

UNITED STATES GOVERNMENT  
MEMORANDUM

November 24, 2017

To: Public Information (MS 5030)  
From: Plan Coordinator, FO, Plans Section (MS  
5231)

Subject: Public Information copy of plan

Control # - N-10000  
Type - Initial Development Operations Coordinations Document  
Lease(s) - OCS-G35325 Block - 257 Mississippi Canyon Area  
Operator - LLOG Exploration Offshore, L.L.C.  
Description - Well SS001  
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.

Robert Arpino  
Plan Coordinator

Site Type/Name	Botm Lse/Area/Blk	Surface Location	Surf Lse/Area/Blk
WELL/SS001	G35325/MC/257	6367 FSL, 2596 FEL	G35325/MC/257

**LLOG Exploration Offshore, L.L.C.  
1001 Ochsner Blvd. Suite 100  
Covington, Louisiana 70433**

**INITIAL DEVELOPMENT OPERATIONS  
COORDINATION DOCUMENT**

**PUBLIC INFORMATION COPY**

**Mississippi Canyon Block 257  
OCS-G-35325 Lease**

**PREPARED BY:**

**Nelda Runyon  
Regulatory Specialist  
LLOG Exploration Offshore, L.L.C.  
(985) 801-4300 Main  
(985) 801-4389 Direct  
[neldar@llog.com](mailto:neldar@llog.com)**

**Dated: October 17, 2017**

**LLOG EXPLORATION OFFSHORE, L.L.C.**  
**INITIAL**  
**DEVELOPMENT OPERATIONS COORDINATION DOCUMENT**

**TABLE OF CONTENTS**

**HISTORY OF THE LEASES**

APPENDIX A	<i>Plan Contents</i>
APPENDIX B	<i>General Information</i>
APPENDIX C	<i>Geological, Geophysical Information</i>
APPENDIX D	<i>H2S Information</i>
APPENDIX E	<i>Mineral Resource Conservation Information</i>
APPENDIX F	<i>Biological, Physical and Socioeconomic Information</i>
APPENDIX G	<i>Waste and Discharge Information</i>
APPENDIX H	<i>Air Emissions Information</i>
APPENDIX I	<i>Oil Spill Information.</i>
APPENDIX J	<i>Environmental Monitoring Information</i>
APPENDIX K	<i>Lease Stipulation Information</i>
APPENDIX L	<i>Environmental Mitigation Measures Information</i>
APPENDIX M	<i>Related Facilities and Operations Information</i>
APPENDIX N	<i>Support Vessels and Aircraft Information</i>
APPENDIX O	<i>Onshore Support Facilities Information</i>
APPENDIX P	<i>Coastal Zone Management Act (CZMA) Information</i>
APPENDIX Q	<i>Environmental Impact Analysis</i>
APPENDIX R	<i>Administrative Information</i>

## History of Leases

**OCS-G-35325 Lease, Mississippi Canyon Block 257** was awarded to Ridgewood Energy Corp., Houston Energy, L.P., and Red Willow Offshore at the Central Gulf of Mexico OCS Lease Sale No. 231 with an effective date of July 1, 2014. LLOG Exploration Offshore, L.L.C was designated Operator effective March 26, 2015.

LLOG Exploration Offshore, L.L.C. has drilled the OCS-G-35325 Lease, Mississippi Canyon Block 257 Well No. SS001ST01 (API # 608174133201) and was temporarily abandoned on September 5, 2016. The MC 257 Well No. SS001 will be completed under our approved Initial Exploration Plan (N-9907) and Revised Plan (R-6441).

A Conservation Information Document (CID) that discusses the depletion plans of these wells will be filed under separate cover.

***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), and NTL No. 2008-G04 and NTL 2015-N01, LLOG Exploration Offshore, LLC proposes to install pipeline end manifold (PLEM) connected via proposed lease term pipeline, umbilical, well jumper to LLOG's platform "A" in OCS-G-35324 Lease, Mississippi Canyon Block 254. This is a manned platform and will process produced hydrocarbons from the incoming subsea well at Mississippi Canyon Block 257 Well SS001ST01, OCS-G-35325 Lease.

Included as *Attachment A-1* is Form BOEM 137 "OCS Plan Information Form"

**B. Location**

*Attachment A-2 – Well Location Plat*

*Attachment A-3 – Bathymetry Map – Seafloor disturbance area (with anchor radius)*

**C. Safety & Pollution Features**

No additional drilling operations will be conducted under this Initial Development Operations Coordination Document.

Safety of personnel and protection of the environment during the proposed operations are a primary concern for LLOG.

Safety features on the platform 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 involved 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.):

**NO ADDITIONAL STORAGE TANKS OR VESSELS – NO ADDITIONAL DRILLING OPERATIONS PROPOSED IN THIS PLAN.**

**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.

**G. Cost Recovery Payment:** Included as Attachment A-4 is the Pay.gov receipt ID in the amount of \$4,238.00 for cost recovery fee associated with the Initial Development Operations Coordination Document for the Mississippi Canyon Block 257 Well SS001ST01, OCS-G-35325 Lease.

# **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)					Initial X	
Company Name: LLOG EXPLORATION OFFSHORE L.L.C.			BOEM Operator Number: 02058						
Address:			Contact Person: NELDA RUNYON						
1001 OCHSNER BOULEVARD			Phone Number: 985-801-4300						
COVINGTON, LA 70433			E-Mail Address: NELDAR@LLOG.COM						
If a service fee is required under 30 CFR 550.125(a), provide the				Amount paid	\$4,238.00	Receipt No.	75338096475		
Project and Worst Case Discharge (WCD) Information									
Lease(s): OCS-G 35325		Area: MC	Block(s): 257	Project Name (If Applicable): RED ZINGER					
Objective(s)	<input checked="" type="checkbox"/> Oil	<input checked="" type="checkbox"/> Gas	<input type="checkbox"/> Sulphur	<input type="checkbox"/> Salt	Onshore Support Base(s): FOURCHON				
Platform/Well Name: Well SS01ST01		Total Volume of WCD: 31,184 BOPD				API Gravity: 31.6			
Distance to Closest Land (Miles): 61			Volume from uncontrolled blowout: 32,405 BOPD						
Have you previously provided information to verify the calculations and assumptions for your WCD?							<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/> No
If so, provide the Control Number of the EP or DOCD with which this information was provided							R-6535		
Do you propose to use new or unusual technology to conduct your activities?							<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/> No
Do you propose to use a vessel with anchors to install or modify a structure?							<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/> No
Do you propose any facility that will serve as a host facility for deepwater subsea development?							<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/> No
Description of Proposed Activities and Tentative Schedule (Mark all that apply)									
Proposed Activity			Start Date	End Date	No. of Days				
Exploration drilling					SEE ATTACHED				
Development drilling					SCHEDULE OF ACITIVITES				
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/umbilicals/well jumpers									
Hook up and commence production									
Other (Specify and attach description)									
Description of Drilling Rig				Description of Structure					
<input type="checkbox"/>	Jackup	<input type="checkbox"/>	Drillship	<input type="checkbox"/>	Caisson	<input type="checkbox"/>	Tension leg platform		
<input type="checkbox"/>	Gorilla Jackup	<input type="checkbox"/>	Platform rig	<input type="checkbox"/>	Fixed platform	<input type="checkbox"/>	Compliant tower		
<input type="checkbox"/>	Semisubmersible	<input type="checkbox"/>	Submersible	<input type="checkbox"/>	Spar	<input type="checkbox"/>	Guyed tower		
<input type="checkbox"/>	DP Semisubmersible	<input type="checkbox"/>	Other (Attach Description)	<input type="checkbox"/>	Floating production system	<input type="checkbox"/>	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)			
SEE ATTACHED DESCRIPTION									

## Form 0137 Page 1 - Attachment

OCS-G-35325 Lease  
Mississippi Canyon Block 257  
Initial Development Operations Coordination Document

### Description of Proposed Activities and Tentative Schedule

<i>Proposed Activity</i>	<i>Start Date</i>	<i>End Date</i>	<i>No. of Days</i>
Lease Term Pipeline	6/15/2018	7/1/2018	16
Lease Term Umbilicals	7/15/2018	7/29/2018	14
Well Jumper	10/31/2018	11/3/2018	3
Hook-up and commence production	11/10/2018	11/13/2018	3

### Description of Lease Term Pipelines

<i>From (Facility/Area/Block)</i>	<i>To (Facility/Area/Block)</i>	<i>Diameter (Inches)</i>	<i>Length (Feet)</i>
Well SS001ST01 MC 257	"A" Platform MC 254	6"	46,568.43'
"A" Platform MC 254	UTA MC 257	6"	49,046.78'
MC 255 Umbilical Termination Assembly	MC 255 Gas Lift Inline Sled	5"	2,204.08'
MC 257 Well SS001ST01	Well Jumper	6.625"	60.45'

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

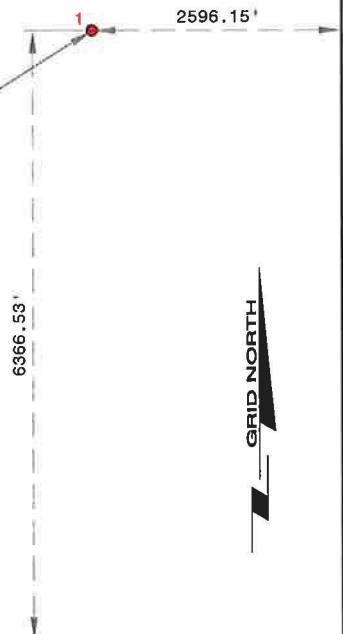
Proposed Well/Structure Location									
Well or Structure Name/Number (If renaming well or structure, reference previous name): Well SS001ST01				Previously reviewed under an approved EP or DOCD?		<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	No
Is this an existing well or structure?		<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No	If this is an existing well or structure, list the Complex ID or API No.			API 608174133201
Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?						<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	No
<b>WCD info</b>	For wells, volume of uncontrolled blowout (Bbls/day): 31,184 bopd			For structures, volume of all storage and pipelines (Bbls):			API Gravity of fluid		31.6
<b>Surface Location</b>				<b>Bottom-Hole Location (For Wells)</b>				<b>Completion (For multiple completions, enter separate lines)</b>	
<b>Lease No.</b>	OCS G 35325			OCS				OCS OCS	
<b>Area Name</b>	MISSISSIPPI CANYON								
<b>Block No.</b>	257								
<b>Blockline Departures (in feet)</b>	N/S Departure: Fs ___ L			N/S Departure: Fs ___ L			N/S Departure: F ___ L		
	6,366.53'						N/S Departure: F ___ L		
	E/W Departure: FE ___ L			E/W Departure: FE ___ L			E/W Departure: F ___ L		
	2,596.15'						E/W Departure: F ___ L		
<b>Lambert X-Y coordinates</b>	X: 1,280,443.85'			X:			X:		
	Y: 10,429.086.53'			Y:			Y: Y: Y:		
<b>Latitude/ Longitude</b>	Latitude 28° 44' 00.251"N			Latitude			Latitude Latitude Latitude		
	Longitude 88° 07' 24.804"W			Longitude			Longitude Longitude Longitude		
Water Depth (Feet): 5,848'				MD (Feet):		TVD (Feet):		MD (Feet): MD (Feet):	
Anchor Radius (if applicable) in feet:								TVD (Feet): TVD (Feet):	
<b>Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)</b>									
<b>Anchor Name or No.</b>	<b>Area</b>	<b>Block</b>	<b>X Coordinate</b>		<b>Y Coordinate</b>		<b>Length of Anchor Chain on Seafloor</b>		
			X =		Y =				
			X =		Y =				
			X =		Y =				
			X =		Y =				
			X =		Y =				
			X =		Y =				
			X =		Y =				

## **Well Location Plats**

### **Attachment A-2 (Proprietary Information)**

**MC257**  
OCS-G-35325  
LLOG

No. 001 ST01 BP00	
Well Surface	
NAD27 BLM16 Feet	
X :	1,280,443.85
Y :	10,429,086.53
Lat :	28°44'00.2510"N
Lon :	88°07'24.8049"W
NAD83 BLM16 Feet	
X :	1,280,453.24
Y :	10,429,746.13
Lat :	28°44'01.1035"N
Lon :	88°07'24.7873"W



I HEREBY CERTIFY THAT THE ABOVE FINAL WELL SURFACE LOCATION IS CORRECT.



*Stephen R. Henry*  
STEPHEN R. HENRY RPLS #4903  
STATE OF LOUISIANA 10-26-16

**NOTES**

1. THIS PLAT WAS PREPARED FOR PERMIT PURPOSES ONLY, AND IS NOT A PROPERTY BOUNDARY SURVEY, AND AS SUCH DOES NOT COMPLY WITH THE "STANDARDS OF PRACTICE FOR BOUNDARY SURVEYS" AS ADOPTED BY THE LOUISIANA PROFESSIONAL ENGINEERING AND LAND SURVEYING BOARD.
2. COORDINATES TRANSFORMED USING NADCON (VER. 2.1).

**PUBLIC INFORMATION**



**FINAL LOCATION**  
**OCS-G-35325 WELL No. 001 ST01 BP00**  
BLOCK 257  
MISSISSIPPI CANYON AREA  
GULF OF MEXICO

**FUGRO CHANCE INC.**

200 Dulles Drive Lafayette, Louisiana 70506 (337) 237-1300



Geodetic Datum: NAD27  
Projection: BLM 16 (NORTH)  
Grid Units: US SURVEY FEET

SCALE 0 2000  
1:24000 FEET

Job No.: 1600728 Date: 10/21/2016 Drwn: BCN Chart: 1 Of: 1  
DWG File: H:\2016\1600728\GIS\...MC257\_F\_1ST1\_G35325 10/21/2016

## **Bathymetry Map**

### **Attachment A-3 (Public Information)**

Y = 10,438,560.00

MC 257  
OCS-G 35325  
LLOG EXPLORATION OFFSHORE, L.L.C.

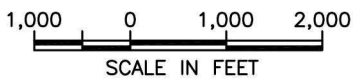


WELL NO.001 ST01 BP00  
2,596.15' FEL  
6,366.53' FSL  
X = 1,280,443.85  
Y = 10,429,086.53  
LAT. = 28° 44' 00.251"N  
LONG. = 88° 07' 24.805"W

X = 1,283,040.00

X = 1,267,200.00

Y = 10,422,720.00



**LEGEND**  
5,750' BATHYMETRIC  
CONTOURS  
IN 50' INTERVALS

DATUM: NAD 27
SPHEROID: CLARKE 1866
PROJECTION: U.T.M.
ZONE: 16
<b>Echo</b> OFFSHORE LLC
36499 Perkins Road Prairieville, Louisiana 70769 Tel: 225-673-2163

<b>LLOG EXPLORATION OFFSHORE, L.L.C.</b>			
<b>BATHYMETRY MAP</b>			
<b>BATHYMETRY MAP OCS-G 35325 BLOCK 257 MISSISSIPPI CANYON AREA</b>			
<b>GULF OF MEXICO</b>			
DRAWN BY: RJN	DATE: 10/17/17	CHECKED BY: MEK	DRAWING No.: 17-031 SM BAT
REV. DATE:	REV. No.:	SCALE: 1" = 2,000'	JOB No.: 17-031-32

# **COST RECOVERY PAYMENT**

## **Attachment A-4 (Public Information)**



## Receipt

### Your payment is submitted

Pay.gov Tracking ID: 2657U58D

Agency Tracking ID: 75338096475

Form Name: BOEM Development Operations Coordination Document or DPP

Application Name: BOEM Development/DOCD Plan - BD

### Payment Information

Payment Type: Bank account (ACH)

Payment Amount: \$4,238.00

Transaction Date: 10/04/2017 03:16:20 PM EDT

Payment Date: 10/05/2017

Region: Gulf of Mexico

Contact: Carol Eaton 985-801-4300

Company Name/No: LLOG Exploration Offshore, L.L.C., 02058

Lease Number(s): 35325, , , ,

Area-Block: Mississippi Canyon MC, 257: , : , : , : ,

Type-Wells: Initial Plan, 1

### Account Information

Account Holder Name: LLOG Exploration Offshore, L.L.C.

Routing Number: 065403626

Account Number: \*\*\*\*\*8323

### Email Confirmation Receipt

Confirmation Receipts have been emailed to:

carole@llog.com

johnr@llog.com



## Receipt

### Your payment is submitted

Pay.gov Tracking ID: 2657U58D

Agency Tracking ID: 75338096475

Form Name: BOEM Development Operations Coordination Document or DPP

Application Name: BOEM Development/DOCD Plan - BD

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Company Name/No: LLOG Exploration Offshore, L.L.C., 02058

Lease Number(s): 35325, , , ,

Area-Block: Mississippi Canyon MC, 257: , : , : , : ,

Type-Wells: Initial Plan, 1

### Account Information

Account Holder Name: LLOG Exploration Offshore, L.L.C.

Routing Number: 065403626

Account Number: \*\*\*\*\*8323

### Email Confirmation Receipt

Confirmation Receipts have been emailed to:

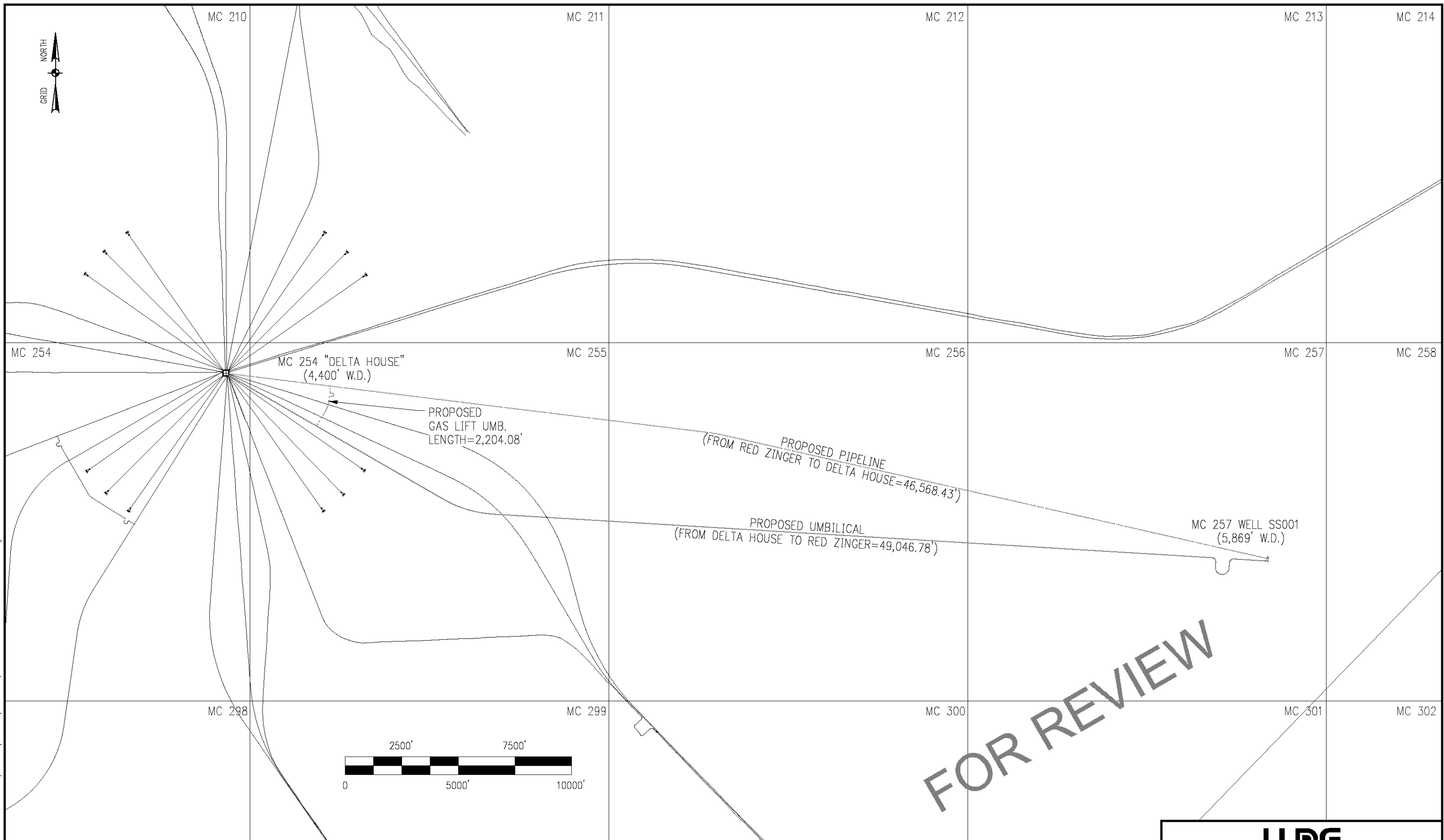
carole@llog.com

johnr@llog.com

# **CONCEPTUAL FIELD DEVELOPMENT**

## **Attachment A-5 (Public Information)**

VANGLADA 7/13/2017 10:29:59 AM P:\STRUCT\204400\PIPELINE\204400-CONCEPTUAL SK01-REVA.dwg



FOR REVIEW

NOTES

THIS DRAWING IS THE PROPERTY OF AND EMBODIES CONFIDENTIAL INFORMATION OF PINNACLE ENGINEERING, INC. & LLOG EXPLORATION OFFSHORE INC. THIS DRAWING AND THE INFORMATION THEREON SHALL NOT BE REPRODUCED OR DISCLOSED TO ANY OTHER PARTY OR USED FOR ANY OTHER PURPOSE OTHER THAN FOR THE BENEFIT OF AND AS AUTHORIZED BY PINNACLE ENGINEERING, INC. OR LLOG EXPLORATION OFFSHORE INC.

NO	DATE	DESCRIPTION	BY	APPR
A	7-13-17	ISSUED FOR PERMIT		

APPROVAL

Drawn By	J. GUEVARA
Date	7-5-17
Checked By	
Date	
Designed By	
Date	
Approved By	
Date	

**PINNACLE ENGINEERING**

TX REGISTERED ENGR FIRM F-567

**LLOG**  
exploration

RED ZINGER SUBSEA DEVELOPMENT  
MC 257 SS001 TO MC 254 "DELTA HOUSE"

PRELIMINARY LAYOUT FOR CONCEPTUAL PLAN

JOB NO. 204400 SCALE: NOTED DWG. NO. CONCEPT-SK01 REV. A

**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/BSEE permit applications and general permits issued by the EPA and COE)

<b>Application/Permit</b>	<b>Issuing Agency</b>	<b>Status</b>
CZM Consistency Certifications	LA/AL	Pending

**B. Drilling Fluids – (No Additional drilling included with this plan)**

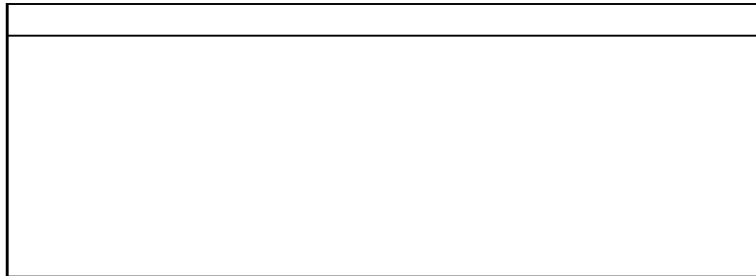
**C. Production**


**D. Oil Characteristics**

The following table details the chemical and physical characteristics of the oils that will be potentially produced, handled, transported, or stored on/by the facility from which the proposed development and production activities will be conducted:

<b>Characteristics</b>	<b>Results</b>	<b>Analytical Methodologies Should be Compatible with:</b>
<b>CONFIDENTIAL</b>		

The above analysis is based on the oil composition most likely to result in the largest volume spill (e.g., the oil from the expected largest reservoir, stored oil or pipeline oil combined from a number of wells).



**E. New Or Unusual Technology**

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

**F. Bonding Statement**

The bond requirements for the activities and facilities proposed in this Initial Development Operations Coordination Document 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. 2008-N07 "Supplemental Bond Procedures."

**G. Oil Spill Responsibility (OSFR)**

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

**H. Deepwater Well Control Statement**

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

**I. Suspensions of Production**

LLOG Exploration Offshore, L.L.C. has not filed and does not anticipate filing any request for Suspension of Production to hold the lease(s) or unit addressed in this Initial Development Operations Coordination Document in active status.

**J. Blowout Scenario**

In the event of a blowout in which the tree has been removed from the wellhead on the MC257 #1 ST01BP00 with the tubing in place, but all barriers (SCSSV, sliding sleeves) have failed, LLOG anticipates a rate of 31,184 BOPD and 15.2 MMCFD with an anticipated gravity of 31.6° as a combination of oil from the B and C Sands. LLOG would immediately activate its Regional Oil Spill Response Plan and Spill Management Team to initiate potential recovery of liquid hydrocarbons on the receiving water and review potential well intervention options. In the event a relief well is initiated, LLOG does not anticipate any delays in acquiring a semi-submersible type rig to conduct the proposed operations. It could take approximately 99 days to drill the relief well. *See Attachment B-1*

**NTL 2010-N06 Data**

**Blowout Scenario**

**Attachment B-1  
(Public Information)**



**BLOWOUT SCENARIO  
MC 257**

Created by: Torben Knudsen  
Last Revised: 10/17/2017  
Page 1 of 7  
Confidential

**BLOWOUT SCENARIO**

Pursuant with 30 CFR 250.213(g), 250.219, 250,250 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**

The Delta House production facility located in MC 254 “A” will serve as a production hub for MC 257 Well SS001ST01 via subsea infrastructure.

Facility	Distance Away (Miles)	NAD 27 Co-ordinates (X)		NAD 27 Co-ordinates (Y)	
MC 254 “A” OCS-G-24053		1,234,482'		10,437,207'	
		X (NAD 27)	Y (NAD 27)	Latitude	Longitude
MC 257 SS001ST01 OCS-G-35325	~ 8.6	10,280,443.85	10,429,086.53'	28° 44' 00.251"	88° 07' 24.804"

**INFORMATION REQUIREMENTS**

**A) Blowout scenario**

The MC 257 Well SS001 was drilled to potential outlined in the Geological and Geophysical Information Section of this plan utilizing a typical subsea wellhead system, conductor, surface and intermediate casing strings and a MODU rig with marine riser and a subsea BOP system. A hydrocarbon influx and a well control event occurring from the objective sand is modeled with no drill pipe or obstructions in the wellbore followed by a failure of the subsea BOP’s and loss of well control at the seabed. 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	Initial DOCD
Type of Activity	Producing
Facility Location (area / block)	MC 257 Well SS001
Facility Designation	MC 254 “A”
Distance to Nearest Shoreline	~53 nautical/ 61 statute miles
Uncontrolled Blowout (Volume per day)	31,184 BOPD
Type of Fluid	Crude (31.6 API oil)

**C) Total volume and maximum duration of the potential blowout**

Duration of Flow (days)	<b>99</b> days total (see Relief Well Response Estimate below)
Total Volume of Spill (bbls)	~ 2626 MMBO based on <b>99</b> days of uncontrolled flow based on simulator models (steady-state model – Prosper®)

**D) Assumptions and calculations used in determining the worst case discharge**

Omitted from Public Information Copies

**E) 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 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 fall/collapse/bridge over within a span of a few days, significantly reducing the outflow of the rates. For this blowout scenario, no bridging is considered.

**F) 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 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 – typically fitted on DP MODU's presently operating in the GOM. 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 such as 4<sup>th</sup> generation moored rigs. 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 HWCG 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. 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. 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 of the above mentioned well.

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

LLOG currently has one deepwater MODU’s under contract (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.

With the current activity level in the GOM, 25 to 30 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 move 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.

<b>OPERATION</b>	<b>SPECIFIC VESSEL OF OPPORTUNITY</b>
<b>Intervention and Containment</b>	<ul style="list-style-type: none"> <li>• Helix Q4000 (DP Semi)</li> <li>• Helix Producer 1 (DP FPU)</li> </ul>
<b>Relief Well Drilling Rigs</b>	<ul style="list-style-type: none"> <li>• Seadrill West Sirius (DP Semi)</li> <li>• Transocean Enterprise (DP Drillship)</li> <li>• Ensco 8502 (DP Semi)</li> <li>• Seadrill West Neptune (DP Drillship)</li> </ul>



**BLOWOUT SCENARIO  
MC 257**

Created by: Torben Knudsen  
Last Revised: 10/17/2017  
Page 4 of 7  
Confidential

<b>ROV / Multi-Purpose Service Vessels</b>	<ul style="list-style-type: none"> <li>• Oceaneering (numerous DP ROV vessels)</li> <li>• HOS Achiever, Iron Horse 1 and 2 (DP MPSV)</li> <li>• Helix Pipe Lay Vessel (equipped w/ 6" PL – 75,000')</li> <li>• Other ROV Vessels – (Chouest, HOS, Fugro, Subsea 7)</li> </ul>
<b>Shuttle Tanker / Barge Support</b>	<ul style="list-style-type: none"> <li>• OSG Ship Management</li> </ul>

**H) 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 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.

**l) 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).

**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 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. A total of **3** relief well surface locations in MC 257 are proposed for the 2 proposed drill sites. The **2** drill sites are the most probable well sites for a development scenario. 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.

Development Well	Proposed Relief Well	X (NAD 27)	Y (NAD 27)
MC 257 SS001 OCS-G-35235	MC 257 NE Relief Well # 5 *	1,280,560'	10,430,560'
	MC 257 SE Relief Well #6 *	1,278,700'	10,427,750'
	MC 257 E Relief Well #7 *	1,279,300'	10,429,600'

\*\*\* Indicates relief well locations common for existing well

**RELIEF WELL RESPONSE TIME ESTIMATE**

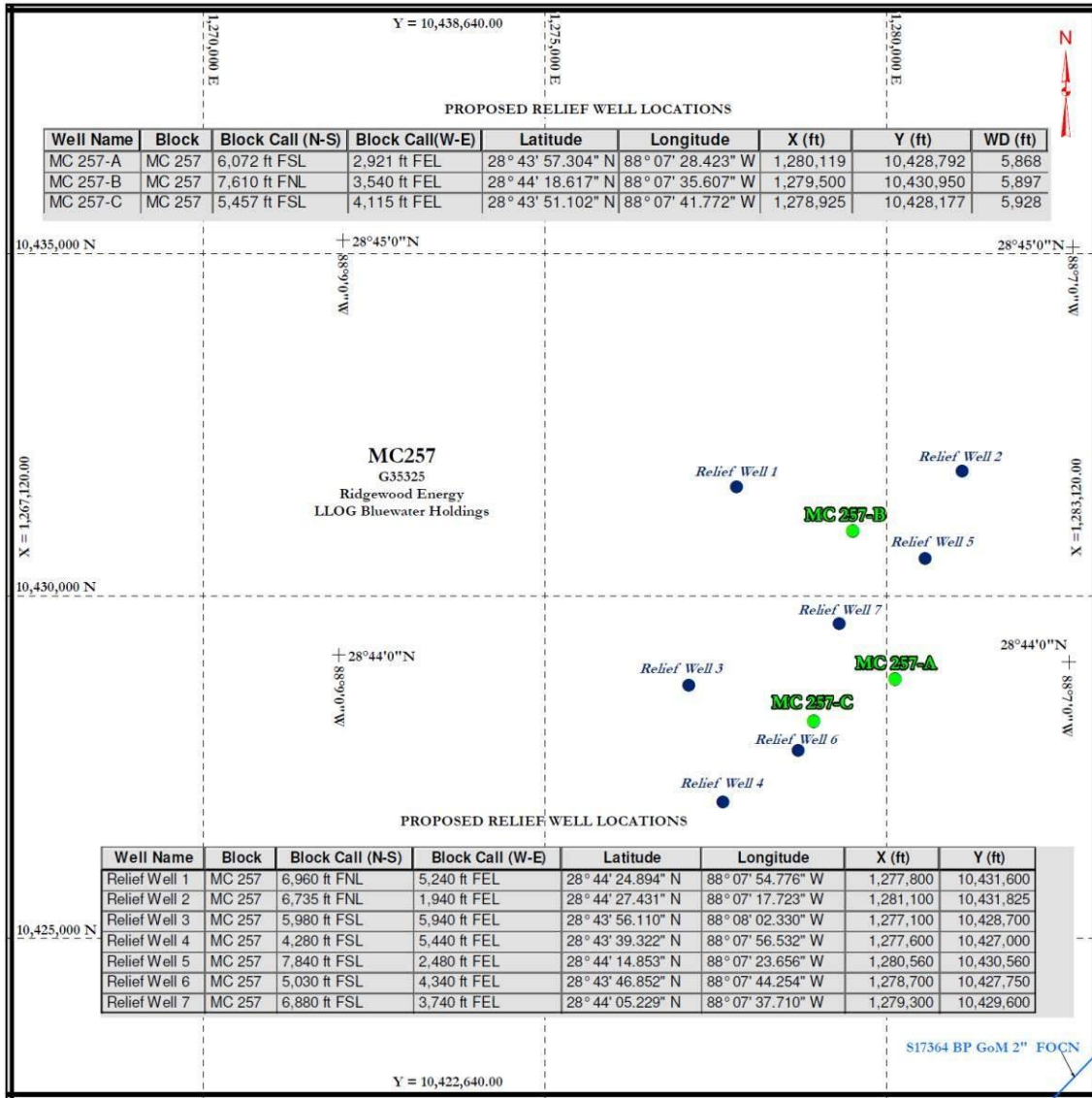
OPERATION	TIME ESTIMATE (DAYS)
<b>IMMEDIATE RESPONSE</b> <ul style="list-style-type: none"> <li>• safeguard personnel, render first-aid</li> <li>• make initial notifications</li> <li>• implement short term intervention (if possible)</li> <li>• implement spill control</li> <li>• develop Initial Action Plan</li> </ul>	1



**BLOWOUT SCENARIO  
MC 257**

Created by: Torben Knudsen  
Last Revised: 10/17/2017  
Page 6 of 7  
Confidential

<p><b>INTERIM RESPONSE</b></p> <ul style="list-style-type: none"> <li>• establish Onsite Command Center and Emergency Management Team</li> <li>• assess well control issues</li> <li>• mobilize people and equipment (Helix DW Containment System)</li> <li>• implement short term intervention and containment (if possible)</li> <li>• develop Intervention Plan</li> <li>• initiate relief well planning</li> <li>• continue spill control measures</li> </ul>	4
<p><b>INTERVENTION AND CONTAINMENT OPERATIONS</b></p> <ul style="list-style-type: none"> <li>• mobilize equipment and initiate intervention and containment operations</li> <li>• perform TA operations and mobilize relief wells rig(s)</li> <li>• finalize relief well plans, mobilize spud equipment, receive approvals</li> <li>• continue spill control measures</li> </ul>	14
<p><b>RELIEF WELL(S) OPERATIONS</b></p> <ul style="list-style-type: none"> <li>• continue intervention and containment measures</li> <li>• continue spill control measures</li> <li>• drill relief well (s)</li> </ul>	60
<p><b>PERFORM HYDRAULIC KILL OPERATIONS / SECURE BLOWNOUT WELL</b></p> <ul style="list-style-type: none"> <li>• continue intervention and containment measures</li> <li>• continue spill control measures</li> <li>• perform hydraulic kill operations, monitor well, secure well</li> </ul>	20
<p><b>ESTIMATED TOTAL DAYS OF UNCONTROLLED FLOW</b></p>	<b>99</b>
<p><b>SECURE RELIEF WELL(S) / PERFORM P&amp;A / TA OPERATIONS / DEMOBE</b></p>	30
<p align="center"><b>TOTAL DAYS</b></p>	<b>129</b>



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

**A. Geological Description**

Not required for this proposed plan – No Additional Drilling Proposed.

**B. Structure Contour Maps**

Included as *Attachment C-1* 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-2* is a copy of the migrated and annotated (shot points, time lines, 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-3*. Such cross section corresponds to each seismic line being submitted.

**E. Shallow Hazards Report**

Shallow Hazards Assessment and Benthic Communities Evaluation, Mississippi Canyon Block 257, OCS-G 35325 Lease, Berger Geosciences, L.L.C. prepared for LLOG Exploration, July, 2015, submitted to BOEM on July 14, 2015.

**F. Shallow Hazards Assessment**

Utilizing the 3D deep seismic exploration data a shallow hazards analysis was prepared for the proposed surface locations, evaluating seafloor and subsurface geologic and manmade features and conditions, and was included with LLOG's Initial Exploration Plan N-9907 filed with BOEM by letter dated August 26, 2015.

***No additional drilling is proposed in this plan.***

**G. High Resolution Seismic Lines**

The proposed operations will be conducted from an approved surface location in the Initial Joint Exploration Plan (N-9907); therefore annotated high resolution survey lines are not being submitted.

**No additional drilling is proposed in this plan.**

## **Structure Maps**

### **Attachment C-1 (Proprietary Information)**

## **Seismic Lines**

### **Attachment C-2 (Proprietary Information)**

# **Geologic Structure Cross Section**

## **Attachment C-3 (Proprietary Information)**

*APPENDIX D*  
**HYDROGEN SULFIDE (H<sub>2</sub>S) INFORMATION**  
**(30 CFR Part 550.215 and 550.245)**

**A. Concentration**

LLOG does not anticipate encountering H<sub>2</sub>S while conducting the proposed development operations provided for under this plan.

**B. Classification**

In accordance with Title 30 CFR 250.490 ©, the areas of operations have been classified by the Bureau of Ocean Energy Management as “H<sub>2</sub>S” absent.

**C. H<sub>2</sub>S Contingency Plan**

Not applicable for the proposed operations.

**D. Modeling Report**

Not applicable to the proposed operations.

*APPENDIX E*  
**MINERAL RESOURCE CONSERVATION INFORMATION**  
**(30 CFR PART 550.246)**

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

**A. High-Density Deepwater Benthic Communities Information**

Water depths in the assessment area range from 4,792' to 6,394' below sea level. Various water bottom seep-related anomalies have been reported by the BOEM including: five (5) high-positive possible oil anomalies, one (1) negative possible oil anomaly, one (1) gas plume point source, and eleven (11) water-column gas plumes associated with 400-ft buffers within the assessment area.

There are no observed apparent features or areas that could support chemosynthetic communities identified within 2,000' of the surface locations for Well SS001ST01..

Numerous seafloor faults are associated with and are limited to Mobile Dome within the southeast quadrant of the assessment area.

**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. – **NO ADDITIONAL DRILLING**

**D. Live Bottoms (Pinnacle Trend) Map**

Mississippi Canyon Block 257 is not located within the vicinity of a proposed live bottom (Pinnacle trend) area.

**E. Live Bottoms (Low Relief) Map**

Mississippi Canyon Block 257 is not located within the vicinity of a proposed live bottom (Low Relief) area.

**F. Potentially Sensitive Biological Features Map**

Mississippi Canyon Block 257 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 257 are not located in a critical habitat designated under ESA and marine mammals protected under the MMPA. In the event federally listed species become present on MC 257, LLOG will mitigate impact through compliance with the following NTL's:

**BOEM NTL 2016-G01** - "Vessel Strike Avoidance and Injured/Dead Protected Species Reporting".

**BOEM NTL 2016-G02** - "Implementation of Seismic survey Mitigation Measures and Protected Species Observer Program".

**BSEE NTL 2015-G03** "Marine Trash and Debris Awareness and Eliminations"

*Attachment F-1* for a list of the NOAA Species known in the Gulf of Mexico

**H. Archaeological Report**

Tesla Offshore, LLC, 2010, Archaeological Deep Tow Survey, Blocks 255, 256, 300, 301, 344, 388 Mississippi Canyon Area, Offshore, Louisiana, Gulf of Mexico, November, 2010. Tesla Offshore, LLC, 2012, Archaeological Deep Tow Survey, Block 257, Mississippi Canyon Area, Offshore Louisiana, Gulf of Mexico, June, 2012. Shallow Hazards Assessment and Benthic Communities Evaluation, Mississippi Canyon Block 257, OCS-G 35325 Lease, Berger Geosciences, L.L.C. prepared for LLOG Exploration, July, 2015, submitted to BOEM on July 14, 2015.

**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 F-1 (Public Information)**



# NOAA FISHERIES

Southeast Region  
Protected Resources Division

## Gulf of Mexico's Threatened and Endangered Species

For more information on listed species please visit:  
<http://www.nmfs.noaa.gov/pr/species/esa/listed.htm>  
[http://sero.nmfs.noaa.gov/protected\\_resources/index.html](http://sero.nmfs.noaa.gov/protected_resources/index.html)

Marine Mammal Species	Scientific Name	Status
fin whale	<i>Balaenoptera physalus</i>	Endangered
humpback whale	<i>Megaptera novaeangliae</i>	Endangered
sei whale	<i>Balaenoptera borealis</i>	Endangered
sperm whale	<i>Physeter macrocephalus</i>	Endangered
<b>Sea Turtle Species</b>		
green sea turtle	<i>Chelonia mydas</i>	Threatened <sup>1</sup>
hawksbill sea turtle	<i>Eretmochelys imbricata</i>	Endangered
Kemp's ridley sea turtle	<i>Lepidochelys kempii</i>	Endangered
leatherback sea turtle	<i>Dermochelys coriacea</i>	Endangered
loggerhead sea turtle	<i>Caretta caretta</i>	Threatened <sup>2</sup>
<b>Fish Species</b>		
Gulf sturgeon	<i>Acipenser oxyrinchus desotoi</i>	Threatened
smalltooth sawfish	<i>Pristis pectinata</i>	Endangered
<b>Invertebrate Species</b>		
lobed star coral	<i>Orbicella annularis</i>	Threatened
mountainous star coral	<i>Orbicella faveolata</i>	Threatened
boulder star coral	<i>Orbicella franksi</i>	Threatened
elkhorn coral	<i>Acropora palmata</i>	Threatened <sup>3</sup>

## Critical Habitat Designations

For final rules, maps, and GIS data please visit:  
[http://sero.nmfs.noaa.gov/maps\\_gis\\_data/protected\\_resources/critical\\_habitat/index.html](http://sero.nmfs.noaa.gov/maps_gis_data/protected_resources/critical_habitat/index.html)

Loggerhead sea turtle: There are 38 designated marine areas that occur throughout the Southeast Region.

Gulf sturgeon: There are 14 marine and estuarine units located in Northwest Florida, Alabama, Mississippi, and eastern Louisiana.

Smalltooth sawfish: There are two habitat units located in Charlotte Harbor and in the Ten Thousand Islands/Everglades, Florida.

<sup>1</sup> Florida's breeding population is listed as endangered.

<sup>2</sup> Northwest Atlantic distinct population segment.

<sup>3</sup> Colonies located at Flower Garden Banks National Marine Sanctuary.

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

**A. Projected Generated Wastes**

See the following tables:

- *No Additional Drilling*

**B. Projected Ocean Discharges**

- *No Additional Drilling*

**C. Modeling**

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

**D. NPDES Permits**

Not applicable. Discharges will be performed under EPA NPDES General Permit GMG290000.

**E. Cooling Water Intakes**

The information at 550.217(e) and 550.248(e) regarding cooling water intakes is not required to accompany DOCD's submitted in the BOEM.

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

The primary air pollutants associated with OCS development activities are:

- Carbon Monoxide
- Particulate Matter
- Sulphur Oxides
- Nitrogen Oxides
- Volatile Organic Compounds

These offshore air emissions result mainly from the drilling rig operations, helicopters, and support vessels. These emissions occur mainly from combustion or burning of fuels and natural gas and from venting or evaporation of hydrocarbons. The combustion of fuels occurs primarily on diesel powered generators, pumps or motors and from lighter fuel motors. Other air emissions can result from catastrophic events such as oil spills and blowouts.

***A. Emission Worksheets and Screening Questions***

The Projected Air Quality Emissions Report (Form MMS-139) addresses the related support vessels and construction barge information.

***B. Emissions Reduction Measures***

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

***C. Verification of Non-default Emissions Factors***

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

***D. Non-Exempt Activities***

The proposed activities are within the exemption amount.

***E. Modeling Report***

Not applicable. The State of Florida is not an affected State for the proposed activities in this plan.

# **Air Quality Emissions Report**

## **Attachment H-1 (Public Information)**

# Attachment H-1

## Air Emissions Information (§§ 550.218 and 550.249)

Screening Questions for DOCD's	Yes	No
Is any calculated Complex Total (CT) Emission amount (tons) associated with your proposed development and production 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
Do your emission calculations include any emission reduction measures or modified emission factors?		X
Does or will the facility complex associated with your proposed development and production activities process production from eight or more wells?	X	
Do you expect to encounter H2S at concentrations greater than 20 parts per million (ppm)?		X
Do you propose to flare or vent natural gas in excess of the criteria set forth under 30 CFR 250.1105(a)(2) and (3)?		X
Do you propose to burn produced hydrocarbon liquids?		X
Are your proposed development and production activities located within 25 miles (40 kilometers) from shore?		X
Are your proposed development and production activities located within 124 miles (200 kilometers) of the Breton Wilderness Area?	X	

DOCD AIR QUALITY SCREENING CHECKLIST

OMB Control No. 1010-0151  
 OMB Approval Expires: 12/31/2011

COMPANY	LLOG Exploration Offshore, LLC
AREA	Mississippi Canyon
BLOCK	257
LEASE	OCS-G-35325 Lease
PLATFORM	N/A
WELL	Well SS001ST01
COMPANY CONTACT	Nelda Runyon
TELEPHONE NO.	985-801-4389
REMARKS	Lease Term PL/Umbilical/Well Jumper Installation

LEASE TERM PIPELINE CONSTRUCTION INFORMATION:		
YEAR	NUMBER OF PIPELINES	TOTAL NUMBER OF CONSTRUCTION DAYS
2018		33 days
2019		
2020		
2021		
2022		
2023		
2024		
2025		
2026		
2027		

**AIR EMISSIONS CUMPUTATION FACTORS**

Fuel Usage Conversion Factors	Natural Gas Turbines		Natural Gas Engines		Diesel Recip. Engine		REF.	DATE
	SCF/hp-hr	9.524	SCF/hp-hr	7.143	GAL/hp-hr	0.0483	AP42 3.2-1	4/76 & 8/84

Equipment/Emission Factors	units	PM	SOx	NOx	VOC	CO	REF.	DATE
NG Turbines	gms/hp-hr		0.00247	1.3	0.01	0.83	AP42 3.2-1& 3.1-1	10/96
NG 2-cycle lean	gms/hp-hr		0.00185	10.9	0.43	1.5	AP42 3.2-1	10/96
NG 4-cycle lean	gms/hp-hr		0.00185	11.8	0.72	1.6	AP42 3.2-1	10/96
NG 4-cycle rich	gms/hp-hr		0.00185	10	0.14	8.6	AP42 3.2-1	10/96
Diesel Recip. < 600 hp.	gms/hp-hr	1	0.005505	14	1.12	3.03	AP42 3.3-1	10/96
Diesel Recip. > 600 hp.	gms/hp-hr	0.32	0.005505	11	0.33	2.4	AP42 3.4-1	10/96
Diesel Boiler	lbs/bbl	0.084	0.009075	0.84	0.008	0.21	AP42 1.3-12,14	9/98
NG Heaters/Boilers/Burners	lbs/mmscf	7.6	0.593	100	5.5	84	AP42 1.4-1, 14-2, & 14	7/98
NG Flares	lbs/mmscf		0.593	71.4	60.3	388.5	AP42 11.5-1	9/91
Liquid Flaring	lbs/bbl	0.42	6.83	2	0.01	0.21	AP42 1.3-1 & 1.3-3	9/98
Tank Vapors	lbs/bbl				0.03		E&P Forum	1/93
Fugitives	lbs/hr/comp.				0.0005		API Study	12/93
Glycol Dehydrator Vent	lbs/mmscf				6.6		La. DEQ	1991
Gas Venting	lbs/scf				0.0034			

Sulphur Content Source	Value	Units
Fuel Gas	3.33	ppm
Diesel Fuel2	0.0015	% weight
Produced Gas( Flares)	3.33	ppm
Produced Oil (Liquid Flaring)	1	% weight

**AIR EMISSIONS CALCULATIONS - FIRST YEAR**

COMPANY	AREA	BLOCK	LEASE	PLATFORM	WELL	CONTACT	PHONE	REMARKS									
MC		257			SS001ST01	Nelda Runyon	985-801-4389	#REF!									
OPERATIONS	EQUIPMENT	RATING	MAX. FUEL	ACT. FUEL	RUN TIME		MAXIMUM POUNDS PER HOUR					ESTIMATED TONS					
	Diesel Engines	HP	GAL/HR	GAL/D													
	Nat. Gas Engines	HP	SCF/HR	SCF/D													
	Burners	MMBTU/HR	SCF/HR	SCF/D	HR/D	DAYS	PM	SOx	NOx	VOC	CO	PM	SOx	NOx	VOC	CO	
DRILLING	PRIME MOVER>600hp 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	
	PRIME MOVER>600hp 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	
	PRIME MOVER>600hp 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	
	PRIME MOVER>600hp 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	
	BURNER diesel	0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	AUXILIARY EQUIP<600hp 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	
	VESSELS>600hp diesel(crew)	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	
	VESSELS>600hp diesel(supply)	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	
VESSELS>600hp diesel(tugs)	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	
PIPELINE INSTALLATION	PIPELINE LAY BARGE diesel	12000	579.6	13910.40	24	30	8.46	0.15	290.75	8.72	63.44	3.04	0.05	104.67	3.14	22.84	
	SUPPORT VESSEL diesel (ROV)	8805	425.2815	10206.76	24	3	6.21	0.11	213.34	6.40	46.55	0.22	0.00	7.68	0.23	1.68	
	PIPELINE BURY 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	
	Umbilical - 2	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	
	Jumper	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	
VESSELS>600hp diesel(crew)	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		
VESSELS>600hp diesel(supply)	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	DERRICK BARGE diesel		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	
	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	
	VESSELS>600hp diesel(crew)	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	
	VESSELS>600hp diesel(supply)	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	RECIP.<600hp 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	
	RECIP.>600hp 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	
	SUPPORT VESSEL 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	
	TURBINE nat gas	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
	RECIP.2 cycle lean nat gas	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
	RECIP.4 cycle lean nat gas	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
	RECIP.4 cycle rich nat gas	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
	BURNER nat gas	0	0.00	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	MISC.	BPD	SCF/HR	COUNT													
	TANK-FLARE-	0			0	0			0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00
	PROCESS VENT-FUGITIVES-		0		0	0								0.00	0.00	0.00	0.00
	GLYCOL STILL VENT-			0.0		0									0.00	0.00	0.00
	DRILLING	OIL BURN	0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WELL TEST	GAS FLARE		0		0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
<b>2018 YEAR TOTAL</b>							<b>14.66</b>	<b>0.25</b>	<b>504.09</b>	<b>15.12</b>	<b>109.98</b>	<b>3.27</b>	<b>0.06</b>	<b>112.35</b>	<b>3.37</b>	<b>24.51</b>	
<b>EXEMPTION CALCULATION</b>	<b>DISTANCE FROM LAND IN MILES</b>											<b>2031.30</b>	<b>2031.30</b>	<b>2031.30</b>	<b>2031.30</b>	<b>52686.43</b>	
	61.0																

AIR EMISSIONS CALCULATIONS - SECOND YEAR

COMPANY	AREA	BLOCK	LEASE	PLATFORM	WELL	CONTACT	PHONE	REMARKS									
LLOG Exploration Offsho	Mississippi Canyon	257	OCS-G-35325 L	N/A	Well SS001ST0	Nelda Runyon	985-801-4389	#REF!									
OPERATIONS	EQUIPMENT	RATING	MAX. FUEL	ACT. FUEL	RUN TIME		MAXIMUM POUNDS PER HOUR					ESTIMATED TONS					
	Diesel Engines	HP	GAL/HR	GAL/D													
	Nat. Gas Engines	HP	SCF/HR	SCF/D													
	Burners	MMBTU/HR	SCF/HR	SCF/D	HR/D	DAYS	PM	SOx	NOx	VOC	CO	PM	SOx	NOx	VOC	CO	
DRILLING	PRIME MOVER>600hp diesel	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	PRIME MOVER>600hp diesel	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	PRIME MOVER>600hp diesel	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	PRIME MOVER>600hp diesel	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	BURNER diesel	0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	AUXILIARY EQUIP<600hp diesel	0	0	0.00	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>600hp diesel(crew)	0	0	0.00	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>600hp diesel(supply)	0	0	0.00	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>600hp diesel(tugs)	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
PIPELINE INSTALLATION	PIPELINE LAY 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	
	SUPPORT VESSEL 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	
	PIPELINE BURY 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	
	SUPPORT VESSEL 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	
	VESSELS>600hp diesel(crew)	0	0	0.00	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>600hp diesel(supply)	0	0	0.00	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	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	
	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	
	VESSELS>600hp diesel(crew)	0	0	0.00	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>600hp diesel(supply)	0	0	0.00	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	RECIP.<600hp 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	
	RECIP.>600hp 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	
	SUPPORT VESSEL 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	
	TURBINE nat gas	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
	RECIP.2 cycle lean nat gas	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
	RECIP.4 cycle lean nat gas	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
	RECIP.4 cycle rich nat gas	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
	BURNER nat gas	0	0.00	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	MISC.	BPD	SCF/HR	COUNT													
	TANK-	0			0	0				0.00						0.00	
	FLARE-		0		0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
PROCESS VENT-		0		0	0				0.00					0.00			
FUGITIVES-			0.0	0	0				0.00					0.00			
GLYCOL STILL VENT-		0		0	0				0.00					0.00			
DRILLING WELL TEST	OIL BURN	0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	GAS FLARE		0		0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
<b>2019 YEAR TOTAL</b>							<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	
<b>EXEMPTION CALCULATION</b>	<b>DISTANCE FROM LAND IN MILES</b>											<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	
	0.0																

AIR EMISSIONS CALCULATIONS - THIRD YEAR

COMPANY	AREA	BLOCK	LEASE	PLATFORM	WELL	CONTACT	PHONE	REMARKS									
LLOG Exploration Offsho	Mississippi Canyon	257	OCS-G-35325 L	N/A	Well SS001ST0	Nelda Runyon	985-801-4389	#REF1									
OPERATIONS	EQUIPMENT	RATING	MAX. FUEL	ACT. FUEL	RUN TIME		MAXIMUM POUNDS PER HOUR					ESTIMATED TONS					
	Diesel Engines	HP	GAL/HR	GAL/D													
	Nat. Gas Engines	HP	SCF/HR	SCF/D													
	Burners	MMBTU/HR	SCF/HR	SCF/D	HR/D	DAYS	PM	SOx	NOx	VOC	CO	PM	SOx	NOx	VOC	CO	
DRILLING	PRIME MOVER>600hp 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	
	PRIME MOVER>600hp 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	
	PRIME MOVER>600hp 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	
	PRIME MOVER>600hp 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	
	BURNER diesel	0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	AUXILIARY EQUIP<600hp 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	
	VESSELS>600hp diesel(crew)	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	
	VESSELS>600hp diesel(tugs)	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	
PIPELINE INSTALLATION	PIPELINE LAY 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	
	SUPPORT VESSEL 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	
	PIPELINE BURY 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	
	SUPPORT VESSEL 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	
	VESSELS>600hp diesel(crew)	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	
	VESSELS>600hp diesel(supply)	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	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	
	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	
	VESSELS>600hp diesel(crew)	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	
	VESSELS>600hp diesel(supply)	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	RECIP.<600hp 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	
	RECIP.>600hp 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	
	SUPPORT VESSEL 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	
	TURBINE nat gas	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
	RECIP.2 cycle lean nat gas	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
	RECIP.4 cycle lean nat gas	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
	RECIP.4 cycle rich nat gas	0	0	0.00	0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
	BURNER nat gas	0	0.00	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	MISC.	BPD	SCF/HR	COUNT													
	TANK-	0			0	0				0.00						0.00	
	FLARE-		0		0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
	PROCESS VENT-		0		0	0				0.00					0.00		
	FUGITIVES-			0.0	0	0				0.00					0.00		
GLYCOL STILL VENT-		0		0	0				0.00					0.00			
DRILLING WELL TEST	OIL BURN	0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	GAS FLARE		0		0	0		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
<b>2020 YEAR TOTAL</b>							<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	
<b>EXEMPTION CALCULATION</b>	<b>DISTANCE FROM LAND IN MILES</b>											<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	
	0.0																

### AIR EMISSIONS CALCULATIONS

COMPANY	AREA	BLOCK	LEASE	PLATFORM	WELL
LLOG Exploratio	Mississippi Canyon	257	OCS-G-35325 Lease	N/A	Well SS001
Year	Emitted Substance				
	PM	SOx	NOx	VOC	CO
2018	3.27	0.06	112.35	3.37	24.51
2019	0.00	0.00	0.00	0.00	0.00
2020	0.00	0.00	0.00	0.00	0.00
2021	0.00	0.00	0.00	0.00	0.00
2022	0.00	0.00	0.00	0.00	0.00
2023	0.00	0.00	0.00	0.00	0.00
2024	0.00	0.00	0.00	0.00	0.00
2025	0.00	0.00	0.00	0.00	0.00
2026	0.00	0.00	0.00	0.00	0.00
2027	0.00	0.00	0.00	0.00	0.00
Allowable	2031.30	2031.30	2031.30	2031.30	52686.43

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

**A. Oil Spill Response Planning**

All the proposed activities in this DOCD will be covered by the Biennial update found to be in compliance June 29, 2016 and revisions to the Regional Oil spill response Plan (OSRP) filed by LLOG (Operator # 02058) in accordance with 30 CFR 254 and approved on April 12, 2017. The Biennial update found to be in compliance June 29, 2016 and revisions to increase drilling worst case scenario in the OSRP were approved April 12, 2017.

The WCD proposed in this Plan does not exceed the WCD outlined in our OSRP.

**B. Spill Response Sites**

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

<b>Primary Response Equipment Location</b>	<b>Pre-Planned Staging Location(s)</b>
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>Initial DOCD</i>
Type of Activity	Development Production > 10 miles from shore	Development Production > 10 miles from shore
Facility Surface Location	Mississippi Canyon Block 547	Mississippi Canyon Block 257 (Well SS001ST01)
Facility Description	Platform "A"	MC 254 "A"
Distance to Nearest Shoreline (Miles)	38 miles	61 miles
Volume:		
Storage Tanks (total)	3,902 bbls	0 bbls
Facility Piping (total)	200 bbls	18 bb;s
Lease Term Pipeline	1908 bbls	1,203 bb;s
Uncontrolled Blowout (day Barging	29,440 bbls	31,184 bb;s
<b>Potential 24 Hour Volume (bbls)</b>	<b>35,450 bbls</b>	<b>32,405 bbls</b>
Type of Liquid Hydrocarbon	Crude Oil	Crude Oil
API Gravity	27°	31.6°

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, Biennial update found to be in compliance June 29, 2016 and revisions to the Regional Oil spill response Plan (OSRP) filed by LLOG (Operator # 02058) in accordance with 30 CFR 254 and approved on April 12, 2017. Because the worst case discharge determined in our Development Operations Coordination Document for MC 257 does not exceed our 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 Initial DOCD. The WCD for the subject plan does not exceed the worst case discharge previously submitted for MC 547 (Plan N-9951).

The WCD for the subject plan does not exceed the worst case discharge previously submitted for MC 547 (Plan S-9951). LLOG Exploration Offshore, L.L.C., Company No. 02058, previously submitted the Regional OSRP Production WCD volume to be reviewed in Plan N-9951, Initial DOCD approved on May 23, 2011.

**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 production operations, estimated to be 31,184 barrels of crude oil with an API gravity of 31.6°.

### 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 1**. The BOEM OSRAM identifies a 21% 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.

### Response

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 25% or approximately 7,796 barrels of crude oil would be evaporated/dispersed within 24 hours, with approximately 23,388 barrels remaining.

Spill Response MC 257, Well SS001	Barrels of Oil
WCD Volume	31,184
Less 25% natural evaporation/dispersion	7,796
Remaining volume	23,388

**Figure 2** 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 2** 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's and MSRC's spill response equipment with a total derated skimming capacity of 200,636 barrels. Temporary storage associated with skimming equipment equals 49,296 barrels. If additional storage is needed, various tank barges with a total of 167,000+ 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's and MSRC's near shore and shallow water skimmers with a totaled derated skimming capacity of 89,994 barrels. Temporary storage associated with skimming equipment equals 996 barrels. If additional storage is needed, various tank barges with a total of 91,000 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 145,200 feet of 18" shoreline protection boom. **Figure 2** 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 60 hours (based on the equipment's Effective Daily Recovery Capacity (EDRC)).

## **Initial Response Considerations**

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

- 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 continual 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, but in coordination to complete a common objective, in a small area and 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 completed
- Initial Safety plan will be written and published
- Unified Command will be established
  - Overall safety plan developed to reflect the operational situation and coordinated objectives
  - Areas of responsibility established for Source Control and each surface operational site
  - On-site command and control established

## Offshore Response Actions

### Equipment Deployment

#### *Surveillance*

- Aerial Observation:
  - Surveillance Aircraft: deployment within two hours of QI notification, or at first light
  - Provide trained observer to provide on site status reports
  - Provide aerial photography and visual confirmation
- Provide 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
- Continual 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)
- Gain FOSC approval for use of dispersants on the surface
- 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
- Confirm dispersant availability for current and long range operations
- Consider ordering 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 continuing reports to vessels to expedite their arrival at sites that will provide for their most effective containment
- Use Vessels of Opportunity (VOO) to deploy and maintain boom
- MSRC OSRVs and OSRBs have on-board ocean boom inventories and additional significant stockpiles are available in 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*

- Use in areas with heaviest oil concentrations
- 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 FRUs*

- To the area of the thickest oil
- Use as far off-shore as allowed

#### *T&T Koseq Skimming Systems*

- To the area of the thickest oil
- 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)
- Early call out (to allow for tug boat acquisition and deployment speeds)
- Phase mobilization to allow storage vessels to arrive at the same time as 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 Vessel of Opportunity Skimming Systems (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 US Coast Guard/ABS for vessel inspections
- Place VOOs in Division or Groups as needed
- Use organic on-board storage if appropriate
- Maximize non-organic storage appropriate to vessel limitations
- Decant as appropriate after approval to do so has been granted
- Assign bulk storage barges to each Division/Group
- 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, but especially offshore
- Nearshore, use shallow water barges and shuttle to skimming units to minimize offloading time
- Plan and equip to use all offloading capabilities of the storage vessel to minimize offloading time

### *In-situ Burn assets*

- Determine appropriateness of in-situ burn operation in coordination with the FOOSC and affected SOSOC
- Determine availability of fire boom and selected ignition systems
- Start ordering fire boom stocks required for expected operations
- Ensure VOO crew members are trained prior to operations
- Determine assets to perform on water operation
- Build operations into safety plan
- Conduct operations in accordance with an approved plan
- Initial test burn to ensure effectiveness

### *Adverse Weather Operations:*

In adverse weather, when seas are  $\geq 3$  feet, the use of larger recovery and storage vessels, oleophilic skimmers, and large offshore boom will be maximized. Safety will be the overriding factor in all operations and will cease at the order of the Unified Command, vessel captain, or 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, groups, etc., 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, and move to, recoverable oil
- Confirm the presence of recoverable oil prior to moving to a new location

#### *Maximize skimmer system efficiency*

- 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 skimming systems (e.g. HOSS Barge) in the largest pockets of the heaviest oil
- Maximize onboard recovered oil storage for vessels.
- Obtain authorization for decanting of recovered water as soon as possible
- 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*

- Smaller barges in larger quantities will increase flexibility for multi-location skimming operations
- Place barges in skimming task forces, groups, etc., to reduce recovered oil offloading time
- Procure and deploy the maximum number of portable tanks to support Vessel of Opportunity Skimming Systems if onboard storage is not available
- Maximize use of the organic recovered oil storage capacity of the skimming vessel

### *Command, Control, and Communications (C<sup>3</sup>)*

- Publish, implement, and fully test an appropriate communications plan
- Design an operational scheme, maintaining a manageable span of control
- Designate and mark C<sup>3</sup> vessels for easy aerial identification
- Designate and employ C<sup>3</sup> aircraft for task forces, groups, etc.
- Use reconnaissance air craft and Rapid Response Teams (RAT) to confirm the presence of recoverable oil

### **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 O<sub>2</sub>, LEL, H<sub>2</sub>S, 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 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 to 5 – Offshore skimming vessels (recovery)
- 1 – Tank barge (temporary storage)
- 1 – Air asset (tactical direction)
- 2 – Support vessels (crew/utility for supply)
- 6 to 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 (High Volume Open Sea Skimming System) out of Harvey, a boom barge (CGA 300) with 25,000' of 42" auto boom out of Leeville, and 9 Fast Response Units (FRUs) from the load-out location at C-Port in Port Fourchon.

As these vessels set up and begin skimming, they are grouped into task forces (TFs) 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 H.3a; 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'+ PIDVs
- 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'+ PIDVs
- 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'+ PIDVs
- 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'+ PIDVs
- 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 Supply Vessel	Utility Boat
<b>Operating parameters</b>			
Sea State	3-5 ft max	9.8 ft max	3-5 ft max
Skimming speed	≤1 kt	≤3 kts	≤1 kt
<b>Vessel size</b>			
Minimum Length	100 ft	200 ft	100 ft
Deck space for: <ul style="list-style-type: none"> <li>• Tank(s)</li> <li>• Crane(s)</li> <li>• Boom Reels</li> <li>• Hydraulic Power Units</li> <li>• Equipment Boxes</li> </ul>	18x32 ft	100x40 ft	18x32 ft
<b>Communication Assets</b>	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 more likely versed in spill response operations. They also have a greater possibility of having on-board storage capacity and the most likely vessels to be under contract, and therefore more readily available to the operator. These vessels would normally be assigned to an on-water recovery group/division (see figure below) and outfitted with a VOSS suited for their size and capabilities. Specific tactics used for skimming operations would be dependent upon many parameters which include, but are not limited to, safety concerns, weather, type VOSS on board, product being recovered, and area of oil coverage. Planners would deploy these assets with the objective of safely maximizing oil- to-skimmer encounter rate by taking actions to minimize non-skimming time and maximizing boom swath. Specific tactical configurations are shown in figures below.

**The 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 Coast Guard, 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 4,100 barrels. An additional boom reel with 440' of offshore boom can be deployed along with the FRU, and a second support vessel for boom towing, 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 Coast Guard licensed Captain in charge of the VOO (with input from the CGAS Supervisor assigned) will be responsible to determine when the 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  $\leq 1$  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  $\leq 1$  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) pump 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 Coast Guard, 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* – The large OSVs in many cases 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' Offshore Supply Vessels (OSV) with set of Koseq Arms

2-4 – portable storage tanks (500 bbl)

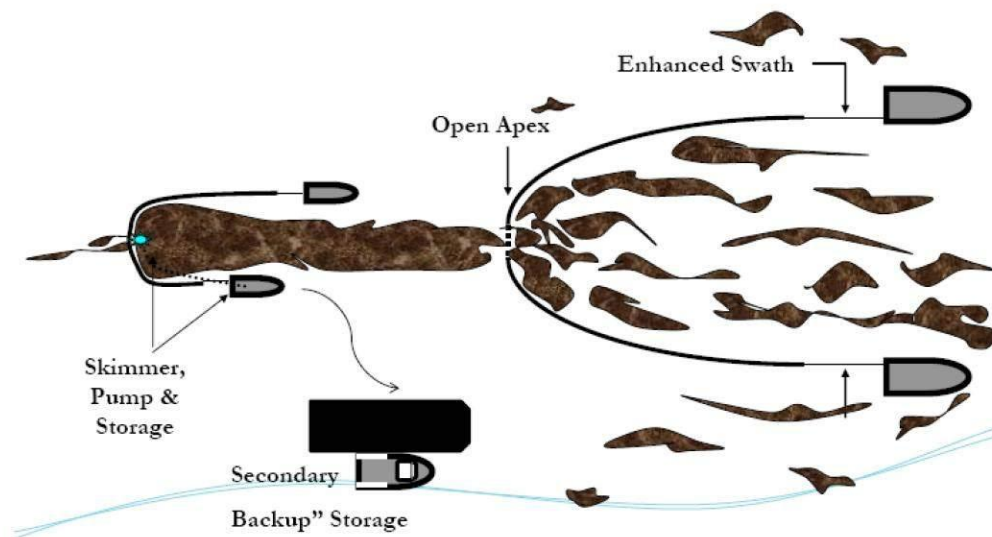
1 – Modular Crane Pedestal System set (MCPS) or 30 cherry picker (crane) for deployment

1 – Tank barge (offshore) for temporary storage

1 – Utility/Crewboat (supply)

1 – Designated spotter aircraft

4 – Personnel (4 T&T OSRO)



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  $>1$ . A recovered oil barge stationed nearby to minimize time taken to offload recovered oil.



This is a depiction of the same operation as above but using KOSEQ Arms. In this configuration, the collecting boom speed dictates the operational pace at  $\geq 1$  knot to minimize entrainment of the oil.

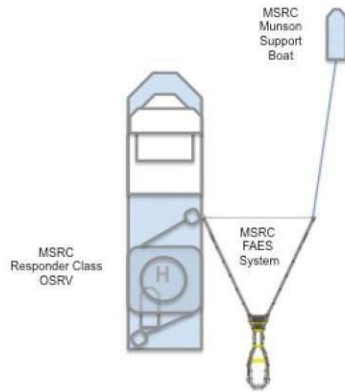
## **Clean Gulf Associates (CGA) Procedure for Accessing Member-Contracted and other Vessels of Opportunity (VOOs) for Spill Response**

- CGA has procedures in place for CGA member companies to acquire vessels of opportunity (VOOs) from an existing CGA member's contracted fleet or other sources for the deployment of CGA portable skimming equipment including Koseq Arms, Fast Response Units (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.

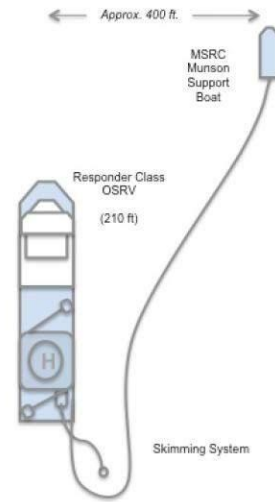
**Typical On-Water Oil Recovery and Removal Tactics** (See *MSRC Gulf Area Tactics Guidebook* for more information)

**Mechanical Recovery  
Large Scale Resources**

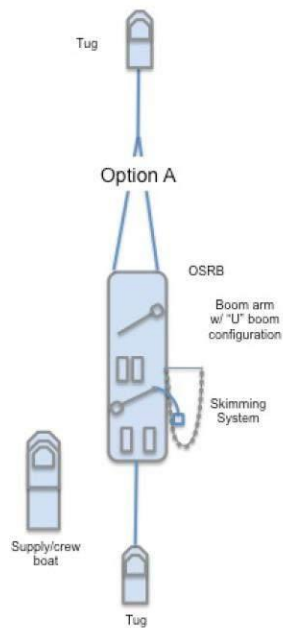
**Option A – OSRV FAES Deployment (Example)**



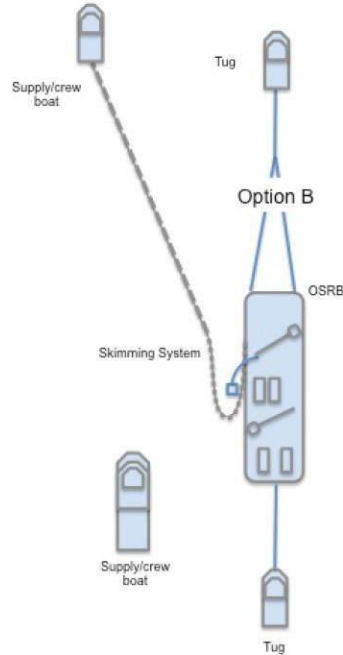
**Option B – OSRV Ocean Boom in a “J” Configuration (Example)**



**Option A – OSRB in a “U” Configuration**

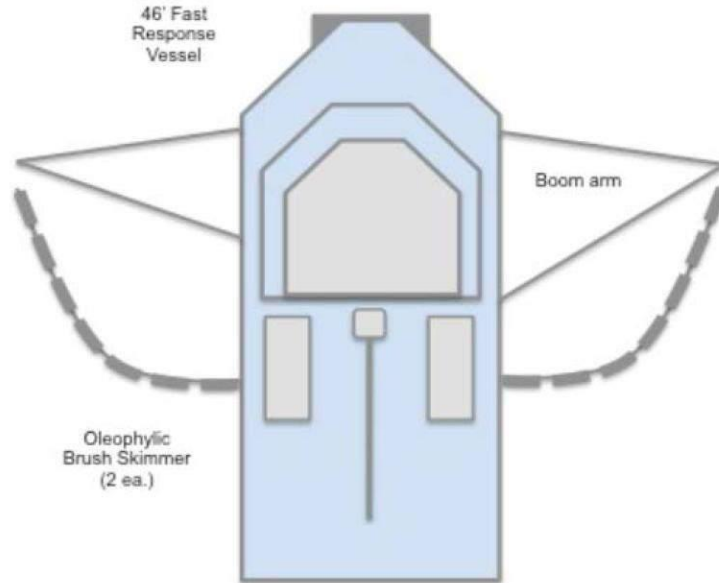


**Option B – OSRB in a “J” Configuration**

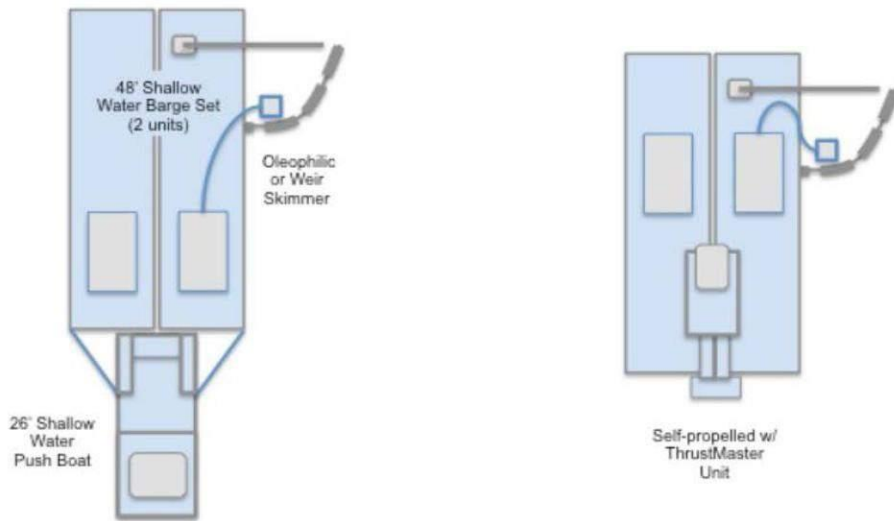


## Small Scale Resources

### TACTIC DIAGRAM (EXAMPLE) NOT TO SCALE

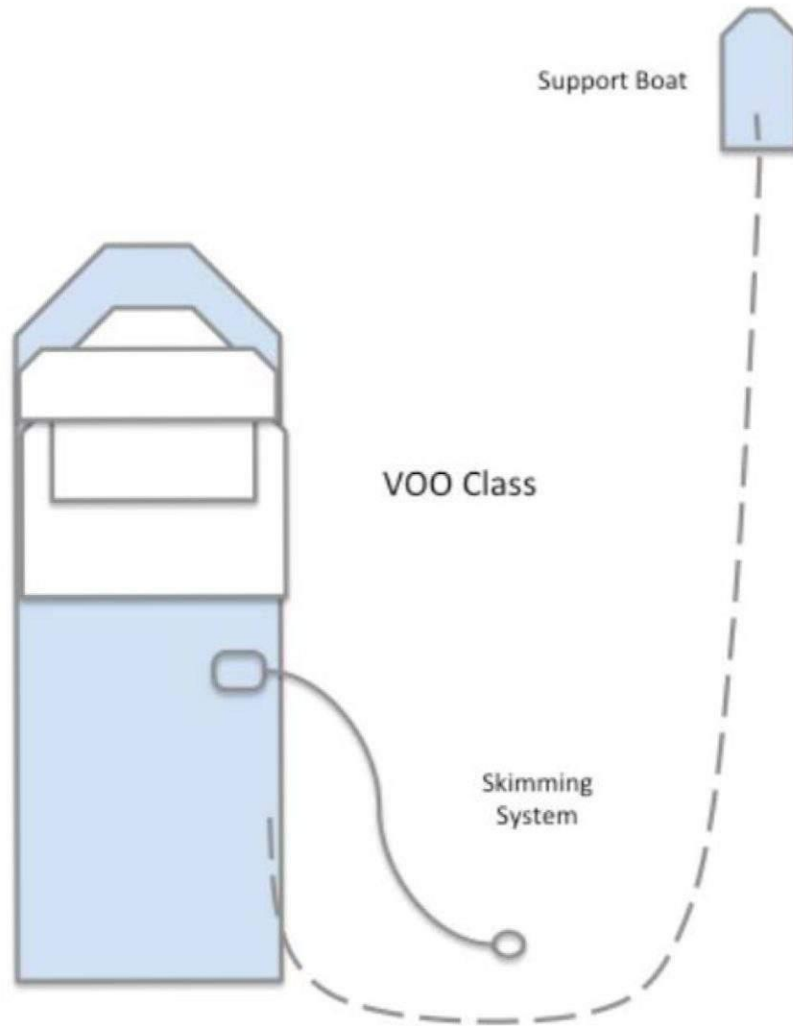


### TACTIC DIAGRAM (EXAMPLE) OPTION A NOT TO SCALE

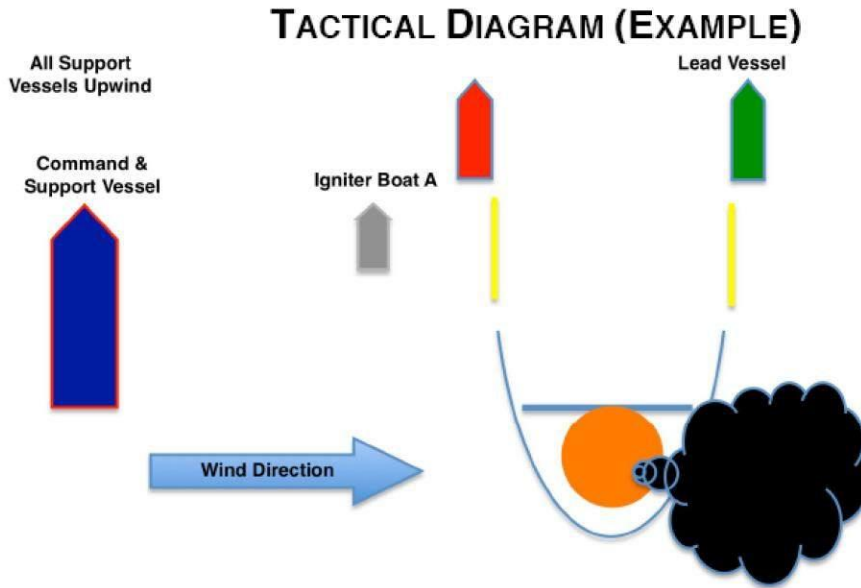


Enhanced Encounter Rate Resources, FAES

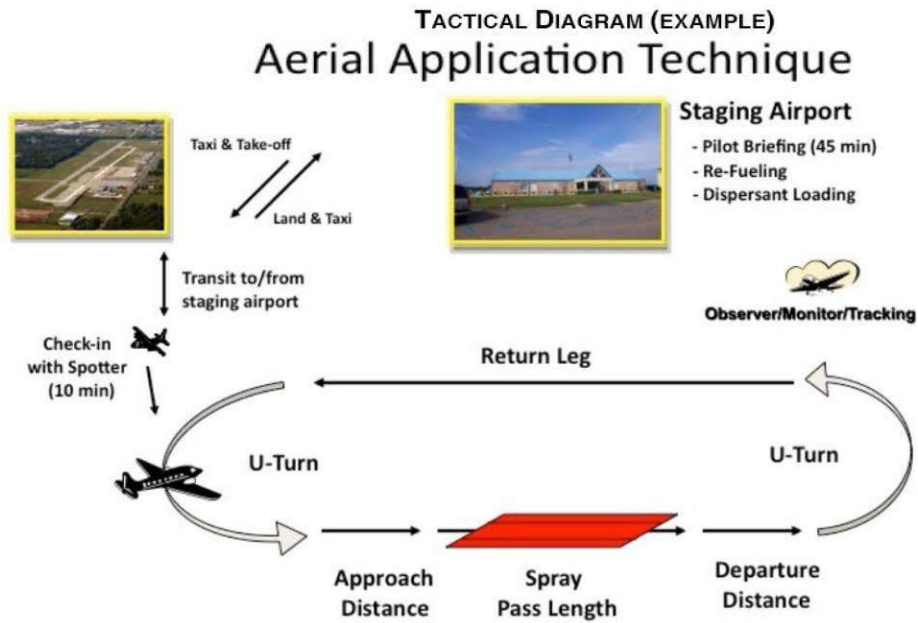
**TACTIC DIAGRAM (EXAMPLE)**  
**NOT TO SCALE**



## In-situ Burn (ISB)



## Aerial Dispersant



## Near Shore Response Actions

### *Timing*

- Put near shore assets on standby and deployment in accordance with planning based on the actual situation, actual 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

### *Equipment Deployment*

#### *Surveillance*

- Provide trained observer to direct skimming operations
- Continual surveillance of oil movement by remote sensing systems, aerial photography and visual confirmation
- Continual 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*

- FRVs
- Egmopol and Marco SWS
- Operate with aerial spotter directing systems to observed oil slicks

#### *VOO*

- Use LLOG Exploration Offshore, L.L.C.'s contracted resources as applicable
- Industry vessel are usually best for deployment of Vessel of Opportunity Skimming Systems (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 US Coast Guard 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
- Capability for continual analysis of trajectories run periodically during the response
- Environmental risk assessments (ERA) to determine priorities for area protection
- Time to acquire personnel and equipment and their availability
- Refer to the State of Louisiana Initial Oil Spill Response Plan, Deep Water Horizon, dated 2 May 2010, as a secondary reference
- Aerial surveillance of oil movement
- Pre-impact beach cleaning and debris removal
- Shoreline Cleanup Assessment Team (SCAT) operations and reporting procedures
- Boom type, size and length requirements and availability
- Possibility of need for In-situ burning in near shore areas
- Current wildlife situation, especially status of migratory birds and endangered species in the area
- Check for Archeological sites and arrange assistance for the appropriate state agency when planning operations that 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 to move oil into those areas
- 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
- Determination of archeological sites and gaining authority to enter
- Monitoring of tide tables and weather to determine extent of high tides
- Pre cleaning of beaches by moving waste above high tide lines to minimize waste

- Determination of logistical requirements and arranging of waste removal and disposal
- Staging of equipment and housing of response personnel as close to the job site as possible to maximize on-site work time
- Boom tending, repair, replacement and security (use of local assets may be advantageous)
- Constant awareness of weather and oil movement for resource re-deployment as necessary
- Earthen berms and shoreline protection boom may be considered to protect sensitive inland areas
- Requisitioning of earth moving equipment
- Plan for efficient and safe use of personnel, ensuring:
  - A continual supply of the proper Personal Protective Equipment
  - Heating or cooling areas when needed
  - Medical coverage
  - Command and control systems (i.e. communications)
  - Personnel accountability measures
- Remediation requirements, i.e., replacement of sands, rip rap, etc.
- Availability of surface washing agents and associated protocol requirements for their use (see National Contingency Plan Product Schedule for list of possible agents)
- Discussions 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 the 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

- 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:
  - Placement of recovered oil or waste storage as near to vessels or beach cleanup crews as possible.
  - Planning for stockage of high use items for expeditious replacement
  - Housing of personnel as close to the work site as possible to minimize travel time
  - Use of shallow water craft
  - Use of communication systems appropriate ensure command and control of assets
  - Use of appropriate boom in areas that I can offer effective protection
  - Planning of waste collection and removal to maximize cleanup efficiency
- Consideration or on-site remediation of contaminated soils to minimize replacement operations and impact on the area

**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.

**CGA Equipment Limitations**

The capability for any spill response equipment, whether a dedicated or portable system, to operate in differing weather conditions will be directly in relation to the capabilities of the vessel the system is placed on. Most importantly, however, the decision to operate will be based on the judgment of the Unified Command and/or the Captain of the vessel, who will ultimately have the final say in terminating operations. Skimming equipment listed below may have operational limits which exceed those safety thresholds. As was seen in the Deepwater Horizon (DWH) oil spill response, vessel skimming operations ceased when seas reached 5-6 feet and vessels were often recalled to port when those conditions were exceeded. Systems below are some of the most up-to-date systems available and were employed during the DWH spill.

Boom	3 foot seas, 20 knot winds
Dispersants	Winds more than 25 knots Visibility less than 3 nautical miles Ceiling less than 1,000 feet.
FRU	8 foot seas
HOSS Barge/OSRB	8 foot seas
Koseq Arms	8 foot seas
OSRV	4 foot seas

### **Environmental Conditions in the GOM**

Louisiana is situated between the easterly and westerly wind belts, and therefore, experiences westerly winds during the winter and easterly winds in the summer. Average wind speed is generally 14-15 mph along the coast. Wave heights average 4 and 5 feet. However, during hurricane season, Louisiana has recorded wave heights ranging from 40 to 50 feet high and winds reaching speeds of 100 mph. Because much of southern Louisiana lies below sea level, flooding is prominent.

Surface water temperature ranges between 70 and 80 ° F during the summer months. During the winter, the average temperature will range from 50 and 60 ° F.

The Atlantic and Gulf of Mexico hurricane season is officially from 1 June to 30 November. 97% of all tropical activity occurs within this window. The Atlantic basin shows a very peaked season from August through October, with 78% of the tropical storm days, 87% of the minor (Saffir-Simpson Scale categories 1 and 2) hurricane days, and 96% of the major (Saffir-Simpson categories 3, 4 and 5) hurricane days occurring then. Maximum activity is in early to mid September. Once in a few years there may be a hurricane occurring "out of season" - primarily in May or December. Globally, September is the most active month and May is the least active month.

**FIGURE 1  
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
<p align="center"><b>MC 257, Well SS001</b></p> <p><i>61 miles from shore</i></p>	G35325	C57	Cameron, LA	1
			Vermilion, LA	1
			Terrebonne, LA	2
			Lafourche, LA	2
			<b>Plaquemines, LA</b>	<b>21</b>
			St. Bernard, LA	3
			Hancock & Harrison, MS	1
			Jackson, MS	1
			Mobile, AL	1
			Baldwin, AL	1
			Escambia, AL	1
			Okaloosa, FL	1
			Walton, FL	1
			Bay, FL	1

**WCD Scenario– BASED ON WELL BLOWOUT DURING PRODUCTION OPERATIONS (61 miles from shore)**

23,388 bbls of crude oil (Volume considering natural weathering)

API Gravity 31.6°

**FIGURE 2 – Equipment Response Time to MC 257, Well SS001**

*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	0.8	4.8
DC 3	1200	2	Houma	2	2	1.1	5.1
DC 3	1200	2	Houma	2	2	1.1	5.1
Aero Commander	NA	2	Houma	2	2	0.8	4.8
MSRC							
C-130 Spray AC	3,250	2	Kiln	3	0	0.4	3.4
King Air BE90 Spray AC	250	2	Kiln	3	0	0.7	3.7

*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	7	0	5	10	1	23
95' FRV	22885	249	NA	6	Leeville	2	0	2	6.5	0	10.5
95' FRV	22885	249	NA	6	Venice	2	0	2	4	0	8
95' FRV	22885	249	NA	6	Galveston	2	0	2	20.5	0	24.5
95' FRV	22885	249	NA	6	Vermilion	2	0	2	10.5	0	14.5
Boom Barge (CGA-300) 42" Auto Boom (25000')	NA	NA	1 Tug 50 Crew	4 (Barge) 2 (Per Crew)	Leeville	4	0	6	18.5	2	30.5

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
Mississippi Responder Transrec 350 + OSRV 2,640' 67" Curtain Pressure Boom	10567	4000	NA	10	Pascagoula	2	0	2	8	1	13
MSRC 402 Offshore Barge 2 Crucial Disk 88/30 2,640' 67" Curtain Pressure Boom	22244	40300	2 Tugs	9	Pascagoula	2.5	0	3	14	1	20.5

Offshore Recovered Oil Storage 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
Enterprise Marine (available through contract with CGA)											
CTCo 2605	NA	20000	1 Tug	6	Amelia	22	12	4	21	1	60
CTCo 2606	NA	20000	1 Tug	6	Amelia	22	12	4	21	1	60
CTCo 5001	NA	47000	1 Tug	6	Amelia	22	12	4	21	1	60
Kirby Offshore (available through contract with MSRC)											
RO Barge	NA	80000+	1 Tug	6	Venice	48	0	2	10	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	2	4	2	7	6	21
MSRC											
67" Curtain Pressure Boom (24750')	NA	NA	7*	14	Houston	1	2	12	14	1	30
67" Curtain Pressure Boom (1320')	NA	NA	2*	4	Belle Chasse	1	2	2	14	1	20
67" Curtain Pressure Boom (1305')	NA	NA	2*	4	Pascagoula	1	2	5	14	1	23
1000' Fire Resistant Boom	NA	NA	3*	6	Galveston	1	4	13	14	6	31
16000' Fire Resistant Boom	NA	NA	3*	6	Houston	1	4	12	14	6	30
2000' Fire Resistant Boom	NA	NA	3*	6	Lake Charles	1	4	8	14	6	33

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

*Nearshore Response*

Nearshore Equipment	EDRC	Storage Capacity	VOO	Persons Req.	From	Hrs to Procure	Hrs to Loadout	Hrs to GOM	Travel to Staging	Hrs to Deploy	Total Hrs
CGA											
Trinity SWS	21500	249	NA	4	Morgan City	2	6	N/A	48	0	56
Trinity SWS	21500	249	NA	4	Vermilion	2	6	N/A	48	0	56
46' FRV	15257	65	NA	4	Morgan City	2	0	2	7	0	11
46' FRV	15257	65	NA	4	Venice	2	0	2	2.5	0	6.5
MSRC											
30 ft. Kvichak	3588	24	NA	2	Belle Chasse	1	1	2	3	0	7
30 ft. Kvichak	3588	24	NA	2	Pascagoula	1	1	2	4	0	8
Enterprise Marine (available through contract with CGA)											
CTCo 2603	NA	25000	1 Tug	6	Amelia	28	12	4	15	1	60
CTCo 2604	NA	20000	1 Tug	6	Amelia	28	12	4	15	1	60
CTCo 2608	NA	23000	1 Tug	6	Amelia	28	12	4	15	1	60
CTCo 2609	NA	23000	1 Tug	6	Amelia	28	12	4	15	1	60

Nearshore and Inland Skimmers With Staging	EDRC	Storage Capacity	VOO	Persons Req.	From	Hrs to Procure	Hrs to Load Out	Travel to Venice	Travel to Deployment	Hrs to Deploy	Total Hrs
CGA											
SWS Marco	3588	34	NA	3	Leeville	2	2	4.4	2	0	10.4
SWS Marco	3588	34	NA	3	Venice	2	2	0	2	0	6
Rope Mop	77	2	0	3	Harvey	2	2	2.1	2	0	8.1
Foilex Skim Package (TDS 150)	1131	50	NA	3	Harvey	2	2	2.1	2	0	8.1
4 Drum Skimmer (Magnum 100)	680	100	1 Crew	3	Harvey	2	2	2.1	2	0	8.1
2 Drum Skimmer (TDS 118)	240	100	1 Crew	3	Harvey	2	2	2.1	2	0	8.1

*Shoreline Protection*

**Staging Area: Venice**

Shoreline Protection Boom	VOO	Persons Req.	Storage/Warehouse Location	Hrs to Procure	Hrs to Loadout	Travel to Venice	Travel to Deployment Site	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
12,000' 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
30,000' 18" Boom	13 Crew	26	Harvey, LA	2	2	2	2	12	20
1,700' 18" Boom	2 Crew	4	Venice, LA	2	2	0	2	2	8
16,000' 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
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
5,800' 18" Boom	5 Crew	10	Venice, LA	1	1	0	2	3	7
13,300' 18" Boom	5 Crew	10	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	12.7	1	2	19.7
Bird Scare Guns (12)	NA	NA	NA	2	Aransas Pass	2	2	17.7	1	2	24.7
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	4.4	1	2	11.4

Response Asset	Total (bbls)
Offshore EDRC	200,636
Offshore Recovered Oil Storage	216,296+
Nearshore / Shallow Water EDRC	89,994
Nearshore / Shallow Water Recovered Oil Storage	91,996

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

**A. 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 257 is in water depths greater than 400 meters (1,312’); therefore LLOG will follow the guidelines of the applicable NTL 2009-G02 “Ocean Current Monitoring”, by monitoring and gathering ocean current data using Acoustic Doppler Current Profile (ADCP) while the MODU is on location.

**B. Incidental Takes**

LLOG does not anticipate the incidental taking of any species as a result of the proposed activities based on the implementation of, and adherence 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.

**C. Flower Garden Banks National Marine Sanctuary**

The activities proposed in this plan are not within the Protective Zones of the Flower Garden Banks and Stetson Banks.

**APPENDIX K**  
**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-35325, Mississippi Canyon Block 257.

Lease Stipulation No. 8 is to reference measures to minimize or avoid potential adverse impacts to protected species (sea turtles, marine mammals, gulf sturgeon, and other federally protected species). BOEM has issued Notice to Lessees Joint NTL No. 2012-G02 “Implementation of Seismic Survey Mitigation Measures and Protected Species Observer Program”, Joint NTL No. 2012-G01 “Vessel Strike Avoidance and Injured/Dead Protected Species Reporting” and BSEE NTL No. 2012-G01 “Marine Trash and Debris Awareness and Elimination”.

**B. Special Conditions**

- **Subsea Completions**

LLOG has completed the MC 257 Well SS001ST01 as a subsea completion and will adhere to the regulations in Title 30 CFR Parts 550.296 through 550.299, which mandates the submittal and approval of separate regulatory filings entitled a “Conservation Information Document” and Title 30 CFR Parts 250.286 to Title 30 CFR Parts 250.295 entitled “Deepwater Operations Plan”.

- **Ocean Current Monitoring**

The proposed operations under this Plan are in water depths greater than 400 meters (1,312’); therefore, LLOG will follow the guidelines of the applicable NTL 2009-G02 “Ocean Current Monitoring”, by continuously monitoring and gathering ocean current data using Acoustic Doppler Current Profile (ADCP) while the MODU is on location.

- **Breton Sound Area**

Mississippi Canyon Block 257 is located within the 200 km zone of the Breton National Wildlife Refuge, and LLOG will consider the use of best available control technology as required if the projected air emissions are determined to significantly affect the air quality of an onshore area.

*APPENDIX L*  
**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.

**B. Incidental Takes**

LLOG does not anticipate the incidental taking of any species as a result of the proposed activities based on the implementation of, and adherence to, the BSEE NTL No. 2015-G03 “Marine Trash and Debris Awareness and Elimination”; 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”.

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

**A. Related OCS Facilities and Operations**

The subject subsea well will be equipped with a wellhead and Pipeline End Manifold (PLEM), connected via proposed Lease Term pipeline, umbilical, and a well jumper to LLOG's platform "A" in OCS-G 35324 Lease, Mississippi Canyon Block 254. This is a manned platform and will process produced hydrocarbons from the incoming subsea well at Mississippi Canyon 257 SS001ST01.

An approximate 46,568.43' long x 6.625 O.D. Lease Term pipeline will be installed (via dynamically positioned pipe lay vessel) to transport production from the OCS-G 35325, Lease Mississippi Canyon Block 257 to the OCS-G 35324, Lease Mississippi Canyon Block 254 "A" Platform.

An approximate 49,046.78' long x 6" Lease Term Umbilical from the OCS-G 35324, Lease, Mississippi Canyon Block 254 "A" production platform to the OCS-G 31498, Lease Mississippi Canyon Block 257 UTA.

An approximate 2,204.08' long x 5" Lease Term Infield Umbilical from the OCS -G 35324, Lease Mississippi Canyon Block 255 Umbilical Termination Assembly to the OCS- G 24064, Lease Mississippi Canyon Block 255 Gas Lift Inline Sled.

An approximate 60.45' long x 6.625" Lease Term Well Jumper at Mississippi Canyon Block 257 Block Well SS001ST01.

No additional pipelines, production equipment or facilities are proposed under this plan.

The anticipated combined flow rates and shut-in times for the proposed pipeline is as follows:

<i>Origination Point</i>	<i>Flow Rates</i>	<i>Shut In Time</i>
MC 257 Well SS001 ST01	5,173 BOPD 2.6 MMscfd	< 20 minutes

**B. Transportation System**

LLOG does not anticipate installation of any new/or modified onshore facilities to accommodate the production from the Mississippi Canyon Block 257 Well SS001ST01.

**C. Produced Liquid Hydrocarbon Transportation Vessels**

Not applicable to proposed operations.

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

**A. General**

**During Installation**

Type	Maximum Fuel Tank Storage Capacity	Maximum No. in Area at Any Time	Trip Frequency or Duration
DP Pipeline Vessel (Lease Term Infield Umbilicals)	10,000 bbls	1	30 days
ROV Vessel (Jumpers)	8,805 bbls	1	3 days

**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	From shorebase in Fourchon, LA to Mississippi Canyon Block 257

**C. *Drilling Fluids Transportation – N/A No Additional Drilling***

**D. *Solid and Liquid Wastes Transportation***

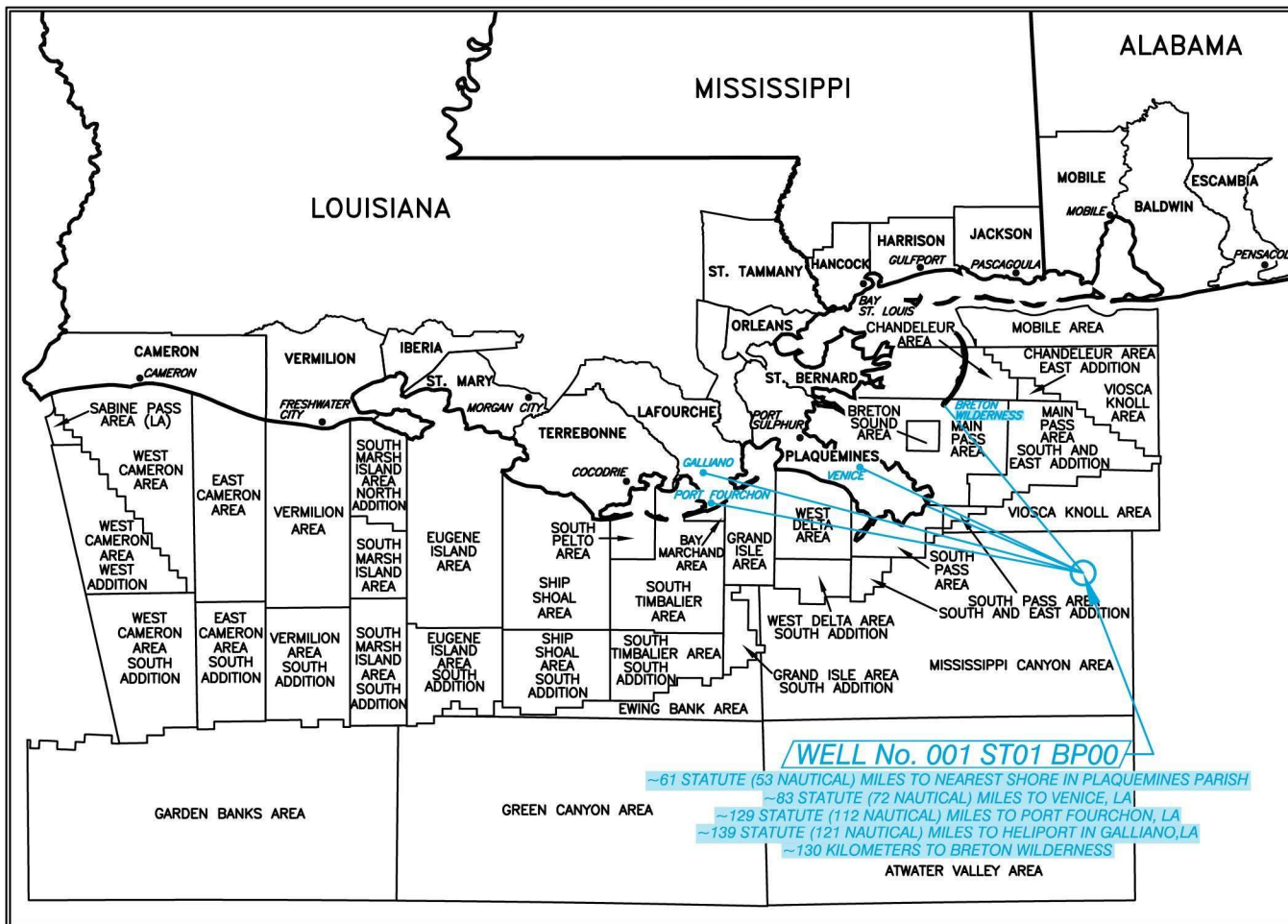
**No Additional Proposed Drilling**

**E. *Vicinity Map* – A Vicinity Map showing the location MC 257 Well SS001ST01 relative to the shoreline and onshore base is attached. *See Attachment N-1.***

## **Vicinity Map**

### **Attachment N-1 (Public Information)**

LOUISIANA GULF COAST INDEX  
BOEM O.C.S. LEASING AREAS



VICINITY MAP

COORDINATE TO NEAREST POINT ON SHORELINE X = 994,351 Y = 10,577,162

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)>

DATUM: NAD 27	<b>LLOG EXPLORATION OFFSHORE, L.L.C.</b> 			
SPHEROID: CLARKE 1866				
PROJECTION: U.T.M.				
ZONE: 16				
 <b>Echo</b> <b>OFFSHORE</b> LLC 36499 Perkins Road Prairieville, Louisiana 70769 Tel: 225-673-2163	VICINITY PLAT  <b>WELL No. 001 ST01 BP00</b> <b>OCS-G 35325 BLOCK 257</b> <b>MISSISSIPPI CANYON AREA</b>  GULF OF MEXICO			
	DRAWN BY: R/JN	DATE: 10/10/2017	CHECKED BY: JFL	DRAWING No.: 17-031-VIC
REV. DATE:	REV. No.:	SCALE: N.T.S.	JOB No.: 17-031-32	

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

**A. General**

The proposed operations in Mississippi Canyon Block 257 will be located approximately 61 statute miles from the nearest Louisiana shoreline, and approximately 129 statute miles from the following onshore support base and the proposed surface disturbances:

<b>Name</b>	<b>Location</b>	<b>Existing/New/Modified</b>
LLOG c/o Turn Key Cleaning Services	Fourchon, LA	Existing
Bristow -Heliport	Galliano, LA	Existing

**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. LLOG will utilize an existing shore base and has no plans to modify due to proposed operations.

**D. Waste Disposal**

**No Additional Drilling Proposed in this Plan.**

*APPENDIX P*  
**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 Alabama are enclosed as *Attachment P-1*

**B. Other Information**

Included as *Attachment P-2* are the enforceable policies from the State of Alabama that are related to OCS Plan Filings .

LLOG has considered all of Louisiana's enforceable policies and certifies the consistency for the proposed operations.

**Coastal Zone Management Consistency Statement for the  
States of Louisiana and Alabama**

**Attachment P-1  
(Public Information)**

**COASTAL ZONE MANAGEMENT CONSISTENCY**  
**CERTIFICATION**

**INITIAL DEVELOPMENT OPERATIONS**  
**COORDINATION DOCUMENT**

**OCS-G-35325 Lease**

**MISSISSIPPI CANYON BLOCK 257**

The proposed activities described in detail in the enclosed Initial Development Operations Coordination Document comply with Alabama's approved Coastal Zone Management Program and will be conducted in a manner consistent with such Program.

**By:** LLOG Exploration Offshore, L.L.C., Operator

**Signed by:** Carol Eaton  
Carol Eaton, Certifying Official

**Date:** 10-17-2017

**COASTAL ZONE MANAGEMENT CONSISTENCY**  
**CERTIFICATION**

**INITIAL DEVELOPMENT OPERATIONS**  
**COORDINATION DOCUMENT**

**OCS-G-35325 LEASE**  
**MISSISSIPPI CANYON BLOCK 257**

The proposed activities described in detail in the enclosed Initial Development Operations Coordination Document comply with Louisiana's approved Coastal Zone Management Program and will be conducted in a manner consistent with such Program.

**By:** LLOG Exploration Offshore, L.L.C., Operator

**Signed by:** Carol Eaton  
Carol Eaton, Certifying Official

**Date:** 10-17-2017

**Coastal Zone Management Enforceable Policies for the  
State of Alabama**

**Attachment P-2  
(Public Information)**

**ALABAMA COASTAL ZONE MANAGEMENT  
CONSISTENCY CERTIFICATION  
INITIAL EXPLORATION PLAN  
MISSISSIPPI CANYON 257  
OCS-G-35325**

The OCS related oil and gas development activities having potential impact on the Alabama Coastal Zone are based on the location of the proposed facilities, access to those sites, best practical techniques for operations and production equipment, guidelines for the prevention of adverse environmental effects, effective environmental protection, emergency plans and contingency plans. Alabama policies have been addressed below or are cross referenced to the appropriate sections of the Plan:

<b>Topic</b>	<b>Cross Reference</b>	<b>Comments</b>
<b>Coastal Resource Use Policies</b>		
Coastal Development		Dock and port facilities in Louisiana will be used. There will be no new construction, dredging or filling in Alabama state waters. There will be no new commercial development or capital improvements in Alabama's coastal zone, nor will there be any employment effects.
Mineral Resource Exploration and Extraction		Proposed development operations will take place 90 statute miles from Alabama's coastline
Commercial Fishing	Appendix H	
Hazard Management	Appendix C	A Shallow Hazards Report was previously submitted to BOEM in order to identify and assess the seafloor and shallow geologic conditions in this block
Shoreline Erosion	Appendix H	Proposed development operations will take place 90 statute miles from Alabama's coastline
Recreation	Appendix H	
Transportation	Appendix B	
<b>Natural Resource Protection Policies</b>		
Biological Productivity	Appendix H	
Water Quality	Appendix H	
Water Resources	Appendix H	
Air Quality	Appendix G	
Wetlands and Submerged Grassbeds	Appendix H	
Beach and Dune Protection	Appendix H	
Wildlife Habitat Protection	Appendix H	
Endangered Species	Appendix H	
Cultural Resources Protection	Appendix D	Mississippi Canyon Block 257 has been determined to have a high potential for containing archaeological properties. An archaeological report was submitted to BOEM under separate cover.

**APPENDIX Q**  
**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
<i>Site Specific at Offshore Location</i>						
Designated topographic features		(1)	(1)		(1)	
Pinnacle Trend area live bottoms		(2)	(2)		(2)	
Eastern Gulf live bottoms		(3)	(3)		(3)	
Chemosynthetic communities			(4)			
Water quality		X			X	
Fisheries	X	X			X	
Marine mammals	X (8)	X			X (8)	
Sea turtles	X (8)	X			X (8)	
Air quality	(9)					
Shipwreck sites (known or potential)			(7)			
Prehistoric archaeological sites			(7)			
<i>Vicinity of Offshore Location</i>						
Essential fish habitat					X (6)	
Marine and pelagic birds					X	
Public health and safety					(5)	
<i>Coastal and Onshore</i>						
Beaches					(6)	
Wetlands					(6)	
Shorebirds and coastal nesting birds					(6)	
Coastal wildlife refuge						
Wilderness areas						

## **Footnotes for Environmental Impact Analysis Matrix:**

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 BOEM as being in water depths 300 meters or greater.
5. Exploration or production activities where H<sub>2</sub>S 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 BOEM 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 Development Operations Coordination Document (DOCD) 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 (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 257 are located a significant distance from the closest designated topographic feature (Sackett Bank).

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 proposed surface disturbances within Mississippi Canyon Block 257 are located a significant distance from the closest pinnacle trend live bottom stipulated block. The crests of these pinnacle trend areas are much deeper than 20 m.

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 disturbance within Mississippi Canyon Block 257 is located a significant distance from the closest Eastern Gulf live bottoms stipulated block. 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**

Water depths at the surface locations in Mississippi Canyon Block 257 range from 4,792' to 6,394'. As noted in the shallow hazards assessment, benthic communities have not been reported in the seafloor assessment area.

- **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 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 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 and Elimination" and 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. 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 2016-G01 "Vessel Strike Avoidance and Injured/Dead Protected Species Reporting". 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 61 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)**

There are no physical disturbances to the seafloor which could impact known or potential shipwreck sites, as the review of high resolution shallow hazards data indicate there are no known or potential shipwreck sites located within the survey area. As such, LLOG does not anticipate any IPF’s as a result of the proposed activities.

- **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 61 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 EIS/EA BOEM 2013-0118 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 61 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 BOEM 2013-0118 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 61 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 BOEM 2013-0118 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 61 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 BOEM 2013-0118 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 61 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 BOEM 2013-0118 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 257 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:

Nelda Runyon  
**Regulatory Specialist**  
1001 Ochsner Boulevard, Suite 100  
Covington, Louisiana 70433  
985-801-4300 (Phone)  
neldar@llog.com

## I. References

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

<b>Document</b>	<b>Author</b>	<b>Dated</b>
Archaeological Deep Tow Survey	Tesla	2010
Archaeological Deep Tow Survey	Tesla	2012
Shallow Hazards Assessment, Benthic Communities Evaluation, and Archaeological Resource Survey	Berger Geosciences, LLC	2015
BOEM Environmental Impact Statement Report No. 2012-019	Bureau of Ocean Energy Management	2012
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NTL 2005-G07 "Archaeological Resource Surveys and Reports"	Bureau of Ocean Energy Management	2005
NTL 2006-N06 "Flaring and Venting Regulations"	Bureau of Ocean Energy Management	2006
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BOEM NTL 2016-G01 "Vessel Strike Avoidance and Injured/Dead Protective Species"	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:

<b>Document</b>	<b>Author</b>	<b>Dated</b>
Archaeological Deep Tow Survey	Tesla	2010
Archaeological Deep Tow Survey	Tesla	2012
Shallow Hazards Assessment, Benthic Communities Evaluation, and Archaeological Resource Survey	Berger Geosciences, LLC	2015
BOEM Environmental Impact Statement Report – No. 2012-019	Bureau of Ocean Energy Management	2012
Regional Oil Spill Response Plan	LLOG Exploration Offshore, L.L.C.	2017