July 01, 2026

UNITED STATES GOVERNMENT
MEMORANDUM

To: Public Information

From: Plan Coordinator, OLP, Plans Section (GM 235D)

Subject: Public Information copy of plan

Control # - Control S-08227
Type - Supplemental Exploration Plan

Lease(s) - OCS-G32504 Block - 432 Green Canyon Area

Operator - Murphy Exploration & Production Company - USA
Description - Drilling and completion/abandonment of Well Locations "N-R", "O-R", "P", "Q", and "R"

Rig Type - Not Found

Attached is a copy of the subject plan.

It has been deemed submitted and is under review for approval.

Henry Emembolu
Plan Coordinator

MURPHY
EXPLORATION & PRODUCTION CO.

June 01, 2026

United States Department of Interior
Gulf of America OCS Region
Bureau of Ocean Energy Management
1201 Elmwood Park Boulevard
New Orleans, LA 70123-2394

Attn: Michelle Uli Picou
Chief, Plans Section

Subject: Murphy Exploration & Production - USA
Supplemental Exploration Plan
Lease OCS-G 32504, Green Canyon Block 432

In accordance with 30 CFR 550.200 Subpart B and NTL 2009-G07, Murphy Exploration & Production Company - USA (Murphy) hereby submits for your review and approval a Supplemental Exploration Plan for the drilling and completion/abandonment of Well Locations "N-R", "O-R", "P", "Q", and "R" in Lease OCS-G 32504, Green Canyon Block 432.

Enclosed you will find one Proprietary Copy and one Public Copy.

If you should have any questions or concerns, please contact Brenda Montavo by phone at (281) 798-0481 or by e-mail at brenda_montalvo@murphyoilcorp.com.

Sincerely,

Brenda Montalvo
Supervisor, Environmental & Regulatory

9805 Katy Freeway, Suite G-200, Houston, Texas 77024
281.675.9000

SUPLEMENTAL
EXPLORATION PLAN

GREEN CANYON BLOCK 432
LEASE OCS-G 32504

PUBLIC INFORMATION COPY

Submitted by:

MURPHY
EXPLORATION & PRODUCTION CO.

TABLE OF CONTENTS

PLAN CONTENTS

(a) Description, Objectives, and Schedule

This proposed Suplemental Exploration Plan is for the drilling and completion/abandonment of Well Locations "N-R", "O-R", "P", "Q", and "R" in Lease OCS-G 32504, Green Canyon Block 432. An OCS Plan Information Form – "Form BOEM-0137" is included under this section with further activity description.

Murphy Exploration & Production Company – USA is the designated operator of all of Green Canyon Block 432 and acquired lease OCS-G 32504 on February 25, 2013.

The drilling activities being proposed under this plan are scheduled to commence on or before September 01, 2026.

(b) Location

A Well Location Map showing the proposed surface and bottom-hole locations of the new well locations "N-R", "O-R", "P", "Q", and "R" is included in this plan along with a Bathymetry Map showing the water depths across the lease block. The vessel type planned for the drilling of these wells is a drillship, therefore no anchors are associated with this project.

(c) Drilling unit

Murphy will use a drillship with subsea BOP's and will comply with all of the regulations of the ABS, IMO and USCG. All drilling operations will be conducted under the provisions of 30 CFR, Part 250, Subpart D, and other applicable regulations and notice to lessees, including those regarding the avoidance of potential drilling hazards and safety and pollution prevention control. Such measures as inflow detection and well control, monitoring for loss of circulation and seepage loss, and casing design will be our primary safety measures.

Pollution prevention measures may include installation of curbs, gutters, drip pans, and drains on drilling deck areas, as needed to collect all contaminants and debris. All discharges will be in accordance with applicable EPA NPDES permits.

Storage Tanks and/or Production Vessels with 25 bbls or more

Type of Storage Tank	Type of Facility	Tank Capacity (bbls)	Number of Tanks	Total Capacity (bbls)	Fluid Gravity (API)
Fuel Oil	Drillship	11,993	2	23,986	32.4
Fuel Oil	Drillship	6,438	2	12,876	32.4
DO Service Tank	Drillship	476	2	952	33
Lube Oil	Drillship	328	1	328	35
Lube Oil	Drillship	275	3	825	35
Base Oil	Drillship	3,140	1	3,140	33

Additional measures which may be initiated by Murphy and/or its contractors beyond those required by Title 30 CFR Part 250 may include all of the following, Preliminary MODU inspection by a contractor to ensure facility meets current regulatory requirements; obtaining historical performance history of MODU; obtaining historical performance history of drilling contractor; safety and environmental briefings with offshore employee and contractor personnel through facility orientation and briefings on current operations; review of BSEE/USCG Incident Reporting System and Sub-Regional Oil Spill Response Plan to ensure

personnel are aware of the notifications and reporting requirements; review of Region IV EPA NPDES General Permit with applicable personnel to ensure awareness of permit effluent limitations and reporting requirements; pre-spud meetings with operations, regulatory, environmental and safety personnel and key vendors and contractors.

(d) Service fee:
In accordance with 550.125, a Pay.gov receipt in the amount of $24,115.00 is enclosed to cover the cost and processing fee for the proposed operations being conducted under this plan.

U.S. Department of the Interior
Bureau of Ocean Energy Management

OMB Control Number: 1010-0151
OMB Approval Expires: 06/30/2021

OCS PLAN INFORMATION FORM

GENERAL INFORMATION

Type of OCS Plan:	X	Supplemental Exploration Plan (SEP)		Development Operations Coordination Document (DOCD)			
Company Name: Murphy Exploration & Production Company - USA				BOEM Operator Number: 02647			
Address: 9805 Katy Freeway, Suite G-200				Contact Person: Brenda Montalvo			
Houston, Texas 77024				Phone Number: (281) 798-0481			
				Email Address: brenda_montalvo@murphyoilcorp.com			
If a service fee is required under 30 CFR 550.125(a) provide the:				Amount paid	$24,115.00	Tracking ID	282LSUAO

Project and Worst-Case Discharge (WCD) Information

Lease: G32504	Area: GC	Block(s): 432	Project Name (If Applicable): Samurai				
Objective(s):	☒Oil	☒Gas	☐Sulphur	☐Salt	Onshore Support Base(s): Fourchon, LA		
Platform/Well Name: N-R, O-R, P, Q, R	Total Volume of WCD: 15.30 mmstbo	API Gravity: 28.5					
Distance to Closest Land (Miles): 107	Volume from uncontrolled blowout: 150,832 bbl/day						

Have you previously provided information to verify the calculations and assumptions for your WCD?	X	Yes		No
If so, provide the Control number of the EP or DOCD with which this information was provided	S-7997			
Do you propose to use new or unusual technology to conduct your activities?		Yes	X	No
Do you propose to use a vessel with anchors to install or modify a structure?		Yes	X	No
Do you propose any facility that will serve as a host facility for deepwater subsea development?		Yes	X	No

Description of Proposed Activities Scheduled (Mark all that apply)

Proposed Activity	Start Date	End Date	No. of Days
Drill/Complete/Abandon Location N-R	September 01, 2026	November 30, 2026	90
Drill/Complete/Abandon Location O-R	November 30, 2026	February 28, 2027	90
Drill/Complete/Abandon Location P	February 28, 2027	May 29, 2027	90
Drill/Complete/Abandon Location Q	May 29, 2027	August 27, 2027	90
Drill/Complete/Abandon Location R	August 27, 2027	November 25, 2027	90

Description of Drilling Rig

	Jackup	X	Drillship		Caisson		Tension leg platform
	Gorilla Jackup		Platform rig		Fixed platform		Compliant tower
	Semisubmersible		Submersible		Spar		Guyed Tower
	DP Semisubmersible		Other (Attach Description)		Floating Production System		Other (Attach Description)
Drilling Rig Name (If Known):							

Description of Structure

Description of Lease Term Pipelines

From (Facility/Area/Block)	To (Facility/Area/Block)	Diameter (Inches)	Length (Feet)

U.S. Department of the Interior
Bureau of Ocean Energy Management

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OCS PLAN INFORMATION FORM

Proposed Well/Structure Location											
Well or Structure Name/Number (If renaming well or structure, reference previous name): **N-R**					Previously reviewed under an approved EP or DOCD?		YES	X	NO		
Is this an existing well or structure?		YES	X	NO	If this is an existing well or structure, list the Complex ID or API No.						
Do you plan to use a subsea BOP or surface BOP on a floating facility to conduct your proposed activities?						X	YES		NO		
WCD info	For wells, volume of uncontrolled blowout (Bbls/day): 150,832		For structures, volume of all storage and pipelines (Bbls): 0		API Gravity of fluid:		28.5				
	Surface Location		**Bottom-Hole Location (For Wells)**		**Completion (For multiple completions, enter separate lines)**						
Lease No.	**OCS-G 32504**										
Area Name	**Green Canyon**										
Block No.	**432**										
Blockline Departures (in feet)	7,795’ FNL										
	7,292’ FEL										
Lambert X-Y Coordinates	X: 2,558,788.00										
	Y: 10,003,084.16										
Latitude/ Longitude	27° 32’ 13.1491” N										
	90° 09’ 56.8361” W										
Water Depth (Feet): 3,450											
Anchor Radius (if applicable) in feet:											

Anchor Locations for Drilling rig or construction Barge (If anchor radius supplied above, not necessary)					
Anchor Name or No.	**Area**	**Block**	**X Coordinate**	**Y Coordinate**	**Length of Anchor Chain or Seafloor**

U.S. Department of the Interior
Bureau of Ocean Energy Management

OMB Control Number: 1010-0151
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OCS PLAN INFORMATION FORM

Proposed Well/Structure Location											
Well or Structure Name/Number (If renaming well or structure, reference previous name): **O-R**					Previously reviewed under an approved EP or DOCD?		YES	X	NO		
Is this an existing well or structure?		YES	X	NO	If this is an existing well or structure, list the Complex ID or API No.						
Do you plan to use a subsea BOP or surface BOP on a floating facility to conduct your proposed activities?						X	YES		NO		
WCD info	For wells, volume of uncontrolled blowout (Bbls/day): 150,832		For structures, volume of all storage and pipelines (Bbls): 0		API Gravity of fluid:		28.5				
	Surface Location		**Bottom-Hole Location (For Wells)**		**Completion (For multiple completions, enter separate lines)**						
Lease No.	**OCS-G 32504**										
Area Name	**Green Canyon**										
Block No.	**432**										
Blockline Departures (in feet)	7,884’ FNL										
	7,313’ FEL										
Lambert X-Y Coordinates	X: 2,558,767.00										
	Y: 10,002,995.10										
Latitude/ Longitude	27° 32’ 12.273” N										
	90° 09’ 57.088” W										
Water Depth (Feet): 3,450											
Anchor Radius (if applicable) in feet:											

Anchor Locations for Drilling rig or construction Barge (If anchor radius supplied above, not necessary)					
Anchor Name or No.	**Area**	**Block**	**X Coordinate**	**Y Coordinate**	**Length of Anchor Chain or Seafloor**

U.S. Department of the Interior
Bureau of Ocean Energy Management

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OCS PLAN INFORMATION FORM

Proposed Well/Structure Location									
Well or Structure Name/Number (If renaming well or structure, reference previous name): **P**					Previously reviewed under an approved EP or DOCD?		YES	X	NO
Is this an existing well or structure?		YES	X	NO	If this is an existing well or structure, list the Complex ID or API No.				
Do you plan to use a subsea BOP or surface BOP on a floating facility to conduct your proposed activities?						X	YES		NO
WCD info	For wells, volume of uncontrolled blowout (Bbls/day): 150,832		For structures, volume of all storage and pipelines (Bbls): 0		API Gravity of fluid:		28.5		
	Surface Location		**Bottom-Hole Location (For Wells)**		**Completion (For multiple completions, enter separate lines)**				
Lease No.	**OCS-G 32504**								
Area Name	**Green Canyon**								
Block No.	**432**								
Blockline Departures (in feet)	7,692’ FNL								
	7,114’ FEL								
Lambert X-Y Coordinates	X: 2,558,965.48								
	Y: 10,003,187.63								
Latitude/ Longitude	27° 32’ 14.1229” N								
	90° 09’ 54.8342” W								
Water Depth (Feet): 3,449									
Anchor Radius (if applicable) in feet:									

Anchor Locations for Drilling rig or construction Barge (If anchor radius supplied above, not necessary)					
Anchor Name or No.	**Area**	**Block**	**X Coordinate**	**Y Coordinate**	**Length of Anchor Chain or Seafloor**

U.S. Department of the Interior
Bureau of Ocean Energy Management

OMB Control Number: 1010-0151
OMB Approval Expires: 06/30/2021

OCS PLAN INFORMATION FORM

Proposed Well/Structure Location											
Well or Structure Name/Number (If renaming well or structure, reference previous name): **Q**					Previously reviewed under an approved EP or DOCD?		YES	X	NO		
Is this an existing well or structure?		YES	X	NO	If this is an existing well or structure, list the Complex ID or API No.						
Do you plan to use a subsea BOP or surface BOP on a floating facility to conduct your proposed activities?						X	YES		NO		
WCD info	For wells, volume of uncontrolled blowout (Bbls/day): 150,832		For structures, volume of all storage and pipelines (Bbls): 0		API Gravity of fluid:		28.5				
	Surface Location		**Bottom-Hole Location (For Wells)**		**Completion (For multiple completions, enter separate lines)**						
Lease No.	**OCS-G 32504**										
Area Name	**Green Canyon**										
Block No.	**432**										
Blockline Departures (in feet)	7,850’ FSL										
	7,072’ FEL										
Lambert X-Y Coordinates	X: 2,559,008.29										
	Y: 10,002,890.26										
Latitude/ Longitude	27° 32’ 11.1685” N										
	90° 09’ 54.4362” W										
Water Depth (Feet): 3,450											
Anchor Radius (if applicable) in feet:											

Anchor Locations for Drilling rig or construction Barge (If anchor radius supplied above, not necessary)					
Anchor Name or No.	**Area**	**Block**	**X Coordinate**	**Y Coordinate**	**Length of Anchor Chain or Seafloor**

U.S. Department of the Interior
Bureau of Ocean Energy Management

OMB Control Number: 1010-0151
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OCS PLAN INFORMATION FORM

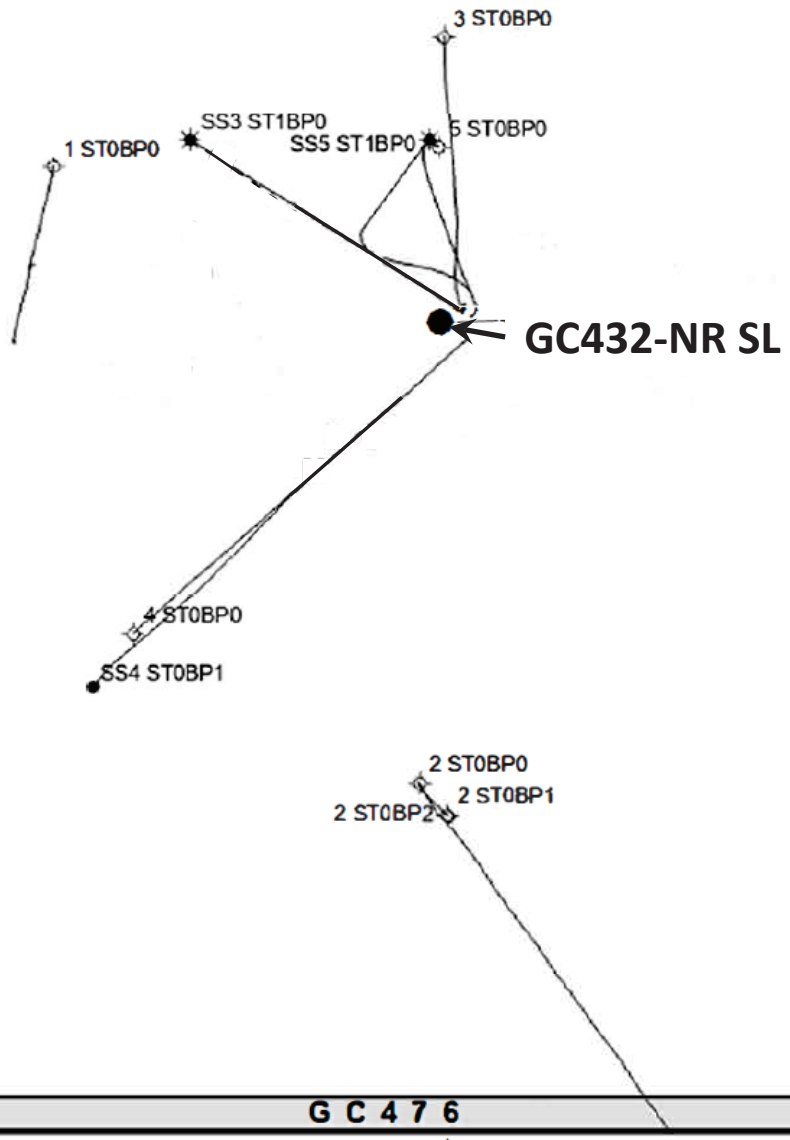
Proposed Well/Structure Location											
Well or Structure Name/Number (If renaming well or structure, reference previous name): **R**					Previously reviewed under an approved EP or DOCD?		YES	X	NO		
Is this an existing well or structure?		YES	X	NO	If this is an existing well or structure, list the Complex ID or API No.						
Do you plan to use a subsea BOP or surface BOP on a floating facility to conduct your proposed activities?						X	YES		NO		
WCD info	For wells, volume of uncontrolled blowout (Bbls/day): 150,832		For structures, volume of all storage and pipelines (Bbls): 0		API Gravity of fluid:		28.5				
	Surface Location		**Bottom-Hole Location (For Wells)**		**Completion (For multiple completions, enter separate lines)**						
Lease No.	**OCS-G 32504**										
Area Name	**Green Canyon**										
Block No.	**432**										
Blockline Departures (in feet)	7,733’ FNL										
	7,021’ FEL										
Lambert X-Y Coordinates	X: 2,559,059.49										
	Y: 10,003,146.09										
Latitude/ Longitude	27° 32’ 13.6887” N										
	90° 09’ 53.8021” W										
Water Depth (Feet): 3,450											
Anchor Radius (if applicable) in feet:											

Anchor Locations for Drilling rig or construction Barge (If anchor radius supplied above, not necessary)					
Anchor Name or No.	**Area**	**Block**	**X Coordinate**	**Y Coordinate**	**Length of Anchor Chain or Seafloor**

GC 3 8 8

Location	Block Calls				Latitude	Longitude	X	Y	WD (ft)
GC432-NR SL	7,795	FNL	7,292	FEL	27° 32' 13.1491" N	90° 09' 56.8361" W	2,558,788.00	10,003,084.16	3,450

432



GC431

GC 4 3 3

GC 4 7 6

2,250 1,125 0 2,250 4,500 US Feet

N

Scale: 1" = 2,000'

NAD 1927 UTM Zone 15N

MURPHY

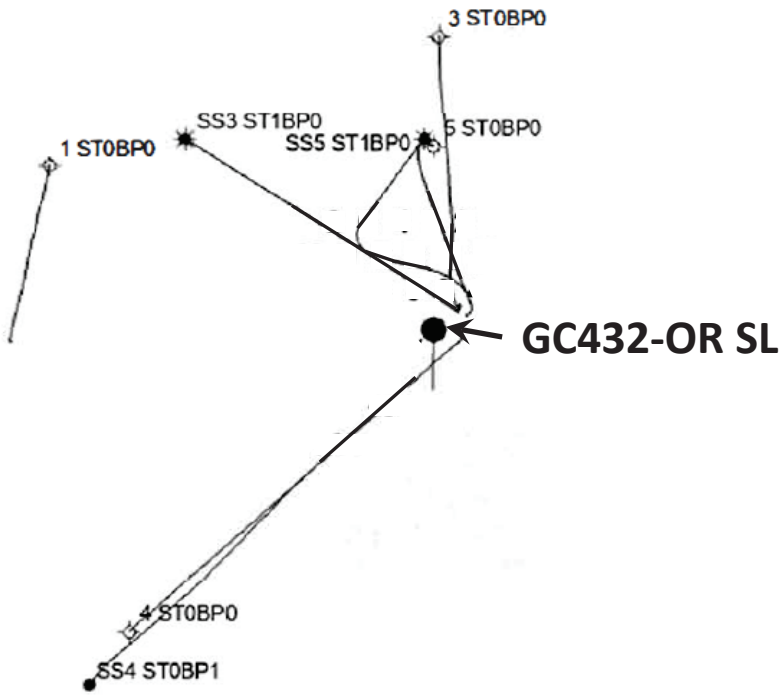
Green Canyon Area
Block 432 OCS-G32504

Samurai
GC432-NR
Locator Map
Public

G C 3 8 8

Location	Block Calls				Latitude	Longitude	X	Y	WD (ft)
GC432-OR SL	7,884	FNL	7,313	FEL	27° 32' 12.273" N	90° 09' 57.088" W	2,558,767.00	10,002,995.10	3,450

432



GC431

G C 4 3 3

G C 4 7 6

2,250 1,125 0 2,250 4,500 US Feet

Scale: 1" = 2,000'

NAD 1927 UTM Zone 15N

MURPHY

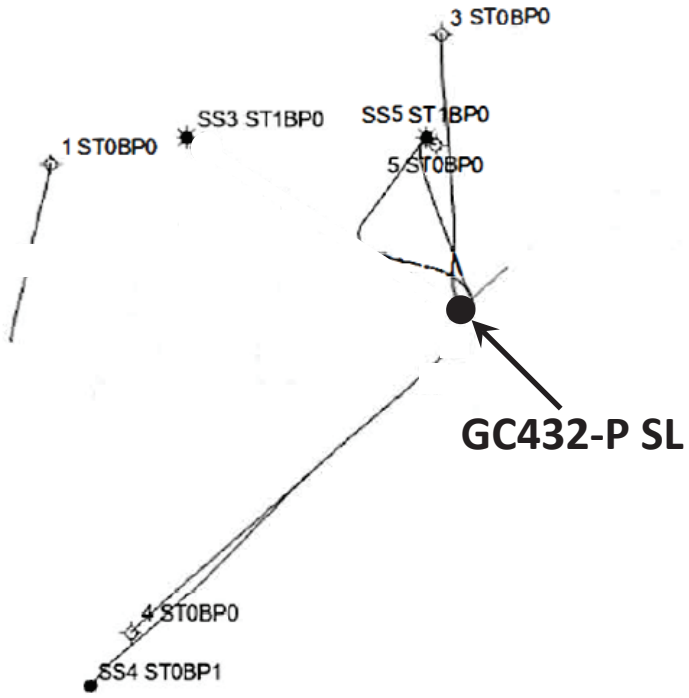
Green Canyon Area
Block 432 OCS-G32504

Samurai
GC432-OR
Locator Map
Public

GC388

Location	Block Calls				Latitude	Longitude	X	Y	WD (ft)
GC432-P SL	7,692	FNL	7,114	FEL	27° 32' 14.1229" N	90° 09' 54.8342" W	2,558,965.48	10,003,187.63	3,449

432



GC431

GC433 GC433

GC476

2,250 1,125 0 2,250 4,500 US Feet

N

NAD 1927 UTM Zone 15N

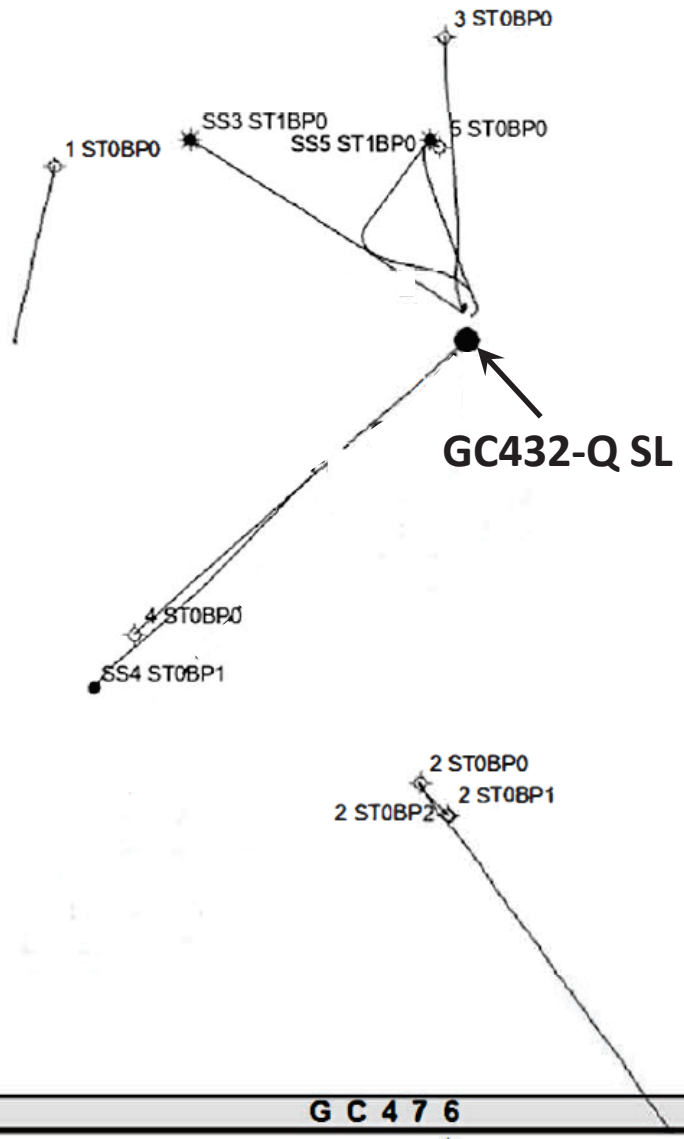
MURPHY

Green Canyon Area
Block 432 OCS-G32504

Samurai
GC432-P
Locator Map
Public

Location	Block Calls				Latitude	Longitude	X	Y	WD (ft)
GC432-Q SL	7,850	FSL	7,072	FEL	27° 32' 11.1685" N	90° 09' 54.4362" W	2,559,008.29	10,002,890.26	3,450

432



2,250 1,125 0 2,250 4,500 US Feet

Scale: 1" = 2,000'

NAD 1927 UTM Zone 15N

MURPHY

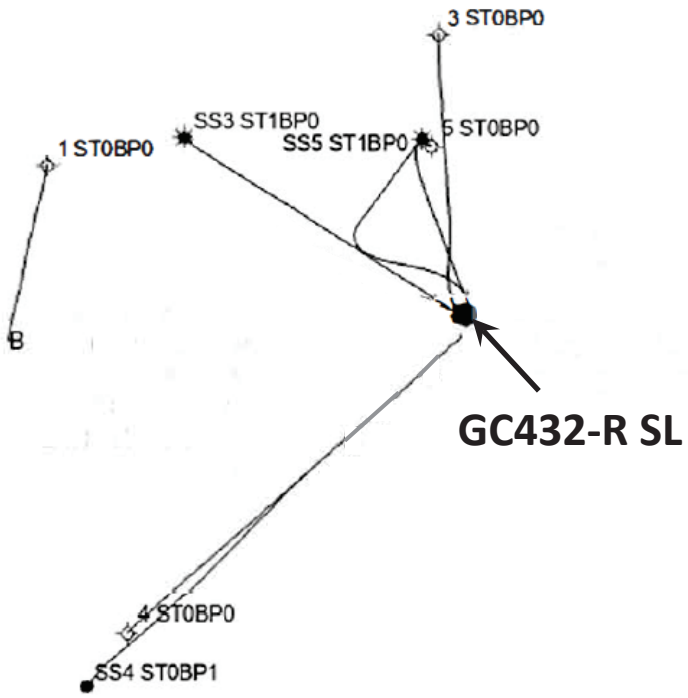
Green Canyon Area
Block 432 OCS-G32504

Samurai
GC432-Q
Locator Map
Public

GC 3 8 8

Location	Block Calls				Latitude	Longitude	X	Y	WD (ft)
GC432-R SL	7,733	FNL	7,021	FEL	27° 32' 13.6887" N	90° 09' 53.8021" W	2,559,059.49	10,003,146.09	3,450

432



GC431

GC 4 3 3

GC 4 7 6

2,250 1,125 0 2,250 4,500 US Feet

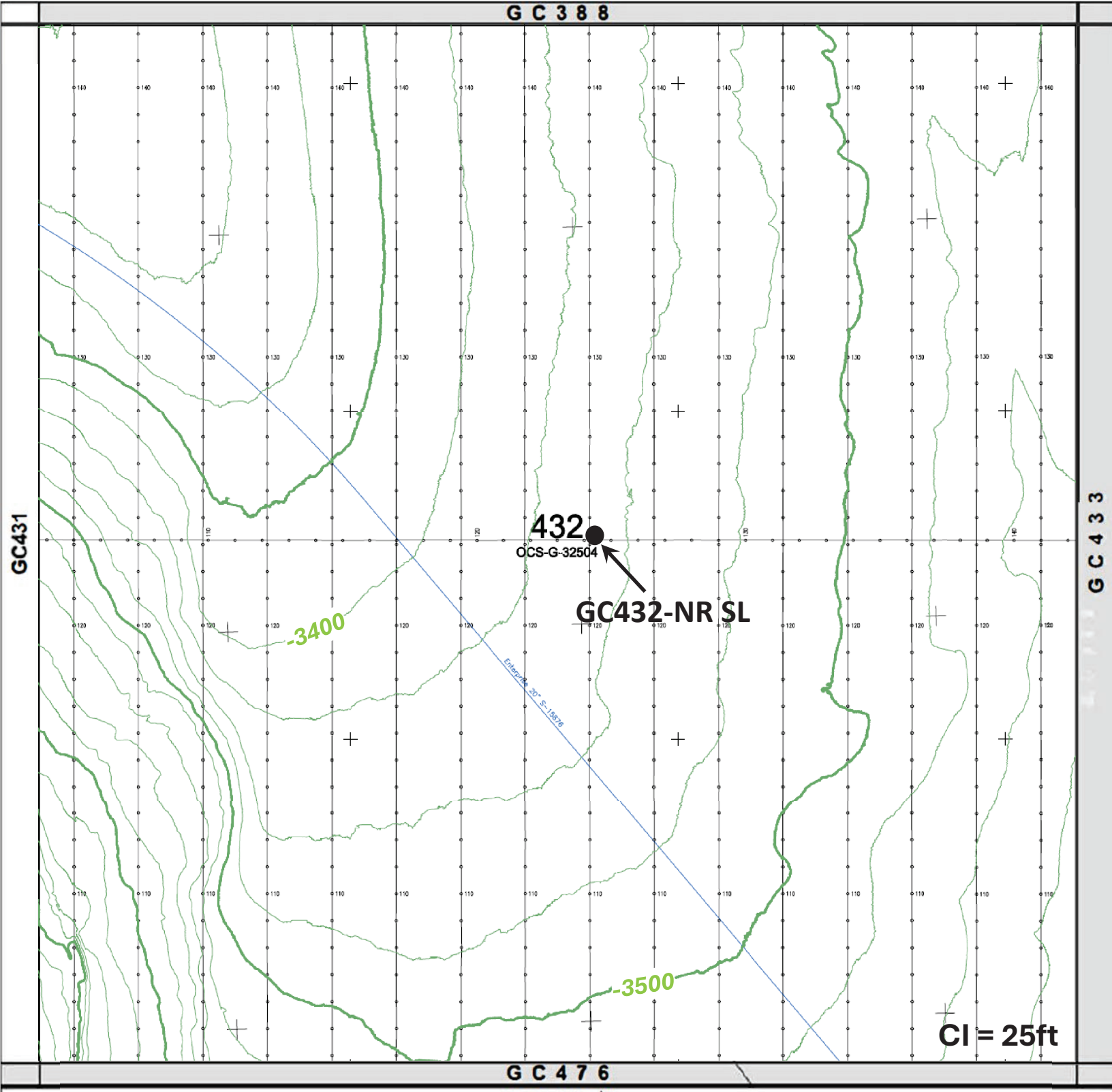
Scale: 1" = 2,000'

NAD 1927 UTM Zone 15N

MURPHY

Green Canyon Area
Block 432 OCS-G32504

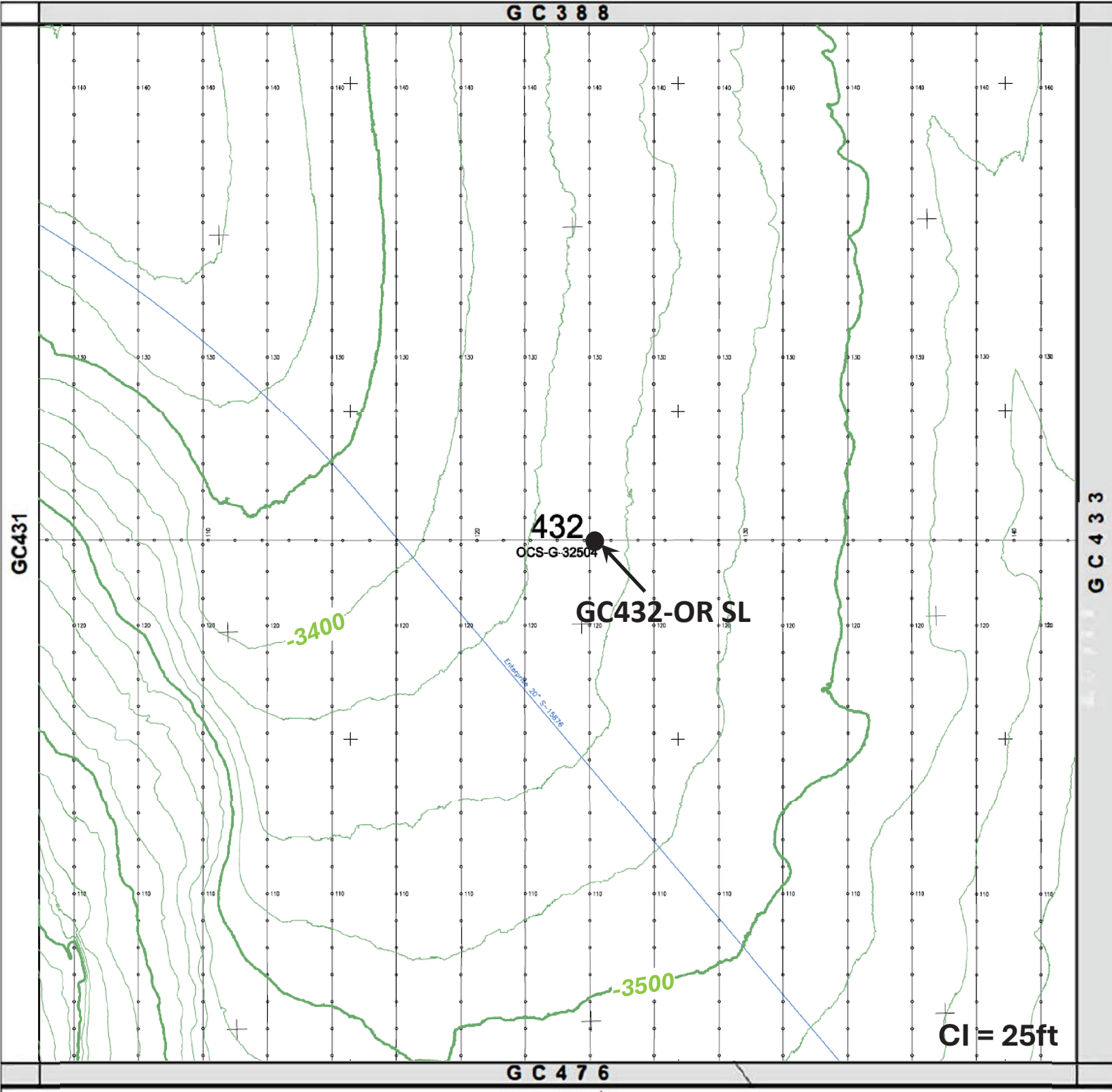
Samurai
GC432-R
Locator Map
Public



MURPHY

Green Canyon Area
Block 432 OCS-G32504

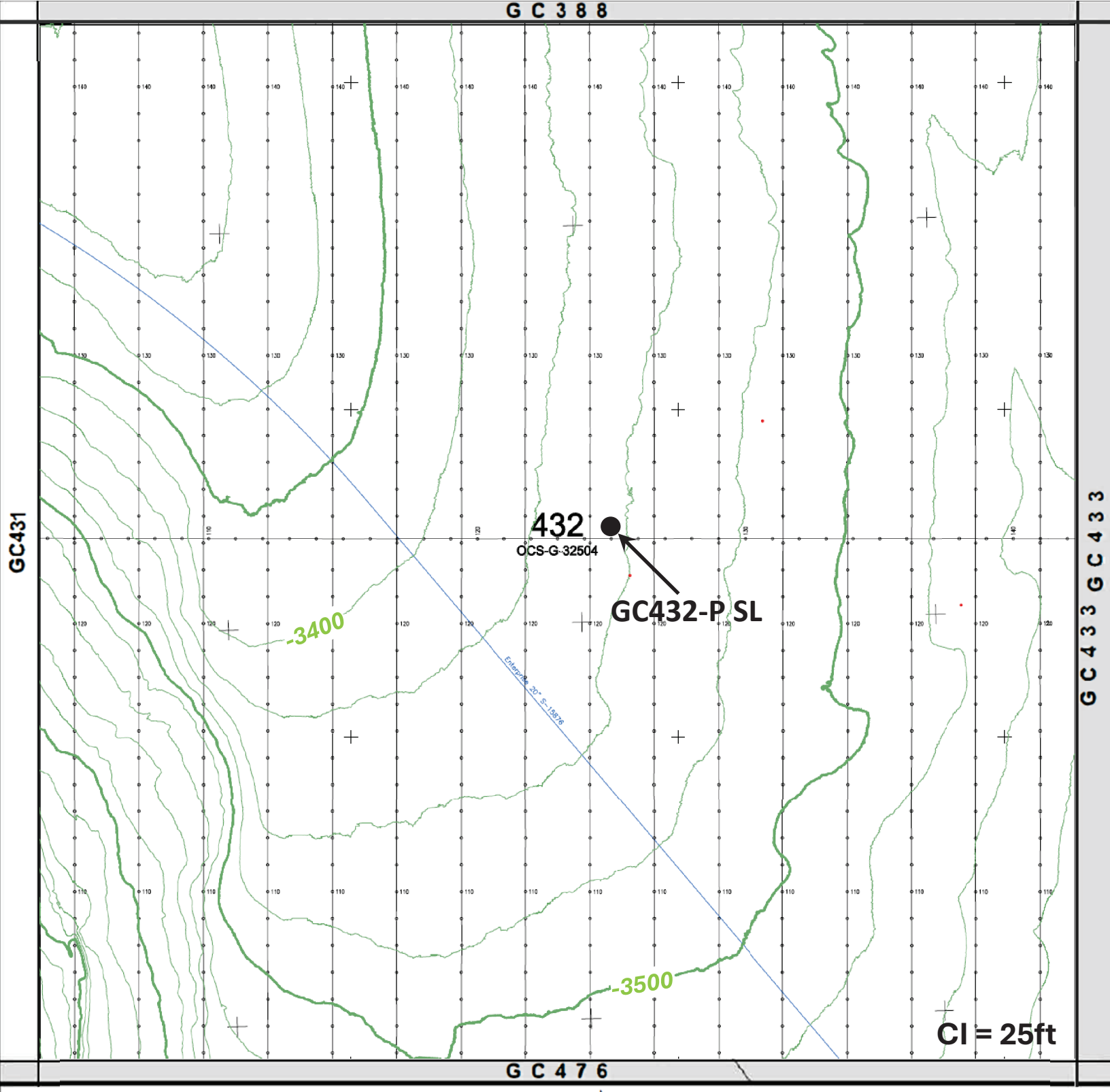
Samurai
GC432-NR
Bathymetry Map
Public



MURPHY

Green Canyon Area
Block 432 OCS-G32504

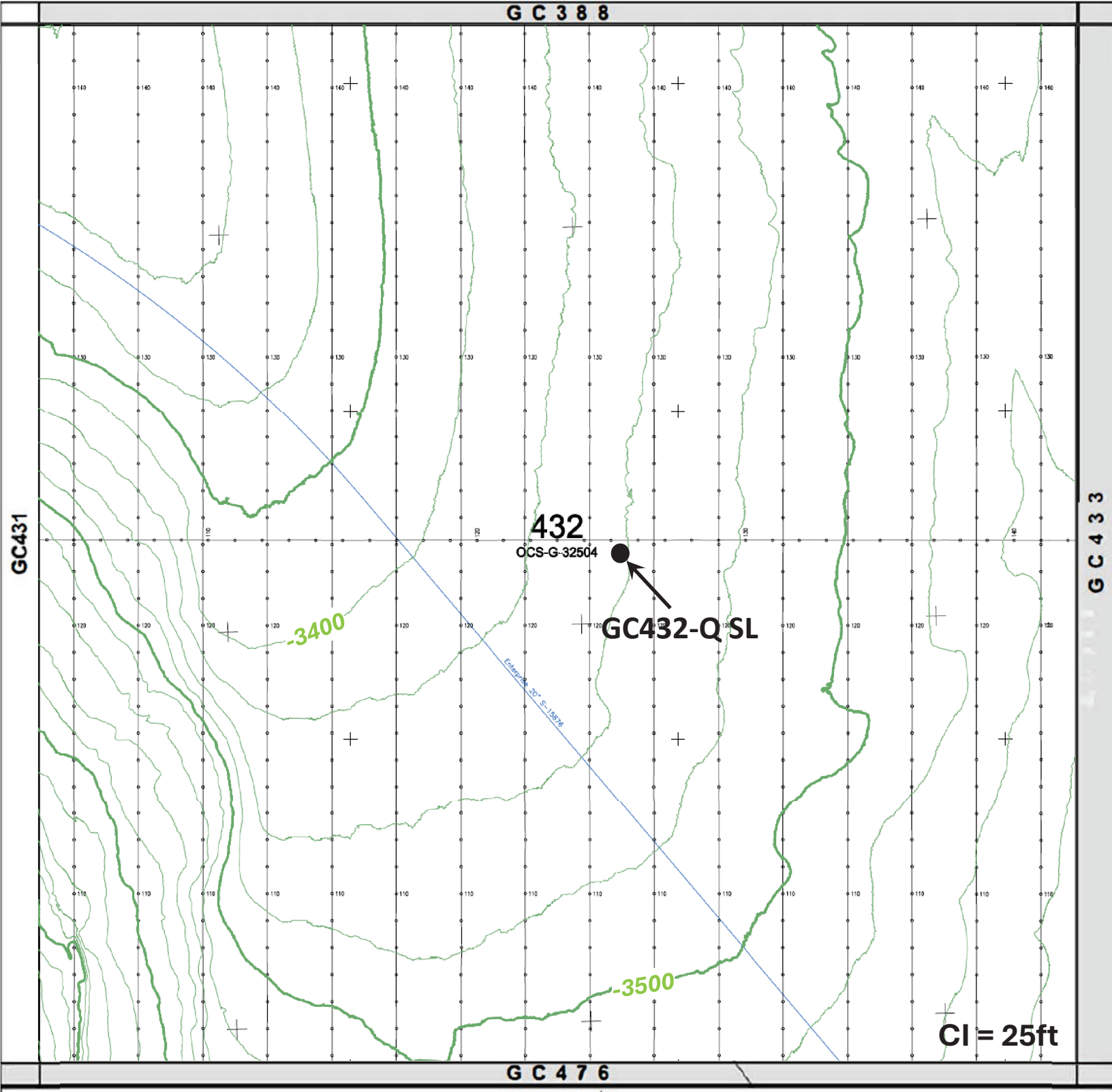
Samurai
GC432-OR
Bathymetry Map
Public



MURPHY

Green Canyon Area
Block 432 OCS-G32504

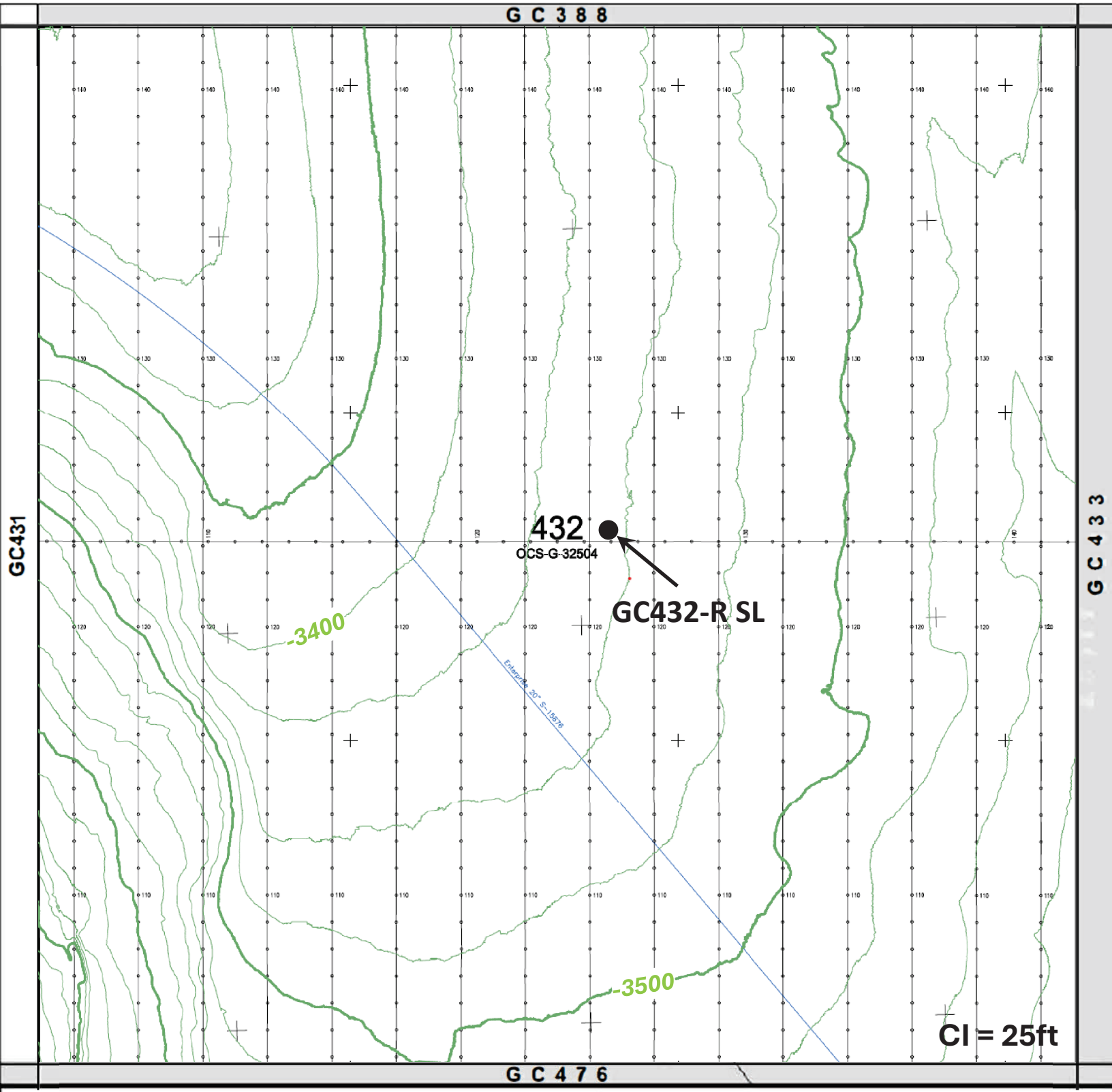
Samurai
GC432-P
Bathymetry Map
Public



MURPHY

Green Canyon Area
Block 432 OCS-G32504

Samurai
GC432-Q
Bathymetry Map
Public



MURPHY

Green Canyon Area
Block 432 OCS-G32504

Samurai
GC432-R
Bathymetry Map
Public

Outlook

Fw: [EXTERNAL] Pay.gov Payment Confirmation: BOEM Exploration Plan - BF

From Kelli Pratt <Kelli_Pratt@murphyoilcorp.com>
Date Wed 5/27/2026 1:36 PM
To Kelli Pratt <Kelli_Pratt@murphyoilcorp.com>

From: notification@pay.gov <notification@pay.gov>
Sent: Wednesday, May 27, 2026 1:18 PM
To: Kelli Pratt <Kelli_Pratt@murphyoilcorp.com>
Subject: [EXTERNAL] Pay.gov Payment Confirmation: BOEM Exploration Plan - BF

An official email of the United States government

Your payment has been submitted to Pay.gov and the details are below. If you have any questions regarding this payment, please contact Bert Readinger at (703) 787-1863 or bseefinanceaccountsreceivable@bsee.gov.

Application Name: BOEM Exploration Plan - BF
Pay.gov Tracking ID: 282LSUAO
Agency Tracking ID: 77399507033
Transaction Type: Sale
Transaction Date: 05/27/2026 02:18:17 PM EDT
Account Holder Name: Kelli Pratt
Transaction Amount: $24,115.00
Card Type: MasterCard
Card Number: **********1951

Region: Gulf of America
Contact: Kelli Pratt (832) 316-8430
Company Name/No: Murphy Exploration and Production - USA, 02647
Lease Number(s): 32504
Area-Block: Green Canyon GC,432
Surface Locations: 5

THIS IS AN AUTOMATED MESSAGE. PLEASE DO NOT REPLY.

SECTION A
GENERAL INFORMATION

(a) Applications and permits
No additional applications or permits from other agencies are required at this time to be submitted and approved other than an Application for Permit to Drill (APD) to the BSEE Houma District.

(b) Drilling fluids
Drilling fluids to be used for this well are described in Table 1 under Section E "Solid and Liquid Wastes and Discharges" of this plan.

(c) Chemical products
Please see Table 1 "Generated Wastes which will be Treated, Disposed of Downhole or Discharged to the GOM" and Table 2 "Wastes you will transport and/or dispose of onshore".

(d) New or unusual technology
Murphy does not propose to use any new or unusual technology as described under 30 CFR 550.200 to carry out the proposed exploration activities.

(e) Bonds, oil spill financial responsibility, and well control statements
The bond requirements for the activities and facilities proposed in this Supplemental EP are satisfied by an *areawide development* bond, furnished and maintained according to 30 CFR 556.900, Subpart I; and if determined by the Regional Director, provide additional under 30 CFR 556.901(d).

Murphy (Operator No. 02647) is of sound financial strength and reliability and has demonstrated oil spill financial responsibility (OSFR) according to 30 CFR 553 for the activities planned in this Supplemental EP. In accordance with 30 CFR 553.29(a), Murphy is insured for *$150,000,000*. This financial reliability ensures that Murphy has the capability to deal with emergency situations such as blowout control, including relief well drilling and kill operations, if such an unlikely event should occur.

Murphy has the financial capability to drill a relief well and conduct other emergency well control operations.

(f) Suspension of operations
Murphy does not anticipate filing a suspension of operations or suspension of production for the activities being proposed under this plan.

(g) Blowout scenario
Murphy will drill to the objective sands outlined in Section B, Geological and Geophysical Information Section of this Plan utilizing a typical structural, conductor, surface and production casing program. If mandated by wellbore conditions, an intermediate casing string will be set prior to drilling through the objective sand. In the event of a blowout during the course of drilling the open hole in the objective sands, Murphy anticipates a rate of 150,832 STBP/D with an anticipated gravity of 28.5° API. The wellbore would most likely not bridge over. Murphy would immediately activate its Sub-Regional Oil Spill Response Plan and Spill Management Team to initiate potential recovery of liquid hydrocarbons on the receiving water and review potential intervention options. In the event a relief well is initiated, Murphy does not anticipate any delays in acquiring a rig to conduct relief well operations. Dependent upon the interval the well was drilled to, it could take at least 30 days to mobilize equipment to the field and drill the relief well. Based on well intervention outlined in the potential worst-case discharge scenarios, the potential for drilling a relief

well and a rig not being immediately available would be a total of 110 days and a potential total of 15.30 mmstb during that time span.

Estimated Flow Rate of the Potential Blowout

Category	
Type of Activity	Drilling
Facility Location	GC 432 (Surface Location)
Facility Designation	MODU
Distance to Nearest Shoreline	107 miles
Uncontrolled Blowout	150,832 bbl/day
Type of Fluid	Crude

Maximum Duration of Potential Blowout

Category	
Duration of flow (days)	110 days
Total Volume of Spill (bbls)	21,780,000 STBL/D

Availability and Timing of a Rig to Drill a Relief Well

- Rig type capable of drilling relief well at water depth and to TD: drillship or DP semi-submersible
- Rig package constraints: DP that can drill in > 5000' water depth
- There are 18-22 DP rigs that can operate in water depths > 5000'.
- Time to acquire rig and move onsite: 30 days
- Drilling time: 80 days
- The possibility of drilling a relief well from a neighboring platform or land is not applicable to operations proposed in this Exploration Plan; there is no existing infrastructure in the vicinity of Green Canyon Block 432.

Measures that Would Reduce the Likelihood of a Blowout

Measures to reduce the likelihood of a blowout include compliance with applicable regulations (30 CFR Parts 250 and 550) and current NTLs. Additional measures:

- A positive and negative test will be performed before displacing marine riser to seawater.

Measures which Would Enhance the Ability to Conduct Early Intervention

Measures to enhance the ability to conduct effective and early intervention in the event of a blowout in addition to the regulation and NTL requirements include:

- The BOPs will be closed on the drill pipe when displacing riser to seawater and will be done in a two-step well control process. First, the riser will be displaced above the rams while monitoring the well below the rams. Then, the portion below the rams will be displaced up the choke or kill line, monitoring the volume going in versus the volume coming out. If the well started to flow, the kick would be detected early and kill weight mud would be pumped back into the well so intervention can be performed.

(h) Contact information

Name	Title	Phone Number	Email
Brenda Montalvo	Supervisor, Environmental and Regulatory	(713) 798-0481	Brenda_montalvo@murphyoilcorp.com

SECTION B
GEOLOGICAL AND GEOPHYSICAL

(a) Geological description
Proprietary Information.

(b) Structure contour map(s)
Proprietary Information.

(c) Two dimensional (2-D) or three-dimensional (3-D) seismic lines
Proprietary Information.

(d) Geological cross-sections
Proprietary Information.

(e) Shallow hazards report
The proposed operations will be conducted from the Bureau of Ocean Energy Management previously approved surface location in Supplemental Exploration (Control No. S-7997); therefore, a shallow hazards report is not being provided.

(f) Shallow hazards assessment
The proposed operations will be conducted from the Bureau of Ocean Energy Management previously approved surface location in Supplemental Exploration (Control No. S-7997); therefore, a shallow hazards assessment is not being provided.

(g) High resolution seismic lines
Proprietary Information.

(h) Stratigraphic column
Proprietary Information.

(i) Time-versus depth chart
Proprietary Information.

(j) Geochemical information.
Proprietary Information.

(k) Future G&G activities
Proprietary Information.

SECTION C
HYDROGEN SULFIDE

(a) Concentration

Murphy does not anticipate encountering any H2S during the proposed operations being conducted under this Supplemental EP.

(b) Classification

In accordance with 30 CFR 250.490(c) Green Canyon 432 has been classified as an area where the "absence" of H2S has been confirmed.

(c) H2S contingency plan

H2S is neither recorded in the project area, nor anticipated based on subsurface modeling (temperature, sulfate availability). Based on this, there is likely no need for contingencies beyond the use of H2S inhibitors in the mud system and the presence of standard emergency equipment on board the rig. It is not anticipated additional H2S contingency plans will be required.

(d) Modeling report

No H2S documented in the offset wells in and around the project area, nor in nearby producing fields. Expected temperatures are too low for two of four main sources of H2S (thermal cracking, thermochemical sulfate reduction), vertical migrations distance prevents a third (direct change), and inadequate sulfate is present for the fourth (bacterial sulfate reduction). Therefore, no further model reports are needed.

SECTION D
BIOLOGICAL, PHYSICAL, AND SOCIOECONOMIC

(a) Deepwater Benthic Communities

The seafloor disturbing activities proposed in this plan are in water depths greater than 300 meters. Fugro Geoconsulting, Inc. was contracted to provide an assessment of the shallow conditions that may impact exploratory drilling operations within 2,000 feet of the proposed well sites. Murphy will avoid all high-density deepwater benthic communities by 2,000 feet from each proposed mud and cuttings discharge location and 250 feet from the location of all other seafloor disturbances. The proposed operations will be conducted from the Bureau of Ocean Energy Management previously approved surface location in Supplemental Exploration (Control No. S-7997); therefore, a Deepwater Benthic Communities map is not being provided.

(b) Biologically Sensitive Underwater Features and Areas

Activities proposed in this Supplemental EP do not fall within 305 meters (1,000 feet) of a topographic "No Activity Zone;" therefore, no map is required per NTL 2009-G39, "Biologically Sensitive Underwater Features and Areas." All activities proposed under this Supplemental EP will be conducted outside all Topographic Feature Protective Zones; therefore, shunting of drill cuttings and drilling fluids is not required per NTL 2009-G39, "Biologically Sensitive Underwater Features and Areas."

Green Canyon Block 432 is not located within 61 meters (200 feet) of any pinnacle trend feature or potentially sensitive biological features; therefore, a separate bathymetry map or biologically sensitive area map is not required per NTL2009-G39, "Biologically Sensitive Underwater Features and Areas."

(c) Physical environment reports

The proposed surface locations included in this plan were previously approved based on a site-specific archaeological report and seafloor site clearance assessments submitted to BOEM under Control No. S-7997.

(d) Socioeconomic study reports

Murphy will utilize an existing shorebase in Fourchon, Louisiana which is fully staffed and operational and does not expect to employ persons. Murphy also does not expect to purchase major supplies, services, energy, water or other resources for the proposed operations.

(e) Archaeological Report

The proposed surface locations included in this plan were previously approved based on a site-specific archaeological report and shallow hazards assessment submitted to BOEM under Control No. S-7997.

SECTION E
WASTES AND DISCHARGES

(a) Projected waste and (b) Projected Ocean discharges

A table providing the name, brief description, projected quantity, and composition of solid and liquid wastes (such as spent drilling fluids, drill cuttings, trash, sanitary and domestic wastes, and chemical product wastes) likely to be generated by the proposed exploration activities is enclosed as Table 1. "Generated Wastes which will be treated, disposed of downhole or discharge to the GOA" for Projected generated wastes and Projected Ocean discharges.

(c) National Pollutant Discharge Elimination System (NPDES) permit

All discharges will be in accordance with Murphy's Region 6 EPA NPDES permit No. GMG29062K.

(d) Modeling report

Murphy did not conduct any modeling of discharges for the projected solid or liquid wastes; therefore, one is not included in this Supplemental EP.

(e) Projected cooling water intake

The proposed exploration activities will not conduct cooling water intake; therefore, this section does not apply.

TABLE 1

GENERATED WASTES WHICH WILL BE TREATED, DISPOSED OF DOWNHOLE OR DISCHARGED TO THE GOM

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

Projected generated waste			Projected ocean discharges		Projected Downhole Disposal
Type of Waste	**Composition**	**Projected Amount**	**Discharge Rate**	**Discharge Method**	**Yes or No**
Will drilling occur? If yes, you should list muds and cuttings					
Water-based drilling fluid	Sodium Chloride brine, barite, sodium chloride powder, xanthan gum	8,000 bbls/well	2000 bbls/well/day	At seabed after being circulated through the well	N/A
Cuttings wetted with water-based fluid	clay, sand	280 bbls/well	140 bbls/well/day	At seabed after being circulated out of the well	N/A
Cuttings wetted with synthetic-based fluid	claystone, sandstone internal olefin based fluid	1050 bbls/well	130 bbls/well/day	Discharged overboard after being treated to meet regulations	N/A
Will humans be there? If yes, expect conventional waste					
Domestic waste (kitchen water, shower water)	grey water	22466 bbls/well	239 bbls/well/day	Remove floating solids and discharge	No
Sanitary water (toilet water)	treated sanitary waste	13010 bbls/well	138.4 bbls/well/day	Chlorinate and discharge	No
Is there a deck? If yes, there will be Deck Drainage					
Deck Drainage	Deck drainage resulting from rainfall	0-4000 bbls/well	15 bbls/hr (max separator discharge)	Treat for oil and gas then discharge	No
Will you conduct well treatment, completion, or workover?					
Well treatment fluids	Gelled Seawater	600 bbls/well	8 bbls/min/well	discharge used fluids overboard	No
Well completion fluids	N/A	N/A	N/A	N/A	
Workover fluids	N/A	N/A	N/A	N/A	N/A
fill in those associated with your					
Desalinization unit discharge	Uncontaminated spent saltwater used for portable water generation unit	128,464 m bbls/well	1835 bbls/day	Discharge overboard	No
Blowout prevent fluid	Completion brine (CaBr2)	12-17 bbls	N/A	Contained	No
Ballast water	Saltwater used for ballast control	6686 bbls/well	6686 bbls/day - 1 day	Discharge overboard	No
Bilge water	Fresh water and salt water overflow/leakage accumulated from machinery operations	977 bbls/well	13.9 bbls/day	Discharge overboard	No
Excess cement at seafloor	N/A	N/A	N/A	N/A	N/A
Fire water	Saltwater	13714 bbls/well	195 bbls/day	Discharge overboard	No
Cooling water	Saltwater	40.7 mm bbls/well	581,510 bbls/day	Discharge overboard	No
Will you produce hydrocarbons? If yes fill in for producted water.					
Produced water	N/A	N/A	N/A	N/A	N/A
Will you be covered by an individual or general NPDES permit?					
NPDES ID: GMG29062K					

NOTE: If you will not have a type of waste, enter NA in the row.

SECTION F
AIR EMISSIONS

(a) Projected emissions

There are no existing facilities or activities co-located with Murphy's proposed activities; therefore, the Complex Total Emissions are the same as the Plan Emissions and are included within this plan.

Screen Questions for EP's	Yes	No
Is the calculated Complex Total (CT) Emission amount (tons) associated with your proposed exploration activities more than 90% of the amounts calculated using the following formula's: 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
Are you proposed exploration activities located east of 87.5° W longitude?		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 for more than 48 continuous hours from any proposed well?		X
Do you propose to burn produced hydrocarbon liquids?		X

Enclosed in this section are the emissions worksheets prepared in accordance with 30 CFR 550.218.

This information was calculated by:

Brenda Montalvo
(281) 216-7717
brenda_montalvo@murphyoilcorp.com

EP - AIR QUALITY

OMB Control No. 1010-0151
OMB Approval Expires: 08/31/2023

COMPANY	Murphy Exploration & Production Company - USA
AREA	Green Canyon
BLOCK	432
LEASE	OCS-G 32504
FACILITY	NA
WELL	N-R, O-R, P, Q, R
COMPANY CONTACT	Brenda Montalvo
TELEPHONE NO.	281-798-0481
REMARKS	Drilling/Completion of 5 Well Locations (Well Locations N-R, O-R, P, Q, and R).

AIR EMISSIONS COMPUTATION FACTORS

Fuel Usage Conversion Factors	Natural Gas Turbines				Natural Gas Engines		Diesel Recip. Engine		Diesel Turbines			
	SCF/hp-hr	9.524			SCF/hp-hr	7.143	GAL/hp-hr	0.0514	GAL/hp-hr	0.0514		

Equipment/Emission Factors	units	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3	REF.	DATE	Reference Links
Natural Gas Turbine	g/hp-hr		0.0086	0.0086	0.0026	1.4515	0.0095	N/A	0.3719	N/A	AP42 3.1-1& 3.1-2a	4/00	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03s01.pdf
RECIP. 2 Cycle Lean Natural Gas	g/hp-hr		0.1293	0.1293	0.0020	6.5998	0.4082	N/A	1.2009	N/A	AP42 3.2-1	7/00	https://www3.epa.gov/ttn/chief/ap42/ch03/final/c03s02.pdf
RECIP. 4 Cycle Lean Natural Gas	g/hp-hr		0.0002	0.0002	0.0020	2.8814	0.4014	N/A	1.8949	N/A	AP42 3.2-2	7/00	https://www3.epa.gov/ttn/chief/ap42/ch03/final/c03s02.pdf
RECIP. 4 Cycle Rich Natural Gas	g/hp-hr		0.0323	0.0323	0.0020	7.7224	0.1021	N/A	11.9408	N/A	AP42 3.2-3	7/00	https://www3.epa.gov/ttn/chief/ap42/ch03/final/c03s02.pdf
Diesel Recip. < 600 hp	g/hp-hr	1	1	1	0.0279	14.1	1.04	N/A	3.03	N/A	AP42 3.3-1	10/96	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03s03.pdf
Diesel Recip. > 600 hp	g/hp-hr	0.32	0.182	0.178	0.0055	10.9	0.29	N/A	2.5	N/A	AP42 3.4-1 & 3.4-2	10/96	https://www3.epa.gov/ttn/chief/ap42/ch03/final/c03s04.pdf
Diesel Boiler	lbs/bbl	0.0840	0.0420	0.0105	0.0089	1.0080	0.0084	5.14E-05	0.2100	0.0336	AP42 1.3-6; Pb and NH3: WebFIRE (08/2018)	9/98 and 5/10	https://www3.epa.gov/ttnchie1/ap42/ch01/final/c01s03.pdf https://cfpub.epa.gov/webfire/
Diesel Turbine	g/hp-hr	0.0381	0.0137	0.0137	0.0048	2.7941	0.0013	4.45E-05	0.0105	N/A	AP42 3.1-1 & 3.1-2a	4/00	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03s01.pdf
Dual Fuel Turbine	g/hp-hr	0.0381	0.0137	0.0137	0.0048	2.7941	0.0095	4.45E-05	0.3719	0.0000	AP42 3.1-1& 3.1-2a; AP42 3.1-1 & 3.1-2a	4/00	https://cfpub.epa.gov/webfire/
Vessels – Propulsion	g/hp-hr	0.320	0.1931	0.1873	0.0047	7.6669	0.2204	2.24E-05	1.2025	0.0022	USEPA 2017 NEI;TSP refer to Diesel Recip. > 600 hp reference	3/19	
Vessels – Drilling Prime Engine, Auxiliary	g/hp-hr	0.320	0.1931	0.1873	0.0047	7.6669	0.2204	2.24E-05	1.2025	0.0022	USEPA 2017 NEI;TSP refer to Diesel Recip. > 600 hp reference	3/19	https://www.epa.gov/air-emissions-inventories/2017-national-emissions-inventory-nei-data
Vessels – Diesel Boiler	g/hp-hr	0.0466	0.1491	0.1417	0.4400	1.4914	0.0820	3.73E-05	0.1491	0.0003	USEPA 2017 NEI;TSP (units converted) refer to Diesel Boiler Reference	3/19	
Vessels – Well Stimulation	g/hp-hr	0.320	0.1931	0.1873	0.0047	7.6669	0.2204	2.24E-05	1.2025	0.0022	USEPA 2017 NEI;TSP refer to Diesel Recip. > 600 hp reference	3/19	
Natural Gas Heater/Boiler/Burner	lbs/MMscf	7.60	1.90	1.90	0.60	190.00	5.50	5.00E-04	84.00	3.2	AP42 1.4-1 & 1.4-2; Pb and NH3: WebFIRE (08/2018)	7/98 and 8/18	https://www3.epa.gov/ttnchie1/ap42/ch01/final/c01s04.pdf https://cfpub.epa.gov/webfire/
Combustion Flare (no smoke)	lbs/MMscf	0.00	0.00	0.00	0.57	71.40	35.93	N/A	325.5	N/A	AP42 13.5-1, 13.5-2	2/18	
Combustion Flare (light smoke)	lbs/MMscf	2.10	2.10	2.10	0.57	71.40	35.93	N/A	325.5	N/A	AP42 13.5-1, 13.5-2	2/18	
Combustion Flare (medium smoke)	lbs/MMscf	10.50	10.50	10.50	0.57	71.40	35.93	N/A	325.5	N/A	AP42 13.5-1, 13.5-2	2/18	https://www3.epa.gov/ttn/chief/ap42/ch13/final/C13S05_02-05-18.pdf
Combustion Flare (heavy smoke)	lbs/MMscf	21.00	21.00	21.00	0.57	71.40	35.93	N/A	325.5	N/A	AP42 13.5-1, 13.5-2	2/18	
Liquid Flaring	lbs/bbl	0.42	0.0966	0.0651	5.964	0.84	0.01428	5.14E-05	0.21	0.0336	AP42 1.3-1 through 1.3-3 and 1.3-5	5/10	https://www3.epa.gov/ttnchie1/ap42/ch01/final/c01s03.pdf
Storage Tank	tons/yr/tank						4.300				2014 Gulfwide Inventory; Avg emiss (upper bound of 95% CI)	2017	https://www.boem.gov/environment/environmental-studies/2014-gulfwide-emission-inventory
Fugitives	lbs/hr/component						0.0005				API Study	12/93	https://www.api.org/
Glycol Dehydrator	tons/yr/dehydrator						19.240				2011 Gulfwide Inventory; Avg emiss (upper bound of 95% CI)	2014	https://www.boem.gov/environment/environmental-studies/2011-gulfwide-emission-inventory
Cold Vent	tons/yr/vent						44.747				2014 Gulfwide Inventory; Avg emiss (upper bound of 95% CI)	2017	https://www.boem.gov/environment/environmental-studies/2014-gulfwide-emission-inventory_
Waste Incinerator	lb/ton		15.0	15.0	2.5	2.0	N/A	N/A	20.0	N/A	AP 42 2.1-12	10/96	https://www3.epa.gov/ttnchie1/ap42/ch02/final/c02s01.pdf
On-Ice – Loader	lbs/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model; TSP (units converted) refer to Diesel Recip. <600 reference	2009	
On-Ice – Other Construction Equipment	lbs/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model; TSP (units converted) refer to Diesel Recip. <600 reference	2009	
On-Ice – Other Survey Equipment	lbs/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model; TSP (units converted) refer to Diesel Recip. <600 reference	2009	
On-Ice – Tractor	lbs/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model; TSP (units converted) refer to Diesel Recip. <600 reference	2009	https://www.epa.gov/moves/nonroad2008a-installation-and-updates
On-Ice – Truck (for gravel island)	lbs/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model; TSP (units converted) refer to Diesel Recip. <600 reference	2009	
On-Ice – Truck (for surveys)	lbs/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model; TSP (units converted) refer to Diesel Recip. <600 reference	2009	
Man Camp - Operation (max people/day)	tons/person/day		0.0004	0.0004	0.0004	0.006	0.001	N/A	0.001	N/A	BOEM 2014-1001	2014	https://www.boem.gov/sites/default/files/uploadedFiles/BOEM/BOEM_Newsroom/Library/Publications/2014-1001.pdf
Vessels - Ice Management Diesel	g/hp-hr	0.320	0.1931	0.1873	0.0047	7.6669	0.2204	2.24E-05	1.2025	0.0022	USEPA 2017 NEI;TSP refer to Diesel Recip. > 600 hp reference	3/19	https://www.epa.gov/air-emissions-inventories/2017-national-emissions-inventory-nei-data
Vessels - Hovercraft Diesel	g/hp-hr	0.320	0.1931	0.1873	0.0047	7.6669	0.2204	2.24E-05	1.2025	0.0022	USEPA 2017 NEI;TSP refer to Diesel Recip. > 600 hp reference	3/19	https://www.epa.gov/air-emissions-inventories/2017-national-emissions-inventory-nei-data

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

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

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

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

AIR EMISSIONS CALCULATIONS - 2ND YEAR

COMPANY	AREA		BLOCK	LEASE	FACILITY	WELL					CONTACT	PHONE	REMARKS
Murphy Exploration & Production Company - USA	Green Canyon		432	OCS-G 32504	NA	N-R, O-R, P, Q, R					Brenda Montalvo	281-798-0481	Drilling/Completion of 5 Well Locations (Well Locations N-R, O-R, P, Q, and R).

OPERATIONS	EQUIPMENT	EQUIPMENT ID	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	D/YR	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3
DRILLING	VESSELS- Drilling - Propulsion Engine - Diesel		61800	3179.3628	76304.71	24	121	43.60	26.30	25.51	0.63	1044.59	30.03	0.00	163.84	0.30	63.31	38.19	37.05	0.92	1516.74	43.61	0.00	237.90	0.44
	VESSELS- Drilling - Propulsion Engine - Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS- Drilling - Propulsion Engine - Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS- Drilling - Propulsion Engine - Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Vessels - Diesel Boiler		0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Vessels – Drilling Prime Engine, Auxiliary		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FACILITY INSTALLATION	VESSELS - Heavy Lift Vessel/Derrick Barge Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			BPD																						
DRILLING	Liquid Flaring		0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WELL TEST	COMBUSTION FLARE - no smoke			0		0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	COMBUSTION FLARE - light smoke			0		0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	COMBUSTION FLARE - medium smoke			0		0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	COMBUSTION FLARE - heavy smoke			0		0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
ALASKA-SPECIFIC SOURCES	**VESSELS**		**kW**			**HR/D**	**D/YR**																		
	VESSELS - Ice Management Diesel		0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
#REF!	**Facility Total Emissions**							**43.60**	**26.30**	**25.51**	**0.63**	**1,044.59**	**30.03**	**0.00**	**163.84**	**0.30**	**63.31**	**38.19**	**37.05**	**0.92**	**1,516.74**	**43.61**	**0.00**	**237.90**	**0.44**
EXEMPTION CALCULATION	**DISTANCE FROM LAND IN MILES**																**5,760.90**			**5,760.90**	**5,760.90**	**5,760.90**		**105,562.50**	
	173.0																								
DRILLING	VESSELS- Crew Diesel (2 x week)		7200	370.4112	8889.87	24	43	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	2.62	1.58	1.53	0.04	62.80	1.81	0.00	9.85	0.02
	VESSELS - Supply Diesel (4 x week)		7200	370.4112	8889.87	24	86	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	5.24	3.16	3.07	0.08	125.59	3.61	0.00	19.70	0.04
	VESSELS - Tugs Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FACILITY INSTALLATION	VESSELS - Material Tug Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS - Crew Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS - Supply Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PRODUCTION	VESSELS - Support Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ALASKA-SPECIFIC SOURCES	**On-Ice Equipment**			**GAL/HR**	**GAL/D**																				
	Man Camp - Operation (maximum people per day)		**PEOPLE/DAY**																						
	VESSELS		**kW**			**HR/D**	**D/YR**																		
	On-Ice – Loader			0	0.0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
	On-Ice – Other Construction Equipment			0	0.0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
	On-Ice – Other Survey Equipment			0	0.0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
	On-Ice – Tractor			0	0.0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
	On-Ice – Truck (for gravel island)			0	0.0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
	On-Ice – Truck (for surveys)			0	0.0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
	Man Camp - Operation		0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	
	VESSELS - Hovercraft Diesel		0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
#REF!	**Non-Facility Total Emissions**							**10.16**	**6.13**	**5.95**	**0.15**	**243.40**	**7.00**	**0.00**	**38.18**	**0.07**	**7.86**	**4.74**	**4.60**	**0.11**	**188.39**	**5.42**	**0.00**	**29.55**	**0.05**

COMPANY	AREA		BLOCK	LEASE	FACILITY	WELL	CONTACT	PHONE	REMARKS
Murphy Exploration & Production Company - USA	Green Canyon		432	OCS-G 32504	NA	N-R, O-R, P, Q, R	Brenda Montalvo	281-798-0481	Drilling/Completion of 5 Well Locations (Well Locations N-R, O-R, P, Q, and R).

OPERATIONS	EQUIPMENT	EQUIPMENT ID	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	D/YR	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3
DRILLING	VESSELS- Drilling - Propulsion Engine - Diesel		61800	3179.3628	76304.71	24	328	43.60	26.30	25.51	0.63	1044.59	30.03	0.00	163.84	0.30	171.60	103.53	100.43	2.50	4111.49	118.21	0.01	644.88	1.20
	VESSELS- Drilling - Propulsion Engine - Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS- Drilling - Propulsion Engine - Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS- Drilling - Propulsion Engine - Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Vessels - Diesel Boiler		0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Vessels – Drilling Prime Engine, Auxiliary		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FACILITY INSTALLATION	VESSELS - Heavy Lift Vessel/Derrick Barge Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			BPD																						
DRILLING	Liquid Flaring		0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WELL TEST	COMBUSTION FLARE - no smoke			0		0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	COMBUSTION FLARE - light smoke			0		0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	COMBUSTION FLARE - medium smoke			0		0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	COMBUSTION FLARE - heavy smoke			0		0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
ALASKA-SPECIFIC SOURCES	**VESSELS**		**kW**			**HR/D**	**D/YR**																		
	VESSELS - Ice Management Diesel		0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
#REF!	**Facility Total Emissions**							**43.60**	**26.30**	**25.51**	**0.63**	**1,044.59**	**30.03**	**0.00**	**163.84**	**0.30**	**171.60**	**103.53**	**100.43**	**2.50**	**4,111.49**	**118.21**	**0.01**	**644.88**	**1.20**
EXEMPTION CALCULATION	**DISTANCE FROM LAND IN MILES**																**5,760.90**			**5,760.90**	**5,760.90**	**5,760.90**		**105,562.50**	
	173.0																								
DRILLING	VESSELS- Crew Diesel (2 x week)		7200	370.411201	8889.87	24	43	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	2.62	1.58	1.53	0.04	62.80	1.81	0.00	9.85	0.02
	VESSELS - Supply Diesel (4 x week)		7200	370.411201	8889.87	24	86	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	5.24	3.16	3.07	0.08	125.59	3.61	0.00	19.70	0.04
	VESSELS - Tugs Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FACILITY INSTALLATION	VESSELS - Material Tug Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS - Crew Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS - Supply Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PRODUCTION	VESSELS - Support Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ALASKA-SPECIFIC SOURCES	**On-Ice Equipment**			**GAL/HR**	**GAL/D**																				
	Man Camp - Operation (maximum people per day)		**PEOPLE/DAY**																						
	VESSELS		**kW**			**HR/D**	**D/YR**																		
	On-Ice – Loader			0	0.0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
	On-Ice – Other Construction Equipment			0	0.0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
	On-Ice – Other Survey Equipment			0	0.0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
	On-Ice – Tractor			0	0.0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
	On-Ice – Truck (for gravel island)			0	0.0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
	On-Ice – Truck (for surveys)			0	0.0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
	Man Camp - Operation		0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	
	VESSELS - Hovercraft Diesel		0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
#REF!	**Non-Facility Total Emissions**							**10.16**	**6.13**	**5.95**	**0.15**	**243.40**	**7.00**	**0.00**	**38.18**	**0.07**	**7.86**	**4.74**	**4.60**	**0.11**	**188.39**	**5.42**	**0.00**	**29.55**	**0.05**

AIR EMISSIONS CALCULATIONS

COMPANY	AREA	BLOCK	LEASE	FACILITY	WELL
Murphy Exploration & Production Company - USA	Green Canyon	432	OCS-G 32504	NA	Drilling/Completion of 5 Well Locations (Well Locations N-R, O-R, P, Q, and R).

Year	Facility Emitted Substance								
	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3
2026	63.31	38.19	37.05	0.92	1516.74	43.61	0.00	644.88	0.44
2027	171.60	103.53	100.43	2.50	4111.49	118.21	0.01	237.90	1.20
Allowable	5760.90			5760.90	5760.90	5760.90		105562.50	

SECTION G
OIL AND HAZARDOUS SUBSTANCE SPILLS

(a) Oil Spill Response Planning

(2)(i) All proposed activities in this Supplemental EP will be covered under Murphy's approved Regional OSRP filed by Murphy Exploration & Production Company – USA, BOEM/BSEE Operator Number 02647, in accordance with 30 CFR 254, approved on November 6, 2023, with most recent modification submitted on January 31, 2025. Murphy's Regional OSRP was found in compliance on March 7, 2025.

(a)(2)(ii) SPILL RESPONSE SITES

Primary Response Equipment Location	Preplanned Staging Location(s)
Houma, LA	Houma, LA
Leeville, LA	Port Fourchon, LA

(a)(2)(iii) OSRO INFORMATION

Clean Gulf Associates (CGA) is the primary equipment provider and Marine Spill Response Corporation (MSRC) is a secondary equipment provider for Murphy in the Gulf of American Region. CGA maintains a dedicated fleet of vessels and other equipment permanently located at designated ports. CGA and MSRC have the capability to plan the mobilization and rapid deployment of spill response resources on a 24 hour, 7 days a week basis. The Incident Commander (IC) may use other service companies if additional equipment, materials, and personnel are needed. Refer to **Appendix F of our OSRP** for a listing of potential support services.

(a)(2)(iv) WORST-CASE SCENARIO COMPARISON

Category	Regional OSRP WCD	EP WCD
Type of Activity	>10 Miles Seaward of the Coastline	>10 Miles Seaward of the Coastline
Facility Location (Area/Block)	MC 600	GC 432
Facility Designation	A	N-R, O-R, P, Q, R
Distance to Nearest Shoreline (miles)	53	107
Volume Storage tanks (total) Uncontrolled blowout Total Volume	335,032	150,832
Type of Oil(s) (crude, condensate, diesel)	Crude	Crude
API Gravity	30°	28.5°

Since Murphy has the capability to respond to the worst-case spill scenario included in our Regional OSRP approved on April 19, 2024, with most recent acknowledgement received on March 7, 2025; the worst-case scenario determined for this Supplemental EP does not replace the worst-case scenario in our Regional OSRP, therefore Murphy hereby certifies that we have the capability to respond, to the maximum extent practicable, to a worst-case spill scenario included in our Regional OSRP resulting from the activities proposed in our Supplemental EP.

(b) Spill response discussion

For the purpose of NEPA and Coastal Zone Management Act analysis, the largest spill volume originating from the proposed activity would be a well blowout during drilling operations, estimated to be 150,832 barrels of crude oil with an API gravity of 28.5°.

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 America available on the BOEM website. The results are shown in Figure 1. The BOEM OSRAM identifies a 5% probability of impact to the shorelines of Cameron Parish, Louisiana within 30 days. Cameron Parish includes the east side of Sabine Lake, Sabine National Wildlife Refuge, Calcasieu Lake, Lacassine National Wildlife Refuge (inland) and Grand Lake. Cameron Parish also includes the area along the coastline from Sabine Pass to Big Constance Lake in Rockefeller Wildlife Refuge. This region is composed of open public beaches, marshlands and swamps. It serves as a habitat for numerous birds, finfish and other animals, including several rare, threatened and endangered species.

Response

Murphy 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 12% or approximately 18,100 barrels of crude oil would be evaporated/dispersed within 24 hours, with approximately 132,732 barrels remaining.

Natural Weathering Data: GC 432, Well Location "N-R", "O-R", "P", "Q", "R"	**Barrels of Oil**
WCD Volume	150,832
Less 12% natural evaporation/dispersion	18,100
Remaining volume	132,732

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.

Murphy'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 2 sorties (9,600 gallons) from two of the DC-3 aircrafts and 4 sorties (8,000 gallons) from the Basler aircraft would provide a daily dispersant capability of 7,540 barrels. If the conditions are favorable for in-situ burning, the proper approvals have been obtained and the proper planning is in place, in-situ burning of oil may be attempted. Slick containment boom would be immediately called out and on-scene as soon as possible. Offshore response strategies may include attempting to skim utilizing CGA and MSRC spill response equipment, with a total derated skimming capacity of 822,944 barrels. Temporary storage associated with skimming equipment equals 194,996 barrels. If additional storage is needed, various storage barges with a total capacity 640,000+ bbl. 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 Cameron Parish, Louisiana would depend upon existing environmental conditions. Shoreline protection would include the use of CGA and MSRC near shore and shallow water skimmers with a totaled derated skimming capacity of 269,968 barrels. Temporary storage associated with skimming equipment equals 9,241 barrels. If additional storage is needed, various storage barges with a total capacity 281,000+ bbl. 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. A Master Service Agreement with OMI Environmental will ensure access to 34,800 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 more effective response to site-specific circumstances. Murphy's contract Spill Management Team has access to the applicable ACP(s) and GRP(s).

Based on the anticipated worst case discharge scenario, Murphy 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 71 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:

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

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

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

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

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

- Information will be confirmed
- An assessment will be made and initial objectives set
- OSRO's 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

- Surveillance Aircraft: within two hours of QI notification, or first light
- Provide trained observer to provide on-site status reports
- Provide command and control platform at the site if needed
- Continual surveillance of oil movement by remote sensing systems, aerial photography and visual confirmation
- Continual monitoring of vessel assets using vessel monitoring systems

Dispersant application assets

- Put ASI 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 movement of dispersants, aircraft, and support equipment and personnel
- Confirm dispersant availability for current and long-range operations
- Start 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

Oceangoing Boom Barge

- Containment at the source
- Increased/enhanced skimmer encounter rate
- Protection booming

In-situ Burn assets

- Determine appropriateness of in-situ burn operation in coordination with the FOSC and affected SOSC
- Determine availability of fire boom and selected ignition systems
- Start ordering fire boom stocks required for expected operations
- Contact boom manufacturer to provide training & tech support for operations, if required
- 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

Dedicated offshore skimming systems
General

- Deployed to the highest concentration of oil
- Assets deployed at a 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 with known debris (seaweed, and other floating materials)

CGA 95' Fast Response Vessels (FRV's)

- 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-shore as safely possible

CGA FRU's

- To the area of the thickest oil
- Use as far offshore as allowed
- VOOs 140' – 180' in length
- VOOs with minimum of 18' x 38' or 23' x 50' of optimum deck space
- VOOs in shallow water should have a draft of <10 feet when fully loaded

T&T Koseq Skimming Systems

- To the area of the thickest oil
- Use as far offshore as allowed
- VOOs with a minimum of 2,000 bbl. of storage capacity
- VOOs with minimum 200' in length
- VOOs with deck space of 100' x 40' to provide space for arms, tanks, and crane
- VOOs for shallow water should be deck barges with a draft of <10 feet when fully loaded

Storage Vessels

- Establish availability of CGA contracted assets (See Appendix E)
- Early call out (to allow for tugboat 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 Murphy'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 for ISB operations or boom tending
- Expect mission specific and safety training to be required
- Plan with the US Coast Guard 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

Adverse Weather Operations:

In adverse weather, when seas are > 3 feet, the use of larger recovery and storage vessels, oleophilic skimmers, and large offshore boom will be maximized. KOSEQ Arm systems are built for rough conditions, and they should be used until their operational limit (9.8' seas) is met. 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 Guidebook 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^3)

- Publish, implement, and fully test an appropriate communications plan
- Design an operational scheme, maintaining a manageable span of control
- Designate and mark C_3 vessels for easy aerial identification
- Designate and employ C_3 aircraft for task forces, groups, etc.
- Use reconnaissance aircraft 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 O2, LEL, H2S, CO, VOC, and Benzene are all within the permissible limits, oil recovery operations may begin.

As skimming vessels arrive, they will be organized to work in areas that allow for the most efficient vessel operation and free vessel movement in the recovery of oil. Vessel groups 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
Operating parameters			
Sea State	3-5 ft max	9.8 ft max	3-5 ft max
Skimming speed	≤1 kt	≤3 kts	≤1 kt
Vessel size			
Minimum Length	100 ft	200 ft	100 ft
Deck space for: • Tank(s) • Crane(s) • Boom Reels • Hydraulic Power Units • Equipment Boxes	18x32 ft	100x40 ft	18x32 ft
Communication Assets	Marine Band Radio	Marine Band Radio	Marine Band Radio

Tactical use of Vessels of Opportunity (VOO): Murphy 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

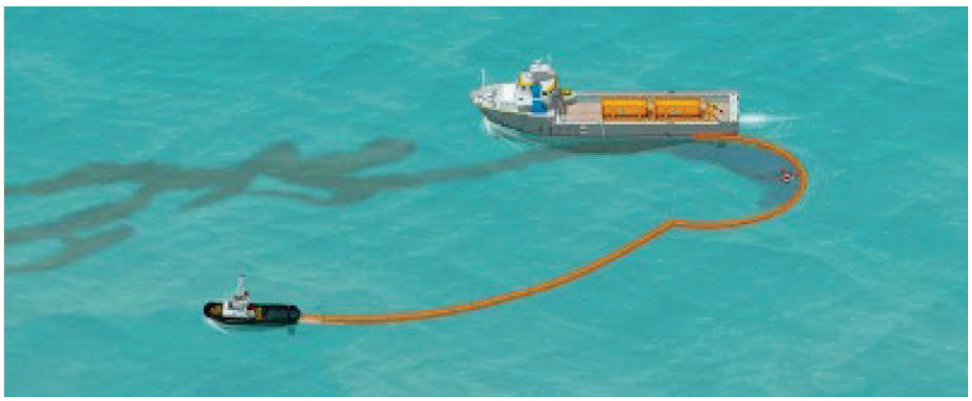
skimmer then pumps all fluids recovered to the storage tank where it is allowed to settle, and with the approval of the Coast Guard, the water is decanted from the bottom of the tank back into the water ahead of the containment boom to be recycled through the system. Once the tank is full of as much 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 are 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/Crew boat (supply)
1 – Designated spotter aircraft

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



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

The Koseq Rigid Sweeping Arm: A skimming system deployed on a vessel of opportunity. It requires a large Offshore or Platform Supply Vessel (OSV/PSV), greater than 200' with at least 100' x 50' of free deck space. On each side of the vessel, a 50' long rigid framed Arm is deployed that consists of pontoon chambers to provide buoyancy, a smooth nylon face, and a hydraulically adjustable mounted weir skimmer. The Arm floats independently of the vessel and is attached by a tow bridle and a lead line. The movement of the vessel forward draws the rubber end seal of the arm against the hull to create a collection point for free oil directed to the weir by the Arm face. The collection weir is adjusted to keep the lip as close to the oil water interface as possible to maximize oil recovery while attempting to minimize excess water collection. A transfer pump (combination of positive displacement, screw type and centrifuge suited for highly viscous oils) 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.

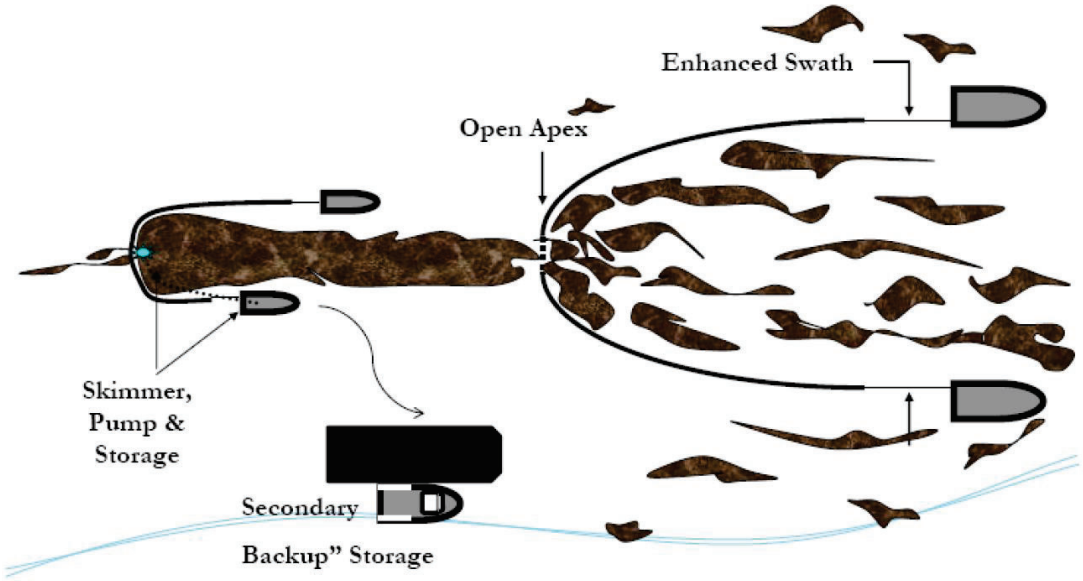
Tactical Overview

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 America. 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 bbl. 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.

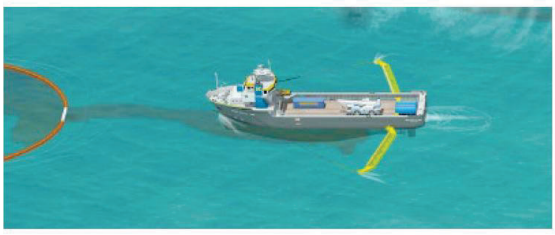
Maximum Sea Conditions - Under most circumstances the larger OSVs are capable of remaining on scene well past the Skimming Arms maximum sea state of 9.8'. Ultimately it will be the decision of the VOO Captain, with input from the T&T Supervisor onboard, to determine when the sea conditions have exceeded 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 – > 200' Offshore Supply Vessels (OSV) with set of Koseq Arms
2 to 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/Crew boat (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 thought 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 > 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.

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

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, it 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
- Marco SWS
- Operate with aerial spotter directing systems to observe oil slicks

VOO
- Use Murphy's contracted resources as applicable

- Industry vessels are usually best for deployment of Vessel of Opportunity Skimming Systems (VOSS)
- Acquiring 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
- 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 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
- Requisition 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 sand, 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., landowners, 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 cleanup 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 roadways
- 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 watercraft
    - Use of communication systems appropriately to ensure command and control of assets
    - Use of appropriate boom in areas that can offer effective protection
    - Planning of waste collection and removal to maximize cleanup efficiency

- Consideration 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 GOA

Texas
Prevailing winds, waves and currents along the Texas coast are from the southeast and northeast quadrants. 10-to-20-foot waves may occur during hurricanes. The combined effect of the winds, surface currents, and waves refracting shoreward produce the prevailing westerly longshore currents.

Tides are semi-diurnal and diurnal, and range in height from less than 1 foot to 2.5 feet. The direction, force, and duration of the wind have a considerable effect on the tides and currents. 15-foot tides may be expected during severe hurricanes and very low tides may accompany strong northerlies of long duration.

Surface water temperature averages slightly less than 90° F and range between 80 and 100° F during the late summer. During the winter the average is slightly less than 60° F, and the range is between 35 and 80° F.

Louisiana
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 America 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 peak 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 from 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 Murphys WCD and information in the BOEM Oil Spill Risk Analysis Model (OSRAM) for the Central and Western Gulf of America 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 (%)
Drilling and completion/abandonment of Well Locations N-R, O-R, P, Q, and R in Lease OCS-G 32504, Green Canyon Block 432 **GC 432, Well Loc N-R, O-R, P, Q, and R** *107 miles from shore*	*G32504*	*C44*	Matagorda, TX Galveston, TX Jefferson, TX **Cameron, LA** Vermilion, LA Terrebonne, LA Lafourche, LA Jefferson, LA Plaquemines, LA	1 2 1 **5** 2 2 1 1 4

WCD Scenario – <u>BASED ON WELL BLOWOUT DRILLING OPERATIONS</u> (107 miles from shore)
174,240 bbl. of crude oil (Volume considering natural weathering)
API Gravity 28.5°

FIGURE 2 – Equipment Response Time to Walker Ridge 432, Well Loc N-R, O-R, P, Q, R

Dispersant/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	5
DC 3	1200	2	Houma	2	2	1	5
Aero Commander	NA	2	Houma	2	2	0.8	4.8
MSRC							
C-130 Spray AC	4,125	2	Kiln	3	0	0.6	3.6
King Air BE90 Spray AC	250	2	Kiln	3	0	0.9	3.9

Offshore Response

Offshore Equipment Pre-Determined Staging	EDRC	Storage Capacity	VOO	Persons Required	From	Hrs. to Procure	Hrs. to Loadout	Hrs. to GOA	Travel to Spill Site	Hrs. to Deploy	Total Hrs.
CGA											
HOSS Barge	76285	4000	3 Tugs	8	Harvey	6	0	12	14	2	34
95' FRV	22885	249	NA	6	Galveston	2	0	2	15	1	20
95' FRV	22885	249	NA	6	Leeville	2	0	2	5.5	1	10.5
95' FRV	22885	249	NA	6	Venice	2	0	3	5.5	1	11.5
95' FRV	22885	249	NA	6	Vermilion	2	0	3	7	1	13
Boom Barge (CGA-300) 42" Auto Boom (25000')	NA	NA	1 Tug 50 Crew	4 (Barge) 2 (Per Crew)	Leeville	8	0	4	16	2	30
Kirby Offshore (available through contract with CGA)											
RO Barge	NA	80000+	1 Tug	6	Venice	41	0	4	14	1	60
RO Barge	NA	80000+	1 Tug	6	Venice	41	0	4	14	1	60
RO Barge	NA	80000+	1 Tug	6	Venice	41	0	4	14	1	60
RO Barge	NA	100000+	1 Tug	6	Venice	41	0	4	14	1	60
RO Barge	NA	100000+	1 Tug	6	Venice	41	0	4	14	1	60
RO Barge	NA	100000+	1 Tug	6	Venice	41	0	4	14	1	60
RO Barge	NA	100000+	1 Tug	6	Venice	41	0	4	14	1	60
MSRC											
Louisiana Responder Transrec 350 + OSRV *2,640' 67" Curtain Pressure Boom*	10567	4000	NA	14	Fort Jackson, LA	2	0	4.5	12	1	19.5
MSRC 452 Offshore Barge 1 Crucial Disk 88/30 *2,640' 67" Curtain Pressure Boom*	11122	45000	3 Tugs	6	Fort Jackson, LA	2.5	0	6	21	1	30.5
Mississippi Responder Transrec 350 + OSRV *2,640' 67" Curtain Pressure Boom*	10567	4000	NA	14	Pascagoula, MS	2	0	2	16	1	21
MSRC 402 Offshore Barge 2 Crucial Disk 88/30 *2,640' 67" Curtain Pressure Boom*	22244	40300	3 Tugs	6	Pascagoula, MS	2.5	0	3	27.5	1	34
S.T. Benz Responder LFF 100 Brush + OSRV *2,640' 67" Curtain Pressure Boom*	18086	4000	NA	14	Grand Isle, LA	2	0	1	8	1	12
Gulf Coast Responder Transrec 350 + OSRV *2,640' 67" Curtain Pressure Boom*	10567	4000	NA	14	Lake Charles, TX	2	0	4	18	1	25
Texas Responder Transrec 350 + OSRV	10567	4000	NA	14	Galveston, TX	2	0	1	22	1	26

2,640' 67" Curtain Pressure Boom											
MSRC 570 Offshore Barge 2 Crucial Disk 88/30 *2,640' 67" Curtain Pressure Boom*	22244	56900	3 Tugs	6	Galveston, TX	2.5	0	2	37.5	1	43

Staging Area: Fourchon

Offshore Equipment with Staging	EDRC	Storage Capacity	VOO	Persons Req.	From	Hrs. to Procure	Hrs. to Loadout	Travel to Staging	Travel to 7Site	Hrs. to Deploy	Total Hrs.
T&T Marine (available through direct contract with CGA)											
Aqua Guard Triton RBS (1)	22323	2000	1 Utility	6	Galveston	4	12	12	9	2	39
Aqua Guard Triton RBS (1)	22323	2000	1 Utility	6	Harvey	4	12	3	9	2	30
Koseq Skimming Arms (10) Lamor brush	228850	10000	5 OSV	30	Galveston	24	24	12	9	2	71
Koseq Skimming Arms (6) MariFlex 150 HF	108978	6000	3 OSV	18	Galveston	24	24	12	9	2	71
Koseq Skimming Arms (2) Lamor brush	45770	2000	1 OSV	6	Harvey	24	24	3	9	2	62
Koseq Skimming Arms (4) MariFlex 150 HF	72652	4000	2 OSV	12	Harvey	24	24	3	9	2	62
CGA											
FRU (1) + 100 bbl Tank (2)	4251	200	1 Utility	6	Vermilion	2	6	5.5	9	1	23.5
FRU (1) + 100 bbl Tank (2)	4251	200	1 Utility	6	Galveston	2	6	12	9	1	30
FRU (1) + 100 bbl Tank (2)	4251	200	1 Utility	6	Aransas Pass	2	6	16.5	9	1	34.5
FRU (1) + 100 bbl Tank (2)	4251	200	1 Utility	6	Lake Charles	2	6	7	9	1	25
FRU (3) + 100 bbl Tank (6)	12753	600	3 Utility	18	Leeville	2	6	2	9	1	20
FRU (2) + 100 bbl Tank (4)	8502	400	2 Utility	12	Venice	2	6	5	9	1	23

Offshore Equipment Preferred Staging	EDRC	Storage Capacity	VOO	Persons Req.	From	Hrs. to Procure	Hrs. to Loadout	Travel to Staging	Travel to Site	Hrs. to Deploy	Total Hrs.
CGA											
Hydro-Fire Boom	NA	NA	8 Utility	40	Harvey	0	24	3	9	6	42
MSRC											
67" Curtain Pressure Boom (53570')	NA	NA	7*	14	Houston	1	2	12	18	1	34
1000' Fire Resistant Boom	NA	NA	3*	6	Galveston	1	4	12	18	6	41
16000' Fire Resistant Boom	NA	NA	3*	6	Houston	1	4	11	18	6	40
2000' Hydro Fire Boom	NA	NA	8*	8	Lake Charles	1	4	7	18	6	36

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

Nearshore Response

Nearshore Equipment Pre-determined Staging	EDRC	Storage Capacity	VOO	Persons Req.	From	Hrs. to Procure	Hrs. to Loadout	Hrs. to GOM	Travel to Site	Hrs. to Deploy	Total Hrs.
CGA											
Mid-Ship SWS	22885	249	NA	4	Leeville	2	0	NA	48	1	51
Mid-Ship SWS	22885	249	NA	4	Venice	2	0	NA	48	1	51
Mid-Ship SWS	22885	249	NA	4	Galveston	2	0	NA	48	1	51
Trinity SWS	21500	249	NA	4	Morgan City	2	0	NA	48	1	51
Trinity SWS	21500	249	NA	4	Lake Charles	2	0	NA	48	1	51
Trinity SWS	21500	249	NA	4	Vermilion	2	0	NA	48	1	51
Trinity SWS	21500	249	NA	4	Galveston	2	0	NA	48	1	51
46' FRV	15257	65	NA	4	Aransas Pass	2	0	2	16	1	21
46' FRV	15257	65	NA	4	Morgan City	2	0	2	6	1	11

46' FRV	15257	65	NA	4	Lake Charles	2	0	2	2.5	1	7.5
46' FRV	15257	65	NA	4	Venice	2	0	2	11	1	16
Enterprise Marine Services LLC (Available through contract with CGA)											
CTCo 2603	NA	25000	1 Tug	6	Amelia	26	0	6	15	1	48
CTCo 2604	NA	20000	1 Tug	6	Amelia	26	0	6	15	1	48
CTCo 2605	NA	20000	1 Tug	6	Amelia	26	0	6	15	1	48
CTCo 2606	NA	20000	1 Tug	6	Amelia	26	0	6	15	1	48
CTCo 2607	NA	23000	1 Tug	6	Amelia	26	0	6	15	1	48
CTCo 2608	NA	23000	1 Tug	6	Amelia	26	0	6	15	1	48
CTCo 2609	NA	23000	1 Tug	6	Amelia	26	0	6	15	1	48
CTCo 5001	NA	47000	1 Tug	6	Amelia	26	0	6	15	1	48
Kirby Offshore (Available through contract with CGA)											
RO Barge	NA	80000+	1 Tug	6	Venice	30	0	4	25	1	60

Staging Area: Cameron

Nearshore Equipment With Staging	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											
SWS Egmopol	1810	100	NA	3	Galveston	2	2	5	2	1	12
SWS Egmopol	1810	100	NA	3	Morgan City	2	2	4.5	2	1	11.5
SWS Marco	3588	20	NA	3	Lake Charles	2	2	2	2	1	9
SWS Marco	3588	34	NA	3	Leeville	2	2	7	2	1	14
SWS Marco	3588	34	NA	3	Venice	2	2	9.5	2	1	16.5
Foilex Skim Package (TDS 150)	1131	50	NA	3	Lake Charles	4	12	2	2	2	22
Foilex Skim Package (TDS 150)	1131	50	NA	3	Galveston	4	12	5	2	2	25
Foilex Skim Package (TDS 150)	1131	50	NA	3	Harvey	4	12	7	2	2	27
4 Drum Skimmer (Magnum 100)	680	100	1 Crew	3	Lake Charels	2	2	2	2	1	9
4 Drum Skimmer (Magnum 100)	680	100	1 Crew	3	Harvey	2	2	7	2	1	14
2 Drum Skimmer (TDS 118)	240	100	1 Crew	3	Lake Charles	2	2	2	2	1	9
2 Drum Skimmer (TDS 118)	240	100	1 Crew	3	Harvey	2	2	7	2	1	14
MSRC											
WP 1 Skimmer (1)	3017	400	1 Utility	4	Ingleside	1	1	9.5	2	0	13.5
Queensboro Skimmer (1)	905	400	1 Utility	4	Galveston	1	1	5	2	0	9
Queensboro Skimmer (5)	4525	2000	5 Utility	20	Lake Charles	1	1	1	2	0	5
AardVac Skimmer (1)	3840	400	1 Utility	4	Lake Charles	1	1	1	2	0	5
Queensboro Skimmer (1)	905	400	1 Utility	4	Belle Chasse	1	1	7	2	0	11
AardVac Skimmer (1)	3840	400	1 Utility	4	Pascagoula	1	1	9.5	2	0	13.5
WP 1 Skimmer (1)	3017	400	1 Utility	4	Pascagoula	1	1	9.5	2	0	13.5
Queensboro Skimmer (1)	905	400	1 Utility	4	Pascagoula	1	1	9.5	2	0	13.5
WP 1 Skimmer (1)	3017	400	1 Utility	4	Tampa	1	1	25	2	0	29
AardVac Skimmer (2)	7680	800	2 Utility	8	Miami	1	1	31	2	0	35
WP 1 Skimmer (1)	3017	400	1 Utility	4	Miami	1	1	31	2	0	35

Shoreline Protection

Staging Area: Cameron

Shoreline Protection Boom	VOO	Persons Req.	Storage/Warehouse Location	Hrs. to Procure	Hrs. to Loadout	Travel to Staging	Travel to Deployment	Hrs. to Deploy	Total Hrs.
OMI Environmental (available through MSA)									
3,800' 18" Boom	2 Crew	4	New Iberia, LA	1	1	4	2	3	11
11,000' 18" Boom	5 Crew	10	La Marque, TX	1	1	4	2	3	11
20,000' 18" Boom	6 Crew	12	Port Arthur, TX	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	7	1	2	14
Bird Scare Guns (24)	NA	NA	NA	2	Harvey	2	2	7	1	2	14
Bird Scare Guns (12)	NA	NA	NA	2	Galveston	2	2	5	1	2	12
Bird Scare Guns (12)	NA	NA	NA	2	Aransas Pass	2	2	9.5	1	2	16.5
Bird Scare Guns (48)	NA	NA	NA	2	Lake Charles	2	2	2	1	2	9
Bird Scare Guns (24)	NA	NA	NA	2	Leeville	2	2	7	1	2	14

Response Asset	Total
Offshore EDRC	822,944
Offshore Recovered Oil Capacity	834,996+
Nearshore / Shallow Water EDRC	269,968
Nearshore / Shallow Water Recovered Oil Capacity	290,241+

(c) Modeling Report

Not required for the location of the activities proposed in this plan.

SECTION H
ALASKA PLANNING INFORMATION

The activities being proposed under this plan are not located in the Alaska OCS Region; therefore, this section does not apply.

SECTION I
ENVIRONMENTAL MONITORING

(a) and (b) Monitoring Systems and Incidental Takes

No incidental takes are anticipated. Murphy implements the mitigation measures and monitors for incidental takes of protected species according to the following notices to lessees and operators from BOEM/BSEE:

- NTL 2015-G03 "Marine Trash and Debris Awareness and Elimination"
- BOEM NTL 2016-G01 "Vessel Strike Avoidance and Injured/Dead Protected Species Reporting"

National Marine Fisheries Service Biological Opinion of March 13, 2020

Murphy has reviewed the referenced opinion and provides the following to assist BOEM in the evaluation process to ensure the ESA listed species are protected as provided for in the BiOp of March 13, 2020.

The drillship that will be used during drilling and completion operations will have a typical moonpool that is used in all Deepwater Dynamic Positioned Drillships and Semisubmersibles. The moonpool is located in the center of the rig with a rectangular opening measuring. The moonpool's purpose is to allow access to the water to drill, complete and workover wells. This also allows access to run Blowout Preventers to latch up to the well for well control in the event of an emergency. There is no closing mechanism for the moonpool as it is always open to the sea.

In the extremely rare instance that marine life would get entrapped or entangled by equipment in the moonpool, or by any other equipment on the rig, below are mitigations that will be put in place to protect marine life in case there was an incident.

- Monitor video from cameras that are focused on the moonpool area 24 hours a day.
- If endangered marine life is seen in the area, a live video feed will be streamed real-time for additional coverage.
- A marine observer will be used if endangered marine life is seen in the area for additional monitoring.
- If marine life is entrapped or entangled, we can safely lower someone into the moonpool to free it.

In addition, as described above, vessel personnel will maintain a vigilant watch for marine mammals and sea turtles and slow down or stop their vessel to avoid striking protected species. If whales are sighted, maintain a distance of 100 yards (91 meters) or greater from the whale. If the whale is believed to be a North Atlantic right whale, vessel personnel will maintain a minimum distance of 500 yards (460 meters) from the animal. If sea turtles or small cetaceans are sighted, maintain a distance of 50 yards (45 meters) or greater whenever possible. When cetaceans are sighted while a vessel is underway, attempt to remain parallel to the animal's course. Avoid excessive speed or abrupt changes in direction until the cetacean has left the area. Reduce vessel speed to 10 knots or less when mother/calf pairs, pods, or large assemblages of cetaceans are observed near an underway vessel when safety permits. A single cetacean at the surface may indicate the presence of submerged animals in the vicinity of the vessel; therefore, precautionary measures will always be exercised.

Whales may surface in unpredictable locations or approach slowly moving vessels. When vessel personnel sight animals in the vessel's path or in close proximity to a moving vessel, reduce speeds and shift the engine to neutral. Do not engage the engines until the animals are clear of the area. Injured/Dead Protected

Species Reporting Vessel personnel will report sightings of any injured or dead protected species (marine mammals and sea turtles) immediately, regardless of whether the injury or death is caused by the vessel in use. Marine mammals reports will be made to the NMFS Southeast Marine Mammal Stranding Hotline at 1-877-433-8299 and sea turtles to the State Coordinators for the Sea Turtle Stranding and Salvage Network (STSSN). Any injured or dead protected species will be reported to takereport.nmfsser@noaa.gov.

In addition, if the injury or death was caused by a collision with a vessel, BSEE will be notified within 24 hours of the strike by email to protectedspecies@bsee.gov. The report will include date and location (latitude/longitude) of the strike, vessel name, and the species identification or a description of the animal.

Species	Scientific Name	Status	Potential Presence		Critical Habitat Designated in the Gulf of Mexico
			Lease Area	Coastal	
Marine Mammals					
Manatee, West Indian	*Trichechus manatus latirostris*	E	--	X	Florida (peninsular)
Giant Manta Ray	*Manta birostris*	E	X	--	None
Whale, Blue	*Balaenoptera masculus*	E	X*	--	None
Whale, Finback	*Balaenoptera physalus*	E	X*	--	None
Whale, Humpback	*Megaptera novaeangliae*	E	X*	--	None
Whale, North Atlantic Right	*Eubalaena glacialis*	E	X*	--	None
Whale, Sei	*Balaenopiera borealis*	E	X*	--	None
Whale, Sperm	*Physeter catodon (=macrocephalus)*	E	X	--	None
Whale, Bryde's	*Balaenoptera edeni*	E	X	--	None
Terrestrial Mammals					
Mouse, Beach (Alabama, Choctawatchee, Perdido Key, St. Andrew)	*Peromyscus polionotus*	E	-	X	Alabama, Florida (panhandle) beaches
Birds					
Plover, Piping	*Charadrius melodus*	T	-	X	Coastal Texas, Louisiana, Mississippi, Alabama and Florida (panhandle)
Crane, Whooping	*Grus Americana*	E	-	X	Coastal Texas

Reptiles					
Sea Turtle, Green	*Chelonia mydas*	T,E**	x	x	None
Sea Turtle, Hawksbill	*Eretmochelys imbricata*	E	x	x	None
Sea Turtle, Kemp's Ridley	*Lepidochelys kempli*	E	x	x	None
Sea Turtle, Leatherback	*Dermochelys coriacea*	E	x	x	None
Sea Turtle, Loggerhead	*Caretta caretta*	T	X	X	Texas, Louisiana, Mississippi, Alabama, Florida
Fish					
Sturgeon, Gulf	*Acipenser oxyrinchus (=oxyrhynchus) desotoi*	T	X	X	Coastal Louisiana, Mississippi, Alabama and Florida (panhandle)
Oceanic Whitetip Shark	*Carcharhinus longimanus*	E	X	--	None
Corals					
Coral, Elkhorn	*Acopora palmate*	T	-	x	Florida Keys and Dry Tortugas
Coral, Staghorn	*Acopora cervicornis*	T	-	X	Florida

- NTL 2016-G02 "Implementation of Seismic Survey Mitigation Measure & Protected Species Observer Program"

(c) Flower Garden Banks National Marine Sanctuary (FGBNMS)

Proposed exploration activities are not within the protective zones of the FGBNMS, therefore a description for monitoring the impacts of an oil spill on the environmentally sensitive resources is not included.

SECTION J
LEASE STIPULATIONS

Murphy will operate in accordance with NTL 2015-G03 “Marine Trash and Debris Awareness and Elimination”, NTL 2016-G01, “Vessel Strike Avoidance and Injured/Dead Protected Species Reporting” and NTL 2016-G02 “Implementation of Seismic Survey Mitigation Measure & Protect Species Observer Program”, to minimize the risk of vessel strikes to protected species and report observations of injured or dead protected species, and the prevention of intentional and/or accidental introduction of debris into the marine environment.

SECTION K
MITIGATION MEASURES

(a) Measures taken to minimize or mitigate environmental impacts
Murphy does not plan to use any additional measures beyond those required by the regulations.

(b) Incidental takes
Murphy does not anticipate any incidental takes related to the proposed operations. Murphy implements the mitigation measures and monitors for incidental takes of protected species according to the following notices to lessees and operators from both BOEM and BSEE:

- NTL 2015-G03 "Marine Trash and Debris Awareness and Elimination"
- NTL 2016-G01 "Vessel Strike Avoidance and Injured/Dead Protected Species Reporting"
- NTL 2016-G02 "Implementation of Seismic Survey Mitigation Measure & Protected Species Observer Program"

SECTION L
SUPPORT VESSELS, OFFSHORE VEHICLES, AND AIRCRAFT

(a) General
Murphy will utilize the most practical, direct route from the shore base as permitted by weather and traffic conditions.

(b) Air emissions
The table below describes the support vessels, offshore vehicles, and aircraft Murphy will use that will operate within 25 miles of our drilling unit.

Type of Vessel	Maximum Fuel Tank Storage Capacity	Maximum Number of Vessels in Area at Any Time	Trip Frequency or Duration
Crew Boat	25,000 gallons	1 vessel	4-5 trips per week
Supply Boat	275,067 gallons	2 vessels	4-5 trips per week
Helicopter	1,050 gallons	1 aircraft	8-10 flights per week

(c) Drilling fluid and chemical products transportation
Please see *Table 1 "Generated Wastes which will be Treated, Disposed of Downhole or Discharged to the GOM" and Table 2 Wastes you will transport and/or dispose of onshore*".

(d) Solid and liquid wastes transportation
A description of solid and liquid waste transportation is included on *Table 2: "Wastes you will transport and/or dispose of onshore".*

(e) Vicinity Map
A vicinity map is enclosed as ***Attachment L-1***, showing the location of the activities proposed herein relative to the shoreline with the distance of the proposed activities from the shoreline and the primary route(s) of the support vessels and aircraft that will be used when traveling between the onshore support facilities and the drilling unit.

TABLE 1

GENERATED WASTES WHICH WILL BE TREATED, DISPOSED OF DOWNHOLE OR DISCHARGED TO THE GOM

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

Projected generated waste			Projected ocean discharges		Projected Downhole Disposal
Type of Waste	Composition	Projected Amount	Discharge Rate	Discharge Method	Yes or No
Will drilling occur? If yes, you should list muds and cuttings					
Water-based drilling fluid	Sodium Chloride brine, barite, sodium chloride powder, xanthan gum	8,000 bbls/well	2000 bbls/well/day	At seabed after being circulated through the well	N/A
Cuttings wetted with water-based fluid	clay, sand	280 bbls/well	140 bbls/well/day	At seabed after being circulated out of the well	N/A
Cuttings wetted with synthetic-based fluid	claystone, sandstone internal olefin based fluid	1050 bbls/well	130 bbls/well/day	Discharged overboard after being treated to meet regulations	N/A
Will humans be there? If yes, expect conventional waste					
Domestic waste (kitchen water, shower water)	grey water	22466 bbls/well	239 bbls/well/day	Remove floating solids and discharge	No
Sanitary water (toilet water)	treated sanitary waste	13010 bbls/well	138.4 bbls/well/day	Chlorinate and discharge	No
Is there a deck? If yes, there will be Deck Drainage					
Deck Drainage	Deck drainage resulting from rainfall	0-4000 bbls/well	15 bbls/hr (max separator discharge)	Treat for oil and gas then discharge	No
Will you conduct well treatment, completion, or workover?					
Well treatment fluids	Gelled Seawater	600 bbls/well	8 bbls/min/well	discharge used fluids overboard	No
Well completion fluids	N/A	N/A	N/A	N/A	
Workover fluids	N/A	N/A	N/A	N/A	N/A
fill in those associated with your					
Desalinization unit discharge	Uncontaminated spent saltwater used for portable water generation unit	128,464 m bbls/well	1835 bbls/day	Discharge overboard	No
Blowout prevent fluid	Completion brine (CaBr2)	12-17 bbls	N/A	Contained	No
Ballast water	Saltwater used for ballast control	6686 bbls/well	6686 bbls/day - 1 day	Discharge overboard	No
Bilge water	Fresh water and salt water overflow/leakage accumulated from machinery operations	977 bbls/well	13.9 bbls/day	Discharge overboard	No
Excess cement at seafloor	N/A	N/A	N/A	N/A	N/A
Fire water	Saltwater	13714 bbls/well	195 bbls/day	Discharge overboard	No
Cooling water	Saltwater	40.7 mm bbls/well	581,510 bbls/day	Discharge overboard	No
Will you produce hydrocarbons? If yes fill in for producted water.					
Produced water	N/A	N/A	N/A	N/A	N/A
Will you be covered by an individual or general NPDES permit?					
NPDES ID: GMG29062K					

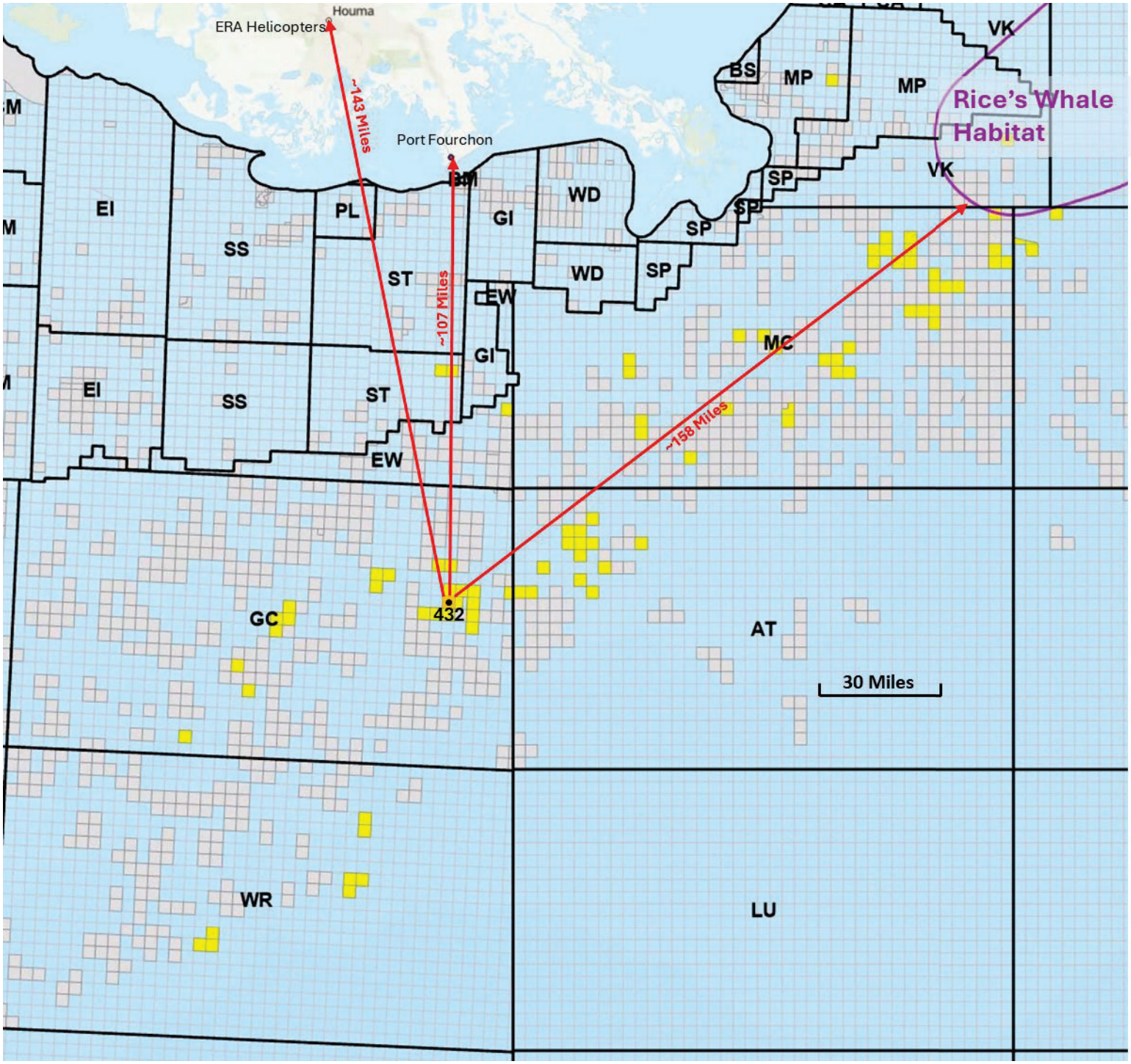
NOTE: If you will not have a type of waste, enter NA in the row.

TABLE 2
WASTES TO BE TRANSPORTED AND/OR DISPOSED OF ONSHORE

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

	Projected generated waste	Solid and Liquid Wastes transportation	Waste Disposal		
Type of Waste	**Composition**	**Transport Method**	**Name/Location of Facility**	**Amount**	**Disposal Method**
Will drilling occur? If yes, fill in the muds and cuttings					
Oil-based drilling fluid or mud	N/A	N/A	N/A	N/A	N/A
Synthetic-based drilling fluid or mud	Internal olefin based	Below deck storage tanks on offshore support vessels	MI Drilling Fluids in Fourchon, LA	600 bbls/well	Recycled
Cuttings wetted with Water-based fluid	Clay, sand, containing NaCl, barite and xanthan gum	N/A	Discoverer Deep Seas	280 bbls/well	At seabed after being circulated out of well.
Cuttings wetted with synthetic-based fluid	Claystone, sand, fluid containing internal olefin	N/A	Discoverer Deep Seas	1000 bbls/well	Discharged overboard after being treated to meet regulations.
Cuttings wetted with oil-based fluid	N/A	N/A	N/A	N/A	N/A
Will you produce hydrocarbons? If yes fill in for produced sand.					
Produced sand	N/A	N/A	N/A	N/A	N/A
Will you have additional wastes that are not permitted for discharge? If yes, fill in the appropriate rows.					
Trash and debris	trash and debris	storage bins on supply boat	Newpark Environmental in Fourchon, LA	500 cu. ft. total	landfill & recycled
Used oil	spent oil from machinery	USCG approved tote tanks	Newpark Environmental in Fourchon, LA	200 bbls/well	Recycled
Wash water	wash water with SBM residue	barged in cutting boxes or mud tanks	Newpark Environmental in Fourchon, LA	2000 bbls/well	disposal well injection or land farm
Chemical product wastes	spent treatment and/or damaged chemicals	barged in cutting boxes	Newpark Environmental in Fourchon, LA	15 bbls/well	Recycled
Displacement spacers	xanthan/biopolymer/solvent/ surfactant/barite	MPTs	Newpark Environmental in Fourchon, LA	1000 bbls/well	disposal well
SBM interface from displacement	Synthetic based mud/spacer	MPTs	Newpark Environmental in Fourchon, LA	100 bbls/well	disposal well
SBM displaced from well for completion operation	Synthetic based mud	storage tanks on supply boat	MI Swaco in Fourchon, LA	7000 bbls/well	reconditioned for later use
Completion brine	CaBr2/MEG	storage tanks on supply boat	MI Swaco in Fourchon, LA	2500 bbls/well	stored for later use
Will you be covered by an individual or general NPDES permit?					
NPDES ID: GMG29062K					

NOTE: If you will not have a type of waste, enter NA in the row.



MURPHY

Green Canyon Block 432 OCS-G32504

Samurai GC432

Vicinity Map

SECTION M
ONSHORE SUPPORT FACILITIES

(a) General

The table below reflects the onshore facilities that will be used to provide supplies and service support for the proposed activities under this plan:

Name of Shorebase	*Location*	*Existing/New/Modified*
Fourchon, LA – Gulf Offshore Logistics	C-Port 2 / OSS Yard (Bldg 18) 180 1st Street Golden Meadow, LA 70357	Existing
ERA Heliport	Houma, LA	Existing

The distance from ERA Heliport to the proposed activities under this plan is 143 nautical miles.

(b) Air emissions

A description of the source, composition, frequency, and duration of the air emissions (attributable to our proposed exploration activities) likely to be generated by the onshore support facilities we will use is in the table below.

Type of Vessel	**Maximum Fuel Tank Storage Capacity**	**Maximum Number of Vessels in Area at Any Time**	**Trip Frequency or Duration**
Crew Boat	25,000 gallons	1 vessel	4-5 trips per week
Supply Boat	275,067 gallons	2 vessels	4-5 trips per week
Helicopter	1,050 gallons	1 aircraft	8-10 flights per week

(c) Unusual solid and liquid wastes

Murphy does not plan to utilize any unusual or unregulated solid or liquid wastes other than what is described in our NPDES permit.

(d) Waste disposal

A description of waste disposal is included on *Table 2: "Wastes you will transport and/or dispose of onshore".*

TABLE 2
WASTES TO BE TRANSPORTED AND/OR DISPOSED OF ONSHORE

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

	Projected generated waste	Solid and Liquid Wastes transportation	Waste Disposal		
Type of Waste	**Composition**	**Transport Method**	**Name/Location of Facility**	**Amount**	**Disposal Method**
Will drilling occur? If yes, fill in the muds and cuttings					
Oil-based drilling fluid or mud	N/A	N/A	N/A	N/A	N/A
Synthetic-based drilling fluid or mud	Internal olefin based	Below deck storage tanks on offshore support vessels	MI Drilling Fluids in Fourchon, LA	600 bbls/well	Recycled
Cuttings wetted with Water-based fluid	Clay, sand, containing NaCl, barite and xanthan gum	N/A	Discoverer Deep Seas	280 bbls/well	At seabed after being circulated out of well.
Cuttings wetted with synthetic-based fluid	Claystone, sand, fluid containing internal olefin	N/A	Discoverer Deep Seas	1000 bbls/well	Discharged overboard after being treated to meet regulations.
Cuttings wetted with oil-based fluid	N/A	N/A	N/A	N/A	N/A
Will you produce hydrocarbons? If yes fill in for produced sand.					
Produced sand	N/A	N/A	N/A	N/A	N/A
Will you have additional wastes that are not permitted for discharge? If yes, fill in the appropriate rows.					
Trash and debris	trash and debris	storage bins on supply boat	Newpark Environmental in Fourchon, LA	500 cu. ft. total	landfill & recycled
Used oil	spent oil from machinery	USCG approved tote tanks	Newpark Environmental in Fourchon, LA	200 bbls/well	Recycled
Wash water	wash water with SBM residue	barged in cutting boxes or mud tanks	Newpark Environmental in Fourchon, LA	2000 bbls/well	disposal well injection or land farm
Chemical product wastes	spent treatment and/or damaged chemicals	barged in cutting boxes	Newpark Environmental in Fourchon, LA	15 bbls/well	Recycled
Displacement spacers	xanthan/biopolymer/solvent/ surfactant/barite	MPTs	Newpark Environmental in Fourchon, LA	1000 bbls/well	disposal well
SBM interface from displacement	Synthetic based mud/spacer	MPTs	Newpark Environmental in Fourchon, LA	100 bbls/well	disposal well
SBM displaced from well for completion operation	Synthetic based mud	storage tanks on supply boat	MI Swaco in Fourchon, LA	7000 bbls/well	reconditioned for later use
Completion brine	CaBr2/MEG	storage tanks on supply boat	MI Swaco in Fourchon, LA	2500 bbls/well	stored for later use
Will you be covered by an individual or general NPDES permit?					
NPDES ID: GMG29062K					

NOTE: If you will not have a type of waste, enter NA in the row.

Section N
COASTAL ZONE MANAGEMENT (CZMA)

LOUISIANA CONSISTENCY CERTIFICATION

SUPPLEMENTAL EXPLORATION PLAN

GREEN CANYON BLOCK 432

OCS-G 32504

The proposed activities described in detail in this OCS Plan will comply with all enforceable policies such as Louisiana's approved Coastal Management Program and will be conducted in a manner consistent with such program(s).

Murphy Exploration & Production Company – USA
Lessee or Operator

Certifying Official

June 01, 2026

Date

SECTION O
ENVIRONMENTAL IMPACT ANALYSIS (EIA)

In accordance with the requirements of 30 CFR 550.227 an Environmental Impact Analysis (EIA) is attached.

Attachments:
Environmental Report

Murphy Exploration & Production Company – USA (Murphy)

Supplemental Exploration Plan
Green Canyon Block 432
OCS-G 32504

(A) IMPACT PRODUCING FACTORS

ENVIRONMENTAL IMPACT ANALYSIS WORKSHEET

Environment Resources	Impact Producing Factors (IPFs) Categories and Examples Refer to recent GOM OCS Lease Sale EIS for a more complete list of IPFs					
	Emissions (air, noise, light, etc.)	**Effluents (muds, cutting, other discharges to the water column or seafloor)**	**Physical disturbances to the seafloor (rig or anchor emplacements, etc.)**	**Wastes sent to shore for treatment or disposal**	**Accidents (e.g., oil spills, chemical spills, H_2S releases)**	**Discarded Trash & Debris**
Site-specific at Offshore Location						
Designated topographic features		(1)	(1)		(1)	
Pinnacle Trend area live bottoms		(2)	(2)		(2)	
Eastern Gulf live bottoms		(3)	(3)		(3)	
Benthic communities			(4)			
Water quality		X			X	
Fisheries		X			X	
Marine Mammals	X(8)	X			X(8)	X
Sea Turtles	X(8)	X			X(8)	X
Air quality	X(9)					
Shipwreck sites (known or potential)			(7)			
Prehistoric archaeological sites			X(7)			
Vicinity of Offshore Location						
Essential fish habitat		X			X(6)	
Marine and pelagic birds					X	X
Public health and safety					(5)	
Coastal and Onshore						
Beaches					X(6)	X
Wetlands					X(6)	
Shore birds and coastal nesting birds					X6)	
Coastal wildlife refuges						
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:
   - 4-mile zone of the Flower Garden Banks, or the 3-mile zone of Stetson Bank;
   - 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;
   - Essential Fish Habitat (EFH) criteria of 500 ft. from any no-activity zone; or
   - Proximity of any submarine bank (500 ft. buffer zone) with relief greater than 2 meters that is not protected by the Topographic Features 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 H2S concentrations greater than 500 ppm might be encountered.
6) All activities that could result in an accidental spill of produced liquid hydrocarbons or diesel fuel that you determine would impact these environmental resources. If the proposed action is located a sufficient distance from a resource that no impact would occur, the EIA can note that in a sentence or two.
7) All activities that involve seafloor disturbances, including anchor emplacements, in any OCS block designated by the 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 a 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) Analysis

Site-Specific at Green Canyon Block 432

Proposed operations consist of the drilling, completion, and temporary abandonment of 5 well locations.

The operations will be conducted with a dynamically-positioned drillship.

1. Designated Topographic Features

Potential IPFs on topographic features include effluents, and accidents.

Effluents: Green Canyon Block 432 is 49 miles from the closest designated Topographic Features Stipulation Block (Diaphus Bank); therefore, no adverse impacts are expected.

Accidents: It is unlikely that an accidental surface or subsurface spill would occur from the proposed activities (refer to statistics in **Item 5**, Water Quality). Oil spills cause damage to benthic organisms only if the oil contacts the organisms. Oil from a surface spill can be driven into the water column; measurable amounts have been documented down to a 10 m depth. At this depth, the oil is found only at concentrations several orders of magnitude lower than the amount shown to have an effect on corals. Because the crests of topographic features in the Northern Gulf of Mexico are found below 10 m, no oil from a surface spill could reach their sessile biota. Oil from a subsurface spill is not applicable due to the distance of these blocks from a topographic area. The activities proposed in this plan will be covered by Murphy's Regional OSRP (refer to information submitted in **Appendix H**).

There are no other IPFs (including emissions, physical disturbances to the seafloor and wastes sent to shore for disposal) from the proposed activities, which could impact topographic features.

2. Pinnacle Trend Area Live Bottoms

Potential IPFs on pinnacle trend area live bottoms include effluents and accidents.

Effluents: Green Canyon Block 432 is 155 miles from the closest live bottom (pinnacle trend) area; therefore, no adverse impacts are expected.

Accidents: It is unlikely that an accidental surface or subsurface spill would occur from the proposed activities (refer to statistics in **Item 5**, Water Quality). Oil spills have the potential to foul benthic communities and cause lethal and sublethal effects on live bottom organisms. Oil from a surface spill can be driven into the water column; measurable amounts have been documented down to a 10 m depth. At this depth, the oil is found only at concentrations several orders of magnitude lower than the amount shown to have an effect on marine organisms. Oil

from a subsurface spill is not applicable due to the distance of these blocks from a live bottom (pinnacle trend) area. The activities proposed in this plan will be covered by Murphy's Regional OSRP (refer to information submitted in **Appendix H**).

There are no other IPFs (including emissions, physical disturbances to the seafloor and wastes sent to shore for disposal) from the proposed activities which could impact a live bottom (pinnacle trend) area.

3. Eastern Gulf Live Bottoms

Potential IPFs on Eastern Gulf live bottoms include effluents and accidents.

Effluents: Green Canyon Block 432 is not located in an area characterized by the existence of live bottoms; therefore, no adverse impacts are expected.

Accidents: It is unlikely that an accidental surface or subsurface spill would occur from the proposed activities (refer to statistics in **Item 5**, Water Quality). Oil spills cause damage to live bottom organisms only if the oil contacts the organisms. Oil from a surface spill can be driven into the water column; measurable amounts have been documented down to a 10 m depth. At this depth, the oil is found only at concentrations several orders of magnitude lower than the amount shown to have an effect on marine invertebrates. Oil from a subsurface spill is not applicable due to the distance of these blocks from a live bottom area. The activities proposed in this plan will be covered by Murphy's Regional OSRP (refer to information submitted in **Appendix H**).

There are no other IPFs (including emissions, physical disturbances to the seafloor and wastes sent to shore for disposal) from the proposed activities which could impact an Eastern Gulf live bottom area.

4. Benthic Communities

There are no IPFs (including emissions, physical disturbances to the seafloor, wastes sent to shore for disposal, or accidents) from the proposed activities that could cause impacts to benthic communities.

A dynamically-positioned drillship is being used for the proposed activities; therefore, only an insignificant amount of seafloor will be disturbed. Because physical disturbances to the seafloor will be minimized by the use of a dynamically-positioned drillship, Murphy's proposed operations in Green Canyon Block 432 would not cause impacts to benthic communities.

Additionally, the nearest known benthic community site listed in NTL 2009-G40 (BenthicGreen Canyon Block 210) is located approximately 14 miles from Green Canyon Block 432.

5. Water Quality

IPFs that could result in water quality degradation from the proposed operations in Green Canyon Block 432 include effluents and accidents.

Effluents: Levels of contaminants in drilling muds and cuttings and produced water discharges, discharge-rate restrictions and monitoring and toxicity testing are regulated by the EPA NPDES permit, thereby eliminating many significant biological or ecological effects. Operational discharges are not expected to cause significant adverse impacts to water quality.

Accidents: Oil spills have the potential to alter offshore water quality; however, it is unlikely that an accidental surface or subsurface spill would occur from the proposed activities. Between 1980 and 2000, OCS operations produced 4.7 billion barrels of oil and spilled only 0.001 percent of this oil, or 1 bbl for every 81,000 bbl produced. The spill risk related to a diesel spill from drilling operations is even less. Between 1976 and 1985, (years for which data were collected), there were 80 reported diesel spills greater than one barrel associated with drilling activities. Considering that there were 11,944 wells drilled, this is a 0.7 percent probability of an occurrence. If a spill were to occur, the water quality of marine waters would be temporarily affected by the dissolved components and small oil droplets. Dispersion by currents and microbial degradation would remove the oil from the water column and dilute the constituents to background levels. Historically, changes in offshore water quality from oil spills have only been detected during the life of the spill and up to several months afterwards. Most of the components of oil are insoluble in water and therefore float. The activities proposed in this plan will be covered by Murphy's Regional Oil Spill Response Plan (refer to information submitted in **Appendix H**).

There are no other IPFs (including emissions, physical disturbances to the seafloor, and wastes sent to shore for disposal) from the proposed activities which could cause impacts to water quality.

6. Fisheries

IPFs that could cause impacts to fisheries as a result of the proposed operations in Green Canyon Block 432 include effluents and accidents.

Effluents: Effluents such as drilling fluids and cuttings discharges contain components and properties which are detrimental to fishery resources. Moderate petroleum and metal contamination of sediments and the water column can occur out to several hundred meters down-current from the discharge point. Offshore discharges are expected to disperse and dilute to very near background levels in the water column or on the seafloor within 3,000 m of the discharge point, and are expected to have negligible effect on fisheries.

Accidents: An accidental oil spill has the potential to cause some detrimental effects on fisheries; however, it is unlikely that such an event would occur from the proposed activities

(refer to **Item 5**, Water Quality). The effects of oil on mobile adult finfish or shellfish would likely be sublethal and the extent of damage would be reduced to the capacity of adult fish and shellfish to avoid the spill, to metabolize hydrocarbons, and to excrete both metabolites and parent compounds. The activities proposed in this plan will be covered by Murphy's Regional OSRP (refer to information submitted in **Appendix H**).

There are no IPFs from emissions, physical disturbances to the seafloor or wastes sent to shore for disposal from the proposed activities which could cause impacts to fisheries.

7. Marine Mammals

GulfCet II studies revealed that cetaceans of the continental shelf and shelf-edge were almost exclusively bottlenose dolphin and Atlantic spotted dolphin. Squid eaters, including dwarf and pygmy killer whale, Risso's dolphin, rough-toothed dolphin, and Cuvier's beaked whale, occurred most frequently along the upper slope in areas outside of anticyclones. IPFs that could cause impacts to marine mammals as a result of the proposed operations in Green Canyon Block 432 include emissions, effluents, discarded trash and debris, and accidents.

Emissions: Noises from drilling activities, support vessels and helicopters may elicit a startle reaction from marine mammals. This reaction may lead to disruption of marine mammals' normal activities. Stress may make them more vulnerable to parasites, disease, environmental contaminants, and/or predation (Majors and Myrick, 1990). There is little conclusive evidence for long-term displacements and population trends for marine mammals relative to noise.

Effluents: Drilling fluids and cuttings discharges contain components which may be detrimental to marine mammals. Most operational discharges are diluted and dispersed upon release. Any potential impact from drilling fluids would be indirect, either as a result of impacts on prey items or possibly through ingestion in the food chain (API, 1989).

Discarded trash and debris: Both entanglement in, and ingestion of debris have caused the death or serious injury of marine mammals (Laist, 1997; MMC, 1999). The limited amount of marine debris, if any, resulting from the proposed activities is not expected to substantially harm marine mammals. Operators are prohibited from deliberately discharging debris as mandated by MARPOL-Annex V and the Marine Plastic Pollution Research and Control Act, and regulations imposed by various agencies including the United States Coast Guard (USCG) and the Environmental Protection Agency (EPA).

Murphy will operate in accordance with the regulations and also avoid accidental loss of solid waste items by maintaining waste management plans, manifesting trash sent to shore, and using special precautions such as covering outside trash bins to prevent accidental loss of solid waste. Special caution will be exercised when handling and disposing of small items and packaging materials, particularly those made of non-biodegradable, environmentally persistent materials such as plastic or glass.

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

Accidents: Collisions between support vessels and cetaceans would be unusual events, however should one occur, death or injury to marine mammals is possible. Contract vessel operators can avoid marine mammals and reduce potential deaths by maintaining a vigilant watch for marine mammals and maintaining a safe distance when they are sighted. Vessel personnel should use a Gulf of Mexico reference guide to help identify the twenty-one species of whales and dolphins, and the single species of manatee that may be encountered in the Gulf of Mexico OCS. Vessel personnel must report sightings of any injured or dead protected marine mammal species immediately, regardless of whether the injury or death is caused by their vessel, to the NMFS Southeast Marine Mammal Stranding Hotline at 1-877-433-8299 (http://www.nmfs.noaa.gov/pr/health/report.htm#southeast). Any injured or dead protected species should also be reported to takereport.nmfsser@noaa.gov. In addition, if the injury or death was caused by a collision with a contract vessel, the BOEM must be notified within 24 hours of the strike by email to protectedspecies@bsee.gov. If the vessel is the responsible party, it is required to remain available to assist the respective salvage and stranding network as needed.

Oil spills have the potential to cause sublethal oil-related injuries and spill-related deaths to marine mammals. However, it is unlikely that an accidental oil spill would occur from the proposed activities (refer to **Item 5**, Water Quality). Oil spill response activities may increase vessel traffic in the area, which could add to changes in cetacean behavior and/or distribution, thereby causing additional stress to the animals. The effect of oil dispersants on cetaceans is not known. The acute toxicity of oil dispersant chemicals included in Murphy's OSRP is considered to be low when compared with the constituents and fractions of crude oils and diesel products. The activities proposed in this plan will be covered by Murphy's OSRP (refer to information submitted in accordance with **Appendix H**).

There are no other IPFs (including physical disturbances to the seafloor) from the proposed activities which could impact marine mammals.

8. Sea Turtles

IPFs that could cause impacts to sea turtles as a result of the proposed operations include emissions, effluents, discarded trash and debris, and accidents. GulfCet II studies sighted most

loggerhead, Kemp's ridley and leatherback sea turtles over shelf waters. Historically these species have been sighted up to the shelf's edge. They appear to be more abundant east of the Mississippi River than they are west of the river (Fritts et al., 1983b; Lohoefener et al., 1990). Deep waters may be used by all species as a transitory habitat.

Emissions: Noise from drilling activities, support vessels, and helicopters may elicit a startle reaction from sea turtles, but this is a temporary disturbance.

Effluents: Drilling fluids and cuttings discharges are not known to be lethal to sea turtles. Most operational discharges are diluted and dispersed upon release. Any potential impact from drilling fluids would be indirect, either as a result of impacts on prey items or possibly through ingestion in the food chain (API, 1989).

Discarded trash and debris: Both entanglement in, and ingestion of, debris have caused the death or serious injury of sea turtles (Balazs, 1985). The limited amount of marine debris, if any, resulting from the proposed activities is not expected to substantially harm sea turtles. Operators are prohibited from deliberately discharging debris as mandated by MARPOL-Annex V and the Marine Plastic Pollution Research and Control Act, and regulations imposed by various agencies including the United States Coast Guard (USCG) and the Environmental Protection Agency (EPA). Murphy will operate in accordance with the regulations and also avoid accidental loss of solid waste items by maintaining waste management plans, manifesting trash sent to shore, and using special precautions such as covering outside trash bins to prevent accidental loss of solid waste. Special caution will be exercised when handling and disposing of small items and packaging materials, particularly those made of non-biodegradable, environmentally persistent materials such as plastic or glass.

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

Accidents: Collisions between support vessels and sea turtles would be unusual events, however should one occur, death or injury to sea turtles is possible. Contract vessel operators can avoid sea turtles and reduce potential deaths by maintaining a vigilant watch for sea turtles and maintaining a safe distance when they are sighted. Vessel crews should use a reference guide to help identify the five species of sea turtles that may be encountered in the Gulf of Mexico OCS. Vessel crews must report sightings of any injured or dead protected sea turtle species immediately, regardless of whether the injury or death is caused by their vessel, to the State

Coordinators for the Sea Turtle Stranding and Salvage Network (STSSN) at http://www.sefsc.noaa.gov/species/turtles/stranding_coordinators.htm (phone numbers vary by state). Any injured or dead protected species should also be reported to takereport.nmfsser@noaa.gov. In addition, if the injury or death was caused by a collision with a contract vessel, the BOEM must be notified within 24 hours of the strike by email to protectedspecies@bsee.gov. If the vessel is the responsible party, it is required to remain available to assist the respective salvage and stranding network as needed.

All sea turtle species and their life stages are vulnerable to the harmful effects of oil through direct contact or by fouling of their food. Exposure to oil can be fatal, particularly to juveniles and hatchlings. However, it is unlikely that an accidental oil spill would occur from the proposed activities (refer to **Item 5**, Water Quality). Oil spill response activities may increase vessel traffic in the area, which could add to the possibility of collisions with sea turtles. The activities proposed in this plan will be covered by Murphy's Regional Oil Spill Response Plan (refer to information submitted in accordance with **Appendix H**).

There are no other IPFs (including physical disturbances to the seafloor) from the proposed activities which could impact sea turtles.

9. Air Quality

The projected air emissions identified in **Appendix G** are not expected to affect the OCS air quality primarily due to distance to the shore or to any Prevention of Significant Deterioration Class I air quality area such as the Breton Wilderness Area. Green Canyon Block 432 is beyond the 200 kilometer (124 mile) buffer for the Breton Wilderness Area and is 103 miles from the coastline. Therefore, no special mitigation, monitoring, or reporting requirements apply with respect to air emissions.

Accidents and blowouts can release hydrocarbons or chemicals, which could cause the emission of air pollutants. However, these releases would not impact onshore air quality because of the prevailing atmospheric conditions, emission height, emission rates, and the distance of Green Canyon Block 432 from the coastline. There are no other IPFs (including effluents, physical disturbances to the seafloor, wastes sent to shore for treatment or disposal) from the proposed activities which could impact air quality.

10. Shipwreck Sites (known or potential)

Potential IPFs that could impact known or unknown shipwreck sites as a result of the proposed operations in Green Canyon Block 432 include disturbances to the seafloor.

Physical disturbances to the seafloor: A dynamically-positioned drillship is being used for the proposed activities; therefore, only an insignificant amount of seafloor will be disturbed. Because physical disturbances to the seafloor will be minimized by the use of a dynamically-

positioned drillship, Murphy's proposed operations in Green Canyon Block 432 would not cause impacts to shipwreck sites.

Additionally, Green Canyon Block 432 is not located in or adjacent to an OCS block designated by BOEM as having a high probability for occurrence of shipwrecks, therefore, no adverse impacts are expected.

There are no other IPFs (including emissions, effluents, wastes sent to shore for treatment or disposal, or accidents) from the proposed activities that could cause impacts to shipwreck sites.

11. Prehistoric Archaeological Sites

IPFs that could cause impacts to prehistoric archaeological sites as a result of the proposed operations in Green Canyon Block 432 are physical disturbances to the seafloor and accidents (oil spills).

Physical Disturbances to the seafloor: Although the operations proposed will be conducted by utilizing a dynamically-positioned drillship, which would cause only an insignificant amount of seafloor to be disturbed, Green Canyon Block 432 is located inside the Archaeological Prehistoric high probability lines. Murphy will report to BOEM the discovery of any object of prehistoric archaeological significance and make every reasonable effort to preserve and protect that cultural resource.

Accidents: An accidental oil spill has the potential to cause some detrimental effects to prehistoric archaeological sites if the release were to occur subsea. However, it is unlikely that an accidental oil spill would occur from the proposed activities (refer to **Item 5**, Water Quality). The activities proposed in this plan will be covered by Murphy's Regional Oil Spill Response Plan (refer to information submitted in accordance with **Appendix H**).

There are no other IPFs (including emissions, effluents or wastes sent to shore for treatment or disposal) from the proposed activities which could impact prehistoric archeological sites.

Vicinity of Offshore Location

1. Essential Fish Habitat (EFH)

IPFs that could cause impacts to EFH as a result of the proposed operations in Green Canyon Block 432 include effluents and accidents. EFH includes all estuarine and marine waters and substrates in the Gulf of Mexico.

Effluents: The Live Bottom Low Relief Stipulation, the Live Bottom (Pinnacle Trend) Stipulation, and the Eastern Gulf Pinnacle Trend Stipulation would prevent most of the potential impacts on live-bottom communities and EFH from operational waste discharges. Levels of contaminants in drilling muds and cuttings and produced-water discharges, discharge-rate

restrictions, and monitoring and toxicity testing are regulated by the EPA NPDES permit, thereby eliminating many significant biological or ecological effects. Operational discharges are not expected to cause significant adverse impacts to EFH.

Accidents: An accidental oil spill has the potential to cause some detrimental effects on EFH. Oil spills that contact coastal bays and estuaries, as well as OCS waters when pelagic eggs and larvae are present, have the greatest potential to affect fisheries. However, it is unlikely that an oil spill would occur from the proposed activities (refer to **Item 5**, Water Quality). The activities proposed in this plan will be covered by Murphy's Regional OSRP (refer to information submitted in **Appendix H**).

There are no other IPFs (including emissions, physical disturbances to the seafloor and wastes sent to shore for treatment or disposal) from the proposed activities which could impact essential fish habitat.

2. Marine and Pelagic Birds

IPFs that could impact marine birds as a result of the proposed activities include air emissions, accidental oil spills, and discarded trash and debris from vessels and the facilities.

Emissions: Emissions of pollutants into the atmosphere from these activities are far below concentrations which could harm coastal and marine birds.

Accidents: An oil spill would cause localized, low-level petroleum hydrocarbon contamination. However, it is unlikely that an oil spill would occur from the proposed activities (refer to **Item 5**, Water Quality). Marine and pelagic birds feeding at the spill location may experience chronic, nonfatal, physiological stress. It is expected that few, if any, coastal and marine birds would actually be affected to that extent. The activities proposed in this plan will be covered by Murphy's Regional OSRP (refer to information submitted in **Appendix H**).

Discarded trash and debris: Marine and pelagic birds could become entangled and snared in discarded trash and debris, or ingest small plastic debris, which can cause permanent injuries and death. Operators are prohibited from deliberately discharging debris as mandated by MARPOL-Annex V and the Marine Plastic Pollution Research and Control Act, and regulations imposed by various agencies including the United States Coast Guard (USCG) and the Environmental Protection Agency (EPA). Murphy will operate in accordance with the regulations and also avoid accidental loss of solid waste items by maintaining waste management plans, manifesting trash sent to shore, and using special precautions such as covering outside trash bins to prevent accidental loss of solid waste. Special caution will be exercised when handling and disposing of small items and packaging materials, particularly those made of non-biodegradable, environmentally persistent materials such as plastic or glass. Informational placards will be posted on all vessels and facilities having sleeping or food preparation capabilities. All offshore personnel, including contractors and other support services-related personnel (e.g. helicopter

pilots, vessel captains and boat crews) will be indoctrinated on waste procedures, and will view the video (or Microsoft PowerPoint presentation), "Think About It" (*previously "All Washed Up: The Beach Litter Problem"*). Thereafter, all personnel will view the marine trash and debris training video annually. Offshore personnel will also receive an explanation from Murphy management or the designated lease operator management that emphasizes their commitment to waste management in accordance with NTL No. 2015-G03-BSEE. Debris, if any, from these proposed activities will seldom interact with marine and pelagic birds; therefore, the effects will be negligible.

There are no other IPFs (including effluents, physical disturbances to the seafloor, or wastes sent to shore for treatment or disposal) from the proposed activities which could impact marine and pelagic birds.

3. Public Health and Safety Due to Accidents.

There are no IPFs (emissions, effluents, physical disturbances to the seafloor, wastes sent to shore for treatment or disposal or accidents, including an accidental H_2S release) from the proposed activities which could cause impacts to public health and safety. In accordance with NTL No.'s 2008-G04, 2009-G27, and 2009-G31, sufficient information is included in **Appendix D** to justify our request that our proposed activities be classified by BSEE as H_2S absent.

Coastal and Onshore

1. Beaches

IPFs from the proposed activities that could cause impacts to beaches include accidents (oil spills) and discarded trash and debris.

Accidents: Oil spills contacting beaches would have impacts on the use of recreational beaches and associated resources. Due to the distance from shore (103 miles) and the response capabilities that would be implemented, no significant adverse impacts are expected. The activities proposed in this plan will be covered by Murphy's Regional OSRP (refer to information submitted in **Appendix H**).

Discarded trash and debris: Trash on the beach is recognized as a major threat to the enjoyment and use of beaches. There will only be a limited amount of marine debris, if any, resulting from the proposed activities. Operators are prohibited from deliberately discharging debris as mandated by MARPOL-Annex V and the Marine Plastic Pollution Research and Control Act, and regulations imposed by various agencies including the United States Coast Guard (USCG) and the Environmental Protection Agency (EPA). Murphy will operate in accordance with the regulations and also avoid accidental loss of solid waste items by maintaining waste management plans, manifesting trash sent to shore, and using special precautions such as covering outside trash bins to prevent accidental loss of solid waste. Special caution will be exercised when handling and disposing of small items and packaging materials,

particularly those made of non-biodegradable, environmentally persistent materials such as plastic or glass.

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

There are no other IPFs (emissions, effluents, physical disturbances to the seafloor, or wastes sent to shore for treatment or disposal) from the proposed activities which could impact beaches.

2. Wetlands

IPFs from the proposed activities that could cause impacts to wetlands include accidents (oil spills) and discarded trash and debris.

Accidents: It is unlikely that an oil spill would occur from the proposed activities (refer to **Item 5**, Water Quality). Due to the distance from shore (103 miles) and the response capabilities that would be implemented, no impacts are expected. The activities proposed in this plan will be covered by Murphy's Regional OSRP (refer to information submitted in **Appendix H**).

Discarded trash and debris: There will only be a limited amount of marine debris, if any, resulting from the proposed activities. Operators are prohibited from deliberately discharging debris as mandated by MARPOL-Annex V and the Marine Plastic Pollution Research and Control Act, and regulations imposed by various agencies including the United States Coast Guard (USCG) and the Environmental Protection Agency (EPA). Murphy will operate in accordance with the regulations and also avoid accidental loss of solid waste items by maintaining waste management plans, manifesting trash sent to shore, and using special precautions such as covering outside trash bins to prevent accidental loss of solid waste. Special caution will be exercised when handling and disposing of small items and packaging materials, particularly those made of non-biodegradable, environmentally persistent materials such as plastic or glass.

Informational placards will be posted on all vessels and facilities having sleeping or food preparation capabilities. All offshore personnel, including contractors and other support services-related personnel (e.g. helicopter pilots, vessel captains and boat crews) will be indoctrinated on waste procedures, and will view the video (or Microsoft PowerPoint presentation), "Think About It" (*previously "All Washed Up: The Beach Litter Problem"*).

Thereafter, all personnel will view the marine trash and debris training video annually. Offshore personnel will also receive an explanation from Murphy management or the designated lease operator management that emphasizes their commitment to waste management in accordance with NTL No. 2015-G03-BSEE.

There are no other IPFs (emissions, effluents, physical disturbances to the seafloor, or wastes sent to shore for treatment or disposal) from the proposed activities which could impact wetlands.

3. Shore Birds and Coastal Nesting Birds

Accidents: Oil spills could cause impacts to shore birds and coastal nesting birds. However, it is unlikely that an oil spill would occur from the proposed activities (refer to **Item 5**, Water Quality). Given the distance from shore (103 miles) and the response capabilities that would be implemented, no impacts are expected. The activities proposed in this plan will be covered by Murphy's Regional OSRP (refer to information submitted in **Appendix H**).

Discarded trash and debris: Coastal and marine birds are highly susceptible to entanglement in floating, submerged, and beached marine debris: specifically plastics. Operators are prohibited from deliberately discharging debris as mandated by MARPOL-Annex V and the Marine Plastic Pollution Research and Control Act, and regulations imposed by various agencies including the United States Coast Guard (USCG) and the Environmental Protection Agency (EPA). Murphy will operate in accordance with the regulations and also avoid accidental loss of solid waste items by maintaining waste management plans, manifesting trash sent to shore, and using special precautions such as covering outside trash bins to prevent accidental loss of solid waste. Special caution will be exercised when handling and disposing of small items and packaging materials, particularly those made of non-biodegradable, environmentally persistent materials such as plastic or glass.

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

There are no other IPFs (emissions, effluents, physical disturbances to the seafloor, or wastes sent to shore for treatment or disposal) from the proposed activities that could cause impacts to shore birds and coastal nesting birds.

4. Coastal Wildlife Refuges

Accidents: An accidental oil spill from the proposed activities could cause impacts to coastal wildlife refuges. However, it is unlikely that an oil spill would occur from the proposed activities (refer to Item 5, Water Quality). Due to the distance from shore (103 miles) and the response capabilities that would be implemented, no impacts are expected. The activities proposed in this plan will be covered by Murphy's Regional OSRP (refer to information submitted in **Appendix H**).

Discarded trash and debris: Operators are prohibited from deliberately discharging debris as mandated by MARPOL-Annex V, the Marine Plastic Pollution Research and Control Act and regulations imposed by various agencies including the United States Coast Guard (USCG) and the Environmental Protection Agency (EPA). Murphy will operate in accordance with the regulations and also avoid accidental loss of solid waste items by maintaining waste management plans, manifesting trash sent to shore, and using special precautions such as covering outside trash bins to prevent accidental loss of solid waste. Special caution will be exercised when handling and disposing of small items and packaging materials, particularly those made of non-biodegradable, environmentally persistent materials such as plastic or glass.

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

There are no other IPFs (emissions, effluents, physical disturbances to the seafloor, or wastes sent to shore for treatment or disposal) from the proposed activities that could cause impacts to coastal wildlife refuges.

5. Wilderness Areas

Accidents: An accidental oil spill from the proposed activities could cause impacts to wilderness areas. However, it is unlikely that an oil spill would occur from the proposed activities (refer to **Item 5**, Water Quality). Due to the distance from the nearest designated Wilderness Area (144 miles) and the response capabilities that would be implemented, no significant adverse impacts are expected. The activities proposed in this plan will be covered by Murphy's Regional OSRP (refer to information submitted in **Appendix H).**

Discarded trash and debris: Operators are prohibited from deliberately discharging debris as mandated by MARPOL-Annex V, the Marine Plastic Pollution Research and Control Act and regulations imposed by various agencies including the United States Coast Guard (USCG) and

the Environmental Protection Agency (EPA). Murphy will operate in accordance with the regulations and also avoid accidental loss of solid waste items by maintaining waste management plans, manifesting trash sent to shore, and using special precautions such as covering outside trash bins to prevent accidental loss of solid waste. Special caution will be exercised when handling and disposing of small items and packaging materials, particularly those made of non-biodegradable, environmentally persistent materials such as plastic or glass.

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

There are no other IPFs (emissions, effluents, physical disturbances to the seafloor, or wastes sent to shore for treatment or disposal) from the proposed activities that could cause impacts to wilderness areas.

6. Other Environmental Resources Identified

There are no other environmental resources identified for this impact assessment.

(C) IMPACTS ON PROPOSED ACTIVITIES

The site–specific environmental conditions have been taken into account for the proposed activities. No impacts are expected on the proposed activities from site-specific environmental conditions.

(D) ENVIRONMENTAL HAZARDS

During the hurricane season, June through November, the Gulf of Mexico is impacted by an average of ten tropical storms (39-73 mph winds), of which six become hurricanes (> 74 mph winds). Due to its location in the gulf, Green Canyon Block 432 may experience hurricane and tropical storm force winds, and related sea currents. These factors can adversely impact the integrity of the operations covered by this plan. A significant storm may present physical hazards to operators and vessels, damage exploration or production equipment, or result in the release of hazardous materials (including hydrocarbons). Additionally, the displacement of equipment may disrupt the local benthic habitat and pose a threat to local species.

The following preventative measures included in this plan may be implemented to mitigate these impacts:

1. Drilling & completion
    a. Secure well

b. Secure rig / platform
c. Evacuate personnel

Drilling activities will be conducted in accordance with NTL No.'s 2008-G09, 2009-G10, and 2010-N10.

2. Structure Installation
   Operator will not conduct structure installation operations during Tropical Storm or Hurricane threat.

(E) ALTERNATIVES

No alternatives to the proposed activities were considered to reduce environmental impacts.

(F) MITIGATION MEASURES

No mitigation measures other than those required by regulation will be employed to avoid, diminish, or eliminate potential impacts on environmental resources.

(G) CONSULTATION

No agencies or persons were consulted regarding potential impacts associated with the proposed activities. Therefore, a list of such entities has not been provided.

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(I) REFERENCES

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Although not cited, the following were utilized in preparing this EIA:

- Hazard Surveys
- BOEM EIS's:
  - GOM Deepwater Operations and Activities. Environmental Assessment. BOEM 2000-001
  - GOM Central and Western Planning Areas Sales 166 and 168 Final Environmental Impact Statement. BOEM 96-0058.

SECTION P
ADMINISTRATIVE INFORMATION

(a) Exempted Information Description

All data related to the bottom-hole location of the proposed wells have been removed from the public information copy of the Supplemental EP as well as any discussions of the target objectives, geologic or geophysical data, and any interpreted geology.

(b) Bibliography

- Supplemental Exploration Plan Control No. S-7997.
- Approved: September 11, 2020