

UNITED STATES GOVERNMENT
MEMORANDUM

August 27, 2026

To: Public Information (MS 5030)
From: Plan Coordinator, FO, Plans Section (MS 5231)
Subject: Public Information copy of plan
Control # - S-08240
Type - Supplemental Exploration Plan
Lease(s) - OCS-G35979 Block - 589 Mississippi Canyon Area
Operator - LLOG Exploration Offshore, L.L.C.
Description - Subsea Wells 001 and 001 ALT
Rig Type - Not Found

Attached is a copy of the subject plan.

It has been deemed submitted as of this date and is under review for approval.

Chiquita Hill
Plan Coordinator

Site Type/Name	Botm Lse/Area/Blk	Surface Location	Surf Lse/Area/Blk
WELL/001	G35979/MC/589	2817 FNL, 2368 FEL	G35979/MC/589
WELL/001 ALT	G35979/MC/589	2870 FNL, 2369 FEL	G35979/MC/589

LLOG EXPLORATION OFFSHORE, L.L.C.
1001 Ochsner Boulevard, Suite 100 -
Covington, Louisiana 70433

SUPPLEMENTAL PLAN OF EXPLORATION
OCS-G-35979 & OCS-G-36132 LEASES
MISSISSIPPI CANYON BLOCKS 589 & 545

PUBLIC INFORMATION COPY

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Date: August 2026

LLOG EXPLORATION OFFSHORE, L.L.C.
SUPPLEMENTAL EXPLORATION PLAN
OCS-G-35979 & OCS-G-36132 LEASES
MISSISSIPPI CANYON 589 & 545

APPENDIX A	<i>Plan Contents</i>
APPENDIX B	<i>General Information</i>
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APPENDIX E	<i>Biological, Physical and Socioeconomic Information</i>
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APPENDIX K	<i>Environmental Mitigation Measures Information</i>
APPENDIX L	<i>Related Facilities and Operations Information</i>
APPENDIX M	<i>Support Vessels and Aircraft Information</i>
APPENDIX N	<i>Onshore Support Facilities Information</i>
APPENDIX O	<i>Coastal Zone Management Act (CZMA) Information</i>
APPENDIX P	<i>Environmental Impact Analysis</i>
APPENDIX Q	<i>Administrative Information</i>

APPENDIX A
PLAN CONTENTS
(30 CFR Part 550.211 and 550.241)

A. Plan information

In accordance with 30 CFR 550.211 and 550.241(a), NTL No. 2008-G04 and NTL 2015-N01, LLOG Exploration Offshore, LLC (LLOG) would like to supplement approved Revised EP (R-7191) to add MC 589 001 ST01 Well. This well will be a sidetrack of existing well MC 545 001 (608174150500). LLOG proposes the drilling, completion, testing and installation of subsea wellhead for one (1) proposed surface location well, on Lease OCS-G-35979. LLOG also proposes (1) mirrored well (MC 589 001 ST Alt) to be drilled only in the event of a failure. All other aspects of the revised exploratory plan R-7191 will remain the same. The operations proposed in this plan will not utilize pile-driving, nor is the Operator proposing any new pipelines expected to make landfall.

Included as ***Attachment A-1*** is Form BOEM 137 “OCS Plan Information Form”, which provides for the drilling, sub-sea completion and testing of all well locations.

B. Location

Attachment A-2 – Well Location Plat

Attachment A-3 – Bathymetry Map

C. Safety & Pollution Features

LLOG will utilize a Drillship or a DP semi-submersible drilling rig for the proposed operations. A description of the drilling units is included on the OCS Plans Information Form. Rig specifications will be made part of the Application for Permit to Drill.

Safety features on the drilling unit will include well control, pollution prevention, and blowout prevention equipment as described in Title 30 CFR Part 250, Subparts C, D, E and G; and further clarified by BOEM’s Notices to Lessees, and currently policy making invoked by BOEM, EPA and USCG. Appropriate life rafts, life jackets, ring buoys, etc., will be maintained on the facility at all times.

Pollution prevention measures include installation of curbs, gutters, drip pans, and drains on the drilling deck areas to collect all contaminants and debris.

D. Storage Tanks and Vessels

The following table details the storage tanks and/or production vessels that will store oil (capacity greater than 25 bbls. or more) and be used to support the proposed activities (MODU, barges, platforms, etc.):

Type of Storage Tank	Type of Facility	Tank Capacity (bbls)	Number of tanks	Total Capacity (bbls)	Fluid Gravity (API)
Fuel Oil Storage Tank	Drillship	16,564	1	16,564	No. 2 Diesel - 43
Fuel Oil Storage Tank		16,685.5	1	16,685.5	No. 2 Diesel - 43
Fuel Oil Settling Tank		836.6	2	1,673.2	No. 2 Diesel - 43
Fuel Oil Day Tanks		836.6	2	1,673.2	No. 2 Diesel - 43

Type of Storage Tank	Type of Facility	Tank Capacity (bbls)	Number of tanks	Total Capacity (bbls)	Fluid Gravity (API)
Fuel Oil (Marine Diesel)	DP Semi-Submersible	164	1	164	30
Fuel Oil Day		367	2	734	30
Emergency Generator		31	1	31	30
Forward Hull Fuel Oil		4634	2	9268	30
Lower Aft Hull Fuel Oil		3462	2	6924	30
Lube Oil Services		117 10.5 4.6	1 1 1	132.1	45
Dirty Lube Oil		38 28	1 1	66	45
Dirty Bilge		190	4	760	10

E. Pollution Prevention Measures: Not applicable. The State of Florida is not an affected State by the proposed activities in this plan.

F. Additional measures: LLOG does not propose any additional safety, pollution prevention, or early detection measures, beyond those required in 30 CFR 250 and per December 13, 2010 – Guidance for Deepwater Drillers to Comply with Strengthened Safety and Environmental Standards.

OCS Plan Information Form

Attachment A-1 (Proprietary Information)

OCS PLAN INFORMATION FORM

General Information									
Type of OCS Plan:		Exploration Plan (EP)		Development Operations Coordination Document (DOCD)					
				Supplemental					
Company Name: LLOG EXPLORATION OFFSHORE, L. L. C.				BOEM Operator Number: 02058					
Address:				Contact Person: SUE SACHITANA					
1001 OCHSNER BLVD, SUITE 100				Phone Number: (985) 801-4716					
COVINGTON, LA 70433				E-Mail Address: SUE.SACHITANA@LLOG.COM					
If a service fee is required under 30 CFR 550.125(a), provide the				Amount paid		\$4,823.00		Receipt No.	
								77472715090	
Project and Worst Case Discharge (WCD) Information									
Lease(s): OCS-G-35979 & OCS-G-36132			Area: MC		Block(s): 4		Project Name (If Applicable): WHO DAT SOUTH		
Objective(s)		☒ Oil	☒ Gas	☐ Sulphur	☐ Salt	Onshore Support Base(s): FOURCHON, LA			
Platform/Well Name: MC 589 001 ST01			Total Volume of WCD: ~18.864 mmbo				API Gravity: 31.8°		
Distance to Closest Land (Miles): 40				Volume from uncontrolled blowout: 314,400 MMBO					
Have you previously provided information to verify the calculations and assumptions for your WCD?							☒ Yes	☐ No	
If so, provide the Control Number of the EP or DOCD with which this information was provided							N-10040		
Do you propose to use new or unusual technology to conduct your activities?							☐ Yes	☒ No	
Do you propose to use a vessel with anchors to install or modify a structure?							☐ Yes	☒ No	
Do you propose any facility that will serve as a host facility for deepwater subsea development?							☐ Yes	☒ No	
Description of Proposed Activities and Tentative Schedule (Mark all that apply)									
Proposed Activity				Start Date		End Date		No. of Days	
Exploration drilling									
Development drilling				See Attached Schedule					
Well completion									
Well test flaring (for more than 48 hours)									
Installation or modification of structure									
Installation of production facilities									
Installation of subsea wellheads and/or manifolds									
Installation of lease term pipelines									
Commence production									
Other (Specify and attach description)									
Description of Drilling Rig					Description of Structure				
☐	Jackup	☒	Drillship	☐	Caisson	☐	Tension leg platform		
☐	Gorilla Jackup	☐	Platform rig	☐	Fixed platform	☐	Compliant tower		
☐	Semisubmersible	☐	Submersible	☐	Spar	☐	Guyed tower		
☒	DP Semisubmersible	☐	Other (Attach Description)	☐	Floating production system	☐	Other (Attach Description)		
Drilling Rig Name (If Known):									
Description of Lease Term Pipelines									
From (Facility/Area/Block)			To (Facility/Area/Block)			Diameter (Inches)		Length (Feet)	

ACTIVITY SCHEDULE

WELL / EVENT	SPUD	TD	COMPL START	COMPL FINISH	DESCRIPTION
MC 589 001 ST01	7/15/2027	10/13/2027	6/1/2028	8/30/2028	Drill, TA, Complete

Years	Number of Days
2027	90
2026	90
2027	90
2028	90
2029	90
2030	90
2031	90
2032	90
2033	90
2034	90

Since LLOG's rig schedule is fluid, we are asking for air emission days for the next 10 years but will not have activity every year.

OCS PLAN INFORMATION FORM (CONTINUED)
Include one copy of this page for each proposed well/structure

Proposed Well/Structure Location									
Well or Structure Name/Number (If renaming well or structure, reference previous name): MC 589 001 ST01				Previously reviewed under an approved EP or DOCD?			Yes	☒	No
Is this an existing well or structure?			Yes		No	If this is an existing well or structure, list the Complex ID or API No.		608174150500 FUTURE ST OF THIS WELLBORE	
Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?						☒	Yes		No
WCD info	For wells, volume of uncontrolled blowout (Bbls/day): 314,400 BOPD			For structures, volume of all storage and pipelines (Bbls):		API Gravity of fluid		31.8°	
	Surface Location			Bottom-Hole Location (For Wells)		Completion (For multiple completions, enter separate lines)			
Lease No.	OCS 35979			OCS		OCS OCS			
Area Name	MISSISSIPPI CANYON								
Block No.	589								
Blockline Departures (in feet)	N/S Departure: F <u> N </u> L 2,817.59			N/S Departure: F <u> </u> L		N/S Departure: F <u> </u> L N/S Departure: F <u> </u> L N/S Departure: F <u> </u> L			
	E/W Departure: F <u> E </u> L 2,368.80			E/W Departure: F <u> </u> L		E/W Departure: F <u> </u> L E/W Departure: F <u> </u> L E/W Departure: F <u> </u> L			
Lambert X-Y coordinates	X: 963,871.20			X:		X: X: X:			
	Y: 10,309,022.41			Y:		Y: Y: Y:			
Latitude/ Longitude	Latitude 28° 23' 29.277" N			Latitude		Latitude Latitude Latitude			
	Longitude 89° 06' 16.742" W			Longitude		Longitude Longitude Longitude			
Water Depth (Feet): 2,569				MD (Feet):		TVD (Feet):		MD (Feet): MD (Feet): MD (Feet):	
Anchor Radius (if applicable) in feet:								TVD (Feet): TVD (Feet): TVD (Feet):	
Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)									
Anchor Name or No.	Area	Block	X Coordinate	Y Coordinate	Length of Anchor Chain on Seafloor				
			X =	Y =					
			X =	Y =					
			X =	Y =					
			X =	Y =					
			X =	Y =					
			X =	Y =					
			X =	Y =					
			X =	Y =					

OCS PLAN INFORMATION FORM (CONTINUED)
Include one copy of this page for each proposed well/structure

Proposed Well/Structure Location									
Well or Structure Name/Number (If renaming well or structure, reference previous name): MC 589 001 ST01 ALT					Previously reviewed under an approved EP or DOCD?		Yes	☒	No
Is this an existing well or structure?		Yes	☐	No	☒	If this is an existing well or structure, list the Complex ID or API No.		608174150500 FUTURE ST OF THIS WELLBORE	
Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?							☒	Yes	No
WCD info	For wells, volume of uncontrolled blowout (Bbls/day): 314,400 BOPD			For structures, volume of all storage and pipelines (Bbls):			API Gravity of fluid		31.8°
	Surface Location			Bottom-Hole Location (For Wells)			Completion (For multiple completions, enter separate lines)		
Lease No.	OCS 35979			OCS			OCS OCS		
Area Name	MISSISSIPPI CANYON								
Block No.	589								
Blockline Departures (in feet)	N/S Departure: F <u>N</u> L 2,870			N/S Departure: F <u> </u> L			N/S Departure: F <u> </u> L N/S Departure: F <u> </u> L N/S Departure: F <u> </u> L		
	E/W Departure: F <u>E</u> L 2,369			E/W Departure: F <u> </u> L			E/W Departure: F <u> </u> L E/W Departure: F <u> </u> L E/W Departure: F <u> </u> L		
Lambert X-Y coordinates	X: 963,871.00			X:			X: X: X:		
	Y: 10,308,970.00			Y:			Y: Y: Y:		
Latitude/ Longitude	Latitude 28° 23' 28.758" N			Latitude			Latitude Latitude Latitude		
	Longitude 89° 06' 16.734" W			Longitude			Longitude Longitude Longitude		
Water Depth (Feet): 2,569				MD (Feet):		TVD (Feet):		MD (Feet): MD (Feet):	
Anchor Radius (if applicable) in feet:								TVD (Feet): TVD (Feet):	
Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)									
Anchor Name or No.	Area	Block	X Coordinate	Y Coordinate			Length of Anchor Chain on Seafloor		
			X =	Y =					
			X =	Y =					
			X =	Y =					
			X =	Y =					
			X =	Y =					
			X =	Y =					
			X =	Y =					
			X =	Y =					

Well Location Plat

Attachment A-2 (Proprietary Information)

Y = 10,311,840.00

#1 ST01 (SL)
1 (G36132)
ALT #1 ST01 (SL)



X = 950,400.00

MC589
OCS-G35979
LLOG EXPLORATION OFFSHORE LLC

X = 966,240.00

PROPOSED WELL LOCATION

LOCATION	BLOCK	CALLS		COORDINATES		LATITUDE	LONGITUDE	WD	MD	TVD
#1 ST01 (SL)	MC/589	2,368.80' FEL	2,817.59' FNL	X = 963,871.20	Y = 10,309,022.41	28° 23' 29.277"N	89° 06' 16.742"W	2,569'		
ALT #1 ST01 (SL)	MC/589	2,369.00' FEL	2,870.00' FNL	X = 963,871.00	Y = 10,308,970.00	28° 23' 28.758"N	89° 06' 16.734"W	2,569'		

Y = 10,296,000.00

PUBLIC INFORMATION

LLOG EXPLORATION
OFFSHORE, L.L.C.



36499 Perkins Road
Prairieville, Louisiana 70769
Tel: 225-673-2163



SCALE IN FEET

EXPLORATION PLAT

PROPOSED WELL #1 ST01 & ALT #1 ST01
OCS-G 35979 BLOCK 589
MISSISSIPPI CANYON AREA

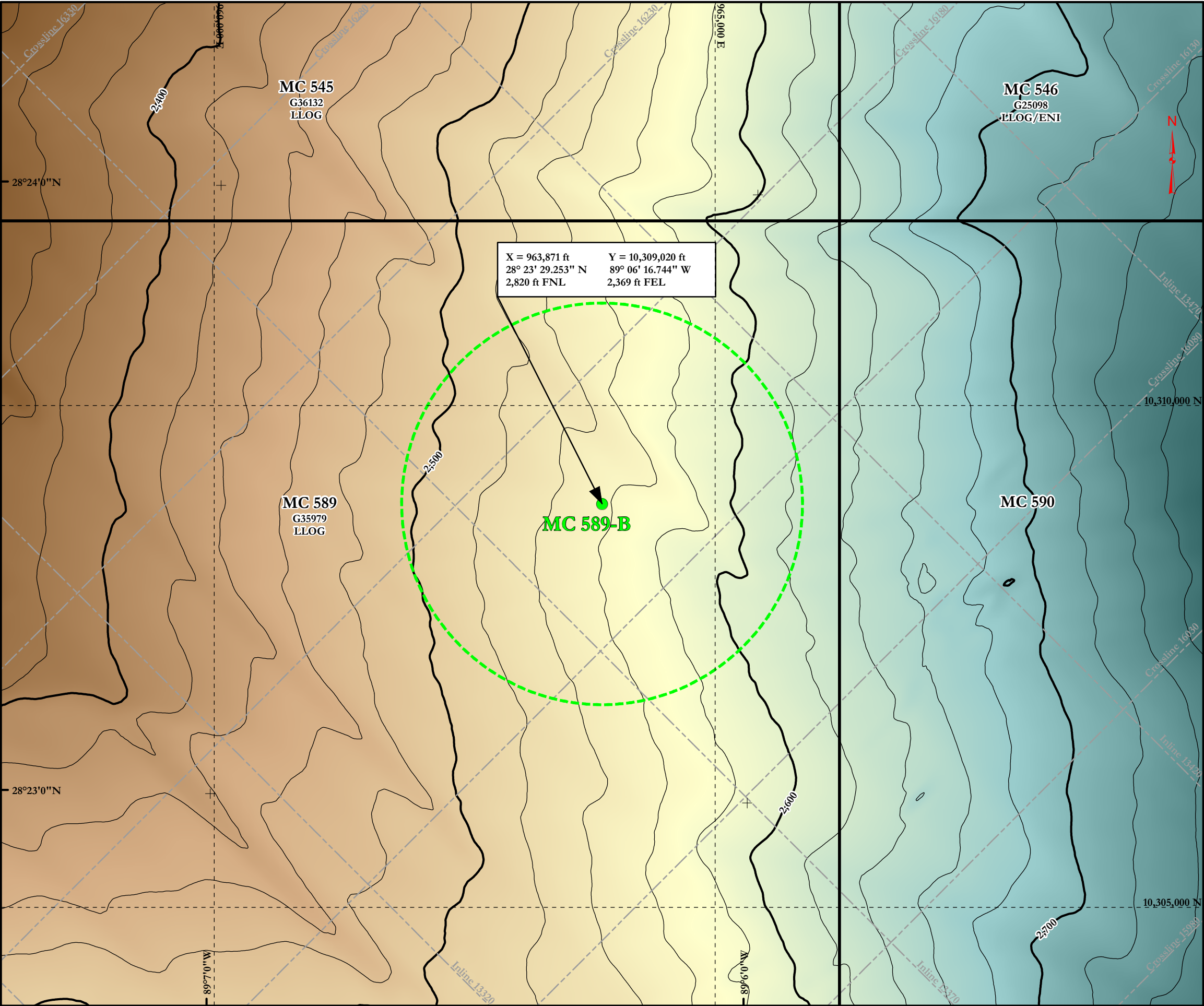
GULF OF MEXICO

DATUM: NAD 27 | SPHEROID: CLARKE 1866 | PROJECTION: U.T.M. | ZONE: 16

DRAWN BY: RJN | CHK. BY: MEK | REV. No.: 1 | JOB No.: 25-008 | DWG No.: 25-008-EXP_REV1
DATE: 2/13/2025 | REV. DATE: 8/3/2026 | SCALE: 1"=2,000' | SHEET 1 OF 1

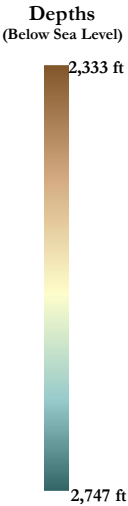
Bathymetry Map

Attachment A-3 (Public Information)



Legend

- + Lat/Long Grid Points
- - - - UTM Northing and Easting Grid Lines
- - - - 3-D Seismic Inlines and Crosslines
- Proposed Well
- 2,000-ft Radius Circle
- Water Depth 100-ft Contours
- Water Depth 20-ft Contours



Grid Information:
Data Source: 3-D Seismic
Method: Kriging
Spacing: 50 ft
Search Radius: 150 ft
Contour Interval: 20 ft

****IMPORTANT NOTICE****
This map is not intended for navigation purposes.
Public information obtained from BOEM database (November 2019).

Geodetic Datum: NAD27 Projection: UTM Zone: 16N Grid Units: Feet	Interpretation By: Bill Berger Cartography: Sandra R Milson Project No.: 19-10-30 Date: November 2019
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05001,0001,5002,000

Feet

Scale = 1:12,000



Block 589
Mississippi Canyon Area
Gulf of Mexico

Map W-1
Bathymetry
Proposed Well MC 589-B
Lease No. G35979

Map Prepared by:
Berger Geosciences, LLC.
© Berger Geosciences, LLC. 2019



APPENDIX B
GENERAL INFORMATION
(30 CFR Part 550.213 and 550.243)

A. Applications and Permits

There are no Federal/State applications to be submitted for the activities provided for in this Plan (exclusive to BOEM permit applications and general permits issued by the EPA and COE)

Application/Permit	Issuing Agency	Status
APD	BSEE	To be filed

B. Drilling Fluids

Type of Drilling Fluid	Estimated Volume of Drilling Fluid to be used per Well
Water Based (seawater, freshwater, barite)	See Appendix F, Table 1 of this Plan
Oil-based (diesel, mineral oil)	N/A
Synthetic-based (internal olefin, ester)	See Appendix F, Table 2 of this Plan

C. New Or Unusual Technology

LLOG does not propose using any new and/or unusual technology for the operations proposed in this Revised Plan.

D. Bonding Statement

The bond requirements for the activities and facilities proposed in this Revised Exploration Plan are satisfied by an area wide bond, furnished, and maintained according to 30 CFR Part 256; subpart I; NTL No. 2000-G16, "Guidelines for General Lease Surety Bonds," and additional security under 30 CFR 256.53(d) and NTL No. 2003-N06 "Supplemental Bond Procedures."

E. Oil Spill Responsibility (OSFR)

LLOG Exploration Offshore, L.L.C (BOEM Co. No. 02058) will demonstrate oil spill financial responsibility for the facilities proposed in this Supplemental EP according to 30 CFR Part 553, and NTL No. 2008-N05 "Guidelines for Oil Spill Financial Responsibility (OSFR) for Covered Facilities."

F. Deepwater Well Control Statement

LLOG Exploration Offshore, L.L.C. (BOEM Co. No. 02058) has the financial capability to drill a relief well and conduct other emergency well control operations.

G. Blowout Scenario

The Worst-Case Discharge (WCD) Calculations for the proposed well have been calculated as 314,400 BOPD. The calculations for the WCD are found in Attachment B-1 of LLOG's Initial EP (N-10040). The Blowout Scenario is submitted in this plan as *Attachment B-1*.

Attachment B-1

Blowout Scenario (Public Information)

	Blowout Scenario MC 545	Last Revised: 8/6/2026 Page 1 of 5
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BLOWOUT SCENARIO

Pursuant with 30 CFR 550.213(g), 550.219, 550.250 and NTL 2015-N01 the following attachment provides a blowout scenario description, information regarding any oil spill, WCD results and assumptions of potential spill and additional measures taken to firstly enhance the ability to prevent a blowout and secondly to manage a blowout scenario if it occurred.

INFORMATION REQUIREMENTS

A) Blowout scenario

Well(s) to be drilled to potential objectives are outlined in the Geological and Geophysical Information Section of this plan utilizing a typical subsea wellhead system, conductor, surface and intermediate casing strings utilizing a MODU rig with marine riser and a subsea BOP system. A hydrocarbon influx and a well control event occurring from the objective sand were modeled with no drill pipe or obstructions in the wellbore followed by a failure of the subsea BOPs and loss of well control at the seafloor. The simulated flow and worst case discharge (WCD) results for all wells are calculated and the highest WCD is used for this unrestricted blowout scenario.

B) Estimated flow rate of the potential blowout

Category	EP
Type of Activity	Drilling
Facility Location (area / block)	MC 589 (surface location)
Facility Designation	MODU
Maximum Estimated Flow Rate (Volume per day)	314,400 BOPD
Type of Fluid	Oil

C) Total volume and maximum duration of the potential blowout

Maximum Duration of Flow (days)	60 days total (see Relief Well Response Estimate below)
Total Volume of Spill (bbls)	18.864 ~ MMBO based on max duration of flow at max rate (steady state)

D) Potential for the well to bridge over

Mechanical failure/collapse of the borehole in a blowout scenario is influenced by several factors including in-situ stress, rock strength, pressure differentials, and fluid velocities at the sand face. Given the substantial fluid velocities inherent in the WCD, and the scenario as defined where the formation is not supported by a cased and cemented wellbore, it is possible that the borehole may fail/collapse/bridge over within a span of a few days, significantly reducing the WCD rates. **For this blowout scenario, no bridging is considered.**

E) Likelihood for intervention to stop blowout

The likelihood of surface intervention to stop a blowout is based on some of the following equipment specific to potential MODU's to be contracted for this well. It is reasonable to assume that the sooner you are able to respond to the initial blowout, the better likelihood there is to control and contain the event due to reduced pressures at the wellhead, less exposure of well fluids to erode and compromise the well

	Blowout Scenario MC 545	Last Revised: 8/6/2026 Page 2 of 5
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control equipment, and less exposure of hydrocarbons to the surface to safeguard personnel and equipment in an emergency situation. This equipment includes:

- Secondary Acoustic BOP Control System – based on specific rig contracted for work, BOP's possibly available with active secondary acoustic controls for specific BOP functions. This system has the ability to communicate and function specific BOP controls from the surface in the event of a failure of the primary umbilical control system. This system typically can establish BOP controls from the surface acoustic system package on the rig or by deploying a second acoustic package from a separate vessel of opportunity. This system may not be included on all MODU's presently in GOM. This system is typically configured to function the following:
 - Blind/shear ram close
 - Pipe ram close
 - LMRP disconnect
- ROV Intervention BOP Control System – includes one or more ROV intervention panels mounted on the subsea BOP's located on the seabed allows a ROV utilizing standard ROV stabs to access and function the specific BOP controls. These functions will be tested at the surface as part of the required BOP stump test and selectively at the seafloor to ensure proper functionality. These function include the following (at a minimum):
 - Blind/shear ram close
 - Pipe ram close
 - LMRP disconnect
 - WH disconnect
- Deadman / Autoshear function – typically fitted on DP MODU's and but to be on all MODU's operating in the GOM according to new requirements, this equipment allows for an automated pre-programmed sequence of functions to close the casing shear rams and the blind/shear rams in the event of an inadvertent or emergency disconnect of the LMRP or loss of both hydraulic and electrical supply from the surface control system.

In the event that the intervention systems for the subsea BOP's fail, LLOG will initiate call out of a secondary containment / surface intervention system supported by the Helix Well Containment Group (HWCG) of which LLOG is a member. This system incorporates a capping stack capable of being deployed from the back of a vessel of opportunity equipped with an ROV or from the Helix Q4000 DP MODU or an rig of opportunity. Based on the potential integrity concerns of the well, a "cap and flow" system can be deployed which may include the Helix Producer 1 capable of handling up to 55,000 BOPD flowback or a HWCG Well Test Package that will replace / supplement the Helix Producer 1 option beginning in Q1 - 2019. The vertical intervention work is contingent upon the condition of the blowing out well and what equipment is intact to access the wellbore for kill or containment operations. The available intervention equipment may also require modifications based on actual wellbore conditions. Standard equipment is available through the Helix Deepwater Containment System to fit the wellhead and BOP stack profiles used for the drilling/completing/workover operations of the above mentioned wells.

F) Availability of rig to drill relief well, rig constraints and timing of rigs

LLOG currently has two deepwater MODU's under contract (**Seadrill West Vela – DP drillship, and Seadrill West Neptune – DP drillship**). In the event of a blowout scenario that does not involve loss or damage to the rig such as an inadvertent disconnect of the BOP's, then the existing contracted rig may be available for drilling the relief well and vertical intervention work. If the blowout scenario involves damage to the rig or loss of the BOP's and riser, a replacement rig or rigs will be required. LLOG is also a member of the Helix Well Containment Group which has the Helix Q4000 under contract for emergency

	Blowout Scenario MC 545	Last Revised: 8/6/2026 Page 3 of 5
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intervention work such as an “Emergency Capping Stack” installation which for this well could include a quick response operation and installation of a capping stack which could be shut-in to control the well.

With the current activity level in the GOM, 10 to 20 deepwater MODU'S are potentially available to support the relief well drilling operations. Rig share and resource sharing agreements are in place between members of the Helix Well Containment Group. The ability to negotiate and contract an appropriate rig or rigs to drill relief wells is highly probable in a short period of time. If the rig or rigs are operating, the time to properly secure the well and mobilize the rig to the relief well site location is estimated to be about 14 to 21 days. Dynamically positioned (DP) MODU's would be the preferred option due to the logistical advantage versus a moored MODU which may add complications due to the mooring spread.

VESSELS OF OPPORTUNITY

Based on the water depth restrictions for the proposed locations the following “Vessels of Opportunity” are presently available for utilization for intervention and containment and relief well operations. These may include service vessels and drilling rigs capable of working in the potential water depths and may include moored vessels and dynamically positioned vessels. The specific conditions of the intervention or relief well operations will dictate the “best fit” vessel to efficiently perform the desired results based on the blowout scenario. The list included below illustrates specific option that may vary according to the actual timing / availability at the time the vessels are needed.

OPERATION	SPECIFIC VESSEL OF OPPORTUNITY
Intervention and Containment	• Helix Q4000 (DP Semi) • Helix Q5000 (DP Semi)
Relief Well Drilling Rigs	• Noble Black Rhino (DP Drillship) • Sevan Louisiana (DP Drillship) • Seadrill West Neptune (DP Drillship) • Seadrill West Vela (DP Drillship)
ROV / Multi-Purpose Service Vessels	• Oceaneering (numerous DP ROV vessels) • HOS Achiever, Iron Horse 1 and 2 (DP MPSV) • Helix Pipe Lay Vessel (equipped w/ 6" PL – 75,000') • Other ROV Vessels – (Chouest, HOS, Fugro, Subsea 7)
Shuttle Tanker / Barge Support	• OSG Ship Management

G) Measures taken to enhance ability to prevent blowout

Pursuant to BOEM-2010-034 Final Interim Rules, measures to enhance the ability to prevent or reduce the likelihood of a blowout are largely based on proper planning and communication, identification of potential hazards, training and experience of personnel, use of good oil field practices and proper equipment that is properly maintained and inspected for executing drilling operations of the proposed well or wells to be drilled.

When planning and designing the well, ample time is spent analyzing offset data, performing any needed earth modeling and identifying any potential drilling hazards or well specific conditions to safeguard the safety of the crews when well construction operations are underway. Once the design criteria and well design is established, the well design is modeled for the lifecycle of the wellbore to ensure potential failure modes are eliminated. Pursuant to BOEM-2010-0034 Interim Final Rules implemented additional

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considerations of a minimum of 2 independent barriers for both internal and external flow paths in addition to proper positive and negative testing of the barriers.

The proper training of crew members and awareness to identify and handle well control event is the best way prevent a blowout incident. Contractor's personnel and service personnel training requirements are verified per regulatory requirements per guidelines issued in BOEM-2010-034 Interim Final Rules. Drills are performed frequently to verify crew training and improve reaction times.

Good communication between rig personnel, office support personnel is critical to the success of the operations. Pre-spud meetings are conducted with rig crews and service providers to discuss, inform and as needed improve operations and well plans for safety and efficiency considerations. Daily meetings are conducted to discuss planning and potential hazards to ensure state of preparedness and behavior is enforced to create an informed and safe culture for the operations. Any changes in the planning and initial wellbore design is incorporated and communicated in a Management of Change (MOC) process to ensure continuity for all personnel.

Use of established good oil field practices that safeguard crews and equipment are integrated to incorporate LLOG's, the contractor and service provider policies.

Additional personnel and equipment will be used as needed to elevate awareness and provide real time monitoring of well conditions while drilling such as MWD/LWD/PWD tools used in the bottom hole assemblies. The tool configuration for each open hole section varies to optimize information gathered including the use of Formation-Pressure-While-Drilling (FPWD) tools to establish real time formation pressures and to be used to calibrates pore pressure models while drilling. Log information and pressure data is used by the drilling engineers, geologist and pore pressure engineers to maintain well control and reduced potential events such as well control events and loss circulation events.

Mud loggers continuously monitor return drilling fluids, drill gas levels and cuttings as well as surface mud volumes and flow rates, rate of penetration and lithology/paleo to aid in understanding trends and geology being drilled. Remote monitoring of real time drilling parameters and evaluation of geologic markers and pore pressure indicators is used to identify potential well condition changes.

Proper equipment maintenance and inspection program for same to before the equipment is required. Programmed equipment inspections and maintenance will be performed to ensure the equipment operability and condition. Operations will cease as needed in order to ensure equipment and well conditions are maintained and controlled for the safety of personnel, rig and subsurface equipment and the environment.

H) Measures to conduct effective and early intervention in the event of a blowout

In conjunction with the LLOG Exploration's "Well Control Emergency Response Plan" and as required by NTL 2010-N06, the following is provided to demonstrate the potential time needed for performing secondary intervention and drilling of a relief well to handle potential worst case discharge for the proposed prospect. Specific plans are integrated into the Helix Well Containment Groups procures to be approved and submitted with the Application for Permit to Drill. Equipment availability, backup equipment and adaptability to the potential scenarios will need to be addressed based on the initial site assessment of the seafloor conditions for intervention operations. Relief well equipment such as backup wellhead equipment and tubulars will be available in LLOG's inventory for immediate deployment as needed to address drilling the relief well(s).

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SITE SPECIFIC PROPOSED RELIEF WELL AND INTERVENTION PLANNING

No platform was considered for drilling relief wells for this location due to location, water depth and lack of appropriate platform within the area. For this reason a moored or DP MODU will be preferred / required.

Relief well sites have been initially identified to address blowout scenarios for the potential geologic targets for the proposed wells. Based on actual seafloor state unforeseen at this time, the final location(s) may need to be revised. The locations have been selected based on proximity to the targets sands and potential shallow hazards.

RELIEF WELL RESPONSE TIME ESTIMATE

OPERATION	TIME ESTIMATE (DAYS)
IMMEDIATE RESPONSE safeguard personnel, render first-aid make initial notifications implement short term intervention (if possible) implement spill control develop Initial Action Plan	1
INTERIM RESPONSE establish Onsite Command Center and Emergency Management Team assess well control issues mobilize people and equipment (Helix DW Containment System) implement short term intervention and containment (if possible) develop Intervention Plan initiate relief well planning continue spill control measures	4
INTERVENTION AND CONTAINMENT OPERATIONS mobilize equipment and initiate intervention and containment operations perform TA operations and mobilize relief wells rig(s) finalize relief well plans, mobilize spud equipment, receive approvals continue spill control measures	15
RELIEF WELL(S) OPERATIONS continue intervention and containment measures continue spill control measures drill relief well (s)	30
PERFORM HYDRAULIC KILL OPERATIONS / SECURE BLOWNOUT WELL continue intervention and containment measures continue spill control measures perform hydraulic kill operations, monitor well, secure well	10
ESTIMATED TOTAL DAYS OF UNCONTROLLED FLOW	60
SECURE RELIEF WELL(S) / PERFORM P&A / TA OPERATIONS / DEMOBE	30
TOTAL DAYS	90

APPENDIX C
GEOLOGICAL AND GEOPHYSICAL INFORMATION
(30 CFR Part 550.214 and 550.244)

A. Geological Description

Included as **Attachment C-1** are the geological targets and a narrative of trapping features proposed in this Plan.

B. Structure Contour Maps

Included as **Attachment C-2** are current structure maps (depth base and expressed in feet subsea) depicting the entire lease coverage area; drawn on top of the prospective hydrocarbon sands. The maps depict each proposed bottom hole location and applicable geological cross section.

C. Interpreted Seismic Lines

Included as **Attachment C-3** is a copy of the migrated and annotated (shot points, timelines, well paths) deep seismic line within 500 feet of the surface location being proposed in this Plan.

D. Geological Structure Cross-Sections

An interpreted geological cross section depicting the proposed well locations and depth of the proposed wells is included as **Attachment C-4**. Such cross section corresponds to each seismic line being submitted.

E. Shallow Hazards Report

Shallow Hazards Assessment and Benthic Communities Evaluation, Mississippi Canyon Block 589, OCS-G 35979 Lease, Berger Geosciences, L.L.C. prepared for LLOG Exploration, dated September 7, 2018, was submitted to BOEM on October 23, 2018.

F. Shallow Hazards Assessment

Wellsite Clearance Letters were prepared by Berger Geosciences, L.L.C dated November 15, 2019 for the proposed surface location, evaluating seafloor and subsurface geologic and manmade features and conditions. As the proposed MC 589 001 ST01 is being drilled from an existing wellbore, a new shallow hazard assessment was not necessary. *Attachment C-5*.

G. High Resolution Seismic Lines

LLOG did not run 3-D seismic for this prospect.

H. Stratigraphic Column

A generalized biostratigraphic/lithostratigraphic column from the seafloor to the total depth of the proposed wells is included as **Attachment C-6**.

I. Time vs Depth Tables

LLOG has determined that there is existing sufficient well control data for the target areas proposed in this Plan; therefore, tables providing seismic time versus depth for the proposed well locations are not required.

Geological Description

Attachment C-1 (Proprietary Information)

Structure Maps

Attachment C-2 (Proprietary Information)

Deep Seismic Lines

Attachment C-3 (Proprietary Information)

Cross Section Maps

Attachment C-4 (Proprietary Information)

Shallow Hazards Assessment

Attachment C-5 (Public Information)



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Wellsite Clearance Letter

Proposed Well MC 589-B

Mississippi Canyon Area

Block 589 (Lease No. G35979)

Gulf of Mexico

Berger Geosciences Project No. 19-10-30

Prepared for:
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- [Plat 4](#) Plat 4: Proposed Relief Wells for Proposed Well MC 589-B (1:24,000)

Introduction

LLOG Exploration Company, LLC. (LLOG) contracted Berger Geosciences, LLC. (Berger) to provide this letter to assess the shallow hazards and benthic communities potential for Proposed Well MC 589-B with surface location in the northeast Mississippi Canyon (MC) Area, Block 589 (Lease No. G35979). The proposed well is planned to deviate below the investigation limit for shallow hazards assessment with an intended bottom hole location in north-central MC 589. All geologic interpretations presented in this report are based on the shallow hazards assessment entitled:

- *Shallow Hazards Assessment and Benthic Communities Evaluation, Block 589 (Lease No. G35979), Mississippi Canyon Area, Gulf of Mexico* prepared by Berger (2018).

This report was prepared for LLOG and submitted to the Bureau of Ocean Energy Management (BOEM) under a different cover.

This letter is intended to update the previous shallow hazards report (Berger, 2018) and is compliant with Notice-to-Lessees (NTL) Nos. 2008-G04 and 2008-G05 (Shallow Hazards; MMS, 2008a and 2008b) and NTL No. 2009-G40 (Deepwater Benthic Communities; MMS, 2009). Bureau of Ocean Energy Management NTL 2015-N02 (BOEM, 2015) eliminates the expiration of MMS NTLs 2008-G04 and 2008-G05. Mississippi Canyon Block 589 is located within an area of high archaeological potential as described in NTL No. 2011 JOINT-G01 (BOEM/BSEE, 2011), NTL No. 2005-G07 (Archaeological Resource Surveys and Reports; MMS, 2005), and supplemental NTLs. For avoidances and sonar contacts, please refer to the Echo Offshore, LLC. Deep-tow Archaeological Assessment (2005).

Four maps and two figures were generated for the proposed wellsite. The maps show the bathymetry ([Map W-1](#)), seafloor rendering ([Map W-2](#)), the variation in seafloor amplitude response ([Map W-3](#)), and the geologic features ([Map W-4](#)) near the proposed well location. [Figure W-1](#) displays the power spectrum extracted from the seismic data at the well location. [Figure W-2](#) is a tophole prognosis for the Proposed Well MC 589-B. All of the maps and figures provided are intended to be reviewed in conjunction with the [Wellsite Discussion](#) section.

Wellsite Discussion

This section contains an assessment of the shallow hazards and tophole prognosis for Proposed Well MC 589-B located within Mississippi Canyon Area, Block 589.

The seafloor and benthic community assessments consider surface conditions within a 2,000-ft muds and cuttings discharge radius from the proposed well location. The wellsite assessment for the proposed location considers the subsurface conditions within a 500-ft radius of a presumed vertical wellbore from the seafloor to 3.363 seconds two-way travel time BML (approximately 7,000 ft BML). The archaeological assessment considers surface conditions and has previously been presented under separate cover by Echo Offshore, LLC (Echo, 2005).

Maximum Anchor Radius Criteria

LLOG anticipates using a dynamically positioned Mobile Offshore Drilling Unit (MODU) in the seafloor assessment area; therefore, no anchor pattern has been analyzed.

Tophole Prognosis Criteria

The following sections specify the criteria used to develop the tophole prognosis for the proposed well. The assessment is based on 3-D seismic data and comparison to regional stratigraphic units as available. The tophole assessment is restricted to the specific proposed well location.

Gas Hydrates. The base of the gas hydrate stability zone (BGHSZ) is calculated based on Maekawa et al. (1995) or an identifiable bottom-simulating reflector. The potential for solid gas hydrates was evaluated for the proposed well. The criteria include:

- Is water depth conducive for gas hydrate formation?
- What is the depth to the base of the gas hydrate stability zone (BGHSZ) at the proposed well?
- Is a bottom-simulating reflector (BSR) present between the seafloor and BGHSZ?
- Is a BSR present within 500 ft of the proposed well?
- Does the proposed well intersect a BSR?
- Have gas hydrates been identified in the region of the proposed well?

HIGH

The wellsite conditions meet ALL of the above stated criteria, and correlates to an existing well that encountered gas hydrates.

MODERATE

The wellsite conditions meet SEVERAL of the above stated criteria. There is no direct evidence of gas hydrates at nearby wells.

LOW

The wellsite conditions meet SOME of the above stated criteria, and does not correlate to nearby wells.

NEGLIGIBLE

The wellsite conditions meet FEW to NONE of the above stated criteria, and there is no evidence of gas hydrates at nearby wells.

Shallow Gas. The potential for shallow gas was evaluated for the proposed well. The criteria used to evaluate the proposed well include:

- Does an anomalous amplitude event exist in proximity of the proposed well, and is there evidence for connectivity to the proposed wellbore?
- Is there supporting geophysical evidence for shallow gas associated with the anomalous amplitude?
- Is the anomalous amplitude within a sequence that may be sand-prone?
- Is there evidence of migration of fluid (including hydrocarbons) from depth, such as along a fault plane?
- Does the sequence correlate to other wells within the area that encountered shallow gas?
- Is the proposed well located in a frontier area with little or no offset well control?

HIGH

The amplitude event meets ALL of the above stated criteria, or correlates to an existing well that encountered shallow gas.

MODERATE

The amplitude event meets SEVERAL of the above stated criteria. There is no direct evidence of shallow gas from nearby wells.

LOW

The amplitude event meets SOME of the above stated criteria, and does not correlate to nearby wells.

NEGLIGIBLE

The amplitude event meets FEW to NONE of the above stated criteria, and there is no evidence of shallow gas from nearby wells.

Shallow Water Flow. The potential for shallow water flow (SWF) was assessed for the proposed well. The potential for SWF is based on the following criteria:

- Does the stratigraphic unit correlate to a regional sand-prone sequence?
- Is the area subject to high sedimentation rates and rapid overburden deposition?
- Is the sequence composed of high-amplitude, chaotic reflectors indicative of sand?
- Is there a potential seal (perhaps clay-prone) above the sand-prone sequence?
- Does the sequence correlate to other wells within the area that encountered SWF?
- Is the proposed well located in a frontier area with little or no offset well control?

HIGH

The stratigraphic unit meets ALL of the above stated criteria, and correlates to an existing well that encountered SWF.

MODERATE

The stratigraphic unit meets SEVERAL of the above stated criteria. There is no direct evidence of SWF from nearby wells.

LOW

The stratigraphic unit meets SOME of the above stated criteria, and does not correlate to nearby wells

NEGLIGIBLE

The stratigraphic unit meets FEW to NONE of the above stated criteria, and there is no evidence of SWF from nearby wells.

Proposed Well MC 589-B

The water depth at Proposed Well MC 589-B is 2,556 ft below sea level (BSL; [Map W-1](#)). The proposed well is within an area of relatively smooth seafloor that slopes to the east at 1.92° ([Figure W-2](#)). The proposed location provided by LLOG is as follows:

Table W-1. Location, block calls, and seismic lines for Proposed Well MC 589-B

NAD27 UTM Zone 16 North, US Survey ft		Geographic Coordinates	
X	Y	Latitude	Longitude
963,871	10,309,020	28° 23' 29.253" N	89° 06' 16.744" W
Block Calls		3-D Seismic Line Reference	
		Line	Trace
2,820' FNL	2,369' FEL	13386	16155

Twinned Location

Proposed Well MC 589-Alt-B is 50 ft south from the Proposed MC 589-B Well with the same well path, and is intended to be used as an alternate drilling location. Seafloor and subsurface conditions at the twinned well location are approximately equivalent and no separate illustrations of the subsurface conditions were prepared. The proposed alternate drilling location is as follows:

Table W-2. Location and block calls for Proposed Well MC 589-Alt-B

NAD27 UTM Zone 16 North, US Survey ft		Geographic Coordinates	
X	Y	Latitude	Longitude
963,871	10,308,970	28° 23' 28.758" N	89° 06' 16.739" W
Block Calls			
2,870' FNL	2,369' FEL		

Power Spectrum Analysis

The power spectrum for the proposed well was derived through the use of IHS Kingdom Suite's Trace Calculator tools. For Proposed Well MC 589-B, the power spectrum was extracted from a subset that ranges from Inline 13361 to 13411 and Crossline 16130 to 16180, and is limited to the upper one second below the seafloor ([Figure W-1](#)). The frequency content within the upper one second below the seafloor is of sufficient quality for shallow hazards analysis.

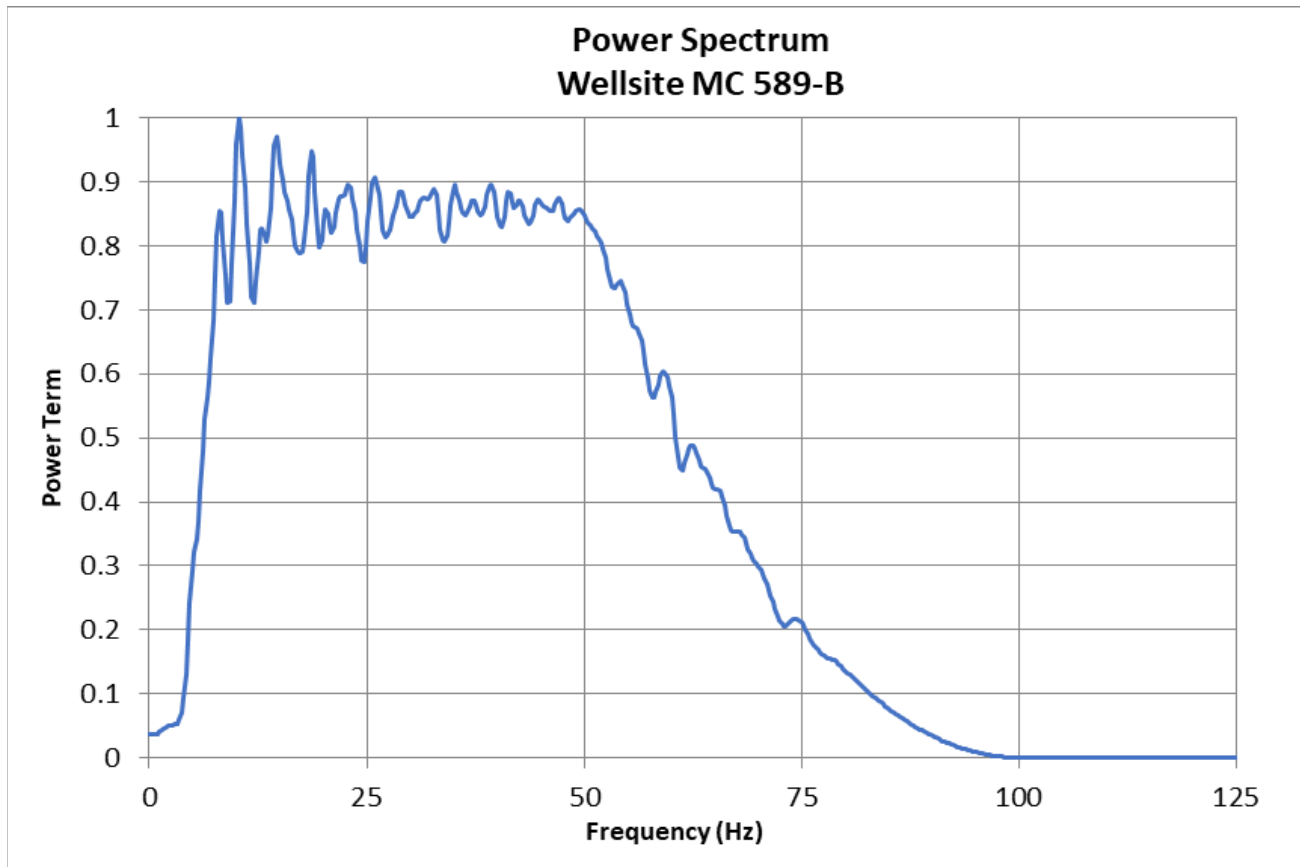


Figure W-1. Power spectrum at Proposed Well MC 589-B

Seafloor Conditions

The following paragraphs summarize the seafloor morphology, benthic communities potential, and archaeological potential at the proposed well location.

Seafloor Morphology. Proposed Well MC 589-B is located in the northeast quadrant of MC 589. Water depths near the proposed well range from 2,333 ft to 2,747 ft BSL ([Maps W-1](#) and [W-2](#)). The seafloor near the proposed well is relatively smooth and gently dips to the east. No seafloor faults are within the 2,000-ft muds and cuttings radius for the proposed wellsite ([Map W-4](#)).

There are no obvious seafloor faults within 2,000 ft of Proposed Well MC 589-B.

Benthic Communities Assessment. There are no water bottom anomalies identified by the BOEM (2019a) within 2,000 ft of the proposed well location. There are no high-amplitude seafloor anomalies identified in the 3-D seismic data within 2,000 ft of the proposed well location ([Map W-3](#)). Features or areas that could support high-density benthic communities are not anticipated within 2,000 ft of the proposed location.

Features or areas that could support high-density chemosynthetic or other benthic communities are not anticipated within 2,000 ft of Proposed Well MC 589-B.

Infrastructure. Pursuant to the public information in the BOEM database (2019b) there is no existing well or other infrastructure within 2,000 ft of the proposed well location ([Maps W-2](#), [W-3](#), and [W-4](#)).

There is no infrastructure within 2,000 ft of Proposed Well MC 589-B.

Archaeologic Assessment. All blocks in the Mississippi Canyon Protraction Area are regarded as being in a high probability zone for historic shipwrecks based on Bureau of Ocean Energy Management (BOEM) and Bureau of Safety and Environmental Enforcement (BSEE) NTL No. 2011-JOINT-G01 (BOEM/BSEE, 2011), including MC 589. Pursuant to the public information in the NOAA Automated Wreck and Obstruction Information System and Navigational Charts (NOAA, 2019); there are no reported shipwrecks within the seafloor assessment area. The required archaeological survey report was completed by Echo and was submitted under a separate cover (Echo, 2005). For avoidances and sonar contacts please refer to the Echo report (2005).

There are no reported cultural resources within MC 589. For details about sonar contacts and avoidances please refer to the Echo deep-tow Archaeological Assessment.

Wellsite Assessment

The wellsite assessment covers the subsurface conditions within a 500-ft radius of the proposed wellpath from the seafloor to the limit of investigation at 3.363 seconds two way travel time BML (approximately 7,000 ft BML).

Stratigraphy and Tophole Prognosis. Seven 3D seismic marker horizons (Horizons 10, 20, 30, 40, 50, 60, and 70) were interpreted at Proposed Well MC 589-B. A generalized description of the stratigraphic sequences can be found in Section 1.4 of the Berger (2018) Shallow Hazards Assessment. The following is a synopsis of the conditions that will be encountered directly below the surface location.

Faults. The wellbore at Proposed Well MC 589-B will not penetrate any apparent seafloor or buried faults between the seafloor and the limit of investigation ([Figure W-2](#)).

A vertical wellbore will not intersect apparent seafloor or buried faults within the investigation limit.

Seafloor to Horizon 10. The sequence between the seafloor and Horizon 10 consists of low-amplitude, parallel and continuous reflections interpreted to represent fine-grained hemipelagic clay drape stratified clays and silts ([Figure W-2](#)). Horizon 10 is expected to be encountered at 250 ft BML ([Figure W-2](#)).

This sequence is assessed as having a **low** potential for gas hydrates ([Figure W-2](#)). There is a **negligible** potential for shallow gas and a **negligible** potential for SWF within this sequence ([Figure W-2](#)).

Horizon 10 to Horizon 20. The sequence between Horizon 10 and the Horizon 20 contains two units. The upper unit consists of alternating intervals of low-amplitude, parallel and continuous reflections with intervals of low-amplitude chaotic reflections ([Figure W-2](#)). These reflections are interpreted to represent normally deposited, clay-rich sediments alternating with clay-rich, mass-transport deposits. The lower interval contains low-amplitude, parallel and continuous reflections interpreted to represent normally deposited clays and silts. The two units are separated by a moderate-amplitude peak reflection interpreted as a clay-rich condensed section (interface at 747 ft BML).

The upper unit is 497 ft thick at the proposed well location and the lower unit is 547 ft thick. The total thickness of sediment between Horizon 10 and Horizon 20 is 1,044 ft at the proposed location. Horizon 20 is mapped at 1,294 ft BML and marks the transition from the overlying clay-rich deposits to the sand-prone sediments of the Blue Unit below.

The base of the gas hydrate stability zone (BGHSZ) at this water depth is estimated to be 967 ft BML based on Maekawa et al. (1995).

There is a **low** potential for gas hydrate from 250 ft BML to the BGHSZ at 967 ft BML and a **negligible** potential for gas hydrates from the BGHSZ at 967 ft BML to 1,294 ft BML ([Figure W-2](#)). There is a **negligible** potential for shallow gas and SWF within this sequence.

Horizon 20 to Horizon 30 (Blue Unit). The Blue Unit at the proposed location contains an upper interval of low-amplitude, parallel and continuous reflections separated from underlying low- to moderate-amplitude, semi-continuous to chaotic reflections by an interface at 1,485 ft BML ([Figure W-2](#)). The unit is interpreted to consist of normally deposited clay and silt overlying clay- and silt- dominated mass-transport deposits with isolated sands.

The upper unit is 191 ft thick and the lower unit is 362 ft thick at the proposed well location. Horizon 30 is estimated to be encountered at 1,847 ft BML ([Figure W-2](#)).

There is a **negligible** potential for gas hydrates within this sequence. There is a **negligible** potential for shallow gas from Horizon 20 (1,294 ft BML) to the interface at 1,485 ft BML, and a **low** potential for shallow gas from 1,485 ft BML to Horizon 30 (1,847 ft BML; [Figure W-2](#)). There is a **moderate** potential for SWF from Horizon 20 (1,294 ft BML) to the interface at 1,485 ft BML, and a **high** potential for SWF from 1,485 ft BML to Horizon 30 (1,847 ft BML).

Horizon 30 to Horizon 40. The sequence between Horizon 30 and Horizon 40 contains low amplitude, semi-continuous to seismically transparent reflections ([Figure W-2](#)). The interval is interpreted to consist of silt- and clay-rich mass-transport deposits with sand intervals possible. The thickness of sediment within this sequence is 459 ft. Horizon 40 is mapped at 2,306 ft BML ([Figure W-2](#)).

There is a **negligible** potential for gas hydrates, there is a **low** potential for shallow gas, and a **low** potential for SWF within this sequence ([Figure W-2](#)).

Horizon 40 to Horizon 50 (Green Unit). The Green Unit consists of two intervals at the proposed location separated by an interface at 3,208 ft BML ([Figure W-2](#)). The upper interval is approximately 902 ft thick and contains low- to moderate amplitude, chaotic reflections that is interpreted to represent silt- and sand-dominated channel and levee-overbank deposits with interbedded clays, silts, and sands. The lower interval contains low-amplitude, continuous to semi-continuous reflections representing sand-rich channel and levee-overbank deposits with interbedded clays, silts, and sands. This lower interval is 521 ft thick ([Figure W-2](#)). Horizon 50 is expected to be encountered at 3,729 ft BML (6,285 ft BLS; [Map 6](#) of Berger 2018).

There is one amplitude anomaly identified within 500 ft of the proposed location within this sequence ([Map W-4](#)). The anomaly is located approximately 375 ft southeast of the proposed wellbore and appears to be related to lithology variation associated with an erosion surface. However, the potential for shallow gas cannot be ruled out.

There is a **negligible** potential for gas hydrates and a **moderate** potential for shallow gas from this sequence. There is a **moderate** potential for SWF from Horizon 40 (2,306 ft BML) to the interface at 3,208 ft BML. There is a **high** potential for SWF from 3,208 ft to Horizon 50 at 3,729 ft BML ([Figure W-2](#)).

Horizon 50 to Horizon 60. The sequence between Horizon 50 and Horizon 60 consists of low-amplitude, continuous to semi-continuous reflections ([Figure W-2](#)). These reflections are interpreted to represent clay- and silt-dominated mass-transport deposits. The sequence is 877 ft thick at the proposed location and Horizon 60 is mapped at 4,606 ft BML.

There is a **negligible** potential for gas hydrates, a **low** potential for shallow gas, and a **low** potential for SWF within this sequence ([Figure W-2](#)).

Horizon 60 to Horizon 70. The Horizon 60 to Horizon 70 sequence contains low-amplitude, continuous to chaotic reflections interpreted as clay- and silt-dominated mass-transport deposits with interbedded, layered clays, silts, and sands ([Figure W-2](#)). The sediments within this sequence are 1,619 ft thick and the base of this sequence, Horizon 70, is mapped at 6,225 ft BML.

There is a **negligible** potential for gas hydrates, a **negligible** potential for shallow gas, and a **negligible** potential for SWF within this sequence ([Figure W-2](#)).

Horizon 70 to Limit of Investigation. The Horizon 70 to the Limit of Investigation (7,000 ft BML) sequence contains low-amplitude, continuous to semi-continuous reflections interpreted as clay- and silt-dominated mass-transport deposits with interbedded clays, silts, sand deposits ([Figure W-2](#)). The sediments within this sequence are 775 ft thick and the base of this sequence is a depth horizon at 7,000 ft BML throughout MC 589.

There is a ***negligible*** potential for gas hydrates, a ***negligible*** potential for shallow gas, and a ***negligible*** potential for SWF within this sequence ([Figure W-2](#)).

Subsurface Faults. The proposed vertical wellbore will not intersect any seafloor or buried faults at the Proposed MC 589-B location ([Figure W-2](#)).

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Mississippi Canyon Area, Block 589
Proposed Well MC 589-B



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Mississippi Canyon Area, Block 589
Proposed Well MC 589-B



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Stratigraphic Column

Attachment C-6 (Proprietary Information)

APPENDIX D
HYDROGEN SULFIDE (H₂S) INFORMATION
(30 CFR Part 550.215 and 550.245)

A. Concentration

LLOG does not anticipate encountering H₂S while conducting the proposed exploratory operations provided for under this plan.

B. Classification

As per the approval letter dated December 14, 2018 for the Initial EP for this area (N-10040) in response to LLOG's request for a hydrogen sulfide (H₂S) classification, the area in which the proposed drilling operations are to be conducted is hereby classified, in accordance with 30 CFR 250.490(c), as "H₂S absent".

C. H₂S Contingency Plan

Not applicable for the proposed operations.

D. Modeling Report

Not applicable to the proposed operations.

APPENDIX E
BIOLOGICAL, PHYSICAL AND SOCIOECONOMIC INFORMATION
(30 CFR Part 550.216 and 550.247)

A. High-Density Deepwater Benthic Communities Information

There are no water bottom anomalies identified by the BOEM (2019a) within 2,000 ft of the proposed well location. There are no high-amplitude seafloor anomalies identified in the 3-D seismic data within 2,000 ft of the proposed well location (Map W-3). Features or areas that could support high-density benthic communities are not anticipated within 2,000 ft of the proposed location.

Features or areas that could support high-density chemosynthetic or other benthic communities are not anticipated within 2,000 ft of Proposed Well MC 589-B.

B. Topographic Features Map

The activities proposed in this Plan are not affected by a topographic feature.

C. Topographic Features Statement (Shunting)

The activities proposed in this Plan are not affected by a topographic feature; therefore, LLOG is not required to shunt drill cuttings and drill fluids.

D. Live Bottoms (Pinnacle Trend) Map

Mississippi Canyon Block 589 is not located within the vicinity of a proposed live bottom (Pinnacle trend) area.

E. Live Bottoms (Low Relief) Map

Mississippi Canyon Block 589 is not located within the vicinity of a proposed live bottom (Low Relief) area.

F. Potentially Sensitive Biological Features Map

Mississippi Canyon 589 is not located within the vicinity of a proposed sensitive biological feature area.

G. Threatened or Endangered Species, Critical Habitat, and Marine Mammal Information.

Proposed activities in **Mississippi Canyon Block 589** are not located in a critical habitat designated under ESA and marine mammals protected under the MMPA although federally protected marine mammals are always anticipated. LLOG will mitigate impact through compliance with BOEM NTL 2016-G01, G02 and NTL 2015 BSEE-G03. See *Attachment E-1* for a list of the NOAA Species known in the Gulf of Mexico. In the event federally listed species become present on Mississippi Canyon Block 589, LLOG will mitigate impact through compliance with BOEM NTL 2016-G01, G02, NTL 2015 BSEE-G03 and the Biological Opinion of the Endangered Species Act Section 7. See Attachment E-1 for a list of the NOAA Species known in the Gulf of Mexico. Moon pool daily observation log shall be maintained on the bridge. The deck supervisor on tour shall go to the bridge and log time, date, and results of each moon pool inspection. STOP WORK AUTHORITY shall be used and implemented, in a safe and timely manner, for any work that could affect marine life listed on the Endangered Species Act.

H. Archaeological Information

An Archaeological Assessment was conducted by Echo Offshore and submitted with Initial Exploration Plan approved December 14, 2018 for Location “A” and “A Alt”. An Archaeological Assessment was conducted by Berger Geoscience, LLC was prepared for Location “B” and B Alt” and submitted with Supplemental Exploration Plan (S-7987) approved January 10, 2020.

I. Air and Water Quality Information

Not applicable to proposed operations.

J. Socioeconomic Information

Not applicable to proposed operations.

NOAA Species Known in GOM

Attachment E-1 (Public Information)

Endangered Species List Common to the Gulf of Mexico

Geophysical surveys, including the use of airguns and airgun arrays, may have an impact on marine wildlife. Many marine species are protected under the Endangered Species Act (ESA) and all marine mammals (including manatees) are protected under the Marine Mammal Protection Act (MMPA). The following Gulf of Mexico species are listed under the ESA:

Gulf of Mexico Bryde's Whale (<i>Balaenoptera edeni</i>)
Sperm Whale (<i>Physeter macrocephalus</i>)
Green Turtle (<i>Chelonia mydas</i>) – North Atlantic DPS and South Atlantic DPS
Hawksbill Turtle (<i>Eretmochelys imbricata</i>)
Kemp's Ridley Turtle (<i>Lepidochelys kempii</i>)
Leatherback Turtle (<i>Dermochelys coriacea</i>) - Northwest Atlantic
Loggerhead Turtle (<i>Caretta caretta</i>) – Northwest Atlantic Ocean DPS
Gulf Sturgeon (<i>Acipenser oxyrinchus desotoi</i>)
Oceanic Whitetip Shark (<i>Carcharhinus longimanus</i>)
Giant Manta Ray (<i>Manta birostris</i>)
West Indian Manatee (<i>Trichechus manatus</i>)*

Note that this list can change as other species are listed/delisted, and this protocol shall be applied to any ESA protected species (and all marine mammals) that occur in the Gulf of Mexico, including rare and extralimital species.

LLOG's proposed operations in this plan will not impact the critical habitats of the marine species listed in the Endangered Species Act.

*Managed by the US Fish and Wildlife Service

APPENDIX F
WASTE AND DISCHARGE INFORMATION
(30 CFR PART 550.217 AND 550.248)

C. Projected Generated Wastes

See the following tables:

TABLE 1. Wastes you will generate, treat and downhole dispose or discharge to the GOM

TABLE 2. Wastes you will transport and /or dispose of onshore

B. Modeling

Not applicable. Proposed activities will be covered by U.S. EPA NPDES General Permit.

TABLE 1. WASTES YOU WILL GENERATE, TREAT AND DOWNHOLE DISPOSE OR

please specify if the amount reported is a total or per well amount

MC 589			Projected ocean discharges		Downhole Disposal
Projected generated waste			Discharge rate	Discharge Method	Answer yes or no
Type of Waste	Composition	Projected Amount			
Will drilling occur ? If yes, fill in the muds and cuttings.					
EXAMPLE: Cuttings wetted with synthetic based fluid	Cuttings generated while using synthetic based drilling fluid.	X bbl/well	X bbl/day/well	discharge overboard	No
Water-based drilling fluid	Water based mud additives, barite and gel used for WBM	99,846 bbls/well	11,151 bbls/day/well	Discharge overboard	No
Cuttings wetted with water-based fluid	Cuttings generated while using water based drilling fluid.	5,417 bbls/well	605 bbls/day/well	Discharge overboard	No
Cuttings wetted with synthetic-based fluid	Cuttings generated while using synthetic based drilling fluid.	5,479 bbls/well	159 bbls/day/well	Discharge overboard	No
Will humans be there? If yes, expect conventional waste					
EXAMPLE: Sanitary waste water	Sanitary waste from living quarters	X bbl/well	X bbl/hr/well	chlorinate and discharge overboard	No
Domestic waste	Misc waste for living quarters	15,877 bbls/well	2.7 bbls/hr/well	Discharge overboard (no free oil)	No
Sanitary waste	Processed sanitary waste from living quarters	10,585 bbls/well	1.8 bbls/hr/well	Chlorinate and discharge overboard	No
Is there a deck? If yes, there will be Deck Drainage					
Deck Drainage	Accumulated drainage due to rainfall	0 to 47,261 bbls/well	0 to 167 bbls/hr/well	Test for oil and grease and discharge overboard	No
Will you conduct well treatment, completion, or workover?					
Well treatment fluids	NPDES approved treatment fluid used for well operations	100 bbls/well	20 bbls/hr/well	Test for oil and grease and discharge overboard.	No
Well completion fluids	Clear brines used for completion operations	500 bbls/well	100 bbls/hr/well	Test for oil and grease and discharge overboard. This excludes clear brines containing Zinc	No
Workover fluids	NA	NA	NA	NA	NA
Miscellaneous discharges. If yes, only fill in those associated with your activity.					
Desalinization unit discharge	Uncontaminated spent seawater used for potable water generation unit	0 to 100,000 bbls/well	60 bbls/hr/well	Discharge overboard	No
Blowout prevent fluid	Treated freshwater used control of subsea blowout preventers	0 to 100 bbls/well	5 bbls/hr/well	Discharge at seafloor	No
Ballast water	Uncontaminated seawater used for ballast control	0 to 100,000 bbls/well	16,350 bbls/hr/well	Discharge overboard	No
Bilge water	NA	NA	NA	NA	NA
Excess cement at seafloor	Excess cement slurry and mixwater used for cementing operation - NPDES allowed	300 bbls/well	360 bbls/hr/well	Discharge at mudline	No
Fire water	Uncontaminated seawater used for fire control system	0 to 10,000 bbls/well	16,350 bbls/hr/well	Discharge overboard	No
Cooling water	Uncontaminated seawater used for heat exchanger operations used to cool machinery	0 to 400,000 bbls/well	120 bbls/hr/well	Discharge overboard	No
Will you produce hydrocarbons? If yes fill in for produced water.					
Produced water	NA	NA	NA	NA	NA
Will you be covered by an individual or general NPDES permit ?			General NPDES		
			GMG 290000		
NOTE: If you will not have a type of waste, enter NA in the row.			Comply with the requirements of the NPDES permit.		

TABLE 2. WASTES YOU WILL TRANSPORT AND /OR DISPOSE OF ONSHORE

Please specify whatever the amount reported is a total or per well

MC 589		Projected generated waste	Solid and Liquid Wastes Transportation	Waste Disposal		
Type of Waste	Composition		Transport Method	Name/Location of Facility	Amount	Disposal Method
				Newport Environmental Services Inc., Ingleside, TX	X bbl/well	Recycled
Oil-based drilling fluid or mud	NA		NA	NA	NA	NA
Synthetic-based drilling fluid or mud	Internal oilfin, ester nbased mud		Barged in 25 bbls cutting boxes and / or liquid mud tanks for supply vessels	Newpark Transfer Station, Fourchon, LA	6750 bbls / well	Recycled
Cuttings wetted with Water-based fluid	NA		NA	NA	NA	NA
Cuttings wetted with Synthetic-based fluid	NA		NA	NA	NA	NA
Cuttings wetted with oil-based fluids	NA		NA	NA	NA	NA
Will you produce hydrocarbons? If yes fill in for produced sand.						
Produced sand	NA		NA	NA	NA	NA
Will you have additional wastes that are not permitted for discharge? If						
EXAMPLE: trash and debris (recylables)	Plastic, paper, aluminum		barged in a storage bin	ARC, New Iberia, LA	X lb/well	Recycled
Trash and debris	Plastic, paper, aluminum		Barged in a storage bin	Blanchard Landfill, Golden Meadows, LA	4000 lbs / well	Recycled
Used oil	Spent oil from machinery		Barged in USCG approved transfer tote tanks.	L&L Services, Fourchon, LA	200 bbls / well	Recycled
Wash water	Wash water w/ SBM residue and surfactants		Barged in 25 bbls cutting boxes and / or liquid mud tanks for supply vessels	Newpark Transfer Station, Fourchon, LA	2000 bbls / well	Approved disposal well injection or land farm
Chemical product wastes	Spent treatment and / or damaged chemicals used in operations		Barged in 25 bbls cutting boxes and / or cutting boxes	L&L Services, Fourchon, LA	10 bbls / well	Recycled
NOTE: If you will not have a type of waste, enter NA in the row.						

APPENDIX G
AIR EMISSIONS INFORMATION
(30 CFR PART 550.218 AND 550.249)

E. Emissions Worksheets and Screening Questions

The Projected Quality Emissions Report (Form MMS-138) addresses the proposed drilling, completion and potential testing operations utilizing a typical drillship, with related support vessels and construction barge information.

As evidenced by *Attachment G-1*, the worksheets were completed based on the proposed flaring and burning operations.

<i>Screening Questions for EP's</i>	<i>Yes</i>	<i>No</i>
Is any calculated Complete Total (CT) Emission amount (in tons associated with your proposed exploration activities more than 90% of the amounts calculated using the following formulas: $CT = 3400D (2/3)$ for CO, and $CT = 33.3D$ for the other air pollutants (where D = distance to shore in miles)?		X
Does your emission calculations include any emission reduction measures or modified emission factors?		X
Are your proposed exploration activities located east of 87.5 degrees W longitude?		X
Do you expect to encounter H ² S at concentrations greater than 20 parts per million (ppm)?		X
Do you propose to flare or vent natural gas for more than 48 continuous hours from any proposed well?		X
Do you propose to burn produced hydrocarbon liquids?		X

E. Emissions Reduction Measures

The projected air emissions are within the exemption level; therefore, no emission reduction measures are being proposed.

E. Verification of Nondefault Emissions Factors

LLOG has elected to use the default emission factors as provided in *Attachment G-1*.

E. Non-Exempt Activities

The proposed activities are within the exemption amount as provided in *Attachment G-1*.

E. Modeling Report

This section of the Plan is not applicable to the proposed operations.

Air Quality Emissions Report

Attachment G-1 (Public Information)

EP - AIR QUALITY

OMB Control No. 1010-0151
OMB Approval Expires: 10/31/2027

COMPANY	LLOG Exploration Offshore, L.L.C.
AREA	Mississippi Canyon
BLOCK	589
LEASE	OCS-G-35979
FACILITY	
WELL	MC 589 001 ST01
COMPANY CONTACT	Susan Sachitana
TELEPHONE NO.	985-801-4300
REMARKS	Drill Ship - Drilling & Completion Operations

AIR EMISSIONS COMPUTATION FACTORS

Fuel Usage Conversion Factors		Natural Gas Turbines		Natural Gas Engines		Diesel Recip. Engines		Diesel Turbines					
		SCF/hp-hr	9.524	SCF/hp-hr	7.143	GAL/hp-hr	0.0514	GAL/hp-hr	0.0514				
Equipment/Emission Factors	units	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3	REF.	DATE	Reference Links
Natural Gas Turbine	g/hp-hr		0.0086	0.0086	0.0028	1.4515	0.0095	N/A	0.3719	N/A	AP42 3.1-18 3.1-2a	499	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03s01.pdf
RECIP. 2 Cycle Lean Natural Gas	g/hp-hr		0.1293	0.1293	0.0020	6.5998	0.4082	N/A	1.2009	N/A	AP42 3.2-1	700	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03s02.pdf
RECIP. 4 Cycle Lean Natural Gas	g/hp-hr		0.0002	0.0002	0.0020	2.8814	0.4014	N/A	1.8949	N/A	AP42 3.2-2	700	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03s02.pdf
RECIP. 4 Cycle Rich Natural Gas	g/hp-hr		0.0323	0.0323	0.0020	7.7224	0.1021	N/A	11.9458	N/A	AP42 3.2-3	700	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03s02.pdf
Diesel Recip. < 600 hp	g/hp-hr	1	1	1	0.0279	14.1	1.04	N/A	3.03	N/A	AP42 3.3-1	1096	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03s03.pdf
Diesel Recip. > 600 hp	g/hp-hr	0.32	0.182	0.178	0.0055	10.9	0.29	N/A	2.5	N/A	AP42 3.4-1 & 3.4-2	1096	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03s04.pdf
Diesel Boiler	lbs/bbl	0.0840	0.0420	0.0105	0.0089	1.0080	0.0084	5.14E-05	0.2100	0.0336	AP42 1.3-6; Pb and NH3: WebFIRE (88/2018)	9/98 and 5/10	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03s04.pdf
Diesel Turbine	g/hp-hr	0.0381	0.0137	0.0137	0.0048	2.7941	0.0013	4.45E-05	0.0105	N/A	AP42 3.1-1 & 3.1-2a	499	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03s01.pdf
Dual Fuel Turbine	g/hp-hr	0.0381	0.0137	0.0137	0.0048	2.7941	0.0095	4.45E-05	0.3719	0.0000	AP42 3.1-18 3.1-2a; AP42 3.1-1 & 3.1-2a	499	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03s01.pdf
Vessels – Propulsion	g/hp-hr	0.320	0.1931	0.1873	0.0047	7.6669	0.2204	2.24E-05	1.2025	0.0022	USEPA 2017 NEI TSP refer to Diesel Recip. > 600 hp reference	3/19	https://www.epa.gov/air-emissions-inventories/2017-national-emissions-inventory-nei-data
Vessels – Drilling Prime Engine, Auxiliary	g/hp-hr	0.320	0.1931	0.1873	0.0047	7.6669	0.2204	2.24E-05	1.2025	0.0022	USEPA 2017 NEI TSP refer to Diesel Recip. > 600 hp reference	3/19	
Vessels – Diesel Boiler	g/hp-hr	0.0466	0.1491	0.1417	0.4400	1.4914	0.0620	3.73E-05	0.1491	0.0003	USEPA 2017 NEI TSP (units converted) refer to Diesel Boiler Reference	3/19	
Vessels – Well Stimulation	g/hp-hr	0.320	0.1931	0.1873	0.0047	7.6669	0.2204	2.24E-05	1.2025	0.0022	USEPA 2017 NEI TSP refer to Diesel Recip. > 600 hp reference	3/19	
Natural Gas Heater/Boiler/Burner	lbs/MMscf	7.60	1.90	1.90	0.60	190.00	5.50	5.00E-04	84.00	3.2	AP42 1.4-1 & 1.4-2; Pb and NH3: WebFIRE (88/2018)	7/98 and 9/18	https://www3.epa.gov/ttnchie1/ap42/ch01/final/c01s04.pdf
Combustion Flare (no smoke)	lbs/MMscf	0.00	0.00	0.00	0.57	71.40	35.93	N/A	325.5	N/A	AP42 13.5-1, 13.5-2	2/18	
Combustion Flare (light smoke)	lbs/MMscf	2.10	2.10	2.10	0.57	71.40	35.93	N/A	325.5	N/A	AP42 13.5-1, 13.5-2	2/18	https://www3.epa.gov/ttnchie1/ap42/ch13/final/C13s06_02-05-18.pdf
Combustion Flare (medium smoke)	lbs/MMscf	10.50	10.50	10.50	0.57	71.40	35.93	N/A	325.5	N/A	AP42 13.5-1, 13.5-2	2/18	
Combustion Flare (heavy smoke)	lbs/MMscf	21.00	21.00	21.00	0.57	71.40	35.93	N/A	325.5	N/A	AP42 13.5-1, 13.5-2	2/18	
Liquid Flaring	lbs/bbl	0.42	0.0966	0.0651	5.964	0.84	0.01428	5.14E-05	0.21	0.0336	AP42 1.3-1 through 1.3-3 and 1.3-5	5/10	https://www3.epa.gov/ttnchie1/ap42/ch01/final/c01s03.pdf
Storage Tank	tons/yr/tank						4.300				2014 Gulfwide Inventory, Avg. emiss (upper bound of 95% CI)	2017	https://www.boem.gov/environmen/environmental-studies/2014-gulfwide-emission-inventory
Fugitives	lbs/hr/component						0.0005				API Study	12/99	https://www.api.org/
Glycol Dehydrator	tons/yr/dehydrator						19.240				2011 Gulfwide Inventory, Avg. emiss (upper bound of 95% CI)	2014	https://www.boem.gov/environmen/environmental-studies/2011-gulfwide-emission-inventory
Cold Vent	tons/yr/vent						44.747				2014 Gulfwide Inventory, Avg. emiss (upper bound of 95% CI)	2017	https://www.boem.gov/environmen/environmental-studies/2014-gulfwide-emission-inventory
Waste Incinerator	lb/ton		15.0	15.0	2.5	2.0	N/A	N/A	20.0	N/A	AP42 2.1-12	10/96	https://www3.epa.gov/ttnchie1/ap42/ch01/final/c01s01.pdf
On-ice – Loader	lbs/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model, TSP (units converted) refer to Diesel Recip. <600 reference	2009	
On-ice – Other Construction Equipment	lbs/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model, TSP (units converted) refer to Diesel Recip. <600 reference	2009	
On-ice – Other Survey Equipment	lbs/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model, TSP (units converted) refer to Diesel Recip. <600 reference	2009	
On-ice – Tractor	lbs/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model, TSP (units converted) refer to Diesel Recip. <600 reference	2009	https://www.epa.gov/ncevs/hornet/2009-a-installation-and-updates
On-ice – Truck (for gravel island)	lbs/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model, TSP (units converted) refer to Diesel Recip. <600 reference	2009	
On-ice – Truck (for surveys)	lbs/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model, TSP (units converted) refer to Diesel Recip. <600 reference	2009	
Man Camp - Operation (max people/day)	tons/person/day		0.0004	0.0004	0.0004	0.006	0.001	N/A	0.001	N/A	BOEM 2014-1001	2014	https://www.boem.gov/activities/updates/2014-1001.pdf
Vessels - Ice Management Diesel	g/hp-hr	0.320	0.1931	0.1873	0.0047	7.6669	0.2204	2.24E-05	1.2025	0.0022	USEPA 2017 NEI TSP refer to Diesel Recip. > 600 hp reference	3/19	https://www.epa.gov/air-emissions-inventories/2017-national-emissions-inventory-nei-data
Vessels - Hovercraft Diesel	g/hp-hr	0.320	0.1931	0.1873	0.0047	7.6669	0.2204	2.24E-05	1.2025	0.0022	USEPA 2017 NEI TSP refer to Diesel Recip. > 600 hp reference	3/19	https://www.epa.gov/air-emissions-inventories/2017-national-emissions-inventory-nei-data

Sulfur Content Source	Value	Units
Fuel Gas	3.38	ppm
Diesel Fuel	0.0015	% weight
Produced Gas (Flare)	3.38	ppm
Produced Oil (Liquid Flaring)	1	% weight

Density and Heat Value of Diesel Fuel	
Density	7.05 lbs/gal
Heat Value	19,300 Btu/lb

Heat Value of Natural Gas	
Heat Value	1,050 MBtu/MMscf

Natural Gas Flare Parameters	Value	Units
VOC Content of Flare Gas	0.6816	lb VOC/lb-mol gas
Natural Gas Flare Efficiency	98	%

[illegible]

AIR EMISSIONS CALCULATIONS - 2ND YEAR

COMPANY		AREA		BLOCK	LEASE	FACILITY	WELL	CONTACT										PHONE		REMARKS												
OPERATIONS		Bakulaga Canyon						RC-SEISMIC										206-590-1100		206-590-1100 - Drilling & Completion Operations												
		EQUIPMENT		EQUIPMENT ID	RATINGS	MAX FUEL	ACT. FUEL	HR/D	SCF/D	GAL/D	HR/D	D/YR	TSP										ESTIMATED TONS									
		Diesel Engines		HP	HP	GAL/HR	SCF/D	GAL/D																								
		Net Gas Engines		MMBTU/HR	SCF/D	SCF/D	HR/D	D/YR																								
		Burners		MMBTU/HR	SCF/D	SCF/D	HR/D	D/YR	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3						
DRILLING	VESSELS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
	VESSELS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
	VESSELS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
	VESSELS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
	VESSELS - Diesel Boiler			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
VESSELS - Drilling Pipe Engine, Auxiliary				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
FACILITY INSTALLATION		VESSELS - Heavy Lift Vessel/Derrick Barge Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
		BPO																														
DRILLING WELL TEST	Liquid Flaring			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
	COMBUSTION FLARE - no smoke			0	162500	24	7	0	0.00	0.00	0.00	0.00	0.09	11.60	5.84	--	52.89	--	0.00	0.00	0.00	0.01	0.97	0.49	--	4.44						
	COMBUSTION FLARE - light smoke			0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00						
	COMBUSTION FLARE - medium smoke			0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00						
	COMBUSTION FLARE - heavy smoke			0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00						
ALASKA-SPECIFIC SOURCES		VESSELS		HW			HR/D	D/YR																								
		VESSELS - Ice Management Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00						
2026 Facility Total Emissions									45.00	26.30	25.51	0.73	1,096.19	36.87	0.00	216.73	6.30	47.09	28.41	27.56	0.69	1,129.13	32.93	0.00	181.99	0.33						
EXEMPTION CALCULATION		DISTANCE FROM LAND IN MILES																														
		40.0																1,332.00			1,332.00	1,332.00				38,766.64						
DRILLING	VESSELS - Crew Diesel			7200	370.4112	8889.87	6	39	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	0.59	0.35	0.34	0.01	14.08	0.40	0.00	2.21	0.00						
	VESSELS - Supply Diesel			7200	370.4112	8889.87	10	77	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	1.96	1.18	1.15	0.03	46.94	1.35	0.00	7.36	0.01						
	VESSELS - Tugs Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00							
	VESSELS - Material Tug Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00							
	VESSELS - Crew Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00							
FACILITY INSTALLATION		VESSELS - Supply Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
PRODUCTION		VESSELS - Support Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
ALASKA-SPECIFIC SOURCES		On-Ice Equipment								GAL/HR	GAL/D																					
		Man Camp - Operation (maximum people per day)																														
		VESSELS		HW			HR/D	D/YR																								
		On-Ice - Loader		0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00						
		On-Ice - Other Construction Equipment		0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00						
		On-Ice - Other Survey Equipment		0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00						
		On-Ice - Tractor		0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00						
		On-Ice - Truck (for gravel island)		0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00						
		On-Ice - Truck (for survey)		0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00						
		Man Camp - Operation		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00						
		VESSELS - Hovercraft Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00						
2026 Non-Facility Total Emissions									10.16	6.13	6.96	0.16	243.40	7.00	0.00	36.16	0.07	2.56	1.54	1.49	0.04	61.02	1.76	0.00	9.57	0.03						

AIR EMISSIONS CALCULATIONS - 3RD YEAR

COMPANY		AREA		BLOCK	LEASE	FACILITY	WELL	CONTACT										PHONE		REMARKS										
OPERATIONS		EQUIPMENT		EQUIPMENT ID	RATING	MAX. FUEL	ACT. FUEL	RUN TIME	EST. EMISSIONS										MAXIMUM POUNDS PER HOUR		DIESEL - Drilling & Completion Operations									
		Diesel Engines		HP	MMBTUHR	GAL/HR	SCF/D		TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3		TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3			
		Net Gas Engines		HP	MMBTUHR	SCF/D	SCF/D	HR/D	D/YR																					
DRILLING	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
	VESSELS - Diesel Boiler	0	0	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
VESSELS - Drilling Pipe Engine, Auxiliary		0	0	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
FACILITY INSTALLATION		VESSELS - Heavy Lift Vessel/Derrick Barge Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
DRILLING		Liquid Flaring		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
WELL TEST		COMBUSTION FLARE - no smoke		0	162500	24	7	0.00	0.00	0.00	0.00	0.09	11.00	5.84	--	52.89	--	0.00	0.00	0.00	0.01	0.97	0.49	--	4.44	--				
		COMBUSTION FLARE - light smoke		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--				
		COMBUSTION FLARE - medium smoke		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--				
		COMBUSTION FLARE - heavy smoke		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--				
ALASKA-SPECIFIC SOURCES		VESSELS - Ice Management Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00				
2025		Facility Total Emissions							49.60	26.30	26.61	0.73	1,056.19	36.87	0.00	216.73	6.30	47.69	26.41	27.96	0.69	1,128.13	32.93	0.00	181.39	0.33				
EXEMPTION CALCULATION		DISTANCE FROM LAND IN MILES																1,332.00	1,332.00	1,332.00	1,332.00	1,332.00				38,766.64				
		40.0																												
DRILLING	VESSELS - Crew Diesel	7200	370.4112	8889.87	6	39	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	0.98	0.35	0.34	0.01	14.08	0.40	0.00	2.21	0.00						
	VESSELS - Supply Diesel	7200	370.4112	8889.87	10	77	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	1.96	1.16	1.15	0.03	46.94	1.35	0.00	7.36	0.01						
	VESSELS - Tugs Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
	VESSELS - Material Tug Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
	VESSELS - Crew Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
FACILITY INSTALLATION		VESSELS - Supply Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
PRODUCTION		VESSELS - Support Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
ALASKA-SPECIFIC SOURCES		On-Ice Equipment				GAL/HR	GAL/D																							
		Man Camp - Operation (maximum people per day)				PEOPLE/DAY																								
		VESSELS				kW		HR/D	D/YR																					
		On-Ice - Loader		0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00				
		On-Ice - Other Construction Equipment		0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00				
		On-Ice - Other Survey Equipment		0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00				
		On-Ice - Tractor		0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00				
		On-Ice - Truck (for gravel island)		0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00				
		On-Ice - Truck (for survey)		0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00				
		Man Camp - Operation		0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00				
		VESSELS - Hovercraft Diesel		0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00				
2025		Non-Facility Total Emissions							10.16	6.13	6.96	0.16	243.40	7.00	0.00	36.16	0.07	2.65	1.64	1.49	0.04	61.02	1.75	0.00	9.97	0.02				

AIR EMISSIONS CALCULATIONS - 4TH YEAR

COMPANY		AREA		BLOCK	LEASE	FACILITY	WELL	CONTACT										PHONE	REMARKS										
OPERATIONS		EQUIPMENT		EQUIPMENT ID	RATINGS	MAX FUEL	ACT. FUEL	RUN TIME	ESTIMATED EMISSIONS										ESTIMATED TONS	ESTIMATED TONS									
		Diesel Engines		HP	HP	GAL/HR	GAL/D		MAXIMUM POUNDS PER HOUR											ESTIMATED TONS									
		Net Gas Engines		MMBTU/HR	SCF/D	SCF/D	SCF/D	HR/D	D/YR	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NO2	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NO2		
DRILLING	VESSELS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	VESSELS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	VESSELS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	VESSELS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	VESSELS - Diesel Boiler			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
VESSELS - Drilling Prime Engine, Auxiliary				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
FACILITY INSTALLATION		VESSELS - Heavy Lift Vessel/Derrick Barge Diesel				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
		BPO				0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
DRILLING WELL TEST	Liquid Flaring			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	COMBUSTION FLARE - no smoke			0	0	162500	24	7	0.00	0.00	0.00	0.00	0.09	11.60	5.84	--	52.89	--	0.00	0.00	0.00	0.01	0.97	0.49	--	4.44	--		
	COMBUSTION FLARE - light smoke			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--		
	COMBUSTION FLARE - medium smoke			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--		
	COMBUSTION FLARE - heavy smoke			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--		
ALASKA-SPECIFIC SOURCES		VESSELS				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
		VESSELS - Ice Management Diesel				0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	
2009		Facility Total Emissions				0	0	0	0.00	45.00	26.30	25.51	0.73	1,096.19	36.87	0.00	216.73	6.30	47.89	28.41	27.66	0.69	1,128.13	32.93	0.00	181.38	6.33		
EXEMPTION CALCULATION		DISTANCE FROM LAND IN MILES				0.0													1,332.00			1,332.00	1,332.00				38,766.64		
DRILLING	VESSELS - Crew Diesel			7200	370.4112	8889.87	6	39	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	0.59	0.35	0.34	0.01	14.98	0.40	0.00	2.21	0.00			
	VESSELS - Supply Diesel			7200	370.4112	8889.87	10	77	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	1.96	1.18	1.15	0.03	46.94	1.35	0.00	7.36	0.01			
	VESSELS - Tugs Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
	VESSELS - Material Tug Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
	VESSELS - Crew Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
FACILITY INSTALLATION	VESSELS - Crew Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
	VESSELS - Supply Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
PRODUCTION		VESSELS - Support Diesel				0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
ALASKA-SPECIFIC SOURCES		On-Ice Equipment																											
		Man Camp - Operation (maximum people per day)																											
		VESSELS																											
		On-Ice - Loader				0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00		
		On-Ice - Other Construction Equipment				0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00		
		On-Ice - Other Survey Equipment				0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00		
		On-Ice - Tractor				0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00		
		On-Ice - Truck (for gravel island)				0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00		
		On-Ice - Truck (for survey)				0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00		
		Man Camp - Operation				0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00		
		VESSELS - Hovercraft Diesel				0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00		
2009		Non-Facility Total Emissions				10.16	6.13	6.96	0.16	243.40	7.00	0.00	38.18	0.87	2.58	1.54	1.49	0.64	61.62	1.75	0.00	9.97	0.00	0.00	0.00	9.97	0.00		

AIR EMISSIONS CALCULATIONS - 5TH YEAR

COMPANY		AREA		BLOCK	LEASE	FACILITY	WELL				CONTACT	PHONE	REMARKS													
OPERATIONS		EQUIPMENT		EQUIPMENT ID	RATING	MAX. FUEL	ACT. FUEL	RUN TIME					DIESEL - Drilling & Completion Operations													
		Diesel Engines		HP	SCF/D	GAL/HR	SCF/D						MAXIMUM POUNDS PER HOUR													
		Net Gas Engines		HP	SCF/D	GAL/HR	SCF/D						ESTIMATED TONS													
		Burners		MMBTUHR	SCF/D	HR/D	D/YR	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3	
DRILLING	VESSLS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSLS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSLS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSLS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSLS - Diesel Boiler			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
FACILITY INSTALLATION		VESSLS - Heavy Lift Vessel/Derrick Barge Diesel				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
DRILLING WELL TEST	Liquid Flaring			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	COMBUSTION FLARE - no smoke			0	162500	24	7	0.00	0.00	0.00	0.00	0.09	11.00	5.84	--	52.89	--	0.00	0.00	0.00	0.01	0.97	0.49	--	4.44	--
	COMBUSTION FLARE - light smoke			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	COMBUSTION FLARE - medium smoke			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	COMBUSTION FLARE - heavy smoke			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
ALASKA-SPECIFIC SOURCES		VESSLS - Ice Management Diesel			HW			HR/D	D/YR																	
2031 Facility Total Emissions				0				0	0	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	
EXEMPTION CALCULATION		DISTANCE FROM LAND IN MILES							49.60	26.30	26.61	0.73	1,056.19	36.87	0.00	216.73	6.30	47.89	28.41	27.66	0.69	1,128.13	32.93	0.00	181.38	6.33
		40.0																1,332.00			1,332.00	1,332.00			39,766.64	
DRILLING	VESSLS - Crew Diesel			7200	370.4112	8889.87	6	30	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	0.59	0.35	0.34	0.01	14.98	0.40	0.00	2.21	0.00
	VESSLS - Supply Diesel			7200	370.4112	8889.87	10	77	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	1.96	1.18	1.15	0.03	46.94	1.35	0.00	7.36	0.01
	VESSLS - Tugs Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSLS - Material Tug Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSLS - Crew Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
FACILITY INSTALLATION		VESSLS - Supply Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
PRODUCTION		VESSLS - Support Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
ALASKA-SPECIFIC SOURCES		On-Ice Equipment				GAL/HR	GAL/D																			
		Man Camp - Operation (maximum people per day)			PEOPLE/DAY																					
		VESSLS			HW			HR/D	D/YR																	
		On-Ice - Loader		0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
		On-Ice - Other Construction Equipment		0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
		On-Ice - Other Survey Equipment		0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
		On-Ice - Tractor		0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
		On-Ice - Truck (for gravel island)		0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
		On-Ice - Truck (for survey)		0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
		Man Camp - Operation		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
		VESSLS - Hoversled Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
2031 Non-Facility Total Emissions									16.16	6.13	6.56	0.16	243.40	7.90	0.00	38.18	0.07	2.55	1.64	1.49	0.04	61.02	1.75	0.00	9.97	0.02

AIR EMISSIONS CALCULATIONS - 6TH YEAR

[illegible]

AIR EMISSIONS CALCULATIONS - 7TH YEAR

COMPANY		AREA		BLOCK	LEASE	FACILITY	WELL	CONTACT										PHONE		REMARKS										
OPERATIONS		EQUIPMENT		EQUIPMENT ID	RATING	MAX. FUEL	ACT. FUEL	RUN TIME	EST. EMISSIONS										MAXIMUM POUNDS PER HOUR		DIESEL - Drilling & Completion Operations									
		Diesel Engines		HP	HP	GAL/HR	GAL/D		TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3		TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3			
		Net Gas Engines		MMBTU/HR	SCF/HR	SCF/D	HR/D	D/YR																						
DRILLING	VESSELS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
	VESSELS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
	VESSELS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
	VESSELS - Drilling - Diesel Boiler			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
	VESSELS - Drilling Prime Engine, Auxiliary			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
FACILITY INSTALLATION		VESSELS - Heavy Lift Vessel/Derrick Barge Diesel				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
DRILLING		Liquid Flaring				0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
WELL TEST		COMBUSTION FLARE - no smoke				0	162500	24	7	0.00	0.00	0.00	0.09	11.00	5.84	--	52.89	--	0.00	0.00	0.00	0.01	0.97	0.49	--	4.44	--			
		COMBUSTION FLARE - light smoke				0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--			
		COMBUSTION FLARE - medium smoke				0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--			
		COMBUSTION FLARE - heavy smoke				0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--			
ALASKA-SPECIFIC SOURCES		VESSELS - Ice Management Diesel				0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00			
2003 Facility Total Emissions						0		0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00			
EXEMPTION CALCULATION		DISTANCE FROM LAND IN MILES							45.00	26.30	26.61	0.73	1,056.19	35.87	0.00	216.73	6.30	47.89	28.41	27.66	0.69	1,128.13	32.93	0.00	181.38	6.33				
		40.0																1,332.00			1,332.00	1,332.00	1,332.00		39,766.64					
DRILLING	VESSELS - Crew Diesel			7200	370,412	8889.87	6	30	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	0.59	0.35	0.34	0.01	14.98	0.40	0.00	2.21	0.00				
	VESSELS - Supply Diesel			7200	370,412	8889.87	10	77	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	1.96	1.18	1.15	0.03	46.94	1.35	0.00	7.36	0.01				
	VESSELS - Tugs Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
	VESSELS - Material Tug Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
	VESSELS - Crew Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
FACILITY INSTALLATION		VESSELS - Supply Diesel				0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
PRODUCTION		VESSELS - Support Diesel				0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
ALASKA-SPECIFIC SOURCES		On-Ice Equipment																												
		Man Camp - Operation (maximum people per day)				PEOPLE/DAY																								
		VESSELS				0	0.0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00			
		On-Ice - Loader				0	0.0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00			
		On-Ice - Other Construction Equipment				0	0.0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00			
		On-Ice - Other Survey Equipment				0	0.0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00			
		On-Ice - Tractor				0	0.0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00			
		On-Ice - Truck (for gravel island)				0	0.0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00			
		On-Ice - Truck (for survey)				0	0.0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00			
		Man Camp - Operation				0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00			
		VESSELS - Hoveler/Diesel				0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00			
2003 Non-Facility Total Emissions									10.16	6.13	6.96	0.16	243.40	7.00	0.00	36.16	0.67	2.56	1.54	1.49	0.64	67.62	1.75	0.00	9.97	0.02				

AIR EMISSIONS CALCULATIONS - 8TH YEAR

COMPANY		AREA		BLOCK		LEASE		FACILITY		WELL		CONTACT		PHONE		REMARKS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
OPERATIONS		EQUIPMENT		EQUIPMENT ID	RATING	MAX. FUEL	ACT. FUEL	SCF/D	GAL/HR	SCF/D	GAL/D	SCF/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	SCF/D	GAL/D	HP	

AIR EMISSIONS CALCULATIONS - 9TH YEAR

COMPANY		AREA		BLOCK	LEASE	FACILITY	WELL	CONTACT										PHONE		REMARKS										
OPERATIONS		EQUIPMENT		EQUIPMENT ID	RATING	MAX. FUEL	ACT. FUEL	RUN TIME	MAXIMUM POUNDS PER HOUR										DIESEL ENGINES		DIESEL ENGINES - Volatile & Completion Operations									
		Diesel Engines		HP	MMBTUHR	SCF/D	SCF/D	HR/D	D/YR	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3			
		Net Gas Engines		HP	MMBTUHR	SCF/D	SCF/D	HR/D	D/YR	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3			
DRILLING	VESSLS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
	VESSLS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
	VESSLS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
	VESSLS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
	VESSLS - Diesel Boiler			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
VESSLS - Drilling Prime Engine, Auxiliary				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
FACILITY INSTALLATION				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
VESSLS - Heavy Lift Vessel/Derrick Barge Diesel				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
BPO				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
DRILLING	Liquid Flaring			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
WELL TEST	COMBUSTION FLARE - no smoke			0	162500	0	24	7	0.00	0.00	0.00	0.00	0.09	11.00	5.84	--	52.89	--	0.00	0.00	0.00	0.01	0.97	0.49	--	4.44	--			
	COMBUSTION FLARE - light smoke			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--			
	COMBUSTION FLARE - medium smoke			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--			
	COMBUSTION FLARE - heavy smoke			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--			
ALASKA-SPECIFIC SOURCES				HW				HR/D	D/YR																					
VESSLS - Ice Management Diesel				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00				
2005 Facility Total Emissions										45.00	26.30	26.61	0.73	1,056.19	35.87	0.00	216.73	6.30	47.89	28.41	27.66	0.69	1,128.13	32.93	0.00	181.38	6.33			
EXEMPTION CALCULATION																			1,332.00			1,332.00	1,332.00			39,766.64				
DISTANCE FROM LAND IN MILES																														
40.0																														
DRILLING	VESSLS - Crew Diesel			7200	370.4112	8889.87	6	39	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	0.59	0.35	0.34	0.01	14.98	0.40	0.00	2.21	0.00				
	VESSLS - Supply Diesel			7200	370.4112	8889.87	10	77	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	1.96	1.18	1.15	0.03	46.94	1.35	0.00	7.36	0.01				
	VESSLS - Tugs Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
	VESSLS - Material Tug Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
	VESSLS - Crew Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
FACILITY INSTALLATION				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
PRODUCTION	VESSLS - Supply Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
	VESSLS - Support Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
	On-Ice Equipment																													
	Man Camp - Operation (maximum people per day)																													
	VESSLS			HW				HR/D	D/YR																					
	On-Ice - Loader			0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00			
	On-Ice - Other Construction Equipment			0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00			
	On-Ice - Other Survey Equipment			0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00			
	On-Ice - Tractor			0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00			
	On-Ice - Truck (for gravel island)			0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00			
	On-Ice - Truck (for survey)			0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00			
	Man Camp - Operation			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00			
	VESSLS - Hovcraft Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00			
	2005 Non-Facility Total Emissions									10.16	6.13	6.96	0.16	243.40	7.00	0.00	38.18	0.67	2.58	1.64	1.49	0.64	61.62	1.75	0.00	9.97	0.02			

AIR EMISSIONS CALCULATIONS - 10TH YEAR

COMPANY		AREA		BLOCK	LEASE	FACILITY	WELL	CONTACT										PHONE		REMARKS											
OPERATIONS		EQUIPMENT		EQUIPMENT ID	RATING	MAX. FUEL	ACT. FUEL	RUN TIME	ESTIMATED TONS										ESTIMATED TONS		ESTIMATED TONS										
		Diesel Engines		HP	MMBTUHR	SCF/D	HR/D	D/YR	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NO2	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NO2					
DRILLING	VESSLS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
	VESSLS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
	VESSLS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
	VESSLS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
	VESSLS - Diesel Boiler			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
VESSLS - Drilling Prime Engine, Auxiliary				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
FACILITY INSTALLATION		VESSLS - Heavy Lift Vessel/Derrick Barge Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
DRILLING WELL TEST	Liquid Flaring			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
	COMBUSTION FLARE - no smoke			0	162500	0	24	7	0.00	0.00	0.00	0.00	0.09	11.60	5.84	--	52.89	--	0.00	0.00	0.00	0.01	0.97	0.49	--	4.44	--				
	COMBUSTION FLARE - light smoke			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--				
	COMBUSTION FLARE - medium smoke			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--				
	COMBUSTION FLARE - heavy smoke			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--				
ALASKA-SPECIFIC SOURCES		VESSLS		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
2036 Facility Total Emissions				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
EXEMPTION CALCULATION		DISTANCE FROM LAND IN MILES										40.0										1,332.00									
DRILLING	VESSLS - Crew Diesel			7200	370,412	8889.87	6	39	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	0.59	0.35	0.34	0.01	14.98	0.40	0.00	2.21	0.00					
	VESSLS - Supply Diesel			7200	370,412	8889.87	10	77	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	1.96	1.18	1.15	0.03	46.94	1.35	0.00	7.36	0.01					
	VESSLS - Tugs Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
	VESSLS - Material Tug Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
	VESSLS - Crew Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
FACILITY INSTALLATION		VESSLS - Crew Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
PRODUCTION	VESSLS - Supply Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
	VESSLS - Support Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
	On-Ice Equipment																														
	Man Camp - Operation (maximum people per day)																														
	VESSLS																														
ALASKA-SPECIFIC SOURCES		On-Ice - Loader		0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00				
		On-Ice - Other Construction Equipment		0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00				
		On-Ice - Other Survey Equipment		0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00				
		On-Ice - Tractor		0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00				
		On-Ice - Truck (for gravel island)		0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00				
		On-Ice - Truck (for survey)		0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00				
		Man Camp - Operation		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00				
		VESSLS - Hovcraft Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00				
2036 Non-Facility Total Emissions									10.16	6.13	6.96	0.16	243.40	7.00	0.00	38.18	0.87	2.58	1.54	1.49	0.64	61.62	1.75	0.00	9.97	0.02					

AIR EMISSIONS CALCULATIONS

COMPANY	AREA	BLOCK	LEASE	FACILITY	WELL	
LOG Exploration Offshore, L.L.C	589	OCS-G-35979		MC 589 001 ST01		

Year	Facility Emitted Substance								
	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3
2027	47.09	28.41	27.56	0.69	1129.13	32.93	0.00	181.39	0.33
2028	47.09	28.41	27.56	0.69	1129.13	32.93	0.00	181.39	0.33
2029	47.09	28.41	27.56	0.69	1129.13	32.93	0.00	181.39	0.33
2030	47.09	28.41	27.56	0.69	1129.13	32.93	0.00	181.39	0.33
2031	47.09	28.41	27.56	0.69	1129.13	32.93	0.00	181.39	0.33
2032	47.09	28.41	27.56	0.69	1129.13	32.93	0.00	181.39	0.33
2033	47.09	28.41	27.56	0.69	1129.13	32.93	0.00	181.39	0.33
2034	47.09	28.41	27.56	0.69	1129.13	32.93	0.00	181.39	0.33
2035	47.09	28.41	27.56	0.69	1129.13	32.93	0.00	181.39	0.33
2036	47.09	28.41	27.56	0.69	1129.13	32.93	0.00	181.39	0.33
Allowable	1332.00			1332.00	1332.00	1332.00		39766.64	

EP - AIR QUALITY**OMB Control No. 1010-0151**
OMB Approval Expires: 10/31/2027

COMPANY	LLOG Exploration Offshore, L.L.C.
AREA	Mississippi Canyon
BLOCK	589
LEASE	OCS-G-35979
FACILITY	
WELL	MC 589 001 ST01
COMPANY CONTACT	Susan Sachitana
TELEPHONE NO.	985-801-4300
REMARKS	DP Semisubmersible - Drilling & Completion Operations

AIR EMISSIONS COMPUTATION FACTORS

Fuel Usage Conversion Factors		Natural Gas Turbines		Natural Gas Engines		Diesel Recip. Engine		Diesel Turbines					
		SCF/hp-hr	9.524	SCF/hp-hr	7.143	GAL/hp-hr	0.0514	GAL/hp-hr	0.0514				
Equipment/Emission Factors	units	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3	REF.	DATE	Reference Links
Natural Gas Turbine	g/hp-hr		0.0086	0.0086	0.0028	1.4515	0.0095	N/A	0.3719	N/A	AP42 3.1-18 3.1-2a	499	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03s01.pdf
RECIP. 2 Cycle Lean Natural Gas	g/hp-hr		0.1293	0.1293	0.0020	6.5998	0.4082	N/A	1.2009	N/A	AP42 3.2-1	700	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03s02.pdf
RECIP. 4 Cycle Lean Natural Gas	g/hp-hr		0.0002	0.0002	0.0020	2.8814	0.4014	N/A	1.8949	N/A	AP42 3.2-2	700	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03s02.pdf
RECIP. 4 Cycle Rich Natural Gas	g/hp-hr		0.0323	0.0323	0.0020	7.7224	0.1021	N/A	11.9408	N/A	AP42 3.2-3	700	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03s02.pdf
Diesel Recip. < 600 hp	g/hp-hr	1	0.2719	14.1	1.04	N/A	3.03	N/A			AP42 3.3-1	1096	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03s03.pdf
Diesel Recip. > 600 hp	g/hp-hr	0.32	0.182	0.178	0.0055	10.9	0.29	N/A	2.5	N/A	AP42 3.4-1 & 3.4-2	1096	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03s04.pdf
Diesel Boiler	lbs/bbl	0.0840	0.0420	0.0105	0.0089	1.0080	0.0084	5.14E-05	0.2100	0.0336	AP42 1.3-6; Pb and NH3: WebFIRE (08/2018)	9/98 and 5/10	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03s04.pdf
Diesel Turbine	g/hp-hr	0.0381	0.0137	0.0137	0.0048	2.7941	0.0013	4.45E-05	0.0105	N/A	AP42 3.1-1 & 3.1-2a	499	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03s01.pdf
Dual Fuel Turbine	g/hp-hr	0.0381	0.0137	0.0137	0.0048	2.7941	0.0095	4.45E-05	0.3719	0.0000	AP42 3.1-18 3.1-2a; AP42 3.1-1 & 3.1-2a	499	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03s01.pdf
Vessels – Propulsion	g/hp-hr	0.320	0.1931	0.1873	0.0047	7.6669	0.2204	2.24E-05	1.2025	0.0022	USEPA 2017 NEI TSP refer to Diesel Recip. > 600 hp reference	3/19	https://www.epa.gov/air-emissions-inventories/2017-national-emissions-inventory-nei-data
Vessels – Drilling Prime Engine, Auxiliary	g/hp-hr	0.320	0.1931	0.1873	0.0047	7.6669	0.2204	2.24E-05	1.2025	0.0022	USEPA 2017 NEI TSP refer to Diesel Recip. > 600 hp reference	3/19	https://www.epa.gov/air-emissions-inventories/2017-national-emissions-inventory-nei-data
Vessels – Diesel Boiler	g/hp-hr	0.0466	0.1491	0.1417	0.4400	1.4914	0.0620	3.73E-05	0.1491	0.0003	USEPA 2017 NEI TSP (units converted) refer to Diesel Boiler Reference	3/19	https://www.epa.gov/air-emissions-inventories/2017-national-emissions-inventory-nei-data
Vessels – Well Stimulation	g/hp-hr	0.320	0.1931	0.1873	0.0047	7.6669	0.2204	2.24E-05	1.2025	0.0022	USEPA 2017 NEI TSP refer to Diesel Recip. > 600 hp reference	3/19	https://www.epa.gov/air-emissions-inventories/2017-national-emissions-inventory-nei-data
Natural Gas Heater/Boiler/Burner	lbs/MMscf	7.60	1.90	1.90	0.60	190.00	5.50	5.00E-04	84.00	3.2	AP42 1.4-1 & 1.4-2; Pb and NH3: WebFIRE (08/2018)	7/98 and 9/18	https://www3.epa.gov/ttnchie1/ap42/ch01/final/c01s04.pdf
Combustion Flare (no smoke)	lbs/MMscf	0.00	0.00	0.00	0.57	71.40	35.93	N/A	325.5	N/A	AP42 13.5-1, 13.5-2	2/18	https://www3.epa.gov/ttnchie1/ap42/ch13/final/C13s05_02-05-18.pdf
Combustion Flare (light smoke)	lbs/MMscf	2.10	2.10	2.10	0.57	71.40	35.93	N/A	325.5	N/A	AP42 13.5-1, 13.5-2	2/18	https://www3.epa.gov/ttnchie1/ap42/ch13/final/C13s05_02-05-18.pdf
Combustion Flare (medium smoke)	lbs/MMscf	10.50	10.50	10.50	0.57	71.40	35.93	N/A	325.5	N/A	AP42 13.5-1, 13.5-2	2/18	https://www3.epa.gov/ttnchie1/ap42/ch13/final/C13s05_02-05-18.pdf
Combustion Flare (heavy smoke)	lbs/MMscf	21.00	21.00	21.00	0.57	71.40	35.93	N/A	325.5	N/A	AP42 13.5-1, 13.5-2	2/18	https://www3.epa.gov/ttnchie1/ap42/ch13/final/C13s05_02-05-18.pdf
Liquid Flaring	lbs/bbl	0.42	0.0966	0.0651	5.964	0.84	0.01428	5.14E-05	0.21	0.0336	AP42 1.3-1 through 1.3-3 and 1.3-5	5/10	https://www3.epa.gov/ttnchie1/ap42/ch01/final/c01s03.pdf
Storage Tank	tons/yr/tank						4.300				2014 Gulfwide Inventory, Avg. emiss (upper bound of 95% CI)	2017	https://www.boem.gov/environmen/environmental-studies/2014-gulfwide-emission-inventory
Fugitives	lbs/hr/component						0.0005				API Study	12/99	https://www.api.org/
Glycol Dehydrator	tons/yr/dehydrator						19.240				2011 Gulfwide Inventory, Avg. emiss (upper bound of 95% CI)	2014	https://www.boem.gov/environmen/environmental-studies/2011-gulfwide-emission-inventory
Cold Vent	tons/yr/vent						44.747				2014 Gulfwide Inventory, Avg. emiss (upper bound of 95% CI)	2017	https://www.boem.gov/environmen/environmental-studies/2014-gulfwide-emission-inventory
Waste Incinerator	lb/ton		15.0	15.0	2.5	2.0	N/A	N/A	20.0	N/A	AP 42 2.1-12	10/96	https://www3.epa.gov/ttnchie1/ap42/ch01/final/c01s03.pdf
On-ice – Loader	lbs/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model, TSP (units converted) refer to Diesel Recip. <600 reference	2009	https://www.epa.gov/nrcv/hotspot/2009-a-installation-and-updates
On-ice – Other Construction Equipment	lbs/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model, TSP (units converted) refer to Diesel Recip. <600 reference	2009	https://www.epa.gov/nrcv/hotspot/2009-a-installation-and-updates
On-ice – Other Survey Equipment	lbs/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model, TSP (units converted) refer to Diesel Recip. <600 reference	2009	https://www.epa.gov/nrcv/hotspot/2009-a-installation-and-updates
On-ice – Tractor	lbs/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model, TSP (units converted) refer to Diesel Recip. <600 reference	2009	https://www.epa.gov/nrcv/hotspot/2009-a-installation-and-updates
On-ice – Truck (for gravel island)	lbs/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model, TSP (units converted) refer to Diesel Recip. <600 reference	2009	https://www.epa.gov/nrcv/hotspot/2009-a-installation-and-updates
On-ice – Truck (for surveys)	lbs/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model, TSP (units converted) refer to Diesel Recip. <600 reference	2009	https://www.epa.gov/nrcv/hotspot/2009-a-installation-and-updates
Man Camp - Operation (max people/day)	tons/person/day		0.0004	0.0004	0.0004	0.006	0.001	N/A	0.001	N/A	BOEM 2014-1001	2014	https://www3.epa.gov/ttnchie1/ap42/ch01/final/c01s03.pdf
Vessels - Ice Management Diesel	g/hp-hr	0.320	0.1931	0.1873	0.0047	7.6669	0.2204	2.24E-05	1.2025	0.0022	USEPA 2017 NEI TSP refer to Diesel Recip. > 600 hp reference	3/19	https://www.epa.gov/air-emissions-inventories/2017-national-emissions-inventory-nei-data
Vessels - Hovercraft Diesel	g/hp-hr	0.320	0.1931	0.1873	0.0047	7.6669	0.2204	2.24E-05	1.2025	0.0022	USEPA 2017 NEI TSP refer to Diesel Recip. > 600 hp reference	3/19	https://www.epa.gov/air-emissions-inventories/2017-national-emissions-inventory-nei-data

Sulfur Content Source	Value	Units
Fuel Gas	3.38	ppm
Diesel Fuel	0.0015	% weight
Produced Gas (Flare)	3.38	ppm
Produced Oil (Liquid Flaring)	1	% weight

Density and Heat Value of Diesel Fuel	
Density	7.05 lbs/gal
Heat Value	19,300 Btu/lb

Heat Value of Natural Gas	
Heat Value	1,050 MBtu/MMscf

Natural Gas Flare Parameters	Value	Units
VOC Content of Flare Gas	0.6816	lb VOC/lb-mol gas
Natural Gas Flare Efficiency	98	%

AIR EMISSIONS CALCULATIONS - 1ST YEAR

COMPANY		AREA		BLOCK	LEASE	FACILITY	WELL											CONTACT	PHONE	REMARKS									
OPERATIONS		EQUIPMENT		EQUIPMENT ID	RATINGS	MAX FUEL	ACT. FUEL	RUN TIME	MAXIMUM POUNDS PER HOUR										OF Substances - Drilling & Completion Operations										
		Diesel Engines		HP	GAL/HR	GAL/D																							
		Nat. Gas Engines		HP	SCF/HR	SCF/D																							
		Burners		MMBTU/HR	SCF/HR	SCF/D	HR/D	D/YR	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3			
DRILLING	VESSELS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
	VESSELS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
	VESSELS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
	VESSELS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
	VESSELS - Diesel Boiler			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
VESSELS - Drilling Prime Engine, Auxiliary				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
FACILITY INSTALLATION		VESSELS - Heavy Lift Vessel/Derrick Barge Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
		BPO																											
DRILLING WELL TEST	Liquid Flaring			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
	COMBUSTION FLARE - no smoke			0	162500	0	24	7	0.00	0.00	0.00	0.09	11.60	5.84	--	52.89	--	0.00	0.00	0.00	0.01	0.97	0.49	--	4.44	--			
	COMBUSTION FLARE - light smoke			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--			
	COMBUSTION FLARE - medium smoke			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--			
	COMBUSTION FLARE - heavy smoke			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--			
ALASKA-SPECIFIC SOURCES		VESSELS		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
VESSELS - Ice Management Diesel				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
2027 Facility Total Emissions									45.18	26.85	25.27	0.72	1,046.05	35.48	0.00	215.14	0.30	46.83	28.13	27.28	0.69	1,118.18	32.61	0.00	179.87	0.33			
EXEMPTION CALCULATION		DISTANCE FROM LAND IN MILES																1,332.00			1,332.00	1,332.00			38,766.64				
		40.0																											
DRILLING	VESSELS - Crew Diesel			7200	370.4112	8889.87	6	39	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	0.59	0.35	0.34	0.01	14.98	0.40	0.00	2.21	0.00			
	VESSELS - Supply Diesel			7200	370.4112	8889.87	10	77	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	1.96	1.18	1.15	0.03	46.94	1.35	0.00	7.36	0.01			
	VESSELS - Tugs Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
	VESSELS - Material Tug Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
	VESSELS - Crew Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
FACILITY INSTALLATION		VESSELS - Supply Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
PRODUCTION		VESSELS - Support Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
ALASKA-SPECIFIC SOURCES		On-Ice Equipment				GAL/HR	GAL/D																						
Man Camp - Operation (maximum people per day)						PEOPLE/DAY																							
VESSELS				0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00			
On-Ice - Loader				0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00			
On-Ice - Other Construction Equipment				0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00			
On-Ice - Other Survey Equipment				0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00			
On-Ice - Tractor				0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00			
On-Ice - Truck (for gravel island)				0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00			
On-Ice - Truck (for survey)				0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00			
Man Camp - Operation				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00			
VESSELS - Hovcraft Diesel				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
2027 Non-Facility Total Emissions									10.16	6.13	6.95	0.15	243.40	7.00	0.00	38.18	0.07	2.58	1.54	1.49	0.04	61.02	1.75	0.00	9.97	0.02			

AIR EMISSIONS CALCULATIONS - 2ND YEAR

COMPANY		AREA		BLOCK	LEASE	FACILITY	WELL	CONTACT										PHONE	REMARKS										
OPERATIONS		EQUIPMENT		EQUIPMENT ID	RATING	MAX. FUEL	ACT. FUEL	RUN TIME	EST. EMISSIONS										EST. EMISSIONS	ESTIMATED TONS									
		Diesel Engines		HP	GAL/HR	SCF/D	GAL/D		MAXIMUM POUNDS PER HOUR																				
		Nat. Gas Engines		HP	SCF/HR	SCF/D																							
		Burners		MMBTU/HR	SCF/Hr	SCF/D	HR/D	D/YR	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3			
DRILLING	VESSELS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
	VESSELS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
	VESSELS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
	VESSELS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
	Vesels - Diesel Boiler			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
VESSELS - Drilling Prime Engine, Auxiliary				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
FACILITY INSTALLATION		VESSELS - Heavy Lift Vessel/Derrick Barge Diesel				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
		BPO				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
DRILLING	Liquid Flaring			0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
WELL TEST	COMBUSTION FLARE - no smoke			0	162500		24	7	0.00	0.00	0.00	0.00	0.09	11.00	5.84	--	52.89	--	0.00	0.00	0.00	0.01	0.97	0.49	--	4.44	--		
	COMBUSTION FLARE - light smoke			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--			
	COMBUSTION FLARE - medium smoke			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--			
	COMBUSTION FLARE - heavy smoke			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--			
ALASKA-SPECIFIC SOURCES		VESSELS - Ice Management Diesel				0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00			
2026 Facility Total Emissions									43.18	26.95	25.27	0.72	1,046.05	35.68	0.00	215.14	6.30	46.63	26.13	27.29	0.69	1,118.18	32.61	0.00	179.67	0.33			
EXEMPTION CALCULATION		DISTANCE FROM LAND IN MILES																											
		40.0																											
DRILLING	VESSELS - Crew Diesel			7200	370.4112	8889.87	6	39	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	0.58	0.35	0.34	0.01	14.08	0.40	0.00	2.21	0.00			
	VESSELS - Supply Diesel			7200	370.4112	8889.87	10	77	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	1.96	1.16	1.15	0.03	46.94	1.35	0.00	7.36	0.01			
	VESSELS - Tugs Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
	VESSELS - Material Tug Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
	VESSELS - Crew Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
FACILITY INSTALLATION		VESSELS - Supply Diesel				0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
PRODUCTION		VESSELS - Support Diesel				0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
ALASKA-SPECIFIC SOURCES		On-Ice Equipment																											
		VESSELS																											
		Man Camp - Operation (maximum people per day)																											
		PEOPLE/DAY																											
		HW																											
		On-Ice - Loader																											
		On-Ice - Other Construction Equipment																											
		On-Ice - Other Survey Equipment																											
		On-Ice - Tractor																											
		On-Ice - Truck (for gravel island)																											
		On-Ice - Truck (for survey)																											
		Man Camp - Operation																											
		VESSELS - Hovercraft Diesel																											
2026 Non-Facility Total Emissions																													

AIR EMISSIONS CALCULATIONS - 3RD YEAR

COMPANY		AREA		BLOCK	LEASE	FACILITY	WELL	CONTACT																PHONE	REMARKS																
OPERATIONS		Management Canyon		EQUIPMENT ID	RATINGS	MAX FUEL	ACT. FUEL	RUN TIME	MAXIMUM POUNDS PER HOUR																	SP Selfmonitoring - Drilling & Completion Operations															
		Diesel Engines Nat. Gas Engines Burners		HP SCFH MMBTUHR	GAL/HR SCFH SCF/D	HP SCFH MMBTUHR	SCFH SCF/D	HR/D D/YR	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3															
DRILLING	VESSLS - Drilling - Propulsion Engine - Diesel	0	0	0	0.00	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00									
	VESSLS - Drilling - Propulsion Engine - Diesel	0	0	0	0.00	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00									
	VESSLS - Drilling - Propulsion Engine - Diesel	0	0	0	0.00	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00									
	VESSLS - Drilling - Propulsion Engine - Diesel	0	0	0	0.00	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00									
	VESSLS - Diesel Boiler	0	0	0	0.00	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00									
	VESSLS - Drilling Prime Engine, Auxiliary	0	0	0	0.00	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00									
FACILITY INSTALLATION		VESSLS - Heavy Lift Vessel/Derrick Barge Diesel		0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00									
		BPO		0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00									
DRILLING WELL TEST	Liquid Flaring	0	0	0	0.00	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00									
	COMBUSTION FLARE - no smoke	0	162500	0	24	7	0	0	0.00	0.00	0.00	0.00	0.09	11.60	5.84	--	52.89	--	0.00	0.00	0.00	0.01	0.97	0.49	--	4.44	--	0.00	0.00	0.00	0.00	0.00									
	COMBUSTION FLARE - light smoke	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00										
	COMBUSTION FLARE - medium smoke	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00										
	COMBUSTION FLARE - heavy smoke	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00										
ALASKA-SPECIFIC SOURCES		VESSLS		0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00									
		VESSLS - Ice Management Diesel		0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00									
2025		Facility Total Emissions							45.18	26.85	25.27	0.72	1,046.05	35.48	0.00	215.14	0.30	46.83	28.13	27.28	0.69	1,118.18	32.61	0.00		179.87	0.33														
EXEMPTION CALCULATION		DISTANCE FROM LAND IN MILES																1,332.00			1,332.00	1,332.00			38,766.64																
		40.0																																							
DRILLING	VESSLS - Crew Diesel	7200	370,412	8889.87	6	39	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	0.59	0.35	0.34	0.01	14.08	0.40	0.00	2.21	0.00																	
	VESSLS - Supply Diesel	7200	370,412	8889.87	10	77	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	1.96	1.18	1.15	0.03	46.94	1.35	0.00	7.36	0.01																	
	VESSLS - Tugs Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00										
	VESSLS - Material Tug Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00										
FACILITY INSTALLATION	VESSLS - Crew Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00										
	VESSLS - Supply Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00										
PRODUCTION	VESSLS - Support Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00										
ALASKA-SPECIFIC SOURCES		On-Ice Equipment																																							
		Man Camp - Operation (maximum people per day)																																							
VESSLS		On-Ice - Loader		0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00										
		On-Ice - Other Construction Equipment		0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00										
		On-Ice - Other Survey Equipment		0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00										
		On-Ice - Tractor		0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00										
		On-Ice - Truck (for gravel island)		0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00										
		On-Ice - Truck (for survey)		0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00										
		Man Camp - Operation		0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00										
		VESSLS - Hoversled Diesel		0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00										
2025		Non-Facility Total Emissions							10.16	6.13	6.95	0.15	243.40	7.00	0.00	38.18	0.07	2.58	1.54	1.49	0.04	67.02	1.75	0.00		9.97	0.02														

AIR EMISSIONS CALCULATIONS - 4TH YEAR

COMPANY		AREA		BLOCK	LEASE	FACILITY	WELL				CONTACT	PHONE	REMARKS	
OPERATIONS		EQUIPMENT		EQUIPMENT ID	RATING	MAX. FUEL	ACT. FUEL	RUN TIME						
		Diesel Engines		HP	HP	GAL/HR	GAL/D							
		Nat. Gas Engines		MMBTU/HR	SCF/HR	SCF/D	HR/D	D/YR	TSP	PM10	PM2.5	SOx	NOx	VOC
		Burners		MMBTU/HR	SCF/HR	SCF/D	HR/D	D/YR	TSP	PM10	PM2.5	SOx	NOx	VOC
DRILLING	VESSLS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00
	VESSLS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00
	VESSLS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00
	VESSLS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00
	VESSLS - Diesel Boiler			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00
FACILITY INSTALLATION		VESSLS - Heavy LR Vessel/Derrick Barge Diesel				0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
DRILLING WELL TEST	Liquid Flaring			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00
	COMBUSTION FLARE - no smoke			0	162500	0	24	7	0.00	0.00	0.00	0.00	11.00	5.94
	COMBUSTION FLARE - light smoke			0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	--
	COMBUSTION FLARE - medium smoke			0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	--
	COMBUSTION FLARE - heavy smoke			0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	--
ALASKA-SPECIFIC SOURCES		VESSLS				0	0	0	0.00	0.00	0.00	0.00	0.00	--
		VESSLS - Ice Management Diesel				0	0	0	0.00	0.00	0.00	0.00	0.00	--
2008 Facility Total Emissions									45.18	26.85	25.27	0.72	1,046.05	36.68
EXEMPTION CALCULATION		DISTANCE FROM LAND IN MILES												
		40.0												
DRILLING	VESSLS - Crew Diesel	7200	370.4112	8889.87	6	39	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09
	VESSLS - Supply Diesel	7200	370.4112	8889.87	10	77	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09
	VESSLS - Tugs Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSLS - Material Tug Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSLS - Crew Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FACILITY INSTALLATION		VESSLS - Supply Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00
PRODUCTION		VESSLS - Support Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00
ALASKA-SPECIFIC SOURCES		On-Ice Equipment				GAL/HR	GAL/D							
		Man Camp - Operation (maximum people per day)				PEOPLE/DAY								
		VESSLS				0	0.0	0	0.00	0.00	0.00	0.00	0.00	--
		On-Ice - Loader				0	0.0	0	0.00	0.00	0.00	0.00	0.00	--
		On-Ice - Other Construction Equipment				0	0.0	0	0.00	0.00	0.00	0.00	0.00	--
		On-Ice - Other Survey Equipment				0	0.0	0	0.00	0.00	0.00	0.00	0.00	--
		On-Ice - Tractor				0	0.0	0	0.00	0.00	0.00	0.00	0.00	--
		On-Ice - Truck (for gravel island)				0	0.0	0	0.00	0.00	0.00	0.00	0.00	--
		On-Ice - Truck (for survey)				0	0.0	0	0.00	0.00	0.00	0.00	0.00	--
		Man Camp - Operation				0	0.0	0	0.00	0.00	0.00	0.00	0.00	--
		VESSLS - Hovercraft Diesel				0	0.0	0	0.00	0.00	0.00	0.00	0.00	--
2008 Non-Facility Total Emissions									10.16	6.13	6.95	0.15	243.40	7.00

AIR EMISSIONS CALCULATIONS - 5TH YEAR

COMPANY	AREA	BLOCK	LEASE	FACILITY	WELL	CONTACT										PHONE	REMARKS																		
OPERATIONS	Management	EQUIPMENT	RATING	MAX. FUEL	ACT. FUEL	SCN	NOx	VOC	Pb	CO	NH3	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3						
	Diesel Engines	HP	GAL/HR	GAL/D	SCFH	SCFD	HR/D	D/YR	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3
	Net Gas Engines	MMBTU/HR	SCFH	SCFD	HR/D	D/YR	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3		
DRILLING	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Vesels - Diesel Boiler	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Vesels - Drilling Prime Engine, Auxiliary	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
FACILITY INSTALLATION	VESSELS - Heavy Lift Vessel/Derrick Barge Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
DRILLING	Liquid Flaring	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
WELL TEST	COMBUSTION FLARE - no smoke	0	162500	24	7	0.00	0.00	0.00	0.00	0.00	0.00	0.09	11.00	5.84	--	52.89	--	0.00	0.00	0.00	0.01	0.97	0.49	--	4.44	--									
	COMBUSTION FLARE - light smoke	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	COMBUSTION FLARE - medium smoke	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	COMBUSTION FLARE - heavy smoke	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
ALASKA-SPECIFIC SOURCES	VESSELS - Ice Management Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2031	Facility Total Emissions						45.18	26.85	25.27	0.72	1,046.05	35.68	0.00	215.14	6.30	46.83	28.13	27.28	0.69	1,118.18	32.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EXEMPTION CALCULATION	DISTANCE FROM LAND IN MILES																1,332.00				1,332.00	1,332.00	1,332.00		39,766.64										
40.0																																			
DRILLING	VESSELS - Crew Diesel	7200	370.4112	8889.87	6	39	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	0.59	0.35	0.34	0.01	14.98	0.40	0.00	2.21	0.00											
	VESSELS - Supply Diesel	7200	370.4112	8889.87	10	77	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	1.96	1.18	1.15	0.03	46.94	1.35	0.00	7.36	0.01											
	VESSELS - Tugs Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
	VESSELS - Material Tug Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
FACILITY INSTALLATION	VESSELS - Crew Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
	VESSELS - Supply Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
PRODUCTION	VESSELS - Support Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
ALASKA-SPECIFIC SOURCES	On-Ice Equipment			GAL/HR	GAL/D																														
	Man Camp - Operation (maximum people per day)			PEOPLE/DAY																															
	VESSELS	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00									
	On-Ice - Loader	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00									
	On-Ice - Other Construction Equipment	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00									
	On-Ice - Other Survey Equipment	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00									
	On-Ice - Tractor	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00									
	On-Ice - Truck (for gravel island)	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00									
	On-Ice - Truck (for survey)	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00									
	Man Camp - Operation	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00									
	VESSELS - Hovcraft Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00									
2031	Non-Facility Total Emissions						10.16	6.13	6.95	6.15	243.40	7.00	0.00	38.18	0.87	2.58	1.54	1.49	0.64	61.62	1.75	0.00	9.97	0.02											

AIR EMISSIONS CALCULATIONS - 8TH YEAR

COMPANY		AREA		BLOCK	LEASE	FACILITY	WELL	CONTACT										PHONE		REMARKS															
OPERATIONS		EQUIPMENT		EQUIPMENT ID	RATING	MAX. FUEL	ACT. FUEL	RUN TIME	ESTIMATED TONS										ESTIMATED TONS		ESTIMATED TONS														
		Diesel Engines		HP	GAL/HR	GAL/D	SCF/HR	SCF/D	HR/D	DAYR	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3							
		Nat. Gas Engines		HP	SCF/HR	SCF/D	HR/D	DAYR	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3
DRILLING	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0.00	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0.00	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0.00	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	VESSELS - Drilling - Diesel Boiler	0	0	0.00	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	VESSELS - Drilling Prime Engine, Auxiliary	0	0	0.00	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
FACILITY INSTALLATION		VESSELS - Heavy Lift Vessel/Derrick Barge Diesel		BPD	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
DRILLING WELL TEST	Liquid Flaring	0	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	COMBUSTION FLARE - no smoke	0	162500	24	7	0.00	0.00	0.00	0.09	11.60	5.84	--	52.89	--	0.00	0.00	0.00	0.01	0.97	0.49	--	4.44	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	COMBUSTION FLARE - light smoke	0	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	COMBUSTION FLARE - medium smoke	0	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
		COMBUSTION FLARE - heavy smoke		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
ALASKA-SPECIFIC SOURCES		VESSELS - Ice Management Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
2002 Facility Total Emissions				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
EXEMPTION CALCULATION		DISTANCE FROM LAND IN MILES		40.0	43.18	26.85	25.27	0.72	1,046.05	35.68	0.00	215.14	6.30	46.83	28.13	27.28	0.69	1,118.18	32.61	0.00	179.67	6.33													
DRILLING	VESSELS - Crew Diesel	7200	370.4112	8889.87	6	39	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	0.59	0.35	0.34	0.01	14.98	0.40	0.00	2.21	0.00											
	VESSELS - Supply Diesel	7200	370.4112	8889.87	10	77	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	1.96	1.18	1.15	0.03	46.94	1.35	0.00	7.36	0.01											
	VESSELS - Tugs Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
	VESSELS - Material Tug Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
FACILITY INSTALLATION	VESSELS - Crew Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
	VESSELS - Support Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
PRODUCTION		VESSELS - Support Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
ALASKA-SPECIFIC SOURCES		On-Ice Equipment				GAL/HR	GAL/D																												
		Man Camp - Operation (maximum people per day)		PEOPLE/DAY																															
		VESSELS		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00								
		On-Ice - Loader		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00								
		On-Ice - Other Construction Equipment		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00								
		On-Ice - Other Survey Equipment		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00								
		On-Ice - Tractor		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00								
		On-Ice - Truck (for gravel island)		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00								
		On-Ice - Truck (for survey)		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00								
		Man Camp - Operation		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00								
		VESSELS - Hovercraft Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00								
2002 Non-Facility Total Emissions				10.16	6.13	6.95	6.15	243.40	7.00	0.00	38.18	0.67	2.58	1.54	1.49	0.64	61.62	1.75	0.00	9.97	0.02														

AIR EMISSIONS CALCULATIONS - 7TH YEAR

COMPANY		AREA		BLOCK		LEASE		FACILITY		WELL		CONTACT		PHONE		REMARKS	
OPERATIONS		EQUIPMENT		EQUIPMENT ID		RATINGS		MAX FUEL		ACT. FUEL		RUN TIME		MAXIMUM POUNDS PER HOUR		ESTIMATED TONS	
		Diesel Engines		HP		GAL/HR		GAL/D		SCF/HR		SCF/D				OF Submarine/air - Drilling & Completion Operations	
		Nat. Gas Engines		HP		SCF/HR		SCF/D		HR/D		DAYR					
		Burners		MMBTU/HR		SCF/HR		SCF/D		HR/D		DAYR					

AIR EMISSIONS CALCULATIONS - 8TH YEAR

COMPANY		AREA		BLOCK	LEASE	FACILITY	WELL				CONTACT	PHONE	REMARKS	
OPERATIONS		EQUIPMENT		EQUIPMENT ID	RATING	MAX. FUEL	ACT. FUEL	RUN TIME						
		Diesel Engines		HP	HP	GAL/HR	GAL/D							
		Nat. Gas Engines		MMBTU/Hr	SCF/Hr	SCF/D	HR/D	D/YR	TSP	PM10	PM2.5	SOx	NOx	VOC
		Burners		MMBTU/Hr	SCF/Hr	SCF/D	HR/D	D/YR	TSP	PM10	PM2.5	SOx	NOx	VOC
DRILLING	VESSELS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS - Diesel Boiler			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00
VESSELS - Drilling Prime Engine, Auxiliary				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00
FACILITY INSTALLATION				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00
VESSELS - Heavy LR Vessel/Derrick Barge Diesel				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00
BPD				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00
DRILLING WELL TEST	Liquid Flaring			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00
	COMBUSTION FLARE - no smoke			0	162500	0	24	7	0.00	0.00	0.00	0.09	11.00	5.94
	COMBUSTION FLARE - light smoke			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	--
	COMBUSTION FLARE - medium smoke			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	--
	COMBUSTION FLARE - heavy smoke			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	--
ALASKA-SPECIFIC SOURCES				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00
VESSELS - Ice Management Diesel				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00
2034 Facility Total Emissions				0	0	0.00	0	0	45.18	26.85	25.27	0.72	1,046.05	35.68
EXEMPTION CALCULATION														
DISTANCE FROM LAND IN MILES														
40.0														
VESSELS														
2034 Non-Facility Total Emissions									10.16	6.13	6.95	0.15	243.40	7.00

AIR EMISSIONS CALCULATIONS - 9TH YEAR

COMPANY		AREA		BLOCK	LEASE	FACILITY	WELL	CONTACT										PHONE	REMARKS									
OPERATIONS		EQUIPMENT		EQUIPMENT ID	RATING	MAX. FUEL	ACT. FUEL	RUN TIME	ESTIMATED TONS										ESTIMATED TONS									
		Diesel Engines		HP	GAL/HR	GAL/D			MAXIMUM POUNDS PER HOUR																			
		Nat. Gas Engines		HP	SCFH	SCFD																						
		Burners		MMBTU/HR	SCFH	SCFD	HR/D	D/YR	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3		
DRILLING	VESSELS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	VESSELS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	VESSELS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	VESSELS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	VESSELS - Diesel Boiler			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
VESSELS - Drilling Prime Engine, Auxiliary				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
FACILITY INSTALLATION				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
VESSELS - Heavy Lift Vessel/Derrick Barge Diesel				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
BPD				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
DRILLING WELL TEST	Liquid Flaring			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	COMBUSTION FLARE - no smoke			0	162500	0	24	7	0.00	0.00	0.00	0.00	0.09	11.00	5.84	--	52.89	--	0.00	0.00	0.00	0.01	0.97	0.49	--	4.44		
	COMBUSTION FLARE - light smoke			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00		
	COMBUSTION FLARE - medium smoke			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00		
COMBUSTION FLARE - heavy smoke				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00		
ALASKA-SPECIFIC SOURCES				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
VESSELS - Ice Management Diesel				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00		
2005 Facility Total Emissions				0	0	0.00	0	0	45.18	26.85	25.27	0.72	1,046.05	35.68	0.00	215.14	0.30	46.83	26.13	27.29	0.69	1,118.18	32.61	0.00	179.67	0.33		
EXEMPTION CALCULATION																												
DISTANCE FROM LAND IN MILES																												
40.0																												
DRILLING	VESSELS - Crew Diesel			7200	370.4112	8889.87	6	39	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	0.59	0.35	0.34	0.01	14.08	0.40	0.00	2.21	0.00		
	VESSELS - Supply Diesel			7200	370.4112	8889.87	10	77	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	1.96	1.16	1.15	0.03	46.94	1.35	0.00	7.36	0.01		
	VESSELS - Tugs Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	VESSELS - Material Tug Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
FACILITY INSTALLATION	VESSELS - Crew Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	VESSELS - Support Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	On-Ice Equipment			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	Man Camp - Operation (maximum people per day)			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
ALASKA-SPECIFIC SOURCES				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
On-Ice Equipment				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Man Camp - Operation (maximum people per day)				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
VESSELS				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00		
On-Ice - Loader				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00		
On-Ice - Other Construction Equipment				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00		
On-Ice - Other Survey Equipment				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00		
On-Ice - Tractor				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00		
On-Ice - Truck (for gravel island)				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00		
On-Ice - Truck (for survey)				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00		
Man Camp - Operation				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00		
VESSELS - Hovercraft Diesel				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00		
2005 Non-Facility Total Emissions				0	0	0.00	0	0	10.16	6.13	5.95	0.15	243.40	7.00	0.00	38.18	0.07	2.58	1.64	1.49	0.04	61.02	1.75	0.00	9.97	0.02		

AIR EMISSIONS CALCULATIONS - 10TH YEAR

COMPANY		AREA		BLOCK	LEASE	FACILITY	WELL				CONTACT	PHONE	REMARKS							
OPERATIONS		EQUIPMENT		EQUIPMENT ID	RATING	MAX. FUEL	ACT. FUEL	RUN TIME	MAXIMUM POUNDS PER HOUR											
		Diesel Engines		HP	GAL/HR	SCF/D	GAL/D													
		Nat. Gas Engines		HP	SCF/HR	SCF/D														
		Burners		MMBTU/Hr	SCF/Hr	SCF/D	HR/D	D/YR	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3			
																		ESTIMATED TONS		
DRILLING	VESSELS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
FACILITY INSTALLATION		VESSELS - Heavy LR Vessel/Derrick Barge Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
DRILLING WELL TEST	Liquid Flaring			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
ALASKA-SPECIFIC SOURCES		VESSELS - Ice Management Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
2036 Facility Total Emissions				0	0	0.00	0	0	45.18	26.85	25.27	0.72	1,046.05	35.68	0.00	215.14	0.30	46.83		
EXEMPTION CALCULATION		DISTANCE FROM LAND IN MILES		40.0																
DRILLING	VESSELS - Crew Diesel			7200	370.4112	8889.87	6	39	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	0.59		
				7200	370.4112	8889.87	10	77	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	1.96		
				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
FACILITY INSTALLATION	VESSELS - Material Trg Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
PRODUCTION	VESSELS - Support Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
ALASKA-SPECIFIC SOURCES		On-Ice Equipment																		
		Man Camp - Operation (maximum people per day)																		
		VESSELS																		
		On-Ice - Loader		0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00		
		On-Ice - Other Construction Equipment		0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00		
		On-Ice - Other Survey Equipment		0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00		
		On-Ice - Tractor		0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00		
		On-Ice - Truck (for gravel island)		0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00		
		On-Ice - Truck (for survey)		0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00		
		Man Camp - Operation		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00		
		VESSELS - Hovcraft Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00		
2036 Non-Facility Total Emissions									10.16	6.13	6.95	0.15	243.40	7.00	0.00	38.18	0.07	2.58		

AIR EMISSIONS CALCULATIONS

COMPANY	AREA	BLOCK	LEASE	FACILITY	WELL	
LOG Exploration Offshore, L.L.C	589	OCS-G-35979		MC 589 001 ST01		

Year	Facility Emitted Substance								
	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3
2027	46.63	28.13	27.29	0.69	1118.18	32.61	0.00	179.67	0.33
2028	46.63	28.13	27.29	0.69	1118.18	32.61	0.00	179.67	0.33
2029	46.63	114.09	27.29	0.69	1118.18	32.61	0.00	179.67	0.33
2030	46.63	28.13	27.29	0.69	1118.18	32.61	0.00	179.67	0.33
2031	46.63	28.13	27.29	0.69	1118.18	32.61	0.00	179.67	0.33
2032	46.63	28.13	27.29	0.69	1118.18	32.61	0.00	179.67	0.33
2033	46.63	28.13	27.29	0.69	1118.18	32.61	0.00	179.67	0.33
2034	46.63	28.13	27.29	0.69	1118.18	32.61	0.00	179.67	0.33
2035	46.63	28.13	27.29	0.69	1118.18	32.61	0.00	179.67	0.33
2036	46.63	28.13	27.29	0.69	1118.18	32.61	0.00	179.67	0.33
Allowable	1332.00			1332.00	1332.00	1332.00		39766.64	

APPENDIX H
OIL SPILL INFORMATION
(30 CFR PART 550.219 AND 550.250)

A. Oil Spill Response Planning

All the proposed activities in this Supplemental Exploration Plan will be covered by the Oil Spill Response Plan filed by LLOG (No. 02058) in accordance with 30 CFR 254 our biennial update was filed on June 17, 2026 and was found to be in compliance on July 17, 2026.

B. Spill Response Sites

The following locations will be used in the event an oil spill occurs as a result of the proposed activities.

Primary Response Equipment Location	Pre-Planned Staging Location(s)
Houma, LA	Fort Jackson, LA

C. OSRO Information

The O'Brien Group (TOG) will provide trained personnel capable of providing supervisory management of the oil spill response in addition to contacting and deploying cleanup personnel and equipment.

LLOG utilizes Clean Gulf Associates (CGA) as it's primary provider for equipment, which is an industry cooperative owning an inventory of oil spill clean-up equipment. CGA is supported by the Marine Spill Response Corporation's (MSRC), which is responsible for storing, inspecting, maintaining, and dispatching CGA's equipment. The MSRC STARS network provides for the closest available personnel, as well as an MSRC supervisor to operate the equipment.

D. Worst-Case Scenario Information

<i>Category</i>	<i>Regional OSRP</i>	<i>EP</i>
Type of Activity	Exploratory MODU	Exploratory MODU
Facility Surface Location	Mississippi Canyon Block 386/387	Mississippi Canyon Block 589
Facility Description	Location Well 001 (Revised Location B)	Loc A
Distance to Nearest Shoreline (Miles)	58 miles	40 miles
Volume: Storage Tanks (total) Facility Piping (total) Lease Term Pipeline Uncontrolled Blowout (day) Barging Potential 24 Hour Volume (bbls)	396,602 bbls	314,400 bbls
Type of Liquid Hydrocarbon	Crude Oil	Crude Oil
API Gravity	25°	31.8°

LLOG Exploration Offshore, L.L.C. (LLOG) has the capability to respond to the appropriate worst-case spill scenario included in its regional OSRP Plan, filed by LLOG (No. 02058) in accordance with 30 CFR 254, our biennial update was filed on June 17, 2026 and was found to be in compliance on July 17, 2026.

Since LLOG Exploration Offshore, L.L.C. (LLOG) has the capability to respond to the appropriate worst-case spill scenario included in its regional OSRP Plan filed by LLOG (Operator No.02058) in accordance with 30 CFR 254 Biennial update modification approved on July 21, 2020 and since the worst case discharge determined in Exploration Plan for Mississippi Canyon Block 387 is the worst case discharge outlined in our Regional OSRP, I hereby certify that LLOG Exploration Offshore, L.L.C. has the capability to respond, to the maximum extent practicable, to a worst-case discharge, or a substantial threat of such a discharge, resulting from the activities proposed in this Exploration Plan.

LLOG Exploration Offshore, L.L.C., Company No. 02058, previously submitted the Regional OSRP Exploration WCD volume in Plan R-6763, Revised Exploration Plan, which was approved on November 2, 2018.

The required proprietary data outlined in NTL 2015-N01 was submitted to BOEM within the Confidential Copy of the Revised Exploration Plan, R-6763.

LLOG Exploration Offshore, L.L.C., Company No. 02058 will not use any new or unusual technology in responding to an oil spill.

E. Oil Spill Response Discussion

See the following Oil Spill Response Discussion.

SPILL RESPONSE DISCUSSION

For the purpose of NEPA and Coastal Zone Management Act analysis, the largest spill volume originating from the proposed activity would be a well blowout during drilling operations, estimated to be 314,400 barrels of crude oil with an API gravity of 31.8°.

Land Segment and Resource Identification

Trajectories of a spill and the probability of it impacting a land segment have been projected utilizing information in the BOEM Oil Spill Risk Analysis Model (OSRAM) for the Central and Western Gulf of Mexico available on the BOEM website. The results are shown in **Figure 2**. The BOEM OSRAM identifies an 8% probability of impact to the shorelines of Plaquemines Parish, Louisiana within 30 days. Plaquemines Parish includes Barataria Bay, the Mississippi River Delta, Breton Sound and the affiliated islands and bays. This region is an extremely sensitive habitat and serves as a migratory, breeding, feeding and nursery habitat for numerous species of wildlife. Beaches in this area vary in grain particle size and can be classified as fine sand, shell or perched shell beaches. Sandy and muddy tidal flats are also abundant. **Figure 1** contains a list of environmental sensitivities found in Plaquemines Parish.

Figure 1 – Environmental Sensitivities

Sensitive Areas	Descriptions	Access	Wildlife	Contact
1) DELTA NATIONAL WILDLIFE REFUGE	48,800 acres of marsh, shallow ponds, channels and bayous. Provides a winter sanctuary for migratory waterfowl such as snow geese and more than 18 species of ducks. Also the home of many other water birds and various wildlife species.	By boat only.	RTE: Brown pelican, American alligator Others: Waterfowl (winter), peregrine falcon, sea birds, shore birds, bass, bream, catfish, crappie, drum, garfish, redfish, speckled trout, flounder, nutria, mink, otter, muskrat, raccoon, white-tailed deer	Delta NWR Bayou Lacombe Centre 61389 Hwy 434 Lacombe, LA 70445 Phone: (985) 882-2000
2) PASS A LOUTRE WILDLIFE MANAGEMENT AREA	66,000 acres characterized by river channels with attendant pass banks, natural bayous and man-made canals which are interspersed with intermediate and fresh marshes. Furbearers and alligators are fairly common in the marsh. Freshwater finfish flourish in the interior marsh ponds.	By boat only, however, the tributaries along the Mississippi River provide excellent traveling passages. The nearest public launches are in Venice.	RTE: Brown pelican, American alligator Others: Waterfowl (winter), peregrine falcon, sea birds, shore birds, bass, bream, catfish, crappie, drum, watermouth, garfish, redfish, speckled trout, flounder, nutria, mink, otter, muskrat, raccoon, white-tailed deer	Pass A Loutre WMA Hammond Field Office 42371 Phyllis Ann Drive Hammond, LA 70403 Phone (985) 543-4777
3) FINE SAND BEACHES	Beaches with low slopes and a grain-size of 0.625 to 0.200 mm. Low percentage of shells and hash. Major fine sand beaches on the delta plain are found at Southwest Pass, Pelican Island and Chandeleur Island.	By boat only.		N/A
4) PERCHED SHELL BEACHES	Shoreline type where a thin shell beach overlies a fresh or salt marsh with an eroded marsh platform outcropping in the surf zone. Organic debris is common to this shoreline type. Where the marsh platform outcrops on the shoreline, it can become re-vegetated by marsh grass.	By boat only.		N/A

Sensitive Areas	Descriptions	Access	Wildlife	Contact
5) SHELL BEACHES	Shoreline types comprised of almost entirely of shell. Shell material may be in the form of shell hash or whole shells. Shell beaches form extremely steep beach faces. Major shell beaches on the delta plain are found at Point Au Fer and Shell Island.	By boat only.		N/A
6) MUDDY TIDAL FLATS	Shoreline types comprised of broad intertidal areas consisting of mud and minor amounts of shell hash. The grain-size is smaller than 0.0625 mm. Muddy tidal flats are typically found in association with prograding river mouths. Major muddy tidal flats on the delta plain are found at the Mississippi and Atchafalaya River mouths.	By boat only.		N/A
7) SANDY TIDAL FLATS	Shoreline types comprised of broad intertidal areas consisting of fine and coarse grain sand and minor amounts of shell hash. Mean grain size is between 0.0625 and 0.4 mm. Typically found in association with barrier island and tidal inlet systems. This type of flat is submerged during each tidal cycle and at low tide may be 100-200 m wide. Slight changes in water levels can produce significant shoreline changes. Low water levels can expose extensive tidal flat areas to oiling. Major sandy tidal flats on the delta plain are found at Barataria Bay and the Mississippi River mouth.	By boat only.		N/A

Areas of Socio-Economic Concern in Plaquemines Parish:

- Commercial fishing routes
 - o South Pass
 - o Tiger Pass
 - o Barataria Waterway

Protection Priorities for Plaquemines Parish:

- Delta National Wildlife Refuge
- Pass-A-Loutre Wildlife Management Area
- Other coastal marshes

Response

General Considerations for all Oil Spill Recovery Operations (Refer to the Tactics discussion below for more detail)

LLOG Exploration Offshore, L.L.C. will use all appropriate measures possible to safely and efficiently recover all oil spills from its facilities. These include but are not limited to:

- Conducting detailed safety analyses on all operations and preparing/disseminating resulting safety plans to all response personnel
- Use of tactics described in the most current *MSRC Gulf Area Tactics Guide Book* and *CGA Equipment Guide Book and Tactic Manual* and any other appropriate tactics developed during the event
- Configuring all surface recovery systems to achieve maximum throughput and recovery efficiency rates:
 - Maximization of the use of advanced and adverse weather recovery systems to increase oil to recovery system encounter rates
 - Use of vessels with the largest possible onboard recovered oil storage to minimize off-load times
 - Use of appropriate vessels to deploy ocean boom to form the widest practical width to maximize oil to recovery system encounter rate
 - Use of appropriate recovery systems to maximize recovery rate in all operable environmental conditions
- Early deployment of MSRC's Responder class OSRVs and large OSRBs along with CGA's 95' vessels and HOSS Barge to recover and store oil while minimizing rig/derig and transit time, maximizing onboard storage and on-station time
- Obtaining early approval for decanting of oil to maximize storage capacity
- Use of most efficient, high volume pumps for oil recovery and decanting, offloading and lightering
- Use of advanced technology (such as thermal infrared and multi-spectral cameras) to detect oil on the water's surface and classify it as recoverable or non-recoverable. This will allow more efficient use of on-water recovery task forces, maximize recovery rates and expand operational windows. This advanced technology is effective in both day and night time surveillance activities depending upon atmospheric conditions
- Early consideration of advanced oil removal methods (e.g. dispersant application and in-situ burning) and coordination/consultation with the USCG and appropriate Regional Response Team for obtaining permission to proceed as necessary
- Providing effective communication systems to allow for the command and control of deployed resources to ensure safety, reduce response times, and collect information necessary to develop a comprehensive, timely, and accurate Common Operating Picture (COP)

LLOG Exploration Offshore, L.L.C. will make every effort to respond to the Worst Case Discharge as effectively as practicable. A description of the response equipment under contract to contain and recover the Worst Case Discharge is shown in **Figure 2**.

Using the estimated chemical and physical characteristics of crude oil, an ADIOS weathering model was run on a similar product from the ADIOS oil database. The results indicate 15% or approximately 47,160 barrels of crude oil would be evaporated/dispersed within 24 hours, with approximately 267,240 barrels remaining.

Spill Response MC 589, Well Location A	Barrels of Oil
WCD Volume	314,400
Less 15% natural evaporation/dispersion	47,160
Remaining volume	267,240

Figure 3 outlines equipment, personnel, materials and support vessels as well as temporary storage equipment available to respond to the worst case discharge. The volume accounts for the amount remaining after evaporation/dispersion at 24 hours. The list estimates individual times needed for procurement, load out, travel time to the site and deployment. **Figure 3** also indicates how operations will be supported.

LLOG Exploration Offshore, L.L.C.'s Oil Spill Response Plan includes alternative response technologies such as dispersants and in-situ burn. Strategies will be decided by Unified Command based on an operations safety analysis, the size of the spill, weather and potential impacts. If aerial dispersants are utilized, 8 sorties (9,600 gallons) from two of the DC-3 aircrafts and 4 sorties (8,000 gallons) from the Basler aircraft would provide a daily dispersant capability of 7,540 barrels. If the conditions are favorable for in-situ burning, the proper approvals have been obtained and the proper planning is in place, in-situ burning of oil may be attempted. Slick containment boom would be immediately called out and on-scene as soon as possible. Offshore response strategies may include attempting to skim utilizing CGA and MSRC spill response equipment, with a total derated skimming capacity of 1,189,841 barrels. Temporary storage associated with skimming equipment equals 407,896 barrels. If additional storage is needed, various tank barges with a total of 1.33 million+ barrels of storage capacity may be mobilized and centrally located to provide temporary storage and minimize off-loading time. **Safety is first priority. Air monitoring will be accomplished and operations deemed safe prior to any containment/skimming attempts.**

If the spill went unabated, shoreline impact in Plaquemines Parish, Louisiana would depend upon existing environmental conditions. Shoreline protection would include the use of CGA and MSRC near shore and shallow water skimmers with a totaled derated skimming capacity 289,041 barrels. Temporary storage associated with skimming equipment equals 8,937 barrels. If additional storage is needed, various tank barges with a total of 281,000+ barrels of storage capacity may be mobilized and centrally located to provide temporary storage and minimize off-loading time. Onshore response may include the deployment of shoreline boom on beach areas, or protection and sorbent boom on vegetated areas. Master Service Agreements with AMPOL and OMI Environmental will ensure access to 134,100 feet of 18" shoreline protection boom. **Figure 3** outlines individual times needed for procurement, load out, travel time to the site and deployment. Strategies would be based upon surveillance and real time trajectories that depict areas of potential impact given actual sea and weather conditions. Applicable Area Contingency

Plans (ACPs), Geographic Response Plans (GRPs), and Unified Command (UC) will be consulted to ensure that environmental and special economic resources are correctly identified and prioritized to ensure optimal protection. Shoreline protection strategies depict the protection response modes applicable for oil spill clean-up operations. As a secondary resource, the State of Louisiana Initial Oil Spill Response Plan will be consulted as appropriate to provide detailed shoreline protection strategies and describe necessary action to keep the oil spill from entering Louisiana's coastal wetlands. The UC should take into consideration all appropriate items detailed in Tactics discussion of this Appendix. The UC and their personnel have the option to modify the deployment and operation of equipment to allow for a more effective response to site-specific circumstances. LLOG Exploration Offshore, L.L.C.'s contract Spill Management Team has access to the applicable ACP(s) and GRP(s).

Based on the anticipated worst case discharge scenario, LLOG Exploration Offshore, L.L.C. can be onsite with contracted oil spill recovery equipment with adequate response capacity to contain and recover surface hydrocarbons, and prevent land impact, to the maximum extent practicable, within an estimated 67 hours (based on the equipment's Effective Daily Recovery Capacity (EDRC)).

Tactics

Initial Response Considerations

Actual actions taken during an oil spill response will be based on many factors to include but not be limited to:

- Safety
- Weather
- Equipment and materials availability
- Ocean currents and tides
- Location of the spill
- Product spilled
- Amount spilled
- Environmental risk assessments
- Trajectory and product analysis
- Well status, i.e., shut in or continuous release

LLOG Exploration Offshore, L.L.C. will take action to provide a safe, aggressive response to contain and recover as much of the spilled oil as quickly as it is safe to do so. In an effort to protect the environment, response actions will be designed to provide an “in-depth” protection strategy meant to recover as much oil as possible as far from environmentally sensitive areas as possible. Safety will take precedence over all other considerations during these operations.

Coordination of response assets will be supervised by the designation of a SIMOPS group as necessary for close quarter vessel response activities. Most often, this group will be used during source control events that require a significant number of large vessels operating independently to complete a common objective, in close coordination and support of each other. This group must also monitor the subsurface activities of each vessel (ROV, dispersant application, well control support, etc.). The SIMOPS group leader reports to the Source Control Section Chief.

In addition, these activities will be monitored by the spill management team (SMT) and Unified Command via a structured Common Operating Picture (COP) established to track resource and slick movement in real time.

Upon notification of a spill, the following actions will be taken:

- Information will be confirmed
- An assessment will be made and initial objectives set
- OSROs and appropriate agencies will be notified
- ICS 201, Initial Report Form will be completed
- Initial Safety plan will be written and published
- Unified Command will be established
 - o Overall safety plan developed to reflect the operational situation and coordinated objectives
 - o Areas of responsibility established for Source Control and each surface operational site
 - o On-site command and control established

Decanting Strategy

Recovered oil and water mixtures will typically separate into distinct phases when left in a quiescent state. When separation occurs, the relatively clean water phase can be siphoned or decanted back to the recovery point with minimal, if any, impact. Decanting therefore increases the effective on-site oil storage capacity and equipment operating time. FOSC/SOSC approval will be requested prior to decanting operations. This practice is routinely used for oil spill recovery.

Offshore Response Actions – Equipment Deployment

Surveillance

- Aerial Observation:
 - Deployment of surveillance aircraft within two hours of QI notification, or at first light
 - Trained observer to provide on site status reports
 - Aerial photography and visual confirmation
- Command and control platform at the site if needed
- Remote Sensing:
 - Use of thermal infrared and multi-spectral sensing systems or other technology to detect oil and classify it as recoverable or non-recoverable to enhance on-water recovery capability
 - Surveillance platforms should be appropriate for weather and atmospheric conditions to provide the greatest altitude (e.g. aircraft, aerostats or ship mounted)
 - Continued surveillance of oil movement by remote sensing systems
- Continuous monitoring of vessel assets using vessel monitoring systems

Dispersant application assets

- Put aerial dispersant providers on standby
- With the FOSC, conduct analysis to determine appropriateness of dispersant application (refer to Section 18 of approved Oil Spill Response Plan)
- Gain FOSC approval for use of dispersants on the surface
- Confirm dispersant availability for current and long range operations
- Deploy aircraft in accordance with a plan developed for the actual situation
- Coordinate deployment of a Special Monitoring of Applied Response Technologies (SMART) team as required
- Coordinate movement of dispersants, aircraft, and support equipment and personnel
- Initiate orders for additional dispersant stocks required for expected operations

Containment boom

- Call out early and expedite deployment to be on scene ASAP
- Ensure boom handling and mooring equipment is deployed with boom
- Provide continuous reports to vessels to expedite their arrival at sites and provide for most effective containment
- Use Vessels of Opportunity (VOO) to deploy and maintain boom
- Deploy CGA 300 Oceangoing Boom Barge
- Deploy MSRC OSRVs and OSRBs with onboard ocean boom inventories
- Additional significant stockpiles of boom are available in CGA and MSRC warehouses

Dedicated off-shore skimming systems

General

- Deployed to the highest concentration of oil
- Assets deployed at safe distance from aerial dispersant and in-situ burn operations

CGA HOSS Barge

- Integrated Infrared Camera and X-Band Radar system allowing for 24/7 oil spill detection, tracking, and oil recovery capability
- Helideck and onboard accommodations for 16 people
- Consider for use in areas of known debris (seaweed, and other floating materials)

CGA 95' Fast Response Vessels (FRVs)

- Designed to be a first vessel on scene
- Capable of maintaining the initial command and control function for on-water recovery operations
- 24 hour oil spill detection capability
- Highly mobile and efficient skimming capability
- Use as far off-shore as safely possible

CGA Fast Response Units (FRU)

- Skid-based skimming system to be deployed from a vessel of opportunity (VOO)
- Use as far off-shore as allowed

T&T Koseq Rigid Sweeping Arms

- High volume skimming system to be deployed from Platform Supply Vessel (PSV)
- Use as far off-shore as allowed

MSRC Responder Class Vessels / Oil Spill Response Vessels (OSRV)

- Use in areas with heaviest oil concentrations
- Use as near-shore as allowed by draft of vessel
- Use as far off-shore as needed
- Consider for use in areas of known debris (seaweed and other floating materials)

MSRC Oil Spill Response Barges (OSRB)

- Use for oil removal operations and storage in areas with heaviest oil concentrations, as appropriate
- Consider for use in areas of known debris (seaweed and other floating materials)

MSRC PSV-VOO Skimming Systems

- Use in areas with heaviest oil concentrations
- Use as near-shore as allowed by draft of vessel
- Use as far off-shore as needed
- Expected 24-hour mobilization
- Expected length of 200 foot or greater
- PSV-VOO with deck space of 150' x 40' to provide space for skimmer, marine storage tanks and boom
- PSV-VOO with 2,000-20,000 bbl below deck storage supplemented with two or more 500 bbl marine portable tanks depending on below deck storage compatibility with flashpoint of recovered product

Storage Vessels

- Establish availability of contracted assets (See Appendix E of OSRP)
- Early call out (to allow for tug boat acquisition and deployment speeds)
- Phase mobilization to allow storage vessels to arrive with skimming systems
- Position as closely as possible to skimming assets to minimize offloading time

Vessels of Opportunity (VOO)

- Use LLOG Exploration Offshore, L.L.C.'s contracted resources as applicable
- Industry vessels are ideal for deployment of VOSS
- Acquire additional resources as needed
- Consider use of local assets, i.e. fishing and pleasure craft
- Expect mission specific and safety training to be required
- Plan with the USCG/American Bureau of Shipping (ABS) for vessel inspections
- Place VOOs in task forces as needed
- Use organic onboard storage if appropriate
- Maximize non-organic storage appropriate to vessel limitations
- Decant as appropriate after approval has been granted
- Assign bulk storage barges to each task force
- Position bulk storage barges as close to skimming units as possible
- Utilize large skimming vessel (e.g. barges) storage for smaller vessel offloading
- Maximize skimming area (swath) to the optimum width given sea conditions and available equipment
- Maximize use of oleophilic skimmers in all operations, especially offshore
- Near shore, use shallow water barges and shuttle to skimming units for minimization of offloading time
- Plan and equip to use all offloading capabilities of the storage vessel for minimization of offloading time

In-situ Burn Assets

- Determine appropriateness of in-situ burning in coordination with the FOSC and affected SOSC
- Determine availability of fire boom and selected ignition systems
- Determine assets to perform on-water operations
- Build operations into safety plan
- Initiate orders for additional fire boom stocks required for expected operations
- Ensure VOO crew members are trained prior to operations
- Conduct initial test burn to ensure effectiveness
- Conduct operations in accordance with an approved plan

Adverse Weather Operations:

In adverse weather, when seas are ≥ 3 feet, the use of larger recovery and storage vessels, oleophilic skimmers, and large offshore boom will be maximized. Safety will be the overriding factor and operations will cease at the order of the Unified Command, vessel captain. In an emergency, "stop work" may be directed by any crew member.

Surface Oil Recovery Considerations and Tactics (Offshore and Near-shore Operations)

Maximization of skimmer-oil encounter rate

- Place barges in skimming task forces to reduce recovered oil offloading time
- Place barges alongside skimming systems for immediate offloading of recovered oil when practicable
- Use two vessels, each with heavy sea boom, in an open-ended “V” configuration to funnel surface oil into a trailing skimming unit’s organic, V-shaped boom and skimmer (see page 7, *CGA Equipment Guide Book and Tactic Manual* (CGATM))
- Use secondary vessels and heavy sea boom to widen boom swath beyond normal skimming system limits (see page 15, CGATM)
- Consider night-time operations, first considering safety issues
- Utilize all available advanced technology systems (IR, X-Band Radar, etc.) to determine the location of recoverable oil
- Confirm the presence of recoverable oil prior to movement of vessels

Maximize skimmer system efficiency

- Obtain authorization for decanting of recovered water as soon as possible
- Place weir skimming systems in areas of calm seas and thick oil
- Maximize the use of oleophilic skimming systems in heavier seas
- Place less mobile, high EDRC systems (barges) in the largest areas of heaviest oil
- Maximize onboard recovered oil storage for vessels
- Use smaller, more agile skimming systems to recover streamers of oil normally found farther from the source. Place recovered oil barges nearby

Recovered Oil Storage

- Procure and deploy the maximum number of portable tanks to support VOSS if onboard storage is not available
- Maximize use of the organic recovered oil storage capacity of the skimming vessel
- Place barges in skimming task forces to reduce recovered oil offloading time
- Use smaller barges in larger quantities to increase flexibility for multi-location skimming operations

Command, Control, and Communications (C³)

- Publish, implement, and fully test an appropriate communications plan
- Design an operational scheme, maintaining a manageable span of control
- Designate and mark C³ vessels for easy aerial identification
- Designate and employ C³ aircraft for task forces
- Use reconnaissance aircraft and Rapid Response Teams (RRT) to confirm the presence of recoverable oil

CGA On-Water Recovery Group

When the first skimming vessel arrives on scene, a complete site assessment will be conducted before recovery operations begin. Once it is confirmed that the air monitoring readings for O₂, LEL, H₂S, CO, VOC, and Benzene are all within the permissible limits, oil recovery operations may begin.

As skimming vessels arrive, they will be organized to work in areas that allow for the most efficient vessel operation and free vessel movement in the recovery of oil. Vessel groups and Task Forces (TF) will vary in structure as determined by the Operations Section of the Unified Command, but will generally consist, at a minimum, of the following dedicated assets:

- (3-5) Offshore skimming vessels (recovery)
- (1) Tank barge (temporary storage)
- (1) Air asset (tactical direction)
- (2) Support vessels (crew/utility for supply)
- (6-10) Boom vessels (enhanced booming)

Example (Note: Actual organization of TFs will be dependent on several factors including, asset availability, weather, spilled oil migration, currents, etc.)

The 95' FRV Breton Island out of Venice arrives on scene and conducts an initial site assessment. Air monitoring levels are acceptable and no other visual threats have been observed. The area is cleared for safe skimming operations. The Breton Island assumes command and control (CoC) of on-water recovery operations until a dedicated non-skimming vessel arrives to relieve it of those duties.

A second 95' FRV arrives and begins recovery operations alongside the Breton Island. Several more vessels begin to arrive, including a third 95' FRV out of Galveston, the HOSS Barge out of Harvey, boom barge (CGA 300) with 25,000' of 42" auto boom out of Leeville, and 9 Fast Response Units (FRUs) from the pre-determined load-out location.

As these vessels set up and begin skimming, they are grouped into task forces as directed by the Operations Section of the Unified Command located at the command post.

Initial set-up and potential actions:

- A 1,000 meter safety zone has been established around the incident location for vessels involved in Source Control
- The HOSS Barge is positioned facing the incident location just outside of this safety zone or at the point where the freshest oil is reaching the surface
- The HOSS Barge engages its Oil Spill Detection (OSD) system to locate the heaviest oil and maintains that ability for 24-hour operations
- The HOSS Barge deploys 1,320' of 67" Sea Sentry boom on each side, creating a swath width of 800'
- The Breton Island and H.I. Rich skim nearby, utilizing the same OSD systems as the HOSS Barge to locate and recover oil
- Two FRUs join this group and it becomes TF1
- The remaining 7 FRUs are split into a 2 and 3 vessel task force numbered TF2 and TF3
- A 95' FRV is placed in each TF
- The boom barge (CGA 300) is positioned nearby and begins deploying auto boom in sections between two utility vessels (1,000' to 3,000' of boom, depending on conditions) with chain-link gates in the middle to funnel oil to the skimmers
- The initial boom support vessels position in front of TF2 and TF3
- A 100,000+ barrel offshore tank barge is placed with each task force as necessary to facilitate the immediate offload of skimming vessels

The initial task forces (36 hours in) may be structured as follows:

TF 1

- 1 – 95' FRV
- 1 – HOSS Barge with 3 tugs
- 2 – FRUs
- 1 – 100,000+ barrel tank barge and associated tug(s)
- 1 – Dedicated air asset for tactical direction
- 8 – 500' sections of auto boom with gates
- 8 – Boom-towing vessels
- 2 – Support vessels (crew/utility)

TF 2

- 1 – 95' FRV
- 4 – FRUs
- 1 – 100,000+ barrel tank barge and associated tug(s)
- 1 – Dedicated air asset for tactical direction
- 10 – 500' sections of auto boom with gates
- 10 – Boom-towing vessels
- 2 – Support vessels (crew/utility)

TF 3

- 1 – 95' FRV
- 3 – FRUs
- 1 – 100,000+ barrel tank barge and associated tug(s)
- 1 – Dedicated air asset for tactical direction
- 8 – 500' sections of auto boom with gates
- 8 – Boom-towing vessels
- 2 – Support vessels (crew/utility)

Offshore skimming equipment continues to arrive in accordance with the ETA data listed in **Figure 3**. This equipment includes 2 AquaGuard skimmers and 11 sets of Koseq Rigid Skimming Arms. These high volume heavy weather capable systems will be divided into functional groups and assigned to specific areas by the Operations Section of the Unified Command.

At this point of the response, the additional TFs may assume the following configurations:

TF 4

- 2 – Sets of Koseq Rigid Skimming Arms w/ associated 200'+ OSV/PSV
- 1 – AquaGuard Skimmer
- 1 – 100,000+ barrel tank barge and associated tug(s)
- 1 – Dedicated air asset for tactical direction
- 2 – Support vessels (crew/utility)
- 6 – 500' sections of auto boom with gates
- 6 – Boom-towing vessels

TF 5

- 3 – Sets of Koseq Rigid Skimming Arms w/ associated 200'+ OSV/PSV
- 1 – AquaGuard Skimmer
- 1 – 100,000+ barrel tank barge and associated tug(s)
- 1 – Dedicated air asset for tactical direction
- 2 – Support vessels (crew/utility)
- 8 – 500' sections of auto boom with gates
- 8 – Boom-towing vessels

TF 6

- 3 – Sets of Koseq Rigid Skimming Arms w/ associated 200'+ OSV/PSV
- 1 – 100,000+ barrel tank barge and associated tug(s)
- 1 – Dedicated air asset for tactical direction
- 2 – Support vessels (crew/utility)
- 6 – 500' sections of auto boom with gates
- 6 – Boom-towing vessels

TF 7

- 3 – Sets of Koseq Rigid Skimming Arms w/ associated 200'+ OSV/PSV
- 1 – 100,000+ barrel tank barge and associated tug(s)
- 1 – Dedicated air asset for tactical direction
- 2 – Support vessels (crew/utility)
- 6 – 500' sections of auto boom with gates
- 6 – Boom-towing vessels

CGA Minimum Acceptable Capabilities for Vessels of Opportunity (VOO)

Minimum acceptable capabilities of Petroleum Industry Designed Vessels (PIDV) for conducting Vessel of Opportunity (VOO) skimming operations are shown in the table below. PIDVs are “purpose-built” to provide normal support to offshore oil and gas operators. They include but are not limited to utility boats, offshore supply vessels, etc. They become VOOs when tasked with oil spill response duties.

Capability	FRU	KOSEQ	AquaGuard
Type of Vessel	Utility Boat	Offshore/Platform Supply Vessel	Utility Boat
Operating parameters			
Sea State	3-5 ft max	9.8 ft max	3-5 ft max
Skimming speed	≤1 kt	≤3 kts	≤1 kt
Vessel size			
Minimum Length	100 ft	200 ft	100 ft
Deck space for: • Tank(s) • Crane(s) • Boom Reels • Hydraulic Power Units • Equipment Boxes	18x32 ft	100x50 ft	18x32 ft
Communication Assets	Marine Band Radio	Marine Band Radio	Marine Band Radio

Tactical use of Vessels of Opportunity (VOO): LLOG Exploration Offshore, L.L.C. will take all possible measures to maximize the oil-to-skimmer encounter rate of all skimming systems, to include VOOs, as discussed in this section. VOOs will normally be placed within an on-water recovery unit as shown in figures below.

Skimming Operations: PIDVs are the preferred VOO skimming platform. OSROs are more versed in operating on these platforms, and the vessels are generally large enough with crews versed in spill response operations. They also have a greater possibility of having onboard storage capacity and are the most likely vessels to be under contract, therefore more readily available to the operator. These vessels will normally be assigned to an on-water recovery task force (see figure below) and outfitted with a VOSS suited for their size and capabilities. Specific tactics used for skimming operations will be dependent upon many parameters which include, but are not limited to, safety concerns, weather, type VOSS onboard, product being recovered, and area of oil coverage. Planners will deploy these assets with the objective of safely maximizing the oil-to-skimmer encounter rate by taking actions to minimize non-skimming time and maximize boom swath. Examples of specific tactical configurations are shown in the figures below.

Fast Response Unit (FRU): A self-contained, skid based, skimming system that is deployed from the right side of a vessel of opportunity (VOO). An outrigger holds a 75’ long section of air inflatable boom in place that directs oil to an apex for recovery via a Foilex 250 weir skimmer. The outrigger creates roughly a 40’ swath width dependent on the VOO beam. The lip of the collection bowl on the skimmer is placed as close to the oil and water interface as possible to maximize oil recovery and minimize water retention. The skimmer then pumps all fluids recovered to the storage tank where it is allowed to settle, and with the approval of the USCG, the water is decanted from the bottom of the tank back into the water ahead of the containment boom to be recycled through the system. Once the tank is full of as much pure recovered oil as possible it is offloaded to a storage barge for disposal in accordance with an approved disposal plan. A second 100 barrel storage tank can be added if the appropriate amount of deck space is available to use as secondary storage.

Tactical Overview

Mechanical Recovery – The FRU is designed to provide fast response skimming capability in the offshore and nearshore environment in a stationary or advancing mode. It provides a rated daily recovery capacity of 4,251 barrels. An additional boom reel with 440' of offshore boom and a second support vessel for boom towing can be deployed along with the FRU to extend the swath width when attached to the end of the fixed boom. The range and sustainability offshore is dependent on the VOO that the unit is placed on, but generally these can stay offshore for extended periods. The FRU works well independently or assigned with other on-water recovery assets in a task force. In either case, it is most effective when a designated aircraft is assigned to provide tactical direction to ensure the best placement in recoverable oil.

Maximum Sea Conditions – Under most circumstances the FRU can maintain standard oil spill recovery operations in 2' to 4' seas. Ultimately, the USCG licensed Captain in charge of the VOO (with input from the CGAS Supervisor assigned) will be responsible for determining when sea conditions have surpassed the vessel's safe operating capabilities.

Possible Task Force Configuration (Multiple VOOs can be deployed in a task force)

- 1 – VOO (100' to 165' Utility or Supply Vessel)
- 1 – Boom reel w/support vessel for towing
- 1 – Tank barge (offshore) for temporary storage
- 1 – Utility/Crewboat (supply)
- 1 – Designated spotter aircraft



The VOSS (yellow) is being deployed and connected to an out-rigged arm. This is suitable for collection in both large pockets of oil and for recovery of streaming oil. The oil-to-skimmer encounter rate is limited by the length of the arm. Skimming pace is ≤ 1 knot.



Through the use of an additional VOO, and using extended sea boom, the swath of the VOSS is increased therefore maximizing the oil-to-skimmer encounter rate. Skimming pace is ≤ 1 knot.

The Koseq Rigid Sweeping Arm: A skimming system deployed on a vessel of opportunity. It requires a large Offshore or Platform Supply Vessel (OSV/PSV), greater than 200' with at least 100' x 50' of free deck space. On each side of the vessel, a 50' long rigid framed Arm is deployed that consists of pontoon chambers to provide buoyancy, a smooth nylon face, and a hydraulically adjustable mounted weir skimmer. The arm floats independently of the vessel and is attached by a tow bridle and a lead line. The movement of the vessel forward draws the rubber end seal of the arm against the hull to create a collection point for free oil directed to the weir by the arm face. The collection weir is adjusted to keep the lip as close to the oil water interface as possible to maximize oil recovery while attempting to minimize excess water collection. A transfer pump (combination of positive displacement, screw type and centrifuge suited for highly viscous oils) pumps the recovered liquid to portable tanks and/or dedicated fixed storage tanks onboard the vessel. After being allowed to sit and separate, with approval from the USCG, the water can be decanted (pumped off) in front of the collection arm to be reprocessed through the system. Once full with as much pure recovered oil as possible, the oil is transferred to a temporary storage barge where it can be disposed of in accordance with an approved disposal plan.

Tactical Overview

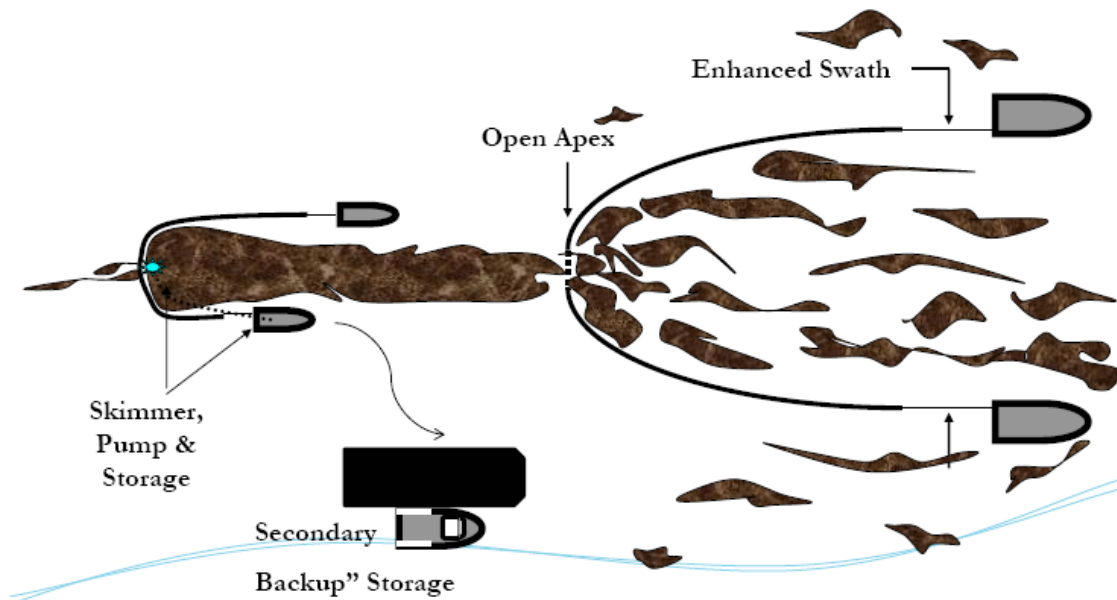
Mechanical Recovery – Deployed on large vessels of opportunity (VOO) the Koseq Rigid Sweeping Arms are high volume surge capacity deployed to increase recovery capacity at the source of a large oil spill in the offshore and outer nearshore environment of the Gulf of Mexico. They are highly mobile and sustainable in rougher sea conditions than normal skimming vessels (9.8' seas). The large Offshore Supply Vessels (OSV) required to deploy the Arms are able to remain on scene for extended periods, even when sea conditions pick up. Temporary storage on deck in portable tanks usually provides between 1,000 and 3,000 bbls. In most cases, the OSV will be able to pump 20% of its deadweight into the liquid mud tanks in accordance with the vessels Certificate of Inspection (COI). All storage can be offloaded utilizing the vessels liquid transfer system.

Maximum Sea Conditions - Under most circumstances the larger OSVs are capable of remaining on scene well past the Skimming Arms maximum sea state of 9.8'. Ultimately it will be the decision of the VOO Captain, with input from the T&T Supervisor onboard, to determine when the sea conditions have exceeded the safe operating conditions of the vessel.

Command and Control – Many large OSV/PSVs have state of the art communication and electronic systems, as well as the accommodations to support the function of directing all skimming operations offshore and reporting back to the command post.

Possible Task Force Configuration (Multiple Koseq VOOs can be deployed in a task force)

- 1 – $\geq$ 200' OSV/PSV with set of Koseq Arms
- 2-4 – Portable storage tanks (500 bbl)
- 1 – Modular Crane Pedestal System set (MCPS) or 30 cherry picker (crane) for deployment
- 1 – Tank barge (offshore) for temporary storage
- 1 – Utility/Crewboat (supply)
- 1 – Designated spotter aircraft
- 4 – Personnel (T&T)



Scattered oil is “caught” by two VOO and collected at the apex of the towed sea boom. The oil moves through a “gate” at that apex, forming a larger stream of oil which moves into the boom of the skimming vessel. Operations are paced at ≤ 3 knots. A recovered oil barge stationed nearby to minimize time taken to offload recovered oil.



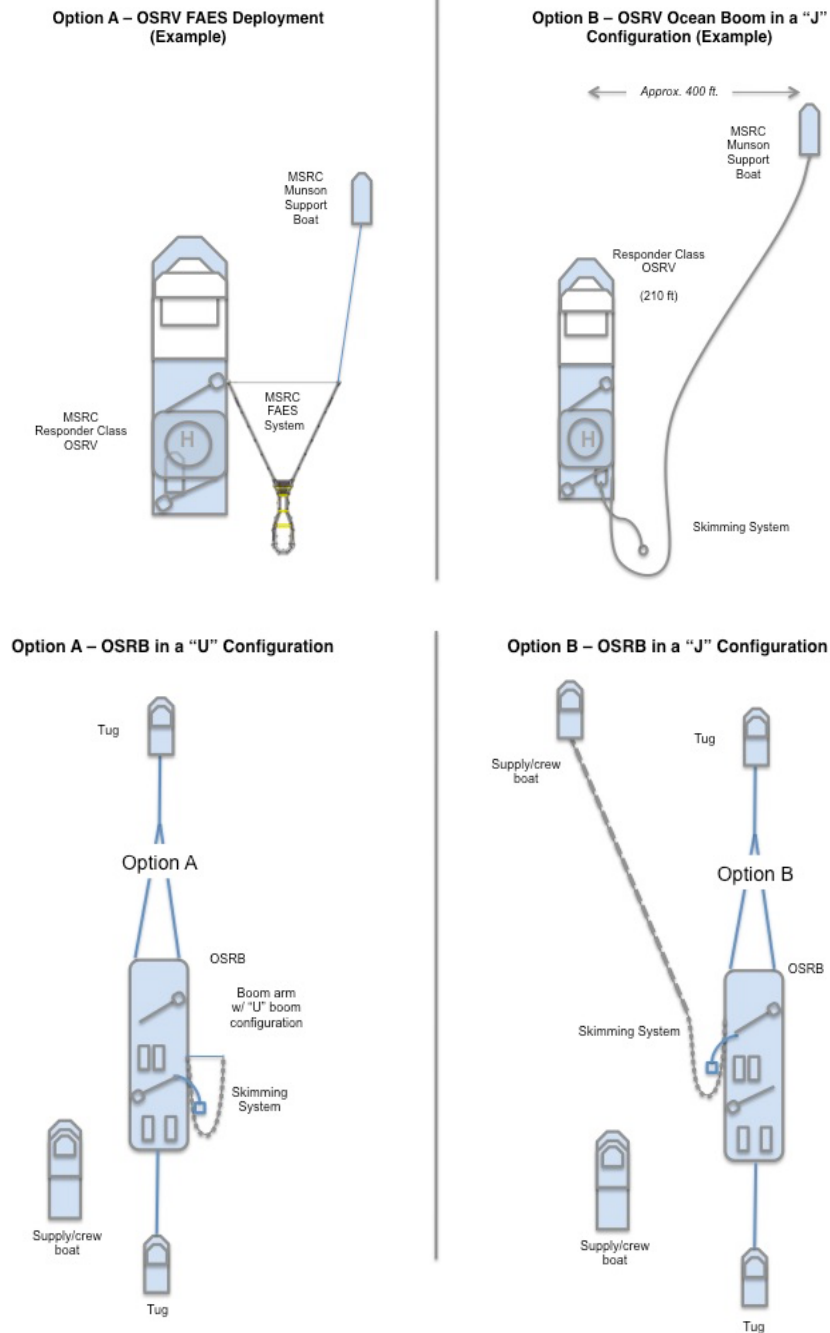
This is a depiction of the same operation as above using KOSEQ Arms. In this configuration, the collecting boom speed dictates the operational pace at ≤ 3 knots to minimize entrainment of the oil.

Clean Gulf Associates (CGA) Procedure for Accessing Member-Contracted and other Vessels of Opportunity (VOOs) for Spill Response

- CGA has procedures in place for CGA member companies to acquire VOOs from an existing CGA member's contracted fleet or other sources for the deployment of CGA portable skimming equipment including Koseq Arms, FRUs, and any other portable skimming system(s) deemed appropriate for the response for a potential or actual oil spill, WCD oil spill or a Spill of National Significance (SONS).
- CGA uses Port Vision, a web-based vessel and terminal interface that empowers CGA to track vessels through *Automatic Identification System* (AIS) and terminal activities using a Geographic Information System (GIS). It provides live AIS/GIS views of waterways showing current vessel positions, terminals, created vessel fleets, and points-of-interest. Through this system, CGA has the ability to get instant snapshots of the location and status of all vessels contracted to CGA members, day or night, from any web-enabled PC.

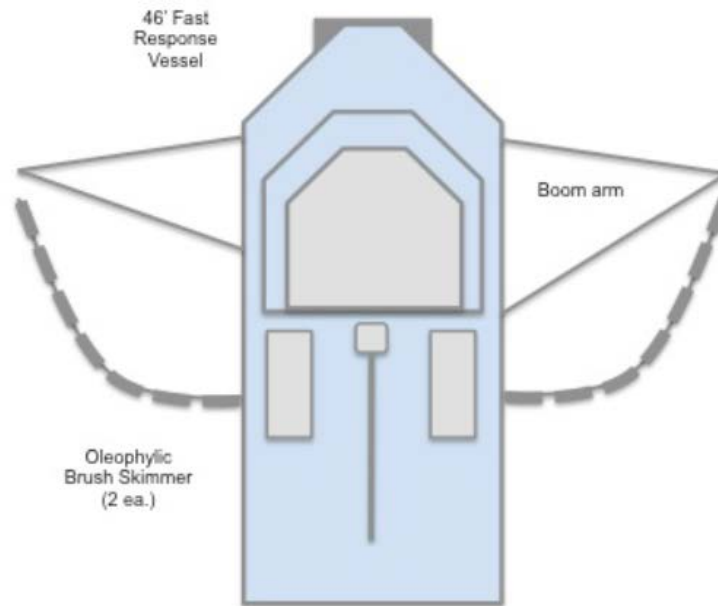
MSRC Typical On-Water Oil Recovery and Removal Tactics *(See MSRC Gulf Area Tactics Guidebook for more information)*

Mechanical Recovery Large Scale Resources

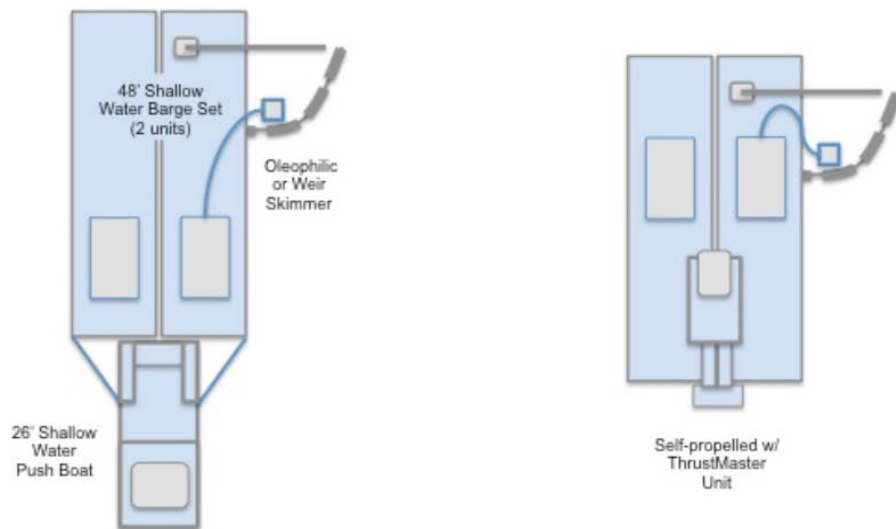


MSRC Small Scale Resources

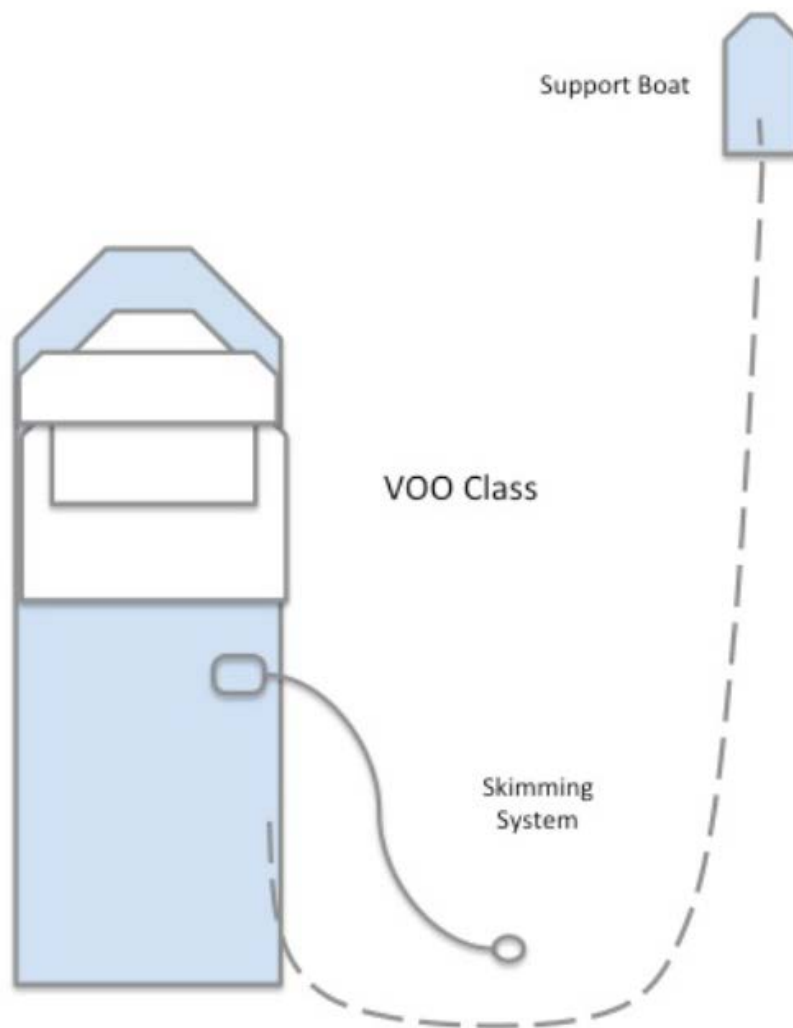
TACTIC DIAGRAM (EXAMPLE) NOT TO SCALE



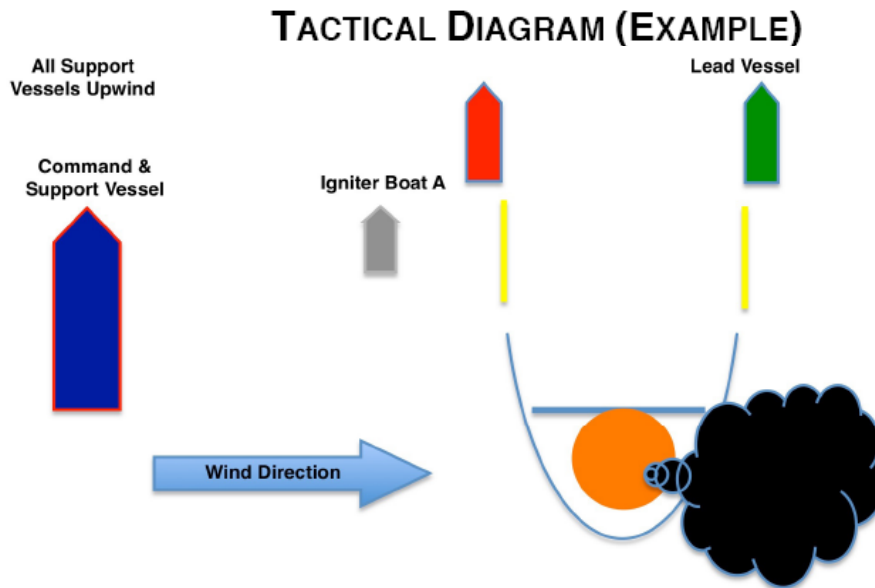
TACTIC DIAGRAM (EXAMPLE) OPTION A NOT TO SCALE



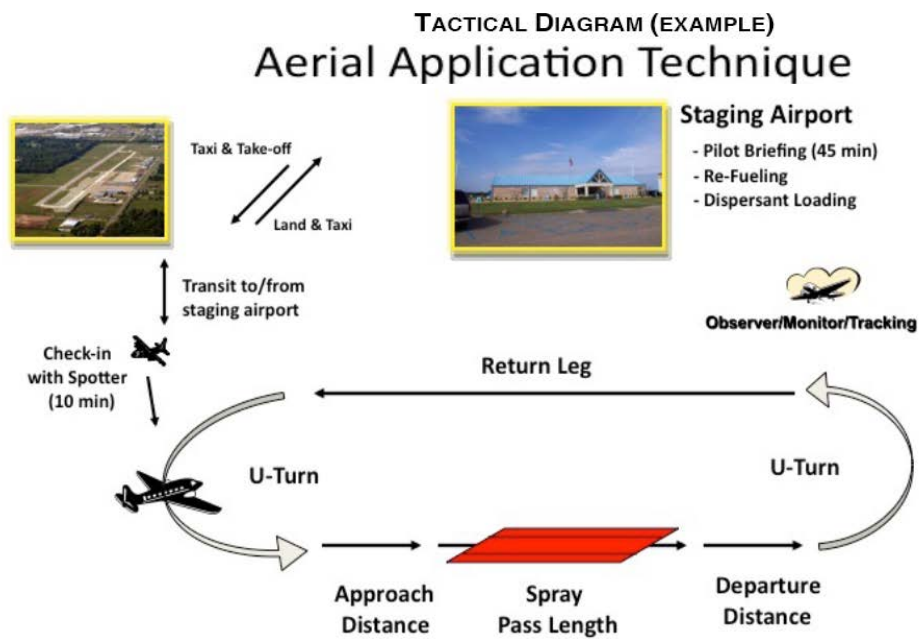
TACTIC DIAGRAM (EXAMPLE)
NOT TO SCALE



MSRC In-situ Burn (ISB)



MSRC Aerial Dispersant



Near Shore Response Actions

Timing

- Put near shore assets on standby and deploy in accordance with planning based on the actual situation, real time trajectories and oil budgets
- VOO identification and training in advance of spill nearing shoreline if possible
- Outfitting of VOOs for specific missions
- Deployment of assets based on actual movement of oil

Considerations

- Water depth, vessel draft
- Shoreline gradient
- State of the oil
- Use of VOOs
- Distance of surf zone from shoreline

Surveillance

- Provide trained observer to direct skimming operations
- Continuous surveillance of oil movement by remote sensing systems, aerial photography and visual confirmation
- Continuous monitoring of vessel assets

Dispersant Use

- Generally will not be approved within 3 miles of shore or with less than 10 meters of water depth
- Approval would be at Regional Response Team level (Region 6)

Dedicated Near Shore skimming systems

- CGA
 - o 46' FRVs
 - o Egmpol and Marco SWS skimmers
 - o 56; Shallow Water skimming vessels
- MSRC Kvichaks
 - o Kvichaks
 - o Quick Strike and Lightning FRVs
 - o AardVac, Queensboro, and WP 1 skimmers
- Operate with aerial spotter directing systems to observed oil slicks

VOO

- Use LLOG Exploration Offshore, L.L.C.'s contracted resources as applicable
- Acquire additional resources as needed
- Consider use of local assets, i.e. fishing and pleasure craft
- Expect mission specific and safety training to be required
- Plan with the USCG for vessel inspections
- Operate with aerial spotter directing systems to oil patches

Shoreline Protection Operations

Response Planning Considerations

- Review appropriate Area Contingency Plan(s)
- Locate and review appropriate Geographic Response and Site Specific Plans
- Refer to appropriate Environmentally Sensitive Area Maps
- Ensure capability of continuous analysis of trajectories run periodically during response
- Run environmental risk assessments (ERA) to determine priorities for area protection
- Allow time to acquire personnel and equipment
- As a secondary reference, refer to the State of Louisiana Initial Oil Spill Response Plan, Deep Water Horizon, dated 2 May 2010
- Perform aerial surveillance of oil movement
- Perform Pre-impact beach cleaning and debris removal
- Adhere to Shoreline Cleanup Assessment Team (SCAT) operations and reporting procedures
- Determine requirements and availability of boom types, sizes and lengths
- Consider need for in-situ burning in near shore areas
- Assess current wildlife situation, especially status of migratory birds and endangered species
- Check for archeological sites and arrange assistance for the appropriate state agency when planning operations may impact these areas

Placement of boom

- Position boom in accordance with the information gained from references listed above and based on the actual situation
- Determine areas of natural collection and develop booming strategies accordingly
- Assess timing of boom placement based on the most current trajectory analysis and the availability of each type of boom needed. Determine an overall booming priority and conduct booming operations accordingly. Consider:
 - Trajectories
 - Weather forecast
 - Oil impact forecast
 - Verified spill movement
 - Boom, manpower and vessel (shallow draft) availability
 - Near shore boom and support material, (stakes, anchors, line)

Beach Preparation Considerations and Actions

- Use of a 10 mile go/no-go line to determine timing of beach cleaning
- SCAT reports and recommendations
- Monitor tide tables and weather to determine extent of high tides
- Pre-clean beaches by moving waste above high tide lines to minimize waste
- Determine logistical requirements of waste removal and disposal
- Stage equipment and housing of response personnel as close to job site as possible to maximize on-site work time
- Tend to boom, repair, replace and secure as needed (use of local assets may be advantageous)
- Maintain constant awareness of weather and oil movement for resource re-deployment as necessary

- Consider earthen berms and shoreline protection boom to protect sensitive inland areas
- Requisition earth moving equipment
- Plan for efficient and safe use of personnel, ensuring:
 - A continuous supply of the proper Personal Protective Equipment (PPE)
 - Heating or cooling areas when needed
 - Medical coverage
 - Command and control systems (i.e. communications)
 - Personnel accountability measures
- Assess remediation requirements, i.e., replacement of sands, rip rap, etc.
- Ensure availability of surface washing agents and associated protocol requirements for their use (see National Contingency Plan (NCP) Product Schedule for list of possible agents)
- Discuss with all stakeholders, i.e., land owners, refuge/park managers, and others as appropriate, covering the following:
 - Access to areas
 - Possible response measures and impact of property and ongoing operations
 - Determination of any specific safety concerns
 - Any special requirements or prohibitions
 - Area security requirements
 - Handling of waste
 - Remediation expectations
 - Vehicle traffic control
 - Domestic animal safety concerns
 - Wildlife or exotic game concerns/issues

Inland and Coastal Marsh Protection and Response Considerations and Actions

- All considered response methods will be weighed against the possible damage they may do to the marsh. Methods will be approved by Unified Command only after discussions with local Stakeholder, as identified above
 - In-situ burn may be considered when marshes have been impacted
- Passive clean up of marshes should be considered and appropriate stocks of sorbent boom and/or sweep obtained.
- Response personnel must be briefed on methods to traverse the marsh, i.e.,
 - use of appropriate vessel
 - use of temporary walkways or road ways
- Discuss and gain approval prior to cutting or moving vessels through vegetation
- Discuss use of vessels that may disturb wildlife, i.e, airboats
- Ensure safe movement of vessels through narrow cuts and blind curves
- Consider the possibility that no response in a marsh may be best
- In the deployment of any response asset, actions will be taken to ensure the safest, most efficient operations possible. This includes, but is not limited to:
 - Planning for stockage of high use items for expeditious replacement
 - Use of shallow water craft
 - Use of communication systems appropriate ensure command and control of assets
 - Use of appropriate boom in areas that can offer effective protection
 - Planning of waste collection and removal to maximize cleanup efficiency
- Consideration of on-site remediation of contaminated soils to minimize replacement operations and impact on the area

FIGURE 2
TRAJECTORY BY LAND SEGMENT

Trajectory of a spill and the probability of it impacting a land segment have been projected utilizing LLOG Exploration Offshore, L.L.C.'s WCD and information in the BOEM Oil Spill Risk Analysis Model (OSRAM) for the Central and Western Gulf of Mexico available on the BOEM website using 30 day impact. The results are tabulated below.				
Area/Block	OCS-G	Launch Area	Land Segment and/or Resource	Conditional Probability (%) within 30 days
Exploratory Drilling MC 589, Well Location A <i>40 statute miles from shore</i>	G35979	C58	Galveston, TX	1
			Jefferson, TX	1
			Cameron, LA	3
			Vermilion, LA	2
			Iberia, LA	1
			Terrebonne, LA	3
			Lafourche, LA	3
			Jefferson, LA	1
			Plaquemines, LA	8
			St. Bernard, LA	1
			Okaloosa, FL	1

WCD Scenario– BASED ON WELL BLOWOUT DURING DRILLING OPERATIONS (40 statute miles from shore)

267,240 bbls of crude oil (Volume considering natural weathering)

API Gravity 31.8°

FIGURE 3 – Equipment Response Time to MC 589, Well Location A

Dispersants/Surveillance

Dispersant/Surveillance	Dispersant Capacity (gal)	Persons Req.	From	Hrs to Procure	Hrs to Loadout	Travel to site	Total Hrs
ASI							
Basler 67T	2000	2	Houma	2	2	0.7	4.7
DC 3	1200	2	Houma	2	2	0.9	4.9
DC 3	1200	2	Houma	2	2	0.9	4.9
Aero Commander	NA	2	Houma	2	2	0.7	4.7
MSRC							
C-130 Spray AC	3,250	2	Kiln	4	0	0.4	4.4
King Air BE90 Spray AC	250	2	Kiln	4	0	0.7	4.7

Offshore Response

Offshore Equipment Pre-Determined Staging	EDRC	Storage Capacity	VOO	Persons Required	From	Hrs to Procure	Hrs to Loadout	Hrs to GOM	Travel to Spill Site	Hrs to Deploy	Total Hrs
CGA											
HOSS Barge	76285	4000	3 Tugs	8	Harvey	6	0	12	6	2	26
95' FRV	22885	249	NA	6	Leeville	2	0	2	4	1	9
95' FRV	22885	249	NA	6	Venice	2	0	3	2.5	1	8.5
95' FRV	22885	249	NA	6	Vermilion	2	0	3	8	1	14
95' FRV	22885	249	NA	6	Galveston	2	0	2	18	1	23
Boom Barge (CGA-300) 42" Auto Boom (25000')	NA	NA	1 Tug 50 Crew	4 (Barge) 2 (Per Crew)	Leeville	8	0	4	11.5	2	25.5

Offshore Response

Offshore Equipment No Staging	EDRC	Storage Capacity	VOO	Persons Required	From	Hrs to Procure	Hrs to Loadout	Hrs to GOM	Travel to Spill Site	Hrs to Deploy	Total Hrs
MSRC											
Louisiana Responder Transrec 350 + OSRV 2,640' 67" Curtain Pressure Boom	10567	4000	NA	10	Fort Jackson	2	0	4	7	1	14
MSRC 452 Offshore Barge 1 Crucial Disk 88/30 2,640' 67" Curtain Pressure Boom	11122	45000	3 Tugs	9	Fort Jackson	4	0	6	11	1	22
Mississippi Responder Transrec 350 + OSRV 2,640' 67" Curtain Pressure Boom	10567	4000	NA	10	Pascagoula	2	0	2	10	1	15
MSRC 402 Offshore Barge 1 Crucial Disk 88/30 2,640' 67" Curtain Pressure Boom	11122	40300	3 Tugs	9	Pascagoula	4	0	3	18	1	26
S.T. Benz Responder 1 LFF 100 Brush 2,640' 67" Curtain Pressure Boom	18086	4000	NA	10	Grand Isle, LA	3	0	1	6	1	11
Gulf Coast Responder Transrec 350 + OSRV 2,640' 67" Curtain Pressure Boom	10567	4000	NA	10	Lake Charles	2	0	4	19.5	1	26.5
Texas Responder Transrec 350 + OSRV 2,640' 67" Curtain Pressure Boom	10567	4000	NA	10	Galveston	2	0	1	25	1	29
MSRC 570 Offshore Barge 1 Crucial Disk 88/30 2,640' 67" Curtain Pressure Boom	11122	56900	3 Tugs	9	Galveston	4	0	2	44	1	51
Southern Responder Transrec 350 + OSRV 2,640' 67" Curtain Pressure Boom	10567	4000	NA	10	Ingleside	2	0	2	34.5	1	39.5
MSRC 403 Offshore Barge 1 Crucial Disk 88/30 2,640' 67" Curtain Pressure Boom	11122	40300	3 Tugs	9	Ingleside	4	0	3	60	1	68
MSRC 360 Offshore Barge 1 Crucial Disk 88/30 1,320' 67" Curtain Pressure Boom	11122	36000	3 Tugs	9	Tampa	4	0	3	50	1	58
Florida Responder Transrec 350 + OSRV 2,640' 67" Curtain Pressure Boom	10567	4000	NA	10	Miami	2	0	1	50	1	54

Recovered Oil Storage No Staging	EDRC	Storage Capacity	VOO	Persons Required	From	Hrs to Procure	Hrs to Loadout	Hrs to GOM	Travel to Spill Site	Hrs to Deploy	Total Hrs
Kirby Offshore (available through contract with CGA)											
RO Barge	NA	80000+	1 Tug	6	Venice	52	0	2	6	0	60
RO Barge	NA	80000+	1 Tug	6	Venice	52	0	2	6	0	60
RO Barge	NA	80000+	1 Tug	6	Venice	52	0	2	6	0	60
RO Barge	NA	100000+	1 Tug	6	Venice	52	0	2	6	0	60
RO Barge	NA	100000+	1 Tug	6	Venice	52	0	2	6	0	60
RO Barge	NA	100000+	1 Tug	6	Venice	52	0	2	6	0	60
RO Barge	NA	100000+	1 Tug	6	Venice	52	0	2	6	0	60
RO Barge	NA	110000+	1 Tug	6	Venice	52	0	2	6	0	60
RO Barge	NA	130000+	1 Tug	6	Venice	52	0	2	6	0	60
RO Barge	NA	140000+	1 Tug	6	Venice	52	0	2	6	0	60
RO Barge	NA	150000+	1 Tug	6	Venice	52	0	2	6	0	60
RO Barge	NA	160000+	1 Tug	6	Venice	52	0	2	6	0	60

Loadout/Staging Area: Venice

Offshore Equipment With Staging	EDRC	Storage Capacity	VOO	Persons Req.	From	Hrs to Procure	Hrs to Loadout	Travel to Staging	Travel to Site	Hrs to Deploy	Total Hrs
CGA											
Hydro-Fire Boom	NA	NA	8 Utility	40	Harvey	0	24	2	4	6	36
MSRC											
67" Curtain Pressure Boom (53570')	NA	NA	80*	160	Houston	1	2	12	4	1	20
1000' Fire Resistant Boom	NA	NA	3*	6	Galveston	1	4	13	4	6	28
16000' Fire Resistant Boom	NA	NA	3*	6	Houston	1	4	12	4	6	27
2000' Hydro Fire Boom	NA	NA	8*	8	Lake Charles	1	4	8	4	6	23

* Utility Boats, Crew Boats, Supply Boats, or Fishing Vessels

Loadout/Staging Area: Venice

Offshore Equipment Preferred Staging	EDRC	Storage Capacity	VOO	Persons Req.	From	Hrs to Procure	Hrs to Loadout	Travel to Staging	Travel to Site	Hrs to Deploy	Total Hrs
T&T Marine (available through direct contract with CGA)											
Aqua Guard Triton RBS (1)	22323	2000	1 Utility	6	Galveston	4	12	13	4	2	35
Aqua Guard Triton RBS (1)	22323	2000	1 Utility	6	Harvey	4	12	2	4	2	24
Koseq Skimming Arms (10) Lamor brush	228850	60000	10 OSV	60	Galveston	24	24	13	4	2	67
Koseq Skimming Arms (6) MariFlex 150 HF	108978	36000	6 OSV	36	Galveston	24	24	13	4	2	67
Koseq Skimming Arms (2) Lamor brush	45770	12000	2 OSV	12	Harvey	24	24	2	4	2	56
Koseq Skimming Arms (4) MariFlex 150 HF	72652	24000	4 OSV	24	Harvey	24	24	2	4	2	56
CGA											
FRU (1) + 100 bbl Tank (2)	4251	200	1 Utility	6	Vermilion	2	6	6	4	1	19
FRU (1) + 100 bbl Tank (2)	4251	200	1 Utility	6	Galveston	2	6	13	4	1	26
FRU (1) + 100 bbl Tank (2)	4251	200	1 Utility	6	Aransas Pass	2	6	18	4	1	31
FRU (1) + 100 bbl Tank (2)	4251	200	1 Utility	6	Lake Charles	2	6	8	4	1	21
FRU (3) + 100 bbl Tank (6)	12753	600	3 Utility	18	Leeville	2	6	5	4	1	18
FRU (2) + 100 bbl Tank (4)	8502	400	2 Utility	12	Venice	2	6	0	4	1	13

Staging Area: Venice

Offshore Equipment Preferred Staging	EDRC	Storage Capacity	VOO	Persons Req.	From	Hrs to Procure	Hrs to Loadout	Travel to Staging	Travel to Site	Hrs to Deploy	Total Hrs
MSRC											
Crucial Disk 56/30 Skimmer (1)	5671	500	1 Utility	5	Ingleside	1	2	18	4	1	26
GT-185 Skimmer w Adaptor (1)	1371	400	1 Utility	5	Ingleside	1	2	18	4	1	26
Foilex 250 Skimmer (1)	3977	400	1 Utility	5	Ingleside	1	2	18	4	1	26
Stress I Skimmer (1)	15840	500	1 Utility	5	Ingleside	1	2	18	4	1	26
Walosep 4 Skimmer (1)	3017	400	1 Utility	5	Ingleside	1	2	18	4	1	26
Crucial Disk 88/30 Skimmer (1)	11122	500	1 PSV	9	Galveston	1	2	13	4	1	21
GT-185 Skimmer w Adaptor (2)	2742	400	2 Utility	10	Galveston	1	2	13	4	1	21
Walosep 4 Skimmer (1)	3017	400	1 Utility	5	Galveston	1	2	13	4	1	21
Foilex 250 Skimmer (1)	3977	400	1 Utility	5	Galveston	1	2	13	4	1	21
Stress I Skimmer (1)	15840	500	1 Utility	5	Galveston	1	2	13	4	1	21
GT-185 Skimmer w Adaptor (1)	1371	400	1 Utility	5	Port Arthur	1	2	10	4	1	18
Desmi Skimmer (1)	3017	400	1 Utility	5	Lake Charles	1	2	8	4	1	16
Foilex 250 Skimmer (1)	3977	400	1 Utility	5	Lake Charles	1	2	8	4	1	16
GT-185 Skimmer w Adaptor (1)	1371	400	1 Utility	5	Lake Charles	1	2	8	4	1	16
Stress I Skimmer (2)	31680	1000	2 Utility	10	Lake Charles	1	2	8	4	1	16
LFF 100 Brush Skimmer (1) <i>1,320' 67" Curtain Pressure Boom</i>	18086	400	1 PSV	9	Lake Charles	1	2	8	4	1	16
LFF 100 Brush Skimmer (1) <i>1,320' 67" Curtain Pressure Boom</i>	18086	400	1 PSV	9	Lake Charles	1	2	8	4	1	16
LFF 100 Brush Skimmer (1) <i>1,320' 67" Curtain Pressure Boom</i>	18086	400	1 PSV	9	Lake Charles	1	2	8	4	1	16
Transrec 350 Skimmer (1) <i>1,320' 67" Curtain Pressure Boom</i>	10567	400	1 PSV	9	Lake Charles	1	2	8	4	1	16
Transrec 350 Skimmer (1) <i>1,320' 67" Curtain Pressure Boom</i>	10567	400	1 PSV	9	Lake Charles	1	2	8	4	1	16

Staging Area: Venice

Offshore Equipment Preferred Staging	EDRC	Storage Capacity	VOO	Persons Req.	From	Hrs to Procure	Hrs to Loadout	Travel to Staging	Travel to Site	Hrs to Deploy	Total Hrs
MSRC											
GT-185 Skimmer w Adaptor (1)	1371	400	1 Utility	5	Baton Rouge	1	2	4.5	4	1	12.5
Stress I Skimmer (1)	15840	500	1 Utility	5	Grand Isle	1	2	5	4	1	15
LFF 100 Brush Skimmer (1) <i>1,320' 67" Curtain Pressure Boom</i>	10567	400	1 PSV	9	Houma	1	2	3.5	4	1	11.5
GT-185 Skimmer w Adaptor (1)	1371	400	1 Utility	5	Belle Chasse	1	2	2	4	1	10
Walosep W4 Skimmer (1)	3017	400	1 Utility	5	Belle Chasse	1	2	2	4	1	10
Foilex 250 Skimmer (1)	3977	400	1 Utility	5	Belle Chasse	1	2	2	4	1	10
Foilex 200 Skimmer (1)	1989	400	1 Utility	5	Belle Chasse	1	2	2	4	1	10
Crucial Disk 56/30 Skimmer (1)	5671	400	1 Utility	5	Belle Chasse	1	2	2	4	1	10
Desmi Skimmer (1)	3017	400	1 Utility	5	Fort Jackson	1	2	0.5	4	1	8.5
Stress I Skimmer (1)	15840	500	1 Utility	5	Fort Jackson	1	2	0.5	4	1	8.5
Crucial Disk 88/30 Skimmer (1) <i>1,320' 67" Curtain Pressure Boom</i>	11122	400	1 PSV	9	Fort Jackson	1	2	0.5	4	1	8.5
Crucial Disk 88/30 Skimmer (1) <i>1,320' 67" Curtain Pressure Boom</i>	11122	400	1 PSV	9	Fort Jackson	1	2	0.5	4	1	8.5
GT-185 Skimmer (1)	1371	400	1 Utility	5	Pascagoula	1	2	5.5	4	1	13.5
Crucial Disk 88/30 Skimmer (1)	11122	500	1 PSV	9	Pascagoula	1	2	5.5	4	1	13.5
Stress I Skimmer (1)	15840	500	1 Utility	5	Pascagoula	1	2	5.5	4	1	13.5
Stress II Skimmer (1)	3017	400	1 Utility	5	Pascagoula	1	2	5.5	4	1	13.5
Stress I Skimmer (1)	15840	400	1 Utility	5	Tampa	1	2	21	4	1	29
Crucial Disk 56/30 Skimmer (1)	5671	400	1 Utility	5	Tampa	1	2	21	4	1	29
GT-185 Skimmer w Adaptor (1)	1371	400	1 Utility	5	Tampa	1	2	21	4	1	29
GT-185 Skimmer w Adaptor (1)	1371	400	1 Utility	5	Miami	1	2	27	4	1	35
Walosep W4 Skimmer (1)	3017	400	1 Utility	5	Miami	1	2	27	4	1	35
Desmi Skimmer (1)	3017	400	1 Utility	5	Miami	1	2	27	4	1	35
Stress I Skimmer (1)	15840	400	1 Utility	5	Miami	1	2	27	4	1	35

Nearshore Response

Nearshore Equipment No Staging	EDRC	Storage Capacity	VOO	Persons Required	From	Hrs to Procure	Hrs to Loadout	Hrs to GOM	Travel to Spill Site	Hrs to Deploy	Total Hrs
CGA											
Mid-Ship SWS	22885	249	NA	4	Leeville	2	0	N/A	48	1	51
Mid-Ship SWS	22885	249	NA	4	Venice	2	0	N/A	48	1	51
Mid-Ship SWS	22885	249	NA	4	Galveston	2	0	N/A	48	1	51
Trinity SWS	21500	249	NA	4	Leeville	2	0	N/A	48	1	51
Trinity SWS	21500	249	NA	4	Lake Charles	2	0	N/A	48	1	51
Trinity SWS	21500	249	NA	4	Vermilion	2	0	N/A	48	1	51
Trinity SWS	21500	249	NA	4	Galveston	2	0	N/A	48	1	51
46' FRV	15257	65	NA	4	Aransas Pass	2	0	2	25	1	30
46' FRV	15257	65	NA	4	Leeville	2	0	2	2.5	1	7.5
46' FRV	15257	65	NA	4	Lake Charles	2	0	2	10	1	15
46' FRV	15257	65	NA	4	Venice	2	0	2	2.5	1	7.5
MSRC											
MSRC Lightning 2 LORI Brush Pack	5000	50	NA	6	Tampa	2	0	1	18.4	1	22.4
MSRC Quick Strike 2 LORI Brush Pack	5000	50	NA	6	Lake Charles	2	0	1	9.6	1	13.6
Enterprise Marine Services LLC (available through contract with CGA)											
CTCo 2603	NA	25000	1 Tug	6	Amelia	25	0	6	16	1	48
CTCo 2604	NA	20000	1 Tug	6	Amelia	25	0	6	16	1	48
CTCo 2605	NA	20000	1 Tug	6	Amelia	25	0	6	16	1	48
CTCo 2606	NA	20000	1 Tug	6	Amelia	25	0	6	16	1	48
CTCo 2607	NA	23000	1 Tug	6	Amelia	25	0	6	16	1	48
CTCo 2608	NA	23000	1 Tug	6	Amelia	25	0	6	16	1	48
CTCo 2609	NA	23000	1 Tug	6	Amelia	25	0	6	16	1	48
CTCo 5001	NA	47000	1 Tug	6	Amelia	25	0	6	16	1	48
Kirby Offshore (available through contract with CGA)											
RO Barge	NA	80000+	1 Tug	6	Venice	48	12	4	7	1	60

Staging Area: Venice

Nearshore Equipment With Staging	EDRC	Storage Capacity	VOO	Persons Req.	From	Hrs to Procure	Hrs to Load Out	Travel to Staging	Travel to Deployment	Hrs to Deploy	Total Hrs
CGA											
SWS Egmopol	1810	100	NA	3	Galveston	2	2	13	2	1	20
SWS Egmopol	1810	100	NA	3	Leeville	2	2	4.5	2	1	11.5
SWS Marco	3588	20	NA	3	Lake Charles	2	2	8	2	1	15
SWS Marco	3588	34	NA	3	Leeville	2	2	4.5	2	1	11.5
SWS Marco	3588	34	NA	3	Venice	2	2	2	2	1	9
Foilex Skim Package (TDS 150)	1131	50	NA	3	Harvey	4	12	2	2	2	22
4 Drum Skimmer (Magnum 100)	680	100	1 Crew	3	Lake Charles	2	2	8	2	1	15
4 Drum Skimmer (Magnum 100)	680	100	1 Crew	3	Harvey	2	2	2	2	1	9
2 Drum Skimmer (TDS 118)	240	100	1 Crew	3	Lake Charles	2	2	8	2	1	15
2 Drum Skimmer (TDS 118)	240	100	1 Crew	3	Harvey	2	2	2	2	1	9
MSRC											
30 ft. Kvichak <i>Marco I Skimmer</i>	3588	24	NA	2	Ingleside	1	1	18	2	1	23
30 ft. Kvichak <i>Marco I Skimmer</i>	3588	24	NA	2	Galveston	1	1	13	2	1	18
30 ft. Kvichak <i>Marco I Skimmer</i>	3588	24	NA	2	Belle Chasse	1	1	2	2	1	7
30 ft. Kvichak <i>Marco I Skimmer</i>	3588	24	NA	2	Pascagoula	1	1	5.5	2	1	10.5
AardVac Skimmer (1)	3840	400	1 Utility	4	Lake Charles	1	1	8	2	1	13
AardVac Skimmer (1)	3840	400	1 Utility	4	Pascagoula	1	1	5.5	2	1	10.5
AardVac Skimmer (2)	7680	800	2 Utility	8	Miami	1	1	27	2	1	32
Queensboro Skimmer (1)	905	400	1 Utility	4	Galveston	1	1	13	2	1	18
Queensboro Skimmer (5)	4525	2000	5 Utility	20	Lake Charles	1	1	8	2	1	13
Queensboro Skimmer (1)	905	400	1 Utility	4	Belle Chasse	1	1	2	2	1	7
Queensboro Skimmer (1)	905	400	1 Utility	4	Pascagoula	1	1	5.5	2	1	10.5
WP 1 Skimmer (1)	3017	400	1 Utility	4	Pascagoula	1	1	5.5	2	1	10.5
WP 1 Skimmer (1)	3017	400	1 Utility	4	Tampa	1	1	21	2	1	26
WP 1 Skimmer (1)	3017	400	1 Utility	4	Miami	1	1	27	2	1	32

Shoreline Protection

Staging Area: Venice

18" Shoreline Protection Boom	VOO	Persons Req.	Storage/Warehouse Location	Hrs to Procure	Hrs to Loadout	Travel to Staging	Travel to Deployment	Hrs to Deploy	Total Hrs
AMPOL (available through MSA)									
34,050' 18" Boom	13 Crew	26	New Iberia, LA	2	2	6	2	12	24
12,850' 18" Boom	7 Crew	14	Chalmette, LA	2	2	2.5	2	6	14.5
900' 18" Boom	1 Crew	2	Morgan City, LA	2	2	4.5	2	2	12.5
3,200' 18" Boom	2 Crew	4	Venice, LA	2	2	0	2	2	8
12,750' 18" Boom	7 Crew	14	Port Arthur, TX	2	2	10	2	6	22
OMI Environmental (available through MSA)									
12,500' 18" Boom	6 Crew	12	New Iberia, LA	1	1	6	2	3	13
6,400' 18" Boom	3 Crew	6	Houston, TX	1	1	12	2	3	19
3,500' 18" Boom	2 Crew	4	Port Arthur, TX	1	1	10	2	3	17
4,000' 18" Boom	2 Crew	4	Longview, TX	1	1	13	2	3	20
4,850' 18" Boom	2 Crew	4	Belle Chasse, LA	1	1	2	2	3	9
8,000' 18" Boom	3 Crew	6	Port Allen, LA	1	1	5	2	3	12
2,000' 18" Boom	1 Crew	2	Houma, LA	1	1	4	2	3	11
2,500' 18" Boom	1 Crew	2	Morgan City, LA	1	1	5	2	3	12
1,600' 18" Boom	1 Crew	2	Gonzalez, LA	1	1	4	2	3	11
1,900' 18" Boom	1 Crew	2	St. James, LA	1	1	4	2	3	11
2,000' 18" Boom	1 Crew	2	Galliano, LA	1	1	4	2	3	11
1,000' 18" Boom	1 Crew	2	St. Rose, LA	1	1	3	2	3	10
1,000' 18" Boom	1 Crew	2	Hackberry, LA	1	1	9	2	3	16
5,800' 18" Boom	3 Crew	6	Venice, LA	1	1	0	2	3	7
13,300' 18" Boom	6 Crew	12	Harvey, LA	1	1	2	2	3	9

Wildlife Response	EDRC	Storage Capacity	VOO	Persons Req.	From	Hrs to Procure	Hrs to Loadout	Travel to Staging	Travel to Deployment	Hrs to Deploy	Total Hrs
CGA											
Wildlife Support Trailer	NA	NA	NA	2	Harvey	2	2	2.1	1	2	9.1
Bird Scare Guns (48)	NA	NA	NA	2	Harvey	2	2	2.1	1	2	9.1
Bird Scare Guns (12)	NA	NA	NA	2	Galveston	2	2	13	1	2	20
Bird Scare Guns (12)	NA	NA	NA	2	Aransas Pass	2	2	17.8	1	2	24.8
Bird Scare Guns (24)	NA	NA	NA	2	Lake Charles	2	2	8	1	2	15
Bird Scare Guns (24)	NA	NA	NA	2	Leeville	2	2	4.6	1	2	11.6

Response Asset	Total
Offshore EDRC (bbls)	1,189,841
Offshore Recovered Oil Storage (bbls)	1,737,896+
Nearshore / Shallow Water EDRC (bbls)	289,041
Nearshore / Shallow Water Recovered Oil Storage (bbls)	289,937+

APPENDIX I
ENVIRONMENTAL MONITORING INFORMATION
(30 CFR PART 550.221 AND 550.252)

E. **Monitoring Systems**

LLOG subscribes to StormGeo Weather Service which provides access to real-time weather conditions and provides periodic updates on impending inclement weather conditions such as tropical depressions, storms and/or hurricanes entering the Gulf of Mexico.

LLOG also relies on the National Weather Service to support the aforementioned subscribed service. During impending inclement weather conditions, LLOG closely coordinates the activity with our contractors and field personnel to ensure the safety of people for evacuation; measures to prepare the facility for evacuation to ensure protection of the environment and the facility/equipment.

Mississippi Canyon Block 589 are in water depths greater than 400 meters (1,312'); therefore, LLOG will follow the guidelines of the applicable NTL 2018-G01 by monitoring and gathering ocean current data using Acoustic Doppler Current Profile (ADCP) while the MODU is on location.

E. **Incidental Takes**

LLOG is sensitive to the marine life and the environment we work in, especially regarding activities in or around the moon pool. LLOG will implement and adhere to, the BSEE NTL No. 2015-G03 “Marine Trash and Debris Awareness Training and Elimination” and BOEM NTL No. 2016-G01 “Vessel Strike Avoidance and Injured/Dead Protected Species Reporting”, and BOEM NTL No. 2016-G02 “Implementation of Seismic Survey Mitigation Measures and Protected Species Observer Program”. Moon pool daily observation log shall be maintained on the bridge. The deck supervisor on tour shall go to the bridge and log time, date, and results of each moon pool inspection. STOP WORK AUTHORITY shall be used and implemented, in a safe and timely manner, for any work that could affect marine life listed on the Endangered Species Act.

LLOG will operate in accordance with the regulations, agency guidance, and Appendix B of the National Marine Fisheries Service Endangered Species Act (ESA) Section 7 Biological Opinion, and also avoid accidental loss of solid waste items by maintaining waste management plans, manifesting trash sent to shore, and using special precautions such as covering outside trash bins to prevent accidental loss of solid waste. Special caution will be exercised when handling and disposing of small items and packaging materials, particularly those made of non-biodegradable, environmentally persistent

materials such as plastic or glass. LLOG will collect and remove flotsam resulting from activities related to proposed operations.

Informational placards will be posted on all vessels and facilities having sleeping or food preparation capabilities. All offshore personnel, including contractors and other support services-related personnel (e.g. helicopter pilots, vessel captains and boat crews) will be indoctrinated on waste procedures, and will view the video (or Microsoft PowerPoint presentation), “Think About It” (previously “All Washed Up: The Beach Litter Problem”). Thereafter, all personnel will view the marine trash and debris training video annually. Offshore personnel will also receive an explanation from LLOG management or the designated lease operator management that emphasizes their commitment to waste management in accordance with NTL No. 2015-G03-BSEE.

Contract vessel operators can avoid marine mammals and reduce potential deaths by maintaining a vigilant watch for marine mammals and maintaining a safe distance of 91 meters or greater from whales and a distance of 45 meters or greater from small cetaceans. When assemblages of cetaceans are observed vessel speeds will be reduced to 10 knots or less. Vessel personnel should use a Gulf of Mexico reference guide to help identify the twenty-one species of whales and dolphins, and the single species of manatee that may be encountered in the Gulf of Mexico OCS. Contract vessel operators will comply with the measures included in Appendix C of the NMFS Biological Opinion, BOEM NTL 2016-G01 “Vessel Strike Avoidance and Injured/Dead Protected Species Reporting” and requirements of the Protected Species Lease Stipulation, except under extraordinary circumstances when the safety of the vessel or crew is in doubt or the safety of life at sea is in question.

Vessel personnel must report sightings of any injured or dead protected marine mammal species immediately, regardless of whether the injury or death is caused by their vessel, to the NMFS Southeast Marine Mammal Stranding Hotline at (877) WHALE-HELP (877-942-5343). Additional information may be found at the following website: (<https://www.fisheries.noaa.gov/report>). Any injured or dead protected species should also be reported to takereport.nmfs@noaa.gov. In addition, if the injury or death was caused by a collision with the operator’s vessel, an entrapment within the operator’s equipment or vessel (e.g. moon pool), or an entanglement within the operator’s equipment, the operator must further notify BOEM and BSEE within 24 hours of the strike or entrapment/entanglement by email to protectedspecies@boem.gov and protectedspecies@bsee.gov. If the vessel is the responsible party, it is required to remain available to assist the respective salvage and stranding network as needed.

These proposed operations may utilize a moon pool(s) to conduct various subsea activities. LLOG’s contractor or company representative will provide a dedicated crew member to monitor and continually survey the moon pool area during the operations for sea turtles. If any sea turtle is detected in the moon pool, LLOG will cease operations and contact NMFS at nmfs.psoreview@noaa.gov and BSEE at protectedspecies@bsee.gov and 985-722-7902 for additional guidance and incidental report information. The procedures found in Appendix J of the NMFS Biological Opinion will be employed to free entrapped or entangled marine life safely.

The specific rig that will be used in the proposed operations has not been identified. A deepwater drilling rig, most likely a dual activity dynamically positioned Drillship with a moonpool will be necessary for the operations. Moonpools on Drillships range in size from 35ft to 45ft in width and 70ft to 130ft in length. The moonpool, located underneath the drilling rig rotary floor, is open to the sea below to allow for passage of wellbore equipment necessary for the construction of the well on the seafloor.

The proposed operations covered by this plan include the drilling and completion of one well. The estimated time to conduct these operations through the moonpool involves approximately 150 drilling days and 150 completion days for the well.

The initial start of each drilling operation consists of 7 days of riserless drilling operations where the drilling tools are tripped in and out through the moonpool to the seabed to drill and install the conductor and surface casings and the subsea wellhead which will be installed 10 feet above the seafloor. After the wellhead is in place and included in this initial 7 day time frame, the Blowout Preventer (BOP) will be run on joints of riser through the moonpool and the BOP will be latched onto the wellhead with the joints of riser pipe extending through the moonpool and connected to the rig floor. The remainder of the drilling operations (193 days) will be conducted through the inside of the riser pipe. The riser pipe will be the only equipment utilized through the moonpool during this time frame. At the end of the drilling operation, the riser and BOP will be retrieved by pulling the equipment through the moonpool and storing on the rig.

The completion operations will involve running the BOP and riser through the moonpool and latching the BOP to the wellhead with joints of riser pipe extending through the moonpool and connected to the rig floor. The entire completion operation will be conducted through the inside of the riser pipe. The riser pipe will be the only equipment utilized through the moonpool during this operation. At the end of the completion, the BOP and riser will be retrieved by pulling the equipment through the moonpool and storing on the rig. The estimated 150 completion days includes 2 days to run the BOP and riser and 2 days to retrieve the equipment.

E. Flower Garden Banks National Marine Sanctuary

This section of the plan is not applicable to the proposed operations.

APPENDIX J
LEASE STIPULATIONS/SPECIAL CONDITIONS INFORMATION
(30 CFR PART 550.222 AND 550.253)

A. Lease Stipulations

Minerals Management Service (BOEM) invoked Stipulation No. 8 – Protected Species on Lease OCS-G-35979, Mississippi Canyon Block 589.

The Endangered Species Act (16 U.S.C. 1531 et seq.) and the Marine Mammal Protection Act (MMPA)(16 U.S.C. 1361 et seq.) are designed to protect threatened and endangered species and mammals and apply to activities on the OCS. The OCS Lands Act (43 U.S.C. 1331, et seq.) provides that the OCS should be made available for expeditious and orderly development subject to environmental safeguards, in a manner which is consistent with the maintenance of competition and other national needs. Both BOEM and BSEE comply with these laws on the OCS.

B. The lessee and its operators must:

1. Collect and remove flotsam resulting from activities related to exploration, development, and production of this lease;
2. Post signs in prominent places on all vessels and platforms used as a result of activities related to exploration, development, and production of this lease detailing the reasons (legal and ecological) why release of debris must be eliminated;
3. Observe for marine mammals and sea turtles while on vessels, reduce vessel speed to 10 knots or less when assemblages of cetaceans are observed, and maintain a distance of 91 meters or greater from whales and a distance of 45 meters or greater from small cetaceans and seas turtles;
4. Employ mitigation measures prescribed by BOEM/BSEE or the National Marine Fisheries Service (NMFS) for all seismic surveys, including the use of an “exclusion zone” based upon the appropriate water depth, ramp-up and shutdown procedures, visual monitoring and reporting;
5. Identify important habitats, including designated critical habitat, used by listed species (e.g., sea turtle nesting beaches, piping plover critical habitat), in oil spill contingency planning and require the strategic placement of spill cleanup equipment to be used only by personnel trained in less-intrusive cleanup techniques on beaches and bay shores; and

6. Immediately report all sightings and locations of injured or dead protected species (e.g., marine mammals and sea turtles) to the appropriate stranding network. If oil and gas industry activity is responsible for the injured or dead animal (e.g., because of a vessel strike), the responsible parties should remain available to assist the stranding network. If the injury or death was caused by a collision with the lessee's vessel, the lessee must notify BSEE within 24 hours of the strike.

BOEM and BSEE issue Notice to Lessees and Operators (NTLs), which more fully describe measure implemented in support of the above-mentioned implementing statutes and regulations, as well as measures identified by the U.S. fish and Wildlife Service and NMFS arising from, among others, conservation recommendations, rulemakings pursuant to the MMPA, or consultation. The lessee and its operators, personnel, and subcontractors, while undertaking activities authorized under this lease, must implement and comply with the specific mitigation measures outlines in BOEM NTL No. 2016-G01 (Vessel Strike Avoidance and Injured/Dead Protected Species Reporting), BOEM NTL No. 2016-G02 (Implementation of Seismic Survey Mitigation Measures and Protected Species Observer Program); and BSEE NTL No. 2015-G03 (Marine Trash and Debris Awareness and Elimination). At the lessee's option, the lessee, its operators, personnel, and contractors may comply with the most current measure to protect species in place at the time an activity is undertaken under this lease, including, but not limited to, new or updated version of the NTLs identified in this paragraph. The lessee and its operators, personnel, and subcontractors will be required to comply with the mitigation measures, identified in the above referenced NTLs, and any additional measures in the conditions of approvals for their plans or permits.

APPENDIX K
ENVIRONMENTAL MITIGATION MEASURES INFORMATION
(30 CFR Part 550.23 and 550.54)

A. Measures Taken to Avoid, Minimize, and Mitigate Impacts

This section does not apply to the operations as proposed herein.

C. Incidental Takes

LLOG is sensitive to the marine life and the environment we work in, especially regarding activities in or around the moon pool. LLOG will implement and adhere to, the BSEE NTL No. 2015-G03 “Marine Trash and Debris Awareness Training and Elimination”; BOEM NTL No. 2016-G01 “Vessel Strike Avoidance and Injured/Dead Protected Species Reporting”; and BOEM NTL No. 2016-G02 “Implementation of Seismic Survey Mitigation Measures and Protected Species Observer Program”. LLOG will also comply with Appendix B, C & J of the Biological Opinion as further stated in Appendix I of this plan.

APPENDIX L
RELATED FACILITIES AND OPERATIONS INFORMATION
(30 CFR PART 550.256)

A. Produced Liquid Hydrocarbon Transportation Vessels

Not applicable to proposed operations.

APPENDIX M
SUPPORT VESSELS AND AIRCRAFT INFORMATION
(30 CFR PART 550.224 AND 550.257)

A. General

Personnel involved in the proposed operations will typically use their own vehicles as transportation to and from the selected onshore base; whereas the selected vendors will transport the equipment by a combination of trucks, boats and/or helicopters to the onshore base. The personnel and equipment will then be transported to the drilling rig via the transportation methods and frequencies shown, taking the most direct route feasible as mandated by weather and traffic conditions. Vessel personnel must report sightings of any injured or dead protected marine mammal species immediately, regardless of whether the injury or death is caused by their vessel, to the NMFS Southeast Marine Mammal Stranding Hotline at (877) WHALE-HELP (877-942-5343). Any injured or dead protected species should also be reported to takereport.nmfs@noaa.gov. In addition, if the injury or death was caused by a collision with the operator's vessel, an entrapment within the operator's equipment or vessel (e.g. moon pool), or an entanglement within the operator's equipment, the operator must further notify BOEM and BSEE within 24 hours of the strike or entrapment / entanglement by email to protectedspecies@boem.gov and protectedspecies@bsee.gov. If the vessel is the responsible party, it is required to remain available to assist the respective salvage and stranding network as needed.

Drillship and DP Semisubmersible Rig:

Type	Maximum Fuel Tank Storage Capacity	Maximum No. in Area at Any Time	Trip Frequency or Duration
Supply Boats	500 bbls	1	Six times weekly
Crew Boats	500 bbls	1	Three times weekly
Aircraft	279 gallons	1	As Needed

B. Diesel Oil Supply Vessels

Size of Fuel Supply Vessel	Capacity of fuel Supply Vessel	Frequency of Fuel Transfers	Route Fuel Supply Vessel Will Take
180' OSV	1900 bbls	1/weekly	Fourchon, LA to Mississippi Canyon Block 589

C. Drilling Fluids Transportation

See Table 2 – Wastes you will Transport and/or Dispose of Onshore, located in Appendix F of this Plan.

D. Solid and Liquid Wastes Transportation

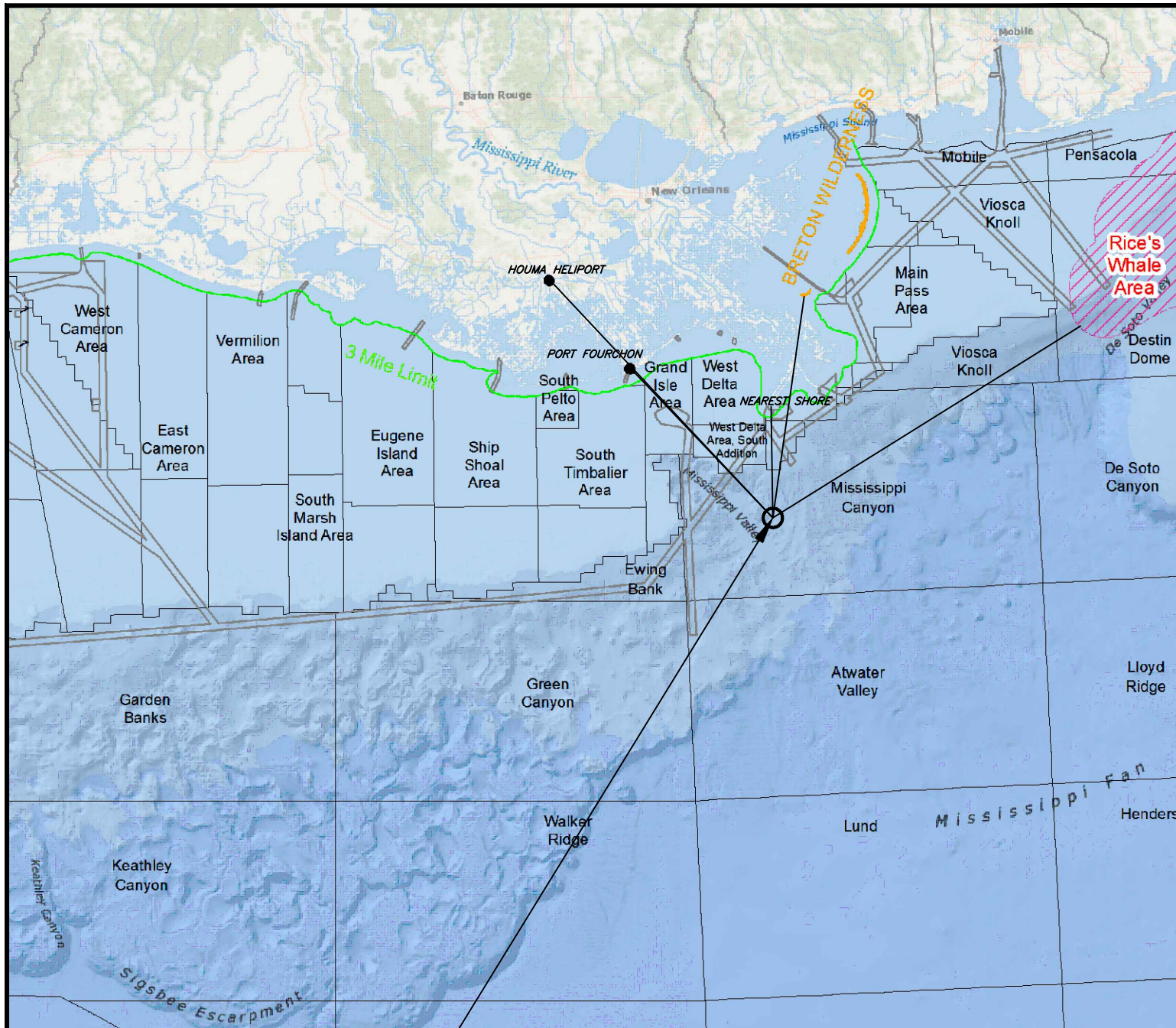
See Table 2 – Wastes you will Transport and/or Dispose of Onshore, located in Appendix F of this Plan.

E. Vicinity Map

The Vicinity Plat showing the location of **Mississippi Canyon Blocks 589** relative to the nearest shoreline and onshore base is included as *Attachment M-1*. Any rigs, vessels, supply boats, etc. utilized for these proposed activities will not transit the Rice's whale area.

Vicinity Map

Attachment M-1 (Public Information)



SITE OF PROPOSED WELL

~40 STATUTE (35 NAUTICAL) MILES TO PLAQUEMINES PARISH (NEAREST SHORE)
 COORDINATE TO NEAREST POINT ON SHORELINE X = 952,619 Y = 10,519,414
 ~83 STATUTE (72 NAUTICAL) MILES TO PORT FOURCHON, LA
 ~124 STATUTE (108 NAUTICAL) MILES TO HOUMA HELIPORT, HOUMA, LA
 ~107 STATUTE (93 NAUTICAL) MILES TO RICE'S WHALE AREA
 ~119 KILOMETERS TO BRETON WILDERNESS

VICINITY MAP

THE DISTANCES SHOWN HEREON ARE FROM THE PROPOSED WELL TO THE NEAREST COASTLINE POINT AS OBTAINED FROM NOAA, ENTITLED NOAA MEDIUM RESOLUTION SHORELINE. <[HTTP://SHORELINE.NOAA.GOV/DATA/DATASHEETS/MEDRES.HTML](http://shoreline.noaa.gov/data/datasheets/MEDRES.HTML)>.

**LLOG EXPLORATION
OFFSHORE, L.L.C.**



Echo
OFFSHORE LLC

36499 Perkins Road
Prairieville, Louisiana 70769
Tel: 225-673-2163

NOT TO SCALE

EXPLORATION PLAT

**PROPOSED WELL #1 ST01
OCS-G 35979 BLOCK 589
MISSISSIPPI CANYON AREA**

GULF OF MEXICO

DATUM: NAD 27	SPHEROID: CLARKE 1866	PROJECTION: U.T.M.	ZONE: 16	DRAWN BY: RJN	CHK. BY: MEK	REV. No.:	JOB No.: 25-008	DWG No.: 25-008-EXP
				DATE: 2/13/2025	REV. DATE:	SCALE: N.T.S.	SHEET 1 OF 1	

APPENDIX N
ONSHORE SUPPORT FACILITIES INFORMATION
(30 CFR PART 550.225 AND 550.258)

A. General

The proposed surface disturbances in **Mississippi Canyon Block 589** will be located approximately 40 statute miles from the nearest Louisiana shoreline, and approximately 83 statute miles from the following onshore support base and 124 statute miles from PHI and Bristow Heliports in Houma, Louisiana and the proposed surface disturbances:

Name	Location	Existing/New/Modified
GIS Yard	Fourchon, LA	Existing
PHI US LLC & Bristow Heliports	Houma, LA	Existing

LLOG will use an existing onshore base to accomplish the following routine operations:

- Loading/Offloading point for equipment supporting the offshore operations.
- Dispatching personnel and equipment and does not anticipate the need for any expansion of the selected facilities as a result of the activities proposed in this Supplemental Plan.
- Temporary storage for materials and equipment.
- 24 Hour Dispatcher

B. Support Base Construction or Expansion

The proposed operations are temporary in nature and do not require any immediate action to acquire additional land or expand existing base facilities.

C. Support Base Construction or Expansion Timetable

This section of the plan is not applicable to the proposed operations.

D. Waste Disposal

See Table 2 – Wastes you will Transport and/or Dispose of Onshore, located in Appendix F of this Plan.

APPENDIX O
COASTAL ZONE MANAGEMENT ACT (CZMA) INFORMATION
(30 CFR PART 550.226 AND 550.260)

A. Consistency Certification

A certificate of Coastal Zone Management Consistency for the States of Louisiana and Texas is not required for supplemental exploratory plans.

APPENDIX P
ENVIRONMENTAL IMPACT ANALYSIS
(30 CFR PART 550.227 AND 550.261)

A. Impact Producing Factors (IPF's) From Proposed Activities

The following matrix is utilized to identify the affected environments that could be impacted by these IPF's. An "x" has been marked for each IPF category that LLOG has determined may impact a particular environment as a result of the proposed activities. For those cells which are footnoted, a statement is provided as to the applicability of the proposed activities, and where there may be an effect, an analysis of the effect is provided.

Environmental Resources	Impact Producing Factors (IPF's)					
	Emissions (air, noise, light, etc)	Effluents (muds, cuttings, other discharges to the water column or seafloor)	Physical disturbances to the seafloor (rig, anchor, structure emplacement, etc.)	Wastes sent to shore for treatment or disposal	Accidents (e.g., oil spills, chemical spills, H2S releases)	Other IPF's you Identify
<u>Site Specific at Offshore Location</u>						
Designated topographic features		(1)	(1)		(1)	
Pinnacle Trend area live bottoms		(2)	(2)		(2)	
Eastern Gulf live bottoms		(3)	(3)		(3)	
Chemosynthetic communities			(4)		X	
Water quality		X	X		X	
Fisheries		X	X		X	
Marine mammals	X (8)	X		X	X (8)	X
Sea turtles	X (8)			X	X (8)	X
Air quality	X (9)					
Shipwreck sites (known or potential)			(7)			
Prehistoric archaeological sites			(7)			
<u>Vicinity of Offshore Location</u>						
Essential fish habitat		X	X		X (6)	
Marine and pelagic birds	X				X	X
Public health and safety					(5)	
<u>Coastal and Onshore</u>						
Beaches					X (6)	
Wetlands					X (6)	
Shorebirds and coastal nesting birds					X (6)	
Coastal wildlife refuge					X	
Wilderness areas						

Footnotes for Environmental Impact Analysis Matrix:

Supplemental Exploration Plan
OCS-G-35979 & OCS-G-36132 Leases
Mississippi Canyon Blocks 589 & 545

1. Activities that may affect a marine sanctuary or topographic feature. Specifically, if the well or platform site or any anchors will be on the seafloor within the:
 - (a) 4-mile zone of the Flower Gardens Banks, or the 3-mile zone of Stetson Bank;
 - (b) 1000-m, 1-mile or 3-mile zone of any topographic feature (submarine bank) protected by the Topographic Features Stipulation attached to an OCS lease;
 - (c) Essential Fish Habitat (EFH) criteria of 500 feet from any no-activity zone; or
 - (d) Proximity of any submarine bank (500 ft buffer zone) with relief greater than 2 meters that is not protected by the Topographic Stipulation attached to an OCS lease.
2. Activities with any bottom disturbance within an OCS lease block protected through the Live Bottom (Pinnacle Trend) Stipulation attached to an OCS lease.
3. Activities within any Eastern Gulf OCS block where seafloor habitats are protected by the Live Bottom (Low-Relief) Stipulation attached to an OCS lease.
4. Activities on blocks designated by the BOEMRE as being in water depths 300 meters or greater.
5. Exploration or production activities where H₂S concentrations greater than 500 ppm might be encountered.
6. All activities that could result in an accidental spill of produced liquid hydrocarbons or diesel fuel that you determine would impact these environmental resources. If the proposed action is located a sufficient distance from a resource that no impact would occur, the EIA can note that in a sentence or two.
7. All activities that involve seafloor disturbances, including anchor emplacements, in any OCS block designated by the BOEMRE as having high-probability for the occurrence of shipwrecks or prehistoric sites, including such blocks that will be affected that are adjacent to the lease block in which your planned activity will occur. If the proposed activities are located a sufficient distance from a shipwreck or prehistoric site that no impact would occur, the EIA can note that in a sentence or two.
8. All activities that you determine might have an adverse effect on endangered or threatened marine mammals or sea turtles or their critical habitats.
9. Production activities that involve transportation of produced fluids to shore using shuttle tankers or barges.

B. Impact Analysis

LLOG does not anticipate any unforeseen incidents from the proposed activities which could significantly impact the associated environment. LLOG activities associated with this Exploration Plan (Plan) will be performed with prudent and industry accepted standards, and in compliance with the federal agency regulations and oversight.

The “Oil Spills Information” Section of this Plan details the potential worse case discharge volume which has been calculated based on the new Bureau of Ocean Energy Management, Regulation and Enforcement (BOEM) Notice to Lessees (NTL 2015-N01). Response details associated with an unanticipated spill from this site are detailed in our Regional Oil Spill Response Plan (OSRP) which outlines the potential spill scenario, spill volumes, anticipated trajectory of the spill, response equipment available, and actions to be taken to respond to the potential spill incident. Additional measures implemented by LLOG is trajectory analyses to be obtained prior to and during the proposed activities, contractual arrangements with well control specialists and preliminary reviews of potential well intervention scenarios, and to supplement existing contracted response/clean-up equipment with equipment offered by Helix which specializes in subsea deepwater well intervention, containment and processing.

Site Specific at Offshore Location

- **Designated Topographic Features**

There are no anticipated emissions, effluents, physical disturbances to the seafloor, wastes transported to shore, and/or accidents from the proposed activities that could cause impacts to topographic features.

The proposed surface disturbances within Mississippi Canyon Block 589 are located approximately 30 miles away from the closest designated topographic feature (Sackett); therefore, no adverse impacts are expected during the planned operations.

The crests of these designated topographic features in the northern Gulf are typically found below 10 m; therefore, concentrated oil from a surface spill is not likely to reach sessile biota. Subsurface spills could cause adverse impacts to a designated topographic feature; however, due to the offset distance this should not have an impact.

In the event of an unanticipated spill, LLOG would immediately implement its Regional Oil Spill Response Plan and active source control and countermeasures to minimize these potential impacts.

- **Pinnacle Trend Area Live Bottoms**

There are no anticipated emissions, effluents, physical disturbances to the seafloor, wastes sent to shore and/or accidents from the proposed activities that could cause impacts to a pinnacle trend area.

The nearest pinnacle trend live bottom stipulation occurs in the Viosca Knoll Area. The proposed surface disturbances within **Mississippi Canyon Block 589** are located southwest of Viosca Knoll Area Block 778, the nearest block where the Live Bottom (Pinnacle Trend) Stipulation applies. After review of impact-producing factors resulting from activities proposed in this Supplemental Exploration Plan, there are no potential impacts to pinnacle trend live bottoms.

During the surface location disturbance review, LLOG reviews potential surface impacts, and would be able to identify any pinnacles within the vicinity and would avoid placement of any surface disturbances such as a drilling rig and associated anchors. These surface location disturbance areas would be avoided and/or mitigated during the review and approval process by the BOEM.

In the event of an unanticipated spill, LLOG would immediately implement its Regional Oil Spill Response Plan and activate source control and countermeasures to minimize these potential impacts.

- **Eastern Gulf Live Bottoms**

There are no anticipated emissions, effluents, emissions physical disturbances to the seafloor, wastes sent to shore, and/or accidents from the proposed activities that could cause impacts to Eastern Gulf live bottoms.

The proposed surface disturbances within **Mississippi Canyon Block 589** are in the central Gulf of Mexico and therefore will not impact any area protected by the eastern live bottom stipulation. After review of impact-producing factors resulting from activities proposed in this Supplemental Exploration Plan, there are no potential impacts to eastern gulf live bottoms. During the surface location disturbance review, LLOG previews potential surface impacts, and would be able to identify any live bottom areas within the vicinity and would avoid placement of any surface disturbances such as a drilling rig and associated anchors.

In the event of an unanticipated spill, LLOG would immediately implement its Regional Oil Spill Response Plan and activate source control and countermeasures to minimize these potential impacts.

- **Chemosynthetic Communities**

There are no water bottom anomalies identified by the BOEM (2019a) within 2,000 ft. of the proposed well location. There are no high-amplitude seafloor anomalies identified in the 3-D seismic data within 2,000 ft. of the proposed well location. Features or areas that could support high-density benthic communities are not anticipated within 2,000 ft. of the proposed location.

- **Water Quality**

Bottom disturbances which may result based on placement of drilling rigs during an exploratory phase could increase water column turbidity and redistribution of any accumulated pollutants in the water column; which could cause temporary impacts on water quality conditions in the immediate vicinity.

Associated overboard effluents are regulated by the EPA Region VI NPDES General Permit GMG290000 which mandates volume discharge rate limitations, certain testing requirements for toxicity and oil and grease limitations. As such, it is not anticipated these discharges authorized under the approved EPA NPDES permit will cause significant adverse impacts to water quality.

Certain wastes generated from the proposed activities will be manifested and sent to shore for treatment and/or disposal at approved facilities. Other waste which may be considered hazardous will be collected and transported in sealed containers and transported to approved disposal sites in accordance with the RCRA regulations and guidelines.

An accidental oil spill release from the proposed activities, and cumulative similar discharge activity within the vicinity could potentially cause temporary impacts to water quality. In the event of such a release, the water quality would be temporarily affected by the dissolved components and small droplets. Currents and microbial degradation would remove the oil from the water column or dilute the constituents to background levels.

In the event of an unanticipated blowout, LLOG will implement industry wide standards for using proven equipment and technology for such responses. LLOG would immediately implement its Regional Oil Spill Response Plan and activate source control and countermeasures to minimize these potential impacts.

- **Fisheries**

Accidental oil spill releases from the proposed activities, and cumulative similar discharge activity within the vicinity may potentially cause some detrimental effects on fisheries. It is unlikely a spill would occur; however, such a release in open waters closed to mobile adult finfish or shellfish would likely be sub-lethal and the extent of damage would be reduced to the capability of adult fish and shellfish to avoid a spill, to metabolize hydrocarbons, and to excrete both metabolites and parent compounds.

In the event of an unanticipated spill, LLOG will implement industry wide standards for using proven equipment and technology for such responses. LLOG would immediately implement its Regional Oil Spill Response Plan and activate source control and countermeasures to minimize these potential impacts.

- **Marine Mammals**

GulfCet II studies reveal that cetaceans of the continental shelf and shelf edge are comprised of bottlenose dolphin and Atlantic spotted dolphin. Squid eaters, including dwarf and pygmy killer whale, Risso's dolphin and Cuvier's beaked whale occur most frequently along the upper slope in areas outside of anticyclones.

As a result of the proposed activities, marine mammals may be adversely impacted by emissions, effluents, waste sent to shore and/or accidents.

Chronic and sporadic sub-lethal effects would occur that may stress and/or weaken individuals of a local group or population and make them more susceptible to infection from natural or anthropogenic sources. Few lethal effects are expected from an accidental oil spill, chance collisions with service vessels and ingestion of plastic material.

The net results of any disturbance would depend on the size and percentage of the population affected, ecological importance of the disturbed area, environmental and biological parameters that influence an animal's sensitivity to disturbance and stress, and the accommodation time in response to prolonged disturbance (Geraci and St. Aubin, 1980). Collisions between cetaceans and ship could cause serious injury or death (Laist et al., 2001).

Sperm whales are one of 11 whale species that are hit commonly by ships (Laist et al., 2001). Collisions between OCS vessels and cetaceans within the project area are expected to be unusual events.

LLOG does not anticipate the incidental taking of any marine mammals as the result of the proposed activities. The proposed activities will be conducted by our company and its contractors under the additional criteria addressed in BSEE NTL No. 2015-G03 "Marine Trash and Debris Awareness Training and Elimination", BOEM NTL

No. 2016-G01 “Vessel Strike Avoidance and Injured/Dead Protected Species Reporting” and BOEM NTL 2016-G02 “Implementation of Seismic Survey Mitigation Measures and Protected Species Observer Program.” The proposed operations will be conducted in accordance with the regulations via manifesting waste sent to shore and ensuring such wastes are contained to prevent loss. Informational placards will be maintained on the facility, and LLOG and the associated contractors obtain training on at least an annual basis to ensure personnel are aware of the reporting and operational requirements.

LLOG will conduct the proposed activities under EPA’s Region VI NPDES General Permit GMG290000 which authorizes the discharge of certain effluents, subject to certain limitations, prohibitions and recordkeeping requirements. As such, it is not anticipated these discharges authorized under the approved EPA NPDES permit will not cause significant adverse impacts to water quality.

In the event of an unanticipated blowout, LLOG will implement industry wide standards for using proven equipment and technology for such responses. LLOG would immediately implement its Regional Oil Spill Response Plan and activate source control and countermeasures to minimize these potential impacts.

- **Sea Turtles**

Small numbers of turtles could be killed or injured by chance collision with service vessels or by eating indigestible trash, particularly plastic items accidentally lost from drilling rigs, production facilities and service vessels. Drilling rigs and project vessels produce noise that could disrupt normal behavior patterns and create some stress to sea turtles, making them more susceptible to disease. Accidental oil spill releases are potential threats which could have lethal effects on turtles. Contact and/or consumption of this released material could seriously affect individual sea turtles. Most OCS related impacts on sea turtles are expected to be sub-lethal. Chronic and/or avoidance of affected areas could cause declines in survival or productivity, resulting in gradual population declines.

LLOG will conduct the proposed activities under EPA’s Region VI NPDES General Permit GMG290000 which authorizes the discharge of certain effluents, subject to certain limitations, prohibitions and recordkeeping requirements. As such, it is not anticipated these discharges authorized under the approved EPA NPDES permit will not cause significant adverse impacts to water quality.

Additionally, LLOG and its contractors will conduct the proposed activities under the additional criteria addressed by BSEE NTL No. 2015-G03 “Marine Trash and Debris Awareness Training and Elimination”, BOEM NTL No. 2016-G01 “Vessel Strike Avoidance and Injured/Dead Protected Species Reporting” and BOEM NTL 2016-G02 “Implementation of Seismic Survey Mitigation Measures and Protected Species Observer Program.” The proposed operations will be conducted in accordance with the regulations via manifesting waste sent to shore and ensuring such wastes are

contained to prevent loss. Informational placards will be maintained on the facility, and LLOG and the associated contractors obtain training on at least an annual basis to ensure personnel are aware of the reporting and operational requirements.

In the event of an unanticipated blowout, LLOG will implement industry wide standards for using proven equipment and technology for such responses. LLOG would immediately implement its Regional Oil Spill Response Plan and activate source control and countermeasures to minimize these potential impacts.

- **Air Quality**

The proposed activities are located approximately 40 miles to the nearest shoreline. LLOG has addressed the air quality issues associated with the proposed activities in the “Air Emissions Information” section of this Plan as a result of the proposed activities.

- **Ship Wreck Sites (Known or Potential)**

All blocks in the Mississippi Canyon Protraction Area are regarded as being in a high probability zone for historic shipwrecks based on Bureau of Ocean Energy Management (BOEM) and Bureau of Safety and Environmental Enforcement (BSEE) NTL No. 2011-JOINT-G01 (BOEM/BSEE, 2011), including MC 589. Pursuant to the public information in the NOAA Automated Wreck and Obstruction Information System and Navigational Charts (NOAA, 2019); there are no reported shipwrecks within the seafloor assessment area. The required archaeological survey report was completed by Echo and was submitted under a separate cover (Echo, 2005).

- **Prehistoric Archaeological Sites**

There are no physical disturbances to the seafloor which could cause impacts to prehistoric archaeological sites, as the review of high resolution shallow hazards data and supporting studies did not reflect the occurrence of prehistoric archaeological sites. As such LLOG does not anticipate any IPF’s as a result of the proposed activities.

Vicinity of Offshore Location

- **Essential Fish Habitat**

As a result of the proposed activities, essential fish habitat may be adversely impacted by effluents and/or accidents.

An Accidental oil spill that may occur as a result of the proposed activities has potential to cause some detrimental effects on essential fish habitat. It is unlikely

that an accidental oil spill release would occur; however, if a spill were to occur in close proximity to finfish or shellfish, the effects would likely be sub-lethal and the extent of damage would be reduced to the capability of adult fish and shellfish to avoid a spill, to metabolize hydrocarbons and to excrete both metabolites and parent compounds.

In the event of an unanticipated blowout, LLOG will implement industry wide standards for using proven equipment and technology for such responses. LLOG would immediately implement its Regional Oil Spill Response Plan and activate source control and countermeasures to minimize these potential impacts.

- **Marine and Pelagic Birds**

As a result of the proposed activities, marine and pelagic birds may be adversely impacted by an accidental oil spill, by the birds coming into contact with the released oil.

In the event of an unanticipated blowout resulting in an oil spill, it is likely to have an impact based on the industry wide standards for using proven equipment and technology for such responses. In that event, LLOG will implement the Regional Oil Spill Response Plan and activate source control and countermeasures to minimize these potential impacts.

- **Public Health and Safety**

There are no anticipated emissions, effluents, wastes sent to shore, and/or accidents from the proposed activities that could cause impacts to the public health safety. LLOG has requested BOEM approval to classify the proposed objective area as absent of hydrogen sulfide.

Coastal and Onshore

- **Beaches**

As a result of the proposed activities, beaches may be adversely impacted by an accidental oil spill. However, due to the distance from shore (approximately 40 miles), and the response capabilities that would be implemented, no significant adverse impacts are expected. Both historical spill data and the combined trajectory/risk calculations referenced in the publication of OCS EIA/EA BOEMRE 2009-053 indicate there is little risk of contact or impact to the coastline and associated environmental resources.

In the event of an unanticipated blowout, LLOG will implement industry wide standards for using proven equipment and technology for such responses. LLOG would immediately implement its Regional Oil Spill Response Plan and activate source control and countermeasures to minimize these potential impacts.

- **Wetlands**

As a result of the proposed activities, wetlands may be adversely impacted by an accidental oil spill. However, due to the distance from shore (approximately 40 miles) and the response capabilities that would be implemented, no significant adverse impacts are expected. Both historical spill data and the combined trajectory/risk calculations referenced in the publication of OCS EIA/EA BOEMRE 2009-053 indicate there is little risk of contact or impact to the coastline and associated environmental resources.

In the event of an unanticipated blowout, LLOG will implement industry wide standards for using proven equipment and technology for such responses. LLOG would immediately implement its Regional Oil Spill Response Plan and activate source control and countermeasures to minimize these potential impacts.

- **Shore Birds and Coastal Nesting Birds**

As a result of the proposed activities, shore birds and coastal nesting birds may be adversely impacted by an accidental oil spill. However, due to the distance from shore (approximately 40 miles) and the response capabilities that would be implemented, no significant adverse impacts are expected. Both historical spill data and the combined trajectory/risk calculations referenced in the publication of OCS EIA/EA BOEMRE 2009-053 indicate there is little risk of contact or impact to the coastline and associated environmental resources.

In the event of an unanticipated blowout, LLOG will implement industry wide standards for using proven equipment and technology for such responses. LLOG would immediately implement its Regional Oil Spill Response Plan and activate source control and countermeasures to minimize these potential impacts.

- **Coastal Wildlife Refuges**

As a result of the proposed activities, coastal wildlife refuges may be adversely impacted by an accidental oil spill. However, due to the distance from shore (approximately 40 miles) and the response capabilities that would be implemented, no significant adverse impacts are expected. Both historical spill data and the combined trajectory/risk calculations referenced in the publication of OCS EIA/EA BOEMRE 2009-053 indicate there is little risk of contact or impact to the coastline and associated environmental resources.

In the event of an unanticipated blowout, LLOG will implement industry wide standards for using proven equipment and technology for such responses. LLOG would immediately implement its Regional Oil Spill Response Plan and activate source control and countermeasures to minimize these potential impacts.

- **Wilderness Area**

As a result of the proposed activities, wilderness areas may be adversely impacted by an accidental oil spill. However, due to the distance from shore (approximately 40 miles) and the response capabilities that would be implemented, no significant adverse impacts are expected. Both historical spill data and the combined trajectory/risk calculations referenced in the publication of OCS EIA/EA BOEMRE 2009-053 indicate there is little risk of contact or impact to the coastline and associated environmental resources.

In the event of an unanticipated blowout, LLOG will implement industry wide standards for using proven equipment and technology for such responses. LLOG would immediately implement its Regional Oil Spill Response Plan and activate source control and countermeasures to minimize these potential impacts.

Other Resources Identified

LLOG has not identified any other environmental resources other than those addressed above.

C. Impacts of Proposed Activities

LLOG does not anticipate any impacts on the offshore site specific locations, offshore vicinity, and/or coastal and onshore environmental conditions based on the potential impacts identified in the EIA worksheets and historical operations in the exploration of this reservoir.

D. Environmental Hazards

The Gulf of Mexico may experience several hurricanes throughout the season which typically runs from June through November. A severe hurricane may impact the activities covered in this Plan. Such impacts may be damage to the drilling rig, the unanticipated release of hydrocarbons depending upon the current status of the well. Additionally, the surfaces located in **Mississippi Canyon Block 589** has the potential to be affected by the “Loop Current” which is a warm ocean current in the Gulf of Mexico that flows northward between Cuba and the Yucatan Peninsula, moves northward into the Gulf of Mexico, then loops east and south before exiting to the east through the Florida Straits. While the loop current is present approximately 95% of the time, it is most active in the summer and fall seasons.

To mitigate potential impacts to the well during impending hurricanes or loop currents, LLOG will take precautionary measures by securing the well, rig and evacuation of personnel; and will comply with the requirements of NTL’s 2008-G09 and 2009-G10.

E. Alternatives

LLOG did not consider any alternatives to reduce environmental impacts as a result of the proposed activities.

F. Mitigation Measures

LLOG will not implement any mitigation measures to avoid, diminish or eliminate potential environmental resources, other than those required by regulation and policy.

G. Consultation

LLOG has not contacted any agencies or persons for consultation regarding potential impacts associated with the proposed activities. Therefore, a list of such entities is not being provided.

H. Preparers

Questions or requests for additional information should be made to LLOG's authorized representative of this Plan:

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I. References

The following documents were utilized in preparing the Environmental Impact Assessment:

Shallow Hazards Assessment and Benthic Communities Evaluation, Block 589, Mississippi Canyon Area	Berger Geosciences, LLC	2019
BOEM Environmental Impact Statement Report No. 2017-009	Bureau of Ocean Energy Management/Bureau of Safety and Environmental Enforcement	2017
Title 30 CFR Part 250 Subpart B (250.216 / 250.221 / 250.223 / 250.227	Bureau of Ocean Energy Management/Bureau of Safety and Environmental Enforcement	2006
NTL 2000-G16 "Guidelines for General Lease Surety Bonds"	Bureau of Ocean Energy Management/Bureau of Safety and Environmental Enforcement	2000
NTL 2005-G07 "Archaeological Resource Surveys and Reports"	Bureau of Ocean Energy Management/Bureau of Safety and Environmental Enforcement	2005
BOEM NTL No. 2016-G02 "Implementation of Seismic Survey Mitigation Measures and Protected Species Observer Program"	Bureau of Ocean Energy Management/Bureau of Safety and Environmental Enforcement	2016
BSEE NTL No. 2015-G03 "Marine Trash and Debris Awareness Training and Elimination"	Bureau of Ocean Energy Management/Bureau of Safety and Environmental Enforcement	2015
BOEM NTL No. 2016-G01 "Vessel Strike Avoidance and Injured/Dead Protected Species Reporting"	Bureau of Ocean Energy Management/Bureau of Safety and Environmental Enforcement	2016
NTL 2008-G04 "Information Requirements for Exploration Plans and Development Operations Coordination Documents"	Bureau of Ocean Energy Management/Bureau of Safety and Environmental Enforcement	2008
NTL 2008-N05 "Guidelines for Oil Spill Financial Responsibility for Covered Offshore Facilities"	Bureau of Ocean Energy Management/Bureau of Safety and Environmental Enforcement	2008
Joint NTL 2011-G01 "Revisions to the List of OCS Lease Blocks Requiring Archaeological Resource Surveys and Reports"	Bureau of Ocean Energy Management/Bureau of Safety and Environmental Enforcement	2011
NTL 2009-G27 "Submitting Exploration Plans and Development Operations Coordination Documents"	Bureau of Ocean Energy Management/Bureau of Safety and Environmental Enforcement	2009
NTL 2009-G29 "Implementation Plan for Transition from North American Datum 27 to North American Datum 83"	Bureau of Ocean Energy Management/Bureau of Safety and Environmental Enforcement	2009
NTL 2009-G31 "Hydrogen Sulphide"	Bureau of Ocean Energy Management/Bureau of Safety and Environmental Enforcement	2009
NTL 2009-G34 "Ancillary Activities"	Bureau of Ocean Energy Management/Bureau of Safety and Environmental Enforcement	2009
BOEM NTL 2012-G01 "Drilling Windows, Eastern Gulf of Mexico"	Bureau of Ocean Energy Management/Bureau of Safety and Environmental Enforcement	2012
NTL 2009-G39 "Biologically-Sensitive Underwater Features and Areas"	Bureau of Ocean Energy Management/Bureau of Safety and Environmental Enforcement	2009
NTL 2009-G40 "Deepwater Benthic Communities"	Bureau of Ocean Energy Management/Bureau of Safety and Environmental Enforcement	2009
NTL 2015-N01 "Information Requirements for EP's, DOCD's, DPP on the OCS"	Bureau of Ocean Energy Management/Bureau of Safety and Environmental Enforcement	2015
NTL 2016-N01 "Requiring Additional Security"	Bureau of Ocean Energy Management	2016
NPDES General Permit GMG290000	EPA – Region VI	2017
Regional Oil Spill Response Plan	LLOG Exploration Offshore, L.L.C.	2018
NTL 2018-G01 "Ocean Current Monitoring"	Bureau of Ocean Energy Management/Bureau of Safety and Environmental Enforcement	2018
Shallow Hazards Assessment and Benthic Communities Evaluation, Block 589, Mississippi Canyon Area	Berger Geosciences, LLC	2019
BOEM Environmental Impact Statement Report No. 2017-009	Bureau of Ocean Energy Management/Bureau of Safety and Environmental Enforcement	2017
Title 30 CFR Part 250 Subpart B (250.216 / 250.221 / 250.223 / 250.227	Bureau of Ocean Energy Management/Bureau of Safety and Environmental Enforcement	2006
NTL 2000-G16 "Guidelines for General Lease Surety Bonds"	Bureau of Ocean Energy Management/Bureau of Safety and Environmental Enforcement	2000
NTL 2016-N01 "Requiring Additional Security"	Bureau of Ocean Energy Management	2016

APPENDIX Q
ADMINISTRATIVE INFORMATION
(30 CFR Part 550.228 and 550.262)

A. Exempted Information Description (Public Information Copies only)

Excluded from the Public Information copies are the following:

- Proposed bottom hole location information
- Proposed total well depths (measured and true vertical depth)
- Production Rates and Life of Reserves
- New and Unusual Technologies
- Geological and Geophysical Attachments

B. Bibliography

The following documents were utilized in preparing this Plan:

Document	Author	Dated
Archaeological Deep Tow Survey Block 545/589	Echo Offshore LLC	2018
Shallow Hazards Assessment, Benthic Communities	Berger Geosciences, LLC	2018
Evaluation, and Archaeological Resource Survey		
Shallow Hazard Clearance Letter	Berger Geosciences, LLC	2019
BOEM Environmental Impact Statement Report No. OCS	Bureau of Ocean Energy Management	2017
EIS/EA BOEM 2016-016		
Regional Oil Spill Response Plan	LLOG Exploration Offshore, L.L.C.	2026