing Co., New York (1973), Perry's Chemical Engineers Handbook, McGraw-Hill Book Company, CRC Handbook of Chemistry and Physics, Chemical Rubber Publishing Company (1986-1987), and Lange's Handbook of Chemistry, John A. Dean, editor, McGraw-Hill Book Company (1985). The true vapor pressure of a component in a solvent mix may be determined by ASTM Method D2879-86. The ROC composite partial pressure of a solvent mix consisting entirely of ROC may be determined by ASTM Method D2879-86.
- d. Pursuant to Rule 74.6.G.6, the active and passive solvent losses from spray gun cleaning systems shall be determined using South Coast Air Quality Management District's "General Test Method for Determining Solvent Losses from Spray Gun Cleaning Systems" dated October 3, 1989. The test solvent for this determination shall be any lacquer thinner with a minimum vapor pressure of 105 mm Hg at 20°C. The minimum test temperature shall be 15°C.
- e. Pursuant to Rule 74.6.G.7, initial boiling point of solvent shall be determined by ASTM 1078-78 or by using a published source such as listed in Rule 74.6.G.5.

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Ventura County Air Pollution Control District
Rule 74.10 Applicable Requirements
Components at Crude Oil and Natural Gas Production and Processing Facilities

Rule 74.10, "Components at Crude Oil and Natural Gas Production and Processing Facilities"

Adopted 03/10/98, Federally Enforceable

Applicability:

This attachment applies to the crude oil and gas production facilities, pipeline transfer stations, and to natural gas processing facilities, at this stationary source. This attachment summarizes the fugitive leak and leak inspection requirements of Rule 74.10.

A crude oil and gas production facility is defined as an onshore or offshore facility at which crude petroleum and natural gas production and handling are conducted, as defined in the SIC Code as Industry No. 1311, Crude Petroleum and Natural Gas. A pipeline transfer station is defined as a facility that handles the transfer or storage of crude oil in pipelines. A natural gas processing facility is defined as a facility engaged in the separation of natural gas liquids from field gas and/or fractionation of the liquids into natural gas products, such as ethane, propane, butane, and natural gasoline. Excluded from the definition are compressor stations, dehydration units, sweetening units, field treatment, underground storage facilities, liquefied natural gas units, and field gas gathering systems unless these facilities are located at a natural gas processing plant. This attachment does not apply to petroleum refineries.

Conditions:

1. Pursuant to Rule 74.10.B, the operator shall identify all leaking components that cannot be immediately repaired. This identification shall consist of readily visible labels, tags, or other such system approved by the APCO, in writing, that enables the District and the operator to locate and identify each leaking component. Identification tags and labels shall remain visible for at least one year from the date attached.

As detailed in Rule 74.10.K.14, a leak is defined as any major gas leak, minor gas leak, major liquid leak or minor liquid leak. A leak is not a gaseous emission from a pneumatic control valve if it occurs when the valve is in the act of opening or closing. As detailed in Rule 74.10.K.3, a component is defined as any valve, stuffing box, dump lever arm, open ended line, fitting, pump seal, compressor seal, pressure relief valve, diaphragm, hatch, sight glass or meter. As detailed in Rule 74.10.K.16, a leak repair is any corrective action taken for the purposes of reducing a component leak to the lowest achievable level or at least below 1,000 ppmv for gas leaks and three drops per minute for liquid leaks using the best modern practices.

2. Pursuant to Rule 74.10.C.1, hatches shall be closed at all times except during sampling, adding of process material through the hatch, or attended maintenance operations.
3. Pursuant to Rule 74.10.C.2, no person shall use a component that emits a major gas leak, major liquid leak or minor liquid leak and the applicable maximum leak threshold for that component category, as listed in Attachment 1 of Rule 74.10, has been exceeded at the facility in any calendar quarter. The provisions of Rule 74.10.C.2 shall not apply to components that are tagged and repaired in accordance with Rules 74.10.D and 74.10.F.

For the purpose of complying with the operating requirements in Rule 74.10.C.2, any fugitive emissions leak originating at a tank seam, broken pipe or any other nondesigned opening in a process unit shall be considered an "other component" leak for the purpose of Attachment 1 of Rule 74.10.

A major gas leak, major liquid leak, and minor liquid leak are defined in Subsections K.17, K.18, and K.20 of Rule 74.10, respectively.

4. Pursuant to Rule 74.10.D.1, at natural gas processing plants, operators shall inspect with or without instrumentation all accessible operating pump seals, compressor seals, and pressure relief valves in service for leaks or indications of leaks once during every operating shift or every eight-hour period, whichever is greater.
5. Pursuant to Rule 74.10.D.2, at oil and gas production facilities and pipeline transfer stations, operators shall inspect with or without instrumentation all operating pump seals, compressor seals, pressure relief valves in service, and polished rod stuffing boxes for leaks or indications of leaks as follows:
 - a. Inspection frequency at manned facilities shall be at least once per day except when operators do not report to work at a facility at any time during that day.
 - b. Inspection frequency at unmanned facilities shall be at least once per week.
6. Pursuant to Rule 74.10.D.3, any gaseous leaks or indications of gaseous leaks discovered by inspection, that cannot be immediately repaired, shall be measured using EPA Method 21. The operator shall perform this leak measurement as follows:
 - a. For leaks detected during normal business hours, the leak measurement shall be performed as soon as feasible but no later than 24 hours after detection. If this 24 hour deadline occurs on a weekend or holiday, then the deadline is shifted to the end of the next normal business day.
 - b. For leaks detected during holidays, weekends or after business hours, the leak measurement shall be performed as soon as feasible but no later than the end of

the next normal business day.

7. Pursuant to Rule 74.10.D.4, immediately after being placed into service, an operator shall inspect all new, replaced or repaired fittings, including flanges and threaded connections, for leaks using EPA Method 21.
8. Pursuant to Rule 74.10.D.5, operators shall inspect all components, except for the following, at least every calendar quarter for gaseous leaks using EPA Method 21.
 - a. Inaccessible components or unsafe to monitor components shall be inspected for leaks by the operator at least annually using EPA Method 21.
 - b. Threaded connections and flanges shall be inspected for leaks by the operator using EPA Method 21 annually, unless the operator has designated them in the Operator Management Plan as exempt from all inspection requirements and subject to a zero leak threshold.
9. Pursuant to Rule 74.10.D.6, a pressure relief valve shall be inspected using EPA Method 21 within 3 calendar days after every known pressure release.
10. Pursuant to Rule 74.10.D.7, upon detection, operators shall affix a visible, weatherproof tag to all leaking components awaiting repair. The tag shall remain affixed until the component is repaired free of leaks as shown by re-inspection.

If the leak is gaseous, the operator shall include the following on the tag: date and time of leak detection, date and time of leak measurement; and the concentration (ppmv) measured using EPA Method 21.

If the leak is liquid, the operator shall include the following on the tag: date and time of leak detection; and whether leak is minor or major.

A tag may also be some other system approved in writing by the APCO that demonstrates to District personnel that the operator has detected a component leak awaiting repair and contains all of the information required to be on tags by Rule 74.10.D.7.

11. Pursuant to Rule 74.10.D.8, notwithstanding the requirements of Rule 74.10.D.5, operators may inspect components annually instead of quarterly at a facility by satisfying all the following provisions, except that compressor seals, pressure relief valves, polished rod stuffing boxes, and pump seals shall not be eligible for this reduction in inspection frequency:
 - a. During 4 consecutive calendar quarters, successfully operate and maintain all components at the facility so that no more than 0.5 percent of the total

components inspected, excluding polished rod stuffing boxes, have liquid leaks or major gas leaks that have not been immediately repaired.

- b. A Notice of Violation from the District for a violation of Rule 74.10.C.2 was not received by the operator for the facility during the previous twelve months.
 - c. Submit a written request to the District for a reduction in inspection frequency. This request shall contain backup documentation including inspection reports that demonstrates that the above performance level in Rule 74.10.D.8.a has been achieved. Requests for a reduction in inspection frequency are not effective until written approval by the APCO is received by the operator.
12. Pursuant to Rule 74.10.D.9, an annual inspection frequency approved in Rule 74.10.D.8 shall revert to the inspection frequency specified in Rule 74.10.D.5 should the sum of liquid leaks and major gas leaks, not including leaks from polished rod stuffing boxes, exceed 0.5 percent of the total components inspected per inspection period or should the operator receive a Notice of Violation from the District for violation of Rule 74.10.C.2 for that facility.
13. Pursuant to Rule 74.10.E.1, each operator shall submit an Operator Management Plan to the APCO for approval. If the APCO fails to respond to the Plan in writing within 90 days after it has been received, then it shall be deemed approved. No provision in the Plan, approved or not, shall conflict with or take precedence over any provision of this rule. The Plan shall identify any component exempt from this rule or part of this rule, and describe the procedures which the operator intends to use to comply with the requirements of this rule. The Plan shall include:
- a. Establishment of a data base of every leaking component that cannot be immediately repaired. The following parameters shall be included:
 - 1) Identification number, name or code.
 - 2) Component type, process unit and location.
 - 3) Dates found leaking and repair description for each leak found.

This identification provision is for inspection, repair, replacement and recordkeeping purposes.

- b. Identification of critical process units.
- c. Identification of components for which exemption from Rule 74.10 is being claimed under Rule 74.10.G.1. Gaseous streams and liquid streams, exempted by

Rule 74.10, Subsections G.1.a, G.1.b, G.1.c, or G.1.e shall be verified by analysis of the ROC concentrations, and the results of such analyses shall be included.

- d. Identification of liquid streams or components for which exemption is being claimed from the operator inspection requirements under Rule 74.10.G.3. The results of any testing used to qualify a stream for exemption shall be included.
 - e. Whether flanges or threaded fittings are exempt from all inspection requirements and subject to a zero leak threshold or whether flanges or threaded fittings are subject to annual inspection requirements and a one percent leak threshold as specified in Attachment 1 of Rule 74.10.
 - f. The inspection schedule to be followed.
 - g. Identification and description of any known hazard which may affect the safety of APCD personnel.
 - h. Identification of unmanned production facilities, if applicable.
14. Pursuant to Rule 74.10.E.2, the operator shall be required, upon written request by the APCO, to re-qualify, by analysis, the exemption(s) from the rule or part of the rule (Rule 74.10.G.1 and 74.10.G.3) if the exemption(s) may no longer be valid based on the changed composition of the process stream. The results of that analysis and any modification to the Plan shall be submitted to the District within 90 calendar days after receipt of the District request.
15. Pursuant to Rule 74.10.E.3, if the exempt status of a component is affected by a revision to Rule 74.10, then the Plan shall be modified accordingly by June 10, 1998.
16. Pursuant to Rule 74.10.E.4, existing operator management plans shall be updated no later than September 10, 1998, to include any provision that is needed to show compliance with Rule 74.10.
17. Pursuant to Rule 74.10.E.5, beginning September 10, 1998, each operator shall submit to the APCO, for approval in writing, an annual report to update the Operator Management Plan by no later than January 30 of each year. This report shall include any changes to exemptions, inspection schedule, or any other changes to the inspection and maintenance program. If no changes to the Plan have occurred over the past 12 months, then the operator shall indicate this in the annual report.

If the APCO fails to respond to the Plan update in writing within 90 days after it has been received, then it shall be deemed approved. No provision in the Plan, approved or not, shall conflict with or take precedence over any provision of Rule 74.10.

18. Pursuant to Rule 74.10.F.1, the operator shall minimize all component leaks immediately if feasible but no later than 1 hour following detection during normal business hours. Component leaks detected during holidays, weekends and after business hours shall be immediately minimized if feasible but not later than the next normal business day.
19. Pursuant to Rule 74.10.F.2, any noncritical component found leaking shall be replaced or repaired to a leak free condition, within the time periods in Table 1 of Rule 74.10. For gaseous leaks, the repair period shall start at the time of leak measurement. For liquid leaks, the repair period shall start at the time of leak detection. If the Table 1 deadline for repairing any major gas leak or any liquid leak falls on a Saturday, Sunday or holiday, then the deadline shall be shifted to the next normal business day.
20. Pursuant to Rule 74.10.F.3, the operator shall re-inspect repaired or replaced components for leaks as soon as practicable using EPA Method 21, but not later than one calendar month after the date on which the component is repaired.
21. Pursuant to Rule 74.10.F.4, any component leak identified by District personnel shall be repaired and inspected as required by Rule 74.10.F.
22. Pursuant to Rule 74.10.F.5, any open-ended line found to be leaking shall be sealed with a blind flange, cap, plug, or a second closed valve at all times except during operations requiring process fluid flow through the open-ended line or valve. If a second closed valve is used, the process side valve shall be closed first, after the completion of any operations requiring flow through the open-ended valve.
23. Pursuant to Rule 74.10.F.6, for major gas leaks (>50,000 ppm) or major liquid leaks from any critical compressor seal, pump seal, pressure relief valve or valve that cannot be repaired within the repair periods set forth in Table 1 of Rule 74.10, the operator shall replace or retrofit the leaking component with Best Available Control Technology (BACT) equipment, as approved by the APCO in writing, within one year from the date of leak detection, or during the next critical process unit shutdown, whichever occurs first.

For gas leaks less than or equal to 50,000 ppm or minor liquid leaks from critical components, or for leaks from critical components other than compressor seals, pump seals, pressure relief valves or valves, the owner or operator shall successfully repair or replace all leaking components within one year from leak detection or during the next critical process unit shutdown, whichever occurs first.

The operator shall notify the District in writing within 3 months after detecting a major gas leak (> 50,000 ppm) or major liquid leak from a critical compressor seal, pump seal, pressure relief valve, or valve if such leak cannot be repaired within the repair periods set

forth in Table 1 of Rule 74.10.

24. Pursuant to Rule 74.10.F.7, for a compressor seal, pump seal, pressure relief valve or valve that emits a total of 5 major leaks within a continuous 12 month period, the operator shall replace or retrofit the leaking component with BACT equipment, as approved by the APCO in writing, within one year from date of leak detection. The operator shall notify the District in writing within 3 months after a compressor, pump, pressure relief valve, or valve has had 5 major leaks in the previous 12 months.
25. Pursuant to Rule 74.10.G.1, the requirements of Rule 74.10 shall not apply to the following components that are verified in the Operator Management Plan:
 - a. Components, not at natural gas processing plants, with gaseous streams with ROC concentrations of 10 percent, by weight or less.
 - b. Components at natural gas processing plants with gaseous streams with ROC concentrations of one percent, by weight or less.
 - c. Components, not at natural gas processing plants, in liquid service, with ROC concentrations of 10 percent, by weight or less.
 - d. Underground components.
 - e. Components exclusively handling fluids if the fluid weight evaporated is 10 percent or less at 150 degrees Celsius.
26. Pursuant to Rule 74.10.G.2, the operator inspection requirements of Rule 74.10.D shall not apply to the following components. All other requirements of this rule shall still apply.
 - a. Pump seals, compressor seals, and pressure relief valves that are equipped with a closed-vent system to a vapor recovery system. The vapor disposal portion of the vapor recovery system shall consist of one of the following:
 - 1) A system which directs all vapors to a fuel gas system, a sales gas system, or a flare that combusts ROC.
 - 2) Any other system that processes all vapors and has a ROC vapor destruction or removal efficiency of at least 90 percent, by weight.
 - b. One-half inch and smaller stainless steel tube fittings that have been determined to be leak-free.

- c. Components in vacuum service.
 - d. Flanges or threaded connections that are designated in the Operator Management Plan as subject to the zero leak threshold specified in Attachment 1 of Rule 74.10.
27. Pursuant to Rule 74.10.G.3, the operator inspection requirements of Rule 74.10, Subsections D.1, D.2, D.4 and D.5 shall not apply to components that are inspected with or without instrumentation on a quarterly basis and are at oil and gas production facilities or pipeline transfer stations that handle liquids with the following properties and specified vapor recovery systems:
- a. Liquid having an API gravity of 20 degrees or less after the point of primary separation;
 - b. Liquid having an API gravity between 20 and 30 degrees which are located either:
 - 1) Downstream of a wellhead equipped with a casing vapor recovery system, provided that the vapor recovery system is operated at a pressure of less than 10 psig; or
 - 2) After the point of primary separation of oil and gas, provided the separation vessel is equipped with a vapor recovery system and is operated at a pressure of less than 25 psig.
28. Pursuant to Rule 74.10.G.4, an owner or operator may petition the APCO for exemption from the replacement or retrofit requirements in Rules 74.10.F.6 and 74.10.F.7 by submitting a cost evaluation for retrofitting or replacing a compressor, pump, pressure relief valve, or valve. Each petition shall include:
- a. A cost-effectiveness evaluation conducted in accordance with "BACT Cost-Effectiveness Procedures and Screening Levels for Costs," adopted by the Air Pollution Control Board on December 20, 1988. The cost analysis shall be based on the retrofit cost of the component if a retrofit is feasible. If the component cannot be retrofitted, then the following control option with the lower cost shall be used in the cost analysis:
 - 1) Component replacement with the lowest feasible cost BACT option.
 - 2) Enclosing the component seal and venting to a vapor recovery system.
 - b. Evidence of costs with written bids from vendors, published price lists, or other verifiable cost information. The potential emission reduction from the component retrofit/replacement shall be based on the ROC emissions over the previous 12

months. ROC emissions from a critical process unit shutdown shall be included if those emissions are associated with a critical leaking component. APCO-approved emission factors or source tests shall be used to quantify emissions.

29. Pursuant to Rule 74.10.H.1, any person subject to Rule 74.10 shall maintain an inspection log. The inspection log shall contain at least the following:
 - a. Location, type, description, and name or code of each leaking component inspected that cannot be immediately repaired, and name of associated operating unit.
 - b. For liquid leaks that cannot be immediately repaired: Date and time of leak detection and whether leak is major or minor.
 - c. For gaseous leaks that cannot be immediately repaired: Date and time of leak detection, date and time of leak measurement, analyzer reading (ppmv) of the leak, and whether the leak is major or minor.
 - d. Date that leak referenced in Rule 74.10.H.1.b or Rule 74.10.H.1.c is repaired to a leak-free condition, description of repair action, and date and emission level of re-check.
 - e. Identification of leak as critical if the component is critical.
 - f. Maintenance and calibration records of appropriate analyzer used in the EPA Method 21 measurements.
30. Pursuant to Rule 74.10.H.2, where a functional pressure relief has been detected, the operator shall record:
 - a. Location, operating unit identification, and date of detection.
 - b. Date of inspection of the pressure relief device after it was detected, and analyzer reading from EPA Method 21.
31. Pursuant to Rules 74.10.H.3 and 74.10.H.4, the inspection log shall be retained by the operator and shall be made available upon request to District personnel.
32. Pursuant to Rule 74.10.I.1, gaseous leaks from components shall be inspected or determined by EPA Method 21 by using an appropriate analyzer calibrated with methane. The calibration, maintenance, and operation of the appropriate analyzer shall follow the manufacturer's recommendations.

33. Pursuant to Rule 74.10.I.2, the ROC concentration, by weight, of process streams shall be measured by ASTM E168-88 (General Techniques of Infrared Qualitative Analysis), ASTM E169-87 (General Techniques of Ultraviolet Quantitative Analysis), or ASTM E260-85 (Gas Chromatography), or updated versions of these methods approved by EPA and published in the 40 CFR Part 60.
34. Pursuant to Rule 74.10.I.3, weight percentage of evaporated compounds of liquids shall be determined using ASTM Method D 86-82.
35. Pursuant to Rule 74.10.I.4, the API gravity of crude oil shall be determined using ASTM Method D287.
36. Pursuant to Rule 74.10.J, the failure of a person to meet any requirements of Rule 74.10 shall constitute a violation of Rule 74.10. Each leak exceeding the applicable maximum leak threshold in Attachment 1 of Rule 74.10 discovered by District personnel will be considered to be a violation.

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Ventura County Air Pollution Control District
Rule 74.11.1 Applicable Requirements
Rule 74.11.1, Large Water Heaters and Small Boilers

Rule 74.11.1, "Large Water Heaters and Small Boilers"
Adopted 09/11/12, Federally Enforceable

Applicability:

This attachment applies to all natural gas-fired water heaters, boilers, steam generators or process heaters (units) with a rated heat input capacity greater than or equal to 75,000 BTU/hr and less than 1,000,000 BTU/hr at this stationary source installed after January 1, 2013 and to the future installation of any such unit at this stationary source. Note that units rated less than 1,000,000 BTU/hr are exempt from District permit requirements pursuant to Rule 23.C.1.

Conditions:

1. Pursuant to Rule 74.11.1.B.2, no person shall sell, offer for sale, or install in Ventura County any new unit with a rated heat input capacity of greater than or equal to 75,000 BTU/hr and less than or equal to 400,000 BTU/hr that does not meet the following criteria:
 - a. Oxides of nitrogen emissions shall not exceed 14 nanograms per joule of heat output (32.5 pounds per billion BTU), or 20 parts per million, and
 - b. The unit is certified in accordance with Rule 74.11.1.C.

The oxides of nitrogen emission standard required above (Condition No. 1.a) does not apply to units specifically designed to heat swimming pools, hot tubs, or spas. For such units, oxides of nitrogen emissions shall not exceed 40 nanograms per joule of heat output (93 pounds per billion BTU), or 55 parts per million.

2. Pursuant to Rule 74.11.1.B.4, no person shall sell, offer for sale, or install in Ventura County any new unit with a rated heat input capacity of greater than 400,000 BTU/hr and less than 1,000,000 BTU/hr that does not meet the following criteria:
 - a. Oxides of nitrogen emissions shall not exceed 20 parts per million and carbon monoxide emissions shall not exceed 400 parts per million, and
 - b. The unit is certified in accordance with Rule 74.11.1.C.
3. The permittee shall maintain a listing of manufacturer, brand name, model number, heat input rating, and installation date for each water heater, boiler, steam generator and

process heater, with a rated heat input capacity greater than or equal to 75,000 BTU/hr and less than 1,000,000 BTU/hr, at this stationary source. Permittee shall submit these identification records for all of these units to the District upon request.

4. On an annual basis, the permittee shall certify that all water heaters, boilers, steam generators and process heaters, with a rated heat input capacity greater than or equal to 75,000 BTU/hr and less than 1,000,000 BTU/hr, at this stationary source are complying with Rule 74.11.1. This annual certification shall include a formal survey identifying each unit and documentation of certification status (pursuant to Rule 74.11.1.C), as required.

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Ventura County Air Pollution Control District
Rule 74.22 Applicable Requirements
Rule 74.22, Natural Gas-Fired Fan-Type Central Furnaces

Rule 74.22, "Natural Gas-Fired Fan-Type Central Furnaces"
Adopted 11/09/93, Federally-Enforceable

Applicability:

This attachment applies to all natural gas-fired, fan-type central furnaces at this stationary source installed after May 31, 1994 and to the future installation of any natural gas-fired, fan-type central furnaces at this stationary source. A fan-type central furnace is a self contained space heater providing for circulation of heated air at pressures other than atmospheric through ducts of more than 10 inches in length that has a rated heat input capacity of less than 175,000 BTU per hour and, for combination heating and cooling units, a rated cooling capacity of less than 65,000 BTU per hour. Natural gas-fired, fan-type central furnaces installed in manufactured housing (mobile homes) are exempt from Rule 74.22.

Conditions:

1. Pursuant to Rule 74.22.B, no person shall install, after May 31, 1994, any natural gas-fired fan-type central furnace:
 - a. with NO_x (oxides of nitrogen) emissions in excess of 40 nanograms per joule of heat output. (74.22.B.1)
 - b. unless it is certified and identified in accordance with Section C of Rule 74.22. (74.22.B.2)
2. Permittee shall maintain a listing of manufacturer, brand name, model number, and heat input rating for each natural gas-fired fan-type central furnace at this stationary source. Permittee shall submit these identification records for all of these furnaces to the District upon request.
3. On an annual basis, permittee shall certify that all natural gas-fired fan-type central furnaces at this stationary source are complying with Rule 74.22. This annual certification shall include a formal survey identifying each natural gas-fired fan-type central furnace; whether it was installed before or after May 31, 1994; and for those furnaces installed after May 31, 1994, information indicating that the certification is contained on the furnace nameplate, or that the furnace is included on a District-provided list of certified furnaces.

10. GENERAL REQUIREMENTS FOR SHORT-TERM ACTIVITIES (ATTACHMENTS)

The general requirements for short-term activities are broadly applicable requirements that apply to temporary activities at the facility (e.g., abrasive blasting, architectural coatings, degassing operations, etc.). These are activities occurring infrequently and for a short duration.

Requirements for short-term activities can normally be adequately addressed in the permit application with minimal or no reference to any specific emissions unit, provided that the scope of the requirement and the manner of its enforcement are clear.

As detailed in the Title V Permit Reissuance Application, general applicable requirements for short-term activities that apply to this facility were determined. The permit conditions associated with each requirement for a short-term activity are listed in an individual attachment. The attachment is identified with the label "Attachment (APCD Rule No.) a" or "Attachment 40CFR61.M" in the lower left corner of each attachment.

Ventura County Air Pollution Control District
Rule 74.1 Applicable Requirements
Abrasive Blasting

Rule 74.1, "Abrasive Blasting"
Adopted 11/12/91, Federally-Enforceable

Applicability:

This attachment applies to short term activities involving any abrasive blasting operation conducted at this facility. Abrasive blasting is the operation of cleaning or preparing a surface by forcibly propelling a stream of abrasive material against that surface. Abrasive materials subject to Rule 74.1 include, but are not limited to, sand, slag, steel shot, garnet or walnut shells.

Conditions:

1. Pursuant to Rule 74.1.B.1.a, all abrasive blasting operations shall be conducted within a permanent building, except for abrasive blasting operations conducted under one or more of the following conditions as detailed in Rule 74.1.B.1.b:
 - a. Steel or iron shot/grit is used exclusively
 - b. The item to be blasted exceeds eight feet in any dimension
 - c. The surface being blasted is situated at its permanent location or no further away from its permanent location than is necessary to allow the surface to be blasted
2. Pursuant to Rule 74.1.B.1.c, any abrasive blasting that is allowed to be conducted outside of a permanent building, and is not exclusively using steel or iron shot/grit, must use one of the following:
 - a. Wet abrasive blasting
 - b. Hydroblasting
 - c. Vacuum blasting
 - d. Dry blasting with California ARB certified abrasives
3. Abrasive blasting for pavement marking shall comply with the requirements of Rule 74.1B.2.

4. Abrasive blasting of stucco and concrete shall comply with the requirements of Rule 74.1.B.3.
5. Packages or containers for abrasives certified in accordance with Section 92530 of the California Code of Regulations used for permissible outdoor blasting shall comply with the labeling requirements of Rule 74.1.B.4.
6. Abrasive blasting operations shall comply with the visible emission standards of Rule 74.1.C.1 and the nuisance prohibition of Rule 74.1.C.2. The visible emission evaluation of abrasive blasting operations shall be conducted in accordance with Section 92400 of the California Code of Regulations.
7. Permittee shall monitor each abrasive blasting operation to ensure that compliance with Rule 74.1 is being maintained. For each abrasive blasting operation conducted at the facility, permittee shall maintain records of the following information:
 - a. Date of operation
 - b. Type of abrasive blasting media used
 - c. Identity, size, and location of item blasted
 - d. Whether operation was conducted inside or outside a permanent building
 - e. California ARB certifications for abrasives used

These records shall be maintained at the facility and submitted to the District upon request.

Ventura County Air Pollution Control District
Rule 74.2 Applicable Requirements
Architectural Coatings

Rule 74.2, "Architectural Coatings"
Adopted 01/12/10, Federally-Enforceable

Applicability:

This attachment applies to short term activities involving any person who supplies, sells, offers for sale, applies or solicits the application of any architectural coating at this stationary source. An architectural coating is a coating to be applied to stationary structures or their appurtenances at the site of installation, to portable buildings at the site of installation, to pavements, or to curbs. Coatings applied in shop applications or to nonstationary structures, such as airplanes, ships, boats, railcars and automobiles, are not considered to be architectural coatings for the purposes of this rule, nor are adhesives.

This attachment and Rule 74.2 do not apply to architectural coatings that are sold in a container with a volume of one liter (1.057 quart) or less and do not apply to any aerosol coating product.

Conditions:

1. Pursuant to Rule 74.2.B.1, the volatile organic compound (VOC) content of architectural coatings shall not exceed the following standards, as found in Table 2 of Rule 74.2.B.1, unless specifically exempted by Rule 74.2:
 - a. The VOC content of flat coatings shall not exceed 50 grams per liter of coating.
 - b. The VOC content of nonflat coatings shall not exceed 100 grams per liter of coating.
 - c. The VOC content of nonflat-high gloss coatings shall not exceed 150 grams per liter of coating.

Limits are expressed as VOC Regulatory (unless otherwise specified in Rule 74.2) thinned to the manufacturer's maximum recommendation, excluding colorant added to the tint bases. VOC Regulatory is defined in Rule 74.2.

2. Pursuant to Rule 74.2.B.1, the VOC content of specialty architectural coatings shall not exceed the VOC limits in the Table of Standards in Rule 74.2, unless specifically exempted by Rule 74.2.

Specifically, the VOC content of industrial maintenance coatings shall not exceed 250 grams per liter of coating.

Limits are expressed as VOC Regulatory (unless otherwise specified in Rule 74.2) thinned to the manufacturer's maximum recommendation, excluding colorant added to the tint bases. VOC Regulatory is defined in Rule 74.2.

3. Pursuant to Rule 74.2.B.4, all architectural coating containers used to apply the contents therein to a surface directly from the container by pouring, siphoning, brushing, rolling, padding, ragging or other means, shall be closed when not in use. These architectural coating containers include, but are not limited to, drums, buckets, cans, pails, trays or other application containers. Containers of any VOC-containing materials used for thinning and cleanup shall also be closed when not in use.
4. Pursuant to Rule 74.2.B.5, no person who applies or solicits the application of any architectural coating shall apply or solicit the application of any coating that is thinned to exceed the applicable VOC limit specified in the Tables in Subsection B.1.
5. Permittee shall monitor each architectural coating operation to ensure that compliance with Rule 74.2 is being maintained. Permittee shall specify the usage of compliant coatings and shall maintain VOC records of coatings used at the stationary source. This information shall be submitted to the District upon request.
6. The VOC content of architectural coatings, along with other specified physical and chemical properties, shall be measured using the testing procedures in Rule 74.2.G.

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Ventura County Air Pollution Control District
Rule 74.16 Applicable Requirements
Oilfield Drilling Operations on Platform Gilda

Rule 74.16, "Oilfield Drilling Operations"
Adopted 01/08/91, Federally-Enforceable

Applicability:

This attachment applies to short term activities involving all oilfield drilling operations. Oilfield drilling operations are defined as activities powered by nonvehicular internal combustion engines for the purpose of drilling or re-drilling oil wells, injection wells, or gas wells. For the purpose of Rule 74.16, drilling operations do not include any operations at any existing well where the derrick is a part of an oilwell production service unit, as defined in the California Vehicle Code. Rule 74.16 applies to drill rig engines over 50 HP including, but not limited to, engines supplying power to drawworks, rotary tables, mud pumps, mud mixers and auxiliary generators.

This attachment applies to an oil company, which Rule 74.16 defines as the person contracting the drilling rig and/or the person who applies for an Authority to Construct for the well. The APCD issues portable Permits to Operate to the owners of drilling rigs. The California Air Resources Board Portable Equipment Registration Program (PERP) is not valid on an OCS platform; therefore an APCD Permit to Operate is required for drilling rig engines.

This permit does not authorize the operation of any non-vehicular engine of 50 BHP, or greater, for well drilling or workover operations. Prior to using such an engine, the engine owner shall obtain a Permit to Operate for the engine. A portable engine used to power an emergency drilling generator that is used only when electrical power line fails is exempt from permit pursuant to Rule 23.D.7.

Conditions:

1. Pursuant to Rule 74.16.B.1, all drilling operations shall be powered by grid power, unless exempted by Rule 74.16.C.1. Grid power is defined as electricity conveyed by power lines connected physically and contractually to the Southern California Edison System, or any electricity generated by equipment permitted by the District and having permitted emissions commensurate with an emissions rate of not more than 1.0 pound of NO_x per megawatt-hour of electricity produced.
2. Pursuant to Rule 74.16.C.1, an oil company may petition the Air Pollution Control Officer for exemption from Rule 74.16.B.1 by submitting a cost evaluation for grid powered drilling. Best Available Control Technology cost guidelines shall be used to determine cost effectiveness. As detailed in APCD Rule 44, "Exemption Evaluation

Fee", Rule 44.B.2 requires that any person requesting an exemption from Rule 74.16 that is based on a cost evaluation shall be assessed an evaluation fee of \$450.00.

3. Pursuant to Rule 74.16.B.2.a, if a drilling operation is exempt from Rule 74.16.B.1, NO_x emissions from drilling engines, or any exhaust stack of multiple engines permanently manifolded together, shall not exceed 515 ppmv corrected to 15% oxygen. As an alternate, pursuant to Rule 74.16.B.2.c, drilling engines certified by the manufacturer to emit 6.9 grams of NO_x per brake horsepower-hour or less based on a California ARB approved heavy duty offroad engine testing procedure shall be deemed in compliance with Rule 74.16.B.2.a, and shall not be subject to the annual source test requirements in Rule 74.16.B.2.b.

In order to comply with this condition, permittee shall ensure that the drilling rig utilized has a valid APCD Permit to Operate and that the drilling rig has demonstrated compliance with Rule 74.16.B.2.a in accordance with CARB Method 100 as detailed in Rule 74.16.E (Test Methods), or has demonstrated compliance with Rule 74.16.B.2.c.

4. In order to demonstrate compliance with Rule 74.16.B.2.a, the drilling rig company shall perform source testing on the drilling engine exhaust annually. Permittee shall obtain from the drilling rig company the most recent source test results for the exempt engines subject to Rule 74.16.B.2.a, or the engine manufacturer certification for engines subject to Rule 74.16.B.2.c. This information shall be made available on site and submitted to the District upon request.
5. Upon District request, the NO_x emissions from the drilling engine exhaust shall be measured using CARB Method 100, in accordance with Rule 74.16.E (Test Methods).
6. In order to demonstrate compliance with Rule 74.16.C.1, permittee shall maintain documentation on the cost analysis as verification to the grid power exemption. This documentation shall be submitted to the District upon request.

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11. GENERAL PERMIT CONDITIONS

This section contains general Part 70 permit conditions and general APCD permit to operate conditions. The general Part 70 permit conditions are associated with general federal requirements that apply to all Title V facilities. These conditions are based on APCD Rules 8, 30, 32, and 33, and 40 CFR Part 70.

The general permit to operate conditions are associated with general District requirements that apply to all operating Title V facilities. These conditions are based on APCD Rules 19, 20, 22, and 27.

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**Ventura County Air Pollution Control District
General Part 70 Permit Conditions**

1. The permittee shall comply with all federally-enforceable conditions of the Part 70 permit. Any permit noncompliance constitutes a violation of the federal Clean Air Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of an application for reissuance of the permit. (40 CFR 70.6(a)(6)(i), APCD Rule 33.3.B.1)
2. The permittee shall continue to comply with all the applicable requirements with which the company has certified that it is already in compliance. The permittee shall comply in a timely manner with applicable requirements that become effective during the permit term of this permit.
3. The permittee shall promptly report deviations from Part 70 permit requirements, including those attributable to upset conditions as defined in the Part 70 permit, the probable cause of the deviations, and any corrective actions or preventive measures taken. Promptly is defined as no later than four (4) hours after its detection by such owner or operator, or his agents or employees. (40 CFR 70.6(a)(3)(iii)(B), APCD Rule 33.3.A.3, APCD Rule 32.B.1)
4. The need to halt or reduce activity is not a defense. It shall not be a defense for a permittee in an enforcement action that it would be necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this Part 70 permit. (40 CFR 70.6(a)(6)(ii), APCD Rule 33.3.B.2)
5. All applicable records, monitoring data, and support information shall be maintained for a period of at least 5 years from the date of the monitoring sample, measurement, report, or application. Support information includes all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, and copies of all reports required by the Part 70 permit. All applicable reports shall be submitted to the District every 6 months and shall be certified by a responsible official. Such reports shall identify any deviations from Part 70 permit conditions. (40 CFR 70.6(a)(3)(ii)(B), 40 CFR 70.6(a)(3)(iii)(A), APCD Rule 33.3.A.3)
6. The permittee shall furnish to the District, within a reasonable time, any information that the District may request in writing to determine whether cause exists for modifying, revoking and reissuing, or terminating the Part 70 permit or to determine compliance with the Part 70 permit. Upon request, the permittee shall also furnish to the District copies of records required to be kept by the Part 70 permit or, for information claimed to be confidential, the permittee may furnish such records directly to the Administrator of the EPA along with a claim of confidentiality. (40 CFR 70.6(a)(6)(v), APCD Rule 33.3.B.5)

7. Upon presentation of credentials and other documents as may be required by law, the permittee shall allow the District or an authorized representative to perform the following:
 - a. Enter upon the permittee's premises where a Part 70 source is located or emissions-related activity is conducted, or where records must be kept under the conditions of the Part 70 permit;
 - b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of the Part 70 permit;
 - c. Inspect at reasonable times any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under the Part 70 permit; and
 - d. As authorized by the federal Clean Air Act, sample or monitor at reasonable times substances or parameters for the purpose of assuring compliance with the Part 70 permit or applicable requirements.

(40 CFR 70.6(c)(2), APCD Rule 8, APCD Rule 33n3.B.7)

8. The Part 70 permit may be modified, revoked, reopened, reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or of a notification of planned changes or anticipated noncompliance does not stay any permit condition. (40 CFR 70.6(a)(6)(iii), APCD Rule 33n3.B.3)
9. A Part 70 permit shall be reopened under the following conditions:
 - a. Additional applicable requirements under the federal Clean Air Act become applicable to the facility with a remaining Part 70 permit term of 3 or more years. Such a reopening shall be completed not later than 18 months after promulgation of the applicable requirement. No such reopening is required if the effective date of the requirement is later than the date on which the Part 70 permit is due to expire, unless the original Part 70 permit or any of its terms and conditions has been extended pursuant to APCD Rule 33n6.D;
 - b. Additional requirements (including excess emissions requirements) become applicable to an affected source under the acid rain program. Upon approval by the Administrator of the EPA, excess emissions offset plans shall be deemed to be incorporated into the Part 70 permit;

- c. The District or EPA determines that the Part 70 permit contains a material mistake or that inaccurate statements were made in establishing the emissions standards or other terms or conditions of the Part 70 permit; or
- d. The Administrator of the EPA or the District determines that the Part 70 permit must be revised or revoked to assure compliance with the applicable requirements.

(40 CFR 70.7(f), APCD Rule 33.8.A)

- 10a All fees required by District Regulation III, Fees, shall be paid on a timely basis as requested by the District. Notwithstanding the term of the Part 70 permit, if the permittee fails to pay the annual renewal fees required pursuant to APCD Rule 42.H within the time period specified in APCD Rule 30, the Part 70 permit will be void. (40 CFR 70.6(a)(7), APCD Rule 30, APCD Rule 33.3rB.6)
- 11a The Part 70 permit does not convey any property rights of any sort, or any exclusive privilege. (40 CFR 70.6(a)(6)(iv), APCD Rule 33rB.B.4)
- 12. The provisions of this Part 70 permit shall be severable, and in the event of any challenge to any portion of the permit, or if any portion is held invalid, the remaining permit conditions shall remain valid and in force. (40 CFR 70.6(a)(5), APCD Rule 33.3.B.8)
- 13. An application for reissuance of this Part 70 Permit shall be submitted no more than 18 months prior to the expiration date and no less than 6 months prior to the expiration date as stated on this permit. The application shall be subject to the same procedural requirements, including those for public participation and EPA review, that apply to initial Part 70 permit issuance. (40 CFR 70.5(a)(1)(iii), 40 CFR 70.7(c)(1)(i), APCD Rule 33.6.B)
- 14. Any Part 70 application and any document, including reports, schedule of compliance progress reports, and compliance certification, required by this Part 70 permit shall be certified by a responsible official. The certification shall state that, based on information and belief formed after a reasonable inquiry, the statements and information in the document are true, accurate, and complete (40 CFR 70.5(d), APCD Rule 33.9C)
- 15a Permittee must submit certification of compliance with all applicable requirements and all Part 70 permit conditions. A compliance certification shall be submitted with any Part 70 permit application and annually, on the anniversary date of the Part 70 permit, or on a more frequent schedule if required by an applicable requirement or permit condition.

This compliance certification shall identify each applicable requirement or condition of the Part 70 permit, the compliance status of the stationary source, whether the compliance

was continuous or intermittent since the last certification, and the method(s) used to determine compliance. In addition, the certification shall indicate the stationary source's compliance status with any applicable enhanced monitoring and compliance certification requirement of the federal Clean Air Act. A copy of each compliance certification shall be submitted to EPA Region IX. (40 CFR 70.5(c)(9), 40 CFR 70.6(c)(5), APCD Rule 33.3.A.9, APCD Rule 33.9.B)

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**Ventura County Air Pollution Control District
General Permit to Operate Conditions**

1. Within 30 days after receipt of a permit to operate, the permittee may petition the Hearing Board, in writing, to review any new or modified condition on the permit. (APCD Rule 22)
2. This permit to operate, or a copy, shall be posted reasonably close to the subject equipment and shall be readily accessible to inspection personnel from the District. Posting a copy of the "Permitted Equipment and Applicable Requirements Table" contained in Section No. 2 will fulfill this requirement if the entire permit to operate is readily available at another location at the stationary source. (APCD Rule 19)
3. This permit to operate is not transferable from one location to another unless the equipment is specifically listed as being portable. (APCD Rule 20)
4. If, within a reasonable amount of time, any permittee refuses to furnish information requested by the District, the District may suspend this permit to operate. The permittee will be informed, in writing, of the permit suspension and the reasons for the suspension. (APCD Rule 27)

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12. MISCELLANEOUS FEDERAL PROGRAM CONDITIONS

This section contains miscellaneous federal program conditions that are not emission unit-specific or short-term. These federal requirements are broadly applicable requirements that apply and are enforced in the same manner for all subject emissions units or short-term activities. Permit conditions associated with these miscellaneous federal program requirements are listed in an individual attachments. The attachment is identified with the label “Attachment 40CFR(Part No.) __” in the lower left corner of each attachment.

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**Ventura County Air Pollution Control District
40 CFR Part 55 Applicable Requirements
Outer Continental Shelf Air Regulations**

**40 CFR Part 55, “Outer Continental Shelf Air Regulations”
Federally-Enforceable**

Applicability:

This attachment applies to the stationary source since it is an existing outer continental shelf (OCS) source. 40 CFR Part 55 and related consistency updates detail the District rules that apply to OCS sources. Attachments contained in this permit use the term “Federally-Enforceable OCS Version” to designate those rules that are federally-enforceable at OCS sources via 40 CFR Part 55.

Conditions:

1. Permittee shall comply with 40 CFR Part 55, "Outer Continental Shelf Air Regulations". Permittee shall also comply with Rule 72.1, "Outer Continental Shelf Air Regulations". Rule 72.1 incorporates the following provisions of 40 CFR Part 55:

Section 55.1	Statutory authority and scope
Section 55.2	Definitions
Section 55.3	Applicability
Section 55.4	Requirement to submit a notice of intent
Section 55.5	Corresponding onshore area designation
Section 55.6	Permit requirements
Section 55.7	Exemptions
Section 55.8	Monitoring, reporting, inspections, and compliance
Section 55.9	Enforcement
Section 55.10	Fees
Section 55.13	Federal requirements that apply to OCS sources
Section 55.14 a,b,c	Requirements that apply to OCS sources located within 25 miles of states' seaward boundaries, by state

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**Ventura County Air Pollution Control District
40 CFR Part 68 Applicable Requirements
Accidental Release Prevention and Risk Management Plans**

**40 CFR Part 68, "List of Regulated Substances and Thresholds for Accidental Release Prevention"
Federally-Enforceable**

Applicability:

This attachment applies to regulated substances that are contained in a process at this facility and that exceed the threshold quantity, as presented in 40 CFR Part 68.130. This regulation addresses the requirements of section 112(r) of the federal Clean Air Act as amended. Specifically, this attachment applies to a facility that has stated that a federal Risk Management Plan pursuant to section 112(r) is currently not required, but where flexibility is desired to preclude a permit reopening should 40 CFR Part 68 become an applicable requirement.

Conditions:

1. Should the stationary source, as defined in 40 CFR Part 68.3, become subject to Part 68, then the owner or operator shall submit a risk management plan (RMP) by the date specified in Part 68.10 and shall certify compliance with the requirements of Part 68 as part of the annual compliance certification as required by 40 CFR Part 70.

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**Ventura County Air Pollution Control District
40 CFR Part 82 Applicable Requirements
Protection of Stratospheric Ozone**

40 CFR Part 82, "Protection of Stratospheric Ozone"

40 CFR Part 82, Subpart B, "Servicing of Motor Vehicle Air Conditioners"

40 CFR Part 82, Subpart F, "Recycling and Emissions Reduction"

Federally-Enforceable

Last revised 04/10/15

Applicability:

This attachment applies to activities conducted at this facility that involve producing, importing, exporting, or consuming of the specified controlled substances described under 40 CFR Part 82.4. Specifically, this attachment includes the requirements of 40 CFR Part 82, Subpart B, "Servicing of Motor Vehicle Air Conditioners", and 40 CFR Part 82, Subpart F, "Recycling and Emissions Reduction".

As defined in 40 CFR Part 82.30, 40 CFR Part 82, Subpart B applies to any person performing service on a motor vehicle for consideration when this service involves the refrigerant in the motor vehicle air conditioner.

As defined in 40 CFR Part 82.150, 40 CFR Part 82, Subpart F applies to any person servicing, maintaining or repairing appliances. This subpart also applies to persons disposing of appliances, including small appliances and motor vehicle air conditioners. In addition, this subpart applies to refrigerant reclaimers, technician certifying programs, appliance owners and operators, manufacturers of appliances, manufacturers of recycling and recovery equipment, approved recycling and recovery equipment testing organizations, persons selling class I or class II refrigerants or offering class I or class II refrigerants for sale, and persons purchasing class I or class II refrigerants.

As defined in 40 CFR 82.152, appliance means any device which contains and uses a refrigerant and which is used for household or commercial purposes, including any air conditioner, refrigerator, chiller, or freezer. Refrigerant means, for purposes of this subpart, any substance consisting in part or whole of a class I or class II ozone-depleting substance that is used for heat transfer purposes and provides a cooling effect.

Conditions:

1. If the permittee performs a service on motor (fleet) vehicles when this service involves ozone-depleting substance refrigerant (or regulated substitute substance) in the motor vehicle air conditioner (MVAC), the permittee is subject to all the applicable

requirements as specified in 40 CFR Part 82, Subpart B, "Servicing of Motor Vehicle Air Conditioners".

The term "motor vehicle" as used in Subpart B does not include a vehicle in which final assembly of the vehicle has not been completed. The term "MVAC" as used in Subpart B does not include the air-tight sealed refrigeration system used as refrigerated cargo, or system used on passenger buses using HCFC-22 refrigerant.

2. If the permittee performs maintenance on, or services, repairs, or disposes of appliances, the permittee is subject to all of the applicable requirements as specified in 40 CFR Part 82, Subpart F, "Recycling and Emissions Reduction".

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**Ventura County Air Pollution Control District
Standards of Performance (NSPS) for
Crude Oil and Natural Gas Production, Transmission and Distribution**

40 CFR Part 60, Subpart OOOO, “Standards of Performance (NSPS) for Crude Oil and Natural Gas Production, Transmission and Distribution”

Applicability:

This NSPS applies to all well completions, pneumatic controllers, equipment leaks from natural gas processing plants, reciprocating compressors, centrifugal compressors and storage vessels which are constructed, modified or reconstructed after August 23, 2011 as discussed in more detail below. Well completions subject to the NSPS are limited to the flowback period following hydraulic fracturing operations at an applicable gas well. These applicable completions include those conducted at newly drilled and fractured gas wells, as well as completions conducted following refracturing operations that may occur at various times over the life of the gas well. When a gas well is refractured, the applicability of this NSPS does not by itself trigger applicability beyond the well head to other ancillary components that may be at the well site such as existing storage vessels, compressors, pneumatic controllers, process vessels, separators, dehydrators or any other components or apparatus. Note that the NSPS does not apply to gas wells located on offshore oil platforms in Ventura County. This document summarizes the requirements of the NSPS and is not intended to supersede or conflict with the requirements of the NSPS.

Note that the issuance of this NSPS now includes, incorporates, and/or revises the requirements of 40 CFR Part 60 Subpart KKK, “Standards of Performance for Equipment Leaks of VOC From Onshore Natural Gas Processing Plants”, and 40 CFR Part 60 Subpart LLL, “Standards of Performance for Onshore Natural Gas Processing: SO₂ Emissions”. These NSPS now each have sunset dates of August 23, 2011 and their requirements are now contained in 40 CFR Part 60, Subpart OOOO, “Standards of Performance (NSPS) for Crude Oil and Natural Gas Production, Transmission and Distribution”.

Conditions:

1. Gas wells undergoing hydraulic fracturing subject to this NSPS shall comply with Section 60.5375. A gas well or natural gas well is defined as an onshore well drilled principally for production of natural gas. In general, the NSPS requires the use of reduced emissions completions (REC) also known as green completions.

The drilling of all new oil wells and all new gas wells requires a Ventura County APCD Authority to Construct. In addition, an Authority to Construct shall be obtained prior to refracturing an existing gas well.

2. Centrifugal compressors subject to this NSPS shall comply with Section 60.5380. A centrifugal compressor is defined as any machine for raising the pressure of a natural gas by drawing in low pressure natural gas and discharging significantly higher pressure natural gas by means of mechanical rotating vanes or impellers. Screw, sliding vane, and liquid ring compressors are not centrifugal compressors as defined in this NSPS. In general, the NSPS requires the operators of affected centrifugal compressors to reduce VOC emissions from each centrifugal compressor wet seal fluid degassing system by 95.0 percent or greater. Compressors located past the point of custody transfer in the gas transmission and storage segments are not covered by this NSPS. A compressor located at a well site, or an adjacent well site and servicing more than one well site, is not covered by this NSPS.

The Ventura County APCD does not require permits for natural gas compressors, but does require permits for an internal combustion engine (in lieu of an electric motor) powering a natural gas compressor (Rule 23.F.18). Therefore, this condition authorizes the installation of the equipment necessary to comply with these centrifugal compressor requirements provided that the permittee comply with all the requirements of Section 60.5380, including the required notification, recordkeeping and reporting requirements.

3. Reciprocating compressors subject to this NSPS shall comply with Section 60.5385. A reciprocating compressor is defined as a piece of equipment that increases the pressure of a process gas by positive displacement, employing linear movement of a drive shaft. In general, the NSPS requires the operators of affected reciprocating compressors to replace the rod packing every 26,000 hours or 36 months from the date of initial startup of the reciprocating compressor affected facility. Compressors located past the point of custody transfer in the gas transmission and storage segments are not covered by this NSPS. A compressor located at a well site, or an adjacent well site and servicing more than one well site, is not covered by this NSPS.

The Ventura County APCD does not require permits for natural gas compressors, but does require permits for an internal combustion engine (in lieu of an electric motor) powering a natural gas compressor (Rule 23.F.18). Therefore, this condition authorizes the work necessary to comply with these reciprocating compressor requirements provided that the permittee comply with all the requirements of Section 60.5385, including the required notification, recordkeeping and reporting requirements.

4. Pneumatic controllers subject to this NSPS shall comply with Section 60.5390. A pneumatic controller is defined as an automated instrument used for maintaining a process condition such as liquid level, pressure, delta-pressure and temperature. The requirements apply to natural gas-driven pneumatic controllers located (a) in the oil production segment between the wellhead and the point of custody transfer to an oil pipeline; or (b) in the natural gas production segment between the wellhead and the point at which the gas enters the transmission and storage segment. In general, this NSPS

requires each pneumatic controller affected facility at a natural gas processing plant to have a natural gas bleed rate of zero standard cubic feet per hour. Each pneumatic controller affected facility between the wellhead and a natural gas processing plant, or between the wellhead and the point of custody transfer to an oil pipeline, must have a natural gas bleed rate of less than or equal to 6 standard cubic feet per hour. Note that a natural gas processing plant is defined as any processing site engaged in the extraction of natural gas liquids from field gas, fractionation of mixed natural gas liquids to natural gas products, or both. A Joule-Thompson valve, a dew point suppression valve, or an isolated or stand-alone Joule-Thompson skid is not a natural gas processing plant.

The Ventura County APCD does not require permits for the installation and operation of pneumatic controllers and other components such as valves and flanges. Therefore, this condition authorizes the work necessary to comply with these pneumatic controller requirements provided that the permittee comply with all the requirements of Section 60.5390, including the required notification, recordkeeping and reporting requirements.

5. Storage vessels subject to this NSPS shall comply with Section 60.5395. A storage vessel is defined as a unit that is constructed primarily of nonearthen materials (such as wood, concrete, steel, fiberglass, or plastic) which provides structural support and is designed to contain an accumulation of liquids or other materials. Note that pressure vessels designed to operate in excess of 204.9 kilopascals (29.7 psi) and without emissions to the atmosphere are not considered to be storage vessels. Also, process vessels such as surge control vessels, bottoms receivers, and knockout vessels are not considered to be process vessels.

In general, the NSPS requires that individual storage vessels with VOC emissions equal to or greater than 6 tons per year achieve at least 95.0 percent reduction in VOC emissions. These requirements do not apply to storage vessels subject to and controlled in accordance with the requirements for storage vessels in 40 CFR Part 60, Subpart Kb, or 40 CFR Part 63, Subparts G, CC, HH, or WW.

The Ventura County APCD does require permits for the installation and operation of storage vessels such as crude oil storage tanks, wash tanks, and produced water storage tanks. In addition, these tanks must comply with the vapor recovery requirements of Rule 71.1, "Crude Oil Production and Separation". If a tank that complies with Rule 71.1 has VOC emissions of 6 tons per year or more, the permittee shall apply for, and obtain, an APCD Authority to Construct for the equipment necessary to comply with Section 60.5395 of the NSPS.

6. All process units, except compressors, located at an onshore natural gas processing plant subject to this NSPS shall comply with Section 60.5400. A process unit means components assembled for the extraction of natural gas liquids from field gas, the fractionation of the liquids into natural gas products or other operations associated with

the processing of natural gas products.

In general, the NSPS requires a leak detection and repair program for components such as pressure relief devices, pumps and valves that reflects the procedures and leak thresholds established in 40 CFR Part 60, Subpart VVa, the NSPS for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry (that is, this NSPS OOOO references out to NSPS VVa). For certain components, a leak is defined as 500 ppm or greater and a first attempt at a repair must be made no later than 5 calendar days after a leak is detected.

The Ventura County APCD does not require permits for the installation and operation of components such as pressure relief devices, pumps, valves and flanges. Therefore, this condition authorizes any work necessary to comply with these leak detection and repair requirements provided that the permittee comply with all the requirements of Section 60.5400, including the required notification, recordkeeping and reporting requirements. Any onshore natural gas processing plant at this facility subject to this NSPS will be specifically addressed elsewhere in this permit, as applicable.

7. Sweetening units at onshore natural gas processing plants subject to this NSPS shall comply with Section 60.5405. A sweetening unit is defined as a process device that removes hydrogen sulfide and/or carbon dioxide from the sour natural gas stream. To qualify as a sweetening unit, there must be sulfur recovery technology with a liquid sulfur accumulation rate. These requirements do not apply to sweetening units located on offshore oil platforms in Ventura County. The requirements also do not apply to devices that remove hydrogen sulfide or carbon dioxide that use replaceable media or units that use membrane separation technology.

In general, the NSPS requires that the sweetening unit achieve a minimum SO₂ reduction efficiency that varies from approximately 74.0% to 99.9% depending on the hydrogen sulfide content of the acid gas and the sulfur feed rate.

The Ventura County APCD does require an Authority to Construct for the installation of a sweetening unit at both onshore natural gas plants and offshore natural gas plants. Any sweetening unit at this facility subject to this NSPS will be specifically addressed elsewhere in this permit, as applicable.

13. PART 70 PERMIT APPLICATION PACKAGE

The Part 70 permit application, which was submitted by this facility, is included in this section for reference only and is not a part of the Part 70 permit.

During the processing of the permit application, additional information was submitted by the facility in response to District requests. This additional information is included with the application. If the applicant was asked to replace a page or a portion of the application, the original submittal is stamped "REPLACED" and the replacement page or section is placed in front of the original. The applicant and District correspondence for the Part 70 permit application is located in the District permit file for this stationary source.

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APPENDIX B

MATERIAL SAFTY DATA SHEETS



Safety Data Sheet EZEFL0* F103 Surfactant

1. Identification

1.1 Product identifier

Product name EZEFL0* F103 Surfactant
Product code F103

1.2 Relevant identified uses of the substance or mixture and uses advised against

Recommended Use Surfactant in oilfield applications.
Uses advised against Consumer use

1.3 Details of the supplier of the safety data sheet

Supplier

Schlumberger Technology Corporation
110 Schlumberger Drive
Sugar Land, Texas 77478, USA
Telephone: 1-281-285-7873

Schlumberger Canada, Ltd.
200, 125 - 9th Avenue SE
Calgary, Alberta T2G 0P6, Canada

E-mail address SDS@slb.com

Prepared by

Global Regulatory Compliance - Chemicals (GRC - Chemicals)

1.4 Emergency Telephone Number

Emergency telephone (24 Hour) Asia Pacific +65 3158 1074, Europe +44 (0) 1235 239 670, Middle East and Africa +44 (0) 1235 239 671, USA +1 281 561 1600, Canada +1 800 579 7421, Argentina: +54 11 5984 3690, Brazil : +55 11 3197 5891

2. Hazards Identification

2.1 Classification of the substance or mixture

GHS - Classification

Health hazards

Acute toxicity - Oral	Category 4
Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 1
Specific target organ toxicity - Single exposure	Category 3 H336

Environmental hazards Not classified

Physical Hazards

Flammable Liquids	Category 3
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2.2 Label elements



Signal word

DANGER

Hazard Statements

H302 - Harmful if swallowed
 H315 - Causes skin irritation
 H318 - Causes serious eye damage
 H336 - May cause drowsiness or dizziness
 H226 - Flammable liquid and vapor

Precautionary Statements

P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking
 P261 - Avoid breathing dust/fume/gas/mist/vapors/spray
 P280 - Wear protective gloves, protective clothing, eye protection
 P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
 P310 - Immediately call a POISON CENTER or physician
 P370 + P378 - In case of fire: Use dry chemical, CO2, water spray or regular foam to extinguish

Supplementary precautionary statements

P240 - Ground/bond container and receiving equipment
 P241 - Use explosion-proof electrical, ventilating, lighting, equipment
 P242 - Use only non-sparking tools
 P243 - Take precautionary measures against static discharge
 P264 - Wash face, hands and any exposed skin thoroughly after handling
 P270 - Do not eat, drink or smoke when using this product
 P271 - Use only outdoors or in a well-ventilated area
 P301 + P312 - IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell
 P302 + P352 - IF ON SKIN: Wash with plenty of soap and water
 P303 + P361 + P353 - IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
 P304 + P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
 P330 - Rinse mouth
 P332 + P313 - If skin irritation occurs: Get medical attention
 P362 + P364 - Take off contaminated clothing and wash it before reuse
 P403 + P233 - Store in a well-ventilated place. Keep container tightly closed
 P403 + P235 - Store in a well-ventilated place. Keep cool
 P501 - Dispose of contents/container in accordance with local, regional, national, and international regulations as applicable

Hazards not otherwise classified

None known

Unknown acute toxicity Not applicable.

3. Composition/information on Ingredients

3.1 Substances

Not applicable

3.2 Mixtures

Chemical Name	CAS No	Weight-%
Propan-2-ol	67-63-0	15 - 40
2-butoxyethanol	111-76-2	15 - 40
Ethoxylated C11 Alcohol	34398-01-1	15 - 40
Ethoxylated Alcohol	68131-39-5	7 - 13
1-undecanol (impurity)	112-42-5	1 - 5

Comments

The exact percentage (concentration) of composition has been withheld as a trade secret.

4. First Aid Measures

4.1 First aid measures

Inhalation	Move the exposed person to fresh air at once. If breathing is difficult, (trained personnel should) give oxygen. If breathing has stopped, begin artificial respiration. Seek medical attention at once.
Ingestion	Rinse mouth. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Get medical attention if symptoms occur.
Skin contact	Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Get medical attention if irritation persists.
Eye Contact	Immediately flush eyes with water for 15 minutes while holding eyelids open. Seek medical attention.

4.2. Most important symptoms and effects, both acute and delayed

General advice The severity of the symptoms described will vary dependant of the concentration and the length of exposure. If adverse symptoms develop, the casualty should be transferred to hospital as soon as possible.

Symptoms

Inhalation	Please see Section 11. Toxicological Information for further information.
Ingestion	Please see Section 11. Toxicological Information for further information.
Skin contact	Please see Section 11. Toxicological Information for further information.
Eye contact	Please see Section 11. Toxicological Information for further information.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician Treat symptomatically

5. Fire-Fighting Measures

5.1 Extinguishing media

Suitable extinguishing media

P370 + P378 - In case of fire: Use dry chemical, CO₂, water spray or regular foam to extinguish.

Extinguishing media which must not be used for safety reasons

Do not use a solid water stream as it may scatter and spread fire.

5.2. Special hazards arising from the substance or mixture

Unusual fire and explosion hazards

Flammable liquid. Vapors are heavier than air and may spread along floors. Vapors may travel considerable distance to source of ignition and flash back. Heating of containers may cause pressure rise, with risk of bursting.

5.3 Advice for firefighters

Special protective equipment and precautions for fire-fighters

As in any fire, wear self-contained breathing apparatus and full protective gear.

Special Fire-Fighting Procedures

Containers close to fire should be removed immediately or cooled with water.

6. Accidental Release Measures

6.1. Personal precautions, protective equipment and emergency procedures

Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Remove all sources of ignition. Use personal protective equipment. See also section 8.

Advice for non-emergency responders

Evacuate non-essential personnel.

Advice for emergency responders

Evacuate personnel to safe areas. Use non-slip safety shoes in areas where spills or leaks can occur. Wear respiratory protection. Keep people away from and upwind of spill/leak.

6.2 Environmental precautions

The product should not be allowed to enter drains, water courses or the soil.

Environmental exposure controls

Avoid release to the environment. Local authorities should be advised if significant spillages cannot be contained.

6.3 Methods and material for containment and cleaning up

Methods for containment

Prevent further leakage or spillage if safe to do so. Dike far ahead of liquid spill for later disposal.

Methods for cleaning up

Take precautionary measures against static discharges. Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal. Use clean non-sparking tools to collect absorbed material. Ground and bond containers when transferring material. After cleaning, flush away traces with water.

6.4 Reference to other sections

See section 13 for more information.

7. Handling and Storage

7.1 Precautions for safe handling

Handling

Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin and eyes. Do not breathe vapors or spray mist. Avoid spills and splashing during use.

Hygiene measures

Use good work and personal hygiene practices to avoid exposure. Wash hands and face before breaks and immediately after handling the product. Remove contaminated clothing. Do not eat, drink or smoke when using this product.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures/precautions Ensure adequate ventilation. Keep airborne concentrations below exposure limits. Take precautionary measures against static discharges. Use spark-proof tools and explosion-proof equipment. Ensure all equipment is electrically grounded before beginning transfer operations.

Storage precautions Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from direct sunlight. Keep away from open flames, hot surfaces and sources of ignition. Protect from freezing. Store above 0°C. Store away from incompatibles: Strong oxidizing agents. Strong bases. Aluminum.

Packaging materials Use specially constructed containers only.

8. Exposure Controls/Personal Protection

8.1 Control parameters

Component Information

Chemical Name	ACGIH TLV	OSHA PEL	Argentina - Occupational Exposure Limits - TWAs (CMPs)	Brazil - Occupational Exposure Limits - TWAs (LTs)	Mexico - Occupational Exposure Limits - TWAs (LMPE-PPTs)
Propan-2-ol	200 ppm	400 ppm TWA 980 mg/m ³ TWA	400 ppm TWA	310 ppm TWA LT; 765 mg/m ³ TWA LT	200 ppm TWA VLE-PPT
2-butoxyethanol	20 ppm	50 ppm TWA 240 mg/m ³ TWA	20 ppm TWA	39 ppm TWA LT; 190 mg/m ³ TWA LT	20 ppm TWA VLE-PPT
Ethoxylated C11 Alcohol	Not determined	Not determined	Not determined	Not determined	Not determined
Ethoxylated Alcohol	Not determined	Not determined	Not determined	Not determined	Not determined
1-undecanol (impurity)	Not determined	Not determined	Not determined	Not determined	Not determined

IDLH (Immediately Dangerous to Life or Health)

Immediately Dangerous to Life or Health (IDLH) is established by the US National Institute for Occupational Safety and Health (NIOSH). The purpose of establishing an IDLH value is to ensure that the worker can escape from a given contaminated environment in the event of failure of the most protective respiratory protection equipment. In the event of failure of respiratory protection equipment every effort should be made to exit immediately.

Chemical Name	IDLH (Immediately Dangerous to Life or Health)
Propan-2-ol 67-63-0	2000 ppm IDLH (10% LEL)
2-butoxyethanol 111-76-2	700 ppm IDLH
Ethoxylated C11 Alcohol 34398-01-1	Not applicable
Ethoxylated Alcohol 68131-39-5	Not applicable
1-undecanol (impurity) 112-42-5	Not applicable

8.2 Exposure controls

A risk assessment is recommended to be performed by a qualified and trained personnel to analyze the worksite and recommends

the appropriate controls such as engineering controls, work practice controls, and administrative controls as primary means of reducing employee exposure. When there is a remaining hazards after applying the primary controls, Personal Protective Equipment (PPE) must be used.

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazard present and the risk of exposure to those hazards. The PPE recommendations below are based on an assessment of the chemical hazards associated with this product. Where this product is used in a mixture with other products or fluids, additional hazards may be created and as such further assessment of risk may be required. The risk of exposure and need of respiratory protection will vary from workplace to workplace and should be assessed by the user in each situation.

Engineering Controls

Ensure adequate ventilation. Mechanical ventilation or local exhaust ventilation is required.

Personal protective equipment

Eye protection	Wear chemical splash goggles and face shield.
Hand protection	Use protective gloves made of: PVC polyvinyl alcohol or nitrile-butyl rubber gloves Break through time >480 minutes Glove thickness 0.4 mm Be aware that liquid may penetrate the gloves. Frequent change is advisable.
Respiratory Protection	All respiratory protection equipment should be used within a comprehensive respiratory protection program that meets the requirements of 29 CFR 1910.134 (U.S. OSHA Respiratory Protection Standard) or local equivalent. If exposed to airborne mist/aerosol of this product, use an organic vapor cartridge with a P-95 pre-filter attached. In work environments containing oil mist/aerosol, use an organic vapor cartridge with a P-95 pre-filter attached. If exposed to vapors from this product, use a NIOSH/MSHA-approved respirator with an organic vapor cartridge.
Skin and body protection	Wear suitable protective clothing, Eye wash and emergency shower must be available at the work place.
Hygiene Measures	Wash hands before eating, drinking or smoking, Remove and wash contaminated clothing before re-use.

9. Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

Physical state	Liquid	
Appearance	Aqueous solution	
Color	Clear	
Odor	Alcohol	
Odor threshold	Not applicable	
Property	Values	Remarks
pH	5	
pH @ dilution	No information available	
Melting point	- 40 °C / - 40 °F	
Boiling point/range	88 °C / 190 °F	
Flash point	32 °C / 90 °F	PMCC
Evaporation rate (BuAc =1)	No information available	
Flammability	Not applicable	
Explosion limits:		
Upper explosion limit	12.7%	
Lower explosion limit	2%	
Vapor pressure	3.4 kPa	@ 25 °C
Relative Vapor Density	>1 (air = 1)	
Specific gravity	0.925 - 0.96	
Bulk density	No information available	
Water solubility	Soluble in water	
Solubility in other solvents	No information available	
Autoignition temperature	No information available	

Decomposition temperature	No information available	
Kinematic viscosity	5.63 mm ² /s	@ 40 °C
Dynamic viscosity	No information available	
Partition Coefficient (n-octanol/water)	No information available	

Explosive properties	Vapours may form explosive mixtures with air
Oxidizing properties	None known.

9.2 Other information

Pour point	No information available
Molecular weight	No information available
VOC content(%)	No information available
Density and/or Relative Density	No information available

Comments

The data listed above are typical physical and chemical properties and should not be construed as product specification.

10. Stability and Reactivity

10.1 Reactivity

FLAMMABLE LIQUID AND VAPOR.

10.2 Chemical stability

Stable under normal temperature conditions and recommended use.

10.3 Possibility of Hazardous Reactions

Hazardous polymerization

Hazardous polymerization does not occur.

10.4 Conditions to avoid

Avoid heat, flames and other sources of ignition. Keep away from direct sunlight. Protect from freezing. Store above 0°C.

10.5 Incompatible materials

Strong oxidizing agents. Strong bases. Aluminum.

10.6 Hazardous decomposition products

See Section 5.2.

11. Toxicological Information

11.1 Information on toxicological effects

Acute toxicity

Inhalation

Vapors may irritate throat and respiratory system. May cause drowsiness or dizziness. May cause central nervous system depression with nausea, headache, dizziness, vomiting, and incoordination.

Eye contact

Causes serious eye damage.

Skin contact

Causes skin irritation. May be absorbed through the skin in harmful amounts.

Ingestion

Harmful if swallowed. May cause additional effects as listed under "Inhalation".

Toxicology data for the components

Chemical Name	LD50 Oral	LD50 Dermal	LC50 Inhalation
Propan-2-ol	1870 mg/kg (rat)	4059 mg/kg (Rabbit)	No data available
2-butoxyethanol	470 mg/kg (rat)	435 mg/kg (Rabbit)	No data available
Ethoxylated C11 Alcohol	1400 mg/kg (rat)	No data available	No data available
Ethoxylated Alcohol	1600 mg/kg (rat)	2500 mg/kg (Rabbit)	No data available
1-undecanol (impurity)	2002 mg/kg (rat)	2002 mg/kg (Rabbit)	No data available

Chemical Name	IARC Group 1 or 2	ACGIH - Carcinogens	OSHA listed carcinogens	NTP
Propan-2-ol	No data available	A4	No data available	No data available
2-butoxyethanol	No data available	A3 - Confirmed animal carcinogen with unknown relevance to humans	No data available	No data available
Ethoxylated C11 Alcohol	No data available	No data available	No data available	No data available
Ethoxylated Alcohol	No data available	No data available	No data available	No data available
1-undecanol (impurity)	No data available	No data available	No data available	No data available

Delayed and immediate effects and chronic effects from short and long term exposure

Sensitization	This product does not contain any components suspected to be sensitizing.
Mutagenic effects	This product does not contain any known or suspected mutagens.
Carcinogenicity	This product does not contain any known or suspected carcinogens.
Reproductive toxicity	This product does not contain any known or suspected reproductive hazards.
Developmental toxicity	Not known to cause birth defects or have a deleterious effect on a developing fetus.
Routes of Exposure	Inhalation. Skin contact. Eye contact. Ingestion.
Routes of entry	Inhalation. Eye contact. Skin contact. Ingestion. Skin absorption.
Specific target organ toxicity - Single exposure	Category 3
Specific target organ toxicity - Repeated exposure	Not classified.
Neurological effects	Central nervous system depressant.
Aspiration hazard	Not applicable.

12. Ecological Information**12.1 Toxicity****Toxicity to algae**

See component information below.

Toxicity to fish

See component information below.

Toxicity to daphnia and other aquatic invertebrates

See component information below.

Toxicology data for the components

Chemical Name	Toxicity to fish	Toxicity to algae	Toxicity to daphnia and other aquatic invertebrates
Propan-2-ol	= 9640 mg/L LC50 Pimephales promelas 96 h = 11130 mg/L LC50 Pimephales promelas 96 h > 1400000 µg/L LC50 Lepomis macrochirus 96 h	> 1000 mg/L EC50 Desmodesmus subspicatus 96 h > 1000 mg/L EC50 Desmodesmus subspicatus 72 h	= 13299 mg/L EC50 Daphnia magna 48 h
2-butoxyethanol	= 1490 mg/L LC50 Lepomis macrochirus 96 h = 2950 mg/L LC50 Lepomis macrochirus 96 h	No information available	= 1698 - 1940 mg/L LC50 Daphnia magna = 1720 mg/L EC50 water flea
Ethoxylated C11 Alcohol	No information available	No information available	No information available
Ethoxylated Alcohol	No information available	No information available	No information available
1-undecanol (impurity)	= 1.04 mg/L LC50 Pimephales promelas 96 h 3.6 - 5.1 mg/L LC50 Lepomis macrochirus 96 h 4.78 - 8.85 mg/L LC50 Oncorhynchus mykiss 96 h	= 2.7 mg/L EC50 Pseudokirchneriella subcapitata 96 h	= 8.5 mg/L EC50 Daphnia magna 48 h 4.78 - 8.87 mg/L EC50 Daphnia magna 48 h = 320 mg/L EC50 Daphnia magna 48 h

12.2 Persistence and degradability

See component information below.

12.3 Bioaccumulative potential

See component information below.

12.4 Mobility

See component information below.

See component information below.

12.5 Results of PBT and vPvB assessment

This preparation contains no substance considered to be persistent, bioaccumulating nor toxic (PBT)

This preparation contains no substance considered to be very persistent nor very bioaccumulating (vPvB)

12.6 Other adverse effects.

None known.

13. Disposal Considerations**13.1 Waste treatment methods****Disposal Method**

Disposal should be made in accordance with federal, state and local regulations.

Contaminated packaging

Do not burn, or use a cutting torch on, the empty drum. Empty containers may contain flammable or explosive vapors. Dispose of contents/container to an approved waste disposal plant.

14. Transport information

14.1. UN number

UN No. (DOT)	UN1993
UN No. (MT/ANTT)	UN1993
UN No. (TDG)	UN1993
UN/ID No. (ADR/RID/ADN/ADG)	UN1993
UN No. (IMDG/ANTAQ)	UN1993
UN No. (ICAO/ANAC)	UN1993
UN No. (DPC)	UN1993

14.2. UN proper shipping name

FLAMMABLE LIQUID, N.O.S. (contains Isopropanol)

14.3 Hazard class(es)

DOT Hazard class	3
ANTT Hazard class	3
TDG Hazard class	3
ADR/RID/ADN/ADG Hazard class	3
IMDG/ANTAQ Hazard class	3
ICAO/ANAC Hazard class/division	3
DPC Hazard class	3

14.4 Packing group

DOT Packing group	III
ANTT Packing group	III
TDG Packing group	III
ADR/RID/ADN/ADG Packing group	III
IMDG/ANTAQ Packing group	III
ICAO/ANAC Packing group	III
DPC Packing group	III

**14.5 Environmental hazard**

Marine pollutant No

14.6 Special precautions

Not applicable

15. Regulatory Information

International inventories

USA (TSCA)	Complies
Canada (DSL)	Complies
Philippines (PICCS)	Complies
Japan (ENCS)	Does not comply
China (IECSC)	Complies

Australia (AICS)	Complies
Korean (KECL)	Complies
New Zealand (NZIoC)	Complies

Europe - REACH

All products supplied from the European Economic Area (EEA) are compliant with the REACH Regulation EC 1907/2006. For products supplied from the EEA, Schlumberger and/or its suppliers have pre-registered and is registering all of the substances that it and/or its suppliers manufactures in or imports into the EEA that are subject to Title II of the REACH Regulation. All products supplied from outside the EEA are subject to REACH only if imported into the EEA. The importer of the products must comply with REACH for each imported substance. Contact REACH@slb.com for REACH information.

IMPORTS, Canada

No import volume restrictions.

U.S. Federal and State Regulations**SARA 311/312 Hazard Categories**

Should this product meet EPCRA 311/312 Tier reporting criteria at 40 CFR 370, refer to Section 2 of this SDS for appropriate classifications. Under the amended regulations at 40 CFR 370, EPCRA 311/312 Tier II reporting for the 2017 calendar year will need to be consistent with updated hazard classifications.

Chemical Name	SARA 302 / TPQs	SARA 313	CERCLA RQ
Propan-2-ol	N/A	1.0 %	N/A
2-butoxyethanol	N/A	N/A	N/A
Ethoxylated C11 Alcohol	N/A	N/A	N/A
Ethoxylated Alcohol	N/A	N/A	N/A
1-undecanol (impurity)	N/A	N/A	N/A

California Proposition 65

This product does not contain chemical[s] which is [are] known to the State of California to cause cancer, birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov

Canadian Classification

This Safety Data Sheet has been prepared in compliance with the Hazardous Products Regulations.

Brazil Regulation This SDS was prepared in accordance with Brazil law ABNT NBR 14725:2014.

Federal Police Not determined

Army Not determined

ANVISA Not determined

MTE (NR 15) No information available

16. Other Information

Supersedes date 02/Mar/2022

Revision date 21/Dec/2022

Version 12

HMIS classification

Health	3
Flammability	3
Physical hazard	0
PPE	X

N/A - Not Applicable, N/D - Not Determined.

Disclaimer

The information contained herein is considered in good faith as reliable of the date issued and is based upon on measurements, tests or data derived from supplier's own study or furnished by others. In providing this SDS information, Supplier makes no express or implied warranties as to the information or product; merchantability or fitness of purpose; any express or implied warranty; or non-infringement of intellectual property rights; and supplier assumes no responsibility for any direct, special or consequential damages, results obtained, or the activities of others. To the maximum extent permitted by law, supplier's warranty obligations and buyer's sole remedies are as stated in separate agreement between the parties.

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Safety Data Sheet Breaker J218

1. Identification

1.1 Product identifier

Product name Breaker J218
Product code J218

1.2 Relevant identified uses of the substance or mixture and uses advised against

Recommended Use Used as a fracturing additive in oilfield applications.
Uses advised against Consumer use

1.3 Details of the supplier of the safety data sheet

Supplier

Schlumberger Technology Corporation
110 Schlumberger Drive
Sugar Land, Texas 77478, USA
Telephone: 1-281-285-7873

Schlumberger Canada, Ltd.
200, 125 - 9th Avenue SE
Calgary, Alberta T2G 0P6, Canada

E-mail address SDS@slb.com

Prepared by

Global Regulatory Compliance - Chemicals (GRC - Chemicals)

1.4 Emergency Telephone Number

Emergency telephone (24 Hour) Asia Pacific +65 3158 1074, Europe +44 (0) 1235 239 670, Middle East and Africa +44 (0) 1235 239 671, USA +1 281 595 3518, Canada +1 800 579 7421, Argentina: +54 11 5984 3690, Brazil : +55 11 3197 5891

2. Hazards Identification

2.1 Classification of the substance or mixture

GHS - Classification

Health hazards

Acute toxicity - Oral	Category 4
Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 2
Respiratory sensitization	Category 1
Skin sensitization	Category 1
Specific target organ toxicity - Single exposure	Category 3

Environmental hazards Not classified

Physical Hazards

Oxidizing Solids	Category 3
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2.2 Label elements**Signal word**

DANGER

Hazard Statements

H302 - Harmful if swallowed
H315 - Causes skin irritation
H317 - May cause an allergic skin reaction
H319 - Causes serious eye irritation
H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled
H335 - May cause respiratory irritation
H272 - May intensify fire; oxidizer

Precautionary Statements

P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking
P220 - Keep/Store away from clothing/ combustible materials
P221 - Take any precaution to avoid mixing with combustibles
P261 - Avoid breathing dust/fume/gas/mist/vapors/spray
P264 - Wash face, hands and any exposed skin thoroughly after handling
P270 - Do not eat, drink or smoke when using this product
P271 - Use only outdoors or in a well-ventilated area
P272 - Contaminated work clothing should not be allowed out of the workplace
P280 - Wear protective gloves and eye/face protection
P283 - Wear fire/flame resistant/retardant clothing
P284 - Wear respiratory protection
P301 + P312 - IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell
P330 - Rinse mouth
P302 + P352 - IF ON SKIN: Wash with plenty of soap and water
P332 + P313 - If skin irritation occurs: Get medical advice/attention
P362 + P364 - Take off contaminated clothing and wash it before reuse
P304 + P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
P342 + P311 - If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P337 + P313 - If eye irritation persists: Get medical advice/attention
P370 + P378 - In case of fire: Use VERY LARGE quantities of water to extinguish
P403 + P233 - Store in a well-ventilated place. Keep container tightly closed
P410 - Protect from sunlight
P411 - Store at temperatures not exceeding 38 °C/ 100 °F
P501 - Dispose of contents/container in accordance with local, regional, national, and international regulations as applicable

Hazards not otherwise classified

None known

Unknown acute toxicity 0% of the mixture consists of ingredient(s) of unknown toxicity.

3. Composition/information on Ingredients

3.1 Substances

Chemical Name	CAS No	Weight-%
Diammonium peroxodisulphate	7727-54-0	100

3.2 Mixtures

Not applicable

Comments

No Comments. The exact percentage (concentration) of composition has been withheld as a trade secret.

4. First Aid Measures

4.1 First aid measures

Inhalation	If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.
Ingestion	Rinse mouth. Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Seek medical attention if irritation occurs.
Skin contact	Wash off immediately with soap and plenty of water. Remove contaminated clothing and shoes. Seek medical attention if irritation occurs.
Eye Contact	Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first five minutes, then continue rinsing eye. Get medical attention if any discomfort continues.

4.2. Most important symptoms and effects, both acute and delayed

General advice The severity of the symptoms described will vary dependant of the concentration and the length of exposure. If adverse symptoms develop, the casualty should be transferred to hospital as soon as possible.

Symptoms

Inhalation	Please see Section 11. Toxicological Information for further information.
Ingestion	Please see Section 11. Toxicological Information for further information.
Skin contact	Please see Section 11. Toxicological Information for further information.
Eye contact	Please see Section 11. Toxicological Information for further information.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician Treat symptomatically

5. Fire-Fighting Measures

5.1 Extinguishing media

Suitable extinguishing media

Deluge with water. Other methods not effective.

Extinguishing media which must not be used for safety reasons

Dry chemical, carbon dioxide and other gas-filled extinguishers.

5.2. Special hazards arising from the substance or mixture

Unusual fire and explosion hazards

May intensify fire; oxidizer.

Hazardous combustion products

Thermal decomposition can lead to release of irritating gases and vapors, Sulfur oxides, Oxygen, Nitrogen.

5.3 Advice for firefighters

Special protective equipment and precautions for fire-fighters

As in any fire, wear self-contained breathing apparatus and full protective gear.

Special Fire-Fighting Procedures

Containers close to fire should be removed immediately or cooled with water.

6. Accidental Release Measures

6.1. Personal precautions, protective equipment and emergency procedures

Remove all sources of ignition. Avoid contact with the skin and the eyes. Wash thoroughly after handling. Use personal protective equipment. See also section 8.

6.2 Environmental precautions

The product should not be allowed to enter drains, water courses or the soil.

Environmental exposure controls

Avoid release to the environment. Local authorities should be advised if significant spillages cannot be contained.

6.3 Methods and material for containment and cleaning up

Methods for containment

Prevent further leakage or spillage if safe to do so.

Methods for cleaning up

Take up mechanically and collect in suitable container for disposal. Take precautionary measures against static discharges. Use non-sparking tools and equipment. Spilled oxidizer must be removed immediately and isolated for disposal. Isolated material must be monitored for signs of decomposition (fuming/smoking). If spilled material is wet, dissolve with large quantity of water. All disposals must be carried out at the earliest opportunity and in accordance with local /regional /national /international regulations. After cleaning, flush away traces with water.

6.4 Reference to other sections

See section 13 for more information.

7. Handling and Storage

7.1 Precautions for safe handling

Handling

Do not handle until all safety precautions have been read and understood. Handle in accordance with good industrial hygiene and safety practice. Follow procedures for safe handling of oxidizers. Do not expose materials or their containers to moisture. Keep away from open flames, hot surfaces and sources of ignition. Avoid handling causing generation of dust.

Hygiene measures

Use good work and personal hygiene practices to avoid exposure. Wash hands and face before breaks and immediately after handling the product. Remove contaminated clothing. Do not eat, drink or smoke when using this product.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures/precautions Ensure adequate ventilation. Keep airborne concentrations below exposure limits.

Storage precautions Oxidizers must be stored separately from all other materials. Keep containers tightly closed in a dry, cool and well-ventilated place. Protect from moisture. Keep away from direct sunlight. Keep at a temperature not exceeding 100 °F/38 °C. Keep away from open flames, hot surfaces and sources of ignition. Oxidizing material - Keep away from flammable and combustible materials. Store away from incompatibles: Oxidizing agents. Reducing Agents. Acids.

Packaging materials Use specially constructed containers only. Coated (epoxy phenolic) steel drum or high density polyethylene (HDPE) can

Packaging materials to be avoided Containers made of MONEL, copper, brass, or iron.

8. Exposure Controls/Personal Protection

8.1 Control parameters

Exposure limits Control as an ACGIH particulate not otherwise specified (PNOS): 10 mg/m³ (Inhalable); 3 mg/m³ (Respirable) and an OSHA particulate not otherwise regulated (PNOR): 15 mg/m³ (Total); 5 mg/m³ (Respirable).

Chemical Name	ACGIH TLV	OSHA PEL	Argentina - Occupational Exposure Limits - TWAs (CMPs)	Brazil - Occupational Exposure Limits - TWAs (LTs)	Mexico - Occupational Exposure Limits - TWAs (LMPE-PPTs)
Diammonium peroxodisulphate	Not determined	Not determined	Not determined	Not determined	Not determined

IDLH (Immediately Dangerous to Life or Health)

Immediately Dangerous to Life or Health (IDLH) is established by the US National Institute for Occupational Safety and Health (NIOSH). The purpose of establishing an IDLH value is to ensure that the worker can escape from a given contaminated environment in the event of failure of the most protective respiratory protection equipment. In the event of failure of respiratory protection equipment every effort should be made to exit immediately.

Chemical Name	IDLH (Immediately Dangerous to Life or Health)
Diammonium peroxodisulphate 7727-54-0	Not determined

8.2 Exposure controls

A risk assessment is recommended to be performed by a qualified and trained personnel to analyze the worksite and recommends

the appropriate controls such as engineering controls, work practice controls, and administrative controls as primary means of reducing employee exposure. When there is a remaining hazards after applying the primary controls, Personal Protective Equipment (PPE) must be used.

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazard present and the risk of exposure to those hazards. The PPE recommendations below are based on an assessment of the chemical hazards associated with this product. Where this product is used in a mixture with other products or fluids, additional hazards may be created and as such further assessment of risk may be required. The risk of exposure and need of respiratory protection will vary from workplace to workplace and should be assessed by the user in each situation.

Engineering Controls

Ensure adequate ventilation. Mechanical ventilation or local exhaust ventilation is required.

Personal protective equipment

Eye protection	Tightly fitting safety goggles.
Hand protection	Wear chemical resistant gloves such as nitrile or neoprene. Frequent change is advisable
Respiratory Protection	All respiratory protection equipment should be used within a comprehensive respiratory protection program that meets the requirements of 29 CFR 1910.134 (U.S. OSHA Respiratory Protection Standard) or local equivalent. If exposed to airborne particles of this product use at least a NIOSH-approved N95 half-mask disposable or re-useable particulate respirator. In work environments containing oil mist/aerosol use at least a NIOSH-approved P95 half-mask disposable or re-useable particulate respirator.
Skin and body protection	Wear appropriate personal protective clothing to prevent skin contact, Eye wash and emergency shower must be available at the work place.
Hygiene Measures	Wash hands before breaks and immediately after handling the product, Remove and wash contaminated clothing before re-use.

9. Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

Physical state	Solid
Appearance	Crystals
Color	White
Odor	Odorless
Odor threshold	Not applicable

<u>Property</u>	<u>Values</u>	<u>Remarks</u>
pH	Not applicable	
pH @ dilution	4 - 5	850 g/l; 25°C
Melting point	120 °C / 249 °F	
Boiling point	No information available	
Flash point	No information available	
Evaporation rate (BuAc =1)	No information available	
Flammability (solid, gas)	Not applicable	
Flammability Limit in Air		
Upper flammability limit	No information available	
Lower flammability limit	No information available	
Vapor pressure	No information available	
Vapor density	No information available	
Specific gravity	1.98 - 2.00 g/cm ³	
Bulk density	2000 kg/m ³	
Water solubility	85g / 100ml	
Solubility in other solvents	No information available	
Autoignition temperature	No information available	

Decomposition temperature	120 °C / 249 °F
Kinematic viscosity	No information available
Dynamic viscosity	No information available
Partition Coefficient (n-octanol/water)	No information available
Explosive properties	Not applicable
Oxidizing properties	May intensify fire; oxidizer
9.2 Other information	
Pour point	No information available
Molecular weight	No information available
VOC content(%)	No information available
Density	No information available

Comments

The data listed above are typical physical and chemical properties and should not be construed as product specification.

10. Stability and Reactivity

10.1 Reactivity

This product is a strong oxidizer and reacts violently with combustibles and reducing agents.

10.2 Chemical stability

Stable under normal temperature conditions and recommended use.

10.3 Possibility of Hazardous Reactions

Hazardous polymerization

Hazardous polymerization does not occur.

10.4 Conditions to avoid

Avoid heat, flames and other sources of ignition. Protect from moisture. Avoid dust formation. Avoid contamination. Keep away from direct sunlight.

10.5 Incompatible materials

Do not mix oxidizers of any concentration with other oxidizing agents, reducing agents, flammable or combustible liquids or solids, acids, most metals and heavy metals, oxygen scavengers, corrosion inhibitors, surfactants, gelling agents, fluid-loss additives, cross linkers, solvents, foaming agents, clay control agents, or any chemical not specifically mentioned as being compatible with the specific oxidizer.

10.6 Hazardous decomposition products

See Section 5.2.

11. Toxicological Information

11.1 Information on toxicological effects

Acute toxicity

Product information May produce an allergic reaction.

Inhalation

May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause irritation of respiratory tract.

Eye contact	Causes serious eye irritation.
Skin contact	Causes skin irritation. May cause an allergic skin reaction.
Ingestion	Harmful if swallowed.

Chemical Name	LD50 Oral	LD50 Dermal	LC50 Inhalation
Diammonium peroxodisulphate	495 mg/kg (rat)	10010 mg/kg (Rabbit)	No data available

Chemical Name	IARC Group 1 or 2	ACGIH - Carcinogens	OSHA listed carcinogens	NTP
Diammonium peroxodisulphate	No data available	No data available	No data available	No data available

Delayed and immediate effects and chronic effects from short and long term exposure

Sensitization	May cause allergic skin reaction. May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Mutagenic effects	This product does not contain any known or suspected mutagens.
Carcinogenicity	This product does not contain any known or suspected carcinogens.
Reproductive toxicity	This product does not contain any known or suspected reproductive hazards.
Developmental toxicity	Not known to cause birth defects or have a deleterious effect on a developing fetus.
Routes of Exposure	Inhalation. Skin contact. Eye contact.
Routes of entry	Inhalation. Ingestion. Skin contact. Eye contact.
Specific target organ toxicity - Single exposure	Category 3
Specific target organ toxicity - Repeated exposure	Not classified.
Target organ effects	Respiratory system.
Aspiration hazard	Not applicable.

12. Ecological Information

12.1 Toxicity

Toxicity to algae
See component information below.

Toxicity to fish

See component information below.

Toxicity to daphnia and other aquatic invertebrates

See component information below.

Chemical Name	Toxicity to fish	Toxicity to algae	Toxicity to daphnia and other aquatic invertebrates
Diammonium peroxodisulphate	= 76.3 mg/L LC50 Oncorhynchus mykiss 96 h	= 136 mg/l EC50 Phaenodactylum tricorutum 72h	= 120 mg/L EC50 Daphnia magna 48 h

12.2 Persistence and degradability

Not Applicable - Inorganic chemical.

12.3 Bioaccumulative potential

Not Applicable - Inorganic chemical.

12.4 Mobility

The product is water soluble, and may spread in water systems.

12.5 Results of PBT and vPvB assessment

This preparation contains no substance considered to be persistent, bioaccumulating nor toxic (PBT)
This preparation contains no substance considered to be very persistent nor very bioaccumulating (vPvB)

12.6 Other adverse effects.

None known.

13. Disposal Considerations

13.1 Waste treatment methods

Disposal Method	Disposal should be made in accordance with federal, state and local regulations.
Contaminated packaging	Do not re-use empty containers. Dispose of contents/container to an approved waste disposal plant.

14. Transport information

14.1. UN number

UN No. (DOT)	UN1444
UN No. (MT/ANTT)	UN1444
UN No. (TDG)	UN1444
UN/ID No. (ADR/RID/ADN/ADG)	UN1444
UN No. (IMDG/ANTAQ)	UN1444
UN No. (ICAO/ANAC)	UN1444
UN No. (DPC)	UN1444

14.2. UN proper shipping name

AMMONIUM PERSULFATE,

14.3 Hazard class(es)

DOT Hazard class	5.1
ANTT Hazard class	5.1
TDG Hazard class	5.1
ADR/RID/ADN/ADG Hazard class	5.1
IMDG/ANTAQ Hazard class	5.1
ICAO/ANAC Hazard class/division	5.1
DPC Hazard class	5.1

14.4 Packing group

DOT Packing group	III
ANTT Packing group	III
TDG Packing group	III
ADR/RID/ADN/ADG Packing group	III
IMDG/ANTAQ Packing group	III
ICAO/ANAC Packing group	III
DPC Packing group	III

**14.5 Environmental hazard**

Marine pollutant	No
------------------	----

14.6 Special precautions

Not applicable

14.7 Transport in bulk according to Annex I/II of MARPOL 73/78 and the IBC Code

Please contact SDS@slb.com for info regarding transport in Bulk.

15. Regulatory Information

International inventories

USA (TSCA)	Complies
Canada (DSL)	Complies
Philippines (PICCS)	Complies
Japan (ENCS)	Complies
China (IECSC)	Complies
Australia (AICS)	Complies
Korean (KECL)	Complies
New Zealand (NZIoC)	Complies

Europe - REACH

All products supplied from the European Economic Area (EEA) are compliant with the REACH Regulation EC 1907/2006. For products supplied from the EEA, Schlumberger and/or its suppliers have pre-registered and is registering all of the substances that it and/or its suppliers manufactures in or imports into the EEA that are subject to Title II of the REACH Regulation. All products

supplied from outside the EEA are subject to REACH only if imported into the EEA. The importer of the products must comply with REACH for each imported substance. Contact REACH@slb.com for REACH information.

U.S. Federal and State Regulations

SARA 311/312 Hazard Categories

Should this product meet EPCRA 311/312 Tier reporting criteria at 40 CFR 370, refer to Section 2 of this SDS for appropriate classifications. Under the amended regulations at 40 CFR 370, EPCRA 311/312 Tier II reporting for the 2017 calendar year will need to be consistent with updated hazard classifications.

Chemical Name	SARA 302 / TPQs	SARA 313	CERCLA RQ
Diammonium peroxodisulphate	N/A	N/A	N/A

California Proposition 65

This product does not contain chemical[s] which is [are] known to the State of California to cause cancer, birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov

Canadian Classification

This Safety Data Sheet has been prepared in compliance with the Hazardous Products Regulations.

16. Other Information

Supersedes date 09/Aug/2017

Revision date 05/Jun/2020

Version 6

This SDS has been revised in the following section(s) 7

HMIS classification

Health	2
Flammability	1
Physical hazard	1
PPE	X

N/A - Not Applicable, N/D - Not Determined.

Disclaimer

The information contained herein is considered in good faith as reliable of the date issued and is based upon on measurements, tests or data derived from supplier's own study or furnished by others. In providing this SDS information, Supplier makes no express or implied warranties as to the information or product; merchantability or fitness of purpose; any express or implied warranty; or non-infringement of intellectual property rights; and supplier assumes no responsibility for any direct, special or consequential damages, results obtained, or the activities of others. To the maximum extent permitted by law, supplier's warranty obligations and buyer's sole remedies are as stated in separate agreement between the parties.

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Safety Data Sheet EB-Clean* J475 Breaker

1. Identification

1.1 Product identifier

Product name EB-Clean* J475 Breaker
Product code J475

1.2 Relevant identified uses of the substance or mixture and uses advised against

Recommended Use Used as a fracturing additive in oilfield applications.
Uses advised against Consumer use

1.3 Details of the supplier of the safety data sheet

Supplier

Schlumberger Technology Corporation
110 Schlumberger Drive
Sugar Land, Texas 77478, USA
Telephone: 1-281-285-7873

Schlumberger Canada, Ltd.

200, 125 - 9th Avenue SE
Calgary, Alberta T2G 0P6, Canada

E-mail address SDS@slb.com

Prepared by

Global Regulatory Compliance - Chemicals (GRC - Chemicals)

1.4 Emergency Telephone Number

Emergency telephone (24 Hour) Asia Pacific +65 3158 1074, Europe +44 (0) 1235 239 670, Middle East and Africa +44 (0) 1235 239 671, USA +1 281 595 3518, Canada +1 800 579 7421 , Argentina: +54 11 5984 3690, Brazil : +55 11 3197 5891

2. Hazards Identification

2.1 Classification of the substance or mixture

GHS - Classification

Health hazards

Acute toxicity - Oral	Category 4
Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 2
Respiratory sensitization	Category 1
Skin sensitization	Category 1
Specific target organ toxicity - Single exposure	Category 3

Environmental hazards Not classified

Physical Hazards

Oxidizing Solids	Category 3
Combustible dust	Category 1

2.2 Label elements



Signal word

DANGER

Hazard Statements

H302 - Harmful if swallowed
 H315 - Causes skin irritation
 H317 - May cause an allergic skin reaction
 H319 - Causes serious eye irritation
 H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled
 H335 - May cause respiratory irritation
 H232 - May form combustible dust concentrations in air
 H272 - May intensify fire; oxidizer

Precautionary Statements

P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking
 P220 - Keep/Store away from clothing/ combustible materials
 P221 - Take any precaution to avoid mixing with combustibles
 P240 - Ground or bond container and receiving equipment
 P242 - Use only non-sparking tools
 P243 - Take precautionary measures against static discharge
 P261 - Avoid breathing dust/fume/gas/mist/vapors/spray
 P264 - Wash face, hands and any exposed skin thoroughly after handling
 P270 - Do not eat, drink or smoke when using this product
 P271 - Use only outdoors or in a well-ventilated area
 P272 - Contaminated work clothing should not be allowed out of the workplace
 P280 - Wear protective gloves and eye/face protection
 P283 - Wear fire/flammable resistant/retardant clothing
 P284 - Wear respiratory protection
 P301 + P312 - IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell
 P302 + P352 - IF ON SKIN: Wash with plenty of soap and water
 P304 + P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
 P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
 P330 - Rinse mouth
 P332 + P313 - If skin irritation occurs: Get medical advice/attention
 P337 + P313 - If eye irritation persists: Get medical advice/attention
 P342 + P311 - If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician
 P362 + P364 - Take off contaminated clothing and wash it before reuse
 P370 + P378 - In case of fire: Use VERY LARGE quantities of water to extinguish
 P403 + P233 - Store in a well-ventilated place. Keep container tightly closed
 P410 - Protect from sunlight
 P411 - Store at temperatures not exceeding 38 °C/ 100 °F

P501 - Dispose of contents/container in accordance with local, regional, national, and international regulations as applicable

Hazards not otherwise classified

None known

Unknown acute toxicity 0% of the mixture consists of ingredient(s) of unknown toxicity.

3. Composition/information on Ingredients

3.1 Substances

Not applicable

3.2 Mixtures

Chemical Name	CAS No	Weight-%
Diammonium peroxodisulphate	7727-54-0	80 - 100
Aliphatic co-polymer	Proprietary	15 - 40

Comments

The product contains other ingredients which do not contribute to the overall classification. The exact percentage (concentration) of composition has been withheld as a trade secret.

Proprietary component(s) in section 3 of this SDS does not/do not trigger application of trade secret exemption under Hazardous Materials Information Review Act (HMIRA). The proprietary component in this product contributes to combustible dust classification.

4. First Aid Measures

4.1 First aid measures

Inhalation	If inhaled, remove to fresh air. If not breathing give artificial respiration, preferably mouth-to-mouth. If breathing is difficult give oxygen. Get immediate medical attention.
Ingestion	Rinse mouth. Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Get immediate medical attention.
Skin contact	Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Seek medical attention.
Eye Contact	Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first five minutes, then continue rinsing eye. Get immediate medical attention.

4.2. Most important symptoms and effects, both acute and delayed

General advice The severity of the symptoms described will vary dependant of the concentration and the length of exposure. If adverse symptoms develop, the casualty should be transferred to hospital as soon as possible.

Symptoms

Inhalation	Please see Section 11. Toxicological Information for further information.
Ingestion	Please see Section 11. Toxicological Information for further information.
Skin contact	Please see Section 11. Toxicological Information for further information.
Eye contact	Please see Section 11. Toxicological Information for further information.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician Treat symptomatically

5. Fire-Fighting Measures

5.1 Extinguishing media

Suitable extinguishing media

Deluge with water. Other methods not effective.

Extinguishing media which must not be used for safety reasons

Dry chemical, carbon dioxide and other gas-filled extinguishers.

5.2. Special hazards arising from the substance or mixture

Unusual fire and explosion hazards

May intensify fire; oxidizer.

Hazardous combustion products

Thermal decomposition can lead to release of irritating gases and vapors, Sulfur oxides, Oxygen, Nitrogen.

5.3 Advice for firefighters

Special protective equipment and precautions for fire-fighters

As in any fire, wear self-contained breathing apparatus and full protective gear.

Special Fire-Fighting Procedures

Containers close to fire should be removed immediately or cooled with water.

6. Accidental Release Measures

6.1. Personal precautions, protective equipment and emergency procedures

Avoid dust formation. Suspended dust may present a dust explosion hazard. Remove all sources of ignition. Avoid contact with the skin and the eyes. Wash thoroughly after handling. Use personal protective equipment. See also section 8.

6.2 Environmental precautions

The product should not be allowed to enter drains, water courses or the soil.

Environmental exposure controls

Avoid release to the environment. Local authorities should be advised if significant spillages cannot be contained.

6.3 Methods and material for containment and cleaning up

Methods for containment

Prevent further leakage or spillage if safe to do so.

Methods for cleaning up

Take up mechanically and collect in suitable container for disposal. Take precautionary measures against static discharges. Use non-sparking tools and equipment. Avoid dust formation. Spilled oxidizer must be removed immediately and isolated for disposal. Isolated material must be monitored for signs of decomposition (fuming/smoking). If spilled material is wet, dissolve with large quantity of water. All disposals must be carried out at the earliest opportunity and in accordance with local /regional /national /international regulations. After cleaning, flush away traces with water.

6.4 Reference to other sections

See section 13 for more information.

7. Handling and Storage

7.1 Precautions for safe handling

Handling

Do not handle until all safety precautions have been read and understood. Handle in accordance with good industrial hygiene and safety practice. Follow procedures for safe handling of oxidizers. Do not expose materials or their containers to moisture. Keep away from open flames, hot surfaces and sources of ignition. Avoid handling causing generation of dust. Avoid breathing dust; if exposed to high dust concentration, leave area immediately. Persons susceptible to allergic reactions should not handle this product.

Hygiene measures

Use good work and personal hygiene practices to avoid exposure. Wash hands and face before breaks and immediately after handling the product. Remove contaminated clothing. Do not eat, drink or smoke when using this product.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures/precautions Ensure adequate ventilation. Keep airborne concentrations below exposure limits.

Storage precautions Oxidizers must be stored separately from all other materials. Keep containers tightly closed in a dry, cool and well-ventilated place. Protect from moisture. Keep away from direct sunlight. Keep at a temperature not exceeding 100 °F /38 °C. Keep away from open flames, hot surfaces and sources of ignition. Oxidizing material - Keep away from flammable and combustible materials. Store away from incompatibles: Oxidizing agents. Reducing Agents. Acids.

Packaging materials Use specially constructed containers only. Coated (epoxy phenolic) steel drum or high density polyethylene (HDPE) can

Packaging materials to be avoided Containers made of MONEL, copper, brass, or iron.

8. Exposure Controls/Personal Protection

8.1 Control parameters

Exposure limits

Control as an ACGIH particulate not otherwise specified (PNOS): 10 mg/m³ (Inhalable); 3 mg/m³ (Respirable) and an OSHA particulate not otherwise regulated (PNOR): 15 mg/m³ (Total); 5 mg/m³ (Respirable).

Chemical Name	ACGIH TLV	OSHA PEL	Argentina - Occupational Exposure Limits - TWAs (CMPs)	Brazil - Occupational Exposure Limits - TWAs (LTs)	Mexico - Occupational Exposure Limits - TWAs (LMPE-PPTs)
Diammonium peroxodisulphate	Not determined	Not determined	Not determined	Not determined	Not determined
Aliphatic co-polymer	Not determined	Not determined	Not determined	Not determined	Not determined

IDLH (Immediately Dangerous to Life or Health)

This product contains substance(s) classified as Immediately Dangerous to Life or Health (IDLH) by the US National Institute for Occupational Safety and Health (NIOSH). The purpose of establishing an IDLH value is to ensure that the worker can escape from a given contaminated environment in the event of failure of the most protective respiratory protection equipment. In the event of failure of respiratory protection equipment every effort should be made to exit immediately.

Chemical Name	IDLH (Immediately Dangerous to Life or Health)
Diammonium peroxodisulphate 7727-54-0	-
Aliphatic co-polymer	-

8.2 Exposure controls

A risk assessment is recommended to be performed by a qualified and trained personnel to analyze the worksite and recommends the appropriate controls such as engineering controls, work practice controls, and administrative controls as primary means of reducing employee exposure. When there is a remaining hazards after applying the primary controls, Personal Protective Equipment (PPE) must be used.

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazard present and the risk of exposure to those hazards. The PPE recommendations below are based on an assessment of the chemical hazards associated with this product. Where this product is used in a mixture with other products or fluids, additional hazards may be created and as such further assessment of risk may be required. The risk of exposure and need of respiratory protection will vary from workplace to workplace and should be assessed by the user in each situation.

Engineering Controls

Ensure adequate ventilation. Mechanical ventilation or local exhaust ventilation is required.

Personal protective equipment

Eye protection	Tightly fitting safety goggles.
Hand protection	Wear chemical resistant gloves such as nitrile or neoprene. Frequent change is advisable
Respiratory Protection	All respiratory protection equipment should be used within a comprehensive respiratory protection program that meets the requirements of 29 CFR 1910.134 (U.S. OSHA Respiratory Protection Standard) or local equivalent. If exposed to airborne particles of this product use at least a NIOSH-approved N95 half-mask disposable or re-useable particulate respirator. In work environments containing oil mist/aerosol use at least a NIOSH-approved P95 half-mask disposable or re-useable particulate respirator.
Skin and body protection	Wear appropriate personal protective clothing to prevent skin contact, Eye wash and emergency shower must be available at the work place.
Hygiene Measures	Wash hands before breaks and immediately after handling the product, Remove and wash contaminated clothing before re-use.

9. Physical and Chemical Properties**9.1 Information on basic physical and chemical properties**

Physical state	Solid
Appearance	Powder
Color	White
Odor	Sweet
Odor threshold	Not applicable

<u>Property</u>	<u>Values</u>	<u>Remarks</u>
pH	No information available	
pH @ dilution	6.5 - 8	@ 10g/l
Melting point	Decomposes	
Boiling point	No information available	
Flash point	> 93 °C / > 200 °F	
Evaporation rate (BuAc =1)	No information available	
Flammability (solid, gas)	Not applicable	
Flammability Limit in Air		
Upper flammability limit	No information available	
Lower flammability limit	No information available	
Vapor pressure	No information available	
Vapor density	No information available	
Specific gravity	1.8	@20 °C
Bulk density	1150 kg/m ³	
Water solubility	10 - 20 g/l	@ 20 °C
Solubility in other solvents	No information available	
Autoignition temperature	No information available	
Decomposition temperature	120 °C/ 248 °F	
Kinematic viscosity	No information available	
Dynamic viscosity	No information available	
Partition Coefficient (n-octanol/water)	No information available	
Explosive properties	No information available	
Oxidizing properties	Oxidizer. Contact with other material may cause fire	
9.2 Other information		
Pour point	No information available	
Molecular weight	No information available	
VOC content(%)	No information available	
Density	No information available	

Comments

The data listed above are typical physical and chemical properties and should not be construed as product specification.

10. Stability and Reactivity

10.1 Reactivity

This product is a strong oxidizer and reacts violently with combustibles and reducing agents.

10.2 Chemical stability

Stable under normal temperature conditions and recommended use.

10.3 Possibility of Hazardous Reactions**Hazardous polymerization**

Hazardous polymerization does not occur.

10.4 Conditions to avoid

Avoid heat, flames and other sources of ignition. Protect from moisture. Avoid dust formation. Avoid contamination. Keep away from direct sunlight.

10.5 Incompatible materials

Do not mix oxidizers of any concentration with other oxidizing agents, reducing agents, flammable or combustible liquids or solids, acids, most metals and heavy metals, oxygen scavengers, corrosion inhibitors, surfactants, gelling agents, fluid-loss additives, cross linkers, solvents, foaming agents, clay control agents, or any chemical not specifically mentioned as being compatible with the specific oxidizer.

10.6 Hazardous decomposition products

See Section 5.2.

11. Toxicological Information

11.1 Information on toxicological effects

Acute toxicity

Product information May produce an allergic reaction.

Inhalation

May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause irritation of respiratory tract. May cause drowsiness or dizziness.

Eye contact

Causes serious eye irritation.

Skin contact

Irritating to skin. May cause an allergic skin reaction.

Ingestion

Harmful if swallowed.

Toxicology data for the components

Chemical Name	LD50 Oral	LD50 Dermal	LC50 Inhalation
Diammonium peroxodisulphate	495 mg/kg (rat)	10010 mg/kg (Rabbit)	No data available
Aliphatic co-polymer	No data available	No data available	No data available

Chemical Name	IARC Group 1 or 2	ACGIH - Carcinogens	OSHA listed carcinogens	NTP
Diammonium peroxodisulphate	No data available	No data available	No data available	No data available
Aliphatic co-polymer	No data available	No data available	No data available	No data available

Delayed and immediate effects and chronic effects from short and long term exposure

Sensitization

May cause sensitization by inhalation and skin contact.

Mutagenic effects

This product does not contain any known or suspected mutagens.

Carcinogenicity

This product does not contain any known or suspected carcinogens.

Reproductive toxicity

This product does not contain any known or suspected reproductive hazards.

Developmental toxicity

Not known to cause birth defects or have a deleterious effect on a developing fetus.

Routes of Exposure

Inhalation. Skin contact. Eye contact. Ingestion.

Routes of entry

Inhalation.

Specific target organ toxicity - Single exposure	Category 3
Specific target organ toxicity - Repeated exposure	Not classified.
Target organ effects	Respiratory system.
Aspiration hazard	Not applicable.

12. Ecological Information

12.1 Toxicity

Toxicity to algae

See component information below.

Toxicity to fish

See component information below.

Toxicity to daphnia and other aquatic invertebrates

See component information below.

Chemical Name	Toxicity to fish	Toxicity to algae	Toxicity to daphnia and other aquatic invertebrates
Diammonium peroxodisulphate	= 323 mg/L LC50 <i>Poecilia reticulata</i> 96 h = 76.3 mg/L LC50 <i>Oncorhynchus mykiss</i> 96 h = 103 mg/L LC50 <i>Lepomis macrochirus</i> 96 h	No information available	= 120 mg/L EC50 <i>Daphnia magna</i> 48 h
Aliphatic co-polymer	No information available	No information available	No information available

12.2 Persistence and degradability

No product level data available.

12.3 Bioaccumulative potential

No product level data available.

12.4 Mobility

No information available.

12.5 Results of PBT and vPvB assessment

This preparation contains no substance considered to be persistent, bioaccumulating nor toxic (PBT)

This preparation contains no substance considered to be very persistent nor very bioaccumulating (vPvB)

12.6 Other adverse effects.

None known.

13. Disposal Considerations

13.1 Waste treatment methods

Disposal Method	Disposal should be made in accordance with federal, state and local regulations.
Waste from residues/unused products	Dispose of as special waste in compliance with local and national regulations.
Contaminated packaging	Do not re-use empty containers. Dispose of contents/container to an approved waste disposal plant.

14. Transport information**14.1. UN number**

UN No. (DOT)	UN1444
UN No. (MT/ANTT)	UN1444
UN No. (TDG)	UN1444
UN/ID No. (ADR/RID/ADN/ADG)	UN1444
UN No. (IMDG/ANTAQ)	UN1444
UN No. (ICAO/ANAC)	UN1444
UN No. (DPC)	UN1444

14.2. UN proper shipping name

AMMONIUM PERSULFATE,

14.3 Hazard class(es)

DOT Hazard class	5.1
ANTT Hazard class	5.1
TDG Hazard class	5.1
ADR/RID/ADN/ADG Hazard class	5.1
IMDG/ANTAQ Hazard class	5.1
ICAO/ANAC Hazard class/division	5.1
DPC Hazard class	5.1

14.4 Packing group

DOT Packing group	III
ANTT Packing group	III
TDG Packing group	III
ADR/RID/ADN/ADG Packing group	III
IMDG/ANTAQ Packing group	III
ICAO/ANAC Packing group	III
DPC Packing group	III

**14.5 Environmental hazard**

Marine pollutant No

14.6 Special precautions

Not applicable

14.7 Transport in bulk according to Annex I/II of MARPOL 73/78 and the IBC Code

Please contact SDS@slb.com for info regarding transport in Bulk.

15. Regulatory Information

International inventories

USA (TSCA)	Complies
Canada (DSL)	Complies
Philippines (PICCS)	Complies
Japan (ENCS)	Complies
China (IECSC)	Complies
Australia (AICS)	Complies
Korean (KECL)	Complies
New Zealand (NZIoC)	Complies

Europe - REACH

All products supplied from the European Economic Area (EEA) are compliant with the REACH Regulation EC 1907/2006. For products supplied from the EEA, Schlumberger and/or its suppliers have pre-registered and is registering all of the substances that it and/or its suppliers manufactures in or imports into the EEA that are subject to Title II of the REACH Regulation. All products supplied from outside the EEA are subject to REACH only if imported into the EEA. The importer of the products must comply with REACH for each imported substance. Contact REACH@slb.com for REACH information.

IMPORTS, Canada

No import volume restrictions.

U.S. Federal and State Regulations

SARA 311/312 Hazard Categories

Should this product meet EPCRA 311/312 Tier reporting criteria at 40 CFR 370, refer to Section 2 of this SDS for appropriate classifications. Under the amended regulations at 40 CFR 370, EPCRA 311/312 Tier II reporting for the 2017 calendar year will need to be consistent with updated hazard classifications.

Chemical Name	SARA 302 / TPQs	SARA 313	CERCLA RQ
Diammonium peroxodisulphate	N/A	N/A	N/A
Aliphatic co-polymer	N/A	N/A	N/A

California Proposition 65

This product does not contain chemical[s] which is [are] known to the State of California to cause cancer, birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov

Canadian Classification

This Safety Data Sheet has been prepared in compliance with the Hazardous Products Regulations.

16. Other Information

Supersedes date	29/Mar/2017
Revision date	05/Jun/2020

Version 6**This SDS has been revised in the following section(s)** All sections. Prepared in accordance with OSHA HAZCOM 2012. Prepared in accordance with WHMIS 2015**HMIS classification**

Health	2
Flammability	1
Physical hazard	1
PPE	X

Disclaimer

The information contained herein is considered in good faith as reliable of the date issued and is based upon on measurements, tests or data derived from supplier's own study or furnished by others. In providing this SDS information, Supplier makes no express or implied warranties as to the information or product; merchantability or fitness of purpose; any express or implied warranty; or non-infringement of intellectual property rights; and supplier assumes no responsibility for any direct, special or consequential damages, results obtained, or the activities of others. To the maximum extent permitted by law, supplier's warranty obligations and buyer's sole remedies are as stated in separate agreement between the parties.

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Safety Data Sheet Borate Crosslinker J532

1. Identification

1.1 Product identifier

Product name Borate Crosslinker J532
Product code J532

1.2 Relevant identified uses of the substance or mixture and uses advised against

Recommended Use Crosslinker in oilfield applications.
Uses advised against Consumer use

1.3 Details of the supplier of the safety data sheet

Supplier
Schlumberger Technology Corporation
110 Schlumberger Drive
Sugar Land, Texas 77478, USA
Telephone: 1-281-285-7873

Schlumberger Canada, Ltd.
200, 125 - 9th Avenue SE
Calgary, Alberta T2G 0P6, Canada
E-mail address SDS@slb.com

Prepared by
Global Regulatory Compliance - Chemicals (GRC - Chemicals)

1.4 Emergency Telephone Number

Emergency telephone (24 Hour) Australia +61 2801 44558, Asia Pacific +65 3158 1074, China +86 10 5100 3039, Europe +44 (0) 1235 239 670, Middle East and Africa +44 (0) 1235 239 671, New Zealand +64 9929 1483, USA 001 281 595 3518

2. Hazards identification

2.1 Classification of the substance or mixture

GHS - Classification

Health hazards

Reproductive toxicity	Category 1B
-----------------------	-------------

Environmental hazards Not classified

Physical Hazards Not classified

2.2 Label elements



Signal word
DANGER

Hazard statements

H360 - May damage fertility or the unborn child
H360FD - May damage fertility. May damage the unborn child

Precautionary statements

P201 - Obtain special instructions before use
P202 - Do not handle until all safety precautions have been read and understood
P281 - Use personal protective equipment as required
P308 + P313 - IF exposed or concerned: Get medical advice/ attention

Supplementary precautionary statements

P202 - Do not handle until all safety precautions have been read and understood
P501 - Dispose of contents/ container to an approved waste disposal plant

Hazards not otherwise classified

None Known

Unknown acute toxicity

0% of the mixture consists of ingredient(s) of unknown toxicity.

3. Composition/information on Ingredients

3.1 Substances

Not Applicable

3.2 Mixtures

Component	CAS-No	Weight % - range
Sodium tetraborate decahydrate	1303-96-4	10 - 30

Comments

The exact percentage (concentration) of composition has been withheld as a trade secret

4. First aid measures

4.1 First-Aid Measures

Inhalation

If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.

Ingestion

Rinse mouth. Never give anything by mouth to an unconscious person. Do not induce vomiting without medical advice. Get medical attention.

Skin contact	Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. Get medical attention if irritation persists. Wash contaminated clothing before re-use.
Eye contact	Rinse immediately with plenty of water, also under the eyelids. Get medical attention if irritation persists.

4.2 Most important symptoms and effects, both acute and delayed

Main symptoms

Inhalation	Please see Section 11. Toxicological Information for further information.
Ingestion	Please see Section 11. Toxicological Information for further information.
Skin contact	Please see Section 11. Toxicological Information for further information.
Eye contact	Please see Section 11. Toxicological Information for further information.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician	Treat symptomatically
---------------------------	-----------------------

5. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media

Use extinguishing media appropriate for surrounding material.

Extinguishing media which shall not be used for safety reasons

None known.

5.2 Special hazards arising from the substance or mixture

Unusual fire and explosion hazards

None known.

Hazardous combustion products

Carbon oxides (COx).

5.3 Advice for firefighters

Special protective equipment for fire-fighters

As in any fire, wear self-contained breathing apparatus and full protective gear.

Special Fire-Fighting Procedures

Cool fire-exposed containers using water spray.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment identified in Section 8. If spilled, take caution, as material can cause surfaces to become very slippery.

6.2 Environmental precautions

Prevent further leakage or spillage.

Environmental exposure controls

No information available.

6.3 Methods and materials for containment and cleaning up**Methods for cleaning up**

Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal. After cleaning, flush away traces with water.

6.4 Reference to other sections

No information available.

7. Handling and storage**7.1 Precautions for safe handling****Handling**

Avoid contact with skin and eyes. Avoid breathing vapors or mists. Wash thoroughly after handling.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures/precautions Ensure adequate ventilation.

Storage precautions Keep containers tightly closed in a dry, cool and well-ventilated place. Incompatible with oxidizing agents.

8. Exposure controls/personal protection**8.1 Control parameters**

Component Information

Component	ACGIH TLV	OSHA PEL
Sodium tetraborate decahydrate	2 mg/m ³	Not Determined

8.2 Exposure controls

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazard present and the risk of exposure to those hazards. The PPE recommendations below are based on an assessment of the chemical hazards associated with this product. Where this product is used in a mixture with other products or fluids, additional hazards may be created and as such further assessment of risk may be required. The risk of exposure and need of respiratory protection will vary from workplace to workplace and should be assessed by the user in each situation.

Engineering measures to reduce exposure

Ensure adequate ventilation.

Personal protective equipment**Eye protection**

It is good practice to wear goggles when handling any chemical.

Hand protection

Rubber gloves.

Respiratory protection

All respiratory protection equipment should be used within a comprehensive respiratory protection program that meets the requirements of 29 CFR 1910.134 (U.S. OSHA Respiratory Protection Standard) or local equivalent.

If exposed to airborne mist/aerosol of this product, use at least a NIOSH-approved N95 half-mask disposable or re-usable particulate respirator. In work environments containing oil mist/aerosol, use at least a NIOSH-approved P95 half-mask disposable or re-usable particulate respirator. If exposed to vapors from this product use a NIOSH/MSHA-approved respirator with an Organic Vapor cartridge.

Skin and body protection

Clean, body-covering clothing, Eye wash and emergency shower must be available at the work place.

Hygiene measures

Keep airborne concentrations below exposure limits, Wash hands before breaks and immediately after handling the product, Remove and wash contaminated clothing before re-use.

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	Liquid
Appearance	Transparent
Color	Colorless
Odor	Odorless
Odor threshold	Not applicable

<u>Property</u>	<u>Values</u>	<u>Remarks</u>
pH	7 - 8	
pH @ dilution		
Melting/freezing point	-9 °C / 15 °F	
Boiling point/range	> 100 °C / 212 °F	
Flash point	> 100 °C / > 212 °F	
Evaporation rate (BuAc =1)	No information available	
Flammability (solid, gas)	Not Applicable	
Flammability Limits in Air		
Upper flammability limit	No information available	
Lower flammability limit	No information available	
Vapor pressure	No information available	
Vapor density	No information available	
Specific gravity	1.1 @25°C	
Bulk density	No information available	
Water solubility	Soluble	
Solubility in other solvents	No information available	
Autoignition temperature	No information available	
Decomposition temperature	No information available	
Kinematic viscosity	No information available	
Dynamic viscosity	No information available	
Log Pow	No information available	
Explosive properties	No information available	
Oxidizing properties	No information available	

9.2 Other information

Pour point	No information available
Molecular weight	No information available
VOC content(%)	No information available
Density	No information available

10. Stability and reactivity

10.1 Reactivity

No specific reactivity hazards associated with this product.

10.2 Chemical stability

Stable under normal temperature conditions and recommended use.

10.3 Possibility of Hazardous Reactions

Hazardous polymerization

Hazardous polymerization does not occur.

10.4 Conditions to avoid

Avoid extreme temperatures.

10.5 Incompatible materials

Strong oxidizing agents. Acids.

10.6 Hazardous decomposition products

Carbon oxides (CO_x).

11. Toxicological information

11.1 Information on toxicological effects**Acute toxicity**

Inhalation	Inhalation of vapors in high concentration may cause irritation of respiratory system.
Eye contact	May cause slight irritation.
Skin contact	Substance may cause slight skin irritation.
Ingestion	Swallowing large amounts may be harmful.

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Sodium tetraborate decahydrate	= 2660 mg/kg (Rat)	No data available	No data available

Component	IARC Group 1 or 2	ACGIH - Carcinogens	OSHA listed carcinogens	NTP
Sodium tetraborate decahydrate	No data available	A4 Not Classifiable as a Human Carcinogen	No data available	No data available

Sensitization	This product does not contain any components suspected to be sensitizing.
Mutagenic effects	No evidence of mutagenic properties.
Carcinogenicity	No evidence of carcinogenic properties.
Reproductive toxicity	May impair fertility.
Developmental toxicity	May be a developmental hazard based on animal data.
Routes of exposure	Skin contact. Inhalation. Eye contact.
Routes of entry	None known.
Specific target organ toxicity (single exposure)	Not classified
Specific target organ toxicity (repeated exposure)	Not classified.
Aspiration hazard	Not Applicable.

12. Ecological information

12.1 Toxicity

Toxicity to algae

See component information below.

Toxicity to fish

See component information below.

Toxicity to daphnia and other aquatic invertebrates

See component information below.

Component	Toxicity to fish	Toxicity to algae	Toxicity to daphnia and other aquatic invertebrates
Sodium tetraborate decahydrate 1303-96-4 (10 - 30)	340 mg/L LC50 (Limanda limanda) = 96 h	2.6 - 21.8 mg/L EC50 (Pseudokirchneriella subcapitata) = 96 h 158 mg/L EC50 (Desmodesmus subspicatus) = 96 h	1085 - 1402 mg/L LC50 (Daphnia magna) = 48 h

12.2 Persistence and degradability

No product level data available.

12.3 Bioaccumulative potential

No product level data available.

12.4 Mobility in soil

No information available.

12.5 Results of PBT and vPvB assessment

This substance is not considered to be persistent, bioaccumulating or toxic (PBT)

12.6 Other adverse effects.

None known.

13. Disposal considerations**13.1 Waste treatment methods****Disposal Method** Disposal should be made in accordance with federal, state and local regulations.**Contaminated packaging** Empty containers should be taken for local recycling, recovery or waste disposal.**14. Transport information****14.1 UN Number**

UN No. (DOT)	Not regulated
UN No. (TDG)	Not regulated
UN/ID No. (ADR/RID/ADN/ADG)	Not regulated
UN No. (IMDG)	Not regulated
UN No. (ICAO)	Not regulated

14.2 Proper shipping name

The product is not covered by international regulation on the transport of dangerous goods

14.3 Hazard class(es)

DOT Hazard class	Not regulated
TDG Hazard class	Not regulated
ADR/RID/ADN/ADG Hazard class	Not regulated
IMDG Hazard class	Not regulated
ICAO Hazard class/division	Not regulated

14.4 Packing group

DOT Packing group	Not regulated
TDG Packing group	Not regulated
ADR/RID/ADN/ADG Packing group	Not regulated
IMDG Packing group	Not regulated
ICAO Packing group	Not regulated

14.5 Environmental hazard

No

14.6 Special precautions

Not Applicable

15. Regulatory information

International inventories

USA (TSCA)	Complies
Canada (DSL)	Complies
Mexico (INSQ)	Complies
European Union (EINECS and ELINCS)	Does not Comply
Philippines (PICCS)	Complies
Japan (ENCS)	Complies
China (IECSC)	Complies
Australia (AICS)	Complies
Korean (KECL)	Complies
New Zealand (NZIoC)	Complies

U.S. Federal and State Regulations**SARA 311/312 Hazard Categories**

Delayed (chronic) health hazard.

Component	SARA 302 / TPQs	SARA 313	CERCLA RQ
Sodium tetraborate decahydrate	N/A	N/A	N/A

State Comments

Proposition 65: This product is not known to contain chemicals considered by the State of California's Safe Drinking Water and Toxic Enforcement Act of 1986 as causing cancer and/or reproductive toxicity at levels that are expected to pose a significant risk under anticipated use conditions.

Canadian Classification

This Safety Data Sheet has been prepared in compliance with the Hazardous Products Regulations.

16. Other information

Supersedes date	11/Apr/2010
Revision date	17/Jun/2015
Version	5
The following sections have been revised	SDS fully updated in the new database. Updated according to GHS/CLP.
HMIS classification	
Health	1 *
Flammability	1
Physical hazard	0
PPE	B
Comments	This new SDS format also replaces Canadian SDS Revision date: 23 October 2012, Version: 4

N/A - Not Applicable, N/D - Not Determined.

Disclaimer

The information contained herein is considered in good faith as reliable of the date issued and is based upon on measurements, tests or data derived from supplier's own study or furnished by others. In providing this SDS information, Supplier makes no express or implied warranties as to the information or product; merchantability or fitness of purpose; any express or implied warranty; or non-infringement of intellectual property rights; and supplier assumes no responsibility for any direct, special or consequential damages, results obtained, or the activities of others. To the maximum extent permitted by law, supplier's warranty obligations and buyer's sole remedies are as stated in separate agreement between the parties.



Safety Data Sheet J564 Environmental Guar Slurry

1. Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Product name J564 Environmental Guar Slurry
Product code J564

1.2 Relevant identified uses of the substance or mixture and uses advised against

Recommended Use Used as a gelling agent in oilfield applications

Uses advised against Consumer use

1.3 Details of the supplier of the safety data sheet

Supplier

Schlumberger Oilfield UK LTD
Minerva, Manor Royal London Road
Crawley
RH10 9BU
United Kingdom

+44 1293 556655

SDS@slb.com

1.4 Emergency Telephone Number

Emergency telephone (24 Hour) Australia +61 2801 44558, Asia Pacific +65 3158 1074, China +86 10 5100 3039, Europe +44 (0) 1235 239 670, Middle East and Africa +44 (0) 1235 239 671, New Zealand +64 9929 1483, USA 001 281 595 3518, Canada 001 613 996 6666

National Poison Center Numbers

Netherlands	NVIC: +31 (0)88 755 8000 : Only for the purpose of informing medical personnel in case of acute intoxications
Norway	Poison information centre: +47 22 59 13 00

2. Hazards Identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008

Health hazards

Acute toxicity - Oral	Category 4
Acute toxicity - Dermal	Category 4
Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 2

Environmental hazards Not classified

Physical Hazards Not classified

2.2 Label elements



Signal word

WARNING

Hazard Statements

H302 - Harmful if swallowed
H315 - Causes skin irritation
H319 - Causes serious eye irritation
H332 - Harmful if inhaled

Precautionary Statements

P261 - Avoid breathing dust/fume/gas/mist/vapors/spray
P280 - Wear protective gloves, protective clothing, eye protection
P302 + P352 - IF ON SKIN: Wash with plenty of soap and water
P304 + P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P501 - Dispose of contents/container in accordance with local, regional, national, and international regulations as applicable

Supplementary precautionary statements

P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking
P264 - Wash face, hands and any exposed skin thoroughly after handling
P270 - Do not eat, drink or smoke when using this product
P271 - Use only outdoors or in a well-ventilated area
P301 + P312 - IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell
P330 - Rinse mouth
P332 + P313 - If skin irritation occurs: Get medical attention
P337 + P313 - If eye irritation persists: Get medical advice/attention
P362 + P364 - Take off contaminated clothing and wash it before reuse
P370 + P378 - In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish

Contains

2-butoxyethanol

2.3 Other hazards

Not classified as PBT/vPvB by current EU criteria
Combustible liquid

3. Composition/information on Ingredients

3.1 Substances

Not applicable

3.2 Mixtures

Chemical Name	EC No	CAS No	Weight-%	Component information
2-butoxyethanol	203-905-0	111-76-2	60-100	Acute Tox. 4 (H302) Acute Tox. 3 (H331) Skin Irrit. 2 (H315) Eye Irrit. 2 (H319) Flam Liq. 4 (H227)

Comments

The product contains other ingredients which do not contribute to the overall classification.

4. First Aid Measures**4.1 First aid measures**

Inhalation	If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.
Ingestion	Rinse mouth. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Get medical attention if symptoms occur.
Skin contact	Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Seek medical attention if irritation occurs.
Eye Contact	Promptly wash eyes with lots of water while lifting eye lids. Remove contact lenses, if worn. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

4.2. Most important symptoms and effects, both acute and delayed

General advice The severity of the symptoms described will vary dependant of the concentration and the length of exposure. If adverse symptoms develop, the casualty should be transferred to hospital as soon as possible.

Symptoms

Inhalation	Please see Section 11. Toxicological Information for further information.
Ingestion	Please see Section 11. Toxicological Information for further information.
Skin contact	Please see Section 11. Toxicological Information for further information.
Eye contact	Please see Section 11. Toxicological Information for further information.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician Treat symptomatically.

5. Fire-Fighting Measures

5.1 Extinguishing media

Suitable extinguishing media

P378 - Use dry sand, dry chemical or alcohol-resistant foam for extinction.

Extinguishing media which must not be used for safety reasons

None known.

5.2. Special hazards arising from the substance or mixture

Unusual fire and explosion hazards

combustible liquid. Vapors are heavier than air and may spread along floors. Vapors may travel to source of ignition and flash back. Heating of containers may cause pressure rise, with risk of bursting.

Hazardous combustion products

Fire or high temperatures create: Carbon oxides (COx).

5.3 Advice for firefighters

Special protective equipment for fire-fighters

As in any fire, wear self-contained breathing apparatus and full protective gear.

Special Fire-Fighting Procedures

Containers close to fire should be removed immediately or cooled with water.

6. Accidental Release Measures

6.1. Personal precautions, protective equipment and emergency procedures

Extinguish all ignition sources. Avoid sparks, flames, heat and smoking. Use personal protection equipment. See also section 8.

6.2 Environmental precautions

The product should not be allowed to enter drains, water courses or the soil.

Environmental exposure controls

Avoid release to the environment. Local authorities should be advised if significant spillages cannot be contained.

6.3 Methods and material for containment and cleaning up

Methods for containment

Prevent further leakage or spillage if safe to do so. Dike far ahead of liquid spill for later disposal.

Methods for cleaning up

Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal. Take precautionary measures against static discharges. After cleaning, flush away traces with water.

6.4 Reference to other sections

See section 13 for more information.

7. Handling and Storage

7.1 Precautions for safe handling

Handling

Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes and clothing. Do not breathe vapors or spray mist. Avoid spills and splashing during use.

Hygiene Measures

Use good work and personal hygiene practices to avoid exposure. When using do not smoke, eat or drink. Wash hands and face before breaks and immediately after handling the product Remove contaminated clothing

7.2 Conditions for safe storage, including any incompatibilities

Technical measures/precautions Ensure adequate ventilation. Keep airborne concentrations below exposure limits. Take precautionary measures against static discharges.

Storage precautions Keep containers tightly closed in a dry, cool and well-ventilated place Keep away from open flames, hot surfaces and sources of ignition Keep away from direct sunlight. Avoid contact with: Oxidizing agents Strong bases

Storage class Chemical storage.

Packaging materials Use specially constructed containers only.

7.3 Specific end uses

See Section 1.2.

8. Exposure Controls/Personal Protection

8.1 Control parameters

Component Information

Chemical Name 2-butoxyethanol	EU OEL 50 ppm STEL 246 mg/m ³ STEL 20 ppm TWA 98 mg/m ³ TWA Possibility of significant uptake through the skin*1)	Austria 40 ppm STEL 200 mg/m ³ STEL 20 ppm TWA 98 mg/m ³ TWA	Denmark 20 ppm 98 mg/m ³
Chemical Name 2-butoxyethanol	France 50ppmSTEL 246mg/m ³ STEL 10 ppmTWA 49 mg/m ³ TWA	Germany 10 ppm TWA 49 mg/m ³ TWA	Hungary 20ppmTWA 98mg/m ³ TWA 50ppmSTEL 246mg/m ³ STEL
Chemical Name 2-butoxyethanol	Italy 20 ppm TWA 97 mg/m ³ TWA 50 ppm STEL 246 mg/m ³ STEL 98 mg/m ³ TWA skin - potential for cutaneous absorption	Netherlands 100 mg/m ³ TWA	Norway 10 ppm TWA 50 mg/m ³ TWA 20 ppm STEL 75 mg/m ³ STEL Skin
Chemical Name 2-butoxyethanol	Poland 200 mg/m ³ STEL NDSch 98 mg/m ³ TWA NDS	Portugal Skin 50 ppm STEL VLE-CD 246 mg/m ³ STEL VLE-CD 20 ppm TWA indicative limit value 98 mg/m ³ TWA indicative limit value	Romania 50ppmSTEL 246mg/m ³ STEL 20ppmTWA 98mg/m ³ TWA
Chemical Name 2-butoxyethanol	Spain 50 ppm STEL 245 mg/m ³ STEL Skin*2) 20 ppm TWA VLA-ED 98 mg/m ³ TWA VLA-ED	Switzerland 20 ppm STEL 98 mg/m ³ STEL Skin*2) 10 ppm TWA MAK 49 mg/m ³ TWA MAK	UK 50 ppm STEL 246 mg/m ³ STEL Skin*2) 25 ppm TWA 123 mg/m ³ TWA

**Europe - REACH
Derived No Effect Level (DNEL)****Short term exposure local effects**

2-butoxyethanol
Inhalation 246 mg/m³

Short term exposure systemic effects

2-butoxyethanol
Dermal 89 mg/kg
Inhalation 1091 mg/m³

Long term exposure systemic effects

2-butoxyethanol
Dermal 125 mg/kg
Inhalation 98 mg/m³

Predicted No Effect Concentration (PNEC)

2-butoxyethanol
Fresh Water 8.8 mg/l
Sea Water 0.88 mg/l
Freshwater sediment 34.6 mg/kg
Sea sediment 3.46 mg/kg
Soil 2.33 mg/kg
Impact on sewage treatment 463 mg/l
Intermittent release 26.4 mg/l

8.2 Exposure controls

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazard present and the risk of exposure to those hazards. The PPE recommendations below are based on an assessment of the chemical hazards associated with this product. Where this product is used in a mixture with other products or fluids, additional hazards may be created and as such further assessment of risk may be required. The risk of exposure and need of respiratory protection will vary from workplace to workplace and should be assessed by the user in each situation.

Engineering Controls

Ensure adequate ventilation, especially in confined areas. Keep airborne concentrations below exposure limits.

Personal protective equipment

Eye protection Use eye protection according to EN 166, designed to protect against liquid splashes. Tightly fitting safety goggles. Safety glasses with side-shields.

Hand protection Wear chemically resistant gloves (tested to EN 374) in combination with 'basic' employee training
Impervious gloves made of: Nitrile Butyl rubber Neoprene
Break through time >480 minutes
Glove thickness 0.4 mm
Be aware that liquid may penetrate the gloves. Frequent change is advisable.

Respiratory protection No personal respiratory protective equipment normally required, In case of insufficient ventilation wear suitable respiratory equipment, Respirator with combination filter for vapour/particulate (EN 141), Type A/P2, At work in confined or poorly ventilated spaces, respiratory protection with air supply must be used, At work in confined or poorly ventilated spaces, respiratory protection with air supply must be used.

Skin and body protection Wear suitable protective clothing, Eye wash and emergency shower must be available at the work place.

Hygiene Measures

Wash hands before breaks and immediately after handling the product, Remove and wash contaminated clothing before re-use.



8.2.3 Environmental exposure controls

Environmental exposure Use appropriate containment to avoid environmental contamination See section 6 for more information

9. Physical and Chemical Properties**9.1 Information on basic physical and chemical properties**

Physical state	Liquid
Appearance	Slurry
Odor	Ether-like
Color	Tan

<u>Property</u>	<u>Values</u>	<u>Remarks</u>
pH	No information available	
pH @ dilution	No information available	
Melting point	No information available	
Boiling point/range	No information available	
Flash point	~ 66 °C / ~ 150.8 °F	PMCC
Evaporation rate (BuAc =1)	No information available	
Flammability	Not applicable	
Explosion limits:		
Upper explosion limit	No information available	
Lower explosion limit	No information available	
Vapor pressure	0.1 kPa	@ 25 °C
Relative Vapor Density	No information available	
Specific gravity	1.06	@ 20 °C
Bulk density	No information available	
Water solubility	Miscible with water.	
Solubility in other solvents	No information available	
Autoignition temperature	No information available	
Decomposition temperature	> 242°C / 467.8°F	
Kinematic viscosity	No information available	
Dynamic viscosity	No information available	
Partition Coefficient (n-octanol/water)	No information available	
Density and/or Relative Density	No information available	
Explosive properties	Vapours may form explosive mixtures with air	
Oxidizing properties	No information available	

9.2 Other information

Pour point	No information available
Molecular weight	No information available
VOC content(%)	No information available

Comments

The data listed above are typical physical and chemical properties and should not be construed as product specification.

10. Stability and Reactivity**10.1 Reactivity**

Combustible liquid.

10.2 Chemical stability

Stable under normal temperature conditions and recommended use.

10.3 Possibility of Hazardous Reactions**Hazardous polymerization**

Hazardous polymerization does not occur.

10.4 Conditions to avoid

Keep away from open flames, hot surfaces and sources of ignition. Keep away from direct sunlight. Take precautionary measures against static charges.

10.5 Incompatible materials

Oxidizing agents. Strong bases.

10.6 Hazardous decomposition products

See Section 5.2.

11. Toxicological Information

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008**Acute toxicity****Inhalation**

Harmful by inhalation. Symptoms of overexposure are dizziness, headache, tiredness, nausea, unconsciousness, cessation of breathing.

Eye contact

Causes serious eye irritation.

Skin contact

Causes skin irritation. Components of the product may be absorbed into the body through the skin.

Ingestion

Harmful if swallowed.

Unknown acute toxicity

Not applicable.

Toxicology data for the components

Chemical Name	LD50 Oral	LD50 Dermal	LC50 Inhalation
2-butoxyethanol	1200 mg/kg (Guinea pigs)	> 2000 mg/kg (Rat)	400 ppm (Rabbit)

Sensitization

This product does not contain any components suspected to be sensitizing.

Mutagenic effects

This product does not contain any known or suspected mutagens.

Carcinogenicity

This product does not contain any known or suspected carcinogens.

Reproductive toxicity

This product does not contain any known or suspected reproductive hazards.

Routes of Exposure

Inhalation. Ingestion. Skin contact. Eye contact.

Routes of entry

Inhalation. Ingestion. Skin absorption. Eye contact.

**Specific target organ toxicity -
Single exposure**

Not classified

**Specific target organ toxicity -
Repeated exposure**

Not classified.

Aspiration hazard Not applicable.

11.2 Information on other hazards

Endocrine disrupting properties This product does not contain any known or suspected endocrine disruptors.

Other information Key literature references and sources for data. See Section 16 for more information.

12. Ecological Information

12.1 Toxicity

The product component(s) are not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Toxicity to algae

See component information below.

Toxicity to fish

See component information below.

Toxicity to daphnia and other aquatic invertebrates

See component information below.

Toxicology data for the components

Chemical Name	Toxicity to fish	Toxicity to algae	Toxicity to daphnia and other aquatic invertebrates
2-butoxyethanol	= 1490 mg/L LC50 Lepomis macrochirus 96 h = 2950 mg/L LC50 Lepomis macrochirus 96 h	No information available	= 1698 - 1940 mg/L LC50 Daphnia magna = 1720 mg/L EC50 water flea

12.2 Persistence and degradability

See component information below.

Chemical Name	Persistence and degradability
2-butoxyethanol	Readily biodegradable

12.3 Bioaccumulative potential

See component information below.

Chemical Name	Bioaccumulation
2-butoxyethanol	Not likely to bioaccumulate

12.4 Mobility

Mobility

The product is miscible with water. May spread in water systems. See component information below.

Chemical Name	Mobility
2-butoxyethanol	Soluble in water

Mobility in soil

See component information below.

Chemical Name	Mobility in soil
2-butoxyethanol	No information available

12.5 Results of PBT and vPvB assessment

Not classified as PBT/vPvB by current EU criteria.

12.6 Endocrine disrupting properties.

This product does not contain any known or suspected endocrine disruptors

12.7 Other adverse effects

None known.

12.8 Additional information

Key literature references and sources for data. See Section 16 for more information.

13. Disposal Considerations

13.1 Waste treatment methods

Waste from residues/unused products	Dispose of in accordance with local regulations.
Contaminated packaging	Do not burn, or use a cutting torch on, the empty drum. Empty containers may contain flammable or explosive vapors. Empty containers should be taken for local recycling, recovery or waste disposal.
EWC Waste Disposal No	According to the European Waste Catalog, Waste Codes are not product specific, but application specific Waste codes should be assigned by the user based on the application for which the product was used The following Waste Codes are only suggestions: EWC Waste Disposal No 07 01 04

14. Transport information

14.1. UN number

Not regulated

14.2. UN proper shipping name

The product is not covered by international regulation on the transport of dangerous goods

14.3 Hazard class(es)

ADR/RID/ADN/ADG Hazard class	Not regulated
IMDG/ANTAQ Hazard class	Not regulated
ICAO/ANAC Hazard class/division	Not regulated

14.4 Packing group

ADR/RID/ADN/ADG Packing group	Not regulated
IMDG/ANTAQ Packing group	Not regulated
ICAO/ANAC Packing group	Not regulated

14.5 Environmental hazard

No

14.6 Special precautions

Not applicable

14.7 Maritime transport in bulk according to IMO instruments

Please contact SDS@slb.com for info regarding transport in Bulk.

15. Regulatory Information**15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**

This safety data sheet complies with the requirements of:
Regulation (EC) No. 1907/2006 and Regulation (EC) No. 1272/2008
Commission Regulation (EU) No 2020/878 of 18 June 2020
Registration, Evaluation, Authorization and Restriction of Chemicals (REACH)

Dangerous substance category per Seveso Directive (2012/18/EU)

This product does not contain substances listed under Dangerous substance category per Seveso Directive (2012/18/EU)

Netherlands**Dutch Mining Regulations: In accordance with Mining Regulations 9.2 and Chapter 4 of the Working Conditions Decree.****International inventories**

USA (TSCA)	Complies
Canada (DSL)	Complies
Philippines (PICCS)	Complies
Japan (ENCS)	Does not comply
China (IECSC)	Complies
Australia (AICS)	Complies
Korean (KECL)	Complies
New Zealand (NZIoC)	Complies

Europe - REACH

All products supplied from the European Economic Area (EEA) are compliant with the REACH Regulation EC 1907/2006. For products supplied from the EEA, Schlumberger and/or its suppliers have pre-registered and is registering all of the substances that it and/or its suppliers manufactures in or imports into the EEA that are subject to Title II of the REACH Regulation. All products supplied from outside the EEA are subject to REACH only if imported into the EEA. The importer of the products must comply with REACH for each imported substance. Contact REACH@slb.com for REACH information.

Norway Pr. no. 53227

15.2 Chemical Safety Report

No information available

16. Other Information

Prepared by	Global Regulatory Compliance - Chemicals (GRC - Chemicals) , Sandra McWilliam
Supersedes Date:	18/Feb/2019
Revision date	07/Jun/2023
Version	3

This SDS has been revised in the following section(s) All sections. There have been changes with regard to classification.

Key literature references and sources for data

www.ChemADVISOR.com

Supplier

National Chemical Inventories

National regulatory information

National occupational exposure limits

Training Advice

Do not handle until all safety precautions have been read and understood

Follow general hygiene considerations recognized as common good workplace practices

HMIS classification

Health	2
Flammability	2
Physical hazard	0
PPE	X

Full text of H-Statements referred to under sections 2 and 3

H302 - Harmful if swallowed

H315 - Causes skin irritation

H319 - Causes serious eye irritation

H332 - Harmful if inhaled

Disclaimer

The information contained herein is considered in good faith as reliable of the date issued and is based upon on measurements, tests or data derived from supplier's own study or furnished by others. In providing this SDS information, Supplier makes no express or implied warranties as to the information or product; merchantability or fitness of purpose; any express or implied warranty; or non-infringement of intellectual property rights; and supplier assumes no responsibility for any direct, special or consequential damages, results obtained, or the activities of others. To the maximum extent permitted by law, supplier's warranty obligations and buyer's sole remedies are as stated in separate agreement between the parties.

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SDS no. L065
Version 10
Revision date 30/Mar/2022
Supersedes date 17/Jan/2018



Safety Data Sheet Scale Inhibitor L065

1. Identification

1.1 Product identifier

Product name Scale Inhibitor L065
Product code L065

1.2 Relevant identified uses of the substance or mixture and uses advised against

Recommended Use Scale Inhibitor. Used as a fracturing additive in oilfield applications.
Uses advised against Consumer use

1.3 Details of the supplier of the safety data sheet

Supplier

Schlumberger Technology Corporation
110 Schlumberger Drive
Sugar Land, Texas 77478, USA
Telephone: 1-281-285-7873

Schlumberger Canada, Ltd.
200, 125 - 9th Avenue SE
Calgary, Alberta T2G 0P6, Canada

Schlumberger Serviços de Petróleo LTDA
Rua Internacional 500Cavaleiro – Macaé, RJ. CEP: 27.930-075
Telefone: +55 22 3311-8974

E-mail address SDS@slb.com

Prepared by

Global Regulatory Compliance - Chemicals (GRC - Chemicals) , Sandra McWilliam

1.4 Emergency Telephone Number

Emergency telephone (24 Hour) Asia Pacific +65 3158 1074, Europe +44 (0) 1235 239 670, Middle East and Africa +44 (0) 1235 239 671, USA +1 281 595 3518, Canada +1 800 579 7421 , Argentina: +54 11 5984 3690, Brazil : +55 11 3197 5891

2. Hazards Identification

2.1 Classification of the substance or mixture

GHS - Classification

Health hazards

Acute toxicity - Oral	Category 4
-----------------------	------------

Specific target organ toxicity - Repeated exposure	Category 2
--	------------

Environmental hazards Not classified

Physical Hazards Not classified

2.2 Label elements



Signal word

WARNING

Hazard Statements

H302 - Harmful if swallowed

H373 - May cause damage to organs through prolonged or repeated exposure

Precautionary Statements

P260 - Do not breathe dust, fume, gas, mist, vapors, spray

P264 - Wash face, hands and any exposed skin thoroughly after handling

P301 + P312 - IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell

P314 - Get medical attention if you feel unwell

P330 - Rinse mouth

P501 - Dispose of contents/container in accordance with local, regional, national, and international regulations as applicable

Supplementary precautionary statements

P270 - Do not eat, drink or smoke when using this product

Hazards not otherwise classified

None known

Unknown acute toxicity Not applicable.

3. Composition/information on Ingredients

3.1 Substances

Not applicable

3.2 Mixtures

Chemical Name	CAS No	Weight-%
Ethylene Glycol	107-21-1	10 - 30
Sodium chloride	7647-14-5	1 - 5
Calcium chloride	10043-52-4	1 - 5

Comments

The exact percentage (concentration) of composition has been withheld as a trade secret.

4. First Aid Measures

4.1 First aid measures

Inhalation	If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.
Ingestion	Rinse mouth. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Get medical attention if symptoms occur.
Skin contact	Wash skin thoroughly with soap and water. Get medical attention if irritation persists.
Eye Contact	Promptly wash eyes with lots of water while lifting eye lids. Remove contact lenses, if worn. Get medical attention if any discomfort continues.

4.2. Most important symptoms and effects, both acute and delayed

General advice The severity of the symptoms described will vary dependant of the concentration and the length of exposure. If adverse symptoms develop, the casualty should be transferred to hospital as soon as possible.

Symptoms

Inhalation	Please see Section 11. Toxicological Information for further information.
Ingestion	Please see Section 11. Toxicological Information for further information.
Skin contact	Please see Section 11. Toxicological Information for further information.
Eye contact	Please see Section 11. Toxicological Information for further information.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician Treat symptomatically

5. Fire-Fighting Measures

5.1 Extinguishing media

Suitable extinguishing media

Use extinguishing media appropriate for surrounding material.

Extinguishing media which must not be used for safety reasons

None known.

5.2. Special hazards arising from the substance or mixture

Unusual fire and explosion hazards

None known.

Hazardous combustion products

Carbon oxides (COx), Oxides of phosphorus, Metal oxide.

5.3 Advice for firefighters

Special protective equipment and precautions for fire-fighters

As in any fire, wear self-contained breathing apparatus and full protective gear.

Special Fire-Fighting Procedures

Containers close to fire should be removed immediately or cooled with water.

6. Accidental Release Measures

6.1. Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. See also section 8.

Advice for non-emergency responders

Evacuate non-essential personnel.

Advice for emergency responders

Evacuate personnel to safe areas. Use non-slip safety shoes in areas where spills or leaks can occur. Wear respiratory protection. Keep people away from and upwind of spill/leak.

6.2 Environmental precautions

The product should not be allowed to enter drains, water courses or the soil.

Environmental exposure controls

Avoid release to the environment. Local authorities should be advised if significant spillages cannot be contained.

6.3 Methods and material for containment and cleaning up

Methods for containment

Prevent further leakage or spillage if safe to do so. Dike far ahead of liquid spill for later disposal.

Methods for cleaning up

Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal. After cleaning, flush away traces with water.

6.4 Reference to other sections

See section 13 for more information.

7. Handling and Storage

7.1 Precautions for safe handling

Handling

Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin and eyes. Do not breathe vapors or spray mist. Avoid spills and splashing during use.

Hygiene measures

Use good work and personal hygiene practices to avoid exposure. When using do not smoke, eat or drink. Wash hands and face before breaks and immediately after handling the product. Remove contaminated clothing.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures/precautions Ensure adequate ventilation. Keep airborne concentrations below exposure limits.

Storage precautions Keep containers tightly closed in a dry, cool and well-ventilated place. Avoid heat, flames and other sources of ignition. Avoid extreme temperatures. Avoid contact with: Strong oxidizing agents.

Packaging materials Use specially constructed containers only.

8. Exposure Controls/Personal Protection

8.1 Control parameters

Component Information

Chemical Name	ACGIH TLV	OSHA PEL	Argentina - Occupational Exposure Limits - TWAs (CMPs)	Brazil - Occupational Exposure Limits - TWAs (LTs)	Mexico - Occupational Exposure Limits - TWAs (LMPE-PPTs)
Ethylene Glycol	25 ppm	Not determined	Not determined	25 ppm TWA LT (vapor fraction)	Not determined
Sodium chloride	Not determined	Not determined	Not determined	Not determined	Not determined
Calcium chloride	Not determined	Not determined	Not determined	Not determined	Not determined

IDLH (Immediately Dangerous to Life or Health)

This product contains substance(s) classified as Immediately Dangerous to Life or Health (IDLH) by the US National Institute for Occupational Safety and Health (NIOSH). The purpose of establishing an IDLH value is to ensure that the worker can escape from a given contaminated environment in the event of failure of the most protective respiratory protection equipment. In the event of failure of respiratory protection equipment every effort should be made to exit immediately.

Chemical Name	IDLH (Immediately Dangerous to Life or Health)
Ethylene Glycol 107-21-1	Not applicable
Sodium chloride 7647-14-5	Not applicable
Calcium chloride 10043-52-4	Not applicable

8.2 Exposure controls

A risk assessment is recommended to be performed by a qualified and trained personnel to analyze the worksite and recommends the appropriate controls such as engineering controls, work practice controls, and administrative controls as primary means of reducing employee exposure. When there is a remaining hazards after applying the primary controls, Personal Protective Equipment (PPE) must be used.

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazard present and the risk of exposure to those hazards. The PPE recommendations below are based on an assessment of the chemical hazards associated with this product. Where this product is used in a mixture with other products or fluids, additional hazards may be created and as such further assessment of risk may be required. The risk of exposure and need of respiratory protection will vary from workplace to workplace and should be assessed by the user in each situation.

Engineering Controls

Ensure adequate ventilation. Mechanical ventilation or local exhaust ventilation is required.

Personal protective equipment

Eye protection

Tightly fitting safety goggles. Safety glasses with side-shields.

Hand protection

Use protective gloves made of: Nitrile rubber Butyl rubber Neoprene
Be aware that liquid may penetrate the gloves. Frequent change is advisable.

Respiratory Protection

All respiratory protection equipment should be used within a comprehensive respiratory protection program that meets the requirements of 29 CFR 1910.134 (U.S. OSHA

Skin and body protection	Respiratory Protection Standard) or local equivalent. If exposed to airborne mist/aerosol of this product, use an organic vapor cartridge with a P-95 pre-filter attached. In work environments containing oil mist/aerosol, use an organic vapor cartridge with a P-95 pre-filter attached. If exposed to vapors from this product, use a NIOSH/MSHA-approved respirator with an organic vapor cartridge. Wear suitable protective clothing, Eye wash and emergency shower must be available at the work place.
Hygiene Measures	Wash hands before breaks and immediately after handling the product, Remove and wash contaminated clothing before re-use.

9. Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

Physical state	Liquid
Appearance	No information available
Color	Pale yellow
Odor	Mild
Odor threshold	Not applicable

<u>Property</u>	<u>Values</u>	<u>Remarks</u>
pH	7.8 - 8.8	
pH @ dilution	No information available	
Melting point	-50 °C / -58 °F	
Boiling point/range	> 100 °C / 212 °F	
Flash point	> 100 °C / 212 °F	
Evaporation rate (BuAc =1)	No information available	
Flammability	Not applicable	
Explosion limits:		
Upper explosion limit	No information available	
Lower explosion limit	No information available	
Vapor pressure	55 mmHg	@ 20 °C
Relative Vapor Density	No information available	
Specific gravity	1.182 - 1.222	@15.6 °C
Bulk density	No information available	
Water solubility	Soluble in water	
Solubility in other solvents	No information available	
Autoignition temperature	No information available	
Decomposition temperature	No information available	
Kinematic viscosity	5 mm ² /s	@ 40 °C
Dynamic viscosity	6 mPa s	@ 38 °C
Partition Coefficient (n-octanol/water)	No information available	
Explosive properties	Not applicable	
Oxidizing properties	None known.	

9.2 Other information

Pour point	No information available
Molecular weight	No information available
VOC content(%)	None
Density and/or Relative Density	No information available

Comments

The data listed above are typical physical and chemical properties and should not be construed as product specification.

10. Stability and Reactivity

10.1 Reactivity

No specific reactivity hazards associated with this product.

10.2 Chemical stability

Stable under normal temperature conditions and recommended use.

10.3 Possibility of Hazardous Reactions

Hazardous polymerization

Hazardous polymerization does not occur.

10.4 Conditions to avoid

Avoid heat, flames and other sources of ignition. Avoid extreme temperatures.

10.5 Incompatible materials

Strong oxidizing agents.

10.6 Hazardous decomposition products

See Section 5.2.

11. Toxicological Information

11.1 Information on toxicological effects

Acute toxicity

Product information

Prolonged and repeated contact with solvents over a long period may lead to permanent health problems.

Inhalation

Inhalation of vapors in high concentration may cause irritation of respiratory system. May cause additional effects as listed under "Ingestion".

Eye contact

May cause slight irritation.

Skin contact

Prolonged contact may cause redness and irritation. Components of the product may be absorbed into the body through the skin.

Ingestion

Harmful if swallowed. May cause damage to organs through prolonged or repeated exposure. May cause adverse cardiac effects, blood disturbances, and metabolic acidosis.

Toxicology data for the components

Chemical Name	LD50 Oral	LD50 Dermal	LC50 Inhalation
Ethylene Glycol	4700 mg/kg (rat)	10600 mg/kg (Rabbit)	No data available
Sodium chloride	3000 mg/kg (rat)	10010 mg/kg (Rabbit)	No data available
Calcium chloride	1000 mg/kg (rat)	5005 mg/kg (Rabbit)	No data available

Chemical Name	IARC Group 1 or 2	ACGIH - Carcinogens	OSHA listed carcinogens	NTP
Ethylene Glycol	No data available	A4 - Not Classifiable as a Human Carcinogen (aerosol)	No data available	No data available
Sodium chloride	No data available	No data available	No data available	No data available
Calcium chloride	No data available	No data available	No data available	No data available

Delayed and immediate effects and chronic effects from short and long term exposure

Sensitization	This product does not contain any components suspected to be sensitizing.
Mutagenic effects	This product does not contain any known or suspected mutagens.
Carcinogenicity	This product does not contain any known or suspected carcinogens.
Reproductive toxicity	This product does not contain any known or suspected reproductive hazards.
Developmental toxicity	Component substance is listed on California Proposition 65 as a developmental hazard.
Routes of Exposure	Ingestion.
Routes of entry	Ingestion. Inhalation. Skin contact. Skin absorption.
Specific target organ toxicity - Single exposure	Not classified
Specific target organ toxicity - Repeated exposure	Category 2.
Target organ effects	Kidneys.
Aspiration hazard	Not applicable.

12. Ecological Information

12.1 Toxicity

Toxicity to algae

See component information below.

Toxicity to fish

See component information below.

Toxicity to daphnia and other aquatic invertebrates

See component information below.

Toxicology data for the components

Chemical Name	Toxicity to fish	Toxicity to algae	Toxicity to daphnia and other aquatic invertebrates
Ethylene Glycol	40000 - 60000 mg/L LC50 (Pimephales promelas) = 96 h 40761 mg/L LC50 (Oncorhynchus mykiss) = 96 h	6500 - 13000 mg/L EC50 (Pseudokirchneriella subcapitata) = 96 h	46300 mg/L EC50 (Daphnia magna) = 48 h

	<p>27540 mg/L LC50 (Lepomis macrochirus) = 96 h</p> <p>14 - 18 mL/L LC50 (Oncorhynchus mykiss) = 96 h</p> <p>16000 mg/L LC50 (Poecilia reticulata) = 96 h</p> <p>41000 mg/L LC50 (Oncorhynchus mykiss) = 96 h</p>		
Sodium chloride	<p>= 12946 mg/L LC50 Lepomis macrochirus 96 h</p> <p>5560 - 6080 mg/L LC50 Lepomis macrochirus 96 h</p> <p>= 7050 mg/L LC50 Pimephales promelas 96 h</p> <p>6420 - 6700 mg/L LC50 Pimephales promelas 96 h</p> <p>4747 - 7824 mg/L LC50 Oncorhynchus mykiss 96 h</p> <p>6020 - 7070 mg/L LC50 Pimephales promelas 96 h</p>	No information available	<p>= 1000 mg/L EC50 Daphnia magna 48 h</p> <p>340.7 - 469.2 mg/L EC50 Daphnia magna 48 h</p>
Calcium chloride	<p>= 10650 mg/L LC50 Lepomis macrochirus 96 h</p>	No information available	<p>2,400 mg/L EC50 (Daphnia magna) = 48 h</p>

12.2 Persistence and degradability

No product level data available.

12.3 Bioaccumulative potential

No product level data available.

12.4 Mobility

Soluble in water.

12.5 Results of PBT and vPvB assessment

This preparation contains no substance considered to be persistent, bioaccumulating nor toxic (PBT)
This preparation contains no substance considered to be very persistent nor very bioaccumulating (vPvB)

12.6 Other adverse effects.

None known.

13. Disposal Considerations

13.1 Waste treatment methods

Disposal Method Disposal should be made in accordance with federal, state and local regulations.

Contaminated packaging Empty containers should be taken for local recycling, recovery or waste disposal.

14. Transport information

14.1. UN number

UN No. (DOT)	NA3082
UN No. (MT/ANTT)	Not regulated
UN No. (TDG)	Not regulated
UN/ID No. (ADR/RID/ADN/ADG)	Not regulated
UN No. (IMDG/ANTAQ)	Not regulated
UN No. (ICAO/ANAC)	Not regulated
UN No. (DPC)	Not regulated

14.2. UN proper shipping name

Other regulated substances, liquid, n.o.s. (Contains Ethylene Glycol)

DOT reportable quantity Product (RQ): 2476 gallons (ethylene glycol)
Not regulated for transportation by DOT if shipped in containers < RQ amount.

14.3 Hazard class(es)

DOT Hazard class	9,
ANTT Hazard class	Not regulated
TDG Hazard class	Not regulated
ADR/RID/ADN/ADG Hazard class	Not regulated
IMDG/ANTAQ Hazard class	Not regulated
ICAO/ANAC Hazard class/division	Not regulated
DPC Hazard class	Not regulated

14.4 Packing group

DOT Packing group	III
ANTT Packing group	Not regulated
TDG Packing group	Not regulated
ADR/RID/ADN/ADG Packing group	Not regulated
IMDG/ANTAQ Packing group	Not regulated
ICAO/ANAC Packing group	Not regulated
DPC Packing group	Not regulated

14.5 Environmental hazard

No

14.6 Special precautions

Not applicable

15. Regulatory Information

International inventories

USA (TSCA)	Complies
Canada (DSL)	Complies
Philippines (PICCS)	Complies
Japan (ENCS)	Complies

China (IECSC)	Complies
Australia (AICS)	Complies
Korean (KECL)	Complies
New Zealand (NZIoC)	Complies

Europe - REACH

All products supplied from the European Economic Area (EEA) are compliant with the REACH Regulation EC 1907/2006. For products supplied from the EEA, Schlumberger and/or its suppliers have pre-registered and is registering all of the substances that it and/or its suppliers manufactures in or imports into the EEA that are subject to Title II of the REACH Regulation. All products supplied from outside the EEA are subject to REACH only if imported into the EEA. The importer of the products must comply with REACH for each imported substance. Contact REACH@slb.com for REACH information.

U.S. Federal and State Regulations**SARA 311/312 Hazard Categories**

Should this product meet EPCRA 311/312 Tier reporting criteria at 40 CFR 370, refer to Section 2 of this SDS for appropriate classifications. Under the amended regulations at 40 CFR 370, EPCRA 311/312 Tier II reporting for the 2017 calendar year will need to be consistent with updated hazard classifications.

Chemical Name	SARA 302 / TPQs	SARA 313	CERCLA RQ
Ethylene Glycol	N/A	1.0 %	5000 lb final RQ 2270 kg final RQ
Sodium chloride	N/A	N/A	N/A
Calcium chloride	N/A	N/A	N/A

California Proposition 65**WARNING**

This product can expose you to chemicals including those listed below, which is [are] known to the State of California to cause cancer, birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov

Chemical Name	California Proposition 65
Ethylene Glycol 107-21-1	Developmental Toxicity

Canadian Classification

This Safety Data Sheet has been prepared in compliance with the Hazardous Products Regulations.

Brazil Regulation	This SDS was prepared in accordance with Brazil law ABNT NBR 14725:2014.
Federal Police	Not determined
Army	Not determined
ANVISA	Not determined
MTE (NR 15)	No information available

16. Other Information

Supersedes date 17/Jan/2018

Revision date 30/Mar/2022

Version 10

This SDS has been revised in the following section(s) All sections. No changes with regard to classification have been made.

HMIS classification

Health	1*
Flammability	1
Physical hazard	0
PPE	X

N/A - Not Applicable, N/D - Not Determined.

Disclaimer

The information contained herein is considered in good faith as reliable of the date issued and is based upon on measurements, tests or data derived from supplier's own study or furnished by others. In providing this SDS information, Supplier makes no express or implied warranties as to the information or product; merchantability or fitness of purpose; any express or implied warranty; or non-infringement of intellectual property rights; and supplier assumes no responsibility for any direct, special or consequential damages, results obtained, or the activities of others. To the maximum extent permitted by law, supplier's warranty obligations and buyer's sole remedies are as stated in separate agreement between the parties.

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Section 1. Identification

Product name	: M275
Product code	: M275
Product type	: Powder.
Recommended use	: Microbiocide.
Supplier's details	: Baker Hughes Kirkby Bank Road, Knowsley Industrial Park, Liverpool, L33 7SY, UK Tel: +44 (0)151 545 3899 Fax: +44 (0)151 548 0094
e-mail address of person responsible for this SDS	: EH-SDS-Admin@bakerhughes.com
Emergency telephone number	: CHEMTREC Emergency Telephone within UK: 0870 820 0418 CHEMTREC Emergency Telephone outside UK: +44 870 820 0418

Section 2. Hazard identification

Classification of the substance or mixture	: ACUTE TOXICITY (oral) - Category 4 ACUTE TOXICITY (dermal) - Category 5 ACUTE TOXICITY (inhalation) - Category 4 SKIN CORROSION/IRRITATION - Category 1C SKIN SENSITISATION - Category 1 SHORT-TERM (ACUTE) AQUATIC HAZARD - Category 1 LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 1
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GHS label elements

Hazard pictograms



GHS05

GHS07

GHS09

Signal word

: Danger

Hazard statements

 : Harmful if swallowed or if inhaled.
May be harmful in contact with skin.
Causes severe skin burns and eye damage.
May cause an allergic skin reaction.
Very toxic to aquatic life with long lasting effects.

Precautionary statements

Prevention

: Wear protective gloves, protective clothing and eye or face protection. Avoid release to the environment. Avoid breathing dust or mist. Do not eat, drink or smoke when using this product. Wash thoroughly after handling.

Response

: Collect spillage. IF INHALED: Immediately call a POISON CENTER or doctor. IF SWALLOWED: Immediately call a POISON CENTER or doctor. Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. Immediately call a POISON CENTER or doctor. Wash contaminated clothing before reuse. IF ON SKIN: Call a POISON CENTER or doctor if you feel unwell. Wash with plenty of water. If skin irritation or rash occurs: Get medical advice or attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Section 2. Hazard identification

- Storage** : Not applicable.
- Disposal** : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Other hazards which do not result in classification : None known.

Section 3. Composition/information on ingredients

- Substance/mixture** : Mixture
- Other means of identification** : Not available.

Ingredient name	%	CAS number
reaction mass of: 5-chloro-2-methyl-4-isothiazolin-3-one [EC no. 247-500-7] and 2-methyl-2H-isothiazol-3-one [EC no. 220-239-6] (3:1)	≤7.5	55965-84-9

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

- Eye contact** : Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Chemical burns must be treated promptly by a physician.
- Inhalation** : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
- Skin contact** : Get medical attention immediately. Call a poison center or physician. Wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.
- Ingestion** : Call a poison center or physician. Wash out mouth with water. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.

Most important symptoms/effects, acute and delayed

Potential acute health effects

- Eye contact** : Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the eyes.
- Inhalation** : Harmful if inhaled. Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the nose, throat and lungs.
- Skin contact** : Causes severe burns. May be harmful in contact with skin. May cause an allergic skin reaction.
- Ingestion** : Harmful if swallowed.

Section 4. First aid measures

Over-exposure signs/symptoms

- Eye contact** : Adverse symptoms may include the following: pain, watering, redness
- Inhalation** : respiratory tract irritation, coughing
- Skin contact** : pain or irritation, redness, blistering may occur
- Ingestion** : Adverse symptoms may include the following: stomach pains

Indication of immediate medical attention and special treatment needed, if necessary

- Notes to physician** : In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
- Specific treatments** : No specific treatment.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Firefighting measures

Extinguishing media

- Suitable extinguishing media** : Use dry chemical powder.
- Unsuitable extinguishing media** : Avoid high pressure media which could cause the formation of a potentially explosible dust-air mixture.

Specific hazards arising from the chemical : May form explosible dust-air mixture if dispersed. This material is very toxic to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Hazardous thermal decomposition products : carbon dioxide, carbon monoxide, nitrogen oxides, sulfur oxides, halogenated compounds, metal oxide/oxides

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Do not breathe dust. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. Collect spillage.

Section 6. Accidental release measures

Methods and material for containment and cleaning up

- Small spill** : Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Avoid dust generation. Using a vacuum with HEPA filter will reduce dust dispersal. Place spilled material in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor.
- Large spill** : Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Avoid creating dusty conditions and prevent wind dispersal. Dispose of via a licensed waste disposal contractor. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.
- Reference to other sections** : See Section 1 for emergency contact information.
See Section 8 for information on appropriate personal protective equipment.
See Section 13 for additional waste treatment information.

Section 7. Handling and storage

Precautions for safe handling

- Protective measures** : Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not breathe dust. Do not ingest. Avoid release to the environment. Avoid the creation of dust when handling and avoid all possible sources of ignition (spark or flame). Prevent dust accumulation. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Electrical equipment and lighting should be protected to appropriate standards to prevent dust coming into contact with hot surfaces, sparks or other ignition sources. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by earthing and bonding containers and equipment before transferring material. Empty containers retain product residue and can be hazardous. Do not reuse container.
- Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

- Conditions for safe storage, including any incompatibilities** : Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Eliminate all ignition sources. Separate from oxidising materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

None.

- Appropriate engineering controls** : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapour or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Section 8. Exposure controls/personal protection

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

Section 9. Physical and chemical properties

Information on basic physical and chemical properties

Physical state : Solid. [Powder.]

Colour : Tan. / Red.

Odour : Faint odour.

Odour threshold : Not available.

pH : Not available.

Melting point/freezing point : Not available.

Initial boiling point and boiling range : Not available.

Flash point : Closed cup: >93°C (>199.4°F)

Evaporation rate : Not available.

Flammability (solid, gas) : May be combustible at high temperature.

Upper/lower flammability or explosive limits : Not available.

Oxidising properties : Not available.

Vapour pressure : Not available.

Vapour density : Not available.

Section 9. Physical and chemical properties

Evaporation rate (butyl acetate = 1)	: Not available.
Relative density	: 0.714 to 0.726 (16°C)
Partition coefficient: n-octanol/water	: Not available.
Solubility	:
Auto-ignition temperature	: Not available.
Decomposition temperature	: Not available.
Viscosity	: Not available.
Explosive properties	: Not available.
Oxidising properties	: Not available.

Other information

Pour point	: Not available.
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Section 10. Stability and reactivity

Reactivity	: No specific test data related to reactivity available for this product or its ingredients.
Chemical stability	: The product is stable.
Possibility of hazardous reactions	: Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid	: Avoid the creation of dust when handling and avoid all possible sources of ignition (spark or flame). Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by earthing and bonding containers and equipment before transferring material. Prevent dust accumulation.
Incompatible materials	: Reactive or incompatible with the following materials: oxidising materials
Hazardous decomposition products	: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
reaction mass of: 5-chloro-2-methyl-4-isothiazolin-3-one [EC no. 247-500-7] and 2-methyl-2H-isothiazol-3-one [EC no. 220-239-6] (3:1)	LC50 Inhalation Dusts and mists	Rat	0.33 mg/l	4 hours

Conclusion/Summary : Not available.

Acute toxicity estimates

Product/ingredient name	Oral (mg/kg)	Dermal (mg/kg)	Inhalation (gases) (ppm)	Inhalation (vapours) (mg/l)	Inhalation (dusts and mists) (mg/l)
M275 reaction mass of: 5-chloro-2-methyl-4-isothiazolin-3-one [EC no. 247-500-7] and 2-methyl-2H-isothiazol-3-one [EC no. 220-239-6] (3:1)	952.1 68.55	2100 151.2	N/A N/A	6.9 0.5	N/A N/A

Irritation/Corrosion

Section 11. Toxicological information

Skin : Skin contact may produce burns. May cause permanent skin damage.

Eyes : No known significant effects or critical hazards.

Respiratory : No known significant effects or critical hazards.

Sensitisation

Skin : May cause sensitisation by skin contact. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Respiratory : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

Reproductive toxicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Specific target organ toxicity (single exposure)

Product/ingredient name	Category	Route of exposure	Target organs
Not available.			

Specific target organ toxicity (repeated exposure)

Product/ingredient name	Category	Route of exposure	Target organs
Not available.			

Aspiration hazard

Not available.

Information on likely routes of exposure : Not available.

Potential acute health effects

Eye contact : Causes serious eye damage.

Inhalation : Toxic if inhaled. May give off gas, vapour or dust that is very irritating or corrosive to the respiratory system. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.

Skin contact : Causes severe burns. May cause an allergic skin reaction.

Ingestion : Harmful if swallowed. May cause burns to mouth, throat and stomach.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : Adverse symptoms may include the following:
Adverse symptoms may include the following: ,pain, watering, redness

Inhalation : Adverse symptoms may include the following:
respiratory tract irritation, coughing

Skin contact : Adverse symptoms may include the following:
pain or irritation, redness, blistering may occur

Ingestion : Adverse symptoms may include the following:
Adverse symptoms may include the following: ,stomach pains

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Section 11. Toxicological information

Potential chronic health effects

Not available.

Conclusion/Summary : Not available.

General : Repeated or prolonged inhalation of dust may lead to chronic respiratory irritation. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Interactive effects : Not available.

Other information : Not available.

Section 12. Ecological information

Toxicity : Water polluting material. This material is very toxic to aquatic life with long lasting effects.

Product/ingredient name	Result	Species	Exposure
reaction mass of: 5-chloro-2-methyl-4-isothiazolin-3-one [EC no. 247-500-7] and 2-methyl-2H-isothiazol-3-one [EC no. 220-239-6] (3:1)	EC50 0.027 mg/l	Algae	72 hours

Persistence and degradability

Conclusion/Summary : Not available.

Bioaccumulative potential

Not available.

Mobility in soil : Not available.



Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations






Disposal methods : Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

International transport regulations

Regulatory information	UN number	Proper shipping name	Transport hazard class(es)	PG*	Label
ADR/RID Class	UN3261	CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S. (isothiazolones)	8	II	 

Section 14. Transport information

ADN Class	UN3261	CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S. (isothiazolones)	8	II	 
IMDG Class	UN3261	CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S. (isothiazolones)	8	II	 
IATA Class	UN3261	CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S. (isothiazolones)	8	II	

PG* : Packing group

Regulatory information	Environmental hazards	Additional information
ADR/RID Class	Yes.	The environmentally hazardous substance mark is not required when transported in sizes of ≤5 L or ≤5 kg. Hazchem code 2X
ADN Class	Yes.	The environmentally hazardous substance mark is not required when transported in sizes of ≤5 L or ≤5 kg.
IMDG Class	Yes.	The marine pollutant mark is not required when transported in sizes of ≤5 L or ≤5 kg.
IATA Class	No.	The environmentally hazardous substance mark may appear if required by other transportation regulations.

Special precautions for user : **Transport within user's premises**: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to IMO instruments : Not available.

Section 15. Regulatory information

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

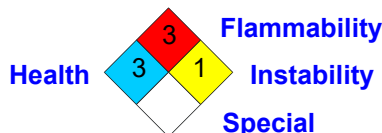
UNECE Aarhus Protocol on POPs and Heavy Metals

Section 15. Regulatory information

Not listed.

Section 16. Other information

National Fire Protection Association (U.S.A.) :



History

Date of issue/Date of revision : 23 March 2021

Date of previous issue : No previous validation

Version : 1

Key to abbreviations : ATE = Acute Toxicity Estimate
 BCF = Bioconcentration Factor
 GHS = Globally Harmonized System of Classification and Labelling of Chemicals
 IATA = International Air Transport Association
 IBC = Intermediate Bulk Container
 IMDG = International Maritime Dangerous Goods
 LogPow = logarithm of the octanol/water partition coefficient
 MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
 N/A = Not available
 SGG = Segregation Group
 UN = United Nations

Procedure used to derive the classification

Classification	Justification
ACUTE TOXICITY (oral) - Category 4	Calculation method
ACUTE TOXICITY (dermal) - Category 5	Calculation method
ACUTE TOXICITY (inhalation) - Category 4	Calculation method
SKIN CORROSION/IRRITATION - Category 1C	Calculation method
SKIN SENSITISATION - Category 1	Calculation method
SHORT-TERM (ACUTE) AQUATIC HAZARD - Category 1	Calculation method
LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 1	Calculation method

References : Not available.

Indicates information that has changed from previously issued version.

Notice to reader

This information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process. Such information is, to the best of the company's knowledge and belief, accurate and reliable as of the date indicated. However, no warranty guarantee or representation is made to its accuracy, reliability or completeness. It is the user's responsibility to satisfy himself as to the suitability of such information for his own particular use.



Safety Data Sheet Non-Emulsifying Agent W54

1. Identification of the Substance/Preparation and of the Company/Undertaking

1.1 Product identifier

Product name Non-Emulsifying Agent W54
Product code W054

1.2 Relevant identified uses of the substance or mixture and uses advised against

Recommended Use Demulsifier.
Uses advised against Consumer use

1.3 Details of the supplier of the safety data sheet

Supplier
Schlumberger Technology Corporation
110 Schlumberger Drive
Sugar Land, Texas 77478, USA
Telephone: 1-281-285-7873

Schlumberger Canada, Ltd.
200, 125 - 9th Avenue SE
Calgary, Alberta T2G 0P6, Canada
Telephone: 1-613-992-4624

E-mail address SDS@slb.com

Prepared by
Global Regulatory Compliance - Chemicals (GRC - Chemicals)

1.4 Emergency Telephone Number

Emergency telephone (24 Hour) Asia Pacific +65 3158 1074, Europe +44 (0) 1235 239 670, Middle East and Africa +44 (0) 1235 239 671, USA +1 281 595 3518/+1 866 928 0789, Canada +1 800 579 7421, Argentina: +54 11 5984 3690, Brazil : 0800-720-8000 /0800-777-2323 (WGRA)

2. Hazards Identification

2.1 Classification of the substance or mixture

GHS - Classification

Health hazards

Acute toxicity - Oral	Category 3
Acute toxicity - Dermal	Category 3

Acute toxicity - Inhalation (Dusts/Mists)	Category 3
Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 1
Carcinogenicity	Category 2
Specific target organ toxicity - Single exposure	Category 1

Environmental hazards

Chronic aquatic toxicity	Category 2
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Physical Hazards

Flammable Liquids	Category 2
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2.2 Label elements**Signal word**

DANGER

Hazard Statements

H301 - Toxic if swallowed
H311 - Toxic in contact with skin
H315 - Causes skin irritation
H318 - Causes serious eye damage
H331 - Toxic if inhaled
H351 - Suspected of causing cancer
H370 - Causes damage to organs
H411 - Toxic to aquatic life with long lasting effects
H225 - Highly flammable liquid and vapor

Precautionary Statements

P201 - Obtain special instructions before use
P202 - Do not handle until all safety precautions have been read and understood
P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking
P233 - Keep container tightly closed
P240 - Ground/bond container and receiving equipment
P241 - Use explosion-proof electrical/ ventilating/ lighting/ equipment
P242 - Use only non-sparking tools
P243 - Take precautionary measures against static discharge
P260 - Do not breathe dust/fume/gas/mist/vapors/spray
P264 - Wash face, hands and any exposed skin thoroughly after handling
P270 - Do not eat, drink or smoke when using this product
P271 - Use only outdoors or in a well-ventilated area
P273 - Avoid release to the environment
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P301 + P310 - IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
P303 + P361 + P353 - IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
P304 + P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P308 + P311 - IF exposed or concerned: Call a POISON CENTER or doctor
P311 - Call a POISON CENTER or doctor/physician

P330 - Rinse mouth
 P332 + P313 - If skin irritation occurs: Get medical advice/attention
 P362 + P364 - Take off contaminated clothing and wash it before reuse
 P370 + P378 - In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish
 P391 - Collect spillage
 P403 + P235 - Store in a well-ventilated place. Keep cool
 P501 - Dispose of contents/container in accordance with local, regional, national, and international regulations as applicable

Hazards not otherwise classified

None known

Unknown acute toxicity

0% of the mixture consists of ingredient(s) of unknown toxicity.

3. Composition/information on Ingredients

3.1 Substances

Not applicable

3.2 Mixtures

Chemical Name	CAS No	Weight-%
Methanol	67-56-1	45 - 70
Oxirane, Methyl-, polymer with Oxirane	9003-11-6	7 - 13
Alcohols, C7-9-iso-, C8-rich, ethoxylated	78330-19-5	5 - 10
Alcohols, C9-11-iso-, C10-rich, ethoxylated	78330-20-8	5 - 10
Alcohol, C11-14, ethoxylated	78330-21-9	3 - 7
N,N-Dimethyl-N-dodecyl benzylaminium chloride	139-07-1	1 - 5
Solvent naphtha (petroleum), heavy arom.	64742-94-5	1 - 5
2-Propen-1-aminium, N,N-dimethyl-N-2-propen-1-yl-, chloride (1:1), homopolymer	26062-79-3	1 - 5
Naphthalene (Impurity)	91-20-3	0.1 - 1

Comments

The product contains other ingredients which do not contribute to the overall classification. The exact percentage (concentration) of composition has been withheld as a trade secret.

4. First Aid Measures

4.1 First aid measures**Inhalation**

If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.

Ingestion

Rinse mouth. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Seek medical attention if irritation occurs.

Skin contact

Wash off immediately with soap and plenty of water. Remove contaminated clothing and shoes. Seek medical attention if irritation occurs.

Eye Contact

Promptly wash eyes with lots of water while lifting eye lids. Remove contact lenses, if worn.

Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

4.2. Most important symptoms and effects, both acute and delayed

General advice The severity of the symptoms described will vary dependant of the concentration and the length of exposure. If adverse symptoms develop, the casualty should be transferred to hospital as soon as possible.

Symptoms

Inhalation Please see Section 11. Toxicological Information for further information.

Ingestion Please see Section 11. Toxicological Information for further information.

Skin contact Please see Section 11. Toxicological Information for further information.

Eye contact Please see Section 11. Toxicological Information for further information.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician Treat symptomatically

5. Fire-Fighting Measures

5.1 Extinguishing media

Suitable extinguishing media

Water Fog, Alcohol Foam, CO₂, Dry Chemical.

Extinguishing media which must not be used for safety reasons

None known.

5.2. Special hazards arising from the substance or mixture

Unusual fire and explosion hazards

FLAMMABLE. Vapors are heavier than air and may spread along floors. Vapors may travel to source of ignition and flash back. Heating of containers may cause pressure rise, with risk of bursting.

Hazardous combustion products

Thermal decomposition can lead to release of irritating gases and vapors.

5.3 Advice for firefighters

Special protective equipment for fire-fighters

As in any fire, wear self-contained breathing apparatus and full protective gear.

Special Fire-Fighting Procedures

Containers close to fire should be removed immediately or cooled with water.

6. Accidental Release Measures

6.1. Personal precautions, protective equipment and emergency procedures

Remove all sources of ignition. Keep away from heat, sparks and flames. Avoid contact with skin, eyes and inhalation of vapors. Do not breathe vapors or spray mist. Wash thoroughly after handling. Use personal protective equipment. See also section 8.

6.2 Environmental precautions

The product should not be allowed to enter drains, water courses or the soil.

Environmental exposure controls

Avoid release to the environment. Local authorities should be advised if significant spillages cannot be contained.

6.3 Methods and material for containment and cleaning up

Methods for containment

Prevent further leakage or spillage if safe to do so. Dike far ahead of liquid spill for later disposal.

Methods for cleaning up

Take precautionary measures against static discharges. Use non-sparking tools and equipment. Contain and collect spillage with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local/national regulations (see Section 13). After cleaning, flush away traces with water.

6.4 Reference to other sections

See section 13 for more information.

7. Handling and Storage

7.1 Precautions for safe handling

Handling

Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes and clothing. Avoid spills and splashing during use. Do not breathe vapors or spray mist. Keep away from open flames, hot surfaces and sources of ignition.

Hygiene measures

Use good work and personal hygiene practices to avoid exposure. Do not eat, drink or smoke when using this product. Wash hands and face before breaks and immediately after handling the product.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures/precautions Ensure adequate ventilation. Keep airborne concentrations below exposure limits. Take precautionary measures against static discharges. Use spark-proof tools and explosion-proof equipment. Ensure all equipment is electrically grounded before beginning transfer operations.

Storage precautions Follow safe warehousing practices regarding palletizing, banding, shrink-wrapping and/or stacking. Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from open flames, hot surfaces and sources of ignition. Keep away from direct sunlight. Protect from freezing. Store away from incompatibles: Oxidizing agents.

8. Exposure Controls/Personal Protection

8.1 Control parameters

Chemical Name	ACGIH TLV	OSHA PEL	Argentina - Occupational Exposure Limits - TWAs (CMPs)	Brazil - Occupational Exposure Limits - TWAs (LTs)	Mexico - Occupational Exposure Limits - TWAs (LMPE-PPTs)
Methanol	200 ppm	200 ppm TWA 260 mg/m ³ TWA	200 ppm TWA	156 ppm TWA LT; 200 mg/m ³ TWA LT	200 ppm TWA VLE-PPT; 260 mg/m ³ TWA VLE-PPT
Oxirane, Methyl-, polymer with Oxirane	Not determined	Not determined	Not determined	Not determined	Not determined

Alcohols, C7-9-iso-, C8-rich, ethoxylated	Not determined	Not determined	Not determined	Not determined	Not determined
Alcohols, C9-11-iso-, C10-rich, ethoxylated	Not determined	Not determined	Not determined	Not determined	Not determined
Alcohol, C11-14, ethoxylated	Not determined	Not determined	Not determined	Not determined	Not determined
N,N-Dimethyl-N-dodecyl benzylaminium chloride	Not determined	Not determined	Not determined	Not determined	Not determined
Solvent naphtha (petroleum), heavy arom.	Not determined	Not determined	Not determined	Not determined	Not determined
2-Propen-1-aminium, N,N-dimethyl-N-2-propen-1-yl-, chloride (1:1), homopolymer	Not determined	Not determined	Not determined	Not determined	Not determined
Naphthalene (Impurity)	10 ppm	10 ppm TWA 50 mg/m ³ TWA	10 ppm TWA	Not determined	10 ppm TWA VLE-PPT; 50 mg/m ³ TWA VLE-PPT

IDLH (Immediately Dangerous to Life or Health)

This product contains substance(s) classified as Immediately Dangerous to Life or Health (IDLH) by the US National Institute for Occupational Safety and Health (NIOSH). The purpose of establishing an IDLH value is to ensure that the worker can escape from a given contaminated environment in the event of failure of the most protective respiratory protection equipment. In the event of failure of respiratory protection equipment every effort should be made to exit immediately.

Chemical Name	IDLH (Immediately Dangerous to Life or Health)
Methanol 67-56-1	6000 ppm IDLH
Oxirane, Methyl-, polymer with Oxirane 9003-11-6	-
Alcohols, C7-9-iso-, C8-rich, ethoxylated 78330-19-5	-
Alcohols, C9-11-iso-, C10-rich, ethoxylated 78330-20-8	-
Alcohol, C11-14, ethoxylated 78330-21-9	-
N,N-Dimethyl-N-dodecyl benzylaminium chloride 139-07-1	-
Solvent naphtha (petroleum), heavy arom. 64742-94-5	-
2-Propen-1-aminium, N,N-dimethyl-N-2-propen-1-yl-, chloride (1:1), homopolymer 26062-79-3	-
Naphthalene (Impurity) 91-20-3	250 ppm IDLH

8.2 Exposure controls

A risk assessment is recommended to be performed by a qualified and trained personnel to analyze the worksite and recommends the appropriate controls such as engineering controls, work practice controls, and administrative controls as primary means of reducing employee exposure. When there is a remaining hazards after applying the primary controls, Personal Protective Equipment (PPE) must be used.

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazard present and the risk of exposure to those hazards. The PPE recommendations below are based on an assessment of the chemical hazards associated with this product. Where this product is used in a mixture with other products or fluids, additional hazards may be created and as such further assessment of risk may be required. The risk of exposure and need of respiratory protection will vary from workplace to workplace and should be assessed by the user in each situation.

Engineering Controls

Ensure adequate ventilation, especially in confined areas.

Personal protective equipment

Eye protection	Tightly fitting safety goggles.
Hand protection	Wear chemical resistant gloves such as nitrile or neoprene. Be aware that liquid may penetrate the gloves. Frequent change is advisable.
Respiratory Protection	All respiratory protection equipment should be used within a comprehensive respiratory protection program that meets the requirements of 29 CFR 1910.134 (U.S. OSHA Respiratory Protection Standard) or local equivalent. If exposed to airborne mist/aerosol of this product, use an organic vapor cartridge with a P-95 pre-filter attached. In work environments containing oil mist/aerosol, use an organic vapor cartridge with a P-95 pre-filter attached. If exposed to vapors from this product, use a NIOSH/MSHA-approved respirator with an organic vapor cartridge.
Skin and body protection	Wear suitable protective clothing, Eye wash and emergency shower must be available at the work place.
Hygiene Measures	Wash hands before breaks and immediately after handling the product, Remove and wash contaminated clothing before re-use.

9. Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

Physical state	Liquid
Appearance	Transparent
Color	Yellow
Odor	Aromatic
Odor threshold	Not applicable

<u>Property</u>	<u>Values</u>	<u>Remarks</u>
pH	No information available	
pH @ dilution	N/D	
Melting / freezing point	-45.6 °C / -50 °F	ASTM D-97
Boiling point/range	71 °C / 160 °F	
Flash point	11 °C / 52 °F	ASTM D 56, Tag Closed Cup
Evaporation rate (BuAc =1)	No information available	
Flammability (solid, gas)	Not applicable	
Flammability Limit in Air		
Upper flammability limit	No information available	
Lower flammability limit	No information available	
Vapor pressure	23.99 kPa	@ 37.8 °C
Vapor density	No information available	
Specific gravity	0.88	@ 15.6 °C
Bulk density	No information available	
Water solubility	Dispersible	
Solubility in other solvents	No information available	
Autoignition temperature	No information available	
Decomposition temperature	No information available	
Kinematic viscosity	3.8 cSt @ 38 °C	
Dynamic viscosity	No information available	
log Pow	No information available	
Explosive properties	Not applicable	
Oxidizing properties	None known.	

9.2 Other information

Pour point	No information available
Molecular weight	No information available
VOC content(%)	No information available

Density No information available

Comments

The data listed above are typical physical and chemical properties and should not be construed as product specification.

10. Stability and Reactivity

10.1 Reactivity

No specific reactivity hazards associated with this product.

10.2 Chemical stability

Stable under normal temperature conditions and recommended use.

10.3 Possibility of Hazardous Reactions

Hazardous polymerization

Hazardous polymerization does not occur.

10.4 Conditions to avoid

Avoid contact with heat, sparks, open flame, and static discharge. Keep away from direct sunlight.

10.5 Incompatible materials

Oxidizing agents.

10.6 Hazardous decomposition products

See Section 5.2.

11. Toxicological Information

11.1 Information on toxicological effects

Acute toxicity

Product information

Toxic by inhalation, in contact with skin and if swallowed. Methanol is more toxic to humans and primates than to most experimental animals, due to differences in how it is metabolized. Non-primates do not appear to experience the acidosis or vision effects observed in humans and primates.

Inhalation

Toxic by inhalation.

Eye contact

Causes serious eye damage.

Skin contact

Toxic in contact with skin. Causes skin irritation. May be absorbed through the skin in harmful amounts.

Ingestion

Toxic if swallowed.

Chemical Name	LD50 Oral	LD50 Dermal	LC50 Inhalation
Methanol	2528 mg/kg (Rat) ECHA Data	17100 mg/kg (Rabbit) ECHA Data	128.2 mg/L (Rat) 4h
Oxirane, Methyl-, polymer with Oxirane	= 5700 mg/kg (Rat) = 16 g/kg (Rat)	No data available	= 320 mg/m ³ (Rat) 4 h

Alcohols, C7-9-iso-, C8-rich, ethoxylated	No data available	No data available	No data available
Alcohols, C9-11-iso-, C10-rich, ethoxylated	No data available	No data available	No data available
Alcohol, C11-14, ethoxylated	=4380 mg/kg (Rat)	No data available	No data available
N,N-Dimethyl-N-dodecyl benzylammonium chloride	= 400 mg/kg (Rat)	No data available	No data available
Solvent naphtha (petroleum), heavy arom.	> 5000 mg/kg (Rat)	> 2 mL/kg (Rabbit)	> 590 mg/m ³ (Rat) 4 h
2-Propen-1-aminium, N,N-dimethyl-N-2-propen-1-yl-, chloride (1:1), homopolymer	= 3 g/kg (Rat)	No data available	No data available
Naphthalene (Impurity)	= 1110 mg/kg (Rat) = 490 mg/kg (Rat)	> 20 g/kg (Rabbit) = 1120 mg/kg (Rabbit)	> 340 mg/m ³ (Rat) 1 h

Chemical Name	IARC Group 1 or 2	ACGIH - Carcinogens	OSHA listed carcinogens	NTP
Methanol	No data available	No data available	No data available	No data available
Oxirane, Methyl-, polymer with Oxirane	No data available	No data available	No data available	No data available
Alcohols, C7-9-iso-, C8-rich, ethoxylated	No data available	No data available	No data available	No data available
Alcohols, C9-11-iso-, C10-rich, ethoxylated	No data available	No data available	No data available	No data available
Alcohol, C11-14, ethoxylated	No data available	No data available	No data available	No data available
N,N-Dimethyl-N-dodecyl benzylammonium chloride	No data available	No data available	No data available	No data available
Solvent naphtha (petroleum), heavy arom.	No data available	No data available	No data available	No data available
2-Propen-1-aminium, N,N-dimethyl-N-2-propen-1-yl-, chloride (1:1), homopolymer	No data available	No data available	No data available	No data available
Naphthalene (Impurity)	Group 2B; Monograph 82 [2002] 2B	A3 Confirmed Animal Carcinogen with Unknown Relevance to Humans	Present	Reasonably Anticipated To Be A Human Carcinogen

Sensitization	Not classified.
Mutagenic effects	This product does not contain any known or suspected mutagens.
Carcinogenicity	Contains a known or suspected carcinogen.
Reproductive toxicity	This product does not contain any known or suspected reproductive hazards.
Developmental toxicity	Component substance is listed on California Proposition 65 as a developmental hazard.
Routes of Exposure	Inhalation. Skin contact. Eye contact. Ingestion.
Routes of entry	Skin contact. Eye contact. Inhalation. Ingestion.
Specific target organ toxicity - Single exposure	Category 1
Specific target organ toxicity - Repeated exposure	Not classified.
Target organ effects	Central nervous system. Peripheral Nervous System (PNS).
Aspiration hazard	Not classified.

12. Ecological Information

12.1 Toxicity

Toxicity to algae

See component information below.

Toxicity to fish

See component information below.

Toxicity to daphnia and other aquatic invertebrates

See component information below.

Chemical Name	Toxicity to fish	Toxicity to algae	Toxicity to daphnia and other aquatic invertebrates
Methanol	15400 mg/L LC50 Freshwater Fish ECHA Data	22000 mg/l EC50/LC50 Freshwater Algae ECHA Data	18260 mg/L EC50 Daphnia Magna OECD 202 ECHA Data
Oxirane, Methyl-, polymer with Oxirane	No information available	No information available	No information available
Alcohols, C7-9-iso-, C8-rich, ethoxylated	No information available	No information available	No information available
Alcohols, C9-11-iso-, C10-rich, ethoxylated	No information available	No information available	No information available
Alcohol, C11-14, ethoxylated	No information available	No information available	No information available
N,N-Dimethyl-N-dodecyl benzylammonium chloride	= 1 mg/L LC50 Salmo gairdneri 15 min 0.223 - 0.46 mg/L LC50 Lepomis macrochirus 96 h = 1.3 mg/L LC50 Poecilia reticulata 96 h = 2.4 mg/L LC50 Oryzias latipes 96 h = 0.823 - 1.61 mg/L LC50 Oncorhynchus mykiss 96 h	No information available	No information available
Solvent naphtha (petroleum), heavy arom.	= 45 mg/L LC50 Pimephales promelas 96 h = 1740 mg/L LC50 Lepomis macrochirus 96 h = 41 mg/L LC50 Pimephales promelas 96 h = 2.34 mg/L LC50 Oncorhynchus mykiss 96 h = 19 mg/L LC50 Pimephales promelas 96 h	= 2.5 mg/L EC50 Skeletonema costatum 72 h	= 0.95 mg/L EC50 Daphnia magna 48 h
2-Propen-1-aminium, N,N-dimethyl-N-2-propen-1-yl-, chloride (1:1), homopolymer	No information available	No information available	No information available
Naphthalene (Impurity)	= 31.0265 mg/L LC50 Lepomis macrochirus 96 h 0.91 - 2.82 mg/L LC50 Oncorhynchus mykiss 96 h = 1.6 mg/L LC50 Oncorhynchus mykiss 96 h 5.74 - 6.44 mg/L LC50 Pimephales promelas 96 h = 1.99 mg/L LC50 Pimephales promelas 96 h	= 0.4 mg/L EC50 Skeletonema costatum 72 h	= 2.16 mg/L LC50 Daphnia magna 48 h = 1.96 mg/L EC50 Daphnia magna 48 h 1.09 - 3.4 mg/L EC50 Daphnia magna 48 h

12.2 Persistence and degradability

No information available.

12.3 Bioaccumulative potential

No information available.

12.4 Mobility

The product is insoluble and floats on water.

12.5 Results of PBT and vPvB assessment

This preparation contains no substance considered to be persistent, bioaccumulating nor toxic (PBT)
This preparation contains no substance considered to be very persistent nor very bioaccumulating (vPvB)

12.6 Other adverse effects.

None known. Check for additional information in sect. 7.

13. Disposal Considerations**13.1 Waste treatment methods**

Disposal Method	Disposal should be made in accordance with federal, state and local regulations.
Contaminated packaging	Do not burn, or use a cutting torch on, the empty drum. Empty containers may contain flammable or explosive vapors. Empty containers should be taken for local recycling, recovery or waste disposal. Dispose of in accordance with local regulations.

14. Transport information**14.1. UN number**

UN No. (DOT)	UN1992
UN No. (MT/ANTT)	UN1992
UN No. (TDG)	UN1992
UN/ID No. (ADR/RID/ADN/ADG)	UN1992
UN No. (IMDG/ANTAQ)	UN1992
UN No. (ICAO/ANAC)	UN1992
UN No. (DPC)	UN1992

14.2. UN proper shipping name

FLAMMABLE LIQUID, TOXIC, N.O.S. (contains methanol),

Product (RQ): 1200 gallons (methanol)
(add RQ if shipped in containers >RQ for DOT only)

14.3 Hazard class(es)

DOT Hazard class	3(6.1)
ANTT Hazard class	3(6.1)
TDG Hazard class	3(6.1)
ADR/RID/ADN/ADG Hazard class	3(6.1)
IMDG/ANTAQ Hazard class	3(6.1)
ICAO/ANAC Hazard class/division	3(6.1)
DPC Hazard class	3(6.1)

14.4 Packing group

DOT Packing group	II
ANTT Packing group	II
TDG Packing group	II
ADR/RID/ADN/ADG Packing group	II
IMDG/ANTAQ Packing group	II
ICAO/ANAC Packing group	II
DPC Packing group	II

**14.5 Environmental hazard**

Marine pollutant

Yes, (Oxyalkylated alcohols)

14.6 Special precautions

Not applicable

14.7 Transport in bulk according to Annex I/II of MARPOL 73/78 and the IBC Code

Please contact SDS@slb.com for info regarding transport in Bulk.

15. Regulatory Information

International inventories

USA (TSCA)	Complies
Canada (DSL)	Complies
Philippines (PICCS)	Does not comply
Japan (ENCS)	Does not comply
China (IECSC)	Does not comply
Australia (AICS)	Does not comply
Korean (KECL)	Does not comply
New Zealand (NZIoC)	Does not comply

Europe - REACH

All products supplied from the European Economic Area (EEA) are compliant with the REACH Regulation EC 1907/2006. For products supplied from the EEA, Schlumberger and/or its suppliers have pre-registered and is registering all of the substances that it and/or its suppliers manufactures in or imports into the EEA that are subject to Title II of the REACH Regulation. All products supplied from outside the EEA are subject to REACH only if imported into the EEA. The importer of the products must comply with REACH for each imported substance. Contact REACH@slb.com for REACH information.

U.S. Federal and State Regulations**SARA 311/312 Hazard Categories**

Should this product meet EPCRA 311/312 Tier reporting criteria at 40 CFR 370, refer to Section 2 of this SDS for appropriate classifications. Under the amended regulations at 40 CFR 370, EPCRA 311/312 Tier II reporting for the 2017 calendar year will need to be consistent with updated hazard classifications.

Chemical Name	SARA 302 / TPQs	SARA 313	CERCLA RQ
Methanol	N/A	1.0 %	5000 lb final RQ 2270 kg final RQ
Oxirane, Methyl-, polymer with Oxirane	N/A	N/A	N/A
Alcohols, C7-9-iso-, C8-rich, ethoxylated	N/A	N/A	N/A
Alcohols, C9-11-iso-, C10-rich, ethoxylated	N/A	N/A	N/A
Alcohol, C11-14, ethoxylated	N/A	N/A	N/A

N,N-Dimethyl-N-dodecyl benzylammonium chloride	N/A	N/A	N/A
Solvent naphtha (petroleum), heavy arom.	N/A	N/A	N/A
2-Propen-1-aminium, N,N-dimethyl-N-2-propen-1-yl-, chloride (1:1), homopolymer	N/A	N/A	N/A
Naphthalene (Impurity)	N/A	0.1 %	100 lb final RQ 45.4 kg final RQ

California Proposition 65**WARNING**

This product can expose you to chemicals including those listed below, which is [are] known to the State of California to cause cancer, birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov

Chemical Name	California Proposition 65
Methanol 67-56-1	developmental toxicity
Naphthalene (Impurity) 91-20-3	carcinogen

Canadian Classification

This Safety Data Sheet has been prepared in compliance with the Hazardous Products Regulations.

16. Other Information

Supersedes date	29/Mar/2017
Revision date	08/Apr/2019
Version	13
This SDS has been revised in the following section(s)	All sections. Prepared in accordance with OSHA HAZCOM 2012. Prepared in accordance with WHMIS 2015
HMIS classification	
Health	3*
Flammability	3
Physical hazard	0
PPE	X

N/A - Not Applicable, N/D - Not Determined.

Disclaimer

The information contained herein is considered in good faith as reliable of the date issued and is based upon on measurements, tests or data derived from supplier's own study or furnished by others. In providing this SDS information, Supplier makes no express or implied warranties as to the information or product; merchantability or fitness of purpose; any express or implied warranty; or non-infringement of intellectual property rights; and supplier assumes no

responsibility for any direct, special or consequential damages, results obtained, or the activities of others. To the maximum extent permitted by law, supplier's warranty obligations and buyer's sole remedies are as stated in separate agreement between the parties.

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APPENDIX C

EMISSIONS ESTIMATES

Platform Gilda Well Stimulation Program
 CRITERIA POLLUTANTS & GREENHOUSE GAS EMISSIONS
 TABLE 1: Emissions Summary - Total Project Emissions

Model Date: October 8, 2025

Year -1 Emissions	Peak Day Emissions, lbs/day													Emissions, tons/year													
	NO _x	ROG	PM _{10E}	PM _{10D}	PM _{10T}	PM _{2.5E}	PM _{2.5D}	PM _{2.5T}	CO	SO ₂	N ₂ O	CH ₄	CO ₂	NO _x	ROG	PM _{10E}	PM _{10D}	PM _{10T}	PM _{2.5E}	PM _{2.5D}	PM _{2.5T}	CO	SO ₂	N ₂ O	CH ₄	CO ₂	
Well Stimulation Activities	767	22.7	12.9	0.000	12.9	12.6	0.000	12.6	894	1.85	2.29	5.08	209,077	5.55	0.121	0.141	0.000	0.141	0.138	0.000	0.138	4.37	0.009	0.019	0.022	1060	
Maximum Day Emissions lb/day	767	22.7	12.9	0.000	12.9	12.6	0.000	12.6	894	1.85	2.29	5.08	209,077	--	--	--	--	--	--	--	--	--	--	--	--	--	
VCAPCD CEQA Significance Thresholds, lbs/day	25	25	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Total Annual Emissions Tons														5.55	0.121	0.141	0.000	0.141	0.138	0.000	0.138	4.37	0.009	0.019	0.022	1,060	
VCAPCD NSR Thresholds, tons/year														5	5			15									
GHG - MTCO ₂ E conversions																							273	27.9	1		
Total GHG Emissions MTCO ₂ E/year																							967				
Year -2 Emissions	Peak Day Emissions, lbs/day													Emissions, tons/year													
	NO _x	ROG	PM _{10E}	PM _{10D}	PM _{10T}	PM _{2.5E}	PM _{2.5D}	PM _{2.5T}	CO	SO ₂	N ₂ O	CH ₄	CO ₂	NO _x	ROG	PM _{10E}	PM _{10D}	PM _{10T}	PM _{2.5E}	PM _{2.5D}	PM _{2.5T}	CO	SO ₂	N ₂ O	CH ₄	CO ₂	
Well Stimulation Activities	767	22.7	12.9	0.000	12.9	12.6	0.000	12.6	894	1.85	2.29	5.08	209,077	5.55	0.121	0.141	0.000	0.141	0.138	0.000	0.138	4.37	0.009	0.019	0.022	1060	
Maximum Day Emissions lb/day	767	22.7	12.9	0.000	12.9	12.6	0.000	12.6	894	1.85	2.29	5.08	209,077	--	--	--	--	--	--	--	--	--	--	--	--	--	
VCAPCD CEQA Significance Thresholds, lbs/day	25	25	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Total Annual Emissions Tons														5.55	0.121	0.141	0.000	0.141	0.138	0.000	0.138	4.37	0.009	0.019	0.022	1,060	
VCAPCD NSR Thresholds, tons/year														5	5			15									
GHG - MTCO ₂ E conversions																							273	27.9	1		
Total GHG Emissions MTCO ₂ E/year																							967				
Year -3 Emissions	Peak Day Emissions, lbs/day													Emissions, tons/year													
	NO _x	ROG	PM _{10E}	PM _{10D}	PM _{10T}	PM _{2.5E}	PM _{2.5D}	PM _{2.5T}	CO	SO ₂	N ₂ O	CH ₄	CO ₂	NO _x	ROG	PM _{10E}	PM _{10D}	PM _{10T}	PM _{2.5E}	PM _{2.5D}	PM _{2.5T}	CO	SO ₂	N ₂ O	CH ₄	CO ₂	
Well Stimulation Activities	767	22.7	12.9	0.000	12.9	12.6	0.000	12.6	894	1.85	2.29	5.08	209,077	4.71	0.097	0.135	0.000	0.135	0.131	0.000	0.131	3.34	0.007	0.017	0.016	833	
Maximum Day Emissions lb/day	767	22.7	12.9	0.000	12.9	12.6	0.000	12.6	894	1.85	2.29	5.08	209,077	--	--	--	--	--	--	--	--	--	--	--	--	--	
VCAPCD CEQA Significance Thresholds, lbs/day	25	25	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Total Annual Emissions Tons														4.71	0.097	0.135	0.000	0.135	0.131	0.000	0.131	3.34	0.007	0.017	0.016	833	
VCAPCD NSR Thresholds, tons/year														5	5			15									
GHG - MTCO ₂ E conversions																							273	27.9	1		
Total GHG Emissions MTCO ₂ E/year																							760				
Total Yealy - Emissions	Peak Day Emissions, lbs/day													Emissions, tons													
	NO _x	ROG	PM _{10E}	PM _{10D}	PM _{10T}	PM _{2.5E}	PM _{2.5D}	PM _{2.5T}	CO	SO ₂	N ₂ O	CH ₄	CO ₂	NO _x	ROG	PM _{10E}	PM _{10D}	PM _{10T}	PM _{2.5E}	PM _{2.5D}	PM _{2.5T}	CO	SO ₂	N ₂ O	CH ₄	CO ₂	
Maximum Day Emissions lb/day	767	22.7	12.9	0.000	12.9	12.6	0.000	12.6	894	1.85	2.29	5.08	209,077	--	--	--	--	--	--	--	--	--	--	--	--	--	
Total Emissions Tons/week														15.8	0.338	0.417	0.000	0.417	0.406	0.000	0.406	12.1	0.026	0.055	0.060	2,952	
GHG - MTCO ₂ E conversions																							273	27.9	1		
Total GHG Emissions MTCO ₂ E																							2,693				

Notes:

- CH₄ - Methane
- CO - Carbon Monoxide
- CO₂ - Carbon Dioxide
- MTCO₂E - Metric Tons of Carbon Dioxide Equivalent
- N₂O - Nitrous Oxide
- NO_x - Oxides of Nitrogen
- PM_{2.5D} - Particulate Matter 10 Microns or Less from dust
- PM_{2.5E} - Particulate Matter 10 Microns or Less from exhaust
- PM_{2.5T} - Total Particulate Matter 10 Microns or Less
- PM_{10D} - Particulate Matter 10 Microns or Less from dust
- PM_{10E} - Particulate Matter 10 Microns or Less from exhaust
- PM_{10T} - Total Particulate Matter 10 Microns or Less
- ROG - Reactive Organic Gases
- VCAPCD - Ventura County Air Pollution Control District
- SO₂ - Sulfur Dioxide

10 Bold text and purple shading indicates that a criteria pollutant is above the VCAPCD threshold.

-- Not Available or Applicable.

**Platform Gilda Well Stimulation Program
CRITERIA POLLUTANTS & GREENHOUSE GAS EMISSIONS
TABLE 4: Year 1 Emissions**

On-Site Sources - Equipment Operations

Source	BHP	Load Factor	Number	Hours/ Day	Duration (days)	Emission Factors (g/bhp-hr)								Peak Day Emissions (lbs/day)								Total Emissions (tons)										
						NO _x	ROG	PM ₁₀	PM _{2.5}	CO	SO ₂	N ₂ O	CH ₄	CO ₂	NO _x	ROG	PM ₁₀	PM _{2.5}	CO	SO ₂	N ₂ O	CH ₄	CO ₂	NO _x	ROG	PM ₁₀	PM _{2.5}	CO	SO ₂	N ₂ O	CH ₄	CO ₂
Frac Pump-1 (frac)	1,650	74	1	24	10.5	2.240	0.060	0.016	0.016	2.600	0.005	0.004	0.016	568	144.7	3.876	1.034	1.034	168	0.323	0.271	1.034	36714	0.760	0.020	0.005	0.005	0.882	0.002	0.001	0.005	193
Frac Pump-2 (frac)	1,650	74	1	24	10.5	2.240	0.060	0.016	0.016	2.600	0.005	0.004	0.016	568	144.7	3.876	1.034	1.034	168	0.323	0.271	1.034	36714	0.760	0.020	0.005	0.005	0.882	0.002	0.001	0.005	193
Frac Pump-3 (frac)	1,650	74	1	24	10.5	2.240	0.060	0.016	0.016	2.600	0.005	0.004	0.016	568	144.7	3.876	1.034	1.034	168	0.323	0.271	1.034	36714	0.760	0.020	0.005	0.005	0.882	0.002	0.001	0.005	193
Gel Hydration Unit	456	74	1	24	4.7	0.260	0.060	0.008	0.008	2.200	0.005	0.004	0.014	568	4.642	1.071	0.143	0.143	39.279	0.089	0.075	0.250	10146	0.011	0.002	0.000	0.000	0.092	0.000	0.000	0.001	23.677
Gravel Pack Blender	575	74	1	24	1.2	0.260	0.060	0.008	0.008	2.200	0.005	0.004	0.014	568	5.853	1.351	0.180	0.180	49.529	0.113	0.095	0.315	12794	0.003	0.001	0.000	0.000	0.029	0.000	0.000	0.000	7.466
Gravel Pack Pump	520	74	1	24	1.2	0.260	0.060	0.008	0.008	2.200	0.005	0.004	0.014	568	5.294	1.222	0.163	0.163	44.792	0.102	0.086	0.285	11571	0.003	0.001	0.000	0.000	0.026	0.000	0.000	0.000	6.751
POD Frac Blender	575	74	1	24	3.5	0.260	0.060	0.008	0.008	2.200	0.005	0.004	0.014	568	5.853	1.351	0.180	0.180	49.529	0.113	0.095	0.315	12794	0.010	0.002	0.000	0.000	0.087	0.000	0.000	0.001	22.390
Primary & Backup Diesel Generator-1	755	74	1	24	9.3	2.240	0.060	0.016	0.016	2.600	0.005	0.004	0.013	568	66.217	1.774	0.473	0.473	76.859	0.148	0.124	0.384	16800	0.309	0.008	0.002	0.002	0.359	0.001	0.001	0.002	78.370
Primary & Backup Diesel Generator-2	755	74	1	24	9.3	2.240	0.060	0.016	0.016	2.600	0.005	0.004	0.013	568	66.217	1.774	0.473	0.473	76.859	0.148	0.124	0.384	16800	0.309	0.008	0.002	0.002	0.359	0.001	0.001	0.002	78.370
WMT Generator-1	49	43	1	0	0	4.630	0.290	0.280	0.280	4.100	0.007	0.004	0.039	568	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WMT Generator-2	49	43	1	0	0	4.630	0.290	0.280	0.280	4.100	0.007	0.004	0.039	568	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
WMT Vessel Main-1	803	50	1	10	29.3	5.048	0.071	0.230	0.223	1.491	0.005	0.025	0.001	509	44.686	0.626	2.040	1.977	13.201	0.041	0.219	0.012	4507	0.655	0.009	0.030	0.029	0.194	0.001	0.003	0.000	66.108
WMT Vessel Main-2	803	50	1	10	29.3	5.048	0.071	0.230	0.223	1.491	0.005	0.025	0.001	509	44.686	0.626	2.040	1.977	13.201	0.041	0.219	0.012	4507	0.655	0.009	0.030	0.029	0.194	0.001	0.003	0.000	66.108
WMT Vessel Main-3	803	50	1	10	29.3	5.048	0.071	0.230	0.223	1.491	0.005	0.025	0.001	509	44.686	0.626	2.040	1.977	13.201	0.041	0.219	0.012	4507	0.655	0.009	0.030	0.029	0.194	0.001	0.003	0.000	66.108
WMT Vessel Main-4	803	50	1	10	29.3	5.048	0.071	0.230	0.223	1.491	0.005	0.025	0.001	509	44.686	0.626	2.040	1.977	13.201	0.041	0.219	0.012	4507	0.655	0.009	0.030	0.029	0.194	0.001	0.003	0.000	66.108
Total						767.0	22.7	12.9	12.6	893.6	1.846	2.289	5.082	209,077	5.546	0.121	0.141	0.138	4.370	0.009	0.019	0.022	1059.7									

Notes:

*Hours per day and durations estimated or provided by client.

*Refer to Table 5 for emission and load factor sources.

**Platform Gilda Well Stimulation Program
CRITERIA POLLUTANTS & GREENHOUSE GAS EMISSIONS
TABLE 4: Year 2 Emissions**

On-Site Sources - Equipment Operations

Source	BHP	Load Factor	Number	Hours/ Day	Duration (days)	Emission Factors (g/bhp-hr)								Peak Day Emissions (lbs/day)								Total Emissions (tons)										
						NO _x	ROG	PM ₁₀	PM _{2.5}	CO	SO ₂	N ₂ O	CH ₄	CO ₂	NO _x	ROG	PM ₁₀	PM _{2.5}	CO	SO ₂	N ₂ O	CH ₄	CO ₂	NO _x	ROG	PM ₁₀	PM _{2.5}	CO	SO ₂	N ₂ O	CH ₄	CO ₂
Frac Pump-1 (frac)	1,650	74	1	24	10.5	2.240	0.060	0.016	0.016	2.600	0.005	0.004	0.016	568	144.7	3.876	1.034	1.034	168	0.323	0.271	1.034	36714	0.760	0.020	0.005	0.005	0.882	0.002	0.001	0.005	193
Frac Pump-2 (frac)	1,650	74	1	24	10.5	2.240	0.060	0.016	0.016	2.600	0.005	0.004	0.016	568	144.7	3.876	1.034	1.034	168	0.323	0.271	1.034	36714	0.760	0.020	0.005	0.005	0.882	0.002	0.001	0.005	193
Frac Pump-3 (frac)	1,650	74	1	24	10.5	2.240	0.060	0.016	0.016	2.600	0.005	0.004	0.016	568	144.7	3.876	1.034	1.034	168	0.323	0.271	1.034	36714	0.760	0.020	0.005	0.005	0.882	0.002	0.001	0.005	193
Gel Hydration Unit	456	74	1	24	4.7	0.260	0.060	0.008	0.008	2.200	0.005	0.004	0.014	568	4.642	1.071	0.143	0.143	39.279	0.089	0.075	0.250	10146	0.011	0.002	0.000	0.000	0.092	0.000	0.000	0.001	23.677
Gravel Pack Blender	575	74	1	24	1.2	0.260	0.060	0.008	0.008	2.200	0.005	0.004	0.014	568	5.853	1.351	0.180	0.180	49.529	0.113	0.095	0.315	12794	0.003	0.001	0.000	0.000	0.029	0.000	0.000	0.000	7.466
Gravel Pack Pump	520	74	1	24	1.2	0.260	0.060	0.008	0.008	2.200	0.005	0.004	0.014	568	5.294	1.222	0.163	0.163	44.792	0.102	0.086	0.285	11571	0.003	0.001	0.000	0.000	0.026	0.000	0.000	0.000	6.751
POD Frac Blender	575	74	1	24	3.5	0.260	0.060	0.008	0.008	2.200	0.005	0.004	0.014	568	5.853	1.351	0.180	0.180	49.529	0.113	0.095	0.315	12794	0.010	0.002	0.000	0.000	0.087	0.000	0.000	0.001	22.390
Primary & Backup Diesel Generator-1	755	74	1	24	9.3	2.240	0.060	0.016	0.016	2.600	0.005	0.004	0.013	568	66.217	1.774	0.473	0.473	76.859	0.148	0.124	0.384	16800	0.309	0.008	0.002	0.002	0.359	0.001	0.001	0.002	78.370
Primary & Backup Diesel Generator-2	755	74	1	24	9.3	2.240	0.060	0.016	0.016	2.600	0.005	0.004	0.013	568	66.217	1.774	0.473	0.473	76.859	0.148	0.124	0.384	16800	0.309	0.008	0.002	0.002	0.359	0.001	0.001	0.002	78.370
WMT Generator-1	49	43	1	0	0	4.630	0.290	0.280	0.280	4.100	0.007	0.004	0.039	568	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WMT Generator-2	49	43	1	0	0	4.630	0.290	0.280	0.280	4.100	0.007	0.004	0.039	568	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
WMT Vessel Main-1	803	50	1	10	29.3	5.048	0.071	0.230	0.223	1.491	0.005	0.025	0.001	509	44.686	0.626	2.040	1.977	13.201	0.041	0.219	0.012	4507	0.655	0.009	0.030	0.029	0.194	0.001	0.003	0.000	66.108
WMT Vessel Main-2	803	50	1	10	29.3	5.048	0.071	0.230	0.223	1.491	0.005	0.025	0.001	509	44.686	0.626	2.040	1.977	13.201	0.041	0.219	0.012	4507	0.655	0.009	0.030	0.029	0.194	0.001	0.003	0.000	66.108
WMT Vessel Main-3	803	50	1	10	29.3	5.048	0.071	0.230	0.223	1.491	0.005	0.025	0.001	509	44.686	0.626	2.040	1.977	13.201	0.041	0.219	0.012	4507	0.655	0.009	0.030	0.029	0.194	0.001	0.003	0.000	66.108
WMT Vessel Main-4	803	50	1	10	29.3	5.048	0.071	0.230	0.223	1.491	0.005	0.025	0.001	509	44.686	0.626	2.040	1.977	13.201	0.041	0.219	0.012	4507	0.655	0.009	0.030	0.029	0.194	0.001	0.003	0.000	66.108
Total						767	22.7	12.9	12.6	894	1.846	2.289	5.082	209,077	5.546	0.121	0.141	0.138	4.370	0.009	0.019	0.022	1059.7									

Notes:

*Hours per day and durations estimated or provided by client.

*Refer to Table 5 for emission and load factor sources.

Platform Gilda Well Stimulation Program
CRITERIA POLLUTANTS & GREENHOUSE GAS EMISSIONS
TABLE 4: Year 1 Emissions

On-Site Sources - Equipment Operations

Source	BHP	Load Factor	Number	Hours/Day	Duration (days)	Emission Factors (g/bhp-hr)								Peak Day Emissions (lbs/day)								Total Emissions (tons)										
						NO _x	ROG	PM ₁₀	PM _{2.5}	CO	SO ₂	N ₂ O	CH ₄	CO ₂	NO _x	ROG	PM ₁₀	PM _{2.5}	CO	SO ₂	N ₂ O	CH ₄	CO ₂	NO _x	ROG	PM ₁₀	PM _{2.5}	CO	SO ₂	N ₂ O	CH ₄	CO ₂
Frac Pump-1 (frac)	1,650	74	1	24	7.5	2.240	0.060	0.016	0.016	2.600	0.005	0.004	0.016	568	144.7	3.876	1.034	1.034	168	0.323	0.271	1.034	36714	0.543	0.015	0.004	0.004	0.630	0.001	0.001	0.004	138
Frac Pump-2 (frac)	1,650	74	1	24	7.5	2.240	0.060	0.016	0.016	2.600	0.005	0.004	0.016	568	144.7	3.876	1.034	1.034	168	0.323	0.271	1.034	36714	0.543	0.015	0.004	0.004	0.630	0.001	0.001	0.004	138
Frac Pump-3 (frac)	1,650	74	1	24	7.5	2.240	0.060	0.016	0.016	2.600	0.005	0.004	0.016	568	144.7	3.876	1.034	1.034	168	0.323	0.271	1.034	36714	0.543	0.015	0.004	0.004	0.630	0.001	0.001	0.004	138
Gel Hydration Unit	456	74	1	24	3.3	0.260	0.060	0.008	0.008	2.200	0.005	0.004	0.014	568	4.642	1.071	0.143	0.143	39.279	0.089	0.075	0.250	10146	0.008	0.002	0.000	0.000	0.065	0.000	0.000	0.000	16.909
Gravel Pack Blender	575	74	1	24	0.8	0.260	0.060	0.008	0.008	2.200	0.005	0.004	0.014	568	5.853	1.351	0.180	0.180	49.529	0.113	0.095	0.315	12794	0.002	0.001	0.000	0.000	0.021	0.000	0.000	0.000	5.329
Gravel Pack Pump	520	74	1	24	0.8	0.260	0.060	0.008	0.008	2.200	0.005	0.004	0.014	568	5.294	1.222	0.163	0.163	44.792	0.102	0.086	0.285	11571	0.002	0.001	0.000	0.000	0.019	0.000	0.000	0.000	4.819
POD Frac Blender	575	74	1	24	2.5	0.260	0.060	0.008	0.008	2.200	0.005	0.004	0.014	568	5.853	1.351	0.180	0.180	49.529	0.113	0.095	0.315	12794	0.007	0.002	0.000	0.000	0.062	0.000	0.000	0.000	15.993
Primary & Backup Diesel Generator-1	755	74	1	24	6.7	2.240	0.060	0.016	0.016	2.600	0.005	0.004	0.013	568	66.217	1.774	0.473	0.473	76.859	0.148	0.124	0.384	16800	0.221	0.006	0.002	0.002	0.256	0.000	0.000	0.001	56.001
Primary & Backup Diesel Generator-2	755	74	1	24	6.7	2.240	0.060	0.016	0.016	2.600	0.005	0.004	0.013	568	66.217	1.774	0.473	0.473	76.859	0.148	0.124	0.384	16800	0.221	0.006	0.002	0.002	0.256	0.000	0.000	0.001	56.001
WMT Generator-1	49	43	1	0	0	4.630	0.290	0.280	0.280	4.100	0.007	0.004	0.039	568	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WMT Generator-2	49	43	1	0	0	4.630	0.290	0.280	0.280	4.100	0.007	0.004	0.039	568	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
WMT Vessel Main-1	803	50	1	10	29.3	5.048	0.071	0.230	0.223	1.491	0.005	0.025	0.001	509	44.686	0.626	2.040	1.977	13.201	0.041	0.219	0.012	4507	0.655	0.009	0.030	0.029	0.194	0.001	0.003	0.000	66.108
WMT Vessel Main-2	803	50	1	10	29.3	5.048	0.071	0.230	0.223	1.491	0.005	0.025	0.001	509	44.686	0.626	2.040	1.977	13.201	0.041	0.219	0.012	4507	0.655	0.009	0.030	0.029	0.194	0.001	0.003	0.000	66.108
WMT Vessel Main-3	803	50	1	10	29.3	5.048	0.071	0.230	0.223	1.491	0.005	0.025	0.001	509	44.686	0.626	2.040	1.977	13.201	0.041	0.219	0.012	4507	0.655	0.009	0.030	0.029	0.194	0.001	0.003	0.000	66.108
WMT Vessel Main-4	803	50	1	10	29.3	5.048	0.071	0.230	0.223	1.491	0.005	0.025	0.001	509	44.686	0.626	2.040	1.977	13.201	0.041	0.219	0.012	4507	0.655	0.009	0.030	0.029	0.194	0.001	0.003	0.000	66.108
Total						767	22.7	12.9	12.6	894	1.846	2.289	5.082	209,077	4.711	0.097	0.135	0.131	3.343	0.007	0.017	0.016	832.5									

Notes:

*Hours per day and durations estimated or provided by client.

*Refer to Table 5 for emission and load factor sources.

Platform Gilda Well Stimulation Program
CRITERIA POLLUTANTS & GREENHOUSE GAS EMISSIONS
TABLE 5: Emission Factors and Assumptions

Onsite				Emission Factors(g/bhp-hr)									Emission Factors(lbs/bhp-hr)								
Source	Tier	Operational Horsepower	Load Factor	NO _x	ROG	PM ₁₀	PM _{2.5}	CO	SO ₂	N ₂ O	CH ₄	CO ₂	NO _x	ROG	PM ₁₀	PM _{2.5}	CO	SO ₂	N ₂ O	CH ₄	CO ₂
Frac Pump-1 (frac)	4	1650	74	2.240	0.060	0.016	0.016	2.600	0.005	0.0042	0.016	568	0.0049	0.0001	0.0000	0.0000	0.0057	0.00001	0.00001	0.00004	1.2529
Frac Pump-2 (frac)	4	1650	74	2.240	0.060	0.016	0.016	2.600	0.005	0.0042	0.016	568	0.0049	0.0001	0.0000	0.0000	0.0057	0.00001	0.00001	0.00004	1.2529
Frac Pump-3 (frac)	4	1650	74	2.240	0.060	0.016	0.016	2.600	0.005	0.0042	0.016	568	0.0049	0.0001	0.0000	0.0000	0.0057	0.00001	0.00001	0.00004	1.2529
Gel Hydration Unit	4	456	74	0.260	0.060	0.008	0.008	2.200	0.005	0.0042	0.014	568	0.0006	0.0001	0.0000	0.0000	0.0049	0.00001	0.00001	0.00003	1.2529
Gravel Pack Blender	4	575	74	0.260	0.060	0.008	0.008	2.200	0.005	0.0042	0.014	568	0.0006	0.0001	0.0000	0.0000	0.0049	0.00001	0.00001	0.00003	1.2529
Gravel Pack Pump	4	520	74	0.260	0.060	0.008	0.008	2.200	0.005	0.0042	0.014	568	0.0006	0.0001	0.0000	0.0000	0.0049	0.00001	0.00001	0.00003	1.2529
POD Frac Blender	4	575	74	0.260	0.060	0.008	0.008	2.200	0.005	0.0042	0.014	568	0.0006	0.0001	0.0000	0.0000	0.0049	0.00001	0.00001	0.00003	1.2529
Primary & Backup Diesel Generator-1	4	755	74	2.24	0.060	0.016	0.016	2.600	0.005	0.0042	0.013	568	0.0049	0.0001	0.0000	0.0000	0.0057	0.00001	0.00001	0.00003	1.2529
Primary & Backup Diesel Generator-2	4	755	74	2.24	0.060	0.016	0.016	2.600	0.005	0.0042	0.013	568	0.0049	0.0001	0.0000	0.0000	0.0057	0.00001	0.00001	0.00003	1.2529
WMT Generator-1	3	49	43	4.63	0.290	0.280	0.280	4.100	0.007	0.0042	0.039	568	0.0102	0.0006	0.0006	0.0006	0.0090	0.00002	0.00001	0.00009	1.2529
WMT Generator-2	3	49	43	4.63	0.290	0.280	0.280	4.100	0.007	0.0042	0.039	568	0.0102	0.0006	0.0006	0.0006	0.0090	0.00002	0.00001	0.00009	1.2529
WMT Vessel Main-1	3	803	50	5.05	0.071	0.230	0.223	1.491	0.005	0.0248	0.001	509	0.0111	0.0002	0.0005	0.0005	0.0033	0.00001	0.00005	0.00000	1.1226
WMT Vessel Main-2	3	803	50	5.05	0.071	0.230	0.223	1.491	0.005	0.0248	0.001	509	0.0111	0.0002	0.0005	0.0005	0.0033	0.00001	0.00005	0.00000	1.1226
WMT Vessel Main-3	3	803	50	5.05	0.071	0.230	0.223	1.491	0.005	0.0248	0.001	509	0.0111	0.0002	0.0005	0.0005	0.0033	0.00001	0.00005	0.00000	1.1226
WMT Vessel Main-4	3	803	50	5.05	0.071	0.230	0.223	1.491	0.005	0.0248	0.001	509	0.0111	0.0002	0.0005	0.0005	0.0033	0.00001	0.00005	0.00000	1.1226

Notes:
Emission Factors and load factors for construction equipment obtained from CalEEMod 2020, Appendix D, CalEEMod 2021, Appendix G
Vessel emission factors and load factors were obtained from MARPOL Regulations, EPA Port Emissions Inventory Guidance and CalEEMod 2020
N₂O emissions factors for equipment obtained from State and Federal Mandatory Reporting Rule, Table 6 and based on an average of N₂O offroad diesel engine emissions factors from obtained from CalEEMod 2022, Appendix G.
Horsepower for vessels and equipment obtained from client.

**GREENHOUSE GAS LIFECYCLE ENERGY EMISSIONS
MODEL (GLEEM) SPREADSHEETS**

Overview

Fuel	Production (bbls, MCF)	CO2, Upstream (Metric Tons)	CH4, Upstream (Metric Tons)	N2O, Upstream (Metric Tons)	CO2, Midstream (Metric Tons)	CH4, Midstream (Metric Tons)	N2O, Midstream (Metric Tons)	CO2, Downstream (Metric Tons)	CH4, Downstream (Metric Tons)
Oil Production	14,218,660	2,678	0.0545	0.0495	55,283	635	0.546	4,569,705	194
Gas Production	13,081,167				11,217	1,005	0.015	687,926	13
Total Production	N/A	2,678	0.0545	0.0495	66,501	1,640	0.562	5,257,631	207
Oil Substitutions	N/A				-	-	-	-	-
Gas Substitutions	N/A				-	-	-	-	-
Total Substitutions	N/A				-	-	-	-	-

Substitution Rates

Substitute Sources	Oil Production Substitutes (Percent)	Natural Gas Production Substitutes (Percent)	Oil Production Substitutes (bbls, mcf, short tons)	Natural Gas Substitutes (bbls, mcf, short tons)
Oil	0	0	-	-
Natural Gas	0	0	-	-
Coal	0	0	-	-

Industry Data

Column1	CO2 (Millions of Metric Tons)	CH4 (Millions of Metric Tons)	N2O (Millions of Metric Tons)	Not Combusted (Ratio)	Processing Gain (Ratio)	National Production (1000s of bbls, millions of cubic feet, thousands of short tons)
Oil	2.8732	0.033	0.0000284	0.1909	0.059	738979
Natural Gas	27.873	2.498	0.0000375	0.034		32504000
Coal	0	0.22	0	0.0011		426509

Downstream EFs

Oil Products	Production (thousands of bbls per day)	CO2 (kg/gallon)	CH4 (kg/gallon)	N2O (kg/gallon)
Asphalt/Road Oil	368	11.91	0.00047	0.00009
Aviation Gasoline	11	8.13	0.00036	0.00007
Distillate Fuel Oil	3916	10.45	0.00042	0.00008
Jet Fuel	1653	9.75	0.00041	0.00008
Kerosene	11	10.15	0.00041	0.00008
Propane	747	5.72	0.00027	0.00005
Propylene	276	6.17	0.00027	0.00005
HGL	2482	5.68	0.00028	0.00006
Lubricants	83	10.69	0.00043	0.00009
Motor Gasoline	8945	8.78	0.00038	0.00008
Petroleum Coke	253	14.64	0.00043	0.00009
Residual Fuel Oil	274	10.74	0.00044	0.00009
Other	1256	10.59	0.00042	0.00008
Weighted Average	20275	8.93	0.00	0.00

Natural Gas Product	Production (thousands of cubic feet)	CO2 (kg/thousands cubic feet)	CH4 (kg/thousands cubic feet)	N2O (kg/thousands cubic feet)
Natural Gas	33105000	54.44	0.00103	0.0001

Coal Products	Production (thousands of short tons)	CO2 (kg/short ton)	CH4 (kg/short ton)	N2O (kg/short ton)
Commerical Sector	594	2016	0.235	0.034
Electric Power Sector	373803	1885	0.217	0.032
Industrial Sector	21444	2116	0.246	0.036
Industrial Coking	15514	2468	0.289	0.042
Weighted Average	411355	1919	0.221	0.033

Multitype Fuels

Distilate Fuel Oil 2	10.21	0.00041	0.00008
Distilate Fuel Oil Average	10.45	0.000423333	8.33333E-05

Multitype Fuel	CO2 (kg/gallon)	CH4 (kg/gallon)	N2O (kg/gallon)
Residual Fuel Oil 5	10.21	0.00042	0.00008
Residual Fuel Oil 6	11.27	0.00045	0.00009
Residual Fuel Oil Average	10.74	0.000435	0.000085

Conversion Factors

Conversion	Value
1 oil bbl to BTUs	5800000
1 natural gas mcf to BTUs	1032000
1 short ton coal to BTUs	20387000
1 kg to metric tons	1000
1 bbl to gallons	42
CO2 to 100-year AR6 CO2e	1
CH4 to 100-year AR6 CO2e	30.0
N2O to 100-year AR6 CO2e	273

APPENDIX D

BIOLOGICAL ASSESSMENT

BIOLOGICAL ASSESSMENT

PLATFORM GILDA WELL STIMULATION: HYDRAULIC FRACTURING OFFSHORE VENTURA COUNTY

Project No. 2502-2681

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APPENDICES

Appendix A – Official Species Lists

LIST OF ACRONYMS AND ABBREVIATIONS

BA	Biological Assessment
BIA	Biologically Important Areas
BOEM	Bureau of Ocean Energy Management
BOPs	Blowout Preventers
BPM	Barrels Per Minute
BSEE	Bureau of Safety and Environmental Enforcement
CDFW	California Department of Fish and Wildlife
CFR	Code of Federal Regulations
CPS	Coastal Pelagic Species
DCOR	Dos Quadros Offshore Resources
DFIT	Diagnostic Fracture Injection Test
DPS	Distinct Population Segment
ESA	Endangered Species Act
ESCA	Endangered Species Conservation Act
ESDV	Emergency Shutdown Valve
ESHA	Environmentally Sensitive Habitat Areas
FESA	Federal Endangered Species Act
FMP	Fishery Management Plan
FOIA	Freedom of Information Act
FR	Federal Register
ft	feet
GIS	Geographic Information Systems
JOFLO	Joint Oil Fisheries Liaison Office
MARINe	Multi-Agency Rocky Intertidal Network
mi	miles
MMPA	Marine Mammal Protection Act
MPAs	Marine Protected Areas
Mph	miles per hour
MSDS	Material Safety Data Sheet
NAS	Non-Native Aquatic Species
NEPA	National Environmental Policy Act
Nm	Nautical miles
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NWFP	Northwest Forest Plan
OCS	Outer Continental Shelf
ONMS	Office of National Marine Sanctuaries
OSRCP	Oil Spill Response and Contingency Plan
PCE	Primary Constituent Element
PISCO	Partnership of Interdisciplinary Studies of Coastal Oceans
PSG	Pacific Seabird Group
ROV	Remote Operated Vehicle

SCUBA	Self-Contained Underwater Breathing Apparatus
SEL	Sound Exposure Level
SEMS	Safety and Environmental Management System
SMCA	State Marine Conservation Area
SMR	State Marine Reserve
SMRMA	State Marine Recreational Management Area
TSS	Traffic Separation Scheme
U.S.	United States
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
USGS	U.S. Geological Survey
WNP	Western North Pacific

1.0 INTRODUCTION

The following Biological Assessment (BA) has been prepared on behalf of Dos Quadros Offshore Resources (DCOR) in support of the Platform Gilda Update to Development and Production Plan and Environmental Report; Well Stimulation (Hydraulic Fracturing) Program (Program). The BA has been prepared to evaluate the potential effect that the proposed action may have on federally threatened, endangered, or proposed species described in this document.

Padre Associates, Inc. (Padre) has prepared this BA in accordance with legal requirements set forth under Section 7 of the Federal Endangered Species Act (FESA, 16 U.S.C. 1536[c]) and certifies that the information contained within is based on the best scientific and commercial data available. In addition, the BA follows the standard established by the National Environmental Policy Act (NEPA) and FESA guidance. This BA is prepared in accordance with the United States (U.S.) Marine Mammal Protection Act (MMPA) of 1972, amended in 1994, which protects all marine mammals by prohibiting intentional killing or harassment of cetaceans, pinnipeds, and sirenians. The species considered in this document were based on information obtained from National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) protected species list for the offshore Program area.

1.1 PROPOSED ACTION AND LOCATION

Platform Gilda (OCS P-0216) is located on the Pacific Outer Continental Shelf (OCS), approximately nine miles (mi) southwest of Ventura, California in the Santa Barbara Channel, and lies within the Santa Clara Unit of federal OCS leases (Figure 1-1). The Platform was installed in 1981 in approximately 205 feet (ft) of water and has operated continuously since its installation. The original DPP and Environmental Report were prepared by Union Oil Company of California in November 1979 and approved by the U.S. Geological Survey in December 1980. A modest update to the DPP was submitted in October 1985 and approved in July 1986.

These earlier documents supported the development and production of multiple geologic formations, including the Pico, Repetto, and Monterey Formations. The proposed Program builds upon the existing documents and incorporates new well stimulation activities, specifically hydraulic fracturing of 16 wells, designed to increase reservoir permeability in order to optimize hydrocarbon recovery.

Figure 1-1. Program Location



1.2 PROGRAM PURPOSE AND METHODOLOGY

The purpose of the proposed well stimulation Program is to improve hydrocarbon recovery from low-permeability zones by increasing effective reservoir permeability and bypassing near-wellbore formation damage. Hydraulic fracturing, a method of well stimulation, achieves this by injecting fluids at high pressure into the target formation to create small, controlled fractures in the rock. Once the fractures are initiated, a proppant (high-grade silica sand) is carried into the formation by the fracturing fluid. The proppant remains in the fractures after pressure is released, holding them open to maintain improved flow paths for hydrocarbons.

The proposed stimulation method involves frac packing, which combines hydraulic fracturing with gravel packing. During a frac pack, the fracking fluid is injected to fracture the formation, while sand control screens are installed across the perforated interval. Proppant is placed both in the fracture and in the annulus between the casing and screen to form a stable gravel pack. This technique provides both productivity enhancement and sand control, making it well-suited to the unconsolidated sands of the proposed formations.

Each treatment will be preceded by a Diagnostic Fracture Injection Test (DFIT) to collect formation-specific pressure and fracture gradient data. This information is used to calibrate stimulation designs using reservoir modeling software.

All flowback fluid generated during stimulation activities will be routed through a closed-loop handling system and retained on the Platform. Fluids will be re-injected into existing injection wells on the Platform, and no offshore discharge of flowback fluids will occur. Solid waste, such as residual sand or other materials, will be separated and contained for transport to a licensed onshore disposal facility. All waste will be disposed of in accordance with the currently approved National Pollutant Discharge Elimination System (NPDES) permit.

1.3 DESCRIPTION OF EXISTING CONDITIONS

1.3.1 Geologic Setting

The Santa Clara Field is located within the offshore portion of the Santa Barbara-Ventura Basin, a structural and sedimentary basin known for prolific oil and gas production (Galloway, 1998). The basin is characterized by a series of east-west trending folding and faulting resulting from compressional tectonics. Within this setting, the Santa Clara Field is situated along the crest and northern flank of a broad east-west trending anticline.

Both structural and stratigraphic traps control hydrocarbon accumulation in the Santa Clara Field. The southern boundary of the field is defined by the World's End Reverse Fault system, which acts as a trapping structure for the field and exhibits up to 500 ft of vertical displacement based on seismic depth mapping conducted in 2015. The Oakridge Fault, another significant regional thrust fault, lies approximately 2.5 mi north of Platform Gilda. Additional mapped faults in the area include the Mid Channel Fault and Montalvo Fault, both located more than 2 mi from the Platform and not intersecting the zones proposed for stimulation. Stratigraphic traps are also present within the field, formed by the lateral thinning and pinch-out of geologic units.

1.3.2 Stratigraphy and Reservoir Characteristics

The Santa Clara Field produces from several formations, each exhibiting different lithologic and production characteristics:

Pico Formation. The Pico Formation is Pliocene in age and is composed of gas-bearing sands deposited in submarine fan systems. While present across the field, the Pico has not been a primary focus of stimulation activity to date.

Repetto Formation. Underlying the Pico Formation and also Pliocene in age, the Repetto Formation is subdivided into Upper and Lower intervals. It is composed of sand-rich submarine fan deposits that prograde westward into the basin from the north and east. Together with the Pico Formation, the Repetto Formation can range between 5,000 and 10,000 ft thick. The Repetto Formation is the primary target of the proposed stimulation Program due to its extensive oil-bearing intervals and moderate to low permeability.

Within the Upper Repetto Formation, eight subzones have been identified (progressing deeper): LP-B, LP-B1, LP-B2, LP-C, LP-C1, LP-C2, LP-C4, and LP-C5. These subzones consist of sand-rich channels and fan-lobe deposits interbedded with mudstones. Deeper sandstone subzones thin and pinch out to the north, creating stratigraphic traps, while shallower subzones pinch out progressively farther south due to southward migration of submarine fan deposition. Where pinch-outs are absent, the World's End Fault system serves as the primary structural trap for hydrocarbons. The average overburden-corrected core porosity is 24.3%, and permeability averages 88 millidarcies (md), with the best reservoir quality found in subzones LP-B and LP-C4.

The Lower Repetto Formation contains five subzones (progressing deeper): LP-K, LP-K1, LP-L, LP-M, and LP-N. These zones are composed of medium- to thinly-bedded sandstones and mudstones deposited in westward-prograding submarine fans. The deepest subzone, LP-N, consists of thicker, more amalgamated sands compared to the overlying subzones. The average overburden-corrected core porosity is 18.4%, and permeability averages 11.5 md.

A confining shale layer ranging 15 to 25 ft thick occurs above the Lower Repetto interval and has been identified in multiple wells across the field. This layer is located approximately 250 ft above the shallowest zone proposed for hydraulic fracturing. Additional overlying shale layers are present and would provide seals to prevent vertical migration of well stimulation fluids.

Monterey Formation. Underlying the Repetto Formation is the Monterey Formation, a Miocene-age unit that is approximately 1,500 ft thick where it occurs in the Santa Clara Field. It is composed of deep-marine cherts, carbonates, and organic-rich siliceous shales. The Monterey Formation is naturally fractured due to silica diagenesis and tectonic compression and has been developed intermittently in the field with variable production performance.

Sespe Formation. The Sespe is an Oligocene-age unit and is the deepest formation penetrated in the field. It underlies the productive sequence but has not been developed for hydrocarbon production in the current lease area.

1.3.3 Well Stimulation History

Platform Gilda was installed in 1981 by Union Oil Company of California, with initial drilling commencing that same year and production beginning in 1982. Since then, 70 wells (plus additional sidetracks and redrills) have been drilled from the Platform, with the most recent well drilled in 2014. DCOR, LLC has operated the Platform and its associated leases (P-0215 and P-0216) since 2005.

To enhance recovery at Platform Gilda within low-permeability zones, a series of well stimulation treatments, specifically hydraulic fracturing, were conducted between 1986 and 2014. These treatments primarily targeted the Upper and Lower Repetto intervals. Stimulation treatments during this period included 14 hydraulic fracturing treatments (Argonne National Laboratory, 2016). Of the hydraulic fracturing treatments, six were performed in the Upper Repetto and seven in the Lower Repetto between 1994 and 2014. The largest treatment, conducted in 2014 on well S-33 RD2, involved the injection of approximately 140,000 gallons of fracturing fluid. This volume is significantly lower than typical onshore hydraulic fracturing operations, which typically use between 1.75 and 10 million gallons per well per year (Houseworth and Stringfellow, 2015).

No induced seismic events were reported during or following any of the offshore stimulation treatments. The proposed stimulation intervals remain located at considerable distances from mapped Quaternary faults. The World's End Fault lies approximately 2,500 ft from the closest planned treatment zone, while other regional faults, such as the Oakridge and Mid Channel Faults, are located more than two mi from the Platform. In addition, no well integrity induced events were reported during or following any of the prior stimulation treatments.

1.4 PROGRAM SCOPE

The purpose of the proposed well stimulation Program is to improve hydrocarbon recovery from low-permeability zones by increasing effective reservoir permeability and bypassing near-wellbore formation damage. Hydraulic fracturing, a method of well stimulation, achieves this by injecting fluids at high pressure into the target formation to create small, controlled fractures in the rock. Once the fractures are initiated, a proppant—typically sand or ceramic balls—is carried into the formation by the fracturing fluid. The proppant remains in the fractures after pressure is released, holding them open to maintain improved flow paths for hydrocarbons.

The proposed stimulation method involves frac packing, which combines hydraulic fracturing with gravel packing. During a frac pack, the fracking fluid is injected to fracture the formation, while sand control screens are installed across the perforated interval. Proppant is placed both in the fracture and in the annulus between the casing and screen to form a stable gravel pack. This technique provides both productivity enhancement and sand control, making it well-suited to the unconsolidated sands of the Repetto intervals.

Each treatment will be preceded by a DFIT to collect formation-specific pressure and fracture gradient data. This information is used to calibrate stimulation designs using reservoir modeling software. Additional operational and design details are provided in Section 1.4.2, while fluid composition and handling details are provided in Section 1.4.3.

1.4.1 Well Selection

Past reservoir simulation studies and recent geologic interpretation have identified 4 well stimulation locations in the Upper Repetto and 12 well stimulation locations in the Lower Repetto, for a total of 16 locations. Due to the relatively low permeability and unconsolidated nature of these sands, well stimulation via frac packing is required to achieve economic production rates.

The zones of interest in the Upper Repetto are the LP-B and LP-C subzones. In the Lower Repetto, the primary targets are the LP-M and LP-N subzones, while the LP-L subzone is considered more marginal and will be evaluated for potential completion based on open-hole log results. Table 1-1 summarizes the 16 locations proposed for stimulation.

Table 1-1. Proposed Wells for Hydraulic Fracturing on Platform Gilda

Well ID	Target Formation	Target Subzone
1 UR	Upper Repetto	B, C
2 UR	Upper Repetto	B, C
3 UR	Upper Repetto	B, C
4 UR	Upper Repetto	B, C
1 LR	Lower Repetto	L, M, N
2 LR	Lower Repetto	M, N
3 LR	Lower Repetto	L, M, N
4 LR	Lower Repetto	M, N
5 LR	Lower Repetto	L, M, N
6 LR	Lower Repetto	M, N
7 LR	Lower Repetto	L, M, N
8 LR	Lower Repetto	M, N
9 LR	Lower Repetto	L, M, N
10 LR	Lower Repetto	M, N
11 LR	Lower Repetto	L, M, N
12 LR	Lower Repetto	M, N

1.4.2 Frac Pack Treatment Design

Combining historical data from prior stimulation treatments and proposed target zone data provides a basis for estimating the scope and scale of future frac pack treatments. The treatment design parameters summarized in Table 1-2 reflect the combined average of all expected treatments. Final designs will be developed using industry-standard fracture modeling software and tailored to each well using data from acquired open-hole logs.

Each treatment will be further refined following a DFIT. The DFIT involves a small-volume fluid injection at sufficient rate and pressure to initiate a short fracture. Following injection, the well is shut in and pressure fall-off is monitored over a period of one to two hours. This test provides key information critical for calibrating the frac model and ensuring zone-specific design accuracy.

Table 1-2. Average Frac Pack Treatment Parameters

Design Parameter	Amount
MD Range	5,900 – 9,300 ft (Upper Repetto) 10,100 – 15,900 ft (Lower Repetto)
TVD Range	4,950 – 5,900 ft (Upper Repetto) 7,900 – 8,600 ft (Lower Repetto)
Water Depth	205 ft
RT to Sea Level	107 ft
Zone Length Range, MD	65 – 319 ft
Zone Length Average, MD	170 ft
Perforated Interval Range	24 – 160 ft
Perforated Interval Average	60 ft
BHST Range	140 – 155 degF (Upper Repetto) 189 – 197 degF (Lower Repetto)
BHST Average	150 degF (Upper Repetto) 193 degF (Lower Repetto)
Perforated Liner Size	5 in and 7 in (about 50/50 split)
Sand Control Screen Size	2-3/8 in for 5-in casing wells; 3-1/2 in for 7-in casing wells
Injection Rate Range	12 – 25 barrels per minute (BPM)
Injection Rate Average	18 BPM
Proppant Volume Range	36,000 – 140,000 lb
Proppant Volume Average	75,000 lb
Clean Fluid Volume Average	1,300 barrels (bbl)

Proppant Slurry Volume Average	1,400 bbl
Maximum Surface Pressure Range	5,000 – 10,000 psi
Hydraulic Horsepower	Up to 5,500 HHP
Average Main Job Pump Time	Up to 2 hrs

A typical frac pack treatment will place approximately 75,000 pounds (lbs.) of proppant, although volumes may range from 36,000 to 140,000 lbs. depending on reservoir characteristics. Treatment volumes include approximately 1,300 barrels of clean fluid and 1,400 barrels of slurry, pumped at rates ranging from 12 to 25 barrels per minute (BPM). Surface pressure during treatment is expected to range from 5,000 to 10,000 psi, with a total hydraulic horsepower requirement of up to 5,500 HHP.

Each frac pack stage is expected to take 6 hours from start to finish. Of this, 4 hours are dedicated to active pumping operations, and 2 hours of “standby” for engineering analysis and final redesign. The pumping sequence includes a step-rate test, the DFIT, and the main frac pack job. The main frac pack job typically lasts 40–120 minutes.

In approximately 50% of cases, if sand placement during the main frac job does not fully cover the screen, a follow-up gravel pack will be necessary to ensure complete annular packing. This operation is typically conducted several hours after the main treatment, with an average pump time of 90 minutes. Gravel packs are performed at a lower pump rate than the frac job—typically around 5 BPM—using a single low-HHP pump and a smaller gravel pack blender.

In total, the full stimulation Program may include up to 38 frac stages distributed across 16 locations, with each Upper Repetto well expected to require 2 frac pack stages, and each Lower Repetto well expected to require 2.5 stages, as only half of the Lower Repetto wells are anticipated to include the LP-L subzone. It is anticipated that up to 6 wells could be stimulated per year, depending on operational logistics, permitting timelines, and equipment availability.

1.4.3 Fluids, Additives, and Source Materials

The base fluid for all treatments will be filtered seawater sourced directly from the surrounding marine environment using Platform Gilda’s existing seawater pumps. The fluid will be mixed with chemical additives to form a viscous gel capable of transporting proppant under high-pressure conditions. The primary gelling agent is guar, which will be crosslinked using a borate crosslinker to form a stable gel. Table 1-3 summarizes the key additives that will be used in a frac pack treatment involving 100,000 lbs. of proppant.

The proppant used will be high-grade silica sand defined by an upper and lower grain diameter by sieve, such as 16/30 mesh or 20/40 mesh. All liquid additives will be transported in stainless steel marine-certified totes (typically 330–550-gallon capacity). Dry materials such as breakers and biocides will be delivered in sealed 5-gallon containers, palletized, and stored in a steel-bottom containment bin (5' x 10') on deck. Spill response materials and handling procedures will be in place per the Platform’s operations management plans (see Section 2.9).

Table 1-3. Additive Amounts and Functions for a 100,000-Pound Frac Pack Treatment

Additive	Product ID	Amount	Function
Environmental Guar Slurry	J564	500 gal	Increases fluid viscosity, allowing the proppant to remain suspended and uniformly transported into the formation.
Surfactant	F103	120 gal	Lowers surface and interfacial tension to improve the cleanup of fracturing fluid and facilitate hydrocarbon flowback.
Emulsion Preventer	W054	55 gal	Prevents the formation of oil-water emulsions during treatment and early production, reducing flow assurance risks.
Scale Inhibitor	L065	55 gal	Mitigates the risk of scale precipitation from seawater components such as calcium or barium, helping to protect downhole equipment and reservoir permeability.
pH Buffer	??	110 gal	Maintains optimal pH range (6.0–7.5) for effective hydration and performance of the guar gel in seawater environments.
Borate Crosslinker	J532	350 gal	Chemically bonds to the guar polymer to enhance viscosity and thermal stability, creating a crosslinked gel suitable for deep, high-pressure formations.
Breaker (encapsulated)	J475	150 lb	Slowly dissolving oxidizer that reduces gel viscosity post-treatment, allowing fluid to break down and be recovered from the formation.
Breaker (raw)	J218	20 lb	Fast-acting oxidizer used for immediate gel breakdown in higher permeability or shallower zones.
Biocide	M275	20 lb	Controls microbial growth in seawater that could otherwise lead to corrosion, plugging, or biofilm development in the reservoir or equipment.

1.4.4 Waste Management and Flowback Fluid Handling

All flowback fluid generated during stimulation activities will be routed through a closed-loop handling system and retained on the Platform. Fluids will be re-injected into existing injection wells on the Platform, and no offshore discharge of flowback fluids will occur. Solid waste, such as residual sand or other materials, will be separated and contained for transport to a licensed onshore disposal facility. All waste will be disposed of in accordance with the currently approved NPDES permit.

1.4.5 Well Integrity Monitoring and Safety

Well integrity will be verified prior to any stimulation activity through mechanical integrity testing, which will include pressure testing of the casing and tubing to confirm the absence of leaks, in accordance with 30 CFR § 250.427 (Pressure Integrity Tests). Test results will be reviewed and documented in accordance with applicable regulatory requirements, including 30 CFR § 250.1916, which mandates formal mechanical integrity procedures as part of the operator's Safety and Environmental Management System (SEMS).

During stimulation, real-time pressure monitoring will be conducted to ensure the well remains within its designed operating envelope, as required under 30 CFR § 250.724 (Real-Time Well Monitoring Requirements). Pressure data will be recorded and reviewed by on-site engineers and remote monitoring teams to detect any anomalies and ensure well control is maintained.

Emergency shutoff systems and well control protocols are in place on the Platform and will be activated in the event of unexpected pressure changes or equipment failure. These include blowout preventers (BOPs), emergency shutdown valves (ESDVs), and immediate access to well kill materials and procedures. Platform personnel will receive pre-job safety briefings and training on response actions specific to hydraulic fracturing operations.

1.4.6 Equipment, Vessels, and Emissions

The proposed stimulation Program will use skid-mounted mobile diesel-powered stimulation equipment rigged directly on Platform Gilda. Equipment emissions, power requirements, and operational runtime will vary depending on the final configuration; however, well stimulation emissions will be covered under the existing Permit to Operate (PTO).

Operations will be executed as batch-complete campaigns to minimize mobilizations and optimize crew utilization. Each stimulation stage will be conducted over the course of one day, with approximately 3 days between each stimulation stage and several weeks between each well. The Program is organized as one campaign per year, with all planned stages for that year completed in a single window approximately 6 months long. The skid-mounted spread will remain staged on the Platform for the duration of each campaign and will be demobilized at once each campaign is completed.

Power for the stimulation equipment will be supplied from the Platform's electrical system where capacity allows, or from portable generators, as listed in Table 1-4. Equipment types, power requirements, and operational runtime are summarized in Table 1-4.

Table 1-4. Equipment List

Equipment Type	Tier	Quantity	Horsepower	Total Operating Hours	Total Operating Days
Stimulation Equipment					
Gel Hydration Unit	Tier 4	1	456 HP	304 hrs	13 days

POD Frac Blender	Tier 4	1	575 HP	228 hrs	10 days
Gravel Pack Blender (optional)	Tier 4	1	575 HP	76 hrs	3 days
2,250 HHP Frac Pumps (frac)	Tier 4	3	1650 HP	684 hrs	29 days
600 HHP Gravel Pack Pump (gravel pack)	Tier 4	1	520 HP	76 hrs	3 days
Primary & Backup Diesel Generators (optional)	Tier 4	2	755 HP	608 hrs	25 days
Control Cabin	N/A	N/A	N/A	N/A	N/A
Sand/Proppant Storage Silos	N/A	N/A	N/A	N/A	N/A
Supply Vessel / Crew Transfer Vessel <i>WMT</i>	EPA Tier 3/IMO-2	4	803	880	88

1.4.7 Personnel and Schedule Requirements

Each stimulation job will require a crew of approximately 10 specialized personnel, including crew supervisors, equipment operators, engineers, and safety staff. Personnel will be mobilized to the platform via crew transfer vessels in coordination with existing platform logistics.

The stimulation Program is planned over a 5-year period, with up to 6 wells stimulated during one campaign in a single year. The Program schedule is expected to follow a batch completion model, wherein each year's group of wells is completed during a single annual campaign. Each job will be performed over one day at the platform, followed by a 3-day standby period before the next stage. Well stimulation equipment is expected to be active and operating for 33 days per year. When active well stimulation is occurring, work would be scheduled for 24/7 operations.

The estimated schedule of activities, including the number of stages, gravel packs, and total operational hours, is summarized in Table 1-5.

Table 1-5. Program Activity Schedule

Activity	Campaign 1	Campaign 2	Campaign 3	TOTAL
Dates	Jan 1, 2028 – Oct 17, 2028	Mar 8, 2030 – Dec 23, 2030	May 13, 2032 – Jan 1, 2033	Jan 1, 2028 – Jan 1, 2033

Number of Days	290 days	290 days	233 days	1,827 days
Number of Upper Repetto Wells	2	2	0	4
Number of Lower Repetto Wells	4	4	4	12
Total Number of Frac Stages	14	14	10	38
Total Number of Gravel Packs	7	7	5	19
Total Frac Hours (6 hrs per stage)	84 hrs	84 hrs	60 hrs	228 hrs
Total Gravel Pack Hours (4 hrs per gravel pack)	28 hrs	28 hrs	20 hrs	76 hrs

2.0 STUDY METHODS

2.1 LITERATURE REVIEW

Padre biologists reviewed available facility design information, historic seafloor maps, and biological and structural survey reports. Lists of federally listed Threatened and Endangered species were obtained from the U.S. Fish and Wildlife Service (USFWS) and from the National Marine Fisheries Service (NMFS), and are included under Attachment A.

2.2 DESKTOP STUDY

A biological resources study area was identified prior to beginning desktop studies (Action area). The Action area is defined by the Code of Federal Regulations (CFR) as “all areas to be affected directly or indirectly by the Program activities and not merely the immediate area involved in the action” (50 CFR § 402.02). The Action area for this report encompasses Platform Gilda and a 500 ft diameter surrounding each platform footprint. This area, while much larger than the Programs’ active work zone, will account for disturbance due to noise associated with Program activities. The desktop study included review of biological and ecological species surveys, including remotely operated vehicle (ROV) videos and (SCUBA) diver performed transects of the Platform Gilda and (Love et al., 2019a; 2019b).

3.0 DESCRIPTION OF THE ACTION AREA

The local climate and waters of the Action area, within the Santa Barbara Channel, is influenced by both its coastal location and ocean currents. It has a Mediterranean climate characterized by mild, wet winters and warm, dry summers with temperatures typically moderate year-round due to the cooling effect of the Pacific Ocean, averaging 50° to 65° Fahrenheit (F) in the winter and 60° to 75°F in the summer. Most rainfall occurs during the winter months, with the region receiving an average of 14.8 inches of rain annually (NWS, 2025). The California Current, which flows southward along the coast, also contributes to the cooler, stable temperature in the area. The prevailing winds of the Santa Barbara Channel generally blow from the west to northwest and generally range from 5 to 15 knots, although seasonal variation does occur. Ecologically the Santa Barbara Channel sits in a transition zone with cooler, more nutrient rich waters to its northwest and warmer, more tropical waters to its southeast. This transition zone has resulted in the development of distinctive communities and foraging grounds for both residents and migrating wildlife.

3.1 PELAGIC HABITAT

The pelagic habitat surrounding Platform Gilda, located in approximately 205 ft of water in the eastern Santa Barbara Channel, is representative of an epipelagic environment where the water column supports a diverse community of plankton and nekton. Phytoplankton and zooplankton form the foundation of this pelagic food web, with copepods, chaetognaths, larvaceans, and euphausiids (krill), providing energy transfer to higher-level consumers. Krill, primarily *Euphausia pacifica* and *Thysanoessa spinifera*, are federally managed under the Coastal Pelagic Species (CPS) Fishery Management Plan (FMP) and serve as a vital trophic link for fishes, seabirds, and baleen whales. Also managed under the CPS FMP are market squid (*Doryteuthis opalescens*), an abundant and ecologically important species which acts as both a mid-level predator of plankton and a prey species for larger fishes, seabirds, and marine mammals. The pelagic fish assemblage commonly includes Pacific sardine (*Sardinops sagax*), northern anchovy (*Engraulis mordax*), Pacific mackerel (*Scomber japonicus*), and jack mackerel (*Trachurus symmetricus*), which utilize the productive surface and midwater layers for foraging and schooling behavior. Hydrodynamically, the eastern Santa Barbara Channel is influenced by the interaction of the southward-flowing California Current and the northward-flowing Southern California Countercurrent, which generate localized eddies and variable transport patterns that shape nutrient delivery, plankton distribution, and the broader structure of pelagic communities in the vicinity of the Platform. Historic ROV surveys have also documented the presence of jack mackerel, Pacific barracuda (*Sphyræna argentea*), and ocean sunfish (*Mola mola*) within the pelagic waters surrounding Platform Gilda (Love et al., 2019a.; 2017)

3.2 PLATFORM STRUCTURE

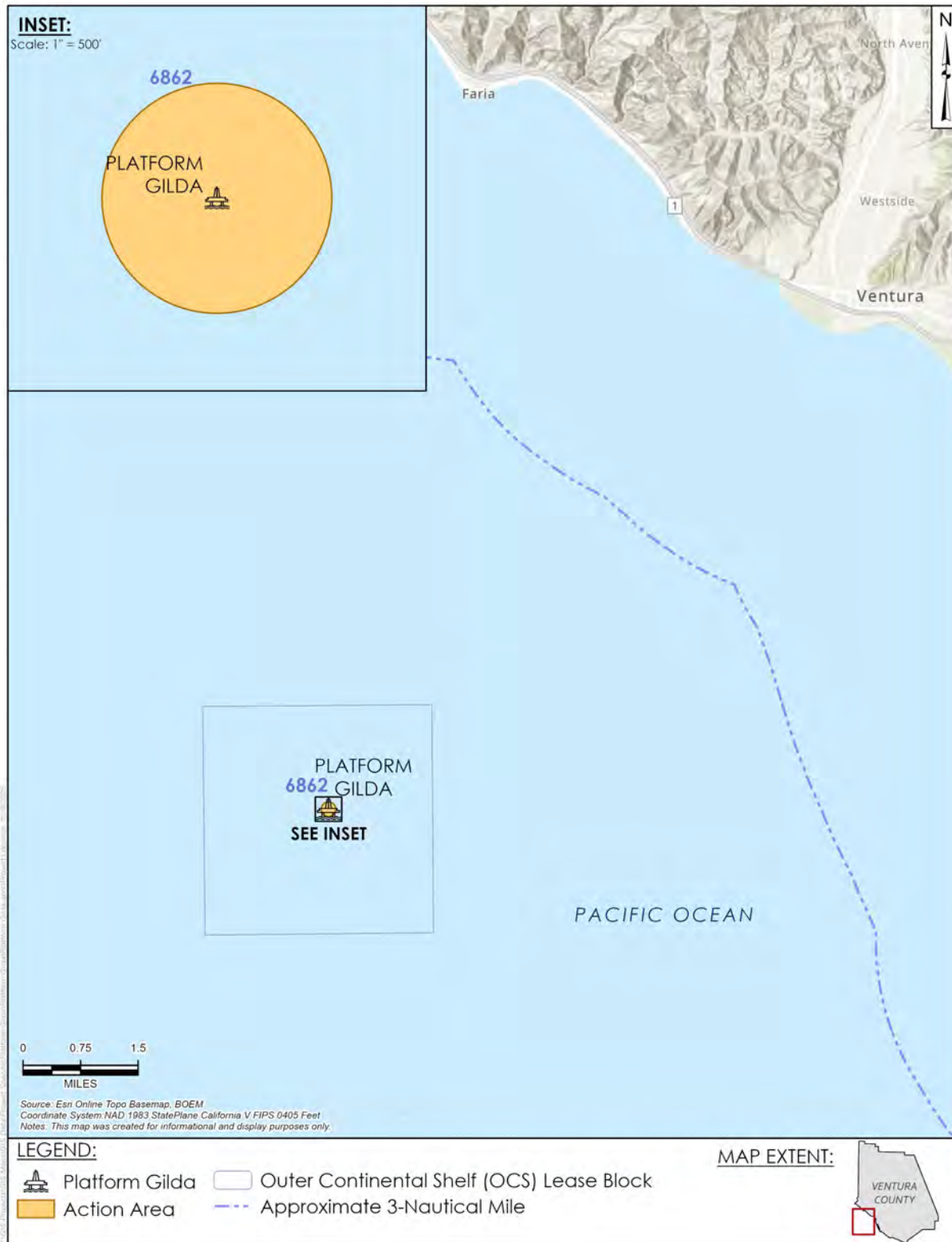
The artificial structure at Platform Gilda supports a diverse assemblage of fishes and invertebrates across its upper, midwater, and base zones. Schooling species such as blacksmith (*Chromis punctipinnis*), señorita (*Oxyjulis californica*), halfmoon (*Medialuna californiensis*), and opaleye (*Girella nigricans*) occur in high relative abundance in the upper water column, while kelp bass (*Paralabrax clathratus*) and black perch (*Phanerodon atripes*) are more common in the mid-depth crossbeams. Rockfishes (*Sebastes* spp.) dominate much of the structure, including blue

rockfish (*Sebastes mystinus*), squarespot rockfish (*S. hopkinsi*), widow rockfish (*S. entomelas*), bocaccio (*S. paucispinis*), vermilion rockfish (*S. miniatus*), and halfbanded rockfish (*S. semicinctus*), with evidence of young-of-the-year recruitment further emphasizing the nursery value of the structure. Predatory species such as lingcod (*Ophiodon elongatus*) and kelp greenling (*Oxylebius pictus*) are also abundant. Invertebrate communities contribute to this structural habitat complexity, with strawberry anemones (*Corynactis californica*), giant plumose anemones (*Metridium farcimen*), and California mussels (*Mytilus californianus*) colonizing the crossbeams and pilings, providing additional vertical relief and shelter for fishes and invertebrates (Love et al., 2017; 2019a; 2019b).

3.3 BENTHIC HABITAT

The shell mound beneath Platform Gilda, created by the long-term accumulation of natural fallout and marine debris clearing in the upper 60 ft of the Platform structure, provides structurally complex benthic habitat distinct from the surrounding soft sediments of the Santa Barbara Channel. This mound supports mainly an assemblage of plumose anemones, sea stars (*Pisaster giganteus* and other asteroid species), and brittle stars, all of which occupy the interstitial spaces and surface of the shell deposits. Demersal fishes such as flatfishes (*Pleuronectiformes* spp. and *Citharichthys* spp.), cabezon (*Scorpaenichthys marmoratus*), and sculpins (*Cottidae*) also utilize this mosaic of hard and soft substrate for foraging and shelter (Love et al., 2019a). Importantly, no historic surveys at Platform Gilda have documented the presence of Federally endangered white abalone (*Haliotis sorenseni*) or the Federally Proposed Threatened sunflower sea star (*Pycnopodia helianthoides*) (Love et al., 2019b). The shell mound habitat aggregates a robust assemblage of benthic invertebrates and demersal fishes, functioning as an ecologically important secondary reef that enhances biodiversity and productivity relative to adjacent sedimentary seafloor.

Figure 3-1. Program Action Area



4.0 REGIONALLY OCCURRING SENSITIVE SPECIES AND HABITATS

Based on information obtained from a preliminary desktop review, there are several habitats that occur in the region that are afforded protection by Federal, State, or local authorities, and may support special-status plants and wildlife. For the purpose of this section, sensitive habitats and species include the following:

- Critical Habitat and Species under the Federally Endangered Species Act (FESA) and protected by the United States Fish and Wildlife Service/ National Marine Fisheries Service (USFWS/NMFS).
- National Marine Sanctuaries afforded protections by National Oceanic and Atmospheric Administration (NOAA) managed under the National Marine Sanctuaries Act.
- Marine Protected Areas (MPAs) afforded protection by the California Department of Fish and Wildlife (CDFW) under the Marine Life Protection Act.
- Biologically Important Areas (BIAs).
- Rare habitats protected by State or local governments, professional organizations, and/or the scientific community.

4.1 CRITICAL HABITATS

Critical Habitat is defined as a “specific area within the geographical area occupied by a species at the time of listing that contains physical or biological features essential to conservation of the species and that may require special management considerations or protection...”. The Action area is within designated Critical Habitat area for Humpback whales (*Megaptera novaeangliae*) of both the Endangered Central American Distinct Population Segment (DPS) and the Threatened Mexico DPS. Humpback whales visit the Santa Barbara Channel from July through September to feed on the krill and anchovy stocks that boom in the late summer warm waters (SBWH, 2025).

4.2 NATIONAL MARINE SANCTUARIES

National Marine Sanctuaries are designated areas that protect significant marine ecosystems, historical sites, and cultural resources. Sanctuaries are afforded protection under the Marine Sanctuaries Act and managed by NOAA with collaborators from local communities, indigenous peoples, and stakeholders, to ensure management practices are effective and consider local needs. The closest National Marine Sanctuaries are the Channel Islands National Marine Sanctuary 4.5 mi away and the Chumash Heritage National Marine Sanctuary, the southern boundary of which is 32.5 mi away (Figure 4-2). Program activities will not occur within a National Marine Sanctuary.

4.3 MARINE PROTECTED AREAS

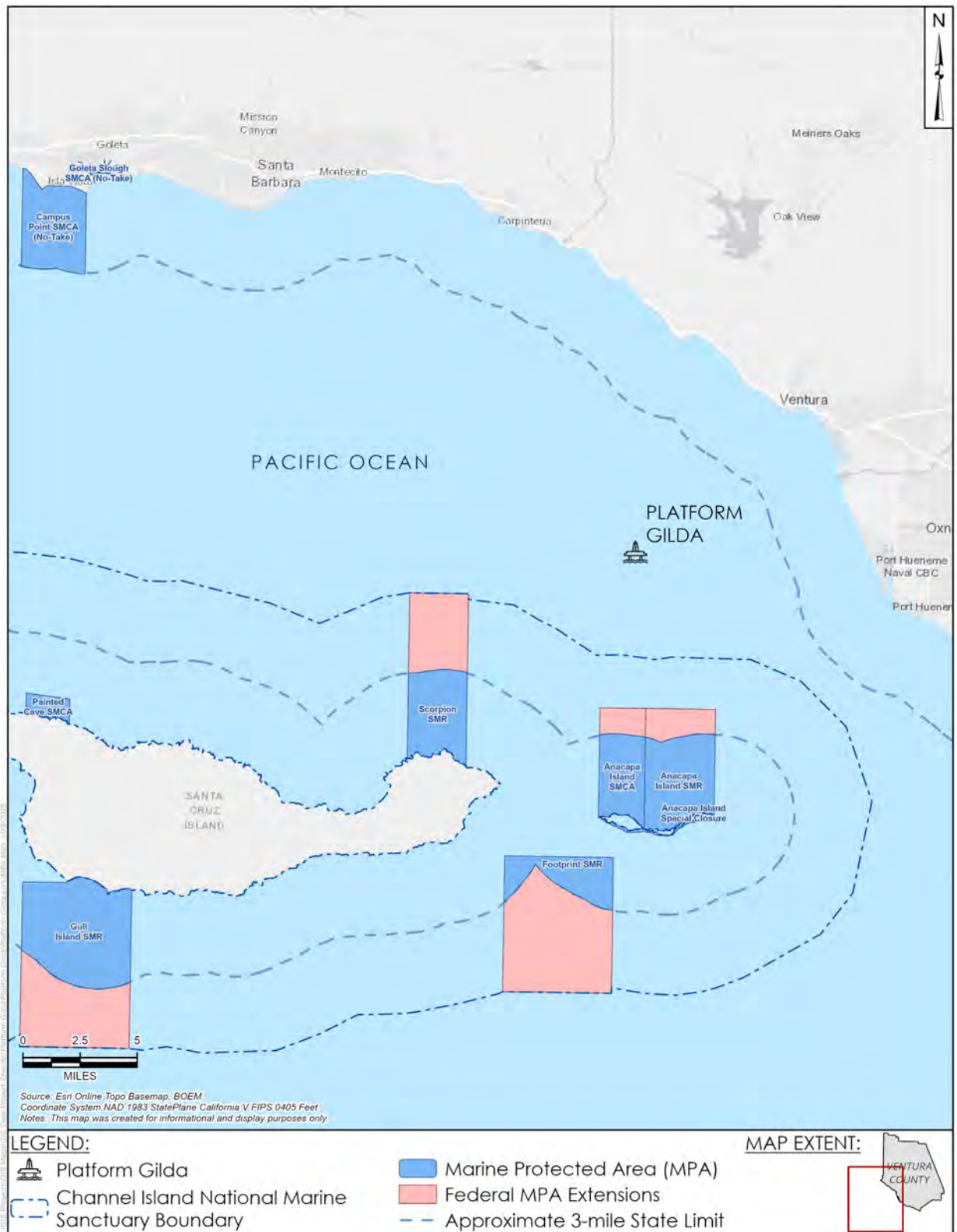
MPAs are afforded protection from the CDFW under the Marine Life Protection Act. The following designations are managed within the West Coast MPA network: State Marine Reserve (SMR), State Marine Conservation Area (SMCA), and State Marine Recreational Management Area (SMRMA). The closest MPAs to the Action area are the Anacapa Island SMR and SMCA,

and the Scorpion SMR, located approximately 6.7 mi and 7.5 mi respectively, south of the Action area. Program activities will not occur within an MPA.

4.4 BIOLOGICALLY IMPORTANT AREAS

Biologically Important Areas (BIAs) represent areas and times in which cetaceans are known to concentrate for activities related to reproduction, feeding, and migration, as well as known ranges of other small resident populations (NOAA, 2025b). While BIAs are utilized to support analysis and decisions with regard to environmental planning, compliance, and protection, they have no inherent or direct regulatory power. Four BIAs have been identified within the Action area for the Program including, Blue Whale Feeding, Fin Whale Feeding, Humpback Whale Feeding, and Gray Whale Reproductive (BIA Mapper, 2025).

Figure 4-2. Marine Protected Area within the Program Region



4.5 PROTECTED SPECIES IN THE ACTION AREA

This BA has been prepared to provide information to the U.S. Army Corps of Engineers (USACE) and other Federal agencies, NMFS and the USFWS, to determine the potential to affect threatened or endangered species, based on one of four possible findings for each species potentially affected:

- **No effect** - the proposed action will not affect the listed species or critical habitat,
- **Not likely to adversely affect** - effects of the listed species are expected to be discountable (extremely unlikely to occur), insignificant (minimal impact without take), or beneficial,
- **Likely to adversely affect** - adverse effects may occur as a direct or indirect result of the proposed action, and the effect is not discountable, insignificant, or beneficial, and
- **Jeopardy/Adverse Modification Finding** – a jeopardy finding is made for species for which a "likely to adversely affect" determination is made. The jeopardy finding determines whether the considered action is or is not likely to jeopardize the continued existence of the species. An adverse modification finding is made if the action will result in the destruction or adverse modification of proposed critical habitat. A "likely to jeopardize or adversely modify" finding is made if the action is reasonably expected to directly or indirectly reduce appreciably the likelihood of both the survival and recovery of a listed species by reducing the reproduction, numbers, or distribution of that species, or by modifying critical habitat to the point of preventing the recovery of a listed species.

An analysis was conducted for all listed and proposed species known to occur in the Action area based on the species lists provided by USFWS and NMFS, as well as the regionally occurring marine mammal species (USFWS, 2025; and NMFS, 2025;) (Appendix A –Official Species Lists). Due to the limits of the Action area, the species descriptions in this section are confined to those listed species that have a potential to occur and have suitable or preferred habitat in the Action area. Certain species (marine and terrestrial) were eliminated from these analyses due to the absence of the preferred habitat or water depths within the Action area. Other species were eliminated from consideration because the Action area was beyond the recorded geographic range for the species. Species that may occur within the Action area and have a **Not Likely to Adversely Affect** determination include the species listed below. Detailed species information and effects analysis can be found in Sections 4.6 and 5.0, respectively.

- Green Turtle, East Pacific DPS (*Chelonia mydas*)
- Loggerhead Turtle, North Pacific Ocean DPS (*Caretta caretta*)
- Leatherback Turtle (*Dermochelys coriacea*)
- Olive Ridley Turtle (*Lepidochelys olivacea*)
- California Least Tern (*Sternula antillarum*)
- Marbled Murrelet (*Brachyramphus marmoratus*)
- Short-tailed Albatross (*Phoebastria albatrus*)

- Blue Whale (*Balaenoptera musculus*)
- Fin Whale (*Balaenoptera physalus*)
- Gray Whale, Western North Pacific DPS (*Eschrichtius robustus*)
- Humpback Whale, Mexico and Central America DPS (*Megaptera novaeangliae*)

The effects determination is based on the potential Program effects and proposed conservation measures to avoid or reduce impacts to a level that is not likely to adversely affect the species or population. Detailed species information and effects analysis can be found in Sections 4.6 and 5.0, respectively. Listed species that may occur within the Action area but would experience **No Effect** due to Program activities described in Table 4-1.

Table 4-1. Federally Listed Species Within the Action Area with a No Effect Determination

Species	Habitat	Status ¹	Designated Critical Habitat	Effects Determination
INVERTEBRATES				
Black Abalone <i>Haliotis cracherodii</i>	Intertidal and subtidal habitats from upper intertidal to 20 ft depth between Point Arena, California to Bahia Tortugas, Mexico. Most commonly observed in complex habitats with deep crevices and drift macroalgae.	FE (74 FR 1937; January 14, 2009)	Yes, but outside of the Action area. (76 FR 66806; October 27,2011)	No Effect. No suitable intertidal habitat is present within Action area. Platform jackets are blast cleaned periodically between the surface and 60 ft depth.
White Abalone <i>Haliotis sorensenii</i>	Water depths from 80 to 200 ft. Open low and high relief rock or boulder habitat that is interspersed with sand channels. Sand channels may be important for the movement and concentration of drift macroalgae and red algae, which white abalone are known to feed	FE	None designated.	No Effect. Suitable habitat is not present in the Action area. Species has not been observed on Platform ROV inspections.
Sunflower Sea Star <i>Pycnopodia helianthoides</i>	Found in a variety of marine environments, including kelp forests, rocky reefs, and sandy bottoms, usually at depths ranging from the intertidal zone to about 655 ft.	FT	None designated.	No Effect. Action area is outside of species' current range and is functionally extinct in California.
Monarch Butterfly <i>Danaus plexippus</i>	Monarch butterflies inhabit coastal dunes, riparian zones, and other areas with moderate temperatures and a consistent water source. Overwintering sites are typically eucalyptus groves clustered in coastal zones, while breeding season habitat includes grasslands, meadows, and milkweed habitat.	PFT (89 FR 100662; December 12, 2024)	Proposed Critical Habitat does not overlap with Action area. (89 FR 100662; December 12, 2024)	No Effect. No suitable foraging or roosting habitat present within the Action area.

Table 4-1. Federally Listed Species Within the Action Area with a No Effect Determination

Species	Habitat	Status ¹	Designated Critical Habitat	Effects Determination
BIRDS				
Hawaiian Petrel <i>Pterodroma sandwichensis</i>	Hawaiian petrel has a small breeding range, known from five locations in the main Hawaiian Islands. Foraging habitat extends from the islands to the Eastern Pacific edge.	FE (32 FR 40001, March 11, 1967)	None designated.	No Effect. No suitable nesting habitat in the Action area. No eBird observations within the Santa Babara Channel, foraging typically occurs farther offshore (eBird, 2025).
FISH				
Southern DPS Green Sturgeon <i>Acipenser medirostris</i>	Found in near shore marine within depths of less than 60 fathoms and estuarine environments from Alaska to Baja California, Mexico.	FT (71 FR 17757; April 7, 2006)	Yes, but outside of the Action area. (74 FR 52299; October 9, 2009)	No Effect. The Program is outside of the species' known spawning range. A small number of green sturgeons have been historically reported from the southern California coast. A mature green sturgeon was reported to be caught near Dana Point, Orange County in 1978, but there are no recent observations of green sturgeon within the Action area.
Oceanic Whitetip Shark <i>Carcharhinus longimanus</i>	Oceanic whitetip sharks live offshore in deep water, spending most of their time in the upper part of the water column near the surface.	FT (83 FR 4153; January 30, 2018)	None designated. (85 FR 12898; March 5, 2020)	No Effect. The preferred habitat of oceanic whitetip shark is outside the Action area. Program activities take place in shallow continental shelf habitat.
Southern California Steelhead <i>Oncorhynchus mykiss irideus</i>	Marine dispersal and rearing habitats consist of nearshore vegetative cover for shelter and prey base near natal rivers/streams.	FT (71 FR 833; January 5, 2006)	Yes, but outside of the Action area. (70 FR 52487; September 2, 2005)	No Effect. No suitable spawning habitat present in the Action area. Nearest spawning river is the Ventura River which sees <10 individuals return yearly (TNC, 2024).

Table 4-1. Federally Listed Species Within the Action Area with a No Effect Determination

Species	Habitat	Status ¹	Designated Critical Habitat	Effects Determination
Scalloped Hammerhead Shark, Eastern Pacific DPS <i>Sphyrna lewini</i>	Scalloped hammerhead sharks are typically found in warm, coastal waters of tropical and subtropical regions. Only a few sightings have been recorded around the Channel Islands.	FE (79 FR 38213; July 3, 2014)	None designated. (80 FR 71774; November 17, 2015)	No Effect. The preferred habitat and temperature range of scalloped hammerhead sharks is outside the Action area of the Program.
Giant Manta Ray <i>Mobula birostris</i>	Giant manta rays are highly migratory, moving seasonally and regionally based on water temperatures and plankton availability, and tend to prefer water typically warmer than 68°F. In California, sightings are rarer but do occur during strong El Niño years. When present, they are usually observed offshore, in warmer waters off southern California.	FT (83 FR 2916; January 22, 2018)	None designated. (84 FR 66652; December 5, 2019)	No Effect. The preferred habitat and temperature range of the giant manta ray is outside the Action area of the Program.
Gulf Grouper <i>Mycteroperca jordani</i>	Gulf groupers inhabit warm, shallow waters and are naturally rare above Bahia Magdalena in southern Baja California.	FE (81 FR 72545; October 20, 2016)	None designated. (81 FR 72545; October 20, 2016)	No Effect. The preferred habitat and temperature range of the gulf grouper is outside the Action area of the Program.
MAMMALS				
Cetaceans				
North Pacific Right Whale <i>Eubalaena glacialis</i>	North Pacific right whales mostly occur in the central North Pacific and Bering Sea. They spend summers in far northern feeding grounds and historically migrated south in winter as far as Baja California.	FE (73 FR 12024; March 6, 2008)	Yes, but outside of the Program area. (73 FR 19000; April 8, 2008)	No Effect. The Action area is outside of the typical species range. Program activities are unlikely to encounter individuals due to population extreme low numbers.

Table 4-1. Federally Listed Species Within the Action Area with a No Effect Determination

Species	Habitat	Status ¹	Designated Critical Habitat	Effects Determination
Sperm Whale <i>Physeter macrocephalus</i>	Offshore deep waters, with highest abundance off California from April to mid-June and from August to mid-November.	FE (35 FR 18319; December 2, 1970)	None designated.	No Effect. The Action area lacks suitable deepwater foraging and migratory habitat.
Sei Whale <i>Balaenoptera borealis</i>	Offshore deep waters away from the coastline. Unpredictable distribution. Breeding areas unknown.	FE (35 FR 18319; December 2, 1970)	None designated.	No Effect. The Action area lacks suitable deepwater foraging and migratory habitat.
Pinnipeds				
Guadalupe Fur Seal <i>Arctocephalus townsendi</i>	Offshore southern California and the Pacific Coast of Mexico. Breed on coastal rocky habitats and caves of Guadalupe Island, Mexico. Recently, few pups have been born on San Miguel Island.	FT (50 FR 51251; December 16, 1985)	None designated.	No Effect. Suitable haul-out and rookery habitat is not present in the Action area and non-breeding season distribution is not well understood.

Status¹

FE = Federally endangered

FT = Federally threatened

PFT = Proposed Federally Threatened

4.6 SPECIES ACCOUNTS

This section includes a discussion of the federally listed species that are known to occur or have potential to occur in the Action area based on habitat availability and known locations of species in the Program region. The discussion below includes the following species:

- Green Turtle, East Pacific DPS
- Loggerhead Turtle, North Pacific Ocean DPS
- Leatherback Turtle, Pacific Ocean DPS
- Olive Ridley Turtle
- Marbled Murrelet
- Short-Tailed Albatross
- Blue Whale
- Fin Whale
- Gray Whale, Western North Pacific DPS
- Humpback Whale, Central American DPS and Mexico DPS

Certain species listed in Table 4-1 (including pelagic birds, large baleen whales, and anadromous fish) may occur within five mi of the Program area; however, the Action area does not contain suitable habitat, substrates, or water depths necessary to support these species. As a result, they are not discussed further in this analysis. Additional species were also excluded from consideration because they lie outside their currently documented geographic ranges.

4.6.1 Turtles

4.6.1.1 Green Turtle, East Pacific DPS (*Chelonia mydas*)

Status and Critical Habitat

The green turtle, East Pacific DPS, was originally listed under the ESA in 1978. Since the ruling, 11 DPS have been identified and listed under the Endangered Species Act. Three DPSs have been listed as Endangered species and eight DPSs as Threatened species, with the East Pacific DPS listed as Threatened (81 FR 200058; April 6, 2016). Critical Habitat for this species was originally designated in 1998 with additional habitat proposed in 2023 (88 FR 46572; July 19, 2023). Designated Critical Habitat includes coastal waters surrounding Culebra Island and Puerto Rico; with proposed Critical Habitat including coastal southern California (mean high water line to six mi offshore) from the Mexico border to North San Diego Bay. None of the designated or proposed Critical Habitats occur within the Action area.

Range and Habitat

The East Pacific DPS of green sea turtles range from southern California to northern Chile, with key nesting sites located in Michoacán, Mexico, the Galápagos Islands, and northwest Costa Rica. After hatching, juveniles spend time in the open ocean before recruiting to coastal foraging grounds rich in seagrass and algae, such as San Diego Bay in California, and Baja California. These turtles exhibit long-distance migrations between nesting and foraging habitats, sometimes

traveling hundreds of mi (NOAA, 2023). Their habitat includes sandy nesting beaches, coastal lagoons, bays, and open ocean pelagic zones.

Natural History

The Eastern Pacific DPS of green sea turtles are a long-lived, late-maturing marine reptile that inhabits the Pacific coastline from southern California to northern Chile. Their life cycle includes several distinct stages, beginning with hatchlings emerging from nesting sites migrate immediately into the pelagic environment. After entering the ocean, juveniles spend several years in the pelagic zone feeding opportunistically on plankton, jellyfish, and other drifting organisms. As they mature, they recruit to nearshore coastal habitats, where their diet shifts to primarily herbivorous feeding on seagrasses and macroalgae such as *Ulva*, *Gracilaria*, and *Zostera* species. Adults exhibit strong site fidelity to coastal foraging areas and nesting beaches, with females returning to their natal beaches every two to four years during the summer (June to September) to lay eggs, while males may migrate seasonally to mating areas (NMFS, 2015c). Although generally herbivorous as adults, Eastern Pacific DPS green turtles may occasionally consume invertebrates like sponges or tunicates, especially when plant matter is less available.

Population Trends and Occurrence in the Action area

Recent minimum population estimates for green turtles indicate that at least 20,112 individuals are known to occur in the eastern Pacific (NMFS, 2015c). In southern California, areas like San Diego Bay and the Channel Islands have seen increased presence of juvenile and adult green turtles, likely due to warming waters. These turtles, originating from Mexican nesting beaches, are attracted to the region's productive coastal ecosystems (NOAA, 2023). NOAA Fisheries notes that the East Pacific green turtle population experienced an extreme decline over the last 30 years, attributed to overharvesting and habitat destruction. While recent data suggest a rebound, ongoing threats such as bycatch, marine debris, and climate change continue to pose risks to the population's stability (NOAA, 2023a).

In the United States, the northernmost reported resident population of East Pacific green turtles occurs in near the mouth of the San Gabriel River in Long Beach. Long-term monitoring, including nine years of citizen-science observations conducted between 2013 and 2021, has documented a consistent presence of green turtles within this riverine habitat. These studies indicate that the San Gabriel River serves as an important foraging and resting area, regularly utilized by the turtles throughout the year (Massey et al., 2023). Although densities are low offshore California, green sea turtles may be present in the Santa Barbara Channel year-round.

4.6.1.2 Loggerhead Turtle, North Pacific Ocean DPS (*Caretta caretta*)

Status and Critical Habitat

The loggerhead turtle was first listed as Endangered throughout its range on July 28, 1978. In September 2011, NMFS and USFWS listed nine DPS of loggerhead turtles under the FESA. At that time, the North Pacific loggerhead turtle DPS was Federally listed as an Endangered species (76 FR 58868; September 22, 2011). No Critical Habitat has yet been designated for the North Pacific DPS.

Range and Habitat

The North Pacific DPS of the loggerhead sea turtles range widely across the North Pacific Ocean, linking nesting sites in southern Japan with distant foraging grounds along the Pacific coast of North America. Nesting occurs exclusively in Japan, primarily on the beaches of Yakushima, Tanegashima, and the Ryukyu Archipelago, with females returning to lay eggs every two to four years during the late spring and summer. After hatching, juveniles enter the Kuroshio Current and drift eastward into pelagic habitats of the central and eastern North Pacific, particularly within the North Pacific Transition Zone between approximately 30° and 40° north latitude (NMFS, 2020e). They remain in these open ocean habitats for 10 to 20 years before recruiting to coastal foraging areas. Subadult and adult loggerheads from the North Pacific DPS are commonly found along the Baja California Peninsula, the Gulf of California, and the Southern California Bight.

Natural History

The North Pacific DPS of loggerhead sea turtles has a highly migratory life history that begins on nesting beaches in southern Japan, where hatchlings enter the Kuroshio Current and drift into the central and eastern North Pacific. Juveniles spend up to 20 years in pelagic habitats, primarily in the North Pacific Transition Zone, feeding on gelatinous zooplankton such as jellyfish and salps. As they mature they shift to coastal foraging areas along the Baja California Peninsula, Gulf of California, and Southern California, where their diet transitions to bottom-dwelling invertebrates like crabs, mollusks, and other benthic prey. Adults undertake transoceanic migrations back to Japan to breed and typically reach sexual maturity at 25 to 35 years.

Population Trends and Occurrence in the Action area

The North Pacific DPS of loggerhead sea turtles has experienced significant declines over the past six decades, with nesting populations in Japan decreasing by approximately 50% to 90%. Despite this long-term decline, nesting trends have shown fluctuations in recent years, indicating some variability in reproductive activity (NOAA, 2025).

Juvenile loggerheads are seen most commonly off the Southern California coast, particularly in El Niño years as they follow prey species such as the pelagic red crab northward. Loggerhead sea turtles have been observed at scattered locations from Point Conception to the U.S. Mexico border, so the potential exists for them to be within the Action area although observations are rare.

4.6.1.3 Leatherback Turtle, Pacific Ocean DPS (*Dermochelys coriacea*)

Status and Critical Habitat

The leatherback turtle was listed as Federally Endangered in 1970 (35 FR 5961; June 3, 1970). Critical Habitat is designated along the U.S. West Coast including approximately 16,910 square mi along the California coast from Point Arena to Point Arguello east of the 3,000 m depth contour; and 25,004 square mi from Cape Flattery, Washington to Cape Blanco, Oregon east of the 2,000 m depth contour (77 FR 4170; January 26, 2012). The designated areas comprise approximately 41,914 square mi of marine habitat from the surface down to a maximum depth of 262 ft. The Action area is not within leatherback turtle Critical Habitat.

Range and Habitat

Leatherbacks have the most extensive range of any living reptiles and have been reported circumglobally throughout the oceans of the world. Leatherbacks can forage in the cold temperate regions of the oceans, occurring at latitudes as high as 71° N. and 47° S.; however, nesting is confined to tropical and subtropical latitudes. In the Pacific Ocean, significant nesting aggregations occur primarily in Mexico, Costa Rica, Indonesia, the Solomon Islands, and Papua New Guinea. Migratory routes of leatherbacks are not entirely known, though it is likely that most individuals seen in coastal California waters are part of the West Pacific DPS. In a single year, a leatherback may swim more than 6,213 mi. Leatherbacks females which nest in Indonesia, make long-distance migrations into the central and eastern North Pacific, westward to the Sulawesi and Sulu and South China Seas, or northward to the Sea of Japan. Turtles tagged after nesting in July in Indonesia arrived in waters off California and Oregon from July to August coincident with the development of seasonal aggregations of jellyfish. Other studies similarly have documented leatherback sightings along the Pacific coast of North America during the summer and fall months, when large aggregations of jellyfish form (NMFS, 2012). Their presence off the U.S. west coast is “two pronged” with sightings occurring in northern California, Oregon, Washington, and southern California, with few sightings occurring along the intermediate (central California) coastline. Among foragers tagged in coastal waters off California, the majority moved north and spent time in areas offshore of northern California and Oregon, before moving towards the equatorial eastern Pacific, then eventually westward presumably towards western Pacific Ocean nesting beaches (NMFS, 2012).

Natural History

Leatherback turtles can reach 2,000 lbs. and 6.5 ft in length. Their lifespan and age of sexual maturity are not well understood. The leatherback turtle lacks a hard shell, and instead has a thick, leathery carapace consisting of connective tissue covering dermal bones. Female leatherbacks require sandy beaches in warm, tropical climates for nesting. West Pacific DPS leatherbacks nest during the winter and summer months in Indonesia (NMFS, 2012). Female leatherbacks lay clutches of approximately 100 eggs on sandy, tropical beaches. Females nest several times during a nesting season, typically at eight to 12-day intervals. The eggs will incubate for 60 to 65 days before hatching (Sea Turtle Conservancy, 2019). As obligate gelatinivores, leatherbacks feed on a variety of jellyfish species, including *Cyanea*, *Aurelia*, *Chrysaora*, and *Phacellophora*, as well as other soft-bodied prey such as salps, pyrosomes, and comb jellies.

Population Trends and Occurrence in the Action area

Abundance has been declining within the turtle’s range in California. For example, the number of leatherback sea turtles observed foraging off central California between 1990 and 2017 declined at an annual rate of 5.6% per year (Benson et al. 2020). There were no marked changes in ocean conditions or prey availability during that time. However, this rate was similar to the rate of decline in numbers at Indonesian nesting beaches over that same time (Benson et al. 2020).

Leatherback turtles have been observed within the Southern California OCS from San Luis Obispo County south to San Diego County (BOEM, 2023), although, more typically, they are seen west of the Channel Islands in deeper water.

4.6.1.4 Olive Ridley Turtle (*Lepidochelys olivacea*)

Status and Critical Habitat

The olive ridley turtle is listed under the ESA as two distinct classifications (43 FR 32800; July 28, 1978). Under this listing, the breeding population on the Pacific coast of Mexico is classified as endangered, while all other populations worldwide are designated as threatened. Since no breeding populations exists within the western United States olive ridley turtles found in coastal Pacific waters are presumed to be migratory individuals, likely originating from nesting beaches in Central America, Costa Rica, or possibly other parts of the eastern Pacific where populations are considered Threatened. Critical Habitat has not been designated for olive ridley turtles.

Range and Habitat

The olive ridley turtle has one of the most widespread ranges of any sea turtle species, inhabiting tropical and subtropical waters of the Pacific, Atlantic, and Indian Oceans. In the Pacific, they are found from Mexico and Central America to Southeast Asia and India, with occasional sightings off the U.S. West Coast, including California, especially during warm oceanographic events like El Niño. Olive ridleys are primarily pelagic, spending much of their life in open ocean habitats, but they also utilize coastal waters, bays, and estuaries for foraging, particularly near nesting sites. Their nesting habitat consists of sandy tropical beaches, notably at beaches in Mexico, Costa Rica, and India.

Natural History

Olive ridley turtles weigh on average 100 lbs. and are 22 to 31 in. in length. Their lifespan is unknown, but they reach sexual maturity around 15 years. Vast numbers of turtles come ashore and nest in what is known as an "arribada" during which hundreds to thousands of females come ashore to lay their eggs. At many nesting beaches, the nesting density is so high that previously laid egg clutches are dug up by other females excavating the nest to lay their own eggs. Major nesting beaches are located on the Pacific coasts of Mexico and Costa Rica (NMFS, 2014a). The exact triggers for these nesting events are unknown but could include the influence of offshore winds, lunar cycles, and the release of pheromones by females. Females nest every year, one to three times a season, laying clutches of approximately 100 eggs. Once hatched, hatchlings move seaward by traveling towards the brightest horizon (NMFS, 2014a). As omnivores, olive ridleys feed on a diverse diet including jellyfish, crustaceans, mollusks, algae, and other invertebrates, foraging both at the surface and along the seafloor.

Population Trends and Occurrence in the Action area

The olive ridley turtle nesting populations along Mexico's Pacific coast have shown encouraging trends in recent decades. Notably, Playa Escobilla in Oaxaca hosts one of the world's largest arribada (mass nesting) events, with estimates of up to 450,000 nesting females participating in a single season (NOAA, 2025c).

Olive ridley sea turtles are rare but occasionally observed in the Santa Barbara Channel, with recent sightings likely driven by anomalous oceanographic conditions. In November 2019, an adult olive ridley was photographed near the Channel Islands National Marine Sanctuary, marking one of the first confirmed sightings in the region and believed to be the result of marine heatwave conditions facilitating northward dispersal (NOAA ONMS, 2020). In early 2025, a cold-stunned olive ridley was recovered from the Channel and rehabilitated by local marine mammal and sea turtle responders, suggesting thermal stress associated with the cooler waters of the

region (CIMWI, 2025). These occurrences underscore the sporadic and largely climate-driven nature of olive ridley presence in the region.

4.6.2 Birds

4.6.2.1 California Least Tern (*Sternula antillarum*)

Status and Critical Habitat

The California least tern was listed as a Federally Endangered species in 1970 (35 FR 16047 16048). No Critical Habitat has been designated to date.

Range and Habitat

The breeding range of the California least tern extends from San Francisco Bay in the north to San Jose del Cabo in Baja California Sur, Mexico (USFW, 2018). Notable nesting sites encompass locations such as Seal Beach, San Pedro Bay, Camp Pendleton, and Ballona Creek. While primarily coastal, there have been occasional reports of nesting at interior sites like California's Central Valley and even in Arizona (AP, 2025). After the breeding season, which typically spans from mid-April to mid-September, California least terns migrate southward. Their exact wintering grounds remain uncertain, but they are believed to winter along the Pacific coasts of Central and South America (USFW, 2018). California least terns prefer to nest on open, sandy beaches, mudflats, and sand dunes with sparse or no vegetation. These nesting sites are usually located near lagoons, estuaries, and bays, providing proximity to foraging areas. Nests are simple, shallow depressions in the ground, often adorned with pebbles or shells. Adults also roost on the ground in unprotected coastal areas, typically near their nesting sites (AP, 2025). While foraging, California least terns utilize nearshore waters, estuaries, and river mouths, where they hunt for slender-bodied fish such as anchovies and topsmelt.

Natural History

The California least tern is a small migratory seabird that breeds in colonies along the Pacific coast from San Francisco Bay to Baja California, typically arriving at nesting sites in mid-April and departing by early September. They nest on flat, open, sandy, or sparsely vegetated beaches, mudflats, or dredge spoil sites near estuaries and coastal lagoons. Nests are shallow scrapes in the sand where pairs lay 1 to 3 eggs, with both parents incubating for about 20 to 25 days. After hatching, semi-precocial chicks are fed by both adults and fledge at 3 to 4 weeks of age. During the breeding season, adults forage in nearby shallow estuarine and nearshore marine waters, feeding primarily on small fish such as anchovies, silversides, topsmelt, and juvenile sardines, and occasionally on crustaceans and insects. They hunt by hovering over the water and diving to capture prey just below the surface, feeding most actively in the early morning and late afternoon. The species' reproductive success depends on the availability of undisturbed nesting sites and abundant forage fish near colony locations.

Population Trends and Occurrence in the Action area

As of the most recent comprehensive statewide data from 2019, the California least tern continues to face challenges in its population trends (CDFW, 2024). In 2019, an estimated 3,169 to 4,037 breeding pairs established 4,485 nests across 59 monitored sites in California. These efforts resulted in the production of approximately 734 to 958 fledglings, yielding a fledgling-to-breeding pair ratio of 0.18 to 0.30. This ratio indicates a continued decline in reproductive success

compared to previous years, with the 2019 figures representing the lowest number of breeding pairs recorded since 1995 and the lowest fledgling count since 2012.

California least terns do not nest in the Action area, but they have the potential to migrate and/or forage in the surface waters of Action area during the non-breeding season. The nearest nesting colony occurs at McGrath Beach, at the mouth of the Santa Clara River, approximately ten mi east of the Action area. During 2016 surveys, an estimated 57 breeding pairs and 62 nests were reported at the Santa Clara River, McGrath Beach colony (Frost, 2017)

4.6.2.2 Marbled Murrelet (*Brachyramphus marmoratus*)

Status and Critical Habitat

The marbled murrelet is listed as a Federally Threatened species on the ESA (57 FR 45328; October 1, 1992). Critical Habitat has been designated for the species' nesting habitat, including coastal old-growth and mature coniferous forests in Washington, Oregon, and California (76 FR 61599; October 5, 2011). Critical Habitat does not include marbled murrelet oceanic foraging territory and therefore will not be intersected during any Program activities.

Range and Habitat

The marbled murrelet is a small seabird found along the northeastern Pacific Ocean from Santa Cruz County in central California through Oregon and Washington, extending into British Columbia, Alaska, and parts of the Russian Far East. Unique among seabirds, marbled murrelets nest inland in old-growth and mature coniferous forests, often 12 to 30 mi from the coast. Preferred nesting trees, such as redwoods, Douglas-firs, Sitka spruce, and western hemlock, provide large, moss-covered branches or natural platforms for solitary nest placement. When not breeding, marbled murrelets inhabit coastal marine waters, including shallow bays, coves, and upwelling zones within about 1.2 mi of shore. During the breeding season murrelets make daily commutes between forest nests and ocean feeding grounds.

Murrelet abundance has been found greater offshore of fine- to medium- grained sand beaches, abundance was also greater offshore of estuaries and marshes, compared to other substrates (Lorenz et al., 2016). This bird is rare in southern California and is only found in the non-breeding season (late fall, winter, and early spring) in Ventura County (USFWS, 1997).

Natural History

The marbled murrelet is a unique seabird whose natural history sets it apart from most other members of the auk family. While it forages at sea like other alcids, it nests inland, often deep within old-growth forests, making it one of the only seabirds in North America to exhibit such behavior. Marbled murrelets reach breeding age around two to three years and typically lay a single egg per season. During the breeding season, which spans from April through September, adults travel inland, sometimes over 30 mi from the coast to nest high in large coniferous trees, selecting wide, moss-covered branches or natural deformities as nest platforms. After hatching, the chick is fed daily with fish delivered from the ocean until it fledges about four weeks later, making a solo flight to sea. Outside of the breeding season, marbled murrelets spend their entire lives in marine environments, often in nearshore coastal waters. Their diet consists primarily of small, schooling forage fish such as anchovies, herring, capelin, and sand lance, as well as

euphausiid crustaceans (krill) and other zooplankton. They forage by diving and using their wings to swim underwater, often capturing prey at depths of up to 100 ft (USFWS, 2019).

Population Trends and Occurrence in the Action area

The most recent population trends for the marbled murrelet indicate ongoing challenges for the species, particularly in the Pacific Northwest. According to the 2023 summary report from the Northwest Forest Plan (NWFP) Effectiveness Monitoring Program, at-sea surveys conducted in Conservation Zone 2 (western Washington coast) and Conservation Zone 4 (southern Oregon to northern California coast) estimated populations of approximately 1,100 and 6,400 murrelets, respectively. These figures are consistent with previous years, suggesting a continued decline in these regions (USFWS, 2019). Southern California populations are largely unknown, with the majority of state surveys conducted off the central California coast, from Santa Cruz to south San Francisco Bay. While the Santa Barbara Channel is within their winter range, sightings are relatively uncommon and dispersed compared to their primary habitats further north. These birds are typically found near the shoreline, within 1.2 mi of the coast. Occurrences in the Santa Barbara Channel are occasionally reported to eBird with the most recent being from January 2025, near Ventura, California (eBird, 2025c).

4.6.2.3 Short-tailed Albatross (*Phoebastria albatrus*)

Status and Critical Habitat

The short-tailed albatross was listed as Endangered in accordance with the ESCA of 1969 as a foreign species. This listing was amended on July 31, 2000, to reflect the short-tailed albatross as Endangered throughout its range (65 FR 46643; July 31, 2000). No Critical Habitat has been designated to date (65 FR 46643; July 31, 2000).

Range and Habitat

The short-tailed albatross is a large, oceanic seabird with a range spanning the North Pacific, from breeding islands in Japan to foraging waters along the U.S. West Coast. The species nests primarily on Torishima Island and the Senkaku Islands in Japan, where it favors open, gently sloping volcanic terrain with minimal disturbance. After the breeding season, which occurs from October through May, short-tailed albatrosses disperse widely across the North Pacific. During this non-breeding period, they have been observed foraging off the California coast, particularly within the California Current System. These birds are rarely seen, but most commonly recorded in shelf-edge waters, seamount zones, and areas of active fisheries.

Natural History

The short-tailed albatross is a large, long-lived seabird native to the North Pacific Ocean, nesting primarily on Torishima Island and the Senkaku Islands of Japan, where breeding begins in October and extends through May. Nests are built on open, gently sloped volcanic terrain with little vegetation. After breeding, adults and fledglings disperse widely across the North Pacific, with non-breeding individuals frequently traveling to waters off Alaska, the Aleutian Islands, the Bering Sea, and along the U.S. West Coast, particularly Oregon and California, where they utilize the California Current System. This nutrient-rich marine ecosystem supports a high diversity of prey, making it an important foraging area. Short-tailed albatrosses feed primarily on squid, flying fish, smaller pelagic fish, crustaceans, and fishery discards, using dynamic soaring to cover vast

distances and diving or surface-seizing techniques to capture prey (USFWS, 2019a). They are generally solitary or found in small groups at sea and may associate with fishing vessels where food is more accessible. With lifespans often exceeding 40 years and delayed maturity (first breeding around age 6 to 10), their recovery depends on low adult mortality and the protection of critical marine and breeding habitats.

Population Trends and Occurrence in the Action area

Historically abundant, the species was driven to near extinction in the late 19th and early 20th centuries due to feather hunting but has since made a slow recovery under international protection. As of 2024, the global population of the short-tailed albatross is estimated at approximately 10,931 individuals, reflecting a steady annual growth rate of 7 to 8% over recent years. Most of the population (about 9,188 birds) nests on Torishima Island in Japan, while an estimated 1,720 individuals are associated with the Senkaku Islands. A smaller, developing colony on Mukojima currently hosts 3 breeding pairs, indicating progress in translocation and colony establishment efforts (PSG 2025).

Program activities within the Action area may intersect with albatross foraging along continental shelf margins. Their presence in California is most frequent from late spring through early fall, though individuals may be observed year-round. Few observations have occurred within the Santa Barbara Channel, the closest being offshore Prisoner's Harbor, Santa Cruz Island in 2005 (eBird, 2025b).

4.6.3 Marine Mammals

4.6.3.1 Blue Whale (*Balaenoptera musculus*)

Status and Critical Habitat

The blue whale was listed as Federally Endangered throughout its range under the ESCA of 1969 prior to the passage of the FESA in 1973 (35 FR 12222; July 30, 1970). Critical Habitat has not been designated for the species.

Range and Habitat

Blue whales are distributed worldwide in circumpolar and temperate waters. They generally occur farther offshore than other baleen whales but can also be found in coastal waters. Like most baleen whales, they migrate between warmer water breeding and calving areas in winter and high latitude feeding grounds in the summer. Feeding grounds have been identified in coastal upwelling zones off the coast of California, primarily within two patches near the Gulf of the Farallones and at the western part of the Channel Islands (Allen et al., 2011). They migrate seasonally between summer and winter, but some evidence suggests that individuals remain in certain areas year-round. Nine BIA's for blue whale feeding were identified off the California coast by Calambokidis et al. (2015), including six in southern California and three in central California.

Natural History

The blue whale, is a large baleen whale found in all major oceans except the Arctic. Preferring deep offshore waters, blue whales are frequently observed along the U.S. West Coast, including the Southern California Bight and near the Channel Islands. They feed almost exclusively on krill, consuming up to four tons per day during seasonal foraging in productive,

high-latitude waters. Blue whales migrate long distances annually, traveling from summer feeding areas to winter breeding grounds in warmer tropical or subtropical regions. Calves are born after an 11 to 12 month gestation period, measuring around 20 to 25 ft at birth, and nurse for up to seven months. These whales produce powerful low-frequency calls that can travel vast distances, aiding in communication and navigation.

Population Trends and Occurrence in the Action area

The Eastern North Pacific population of blue whales, which inhabits the waters off the U.S. West Coast, including California, Oregon, and Washington has shown signs of partial recovery since the end of commercial whaling, but recent data indicate that the population has stabilized rather than continued to grow. In recognition of the region's cetacean diversity and abundance, including substantial populations of blue whales, the Santa Barbara Channel was designated as a Whale Heritage Zone in 2023. The most recent estimates of the blue whale indicate that a minimum of 1,767 individuals are known to occur off the west coast (NMFS, 2024a). A Feeding BIA is identified within the Action area and westward along the northern Channel Islands, with whales actively feeding from June to November. Blue whales are frequently observed in the Santa Barbara Channel around offshore oil platforms during the summer and fall seasons (BIA mapper, 2025).

4.6.3.2 Fin Whale (*Balaenoptera physalus*)

Status and Critical Habitat

The fin whale was listed as Federally Endangered throughout its range under the ESCA of 1969 prior to the passage of the FESA in 1973 (35 FR 12222; July 30, 1970). Critical Habitat has not been designated for the species.

Range and Habitat

Fin whales have a broad distribution throughout the Pacific Ocean, ranging from subarctic to tropical waters, though they are most commonly found in temperate and subpolar regions. In the North Pacific, their range extends from the Bering Sea and Gulf of Alaska southward to Baja California, including the California Current System and the waters surrounding the Channel Islands, where they are frequently observed. They are pelagic and primarily inhabit deep offshore waters beyond the continental shelf, typically favoring depths greater than 656 ft. Fin whales are most often found in areas of high ocean productivity, such as upwelling zones, where they feed on krill, small schooling fish, and other zooplankton. While they may move into lower latitudes during winter months, likely for calving or mating, their reproductive habitats are less clearly defined than those of other baleen whales.

Natural History

Fin whales are on average 59 ft in length and weigh 50 to 70 tons, making them the second-largest animal on earth (Allen et al., 2011). Little is known about the social and mating systems of fin whales though it is believed that males become sexually mature at six to ten years of age; and females at seven to 12 years of age. Physical maturity is attained at approximately 25 years for both sexes. Fin whales are filter feeders that primarily consume krill and small schooling fish using lunge-feeding, a method in which they engulf large volumes of water and strain prey through their baleen plates. They typically feed in high-latitude, productive waters

during summer and likely migrate to lower latitudes in winter to breed. Calves are born after an 11- to 12-month gestation and nurse for 6 to 7 months.

Population Trends and Occurrence in the Action area

Recent population estimates for fin whales indicate a minimum of 7,970 individuals are present in the waters off the coast of California, Oregon, and Washington (NMFS, 2024b). In recognition of the region's cetacean diversity and abundance, including substantial populations of fin whales, the Santa Barbara Channel was designated as a Whale Heritage Zone in 2023. The Action area surrounding Platform Gilda has documented numerous sightings of fin whales (Happywhale, 2025), which are known to spend extended periods (over six months) engaged in foraging activities in the warm, shallow, nearshore waters, typically less than 1,500 ft (457 m) in depth. The Action area also overlaps with a designated Feeding BIA for fin whales, who typically use the area from June to November (BIA mapper, 2025). Peak abundances of fin whales in the Southern California Bight occur after periods of maximum upwelling, in summer and fall (Allen et al., 2011).

4.6.3.3 Gray Whale, Western North Pacific DPS (*Eschrichtius robustus*)

Status and Critical Habitat

The Western North Pacific (WNP) DPS gray whale was listed as Federally Endangered throughout its range in 1970 (35 FR 18319; December 2, 1970). At this time no Critical Habitat has been designated.

Range and Habitat

The WNP DPS of gray whale inhabits a range extending from Arctic feeding grounds in the Okhotsk Sea, particularly near Sakhalin Island, to presumed but poorly documented breeding areas in the East China Sea, South China Sea, and coastal regions of Japan and the Korean Peninsula. The population utilizes shallow, nearshore waters with soft sediment substrates for benthic foraging, primarily targeting amphipods and other infaunal prey. Seasonal migrations between high-latitude feeding areas and lower-latitude breeding regions are typical, with whales generally following coastal corridors, although satellite telemetry has shown some individuals utilizing offshore routes. Breeding and calving habitat is believed to consist of warm, shallow bays or lagoons similar to those used by the Eastern North Pacific population, though specific calving sites for the WNP remain unconfirmed. Occasional sightings and photo-identification matches of WNP individuals along the U.S. Pacific coast, including California, suggest limited overlap with ENP migratory pathways. However, such occurrences are rare and considered incidental to the primary range of the population (NOAA, 2023b). The WNP gray whale is primarily found along the coast of eastern Asia; however, occasional they have been observed migrating along the west coast of the U.S. to breeding grounds in Baja California.

Natural History

Gray whales are primarily bottom feeders that consume a wide range of benthic and epibenthic invertebrates, such as amphipods. Gray whales sieve sediment and food from the sea floor by rolling on their sides and swimming slowly along, filtering their food through their baleen plates on each side of their upper jaw. Although western and eastern stocks of gray whales were thought to be relatively isolated from each other, recent satellite tagging data and photo-

identification and genetic matches have shown that at least some western North Pacific gray whales migrate across the northern Gulf of Alaska, and along the west coast of British Columbia, the United States, and Mexico. The gray whale migration can be categorized into three phases: The southbound phase includes all age classes as they migrate to the lagoons in Mexico (October through March, peaking in December through March); the first northbound phase consists mainly of adults and juveniles that lead the northbound migration (late January through July, peaking in April through July); and second northbound phase consists of cow-calf pairs (March through July) (NMFS, 2021b).

Occurrence in the Action Area

A small portion of WNP gray whale have been reported to migrate to the breeding grounds in the Eastern Pacific. This group of WNP gray whales have a moderate likelihood of occurring in the Action area during southbound migration October through March, or during their northbound migration in late January through July. There are no recording feeding or breeding grounds for gray whales within the Action area; however, shallow water benthic habitat and prey do occur (NMFS, 2021b). The Action area also overlaps with a designated Migratory BIA for gray whales (BIA mapper, 2025).

4.6.3.4 Humpback Whale, Central American and Mexican DPS's (*Megaptera novaeangliae*)

Status and Critical Habitat

The humpback whale was listed as Endangered in the ESCA of 1969, prior to the passage of the modern-day ESA. In September 2016, NOAA revised the ESA listing for the humpback whale to identify 14 DPS, listing one as Threatened, four as Endangered, and identifying nine others as not warranted for listing. The Central America DPS is listed as Federally Endangered (81 FR 62260; September 8, 2016) and the Mexico DPS is listed as a Federally Threatened population (81 FR 62260; September 8, 2006).

Critical Habitat for the Central America DPS encompasses 48,521 square nautical mi of coastline from the Channel Islands in California, north to the Strait of Juan de Fuca in Washington (86 FR 21082; April 21, 2021). Critical Habitat for the Mexico DPS of humpback whales encompasses approximately 116,098 square nautical mi of marine habitat in the North Pacific Ocean, including areas within portions of the eastern Bering Sea, Gulf of Alaska, and California Current Ecosystem. Program area intersects with Critical Habitat for both DPS of humpback whale; however, manmade structures and the land they sit upon are excluded from designation (86 FR 21082, April 21, 2021).

A Primary Constituent Element (PCE) refers to the specific physical or biological features within a designated critical habitat that are essential to the conservation of a species, as defined under Section 3(5)(A) of the Endangered Species Act (ESA). For the Central America and Mexico DPSs of the humpback whale, the NMFS identified one PCE that supports the species' foraging and recovery needs. As stated in the final biological report for Critical Habitat designation, the PCE consists of:

"Prey species, primarily euphausiids (*Thysanoessa* and *Euphausia*) and small pelagic schooling fishes, such as Pacific herring (*Clupea pallasii*), capelin (*Mallotus villosus*), juvenile walleye pollock (*Gadus chalcogrammus*), and Pacific sand lance (*Ammodytes personatus*), of

sufficient quality, abundance, and accessibility within humpback whale feeding areas to support feeding and population growth.”

Range and Habitat

Humpback whales are distributed worldwide and travel great distances during their seasonal migration, the farthest migration of any animal. Humpback whales spend the winter and spring months offshore of Central America and Mexico for breeding and calving and then migrate to their summer and fall range between California and southern British Columbia to feed (Allen et al., 2011). Although humpback whales typically travel over deep, oceanic waters during migration, their feeding and breeding habitats are in shallow, coastal waters over continental shelves. Cold and productive coastal waters characterize feeding grounds (NMFS, 2021g). In the North Pacific, the California/Oregon/Washington stock winters in coastal Central America and Mexico and migrates to areas ranging from the coast of California to southern British Columbia in summer/fall (NMFS, 2021g).

Natural History

Humpback whales are on average 42 ft in length and weigh 25 to 40 tons. Their natural history is defined by long-distance migrations between warm-water breeding areas, where they fast and focus on mating and calving, and cooler, productive feeding grounds. While at feeding grounds, humpback whales primarily consume small schooling fish such as anchovies, sardines, herring, and juvenile salmon, as well as krill and other small crustaceans. They employ a variety of foraging techniques, including lunge feeding and bubble-net feeding, to capture dense prey aggregations.

Population Trends and Occurrence in the Action area

The Central America DPS, which winters along the Pacific coasts from Panama to southern Mexico and migrates to feeding grounds off California, Oregon, and Washington, has an estimated minimum population of approximately 1,284 individuals. This group has experienced a modest annual growth rate of about 1.6%, with a standard deviation of 2.0%, indicating a slow recovery trajectory. This growth rate is notably lower than the overall 8.2% annual increase observed for humpback whales along the U.S. West Coast since 1989. In contrast, the Mexico DPS, which breeds along the Pacific coast of mainland Mexico and migrates to feeding areas extending from California to Alaska and even Russia, has demonstrated a more robust recovery. While specific growth rates for this DPS are not detailed in the provided sources, the overall increase in humpback whale numbers along the U.S. West Coast suggests a positive trend for this population segment. The Mexico DPS benefits from a broader range of breeding and feeding habitats, which may contribute to its comparatively healthier population status, which appears to be increasing.

A Feeding BIA is established for humpback whales within the Action area. Humpback whales are more likely to occur in the Action area from March through September when their target prey, schooling fish and krill, is most abundant.

4.6.3.5 Marine Mammal Protection Act Species

In addition to the species discussed above protected under the Federal Endangered Species Act, all marine mammals are protected by the Marine Mammal Protection Act (MMPA)

of 1972. Baleen whales, toothed whales (including dolphins), and pinnipeds could occur in the Action area. Although seasonal abundances may vary, both residents, seasonal, and migrant MMPA species are expected to occur in the Program region. Table 4-2 lists the MMPA-protected species likely to occur within the Action area, and their known stock population abundances.

Table 4-2. Marine Mammal Population Statuses within Program Region

Common Name Scientific Name	Status ^{1,2}	Minimum Population Estimate (Stock)	Current Population Trend	Source
MYSTICETI-CETACEANS				
Blue whale <i>Balaenoptera musculus</i>	FE	1,767 (Eastern North Pacific Stock)	Stable	NMFS 2023a.
California gray whale <i>Eschrichtius robustus</i>	FE	271 (Western North Pacific Stock)	Increasing	NMFS 2021b.
	MMPA	25,849 (Eastern North Pacific Stock)	Increasing	NMFS 2021a.
Fin whale <i>Balaenoptera physalus</i>	FE	7,970 (California/Oregon/Washington Stock)	Increasing	NMFS 2023b.
Humpback whale <i>Megaptera novaeangliae</i>	FT	3,185 (Mainland Mexico - California/Oregon/Washington Stock)	Unknown	NMFS 2023e.
	FE	1,284 (Central American/ Southern Mexico – California/Oregon/Washington Stock)	Increasing	NMFS 2023d.
Minke whale <i>Balaenoptera acutorostrata</i>	MMPA	509 (California/Oregon/Washington Stock)	No long-term trend suggested	NMFS 2023c.
ODONTOCETI-CETACEANS				
Baird's beaked whale <i>Berardius bairdii</i>	MMPA	894 (California/Oregon/Washington Stock)	Increasing	NMFS 2022i.
Common bottlenose dolphin <i>Tursiops truncatus</i>	MMPA	2,048 (California/Oregon/Washington Offshore Stock)	No long-term trend suggested	NMFS 2022d.
	MMPA	346 (California Coastal Stock)	Increasing	NMFS 2017b.
Dall's porpoise <i>Phocoenoides dalli dalli</i>	MMPA	10,286 (California/Oregon/Washington Stock)	Unable to determine	NMFS 2022b.
Killer whale <i>Orcinus orca</i>	MMPA	276 (Eastern North Pacific Offshore Stock)	Stable	NMFS 2019b.
	MMPA	349 (West Coast Transient Stock)	Unable to determine	NMFS 2021d.

Common Name Scientific Name	Status ^{1,2}	Minimum Population Estimate (Stock)	Current Population Trend	Source
Long-beaked common dolphin <i>Delphinus delphis bairdii</i>	MMPA	69,636 (California Stock)	Unable to determine	NMFS 2022g.
Mesoplodont beaked whales	MMPA	1,967 (California/Oregon/Washington Stocks)	Stable	NMFS 2018a.
Northern right whale dolphin <i>Lissodelphis borealis</i>	MMPA	17,024 (California/Oregon/Washington Stock)	No long-term trend suggested	NMFS 2022h.
Pacific white-sided dolphin <i>Aethalodelphis obliquidens</i>	MMPA	29,090 (California/Oregon/Washington Northern and Southern Stocks)	No long-term trend suggested	NMFS 2022c.
Risso's dolphin <i>Grampus griseus</i>	MMPA	4,817 (California/Oregon/Washington Stock)	No long-term trend suggested	NMFS 2017a.
Short-beaked common dolphin <i>Delphinus delphis delphis</i>	MMPA	888,971 (California/Oregon/Washington Stock)	Increasing	NMFS 2022f.
Striped dolphin <i>Stenella coeruleoalba</i>	MMPA	23,448 (California/Oregon/Washington Stock)	No long-term trend suggested	NMFS 2022e.
PINNIPEDS				
California sea lion <i>Zalophus californianus</i>	MMPA	233,515 (U.S. Stock)	Increasing	NMFS 2019a.
Guadalupe fur seal <i>Arctocephalus townsendi</i>	FT	31,019	Increasing	NMFS 2020a.
Northern elephant seal <i>Mirounga angustirostris</i>	MMPA	85,369 (California Breeding Stock)	Increasing	NMFS 2022a.
Northern fur seal <i>Callorhinus ursinus</i>	MMPA	7,524 (California Stock)	Increasing	NMFS 2015b.
Pacific harbor seal <i>Phoca vitulina richardii</i>	MMPA	27,348 (California Stock)	Stable	NMFS 2015a.

¹Status Codes:

FE Federally listed Endangered Species

FT Federally listed Threatened Species

²All marine mammals are Federally protected under the Marine Mammal Protection Act (MMPA).

5.0 POTENTIAL EFFECTS OF THE PROPOSED ACTION ON LISTED SPECIES

The evaluation of potential effects includes the analysis of direct and indirect effects on the species and their associated habitats as a result of Program activities. Direct effects are those impacts caused during activities of the proposed Program; indirect effects are those impacts that are caused by the proposed Program but occur later in time or as a result of altered site conditions. Potential impacts due to Program activities include temporary degradation of water quality from increased vessel traffic and/or hydrocarbon release or use of lighting during nighttime activities. Program avoidance and minimization measures that will be implemented as part of Program activities were included in the evaluation for a determination of effects (**No effect, Not likely to adversely affect, or Likely to adversely affect**), further discussed in Section 6.0.

5.1 GREEN TURTLE, EAST PACIFIC DPS

Potential impacts to East Pacific DPS green turtles could occur during Program activities which require mobilization of marine vessels and equipment which may displace turtles temporarily out of the Action area. Other effects could include potential degradation of water quality from the accidental discharge of contaminants in the event of a spill from Program vessels or well casings and increased underwater noise.

Loss of Habitat. No loss of habitat is expected due to Program-related activities. No nesting activities occur within Action area.

Mortality. The risk to East Pacific DPS green turtles from boat strikes has been shown to increase with vessel speed and correspond to behavioral responses of turtles. Approaching vessels found that turtles fled frequently in encounters with slow vessels (2 knots), infrequently with moderate speed (6 knots), and rarely in encounters with fast speed (10 knots) (Hazel et al., 2007). Interactions with large Program vessels could occur during transit to and from the Action area; however, Program vessels will work within existing and established supply transit routes for commercial vessels.

Harassment. East Pacific DPS green turtles, if present within the Action area, may be displaced during Program operations involving the use of vessels, Platform cranes, and hydraulic fracturing equipment, all of which generate underwater noise. These stimuli may elicit behavioral responses in green turtles such as avoidance of the area, interrupted foraging behavior, or altered dive and surfacing patterns. While an accidental release of well stimulation fluid would cause significant harassment to East Pacific green turtles it is considered unlikely due to mandated well integrity testing which will be conducted prior to and throughout any stimulation activity, including pressure testing of the casing and tubing to confirm the absence of leaks.

Loss of Forage. Program activities would not result in loss of forage for adult East Pacific DPS green turtles, which feed predominantly on seagrasses, macroalgae, and, occasionally, sponges and other benthic invertebrates. These food resources are partially supported by the biofouling communities present on the Platform; however, given the species' strong site fidelity to nearshore foraging grounds it is unlikely that adult individuals will make use of Platform-associated habitat.

Loss of Shelter/Cover. East Pacific DPS green turtles do not use Platform habitat for shelter or cover therefore no loss is expected to occur due to Program activities.

Loss of Access. East Pacific DPS green turtles that occur within the Action area would experience a temporary loss of access due to Program activities during vessel and equipment presence. The likelihood that individuals would be present in the Santa Barbara Channel is highest during the summer and fall; therefore, Program activities could potentially overlap with migratory and feeding behaviors of any individuals within the Action area.

Noise During Construction. East Pacific DPS green turtles may be affected by the above and underwater noise generated during Program activities such as well stimulation activities and vessel operations. While turtles lack external ears, they are sensitive to low-frequency sounds and vibrations, particularly in the 30 Hz to 1,000 Hz range, which overlaps with many industrial noise sources. While noise levels generated by the Program have potential to impact marine turtles at close range, it is likely they will exhibit avoidance behavior and temporarily avoid the Action area. The available data show that there is little to no increase in noise levels from fixed platforms during drilling operations as compared to non-drilling operations (Noise Control Engineering, 2007). Pressurized fluids would likely cause conductors to vibrate, creating indirect underwater noise sources; however, the majority of the noise sources would be produced under the seafloor and would dissipate before reaching open water. In addition, equipment activity and Program operations originating on the Platform have the potential to create noise that may penetrate the water column; however, activities would be temporary and noise levels are not expected to exceed the existing operation levels or hearing thresholds that would cause adverse effects to marine wildlife.

Fragmentation. Program activities are not expected to result in population fragmentation for the East Pacific DPS of green turtles, as any individuals occurring within the Action area are likely to be transient, utilizing the region as part of broader migratory routes or as pelagic foraging habitat.

5.2 LOGGERHEAD TURTLE, NORTH PACIFIC DPS

Potential impacts to North Pacific DPS loggerhead turtles could occur during Program activities which require mobilization of marine vessels and equipment which may displace turtles temporarily out of the Action area. Other effects could include potential degradation of water quality from the accidental discharge of contaminants in the event of a spill from Program vessels or well casings and increased underwater noise.

Loss of Habitat. No loss of habitat is expected due to Program-related activities. No nesting activities occur within Action area.

Mortality. The risk to North Pacific DPS loggerhead turtles from boat strikes has been shown to increase with vessel speed and correspond to behavioral responses of turtles. Approaching vessels found that turtles fled frequently in encounters with slow vessels (2 knots), infrequently with moderate speed (6 knots), and rarely in encounters with fast speed (10 knots) (Hazel et al., 2007). Interactions with large Program vessels could occur during transit to and from the Action area; however, Program vessels will work within existing and established supply transit routes for commercial vessels.

Harassment. North Pacific DPS loggerhead turtles, if present within the Action area, may be displaced during Program operations involving the use of vessels, Platform cranes, and hydraulic fracturing equipment, all of which generate underwater noise. Program activities may

create minor increases in turbidity in the water column near the Platform. These stimuli may elicit behavioral responses in turtles such as avoidance of the area, interrupted foraging behavior, or altered dive and surfacing patterns. While an accidental release of well stimulation fluid would cause significant harassment to North Pacific loggerhead turtles it is considered unlikely due to mandated well integrity testing which will be conducted prior to and throughout any stimulation activity, including pressure testing of the casing and tubing to confirm the absence of leaks.

Loss of Forage. Program activities are not expected to result in the loss of foraging habitat for adult North Pacific DPS loggerhead turtles, which feed predominantly on mollusks, crustaceans, sponges, and other benthic invertebrates in the coastal zone. These food resources are partially supported by the biofouling communities present on the Platform; however, given the species' strong site fidelity to nearshore foraging grounds it is unlikely that adult individuals make use of Platform-associated habitat.

Loss of Shelter/Cover. North Pacific DPS loggerhead turtles do not use Platform habitat for shelter or cover therefore no loss is expected to occur due to Program activities.

Loss of Access. North Pacific DPS loggerhead turtles that occur within the Action area would experience a temporary loss of access due to Program activities during vessel and equipment presence. The likelihood that individuals would be present in the Santa Barbara Channel is highest between August and October; therefore, Program activities could potentially overlap with migratory and feeding behaviors of any individual within the Action area.

Noise During Construction. North Pacific DPS loggerhead turtles may be affected by the above and underwater noise generated during Program activities such as well stimulation activities and vessel operations. While turtles lack external ears, they are sensitive to low-frequency sounds and vibrations, particularly in the 30 Hz to 1,000 Hz range, which overlaps with many industrial noise sources. While noise levels generated by the Program have potential to impact marine turtles at close range, it is likely they will exhibit avoidance behavior and temporarily avoid the Action area. The available data show that there is little to no increase in noise levels from fixed platforms during drilling operations as compared to non-drilling operations (Noise Control Engineering, 2007). Pressurized fluids would likely cause conductors to vibrate, creating indirect underwater noise sources; however, the majority of the noise sources would be produced under the seafloor and would dissipate before reaching open water. In addition, equipment activity and Program operations originating on the Platform have the potential to create noise that may penetrate the water column; however, activities would be temporary and noise levels are not expected to exceed the existing operation levels or hearing thresholds that would cause adverse effects to marine wildlife.

Fragmentation. Program activities are not expected to result in population fragmentation for the North Pacific DPS of loggerhead turtles, as any individuals occurring within the Action area are transient, utilizing the region as part of broader migratory routes or as pelagic foraging habitat.

5.3 LEATHERBACK TURTLE, PACIFIC OCEAN DPS

Potential impacts to Pacific Ocean DPS leatherback turtles could occur during Program activities which require mobilization of marine vessels and equipment which may displace turtles temporarily out of the Action area. Other effects could include potential degradation of water

quality from the accidental discharge of contaminants in the event of a spill from Program vessels or well casings and increased underwater noise.

Loss of Habitat. No loss of habitat is expected due to Program-related activities. No nesting activities occur within Action area.

Mortality. The risk to Pacific Ocean DPS leatherback turtles from boat strikes has been shown to increase with vessel speed and correspond to behavioral responses of turtles. Approaching vessels found that turtles fled frequently in encounters with slow vessels (2 knots), infrequently with moderate speed (6 knots), and rarely in encounters with fast speed (10 knots) (Hazel et al., 2007). Interactions with large Program vessels could occur during transit to and from the Action area; however, Program vessels will work within existing and established supply transit routes for commercial vessels.

Harassment. Pacific Ocean DPS leatherback turtles, if present within the Action area, may be displaced during Program operations involving the use of vessels, Platform cranes, and hydraulic fracturing equipment, all of which generate underwater noise. Program activities may create minor increases in turbidity in the water column near the Platform. These stimuli may elicit behavioral responses in turtles such as avoidance of the area, interrupted foraging behavior, or altered dive and surfacing patterns. While an accidental release of well stimulation fluid would cause significant harassment to Pacific Ocean leatherback turtles it is considered unlikely due to mandated well integrity testing which will be conducted prior to and throughout any stimulation activity, including pressure testing of the casing and tubing to confirm the absence of leaks.

Loss of Forage. Program activities are not expected to result in the loss of foraging habitat for adult North Pacific DPS loggerhead turtles, which feed predominantly on gelatinous plankton such as salps, jellyfish, and tunicates. These food resources are supported by the pelagic habitat surrounding Platform Gilda and would not be altered during Program activities.

Loss of Shelter/Cover. Pacific Ocean DPS leatherback turtles do not use Platform habitat for shelter or cover therefore no loss is expected to occur due to Program activities.

Loss of Access. Pacific Ocean DPS leatherback turtles that occur within the Action area would experience a temporary loss of access due to Program activities during vessel and equipment presence. The likelihood that individuals would be present in the Santa Barbara Channel is highest between July and August; therefore, Program activities have potential to overlap with migratory and feeding behaviors of any individuals within the Action area.

Noise During Construction. Pacific Ocean DPS leatherback turtles may be affected by the above and underwater noise generated during Program activities such as well stimulation activities and vessel operations. While turtles lack external ears, they are sensitive to low-frequency sounds and vibrations, particularly in the 30 Hz to 1,000 Hz range, which overlaps with many industrial noise sources. While noise levels generated by the Program have potential to impact marine turtles at close range, it is likely they will exhibit avoidance behavior and temporarily avoid the Action area. The available data show that there is little to no increase in noise levels from fixed platforms during drilling operations as compared to non-drilling operations (Noise Control Engineering, 2007). Pressurized fluids would likely cause conductors to vibrate, creating indirect underwater noise sources; however, the majority of the noise sources would be produced under the seafloor and would dissipate before reaching open water. In addition, equipment activity

and Program operations originating on the Platform have the potential to create noise that may penetrate the water column; however, activities would be temporary and noise levels are not expected to exceed the existing operation levels or hearing thresholds that would cause adverse effects to marine wildlife.

Fragmentation. Program activities are not expected to result in population fragmentation for leatherback turtles, as any individuals occurring within the Action area are transient, utilizing the region as part of broader migratory routes or as pelagic foraging habitat.

5.4 OLIVE RIDLEY TURTLE

Potential impacts to olive ridley turtles could occur during Program activities which require mobilization of marine vessels and equipment which may displace turtles temporarily out of the Action area. Other effects could include potential degradation of water quality from the accidental discharge of contaminants in the event of a spill from Program vessels or well casings and increased underwater noise.

Loss of Habitat. No loss of habitat is expected due to Program-related activities. No nesting activities occur within Action area.

Mortality. The risk to olive ridley turtles from boat strikes has been shown to increase with vessel speed and correspond to behavioral responses of turtles. Approaching vessels found that turtles fled frequently in encounters with slow vessels (2 knots), infrequently with moderate speed (6 knots), and rarely in encounters with fast speed (10 knots) (Hazel et al., 2007). Interactions with large Program vessels could occur during transit to and from the Action area; however, Program vessels will work within existing and established supply transit routes for commercial vessels.

Harassment. Olive ridley turtles, if present within the Action area, may be displaced during Program operations involving the use of vessels, Platform cranes, and hydraulic fracturing equipment, all of which generate underwater noise. Program activities may create minor increases in turbidity in the water column near the Platform. These stimuli may elicit behavioral responses in turtles such as avoidance of the area, interrupted foraging behavior, or altered dive and surfacing patterns. While an accidental release of well stimulation fluid would cause significant harassment to olive ridley turtles it is considered unlikely due to mandated well integrity testing which will be conducted prior to and throughout any stimulation activity, including pressure testing of the casing and tubing to confirm the absence of leaks.

Loss of Forage. Program activities are not expected to result in the loss of foraging habitat for olive ridley turtles which feed predominantly on algae, mollusks, crustaceans, sponges, and other benthic invertebrates in the coastal zone. These food resources are partially supported by the biofouling communities present on the Platform; however, given the species' rare occurrences in the Program region it is unlikely that individuals will make use of Platform-associated habitat.

Loss of Shelter/Cover. Olive ridley turtles do not use Platform habitat for shelter or cover therefore no loss is expected to occur due to Program activities.

Loss of Access. Olive ridley turtles that occur within the Action area would experience a temporary loss of access due to Program activities during vessel and equipment presence. The likelihood that individuals would be present in the Santa Barbara Channel is highest between

August and October; therefore, Program activities have potential to overlap with migratory and feeding behaviors of any individuals within the Action area.

Noise During Construction. Olive ridley turtles may be affected by the above and underwater noise generated during Program activities such as well stimulation activities and vessel operations. While turtles lack external ears, they are sensitive to low-frequency sounds and vibrations, particularly in the 30 Hz to 1,000 Hz range, which overlaps with many industrial noise sources. While noise levels generated by the Program have potential to impact marine turtles at close range, it is likely they will exhibit avoidance behavior and temporarily avoid the Action area. The available data show that there is little to no increase in noise levels from fixed platforms during drilling operations as compared to non-drilling operations (Noise Control Engineering, 2007). Pressurized fluids would likely cause conductors to vibrate, creating indirect underwater noise sources; however, the majority of the noise sources would be produced under the seafloor and would dissipate before reaching open water. In addition, equipment activity and Program operations originating on the Platform have the potential to create noise that may penetrate the water column; however, activities would be temporary and noise levels are not expected to exceed the existing operation levels or hearing thresholds that would cause adverse effects to marine wildlife.

Fragmentation. Program activities are not expected to result in population fragmentation for olive ridley turtles, as any individuals occurring within the Action area are transient, utilizing the region as part of broader migratory routes or as pelagic foraging habitat.

5.5 CALIFORNIA LEAST TERN

Potential impacts to California least tern could occur during Program activities that require mobilization of a marine spread of vessels, potentially displacing terns from foraging in open surface waters. The presence of Program vessels, and noise generated from Program equipment could interfere with California least tern migrating and foraging behavior.

Loss of Habitat. California least terns primarily use nearshore waters as foraging habitat and do not utilize Platform structures as habitat; therefore, no loss of habitat is expected due to Program related activities.

Mortality. No mortality expected because Program activities will not cause fatal conflicts with California least terns.

Harassment. California least terns, if present within the Action area, may be displaced during Program operations involving the use of vessels, Platform cranes, and hydraulic fracturing equipment, all of which generate above water noise. These stimuli may elicit behavioral responses such as avoidance of the area or interrupted foraging behavior. While an accidental release of well stimulation fluid would cause significant harassment it is considered unlikely due to mandated well integrity testing which will be conducted prior to and throughout any stimulation activity, including pressure testing of the casing and tubing to confirm the absence of leaks.

Loss of Forage. Program activities could result in the temporary loss of foraging area for California least terns due to vessel presence, potentially displacing individuals from the Action area during construction.

Loss of Shelter/Cover. Program activities would not result in the loss of shelter or cover for California least terns. No studies or observations to date have observed individuals roosting or nesting on Platform Gilda.

Loss of Access. Program activities may result in temporary loss of access to the open surface waters within the nearshore Action area for California least terns; however, Program supply and transit routes would use existing and established corridors for commercial vessels.

Noise During Construction. While noise levels generated by the Program have potential to impact California least terns at close range, it is likely they will exhibit avoidance behavior and temporarily avoid the Action area. The available data show that there is little to no increase in noise levels from fixed platforms during drilling operations as compared to non-drilling operations (Noise Control Engineering, 2007). Pressurized fluids would likely cause conductors to vibrate, creating indirect underwater noise sources; however, the majority of the noise sources would be produced under the seafloor and would dissipate before reaching open water. In addition, equipment activity and Program operations originating on the Platform will generate noise; however, activities would be temporary and noise levels are not expected to exceed the existing operation levels or hearing thresholds that would cause adverse effects to marine birds.

Fragmentation. Program activities are not expected to result in population fragmentation for California least terns, as any individual occurring within the Action area are transient, utilizing the region as part of their pelagic foraging habitat. No nesting activities occur within the Action area.

5.6 MARBLED MURRELET

Potential impacts to marbled murrelet could occur during Program activities that require mobilization of a marine spread of vessels, potentially displacing individuals from foraging in open surface waters. The presence of Program vessels, and noise generated from Program equipment could interfere with marbled murrelet migrating and foraging behavior; however, given their strong preference for nesting in forested habitats and foraging close to shore, Platform Gilda does not provide preferred habitat for marbled murrelet. No documented evidence to date shows marbled murrelets utilizing Platform structure for roosting or nesting purposes.

Loss of Habitat. No loss of habitat is expected for marbled murrelets due to Program activities. Marbled murrelets are typically found within 1.2 mi of the shoreline and have not been observed using oil platforms as roosting or nesting habitat.

Mortality. No mortality expected because Program activities will not cause fatal conflicts with marbled murrelets.

Harassment. Marbled murrelets, if present within the Action area, may be displaced during Program operations involving the use of vessels, Platform cranes, and hydraulic fracturing equipment, all of which generate above water noise. These stimuli may elicit behavioral responses such as avoidance of the area or interrupted foraging behavior. While an accidental release of well stimulation fluid would cause significant harassment it is considered unlikely due to mandated well integrity testing which will be conducted prior to and throughout any stimulation activity, including pressure testing of the casing and tubing to confirm the absence of leaks.

Loss of Forage. Program activities could result in the temporary loss of foraging area due to vessel presence; however, Platform Gilda is outside of preferred foraging territory for marbled murrelets.

Loss of Shelter/Cover. Program activities would not result in the loss of shelter or cover for marbled murrelets. No studies or observations to date have observed individuals roosting or nesting on Platform Gilda.

Loss of Access. Program activities may result in temporary loss of access to the open surface waters within the Action area for marbled murrelets; however, Program supply and transit routes would use existing and established corridors for commercial vessels.

Noise During Construction. While noise levels generated by the Program have potential to impact marbled murrelets at close range, it is likely they will exhibit avoidance behavior and temporarily avoid the Action area if present within the region. The available data show that there is little to no increase in noise levels from fixed platforms during drilling operations as compared to non-drilling operations (Noise Control Engineering, 2007). Pressurized fluids would likely cause conductors to vibrate, creating indirect underwater noise sources; however, the majority of the noise sources would be produced under the seafloor and would dissipate before reaching open water or the surface. In addition, equipment activity and Program operations originating on the Platform will generate noise; however, activities would be temporary and noise levels are not expected to exceed the existing operation levels or hearing thresholds that would cause adverse effects to marine birds.

Fragmentation. Program activities are not expected to result in population fragmentation for marbled murrelets, as any individuals occurring within the Action area are transient, utilizing the region as part of their pelagic foraging habitat. No nesting activities occur within the Action area.

5.7 SHORT-TAILED ALBATROSS

Potential impacts to short-tailed albatross could occur during Program activities that require mobilization of a marine spread of vessels, potentially displacing individuals from foraging in open surface waters. The presence of Program vessels, and noise generated from Program equipment could also interfere with albatross migrating and foraging behavior.

Loss of Habitat. No loss of habitat is expected due to Program-related activities. Short-tailed albatross does not roost within the Action area, preferring to rest while at sea by sleeping on the water's surface. Nesting exclusively occurs in Japan.

Mortality. No mortality expected because Program activities will not cause fatal conflicts with short-tailed albatross.

Harassment. Short-tailed albatross, if present within the Action area, may be displaced during Program operations involving the use of vessels, Platform cranes, and hydraulic fracturing equipment, all of which generate above water noise. These stimuli may elicit behavioral responses such as avoidance of the area or interrupted foraging behavior. While an accidental release of well stimulation fluid would cause significant harassment it is considered unlikely due to mandated well integrity testing which will be conducted prior to and throughout any stimulation activity, including pressure testing of the casing and tubing to confirm the absence of leaks.

Loss of Forage. Program activities could result in the temporary loss of foraging area for short-tailed albatross due to vessel presence, potentially displacing individuals from the Action area during mobilization and construction.

Loss of Shelter/Cover. Program activities would not result in the loss of shelter or cover for short-tailed albatross. No studies or observations to date have observed individuals roosting or nesting on Platform Gilda.

Loss of Access. Program activities may result in temporary loss of access to the open surface waters within the Action area for short-tailed albatross; however, Program supply and transit routes would use existing and established corridors for commercial vessels.

Noise During Construction. While noise levels generated by the Program have potential to impact short-tailed albatross at close range, it is likely they will exhibit avoidance behavior and temporarily avoid the Action area if present within the region. The available data show that there is little to no increase in noise levels from fixed platforms during drilling operations as compared to non-drilling operations (Noise Control Engineering, 2007). Pressurized fluids would likely cause conductors to vibrate, creating indirect underwater noise sources; however, the majority of the noise sources would be produced under the seafloor and would dissipate before reaching open water or the surface. In addition, equipment activity and Program operations originating on the Platform will generate noise; however, activities would be temporary and noise levels are not expected to exceed the existing operation levels or hearing thresholds that would cause adverse effects to marine birds.

Fragmentation. Program activities are not expected to result in population fragmentation for short-tailed albatross, as any individuals occurring within the Action area are transient, utilizing the region as part of their pelagic foraging habitat. No nesting activities occur within the Action area.

5.8 ENDANGERED AND THREATENED WHALE SPECIES AND MMPA SPECIES

Program activities could potentially cause impacts to Federally listed whale species, as well as MMPA-protected marine mammals. Potential impacts could occur during vessel transit, construction noise, or from incidental oil/contaminate spills.

Loss of Habitat. No loss of habitat is expected due to Program activities. While the topside deck structure provides haul-out habitat for California sea lions, and various marine mammals utilize subsea areas as foraging grounds, these areas would not be permanently altered due to Program activities.

Mortality. Vessel transit and operations have a low potential to result in the mortality of listed whale species and other protected marine mammals. Collisions of ships and marine animals can cause major wounds, which may lead to the death of the animal; however, vessel strikes are more likely to occur with large cargo vessels or vessels with limited visibility that are traveling at speeds greater than 14 knots. These incidents occur because marine mammals must come to the surface to breathe and may spend time resting or foraging near the surface. An animal at the surface could be struck directly by a vessel, could be hit at the bottom of a vessel, or an animal just below the surface could be cut by a vessel's propeller.

An incidental release of hydrocarbons could cause direct and indirect impacts to whale species. Marine wildlife exposed to oil spills could experience skin contamination, loss of buoyancy, and loss of locomotive capabilities as well as direct lethal toxicity to or sub-lethal irritation. Baleen whales are particularly vulnerable because of their surface feeding behavior. While an accidental release of well stimulation fluid would cause significant impacts it is considered unlikely due to mandated well integrity testing which will be conducted prior to and throughout any stimulation activity, including pressure testing of the casing and tubing to confirm the absence of leaks.

Harassment. Program activities could result in the temporary displacement of listed whale and other MMPA species due to vessel presence in the Action area.

Loss of Forage. Program activities could result in the temporary loss of foraging opportunities for listed whale species and other MMPA species due to vessel presence in the Action area; however, Program vessels would use existing transit routes and established corridors for commercial vessels.

Loss of Shelter/Cover. No loss of shelter or cover is expected for Federally listed whale species or MMPA species as a result of Program activities. Program vessels and equipment will utilize the existing Platform boat transfer decks and California sea lion are expected to continue to have access to shelter on Platform haul-out areas around the Platform and mooring buoys.

Loss of Access: Program activities may result in temporary loss of access to the open water migratory and foraging habitat within the Action area for listed whale and MMPA species; however, Program vessels would use existing transit routes and established corridors for commercial vessels.

Noise During Construction: Listed whales and MMPA species may be affected by the above and underwater noise generated during Program activities such as well stimulation activities and vessel operations. The available data show that there is little to no increase in noise levels from fixed platforms during drilling operations as compared to non-drilling operations (Noise Control Engineering, 2007). Pressurized fluids would likely cause conductors to vibrate, creating indirect underwater noise sources; however, the majority of the noise sources would be produced under the seafloor and would dissipate before reaching open water. In addition, equipment activity and Program operations originating on the Platform have the potential to create noise that may penetrate the water column; however, activities would be temporary and noise levels are not expected to exceed the existing operation levels or hearing thresholds that would cause adverse effects to marine wildlife. As such, noise levels are not expected to be of high enough energy to cause pathological or physiological effects; however, there is the potential for temporary behavioral changes in the form of avoidance of the deeper water within Action area. Behavioral effects on marine mammals include temporary displacement out of the Action area.

While SPL describes the initial output of a source at a fixed distance, Sound Exposure Level (SEL) describes the cumulative acoustic dose received over time, making it particularly relevant for assessing potential impacts on marine mammals from repeated or prolonged exposure (marine mammal publications use the 24-hour exposure duration as a standard for SEL). Table 5-1 categorizes the SEL threshold levels for various marine mammal groups below

Table 5-1. Marine Mammal Hearing Threshold Shifts

Hearing Group	Non-Impulsive Sources		
	Permanent Threshold Shift Onset: SEL (weighted)	Temporary Threshold Shift Onset: SEL (weighted)	Behavioral Response Onset
Low-frequency cetaceans	197 dB re (1 μPa) ² s	177 dB re (1 μPa) ² s	120 dB re (1 μPa) ² s
High-frequency cetaceans	201 dB re (1 μPa) ² s	181 dB re (1 μPa) ² s	120 dB re (1 μPa) ² s
Very high-frequency cetaceans	181 dB re (1 μPa) ² s	161 dB re (1 μPa) ² s	120 dB re (1 μPa) ² s
Phocid pinnipeds underwater	195 dB re (1 μPa) ² s	175 dB re (1 μPa) ² s	120 dB re (1 μPa) ² s
Phocid pinnipeds in air	154 dB re (20 μPa) ² s	134 dB re (20 μPa) ² s	90 dB re (20 μPa) ² s
Otariid pinnipeds underwater	199 dB re (1 μPa) ² s	179 dB re (1 μPa) ² s	120 dB re (1 μPa) ² s
Otariid pinnipeds in air	177 dB re (20 μPa) ² s	157 dB re (20 μPa) ² s	100 dB re (20 μPa) ² s

Sources: Southall et al. 2019, NMFS 2024, Summary of Marine Mammal Protection Act Acoustic Thresholds.

There is a high likelihood that marine mammals will exhibit avoidance behavior in response to the physical presence and activity of vessels and equipment prior to detectable acoustic exposure; therefore, the potential for behavioral disturbance is expected to be limited and spatially constrained around the immediate work area.

Fragmentation: Program activities will not result in permanent fragmentation of listed whale species' foraging habitat or migration routes. The Action area is small enough that migrating species will likely navigate around Program activities.

Critical Habitat. Critical habitat for both the Central America and Mexico DPSs of humpback whale have been designated within the Action area to protect important prey resources, specifically euphausiids (krill) and small pelagic schooling fishes. These prey species must be present in sufficient quality, abundance, and accessibility within designated feeding areas to support the foraging needs and population recovery of humpback whales.

Program activities are not expected to adversely affect the habitat's capacity to support these prey species, as their distribution and productivity are primarily governed by oceanographic processes such as nutrient upwelling and sea surface temperature, factors which will remain unaffected by the proposed actions. Moreover, the Critical Habitat designation explicitly excludes man-made structures and the land (or seafloor) beneath them; thus, while vessel traffic will transit through Critical Habitat, the Platform footprint does not fall within designated Critical Habitat boundaries.

6.0 PROGRAM INCORPORATED MEASURES

The following measures have been incorporated into the Program design and will be implemented during Program during construction to minimize potential impacts to marine biological resources.

- **Closed-Loop Fluids Management.** All stimulation flowback is retained on the Platform and reinjected; no unauthorized fluids are discharged to the ocean.
- **Chemical Handling And Containment.** Covered secondary containment; closed-connection transfers over contained deck areas; segregation of incompatible materials.
- **Well Integrity Verification.** An independent registered professional engineer reviews and certifies casing programs for compliance with 30 CFR § 250.420. Casing and liners are designed to withstand anticipated stresses, cemented to isolate hydrocarbon-bearing zones, and pressure-tested prior to stimulation to confirm mechanical integrity.
- **Produced-Water Compliance And Monitoring.** Continued adherence to NPDES permit limits (oil and grease, whole-effluent toxicity, sheen prohibition).
- **Program Vessel Traffic.** Program vessels will utilize (or continue to utilize) the existing U.S. Coast Guard Traffic Separation Scheme (TSS) and Joint Oil Fisheries Liaison Office (JOFLO) corridors within the Santa Barbara Channel. At all times, Program vessels will operate using the highest level of navigational safety and in accordance with International and USCG regulations and guidelines.
- **Oil Spill Response and Contingency Plan Implementation.** A Platform-specific Oil Spill Response and Contingency Plan (OSRCP) will be implemented during all Program activities in the event of a release of oil or contaminants. The OSRCP would include site-specific details, oil spill removal organization (OSRO) coverage, and drills ensure readiness for any vessel- or Platform-related spill.
- **Prevent Introduction of Non-Native Aquatic Species (NAS).** All Program vessels will be in compliance with California's state ballast management regulations when transiting through State waters.

7.0 CUMULATIVE EFFECTS

FESA Regulations at 50 CFR 402.14(g)(3)(4) require Federal agencies to “evaluate the effects of the action and cumulative effects on the listed species or critical habitat” and “formulate its biological opinion as to whether the action, taken together with cumulative effects, is likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat.”

According to the Endangered Species Consultation Handbook (NMFS and USFWS, 1998), cumulative effects include the effects of future State, local or private actions that are reasonably certain to occur in the Action area considered in a biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to Section 7 of FESA. Indicators of effects “reasonably certain to occur” may include but are not limited to: approval of the action by State or local agencies or governments (e.g., permits, grants); indications by granting authorities that an action is imminent; assurances by project sponsors that an action will proceed; the obligation of venture capital; and/or initiation of contracts. Speculative non-Federal actions that may never be implemented are not factored into cumulative effects analyses.

7.1 COMPLETED PROGRAMS

Prior to the Ninth Circuit’s 2022 decision in *Environmental Defense Center v. BOEM*, well stimulation treatments, including hydraulic fracturing and acidizing, were routinely conducted on offshore oil platforms in both Federal and State waters off California as part of standard lease operations, without requiring independent ESA Section 7 consultation. According to Associated Press reporting, at least 203 offshore fracking operations were completed over the past two decades, including numerous treatments on artificial islands nearshore (off Long Beach, Seal Beach, and Huntington Beach) as well as in offshore waters within the Santa Barbara Channel (AP, 2013). The Bureau of Ocean Energy Management’s *Programmatic Environmental Assessment of the Use of Well Stimulation Treatments on the Pacific Outer Continental Shelf* identified 24 well stimulation treatments (21 of which involved hydraulic fracturing) conducted between 1982 and 2014 across four of the 23 active Pacific OCS platforms, including Platforms Gilda, Gail, Grace, and Holly (BOEM, 2016). These operations were previously considered “routine” under lease compliance and did not trigger separate environmental consultations.

7.2 PROPOSED PROGRAMS

There are no known future Programs within the region which would contribute to impacts for any listed species discussed in this document, which are not undergoing their own Section 7 consultation.

8.0 CONCLUSION AND DETERMINATION

8.1 CONCLUSION

Implementation of the Program will involve potential impacts to marine species and habitats that could affect Threatened and Endangered species in the Program region. Of the 24 Federally listed species that were included on the NOAA and USFWS species list that have the potential to occur in the Program region, 11 of the species were ruled out for further analysis because of lack of suitable habitat within the Program area, or the Program area is located outside of the species' known current geographic range.

Potential impacts due to Program activities include an increase in vessel traffic and potential degradation of water quality and seafloor habitats from the discharge of contaminants in the event of an accidental spill from vessels or well casings. To avoid and minimize effects to listed species, the Program will incorporate the conservation measures outlined in Section 6.0.

This BA has been prepared to provide information to the USACE and other Federal agencies, NMFS and the USFWS, to determine the potential to affect Threatened or Endangered species, based on one of four possible findings for each species potentially affected:

- **No effect** - the proposed action will not affect the listed species or Critical Habitat;
- **Not likely to adversely affect** - effects of the listed species are expected to be discountable (extremely unlikely to occur), insignificant (minimal impact without take), or beneficial;
- **Likely to adversely affect** - adverse effects may occur as a direct or indirect result of the proposed action, and the effect is not discountable, insignificant, or beneficial; and
- **Jeopardy/Adverse Modification Finding** – a jeopardy finding is made for species for which a "likely to adversely affect" determination is made. Jeopardy finding determines whether the considered action is or is not likely to jeopardize the continued existence of the species. An adverse modification finding is made if the action will result in the destruction or adverse modification of proposed critical habitat. A "likely to jeopardize or adversely modify" finding is made if the action is reasonably expected to directly or indirectly reduce appreciably the likelihood of both the survival and recovery of a listed species by reducing the reproduction, numbers, or distribution of that species, or by modifying critical habitat to the point of preventing the recovery of a listed species.

Federally listed species have the potential to occur on or near the defined Action area; therefore, a detailed analysis has been conducted to determine the impacts and effects of the Program on these species. Based on this analysis, the following determinations have been made:

8.1.1 Green Turtle, East Pacific DPS

The Program is **Not Likely to Adversely Affect** East Pacific DPS green turtles. Temporary disturbance or loss of access to marine habitat may occur during Program activities due to the presence of vessels and equipment; however, these effects will be short-term and will not result in any permanent degradation or loss of habitat. The potential for an accidental release of oil or well stimulation fluids, while potentially resulting in significant adverse effects to individual green turtles, is considered unlikely due to multiple layers of preventive and response measures,

including mandated well integrity testing conducted prior to and throughout all stimulation operations. These tests include pressure testing of casing and tubing to confirm the absence of leaks. In addition, both the Platform and support vessels maintain Oil Spill Response and Contingency Plans to ensure rapid containment and mitigation of any accidental oil discharge.

No analysis was conducted for Program effects on Critical Habitat because there is no Critical Habitat designated for this species within the Action area.

8.1.2 Loggerhead Turtle, North Pacific DPS

The Program is ***Not Likely to Adversely Affect*** North Pacific DPS loggerhead turtles. Temporary disturbance or loss of access to marine habitat may occur during Program activities due to the presence of vessels and equipment; however, these effects will be short-term and will not result in any permanent degradation or loss of habitat. The potential for accidental release of oil or well stimulation fluids, while potentially resulting in significant adverse effects to individual loggerhead turtles, is considered unlikely due to multiple layers of preventive and response measures, including mandated well integrity testing conducted prior to and throughout all stimulation operations. These tests include pressure testing of casing and tubing to confirm the absence of leaks. In addition, both the Platform and support vessels maintain Oil Spill Response and Contingency Plans to ensure rapid containment and mitigation of any accidental oil discharge.

No analysis was conducted for Program effects on Critical Habitat because Critical Habitat has not been designated for North Pacific DPS loggerhead turtles.

8.1.3 Leatherback Turtle, Pacific Ocean DPS

The Program is ***Not Likely to Adversely Affect*** leatherback turtles. Temporary disturbance or loss of access to marine habitat may occur during Program activities due to the presence of vessels and equipment; however, these effects will be short-term and will not result in any permanent degradation or loss of habitat. The potential for an accidental release of oil or well stimulation fluids, while potentially resulting in significant adverse effects to individual leatherback turtles, is considered unlikely due to multiple layers of preventive and response measures, including mandated well integrity testing conducted prior to and throughout all stimulation operations. These tests include pressure testing of casing and tubing to confirm the absence of leaks. In addition, both the Platform and support vessels maintain Oil Spill Response and Contingency Plans to ensure rapid containment and mitigation of any accidental oil discharge.

No analysis was conducted for Program effects on Critical Habitat because there is no Critical Habitat designated for this species within the Action area.

8.1.4 Olive Ridley Turtle

The Program is ***Not Likely to Adversely Affect*** olive ridley turtles. Temporary disturbance or loss of access to marine habitat may occur during Program activities due to the presence of vessels and equipment; however, these effects will be short-term and will not result in any permanent degradation or loss of habitat. The potential for accidental release of oil or well stimulation fluids, while potentially resulting in significant adverse effects to individual turtles, is considered unlikely due to multiple layers of preventive and response measures, including mandated well integrity testing conducted prior to and throughout all stimulation operations. These tests include pressure testing of casing and tubing to confirm the absence of leaks. In addition,

both the Platform and support vessels maintain Oil Spill Response and Contingency Plans to ensure rapid containment and mitigation of any accidental oil discharge.

No analysis was conducted for Program effects on Critical Habitat because there is no Critical Habitat designated for this species within the Action area.

8.1.5 California Least Tern

The Program is ***Not Likely to Adversely Affect*** California least tern. Marginal offshore foraging habitat is present; however, no nesting sites are present in the Action area. California least terns have the highest potential to occur within the Program area during the non-breeding season (winter to early spring) but could occur year-round. All impacts from Program activities to this species including loss of foraging habitat, will be temporary.

No analysis was conducted for Program effects on Critical Habitat because there is no Critical Habitat designated for this species.

8.1.6 Marbled Murrelet

The Program is ***Not Likely to Adversely Affect*** marbled murrelet. During vessel mobilization, temporary and localized displacement of marbled murrelets from nearshore waters may occur along active vessel transit routes. No documented evidence to date shows marbled murrelets utilizing Platform structure for roosting or nesting purposes.

No analysis was conducted for the Program effects on Critical Habitat for marbled murrelet since none is present within the Action area.

8.1.7 Short Tailed Albatross

The Program is ***Not Likely to Adversely Affect*** short-tailed albatross. Offshore foraging habitat is present; however, no nesting sites are present in the Action area. Short-tailed albatross have the highest potential to occur within the Action area from late spring through early fall, though individuals may be observed year-round. All impacts from Program activities to this species including loss of foraging habitat, will be temporary.

No analysis was conducted for Program effects on Critical Habitat because there is no Critical Habitat designated for short-tailed albatross.

8.1.8 Blue Whale

The Program is ***Not Likely to Adversely Affect*** blue whale. Temporary impacts could occur from vessel transit, underwater noise, or from incidental oil or contaminant spills. Temporary loss in some foraging and migration habitat may occur temporarily during Program activities due to vessel presence but will not result in any permanent impacts to habitat. Blue whales are present most commonly from June to November when they visit the region to forage on the summer and fall plankton blooms. While an accidental release of oil or well stimulation fluid would cause significant impacts it is considered unlikely due to mandated well integrity testing which will be conducted prior to and throughout any stimulation activity, including pressure testing of the casing and tubing to confirm the absence of leaks. In addition, both the Platform and support vessels maintain Oil Spill Response and Contingency Plans to ensure rapid containment and mitigation of any accidental oil discharge.

No analysis was conducted for Program effects on Critical Habitat because there is no Critical Habitat designated for blue whales.

8.1.9 Fin Whale

The Program is ***Not Likely to Adversely Affect*** fin whales. Temporary impacts could occur from vessel transit, underwater noise, or from incidental oil or contaminant spills. Temporary loss in some foraging and migration habitat may occur during Program activities due to vessel presence but will not result in any permanent impacts to habitat. Fin whales are present year-round in Southern California, with individuals usually closer to shore in winter and spring, and farther offshore in summer and fall. While an accidental release of oil or well stimulation fluid would cause significant impacts it is considered unlikely due to mandated well integrity testing which will be conducted prior to and throughout any stimulation activity, including pressure testing of the casing and tubing to confirm the absence of leaks. In addition, both the Platform and support vessels maintain Oil Spill Response and Contingency Plans to ensure rapid containment and mitigation of any accidental oil discharge.

No analysis was conducted for Program effects on Critical Habitat because there is no Critical Habitat designated for fin whales.

8.1.10 Gray Whale, Western North Pacific DPS

The Program is ***Not Likely to Adversely Affect*** Western North Pacific gray whales. Temporary impacts could occur from vessel transit, underwater noise, or from incidental oil or contaminant spills. Temporary loss in some foraging and migration habitat may occur during Program activities due to vessel presence but will not result in any permanent impacts to habitat. Western North Pacific gray whales could be present during southern migration to Baja California or during northern migration back to their Arctic feeding grounds. While an accidental release of oil or well stimulation fluid would cause significant impacts it is considered unlikely due to mandated well integrity testing which will be conducted prior to and throughout any stimulation activity, including pressure testing of the casing and tubing to confirm the absence of leaks. In addition, both the Platform and support vessels maintain Oil Spill Response and Contingency Plans to ensure rapid containment and mitigation of any accidental oil discharge.

No analysis was conducted for Program effects on Critical Habitat because there is no Critical Habitat designated for Western North Pacific gray whales within the Action area.

8.1.11 Humpback Whale (Central American DPS and Mexico DPS)

The Program is ***Not Likely to Adversely Affect*** either Humpback whale DPS. Temporary impacts could occur from vessel transit, underwater noise, or from incidental oil or contaminant spills. Temporary loss in some foraging and migration habitat may occur temporarily during Program activities due to vessel presence but will not result in any permanent impacts to habitat. While an accidental release of oil or well stimulation fluid would cause significant impacts it is considered unlikely due to mandated well integrity testing which will be conducted prior to and throughout any stimulation activity, including pressure testing of the casing and tubing to confirm the absence of leaks. In addition, both the Platform and support vessels maintain Oil Spill Response and Contingency Plans to ensure rapid containment and mitigation of any accidental oil discharge.

The Action area intersects with Critical Habitat for Central American DPS and Mexico DPS humpback whales. Critical Habitat was designated to ensure access to feeding grounds, and abundance of prey within the Santa Barbara Channel. Program activities are unlikely to impact Critical Habitat during vessel transit or from incidental oil or contaminant spills.

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APPENDIX A

OFFICIAL SPECIES LISTS

Summary table of ESA-listed species and critical habitat under NMFS' jurisdiction for marine waters off California

Type	Common Name	Scientific Name	ESA Listing Decision	Critical Habitat Designation	Recovery Plan	Status ^a	Critical Habitat ^b
Fish	Giant manta ray	<i>Mobula birostris</i>	83 FR 2916; January 22, 2018	None; 84 FR 66652; December 5, 2019	Under development	T	No
	Green sturgeon, Southern DPS	<i>Acipenser medirostris</i>	71 FR 17757; April 7, 2006	74 FR 52299; October 9, 2009	(NMFS 2018)	T	74 FR 52299; October 9, 2009
	Oceanic whitetip shark	<i>Carcharhinus longimanus</i>	83 FR 4153; January 30, 2018	None; 85 FR 12898; March 5, 2020	Under development	T	No
	Scalloped hammerhead shark, Eastern Pacific DPS	<i>Sphyrna lewini</i>	79 FR 38213; July 3, 2014	None; 80 FR 71774; November 17, 2015	None	E	No
	Steelhead, Southern California DPS	<i>Oncorhynchus mykiss</i>	71 FR 833; January 5, 2006	70 FR 52487; September 2, 2005	(NMFS 2012)	E	No
	Gulf grouper	<i>Mycteroperca jordani</i>	81 FR 72545; October 20, 2016	None; 81 FR 72545; October 20, 2016	None	E	No
Marine Mammals	Guadalupe fur seal	<i>Arctocephalus townsendii</i>	50 FR 51251; December 16, 1985	None	None	T	No

Type	Common Name	Scientific Name	ESA Listing Decision	Critical Habitat Designation	Recovery Plan	Status ^a	Critical Habitat ^b
	Blue whale	<i>Balaenoptera musculus</i>	Endangered (35 FR 18319; December 2, 1970)	None	(NMFS 2020b)	E	No
	Fin whale	<i>Balaenoptera physalus</i>	Endangered (35 FR 18319; December 2, 1970)	None	(NMFS 2010a)	E	No
	Gray whale, Western North Pacific DPS	<i>Eschrichtius robustus</i>	Endangered (35 FR 18319; December 2, 1970)	None	None	E	No
	Humpback whale, Central American DPS	<i>Megaptera novaeangliae</i>	Endangered (81 FR 62259; September 8, 2016)	86 FR 21082; April 21, 2021	(NMFS 1991)	E	86 FR 21082; April 21, 2021
	Humpback whale, Mexico DPS	<i>Megaptera novaeangliae</i>	Threatened (81 FR 62259; September 8, 2016)	86 FR 21082; April 21, 2021	(NMFS 1991)	T	86 FR 21082; April 21, 2021

Type	Common Name	Scientific Name	ESA Listing Decision	Critical Habitat Designation	Recovery Plan	Status ^a	Critical Habitat ^b
	North Pacific right whale	<i>Eubalaena japonica</i>	Endangered (73 FR 12024; March 6, 2008)	73 FR 19000; April 8, 2008	(NMFS 2013)	E	No
	Sei whale	<i>Balaenoptera borealis</i>	Endangered (35 FR 18319; December 2, 1970)	None	(NMFS 2011)	E	No
	Sperm whale	<i>Physeter macrocephalus</i>	Endangered (35 FR 18319; December 2, 1970)	None	(NMFS 2010b)	E	No
Sea Turtles	Green turtle, East Pacific DPS	<i>Chelonia mydas</i>	43 FR 32800; July 28, 1978	Proposed; 88 FR 46572; July 19, 2023	(NMFS and USFWS 1998a)	T	No
	Leatherback turtle	<i>Dermochelys coriacea</i>	35 FR 8491, June 2, 1970	77 FR 4170; January 26, 2012	(NMFS and USFWS 1998b)	E	77 FR 4170; January 26, 2012
	Loggerhead turtle, North Pacific Ocean DPS	<i>Caretta caretta</i>	43 FR 32800; July 28, 1978	None; 79 FR 39855; July 10, 2014	(NMFS and USFWS 1998c)	E	No

Type	Common Name	Scientific Name	ESA Listing Decision	Critical Habitat Designation	Recovery Plan	Status ^a	Critical Habitat ^b
			76 FR 58868; September 22, 2011				
	Olive ridley turtle	<i>Lepidochelys olivacea</i>	43 FR 32800; July 28, 1978	None	(NMFS and USFWS 1998d)	T	No
Invertebrates	White abalone	<i>Haliotis sorenseni</i>	66 FR 29046; May 29, 2001	None; 66 FR 29046; May 29, 2001	(NMFS 2008)	E	No
	Black abalone	<i>Haliotis cracherodii</i>	74 FR 1937; January 14, 2009	76 FR 66806; October 27, 2011	(NMFS 2020a)	E	76 FR 66806; October 27, 2011
	Sunflower sea star	<i>Pycnopodia helianthoides</i>	88 FR 16212; March 16, 2023	NA	NA	Proposed (T)	No

^a Status is either threatened (T) or endangered (E).

^b Critical habitat is defined as: (1) specific areas within the geographical area occupied by the species at the time of listing, if they contain physical or biological features essential to conservation, and those features may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by the species if the agency determines that the area itself is essential for conservation. We cite the Federal Register Notice for the final designations. Critical habitat designations may or may not occur within the action area for a proposed action.

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United States Department of the Interior



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In Reply Refer To:

09/05/2025 20:36:13 UTC

Project Code: 2025-0145724

Project Name: Platform Gilda DPP update

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed list identifies species listed as threatened and endangered, species proposed for listing as threatened or endangered, designated and proposed critical habitat, and species that are candidates for listing that may occur within the boundary of the area you have indicated using the U.S. Fish and Wildlife Service's (Service) Information Planning and Conservation System (IPaC). The species list fulfills the requirements under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the species list should be verified after 90 days. We recommend that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists following the same process you used to receive the enclosed list. Please include the Consultation Tracking Number in the header of this letter with any correspondence about the species list.

Due to staff shortages and excessive workload, we are unable to provide an official list more specific to your area. Numerous other sources of information are available for you to narrow the list to the habitats and conditions of the site in which you are interested. For example, we recommend conducting a biological site assessment or surveys for plants and animals that could help refine the list.

If a Federal agency is involved in the project, that agency has the responsibility to review its proposed activities and determine whether any listed species may be affected. If the project is a major construction project*, the Federal agency has the responsibility to prepare a biological assessment to make a determination of the effects of the action on the listed species or critical habitat. If the Federal agency determines that a listed species or critical habitat is likely to be adversely affected, it should request, in writing through our office, formal consultation pursuant to section 7 of the Act. Informal consultation may be used to exchange information and resolve

conflicts with respect to threatened or endangered species or their critical habitat prior to a written request for formal consultation. During this review process, the Federal agency may engage in planning efforts but may not make any irreversible commitment of resources. Such a commitment could constitute a violation of section 7(d) of the Act.

Federal agencies are required to confer with the Service, pursuant to section 7(a)(4) of the Act, when an agency action is likely to jeopardize the continued existence of any proposed species or result in the destruction or adverse modification of proposed critical habitat (50 CFR 402.10(a)). A request for formal conference must be in writing and should include the same information that would be provided for a request for formal consultation. Conferences can also include discussions between the Service and the Federal agency to identify and resolve potential conflicts between an action and proposed species or proposed critical habitat early in the decision-making process. The Service recommends ways to minimize or avoid adverse effects of the action. These recommendations are advisory because the jeopardy prohibition of section 7(a)(2) of the Act does not apply until the species is listed or the proposed critical habitat is designated. The conference process fulfills the need to inform Federal agencies of possible steps that an agency might take at an early stage to adjust its actions to avoid jeopardizing a proposed species.

When a proposed species or proposed critical habitat may be affected by an action, the lead Federal agency may elect to enter into formal conference with the Service even if the action is not likely to jeopardize or result in the destruction or adverse modification of proposed critical habitat. If the proposed species is listed or the proposed critical habitat is designated after completion of the conference, the Federal agency may ask the Service, in writing, to confirm the conference as a formal consultation. If the Service reviews the proposed action and finds that no significant changes in the action as planned or in the information used during the conference have occurred, the Service will confirm the conference as a formal consultation on the project and no further section 7 consultation will be necessary. Use of the formal conference process in this manner can prevent delays in the event the proposed species is listed or the proposed critical habitat is designated during project development or implementation.

Candidate species are those species presently under review by the Service for consideration for Federal listing. Candidate species should be considered in the planning process because they may become listed or proposed for listing prior to project completion. Preparation of a biological assessment, as described in section 7(c) of the Act, is not required for candidate species. If early evaluation of your project indicates that it is likely to affect a candidate species, you may wish to request technical assistance from this office.

Only listed species receive protection under the Act. However, sensitive species should be considered in the planning process in the event they become listed or proposed for listing prior to project completion. We recommend that you review information in the California Department of Fish and Wildlife's Natural Diversity Data Base. You can contact the California Department of Fish and Wildlife at (916) 324-3812 for information on other sensitive species that may occur in this area.

[*A Biological Assessment is required for construction projects (or other undertakings having

similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Ventura Fish And Wildlife Office

2493 Portola Road, Suite B

Ventura, CA 93003-7726

(805) 644-1766

PROJECT SUMMARY

Project Code: 2025-0145724
Project Name: Platform Gilda DPP update
Project Type: Oil & Gas Exploration - Offshore
Project Description: updating the DPP for well stimulation.
Project Location:

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@34.1672112,-119.39363292280223,14z>



Counties:

ENDANGERED SPECIES ACT SPECIES

There is a total of 2 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

BIRDS

NAME	STATUS
Hawaiian Petrel <i>Pterodroma sandwichensis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6746	Endangered
Short-tailed Albatross <i>Phoebastria (=Diomedea) albatrus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/433	Endangered

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

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APPENDIX E

ESSENTIAL FISH HABITAT ASSESSMENT

ESSENTIAL FISH HABITAT ASSESSMENT

PLATFORM GILDA WELL STIMULATION: HYDRAULIC FRACTURING OFFSHORE VENTURA COUNTY

Project No. 2502-2681

Prepared for:

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OCTOBER 2025



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1.0 INTRODUCTION

In support of a permit application to the U.S. Army Corps of Engineers (ACOE), Los Angeles District, and to satisfy the requirements of Section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act, the following Assessment of potential impacts to Essential Fish Habitat (EFH) has been prepared. This assessment has been prepared on behalf of Dos Quadros Offshore Resources (DCOR) in support of the Platform Gilda Update to Development and Production Plan and Environmental Report; Well Stimulation: Hydraulic Fracturing Program (Program). EFH on the West Coast is identified and managed by the Pacific Fishery Management Council (PFMC), a federal entity established under 50 Code of Federal Regulations (CFR) 600.920(g)(2) to address the managed fish and invertebrate taxa that could occur in the Project area. The PFMC makes recommendations to the National Marine Fisheries Service (NMFS) regarding fishery management measures in federal waters.

EFH is defined as "...those waters and substrate necessary for fish spawning, breeding, feeding, or growth to maturity." "Waters," as used in this definition, are defined to include "aquatic areas and their associated physical, chemical, and biological properties that are used by fish." These may include "...areas historically used by fish where appropriate; 'substrate' to include sediment, hard bottom, structures underlying the waters, and associated biological communities." "Necessary" means, "the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem." EFH is described as a subset of all habitats occupied by a species (NOAA, 1998).

1.1 PROPOSED ACTION AND LOCATION

Platform Gilda (OCS P-0216) is located on the Pacific Outer Continental Shelf (OCS), approximately nine miles southwest of Ventura, California in the Santa Barbara Channel, and lies within the Santa Clara Unit of federal OCS leases (Figure 1-1). The platform was installed in 1981 in approximately 205 feet (ft) of water and has operated continuously since its installation. The original DPP and Environmental Report were prepared by Union Oil Company of California in November 1979 and approved by the U.S. Geological Survey in December 1980. A modest update to the DPP was submitted in October 1985 and approved in July 1986.

The proposed Program builds upon the existing documents and incorporates new well stimulation activities, specifically hydraulic fracturing of 16 wells, designed to increase reservoir permeability in order to optimize hydrocarbon recovery.

Figure 1-1. Program Location



1.2 PROGRAM PURPOSE AND METHODOLOGY

The purpose of the proposed well stimulation Program is to improve hydrocarbon recovery from low-permeability zones by increasing effective reservoir permeability and bypassing near-wellbore formation damage. Hydraulic fracturing, a method of well stimulation, achieves this by injecting fluids at high pressure into the target formation to create small, controlled fractures in the rock. Once the fractures are initiated, a proppant (high-grade silica sand) is carried into the formation by the fracturing fluid. The proppant remains in the fractures after pressure is released, holding them open to maintain improved flow paths for hydrocarbons.

The proposed stimulation method involves frac packing, which combines hydraulic fracturing with gravel packing. During a frac pack, the fracking fluid is injected to fracture the formation, while sand control screens are installed across the perforated interval. Proppant is placed both in the fracture and in the annulus between the casing and screen to form a stable gravel pack. This technique provides both productivity enhancement and sand control, making it well-suited to the unconsolidated sands of the proposed formations.

Each treatment will be preceded by a Diagnostic Fracture Injection Test (DFIT) to collect formation-specific pressure and fracture gradient data. This information is used to calibrate stimulation designs using reservoir modeling software.

All flowback fluid generated during stimulation activities will be routed through a closed-loop handling system and retained on the platform. Fluids will be re-injected into existing injection wells on the platform, and no offshore discharge of flowback fluids will occur. Solid waste, such as residual sand or other materials, will be separated and contained for transport to a licensed onshore disposal facility. All waste will be disposed of in accordance with the currently approved National Pollutant Discharge Elimination System (NPDES) permit.

1.3 DESCRIPTION OF EXISTING CONDITIONS

1.3.1 Geologic Setting

The Santa Clara Field is located within the offshore portion of the Santa Barbara-Ventura Basin, a structural and sedimentary basin known for prolific oil and gas production (Galloway, 1998). The basin is characterized by a series of east-west trending folding and faulting resulting from compressional tectonics. Within this setting, the Santa Clara Field is situated along the crest and northern flank of a broad east-west trending anticline.

Both structural and stratigraphic traps control hydrocarbon accumulation in the Santa Clara Field. The southern boundary of the field is defined by the World's End Reverse Fault system, which acts as a trapping structure for the field and exhibits up to 500 ft of vertical displacement based on seismic depth mapping conducted in 2015. The Oakridge Fault, another significant regional thrust fault, lies approximately 2.5 miles north of Platform Gilda. Additional mapped faults in the area include the Mid Channel Fault and Montalvo Fault, both located more than two miles from the Platform and not intersecting the zones proposed for stimulation. Stratigraphic traps are also present within the field, formed by the lateral thinning and pinch-out of geologic units.

1.3.2 Well Stimulation History

Platform Gilda was installed in 1981 by Union Oil Company of California, with initial drilling commencing that same year and production beginning in 1982. Since then, 70 wells (plus additional sidetracks and redrills) have been drilled from the platform, with the most recent well drilled in 2014. DCOR, LLC has operated the Platform and its associated leases (P-0215 and P-0216) since 2005.

To enhance recovery at Platform Gilda within low-permeability zones, a series of well stimulation treatments, specifically hydraulic fracturing, were conducted between 1986 and 2014. These treatments primarily targeted the Upper and Lower Repetto intervals. Stimulation treatments during this period included 14 hydraulic fracturing treatments (Argonne National Laboratory, 2016). Of the hydraulic fracturing treatments, six were performed in the Upper Repetto and seven in the Lower Repetto between 1994 and 2014. The largest treatment, conducted in 2014 on well S-33 RD2, involved the injection of approximately 140,000 gallons of fracturing fluid. This volume is significantly lower than typical onshore hydraulic fracturing operations, which typically use between 1.75 and 10 million gallons per well per year (Houseworth and Stringfellow, 2015).

No induced seismic events were reported during or following any of the offshore stimulation treatments. The proposed stimulation intervals remain located at considerable distances from mapped Quaternary faults. The World's End Fault lies approximately 2,500 ft from the closest planned treatment zone, while other regional faults, such as the Oakridge and Mid Channel Faults, are located more than two miles from the Platform.

1.4 PROGRAM SCOPE

The purpose of the proposed well stimulation Program is to improve hydrocarbon recovery from low-permeability zones by increasing effective reservoir permeability and bypassing near-wellbore formation damage. Hydraulic fracturing, a method of well stimulation, achieves this by injecting fluids at high pressure into the target formation to create small, controlled fractures in the rock. Once the fractures are initiated, a proppant (typically sand or ceramic balls) is carried into the formation by the fracturing fluid. The proppant remains in the fractures after pressure is released, holding them open to maintain improved flow paths for hydrocarbons.

The proposed stimulation method involves frac packing, which combines hydraulic fracturing with gravel packing. During a frac pack, the fracking fluid is injected to fracture the formation, while sand control screens are installed across the perforated interval. Proppant is placed both in the fracture and in the annulus between the casing and screen to form a stable gravel pack. This technique provides both productivity enhancement and sand control, making it well-suited to the unconsolidated sands of the Repetto intervals.

Each treatment will be preceded by a DFIT to collect formation-specific pressure and fracture gradient data. This information is used to calibrate stimulation designs using reservoir modeling software.

1.4.1 Well Selection

Past reservoir simulation studies and recent geologic interpretation have identified four well stimulation locations in the Upper Repetto and 12 well stimulation locations in the Lower

Repetto, for a total of 16 locations. Due to the relatively low permeability and unconsolidated nature of these sands, well stimulation via frac packing is required to achieve economic production rates.

The zones of interest in the Upper Repetto are the LP-B and LP-C subzones. In the Lower Repetto, the primary targets are the LP-M and LP-N subzones, while the LP-L subzone is considered more marginal and will be evaluated for potential completion based on open-hole log results. Table 1-1 summarizes the 16 locations proposed for stimulation.

Table 1-1. Proposed Wells for Hydraulic Fracturing on Platform Gilda

Well ID	Target Formation	Target Subzone
1 UR	Upper Repetto	B, C
2 UR	Upper Repetto	B, C
3 UR	Upper Repetto	B, C
4 UR	Upper Repetto	B, C
1 LR	Lower Repetto	L, M, N
2 LR	Lower Repetto	M, N
3 LR	Lower Repetto	L, M, N
4 LR	Lower Repetto	M, N
5 LR	Lower Repetto	L, M, N
6 LR	Lower Repetto	M, N
7 LR	Lower Repetto	L, M, N
8 LR	Lower Repetto	M, N
9 LR	Lower Repetto	L, M, N
10 LR	Lower Repetto	M, N
11 LR	Lower Repetto	L, M, N
12 LR	Lower Repetto	M, N

1.4.2 Frac Pack Treatment Design

Combining historical data from prior stimulation treatments and proposed target zone data provides a basis for estimating the scope and scale of future frac pack treatments. The treatment

design parameters summarized in Table 1-2 reflect the combined average of all expected treatments. Final designs will be developed using industry-standard fracture modeling software and tailored to each well using data from acquired open-hole logs.

Each treatment will be further refined following a DFIT. The DFIT involves a small-volume fluid injection at sufficient rate and pressure to initiate a short fracture. Following injection, the well is shut in and pressure fall-off is monitored over a period of one to two hours. This test provides key information critical for calibrating the frac model and ensuring zone-specific design accuracy.

Table 1-2. Average Frac Pack Treatment Parameters

Design Parameter	Amount
MD Range	5,900 – 9,300 ft (Upper Repetto) 10,100 – 15,900 ft (Lower Repetto)
TVD Range	4,950 – 5,900 ft (Upper Repetto) 7,900 – 8,600 ft (Lower Repetto)
Water Depth	205 ft
RT to Sea Level	107 ft
Zone Length Range, MD	65 – 319 ft
Zone Length Average, MD	170 ft
Perforated Interval Range	24 – 160 ft
Perforated Interval Average	60 ft
BHST Range	140 – 155 degF (Upper Repetto) 189 – 197 degF (Lower Repetto)
BHST Average	150 degF (Upper Repetto) 193 degF (Lower Repetto)
Perforated Liner Size	5 in and 7 in (about 50/50 split)
Sand Control Screen Size	2-3/8 in for 5-in casing wells; 3-1/2 in for 7-in casing wells
Injection Rate Range	12 – 25 barrels per minute (BPM)
Injection Rate Average	18 BPM

Proppant Volume Range	36,000 – 140,000 lb
Proppant Volume Average	75,000 lb
Clean Fluid Volume Average	1,300 barrels (bbl)
Proppant Slurry Volume Average	1,400 bbl
Maximum Surface Pressure Range	5,000 – 10,000 psi
Hydraulic Horsepower	Up to 5,500 HHP
Average Main Job Pump Time	Up to 2 hrs

A typical frac pack treatment will place approximately 75,000 pounds of proppant, although volumes may range from 36,000 to 140,000 pounds depending on reservoir characteristics. Treatment volumes include approximately 1,300 barrels of clean fluid and 1,400 barrels of slurry, pumped at rates ranging from 12 to 25 barrels per minute (BPM). Surface pressure during treatment is expected to range from 5,000 to 10,000 psi, with a total hydraulic horsepower requirement of up to 5,500 HHP.

Each frac pack stage is expected to take six hours from start to finish. Of this, four hours are dedicated to active pumping operations, and two hours of “standby” for engineering analysis and final redesign. The pumping sequence includes a step-rate test, the DFIT, and the main frac pack job. The main frac pack job typically lasts 40 to 120 minutes.

In approximately 50% of cases, if sand placement during the main frac job does not fully cover the screen, a follow-up gravel pack will be necessary to ensure complete annular packing. This operation is typically conducted several hours after the main treatment, with an average pump time of 90 minutes. Gravel packs are performed at a lower pump rate than the frac job (typically around 5 BPM) using a single low-HHP pump and a smaller gravel pack blender.

In total, the full stimulation Program may include up to 38 frac stages distributed across 16 locations, with each Upper Repetto well expected to require two frac pack stages, and each Lower Repetto well expected to require 2.5 stages, as only half of the Lower Repetto wells are anticipated to include the LP-L subzone. It is anticipated that up to six wells could be stimulated per year, depending on operational logistics, permitting timelines, and equipment availability.

1.4.3 Fluids, Additives, and Source Materials

The base fluid for all treatments will be filtered seawater sourced directly from the surrounding marine environment using Platform Gilda’s existing seawater pumps. The fluid will be mixed with chemical additives to form a viscous gel capable of transporting proppant under high-pressure conditions. The primary gelling agent is guar, which will be crosslinked using a borate crosslinker to form a stable gel.

The proppant used will be high-grade silica sand defined by an upper and lower grain diameter by sieve, such as 16/30 mesh or 20/40 mesh. All liquid additives will be transported in

stainless steel marine-certified totes (typically 330–550-gallon capacity). Dry materials such as breakers and biocides will be delivered in sealed 5-gallon containers, palletized, and stored in a steel-bottom containment bin (5' x 10') on deck. Spill response materials and handling procedures will be in place per the Platform's operations management plans.

1.4.4 Waste Management and Flowback Fluid Handling

All flowback fluid generated during stimulation activities will be routed through a closed-loop handling system and retained on the Platform. Fluids will be re-injected into existing injection wells on the Platform, and no offshore discharge of flowback fluids will occur. Solid waste, such as residual sand or other materials, will be separated and contained for transport to a licensed onshore disposal facility. All waste will be disposed of in accordance with the currently approved National Pollutant Discharge Elimination System (NPDES) permit.

1.4.5 Well Integrity Monitoring and Safety

Well integrity will be verified prior to any stimulation activity through mechanical integrity testing, which will include pressure testing of the casing and tubing to confirm the absence of leaks, in accordance with 30 CFR § 250.427 (Pressure Integrity Tests). Test results will be reviewed and documented in accordance with applicable regulatory requirements, including 30 CFR § 250.1916, which mandates formal mechanical integrity procedures as part of the operator's Safety and Environmental Management System (SEMS).

During stimulation, real-time pressure monitoring will be conducted to ensure the well remains within its designed operating envelope, as required under 30 CFR § 250.724 (Real-Time Well Monitoring Requirements). Pressure data will be recorded and reviewed by on-site engineers and remote monitoring teams to detect any anomalies and ensure well control is maintained.

Emergency shutoff systems and well control protocols are in place on the Platform and will be activated in the event of unexpected pressure changes or equipment failure. These include blowout preventers (BOPs), emergency shutdown valves (ESDVs), and immediate access to well kill materials and procedures. Platform personnel will receive pre-job safety briefings and training on response actions specific to hydraulic fracturing operations.

1.4.6 Equipment, Vessels, and Emissions

The proposed stimulation Program will use skid-mounted mobile diesel-powered stimulation equipment rigged directly on Platform Gilda. Equipment emissions, power requirements, and operational runtime will vary depending on the final configuration; however, well stimulation emissions will be covered under the existing Permit to Operate (PTO).

Operations will be executed as batch-complete campaigns to minimize mobilizations and optimize crew utilization. Each stimulation stage will be conducted over the course of one day, with approximately three days between each stimulation stage and several weeks between each well. The Program is organized as one campaign per year, with all planned stages for that year completed in a single window approximately six months long. The skid-mounted spread will remain staged on the platform for the duration of each campaign and will be demobilized at once each campaign is completed.

Power for the stimulation equipment will be supplied from the Platform's electrical system where capacity allows, or from portable generators, as listed in Table 1-3.

Table 1-3. Equipment List

Equipment Type	Tier	Quantity	Horsepower	Total Operating Hours	Total Operating Days
Stimulation Equipment					
Gel Hydration Unit	Tier 4	1	456 HP	304 hrs	13 days
POD Frac Blender	Tier 4	1	575 HP	228 hrs	10 days
Gravel Pack Blender (optional)	Tier 4	1	575 HP	76 hrs	3 days
2,250 HHP Frac Pumps (frac)	Tier 4	3	1650 HP	684 hrs	29 days
600 HHP Gravel Pack Pump (gravel pack)	Tier 4	1	520 HP	76 hrs	3 days
Primary & Backup Diesel Generators (optional)	Tier 4	2	755 HP	608 hrs	25 days
Control Cabin	N/A	N/A	N/A	N/A	N/A
Sand/Proppant Storage Silos	N/A	N/A	N/A	N/A	N/A
Supply Vessel / Crew Transfer Vessel <i>WMT</i>	EPA Tier 3/IMO-2	4	803	880	88

1.4.7 Personnel and Schedule Requirements

Each stimulation job will require a crew of approximately ten specialized personnel, including crew supervisors, equipment operators, engineers, and safety staff. Personnel will be mobilized to the Platform via crew transfer vessels in coordination with existing Platform logistics.

The stimulation Program is planned over a five-year period, with up to six wells stimulated during one campaign in a single year. The Program schedule is expected to follow a batch completion model, wherein each year's group of wells is completed during a single annual campaign. Each job will be performed over one day at the platform, followed by a three-day standby period before the next stage.

The estimated schedule of activities, including the number of stages, gravel packs, and total operational hours, is summarized in Table 1-4.

Table 1-4. Program Activity Schedule

Activity	Campaign 1	Campaign 2	Campaign 3	TOTAL
Dates	Jan 1, 2028 – Oct 17, 2028	Mar 8, 2030 – Dec 23, 2030	May 13, 2032 – Jan 1, 2033	Jan 1, 2028 – Jan 1, 2033
Number of Days	290 days	290 days	233 days	1,827 days
Number of Upper Repetto Wells	2	2	0	4
Number of Lower Repetto Wells	4	4	4	12
Total Number of Frac Stages	14	14	10	38
Total Number of Gravel Packs	7	7	5	19
Total Frac Hours (six hrs per stage)	84 hrs	84 hrs	60 hrs	228 hrs
Total Gravel Pack Hours (four hrs per gravel pack)	28 hrs	28 hrs	20 hrs	76 hrs

2.0 ENVIRONMENTAL SETTING

The local climate and waters of the Action area, within the Santa Barbara Channel are influenced by both its coastal location and ocean currents. It has a Mediterranean climate characterized by mild, wet winters and warm, dry summers with temperatures typically moderate year round due to the cooling effect of the Pacific Ocean, averaging 50° to 65° Fahrenheit (F) in the winter and 60° to 75°F in the summer. Most rainfall occurs during the winter months, with the region receiving an average of 14.8 inches (in) of rain annually (NWS, 2025). The California Current, which flows southward along the coast, also contributes to the cooler, stable temperature in the area. The prevailing winds of the Santa Barbara Channel generally blow from the west to northwest and generally range from 5 to 15 knots, although seasonal variation does occur. Ecologically the Santa Barbara Channel sits in a transition zone with cooler, more nutrient rich waters to its northwest and warmer, more tropical waters to its southeast. This transition zone has resulted in the development of distinctive communities and foraging grounds for both resident and migrating wildlife.

2.1 PELAGIC HABITATS

The pelagic habitat surrounding Platform Gilda, located in approximately 205 ft of water in the eastern Santa Barbara Channel, is representative of an epipelagic environment where the water column supports a diverse community of plankton and nekton. Phytoplankton and zooplankton form the foundation of this pelagic food web, with copepods, chaetognaths, larvaceans, and euphausiids (krill), providing energy transfer to higher-level consumers. Krill, primarily *Euphausia pacifica* and *Thysanoessa spinifera*, are federally managed under the Coastal Pelagic Species (CPS) Fishery Management Plan (FMP) and serve as a vital trophic link for fishes, seabirds, and baleen whales. Also managed under the CPS FMP are market squid (*Doryteuthis opalescens*), an abundant and ecologically important species which acts as both a mid-level predator of plankton and a prey species for larger fishes, seabirds, and marine mammals. The pelagic fish assemblage commonly includes Pacific sardine (*Sardinops sagax*), northern anchovy (*Engraulis mordax*), Pacific mackerel (*Scomber japonicus*), and jack mackerel (*Trachurus symmetricus*), which utilize the productive surface and midwater layers for foraging and schooling behavior. Hydrodynamically, the eastern Santa Barbara Channel is influenced by the interaction of the southward-flowing California Current and the northward-flowing Southern California Countercurrent, which generate localized eddies and variable transport patterns that shape nutrient delivery, plankton distribution, and the broader structure of pelagic communities in the vicinity of the Platform. Historic ROV surveys have also documented the presence of jack mackerel, Pacific barracuda (*Sphyræna argentea*), and ocean sunfish (*Mola mola*) within the pelagic waters surrounding Platform Gilda (Love et al., 2017; 2019a.).

2.2 PLATFORM STRUCTURE

The artificial structure at Platform Gilda supports a diverse assemblage of fishes and invertebrates across its upper, midwater, and base zones. Schooling species such as blacksmith (*Chromis punctipinnis*), señorita (*Oxyjulis californica*), halfmoon (*Medialuna californiensis*), and opaleye (*Girella nigricans*) occur in high relative abundance in the upper water column, while kelp bass (*Paralabrax clathratus*) and black perch (*Phanerodon atripes*) are more common in the mid-depth crossbeams. Rockfishes (*Sebastes spp.*) dominate much of the structure, including blue

rockfish (*Sebastes mystinus*), squarespot rockfish (*S. hopkinsi*), widow rockfish (*S. entomelas*), bocaccio (*S. paucispinis*), vermilion rockfish (*S. miniatus*), and halfbanded rockfish (*S. semicinctus*), with evidence of young-of-the-year recruitment further emphasizing the nursery value of the structure. Predatory species such as lingcod (*Ophiodon elongatus*) and kelp greenling (*Oxylebius pictus*) are also abundant. Invertebrate communities contribute to this structural habitat complexity, with strawberry anemones (*Corynactis californica*), giant plumose anemones (*Metridium farcimen*), and California mussels (*Mytilus californianus*) colonizing the crossbeams and pilings, providing additional vertical relief and shelter for fishes and invertebrates (Love et al., 2017; 2019a; 2019b).

2.3 BENTHIC HABITAT

The shell mound beneath Platform Gilda, created by the long-term accumulation of natural fallout and marine debris clearing in the upper 60 ft of the Platform structure, provides structurally complex benthic habitat distinct from the surrounding soft sediments of the Santa Barbara Channel. This mound supports mainly an assemblage of plumose anemones, sea stars (*Pisaster giganteus* and other asteroid species), and brittle stars, all of which occupy the interstitial spaces and surface of the shell deposits. Demersal fishes such as flatfishes (*Pleuronectiformes spp. and Citharichthys spp.*), cabezon (*Scorpaenichthys marmoratus*), and sculpins (*Cottidae*) utilize this mosaic of hard and soft substrate for foraging and shelter (Love et al., 2019a). The shell mound habitat aggregates a robust assemblage of benthic and demersal fishes, functioning as an ecologically important secondary reef that enhances biodiversity and productivity relative to adjacent sedimentary seafloor.

3.0 MANAGED SPECIES OF INTEREST

The PFMC manages commercial, recreational, and tribal fisheries within Federal Waters of Washington, Oregon, and California under four Fishery Management Plans (FMPs): 1) Pacific Coast Groundfish FMP; 2) Pacific Salmon FMP; 3) Coastal Pelagic Species FMP; and 4) Highly Migratory Species FMP. These FMPs are used to identify EFHs and Habitat Areas of Particular Concern (HAPC) along the Pacific Coast and to recommend fishery management measures to NMFS. The NMFS EFH online mapper was utilized to identify which management units are located within the Program area (NMFS, 2025).

3.1 PACIFIC COAST GROUND FISH

Groundfish EFH includes (1) all waters and substrate within depths less than or equal to 11,480 ft (3,500 m) to the to mean higher high water level or the upriver extent of saltwater intrusion; (2) seamounts in depths greater than 11,480 ft (3,500 m) (as mapped in the EFH assessment geographic information system); and (3) designated HAPCs, including estuaries, canopy kelp, seagrass, rocky reefs and “areas of interest”. The Program exists within managed Groundfish EFH; however, no Groundfish HAPC are present within the Program area (PFMC, 2025).

3.2 PACIFIC COAST SALMON

The Pacific Coast Salmon EFH regulates catch for chinook, coho, and pink salmon. The EFH includes estuarine and marine areas from the extreme high tide line in nearshore and tidal submerged environments within State territorial waters out to the full extent of the EEZ (200 nautical mi) offshore of California north of Point Conception (PFMC, 2024c). HAPC for Pacific Coast Salmon includes estuaries, estuary-influenced offshore areas, and submerged aquatic vegetation. Within the Program area there are no designated EFH or HAPC for Pacific Coast Salmon present.

3.3 COASTAL PELAGIC SPECIES

The Coastal Pelagic Species Fishery Management Plan identified EFH for four finfish species (Pacific sardine, Pacific mackerel, northern anchovy, and jack mackerel), market squid, and all euphausiid (krill) species that occur in the West Coast EEZ (PFMC, 2024a). The combined EFH for these species covers the marine and estuarine waters from the shoreline along the coasts of California offshore to the limits of the California EEZ and above the thermocline where sea surface temperatures range between 50°F and 78.8°F (10 and 26°C) (PFMC, 2024a). The EFH designation for all species of krill extends the length of the West Coast from the shoreline seaward to the 6,000 ft (1,829 m) isobath and from the surface to a depth of 1,312 ft (400 m). The Program exists within managed Coastal Pelagic EFH; however, no HAPC have been designated for coastal pelagics (PFMC, 2024a).

3.4 HIGHLY MIGRATORY SPECIES

The Highly Migratory Species FMP identified EFH for several species of tuna and oceanic sharks, as well as for Dorado, swordfish, and striped marlin (PFMC 2024b). Highly migratory species are defined by their pelagic habitat orientation and the large geographic extent of their migrations. EFH designation varies by species, but in total, it covers all offshore waters of

Southern California. The Program exists within managed Highly Migratory Species EFH; however, no HAPC have been designated for highly migratory species (PFMC 2024b).

3.5 PROGRAM AREA MANAGED SPECIES

A list of managed species that could be found during all or part of their life cycle within the Program area is provided in Table 3-1. This list was developed based on the EFH management units present in the region, species distribution, water depth range, and habitat types found within the Program area (PFMC; 2024a; 2024b; 2024c; and 2025). At least 65 species listed under the Pacific Coast Groundfish FMP, eight species listed under the Coastal Pelagic Species FMP, and eight species under the Highly Migratory Species FMP could be present during some life stages in the Program area. Pelagic species could be present for short time periods as schooling adults whereas many of the groundfish species could be present for longer time periods as both juveniles and adults. The juveniles of many rockfish species are known to utilize the anthropogenic habitat within the Program area as nursery grounds.

Table 3-1. Potentially Occurring Managed Fish Species in the Program Area

Common Name	Scientific Name
Pacific Coast Groundfish FMP	
Flatfish	
Butter sole	<i>Isopsetta isolepis</i>
Curlfin sole	<i>Pleuronichthys decurrens</i>
Dover sole	<i>Microstomus pacificus</i>
English sole	<i>Parophrys vetulus</i>
Pacific sanddab	<i>Citharichthys sordidus</i>
Petrale sole	<i>Eopsetta jordani</i>
Rex sole	<i>Glyptocephalus zachirus</i>
Rock sole	<i>Lepidopsetta bilineata</i>
Sand sole	<i>Psettichthys melanostictus</i>
Rockfish	
Aurora rockfish	<i>Sebastes aurora</i>
Bank rockfish	<i>Sebastes rufus</i>
Black rockfish	<i>Sebastes melanops</i>
Black-and-yellow rockfish	<i>Sebastes chrysomelas</i>
Blackgill rockfish	<i>Sebastes melanostomus</i>
Blue rockfish	<i>Sebastes mystinus</i>
Bocaccio	<i>Sebastes paucispinis</i>
Bronzespotted rockfish	<i>Sebastes gilli</i>
Brown rockfish	<i>Sebastes auriculatus</i>
Calico rockfish	<i>Sebastes dalli</i>
California scorpionfish	<i>Scorpaena guttata</i>
Canary rockfish	<i>Sebastes pinniger</i>
Chilipepper	<i>Sebastes goodei</i>
China rockfish	<i>Sebastes nebulosus</i>
Copper rockfish	<i>Sebastes caurinus</i>
Cowcod	<i>Sebastes levis</i>

Common Name	Scientific Name
Darkblotched rockfish	<i>Sebastes crameri</i>
Flag rockfish	<i>Sebastes rubrivinctus</i>
Gopher rockfish	<i>Sebastes carnatus</i>
Grass rockfish	<i>Sebastes rastrelliger</i>
Greenblotched rockfish	<i>Sebastes rosenblatti</i>
Greenspotted rockfish	<i>Sebastes chlorostictus</i>
Greenstriped rockfish	<i>Sebastes elongatus</i>
Halfbanded rockfish	<i>Sebastes semicinctus</i>
Honeycomb rockfish	<i>Sebastes umbrosus</i>
Kelp rockfish	<i>Sebastes atrovirens</i>
Mexican rockfish	<i>Sebastes macdonaldi</i>
Olive rockfish	<i>Sebastes serranoides</i>
Pink rockfish	<i>Sebastes eos</i>
Pygmy rockfish	<i>Sebastes wilsoni</i>
Pacific Ocean perch	<i>Sebastes alutus</i>
Quillback rockfish	<i>Sebastes maliger</i>
Redbanded rockfish	<i>Sebastes babcocki</i>
Redstriped rockfish	<i>Sebastes proriger</i>
Rosethorn rockfish	<i>Sebastes helvomaculatus</i>
Rosy rockfish	<i>Sebastes rosaceus</i>
Rougheyeye rockfish	<i>Sebastes aleutianus</i>
Sharpchin rockfish	<i>Sebastes zacentrus</i>
Shortspine thornyhead	<i>Sebastolobus alascanus</i>
Speckled rockfish	<i>Sebastes ovalis</i>
Splitnose rockfish	<i>Sebastes diploproa</i>
Squarespot rockfish	<i>Sebastes hopkinsi</i>
Starry rockfish	<i>Sebastes constellatus</i>
Stripetail rockfish	<i>Sebastes saxicola</i>
Swordspine rockfish	<i>Sebastes ensifer</i>
Tiger rockfish	<i>Sebastes nigrocinctus</i>
Treefish rockfish	<i>Sebastes serriceps</i>
Vermilion rockfish	<i>Sebastes miniatus</i>
Widow rockfish	<i>Sebastes entomelas</i>
Yelloweye rockfish	<i>Sebastes ruberrimus</i>
Yellowtail rockfish	<i>Sebastes flavidus</i>
Roundfish	
Cabazon	<i>Scorpaenichthys marmoratus</i>
Kelp greenling	<i>Hexagrammos decagrammus</i>
Lingcod	<i>Ophiodon elongatus</i>
Pacific whiting (hake)	<i>Merluccius productus</i>
Sharks and Rays	
Big skate	<i>Raja binoculata</i>
Leopard shark	<i>Triakis semifasciata</i>
Longnose skate	<i>Raja rhina</i>
Pacific Spiny dogfish	<i>Squalus suckleyi</i>

Common Name	Scientific Name
Coastal Pelagic Species FMP	
Pacific sardine	<i>Sardinops sagax</i>
Pacific (chub) mackerel	<i>Scomber japonicus</i>
Northern anchovy	<i>Engraulis mordax</i>
Jack mackerel	<i>Trachurus symmetricus</i>
Market squid	<i>Doryteuthis opalescens</i>
Krill	<i>Euphausiid ssp.</i>
Pacific herring	<i>Clupea pallasii</i>
Jacksnelt	<i>Atherinopsis californiensis</i>
Highly Migratory Species FMP	
Albacore tuna	<i>Thunnus alalunga</i>
Bigeye tuna	<i>Thunnus obesus</i>
Blue shark	<i>Prionace glauca</i>
Common thresher shark	<i>Alopias vulpinus</i>
Dorado	<i>Coryphaena hippurus</i>
Northern bluefin tuna	<i>Thunnus thynnus</i>
Shortfin mako shark	<i>Isurus oxyrinchus</i>
Yellowfin tuna	<i>Thunnus albacares</i>

4.0 IMPACT ASSESSMENT

Pacific Coast Groundfish, Coastal Pelagic Species, and Highly Migratory Species EFH management units are present in the Program area (NMFS, 2025). No HAPC are designated within the Program area. The geographic extent of EFH for Pacific Salmon includes all marine waters within the EEZ north of Point Conception, California, and is therefore not included in this assessment.

4.1 SEAFLOOR DISTURBANCE

The proposed well stimulation Program will improve hydrocarbon recovery from low-permeability zones by increasing effective reservoir permeability and bypassing near-wellbore formation damage. This is achieved by injecting fluids at high pressure into the target formation to create small, controlled fractures in the rock. Potential seafloor disturbance impacts could result from the inadvertent discharge of contaminants in the event of an accidental spill from vessels or leak from the well casings.

Unintentional release of contaminants from hydraulic fracturing processes can also occur if the hydraulic fracture provides a leakage pathway to the sea floor. Natural boundaries, stresses in the target formation, and volume of injection are contributing factors to leaks. Unintentional release of contaminants caused by hydraulic fracturing between a reservoir and the ocean floor is considered unlikely due to mandated well integrity testing which will be conducted prior to and throughout any stimulation activity, including pressure testing of the casing and tubing to confirm the absence of leaks.

4.2 UNDERWATER NOISE

Fish may experience a range of impacts from underwater sounds and vibration depending on the physical qualities of sound sources and the environment, as well as physiological characteristics and the behavioral context of the species. Unlike mammals, fish can regenerate specified cells involved with auditory interpretation if they are damaged; therefore, there are not explicit threshold levels associated with permanent auditory injury (PTS) like we have documented for marine mammals, turtles, and birds (NMFS, 2024). However, fish do experience temporary threshold shifts (TTS) which can include barotrauma when very close to impulsive sounds sources or explosions (Table 4-1).

While noise levels generated by the Program have potential to impact fish at close range, it is likely they will exhibit avoidance behavior and temporarily avoid the Program area. The available data show that there is little to no increase in noise levels from fixed platforms during drilling operations as compared to non-drilling operations (Noise Control Engineering, 2007). Pressurized fluids injection could create indirect underwater noise sources; however, the majority of the noise sources would be produced under the seafloor and would dissipate before reaching open water. In addition, equipment activity and Program operations originating on the Platform have the potential to create noise that may penetrate the water column; however, activities would be temporary and noise levels are not expected to exceed the existing operation levels or hearing thresholds that would cause adverse effects to fish species.

Fishes experiencing non-impulsive noise sources approaching their TTS are likely to exhibit avoidance behavior. Behavioral effects include changes in the distribution, migration, and

reproduction behaviors of exposed animals, but are only considered biologically significant if the changes in behavior affect growth, survival, and/or reproduction.

Table 4-1. Onset of Physical Injury from Impulsive Sources for Fishes

Fish Size	Onset of Physical Injury from Impulsive Sources
Fishes \geq 2 grams	187 dB re (1 μ Pa) ² s
Fishes < 2 grams	183 dB re (1 μ Pa) ² s

Source: NMFS 2024, Summary of Endangered Species Act Acoustic Thresholds

Note: Program activities will largely generate non-impulsive noise levels, however metrics for this are not currently known.

Underwater construction noise levels, related to Program activities are not anticipated to exceed harassment thresholds for managed fish species. Given the high likelihood of fish vacating the immediate area due to the physical presence of the equipment prior to noise exposure, potential impacts to fish from underwater sounds generated by Program activities are expected to be minimal and temporary.

4.3 WATER QUALITY

The accidental release of hazardous materials into the marine environment from vessels or associated equipment during mobilization and or well stimulation activities could result in potentially significant impacts to marine fish, including early life stages of fish which are particularly sensitive to those chemicals. These hazardous materials include refined petroleum products and well stimulation fluids.

Refined petroleum products (i.e., diesel, gasoline, and lubricating oils) are more toxic than heavier crude, and the loss of a substantial amount of fuel or lubricating oil during construction operations could affect the water column, seafloor, and associated fishes, resulting in their mortality or substantial injury. The effects of petroleum products on fish have been well documented both in the field and within a laboratory. This research shows that fish are unable to avoid hydrocarbons, which they take up from food, sediments and surrounding waters. Once these hydrocarbons are in the tissues of the organism they will affect the life span through a variety of behavioral, physiological, or biochemical changes. Also, exposure to hydrocarbons will affect a species' ability to search for, find, and capture food, which will affect its nutritional requirements. Early development life stages such as larvae will be especially impacted by this, with just a small amount of hydrocarbons impacting fish embryos by causing physical deformities, damage to genetic material, and mortality (Carls et al., 1999). Based on past studies of fish populations following oil spills and given that a spill from a Program vessel would be unlikely, no significant short-term or long-term impacts on fish are anticipated.

Similar to petroleum products, the potential accidental release of well stimulation fluids could result in adverse effects to fish species. Well stimulation fluids could become integrated into the water column after escaping the wells. Studies have shown that stimulation fluids could be particularly harmful in reproductive behavior and larval development of some fish species (Houseworth and Stringfellow, 2015). However, accidental release of stimulation fluids remains unlikely due to Program specific preventive and response measures, including mandated well

integrity testing conducted prior to and throughout all stimulation operations. These tests include pressure testing of casing and tubing to confirm the absence of leaks. Therefore, no significant short-term or long-term impacts on fish are anticipated.

4.4 INVASIVE SPECIES

Invasive species can alter the habitat structure, food sources, and overall health of fishes. Invasive species can be accidentally released, especially during ballast and bilge water discharges and within the fouling communities of ship hulls. Once established in the region, invasive species have been found to quickly colonize available hard surfaces on offshore oil and gas infrastructure in southern California (Viola et al. 2018; Page et al. 2019). The potential for introducing an invasive species through ballast water releases or biofouling from construction activities is quite small since all Program vessels are required to adhere to existing state and federal regulations related to ballast and bilge water discharge, including USCG regulations (33 CFR 151.2025) and USEPA NPDES Vessel General Permit standards, both of which aim to prevent the release of ballast waters contaminated with an invasive species. The introduction of an invasive species related to Program activities is expected to be extremely rare.

5.0 MITIGATION MEASURES

Program activities have the potential to impact the Pacific Coast Groundfish, Coastal Pelagic Species, and Highly Migratory Species EFH located within the Program area. The following avoidance and minimization measures (AMMs) have been incorporated into the Program design and will be implemented during construction to minimize potential impacts to marine biological resources.

- **Closed-Loop Fluids Management.** All stimulation flowback is retained on the Platform and reinjected; no unauthorized fluids are discharged to the ocean.
- **Chemical Handling And Containment.** Covered secondary containment; closed-connection transfers over contained deck areas; segregation of incompatible materials.
- **Well Integrity Verification.** An independent registered professional engineer reviews and certifies casing programs for compliance with 30 CFR § 250.420. Casing and liners are designed to withstand anticipated stresses, cemented to isolate hydrocarbon-bearing zones, and pressure-tested prior to stimulation to confirm mechanical integrity.
- **Produced-Water Compliance And Monitoring.** Continued adherence to NPDES permit limits (oil and grease, whole-effluent toxicity, sheen prohibition).
- **Program Vessel Traffic.** Program vessels will utilize (or continue to utilize) the existing U.S. Coast Guard Traffic Separation Scheme (TSS) and Joint Oil Fisheries Liaison Office (JOFLO) corridors within the Santa Barbara Channel. At all times, Program vessels will operate using the highest level of navigational safety and in accordance with International and USCG regulations and guidelines.
- **Oil Spill Response and Contingency Plan Implementation.** An Oil Spill Response and Contingency Plan (OSRCP) will be implemented during all Program activities in the event of the release of oil or contaminants. The OSRCP will include site-specific details, oil spill removal organization (OSRO) coverage, and drills ensure readiness for any vessel- or Platform-related spill.
- **Prevent Introduction of Non-Native Aquatic Species (NAS).** All Program vessels will be in compliance with California's state ballast management regulations.

6.0 CONCLUSION

Pacific Groundfish, Coastal Pelagic, and Highly Migratory species EFH could be affected by Program activities. Potential impacts due to Program activities include an increase in vessel traffic, underwater noise, potential degradation of water quality and seafloor habitats from the discharge of contaminants in the event of an accidental spill from vessels or well casings. Additionally, temporary loss in some foraging habitat may occur during Program activities due to vessel and equipment presence but will not result in any permanent impacts to EFH.

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