UNITED STATES GOVERNMENT
MEMORANDUM

March 5, 2025

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

Subject: Public Information copy of plan

- Control # - S-08185
- Type - Supplemental Exploration Plan
- Lease(s) - OCS-G27278 Block - 519 Mississippi Canyon Area
- Operator - Talos QN Exploration LLC
- Description - Drill Wells A, A-Alt
- Rig Type - Not Found

Attached is a copy of the subject plan.

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

Tehirah Barkum
Plan Coordinator

Site Type/Name	Botm Lse/Area/Blk	Surface Location	Surf Lse/Area/Blk
WELL/A	G27278/MC/519	1655 FSL, 4661 FWL	G27278/MC/519
WELL/A-ALT	G27278/MC/519	1655 FSL, 4611 FWL	G27278/MC/519

Supplemental Exploration Plan
Plan Control No. 8185
Mississippi Canyon Block 519, Well Locations A & A-Alt

Record of Changes:

Date	Section	Change Description
2/12/2025	Appendix A Plan Contents – OCS Information Form Attachments	Corrected plan reference for WCD data to S-7934
2/12/2025	Appendix I Oil Spills Information	Corrected plan reference for WCD data to S-7934

APPENDIX I
OIL SPILLS INFORMATION

A) OIL SPILL RESPONSE PLANNING

Pursuant to CFR 250.219 and NTL BOEM 2015-N01, this appendix provides information regarding any potential oil spill(s), the assumptions and calculations used to determine the worst case discharge (WCD) measures scenario.

Below is a reference to and status of Talos QN Exploration LLC's Regional OSRP. A site specific OSRP nor a subregional OSRP is not required with this plan, as the State of Florida is not an affected State for the activities proposed herein.

1) REGIONAL OR SUBREGIONAL OSRP INFORMATION

All of the proposed activities and facilities in this Plan will be covered by the Regional Oil Spill Response Plan filed by Talos Production Inc. (BOEM Company No. 03283) in accordance with 30 CFR 254 and approved on May 4, 2017, OSRP Control No. O-647. By letter dated December 18, 2024, the latest OSRP nonregulatory revision was found to be in compliance. The following operators are covered under this OSRP:

Talos ERT LLC (02899)
Talos Petroleum LLC (01834)
Talos Energy Offshore LLC (03247)
Talos Oil and Gas LLC (03269)
Talos Third Coast LLC (03619)
Talos Gulf Coast Onshore LLC (22691)
Talos Gulf Coast Offshore LLC (03201)
Talos Production Inc. (03283)
Talos Energy Ventures, LLC (03026)
Talos QN Exploration LLC (03672)
Talos Resources (03065)

2) SPILL RESPONSE SITES

The table below provides information on the location of the primary spill response equipment and the location of the planned staging area(s) that would be used should an oil spill occur resulting from the activities proposed herein.

Primary Response Equipment Location	Pre-planned Staging Location
Houma, LA; Harvey, LA; Leeville, LA	Houma, LA; Harvey, LA; Leeville, LA; Fourchon, LA

3) OIL SPILL REMOVAL ORGANIZATION (OSRO) INFORMATION

Talos' primary equipment provider is Clean Gulf Association (CGA). The Marine Spill Response Corporation's (MSRC) STARS network will closest available personnel, as well as a MSRC supervisor to operate the equipment. CGA and MSRC have equipment pre-staged around the Gulf of Mexico. The major locations of this equipment are Lake Charles, Houma, Fort Jackson, and Venice, Louisiana; Galveston and Ingleside, Texas; and Pascagoula, Mississippi.

4) WORST CASE SCENARIO COMPARISON

The table below provides a comparison of the worst-case discharge scenario from the above referenced Regional OSRP with the worst-case scenario from the activities proposed herein. Please note the Regional OSRP distance to shore scenarios are approximate and will be updated as required with modifications to the OSRP. The distance to shore for the proposed activities is accurate and based on survey data.

Worst Case Discharge Comparison Chart				
Category	**DRILLING**		**PRODUCTION**	
	REGIONAL OSRP WCD	DOCD WCD CURRENT PLAN	REGIONAL OSRP WCD	DOCD WCD CURRENT PLAN
Type of Activity	EXPLORATORY WELL	DOCD WCD	Production > 10 miles from shore	DOCD WCD
Facility Location (Area/Block)	GC 39	MC 519	N/A	N/A
Facility Designation	Katmai West #2	Well A	N/A	N/A
Distance to Shore (miles)	73	66	N/A	N/A

Worst Case Discharge Comparison Chart				
Category	**DRILLING**		**PRODUCTION**	
	REGIONAL OSRP WCD	DOCD WCD CURRENT PLAN	REGIONAL OSRP WCD	DOCD WCD CURRENT PLAN
Type of Activity	EXPLORATORY WELL	DOCD WCD	Production > 10 miles from shore	DOCD WCD
Volume				
Flowlines (on facility)				
Lease Term Pipelines				
Uncontrolled Blowout	388000.00	13864.00		
Storage				
Total Volume	**388000.00**	**13864.00**	**0.00**	**0.00**
Type of Oil(s) (crude, condensate, diesel)	Crude	Crude	N/A	N/A
API Gravity	37.9	22.3	N/A	N/A

Since Talos QN Exploration LLC has the capacity to respond to the worst case spill scenario included in our Regional OSRP approved on May 4, 2017 and determined in compliance December 18, 2024, and since the worst case scenario determined for our Plan does not replace the worst case scenario in our Regional
OSRP, Talos hereby certifies that we have the capacity to respond, to the maximum extent practicable, to a worst case discharge, or substantial threat of such a discharge, resulting from the activities proposed in this Plan.

5) WORST CASE DISCHARGE SCENARIOS AND ASSUMPTIONS

Talos provided the assumptions and calculations for the Worst Case Discharge Volume of Mississippi Canyon Block 519 in Plan Control No. S-7934, which established the Worst Case Discharge Volume for the Field. The proposed operations do not supersede the worst case discharge volume previously provided and approved.

6) OIL SPILL RESPONSE DISCUSSION

Talos provided an Oil Spill Response Discussion for the Worst Case Discharge Volume for Lease OCS-G 27278, Mississippi Canyon Block 519 in Plan Control No. S-7934, which established the Worst Case Discharge Volume for the Field.The proposed operations do not supersede the
worst case discharge volume previously provided and approved.

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

OMB Control Number: 1010-0151
OMB Approval Expires: 6/30/2021

OCS PLAN INFORMATION FORM

General Information

Type of OCS Plan:	X	Exploration Plan (EP)	Development Operations Coordination Document (DOCD)	

Company Name: Talos QN Exploration LLC	BOEM Operator Number: 03672
Address:	Contact Person: Erin Harold
333 Clay St., Suite 3300	Phone Number: 713-335-6952
Houston, Texas 77002	E-Mail Address: erin.harold@talosenergy.com

If a service fee is required under 30 CFR 550.125(a), provide the	Amount paid	$4823	Receipt No.	27L23Q4I

Project and Worst Case Discharge (WCD) Information

Lease(s): G27278	Area: MC	Block(s): 519	Project Name (If Applicable): Cormorant Point North (CPN)

Objective(s)	X	Oil		Gas		Sulphur		Salt	Onshore Support Base(s): Port Fourchon, LA

Platform/Well Name: A	Total Volume of WCD: 195,781	API Gravity: 30.5
Distance to Closest Land (Miles): 66	Volume from uncontrolled blowout: 6.7MMBOPD	

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-7934			
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 and Tentative Schedule (Mark all that apply)

Proposed Activity	Start Date	End Date	No. of Days
Exploration drilling	10/17/2025	11/30/2025	45
Development drilling			
Well completion	12/1/2025	12/30/2025	30
Well test flaring (for more than 48 hours)			
Installation or modification of structure			
Installation of production facilities			
Installation of subsea wellheads and/or manifolds			
Installation of lease term pipelines			
Commence production			
Other (Specify and attach description)			

Description of Drilling Rig

	Jackup	X	Drillship		Caisson		Tension leg platform
	Gorilla Jackup		Platform rig		Fixed platform		Compliant tower
	Semisubmersible		Submersible		Spar		Guyed tower
X	DP Semisubmersible		Other (Attach Description)		Floating production system		Other (Attach Description)

Drilling Rig Name (If Known):

Description of Lease Term Pipelines

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

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

Proposed Well/Structure Location

Well or Structure Name/Number (If renaming well or structure, reference previous name): A					Previously reviewed under an approved EP or DOCD?		Yes	X	No
Is this an existing well or structure?		Yes		No X	If this is an existing well or structure, list the Complex ID or API No.				
Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?						X	Yes		No

WCD info	For wells, volume of uncontrolled blowout (Bbls/day): 195781 bOPD	For structures, volume of all storage and pipelines (Bbls):	API Gravity of fluid	30.5

	Surface Location	**Bottom-Hole Location (For Wells)**	**Completion (For multiple completions, enter separate lines)**
Lease No.	OCS G27278	OCS	OCS OCS
Area Name	MC		
Block No.	519		
Blockline Departures (in feet)	N/S Departure: F S ___ L 1655' E/W Departure: F W ___ L 4661'	N/S Departure: F____ L E/W Departure: F____ L	N/S Departure: F____ L N/S Departure: F____ L N/S Departure: F____ L E/W Departure: F____ L E/W Departure: F____ L E/W Departure: F____ L
Lambert X-Y coordinates	X: 1240181' Y: 10329335'	X: Y:	X: X: X: Y: Y: Y:
Latitude/ Longitude	Latitude 28.45791° Longitude -88.245963°	Latitude Longitude	Latitude Latitude Latitude Longitude Longitude Longitude

Water Depth (Feet): 6601	MD (Feet):	TVD (Feet):	MD (Feet): MD (Feet): MD (Feet):	TVD (Feet): TVD (Feet): TVD (Feet):
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 on Seafloor
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

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

Proposed Well/Structure Location

Well or Structure Name/Number (If renaming well or structure, reference previous name): A-Alt					Previously reviewed under an approved EP or DOCD?		Yes	X	No
Is this an existing well or structure?		Yes		No X	If this is an existing well or structure, list the Complex ID or API No.				
Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?						X	Yes		No

WCD info	For wells, volume of uncontrolled blowout (Bbls/day): 195781 bOPD	For structures, volume of all storage and pipelines (Bbls):	API Gravity of fluid	30.5

	Surface Location	**Bottom-Hole Location (For Wells)**	**Completion (For multiple completions, enter separate lines)**
Lease No.	OCS G27278	OCS	OCS OCS
Area Name	MC		
Block No.	519		
Blockline Departures (in feet)	N/S Departure: F S 1655' L	N/S Departure: F____ L	N/S Departure: F____ L N/S Departure: F____ L N/S Departure: F____ L
	E/W Departure: F W 4611' L	E/W Departure: F____ L	E/W Departure: F____ L E/W Departure: F____ L E/W Departure: F____ L
Lambert X-Y coordinates	X: 1240131'	X:	X: X: X:
	Y: 10329335'	Y:	Y: Y: Y:
Latitude/ Longitude	Latitude 28.457909°	Latitude	Latitude Latitude Latitude
	Longitude -88.246118°	Longitude	Longitude Longitude Longitude

Water Depth (Feet): 6601	MD (Feet):	TVD (Feet):	MD (Feet): MD (Feet): MD (Feet):	TVD (Feet): TVD (Feet): TVD (Feet):
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 on Seafloor
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

MC 519
Well(s): A, A-Alt
OCS-G 27278
SUPPLEMENTAL EXPLORATION PLAN

January 23, 2025

Bureau of Ocean Energy Management
New Orleans Regional Office
ATTN: Plans Section
1201 Elmwood Park Boulevard
New Orleans, LA 70123

Ladies/Gentlemen:

Talos QN Exploration LLC has reviewed NTLs 2008-G04, BOEM 2015-N01 and other relevant NTLs and FAQs for the activities proposed herein and included in this submittal all pertinent proprietary and public information and documentation in regards to those activities.

The activities noted above are expected to commence on or about October 17, 2025.

All questions and/or correspondence regarding this plan should be submitted to Erin Harold at (713) 335-6952 or via email at erin.harold@talosenergy.com.

Respectfully,

Erin Harold
Talos QN Exploration LLC

TALOS
QN EXPLORATION LLC

SUPPLEMENTAL EXPLORATION PLAN

PUBLIC INFORMATION

Lease Number: **OCS-G 27278**

Area/Block: **MC 519**

Well(s): **A, A-Alt**

Offshore: **Louisiana**

Submitted By: **Talos QN Exploration LLC (03672)**
333 Clay St., Suite 3300
Houston, Tx 77002

Estimated Start-up Date: **Monday, January 1, 0001**

xrLabelCoverSheetDate

MC 519
Well(s): A, A-Alt
OCS-G 27278

SUPPLEMENTAL EXPLORATION PLAN

APPENDIX A
PLAN CONTENTS

A) PLAN INFORMATION

Included in the attachments for this appendix is the OCS Plan Information Form BOEM-137, providing information on the activities proposed herein.

Talos proposes the following activities for lease OCS-G 27278 as follows:

The drilling, completion and temporary abandonment of MC 519 wells A & A-Alt.

B) LOCATION

A map depicting the proposed surface and bottomhole locations is included in the attachments to this appendix of the proprietary information copy of this plan.

A map depicting the proposed surface locations is included in the attachments to the appendix of the public information copy of this plan.

C) SAFETY AND POLLUTION PREVENTION FEATURES

Talos QN Exploration LLC proposes to utilize a drillship or dynamically positioned semi-submersible for the drilling of this prospect. Rig specifications will be included in the Application for Permit to Drill.

We are also requesting permission to have the option of choosing the most appropriate/available drilling unit at the time our Application for Permit to Drill (APD) is filed. We are considering choosing one of the following drilling units; a drillship or dynamically positioned semi-submersible.

Safety features on the drilling unit selected will include pollution prevention, well control, and blowout prevention equipment as described in Title 30 CFR Part 250, Subparts C, D, E, and G; and as further clarified by DOI Notices to Lessees, and current policy making invoked by the DOI, Environmental Protection Agency and the U.S. Coast Guard. A Safety and Environmental Management System that is consistent with Title 30 CFR Part 250 Subparts "O" and "S" will be in effect during the proposed operations. In addition, the Well Control System, consisting of subsea BOP equipment, BOP control system, choke and kill lines, choke manifold, mud-gas separator, circulation system and monitoring (PVT) equipment will be installed and available upon demand when the riser and BOP is attached to the well. The emergency systems consisting of secondary BOP activation equipment, firefighting and abandonment equipment utilized will meet or exceed the regulatory requirements of the DOI and USCG.

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

The drilling rig and each of the marine vessels servicing the rig and its operations will be equipped with all U.S. Coast Guard required navigational safety aids to alert ships of its presence in all weather conditions.

D) STORAGE TANKS AND/OR PRODUCTION VESSELS

The table below provides the information on oil storage tanks with a capacity of 25 bbls or more. Thank tank capacities are representatives of either DP semi-submersible or drillship.

Type of Storage Tank	Type of Facility	Tank Capacity (bbls)	Number of Tanks	Total Capacity (bbls)	Fluid Gravity (API)
Fuel Oil	MODU	9250	4	37000	32.4
Fuel Oil	Crew Boat	394	1	394	30
Fuel Oil	Support Vessel	6630	1	6630	30
Fuel Oil	Support Vessel	6630	1	6630	30

E) POLLUTION PREVENTION

In accordance with NTL 2008-G04, this information is not applicable to the activities proposed herein as the State of Florida is not an affected State.

F) ADDITIONAL MEASURES

Talos QN Exploration LLC does not propose additional safety, pollution prevention, or early spill detection measures beyond those required by 30 CFR 250.

Talos QN Exploration LLC is a member of HWCG LLC, Clean Gulf Associates, and the National Response Corporation.

G) SERVICE FEE

Included in Attachment A is a Pay.Gov receipt in the amount of $4823 to cover operations proposed in this plan.

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

OMB Control Number: 1010-0151
OMB Approval Expires: 6/30/2021

OCS PLAN INFORMATION FORM

General Information

Type of OCS Plan:	X	Exploration Plan (EP)	Development Operations Coordination Document (DOCD)	

Company Name: Talos QN Exploration LLC	BOEM Operator Number: 03672
Address:	Contact Person: Erin Harold
333 Clay St., Suite 3300	Phone Number: 713-335-6952
Houston, Texas 77002	E-Mail Address: erin.harold@talosenergy.com

If a service fee is required under 30 CFR 550.125(a), provide the	Amount paid	$4823	Receipt No.	27L23Q4I

Project and Worst Case Discharge (WCD) Information

Lease(s): G27278	Area: MC	Block(s): 519	Project Name (If Applicable): Cormorant Point North

Objective(s)	X	Oil		Gas		Sulphur		Salt	Onshore Support Base(s): Port Fourchon, LA

Platform/Well Name: A	Total Volume of WCD: 72,500	API Gravity: 28°
Distance to Closest Land (Miles): 66	Volume from uncontrolled blowout:	

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	N-9122			
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 and Tentative Schedule (Mark all that apply)

Proposed Activity	Start Date	End Date	No. of Days
Exploration drilling	10/17/2025	11/30/2025	45
Development drilling			
Well completion	12/1/2025	12/30/2025	30
Well test flaring (for more than 48 hours)			
Installation or modification of structure			
Installation of production facilities			
Installation of subsea wellheads and/or manifolds			
Installation of lease term pipelines			
Commence production			
Other (Specify and attach description)			

Description of Drilling Rig

	Jackup	X	Drillship		Caisson		Tension leg platform
	Gorilla Jackup		Platform rig		Fixed platform		Compliant tower
	Semisubmersible		Submersible		Spar		Guyed tower
X	DP Semisubmersible		Other (Attach Description)		Floating production system		Other (Attach Description)

Drilling Rig Name (If Known):

Description of Lease Term Pipelines

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

OCS Plan Info Form

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

Proposed Well/Structure Location

Well or Structure Name/Number (If renaming well or structure, reference previous name): A					Previously reviewed under an approved EP or DOCD?		Yes	X	No
Is this an existing well or structure?		Yes		No X	If this is an existing well or structure, list the Complex ID or API No.				
Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?						X	Yes		No

WCD info	For wells, volume of uncontrolled blowout (Bbls/day): 72,500	For structures, volume of all storage and pipelines (Bbls):	API Gravity of fluid

	Surface Location	**Bottom-Hole Location (For Wells)**	**Completion (For multiple completions, enter separate lines)**
Lease No.	OCS G27278	OCS	OCS OCS
Area Name	MC		
Block No.	519		
Blockline Departures (in feet)	N/S Departure: F S 1655' L	N/S Departure: F____ L	N/S Departure: F____ L N/S Departure: F____ L N/S Departure: F____ L
	E/W Departure: F W 4661' L	E/W Departure: F____ L	E/W Departure: F____ L E/W Departure: F____ L E/W Departure: F____ L
Lambert X-Y coordinates	X: 1240181'	X:	X: X: X:
	Y: 10329335'	Y:	Y: Y: Y:
Latitude/ Longitude	Latitude 28.45791°	Latitude	Latitude Latitude Latitude
	Longitude -88.245963°	Longitude	Longitude Longitude Longitude
	Water Depth (Feet): 6601	MD (Feet): / TVD (Feet):	MD (Feet): / TVD (Feet): MD (Feet): / TVD (Feet): MD (Feet): / TVD (Feet):
	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 on Seafloor
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

OCS Plan Info Form

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

Proposed Well/Structure Location

Well or Structure Name/Number (If renaming well or structure, reference previous name): A-Alt					Previously reviewed under an approved EP or DOCD?		Yes	X	No
Is this an existing well or structure?		Yes		No X	If this is an existing well or structure, list the Complex ID or API No.				
Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?						X	Yes		No
WCD info	For wells, volume of uncontrolled blowout (Bbls/day): 72,500		For structures, volume of all storage and pipelines (Bbls):			API Gravity of fluid			

	Surface Location	**Bottom-Hole Location (For Wells)**	**Completion (For multiple completions, enter separate lines)**
Lease No.	OCS G27278	OCS	OCS OCS
Area Name	MC		
Block No.	519		
Blockline Departures (in feet)	N/S Departure: F S 1655' L	N/S Departure: F____ L	N/S Departure: F____ L N/S Departure: F____ L N/S Departure: F____ L
	E/W Departure: F W 4611' L	E/W Departure: F____ L	E/W Departure: F____ L E/W Departure: F____ L E/W Departure: F____ L
Lambert X-Y coordinates	X: 1240131'	X:	X: X: X:
	Y: 10329335'	Y:	Y: Y: Y:
Latitude/ Longitude	Latitude 28.457909°	Latitude	Latitude Latitude Latitude
	Longitude -88.246118°	Longitude	Longitude Longitude Longitude
Water Depth (Feet): 6601		MD (Feet): / TVD (Feet):	MD (Feet): / TVD (Feet): MD (Feet): / TVD (Feet): MD (Feet): / TVD (Feet):
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 on Seafloor
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

OCS Plan Info Form

Erin Harold

From: notification@pay.gov
Sent: Thursday, January 23, 2025 12:31 PM
To: Erin Harold
Subject: Pay.gov Payment Confirmation: BOEM Exploration Plan - BF

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.go.

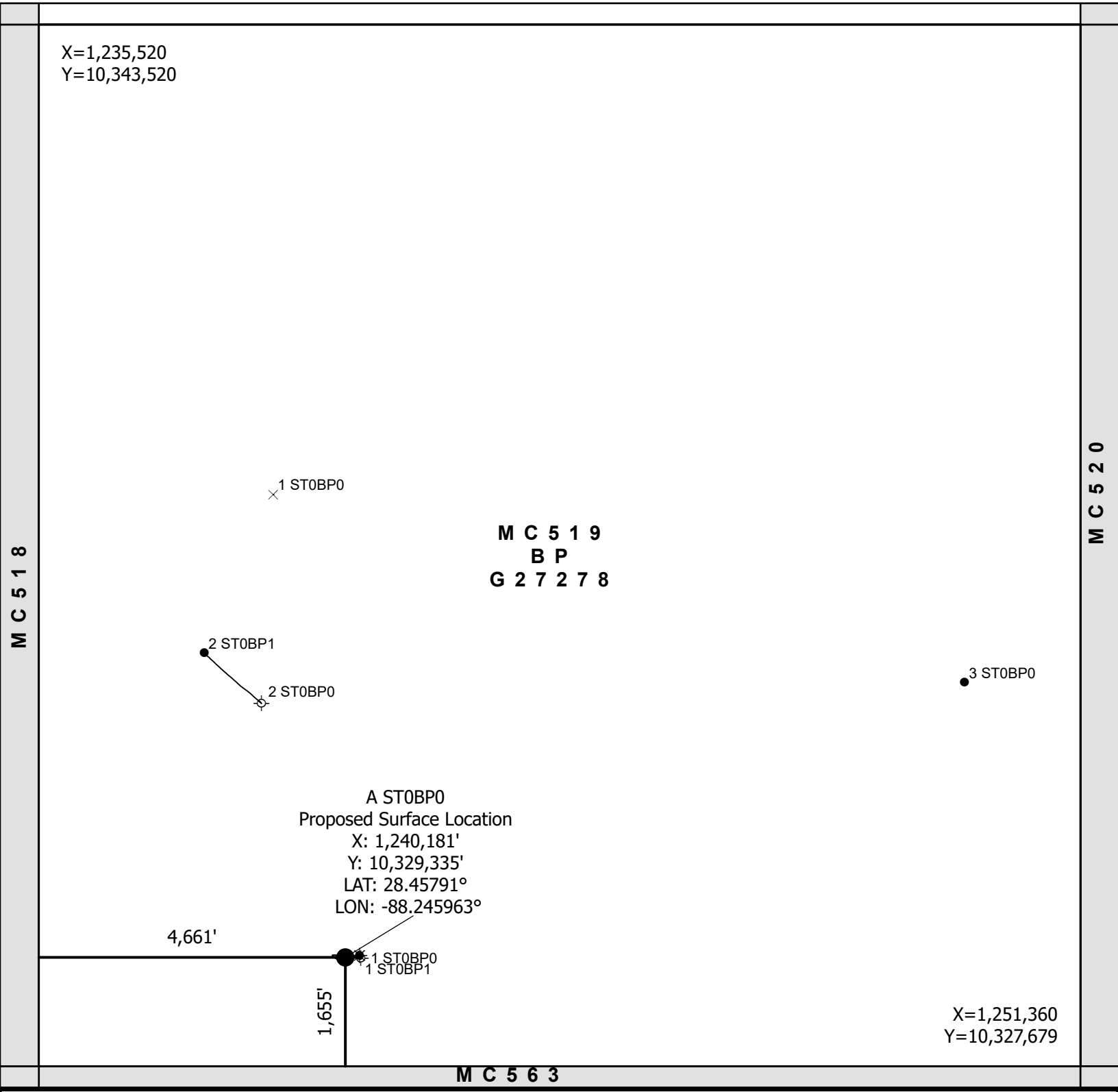
Application Name: BOEM Exploration Plan - BF
Pay.gov Tracking ID: 27L23Q4I
Agency Tracking ID: 76942600449
Transaction Type: Sale
Transaction Date: 01/23/2025 01:31:15 PM EST
Account Holder Name: Melissa Sassella
Transaction Amount: $4,823.00
Card Type: MasterCard
Card Number: **********5056

Region: Gulf of Mexico
Contact: Erin Harold (713) 335-6952
Company Name/No: Talos QN Exploration LLC, 03672
Lease Number(s): 27278
Area-Block: Mississippi Canyon MC,519
Surface Locations: 1

THIS IS AN AUTOMATED MESSAGE. PLEASE DO NOT REPLY.

Pay.Gov Receipt

Pay.gov is a program of the U.S. Department of the Treasury, Bureau of the Fiscal Service



2,000 1,000 0 2,000 4,000 US Feet

N

NAD 1927 UTM Zone 16N

Mississippi Canyon 519 (CPN)
MC519
G27278

Talos Energy Offshore LLC

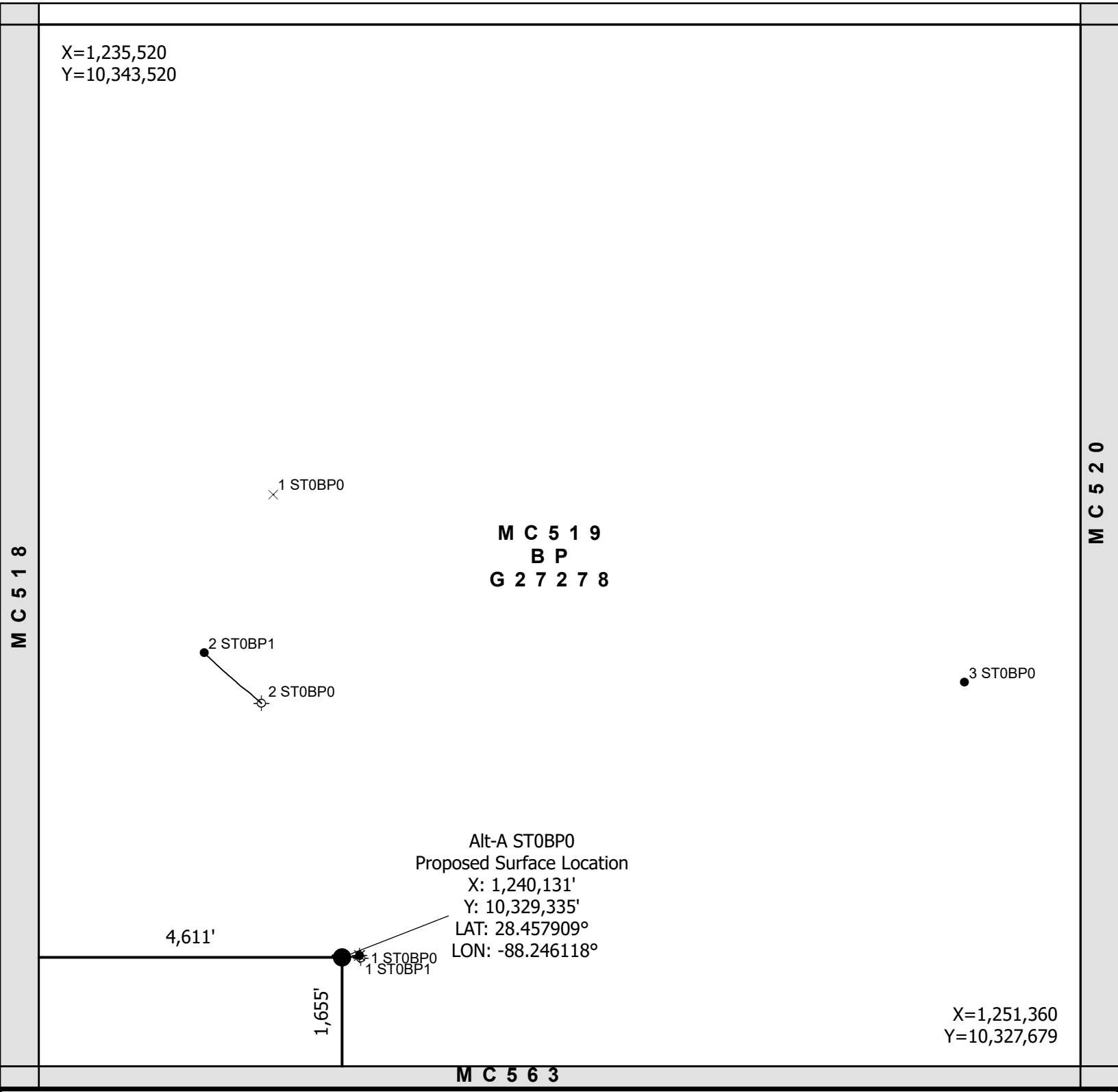
Scale: 1" = 2,000'
Date: 12/5/2024

Well Info
A ST0BP0
Water Depth: 6,601'
TVD: 13,323'
MD: 13,462'

Proposed Surface Location
X: 1,240,181' Lat: 28.45791° FSL: 1,655
Y: 10,329,335' Lon: -88.245963° FWL: 4,661

Proposed Bottom Hole Location

Well Location A



2,000 1,000 0 2,000 4,000 US Feet

N

NAD 1927 UTM Zone 16N

Mississippi Canyon 519 (CPN)
MC519
G27278

Talos Energy Offshore LLC

Scale: 1" = 2,000'
Date: 12/5/2024

Well Info
Alt-A ST0BP0
Water Depth: 6,601'
TVD: 13,323'
MD: 13,462'

Proposed Surface Location
X: 1,240,131' Lat: 28.457909° FSL: 1,655
Y: 10,329,335' Lon: -88.246118° FWL: 4,611

Proposed Bottom Hole Location

Well Location A-Alt

APPENDIX B
GENERAL INFORMATION

A) APPLICATIONS & PERMITS

Listed in the table below are the applications and/or permits that are required to be filed prior to conducting the activities proposed herein:

Application/Permit	Issuing Agency	Status
Application for Permit to Drill (APD)	BSEE New Orleans	Pending
Rig Emergency Evacuation Plan	USCG	Pending
NPDES	EPA	Pending

B) DRILLING FLUIDS

In accordance with BOEM guidance, the required drilling fluid information has been incorporated into the Waste & Discharge tables which are included in the attachment(s) to the Waste & Discharge Information appendix.

Listed in the table below are the drilling fluid and estimated volume to be used per well in the operations proposed herein:

Product Name	Amount to be Used	Reference Number
Water-based (Seawater, freshwater, barite)	45,000	-
Synthetic Based (Encore SBM)	10,000	-

In accordance with NTL 2008-G04, this information is not applicable to the activities proposed herein as no oil-based drilling fluids will be utilized.

A drilling fluids constituents list will be made available upon a request from any federal and/or state agency as deemed necessary to approve this plan.

C) PRODUCTION

In accordance with NTL 2008-G04, this information is not applicable as this is an Exploration Plan.

D) OIL CHARACTERISTICS

In accordance with NTL 2008-G04, this information is not applicable as this is an Exploration Plan.

E) NEW OR UNUSUAL TECHNOLOGY

In accordance with NTL 2008-G04, this information is not applicable to the activities proposed herein as no new or unusual technology as defined in 30 CFR 250.200 will be utilized to carry out the proposed activities. Talos will endeavor to use the best available and safest technologies (BAST), as referred to in 30 CFR 250, provided it is proven for the well conditions anticipated and is reasonably available at the time of well operations.

F) BONDING STATEMENT

The bond requirements for the activities and facilities proposed in this EP are satisfied by a $3,000,000.00 areawide development bond, furnished and maintained according to 30 CFR 556, Subpart I, and NTL No. 2015-N04, "General Financial Assurance." Additional security will be satisfied in accordance with the regulations contained in 30 CFR 556.901(d) and NTL No. 2016-N01, "Requiring Additional Security."

G) OIL SPILL FINANCIAL RESPONSIBILITY

Talos QN Exploration LLC (03672), has demonstrated oil spill financial responsibility (OSFR) for the activities/facilities proposed herein according to 30 CFR Part 553, and NTL No. 2008-N05, "Guidelines for Oil Spill Financial Responsibility for Covered Facilities."

H) DEEPWATER WELL CONTROL STATEMENT

Talos QN Exploration LLC (03672) has the financial capability to drill a relief well and conduct other emergency well control operations.

I) SUSPENSION OF PRODUCTION

In accordance with NTL 2008-G04, this information is not applicable as this is an Exploration Plan.

J) BLOWOUT SCENARIO

Provided as an attachment at the end of this section is a Worst Case Discharge (WCD) Blowout Scenario for the activities proposed in this Plan.

NTL 2015-N01 Information Requirements

Mississippi Canyon Block 519, OCS-G 27278

Blowout Scenario:
The proposed well has drilled the production hole interval with all potential producible hydrocarbon sands (PPHS) exposed. A blowout occurs. As per NTL 2015-N01, the BOP is not connected to the wellhead and the wellbore is free of drill pipe, logging tools, or other similar equipment resulting in an unrestricted and uncontrolled blowout thru the borehole and wellbore. The blowout scenario assumes the rig has sunk and is displaced from the wellhead. The well is flowing uncontrolled at the mudline. A wellbore schematic with the required data and plats are included in this information package.

Worst Case Discharge: The calculated worst case discharge (WCD) rate for the scenario described above would be when the wellbore is exposed to both the M89 and the M84 reservoir sand in 12 ¼" hole interval. The calculated WCD would be 13,864 BOPD, 10 MMSCFD and 0 BWPD. The WCD is based on nodal analysis using field analog reservoir data.

Maximum duration of the potential blowout: The maximum duration of an uncontrolled blowout depends on the time it takes for either the well to bridge over, shut-in or contain using subsea intervention or relief well intervention. Each scenario is described in the subsequent paragraphs below. The table below summarizes the maximum duration of a potential blowout for each scenario.

Scenario	Blowout Duration	Oil Discharge*
Well Bridges Over	3 to 5 days	41,592 to 69,320 bbls
Subsea Intervention	6 to 16 days	83,184 to 221,824 bbls
Drill Relief Well	60 days	831,840 bbls

*Assumes no declining oil production, based on WCD of 13,864 BOPD.

Potential of well to bridge over: Failure of the borehole in a blowout scenario is influenced by several factors including in-situ stress, rock strength, and fluid velocities at the sand face. Blowout simulations confirm that, due to the typically large, induced drawdown pressures at the sand face, wellbore pressure gradients in an open hole blowout invariably falls below the collapse gradient of the open formations. The high fluid velocities in an unrestricted scenario will likely cause the borehole to collapse and bridge over in a few days, significantly reducing flow rate out of the wellbore.

The Intra-Wellbore Flow across the M89 and M84 sands in the MC 519 well is expected to be abnormally pressured, unconsolidated and friable, therefore making "bridging" likely in a blowout event. The highest estimated bottom hole pressure of the sands is approximately 7,000 psi. The wellbore is planned to be at 13.0° inclination through the objective sand interval. The primary

Blowout Scenario

recovery energy source in the objective reservoir is water drive and requires sand control to prevent the reservoir from "sanding up".

Subsea Control and Containment: Talos QN Exploration LLC (Talos), as a member of HWCG Holdings LLC (HWCG), will have access to a fully integrated subsea well control and containment system that can be rapidly deployed. The equipment is designed, constructed, tested and maintained in a state of continuous readiness for rapid response.

In the event of a blowout Talos would immediately mobilize HWCG's vessels and equipment to shut-in and contain the well or flow and capture the fluids. Equipment and services required for the response beyond those provided through HWCG will be contracted directly by Talos as specified in the current and approved Regional Containment Demonstration (RCD). Talos has Master Service Contracts with equipment and service companies to respond to a blowout as described in the RCD.

Additionally, and as a member of HWCG, Talos will draw on HWCG's Mutual Aid of human resources available with the HWCG membership to support a response to a deepwater blowout. Access to this resource is provided by the Mutual Aid Agreement between the HWCG members.

HWCG response equipment resources include capping stack, "top hat", transfer hoses, tanker, IRS, ROV to remotely close the blind shear rams, vessels to begin subsea dispersant operations, and vessels to initiate debris removal / salvage operations. The Helix Q-4000 or equivalent vessel would also be immediately mobilized to assist in the response.

In the event the blind shear rams cannot be remotely closed with the ROV, the LMRP will be removed from the BOP. The HWCG 13-5/8" 15K capping stack will be deployed by the Q-4000 or other suitable vessel and installed on the BOP. The blind rams in the capping stack would then be closed to contain the well.

A top kill operation would then be initiated to kill and control the well. The proposed well design will be able to withstand the anticipated shut-in pressure at the BOP, as well as additional pressure exerted on the casing during the top kill operation. In addition, Talos would employ the expertise of Wild Well Control, Inc. to assist with all intervention options.

The estimated duration for subsea intervention requiring the deployment of the capping stack is 6 to 8 days. This case assumes the HWCG vessels and equipment will be utilized to shut-in and contain the well. In the event it is necessary to "flow and capture" the fluids, an additional 7 to 8 days is estimated. Therefore, subsea intervention time would take 6 to 16 days. Talos is a member of Clean Gulf Associates, MSRC and HWCG.

Talos has Master Service Contracts in place with Cudd Pressure Control, Superior Energy (Wild Well Control) and Halliburton (Boots & Coots), which are diversified well control services companies offering full general contracting services with strong engineering component resources.

Relief well: In the event of an uncontrolled blowout, relief well planning, and rig availability inquiries would commence immediately. The SHL of the MC 519 Well A is in ~6,500 ft WD and is free of pipelines or other obstructions. The seafloor is free of any obstructions within 2000 ft of the proposed well center. There are currently 14 rigs in the USGOM which are "active" and capable of drilling a relief well with an open water location in ~6,500 ft water depth in MC 519. Talos has alliances with diversified engineering consulting firms which would provide Talos relief well operations, engineering, logistical, materials management, QA/QC and well-site supervision support. Mutual Aid Agreement is in place with several USGOM operators to secure a drill ship and/or dynamically positioned semi-submersible drilling rig to drill the relief well.

There are no known rig package constraints for a relief well. All 4th, 5th and 6th generation rigs in the USGOM would be suitable to drill a relief well. Therefore, the rig choice would be first available, quickest to mobilize and move into position offsetting the blow out well. A relief well would be drilled from an open water location about 1500' from the blowout well. The final rig location will be influenced by operator, contractor, BSEE and depth of intersect to ensure safety of all personnel and equipment involved in the relief well effort. Potential relief well locations clear of shallow hazards have been identified for each of the well from the shallow hazard study.

There are no suitable platforms in the area which would provide an advantage for drilling the relief well. A relief well could not be drilled from an onshore location.

The estimated time to drill a relief is summarized in the table below:

Description	Planned Days	Cumulative Days
Site Assessment	3	3
Contract/ Mobilize Rig to Location	20	23
Jet-in 36"	2	25
Drill & Set 22" surface casing	5	30
Certify BOPE / Run and test BOP stack	10	40
Drill & Set 13 ⅝" Casing	6	46
Drill and range to intercept the HC interval	8	54
R/U pumping equipment and kill well	6	60

Proposed measures to enhance the ability to prevent a blowout and reduce the likelihood of a blowout:

Preventing a blowout starts with preventing a well control incident or "kick". In order to prevent a "kick", a thorough understanding of the geology, reservoir characteristics and field/area production history is needed. Key offset wells are identified, and drilling records of these wells are studied in great detail and used in well planning. Specifically, this information is used for lithology correlation,

abnormal pressure formation prediction, mud weight schedule, casing design, and other potential geological risk identification such as depleted or weak zones, ballooning formations, sloughing shale, gumbo and hole instability. This research reduces the risk of a well control incident.

Hydrostatic control of the well will be maintained by utilizing a drilling fluid (mud) which exerts sufficient hydrostatic pressure to prevent the unintended flow of wellbore fluids or "kick" during drilling operations. All Drilling Fluid Requirements per 30 CFR 250 Subpart D 250.455 thru 250.458 will be implemented while drilling the well.

The MC 519 Well "A" will be drilled using mud weights as per the well plan's mud weight schedule. Mud weight adjustments will be made based on observed drilling parameters including rate of penetration, cuttings quantity and appearance, chloride contamination and gas monitoring. In the event drilling parameters indicate a potential for a "kick", the drilling operations will cease, and a flow check will be performed. Penetration rate will be controlled while drilling thru any hydrocarbon sand. Two mud engineers will work 12 hr shifts providing 24 hr mud engineering support during drilling operations. Two "shaker" men working 12 hr shifts continuously monitor mud weight and returns at the shakers. Electronic PVT equipment will be utilized throughout all drilling operations.

Mud properties including viscosity and gel strengths will be adequately maintained to reduce the possibility of swab and surge during tripping operations. Displacement volumes will be monitored and recorded during all tripping operations. A heavy slug will be pumped when possible before trips so that the pipe can be pulled dry, and the hole more accurately monitored. As a minimum, a volume equal to the annular volume will be circulated before pulling out of the hole. Pipe trip speeds will also be adjusted as such not to cause swab or surge pressures.

Adequate mud and chemicals will be kept on board the rig to ensure well control at all times. Sea water or synthetic base oil will be available and ready to be pumped down hole if a high volume of loss circulation zone is encountered. This will enable immediate stabilization of the well until additional mud can be mixed. If lost circulation occurs and well conditions allow, pipe may be pulled up into the casing shoe.

Short trips and wiper trips will be performed as the hole conditions dictate or periodically during prolonged drilling intervals to monitor and assess any change in hole conditions. These trips also help reduce the risk of swab and surge related problems.

Gas-detecting equipment will monitor all drilling fluid returns. Mudlogging services will commence upon the BOP and riser installation and will be used to monitor wellbore conditions. Mudlogging service will include monitoring mud weights (in and out), drill gas, background gas, connection gas, trip gas, bottoms up gas and lithology description. This information will be used to assess any relative changes in hole conditions and aid in making mud weight adjustments.

LWD (GR/Res)/MWD services will be utilized to provide real-time directional surveying well, formation evaluation, reservoir fluid type, and formation pressures including abnormal pressure

detection. LWD will enable the drilling team with real-time identification of unexpected and potential drilling hazards.

All efforts will be made to avoid a loss returns event. This includes but not limited to identification of depleted zones and faults, high quality casing seats, controlled penetration rates, controlling trip in hole speeds, staging up pumps, cement placement models, controlling casing surge pressures and solids control.

Cement programs will be designed to prevent gas influx during cement setting. All casing strings will be centralized across hydrocarbon bearing zones. Prior to cementing casing, the annulus will be circulated clean as long as mud returns are maintained. After cementing casing, the annulus will be monitored while the cement sets.

Diverter and BOP System Requirements as per 30 CFR 250 Subpart D 250.430 thru 250.451 will be in effect while drilling the well. BOP equipment will be installed and tested while conducting operations below surface casing. All BOPE will be tested every 14 or 21 days, as approved by BSEE. Annular and ram BOP's will be function tested every 7 days between pressure tests. BOP's will include at least two set of blind/shear rams capable of shearing the drill pipe under MASP conditions.

A minimum of two (2) offshore supervisors will be on the rig at all times to ensure 24-hour supervision of all drilling activities on the well location. These onsite supervisors will witness and review all BOP tests, casing tests and formation integrity tests. Formation integrity tests must be approved by the Talos drilling superintendent, manager or project drilling engineer prior to drilling ahead.

Talos conducts rig safety and well control system audits on every rig contracted. Each rig crew practices well control drills daily. These well control drills include pit drill, kick drill and trip drill. Each drill will emphasize "kick" recognition, confirmation, shut-in procedures and personnel assignments.

Additional measures to enhance Talos ability to prevent and reduce the likelihood of a blowout are:

Management and Direct Supervision Processes:

- Act in accordance with the latest version 2016 WCR
- Drilling Supervisors, Completion Supervisors, MODU OIM's, Drillers, and Tool Pushers, (including all personnel that may be acting in these capacities) must hold a valid well control certificate from an accredited IWCF or WellCAP organization.
- Compliance with all federal rules and regulations: CFRs, NTLs, and Final Rules
- Pursuant to wellbore cementing and zonal isolation techniques, all cementing operations will be modeled and designed under the guidelines set forth in API RP 65 Part I & II.
- RP 53 for Blowout Prevention Equipment Systems for Drilling Wells and RP 16Q for Marine Drilling Risers will be used for installation, testing and maintenance of the surface and subsea marine risers and BOP systems.

- Utilization of Talos management systems: SEMS and MOC.
- Adherence to Contractors Safety Management Systems.
- Ensure proper physical barriers are in place to prevent uncontrolled flow.
- Professionally certified and peer reviewed well design (casing and cementing).
- Contractor engagement meeting to gain alignment on well plan.
- Specific procedures to execute well plan.

Well and rig equipment:

- Compliance in accordance with the latest version 2016 WCR.
- All rigs will meet all applicable rules and regulations per 30 CFR 250 and 550, as well as all Notice to Leases.
- Certified BOP equipment that is fit for purpose.
- Utilize rig and equipment that is fit for purpose.
- The working pressure and temperature rating of the BOPE and wellhead will exceed the maximum anticipated pressure and temperature.
- Accumulator controls will always be left in the power position (i.e., opened/closed; not neutral).
- Rams installed & tested to fit all sizes of drill pipe, casing, and tubing in use.
- A pressure tested fully opening safety valve (FOSV) and opening/closing wrench with appropriate threads or crossover subs for all connections will be available on the rig floor at all times.
- A drill string float valve (ported acceptable) will be installed in all drilling bottom hole assemblies (BHA's). Similar valves will be considered for well intervention and completion operations when reverse circulating is not required.
- MWD/LWD/PWD tools will be used accordingly to obtain real-time data on subsurface zones.
- Circulating trip tanks are required for all drilling operations.
- PVT and gas detection equipment will be employed for all hole sections.

Drilling Practices:

- Volume measurements relative to the well will be monitored at all times.
- All critical pressure test charts (i.e., negative tests, casing tests, FIT/LOT) will be reviewed by Drilling Engineer/Drilling Supervisor prior to continuing with operations.
- During drilling operations, slow circulating rates (SCR) will be taken and recorded for each mud pump at least after BHA or mud weight changes and 500 feet of formation drilled, after the installation of BOP and riser.

- Flow checks shall be conducted after drilling breaks, prior to tripping, after or during lost circulation events, pumping out, prior to unlatching BOP's, and any other time when anomalous pit volume readings are observed. Minimum flow check duration shall be 5 minutes.
- Drilling BOP space-out and tool joint space-out diagrams shall be posted on the rig floor at all times.
- Kill sheets will be updated during each tour and posted on the rig floor.
- PVT and gas detection equipment will be employed for all hole sections.

Effective and early blowout intervention:

In the event of a blowout, the Talos OSRP will be activated. The first priority will be to quickly organize a focused team of operational and technical professionals including a blowout specialty company (BSC). The BSC will be immediately mobilized to the blowout site. The BSC will analyze the blowout situation and devise an intervention strategy. Site assessment will be used to assist in determining the relief well location options so that planning can be initiated. A suitable rig for a relief well will be sourced and preparations made for the suspension of current activities in order to mobilize to relief well site.

APPENDIX C
GEOLOGICAL & GEOPHYSICAL INFORMATION

A) GEOLOGICAL DESCRIPTION
PROPRIETARY INFORMATION

B) STRUCTURE CONTOUR MAPS
PROPRIETARY INFORMATION

C) INTERPRETED 2D/3D SEISMIC CROSS SECTIONS
PROPRIETARY INFORMATION

D) GEOLOGICAL STRUCTURE CROSS SECTIONS
PROPRIETARY INFORMATION

E) SHALLOW HAZARDS REPORT
An Archaeological and Hazard Survey was previously submitted and approved under Plan Conrol No. N-9122.

F) SHALLOW HAZARDS ASSESSMENT
A Shallow Hazards Assessment for the proposed well(s) is included in the attachments to this appendix.

G) HIGH RESOLUTION SEISMIC LINES
High Resolution Seismic Lines were included in the previously submitted and approved Archaeological and Hazards Survey (Plan Control No. N-9122).

H) STRATIGRAPHIC COLUMN
PROPRIETARY INFORMATION

I) TIME VS DEPTH TABLES
In accordance with NTL 2008-G04, this information is not applicable to the activities proposed herein as well control is available in the plan area.

J) GEOCHEMICAL INFORMATION
In accordance with NTL 2008-G04, this information is not applicable to the activities proposed herein as the subject area is within the boundaries of the Gulf of Mexico.

K) FUTURE G&G ACTIVITIES
In accordance with NTL 2008-G04, this information is not applicable to the activities proposed herein as the subject area is within the boundaries of the Gulf of Mexico.

BERGER GEOSCIENCES, LLC.
13100 NORTHWEST FWY, STE 600
HOUSTON, TEXAS 77040
PHONE: 713-341-0397
FAX: 713-341-0398

12 June 2019

Mr. Eric Kubera
Fieldwood Energy, LLC.
2000 W. Sam Houston Pkwy., Suite 1200
Houston, TX 77042-3623

RE: Addendum Report: Extended Shallow Hazards Assessment and Wellsite Clearance Letters, Proposed Wells MC 519-A and MC 519-B, Mississippi Canyon Area, Block 519 (Lease No. G27278)

Dear Mr. Kubera,

Berger Geosciences, LLC. (Berger) is pleased to provide Fieldwood Energy, LLC. (Fieldwood), with the following addendum report extending the shallow geologic interpretation below Horizon G to 5,000 ft below the mudline for Proposed Wells MC 519-A and MC 519-B, Block 519, Mississippi Canyon (MC) area, Gulf of Mexico.

This addendum report is a supplement to the report entitled, *Shallow Hazards Assessment, Benthic Communities Evaluation, and Archaeological Assessment Review, Mississippi Canyon Area, Blocks 519 (Lease No. G27278) and 563 (Lease No. 21176), Gulf of Mexico*, prepared by Berger and submitted to Fieldwood on 21 November 2018. A tophole prognosis for each proposed well is included in the Wellsite Discussion section of this addendum report. This addendum report is intended to be used in conjunction with the Berger 2018 report and is not intended to satisfy BOEM NTL requirements as a stand-alone document.

We appreciate the opportunity to be of service to Fieldwood on this project and look forward to working with you in the future. Please contact us if you have any questions or need further information.

Sincerely,

James F. Keenan
Manager, Geohazards Services

William J. Berger III, P.G.
President and CEO

Distribution: 2 copies

Wellsite Clearance Letter

BERGER GEOSCIENCES, LLC.
13100 NORTHWEST FWY, STE 600
HOUSTON, TEXAS 77040
PHONE: 713-341-0397
FAX: 713-341-0398

Addendum Report:
Extended Shallow Hazards Assessment and Wellsite Clearance Letters Proposed Wells MC 519-A and MC 519-B

Mississippi Canyon Area
Block 519 (Lease No. G27278)
Gulf of Mexico

Berger Geosciences Project Number 19-04-30

Prepared for:

Fieldwood Energy, LLC.
2000 W. Sam Houston Pkwy.
Suite 1200
Houston, TX 77042-3623

June 2019

Wellsite Clearance Letter

Executive Summary

The locations of Proposed Wells MC 519-A and MC 519-B appear feasible for drilling operations. This addendum report provides an assessment of subsurface conditions in Mississippi Canyon (MC) Block 519 that can impact drilling activities. This assessment is based on the depth extension of interpretation of 3-D seismic data below the previous limit of investigation at approximately 3,825 ft to 5,000 ft bml. In addition to the extended shallow hazards interpretation, wellsite assessments for Proposed Wells MC 519-A and MC 519-B from the seafloor to 5,000 ft bml, are provided in the Wellsite Discussion section of this addendum.

The following points summarize the geologic conditions assessed in the extended interpretation to a depth of 5,000 ft bml in the subsurface study area.

- For discussions concerning seafloor conditions, water depths, and man-made structures; as well as shallow gas potential, shallow water flow potential, gas hydrate potential, stratigraphy, and faulting for the Seafloor through Horizon G, please refer to the previous Berger 2018 shallow hazards assessment report.
- Existing infrastructure within 2,000 ft of the proposed well locations include: one well MC 519-1 (G27278#1), four BP operated active oil pipelines (segment nos. 18265, 16281, 16283, and 16285), two umbilicals (segment nos. 16277 and 16284), and a inactive pipeline (segment no. 16282).
- The subsurface study area lies inside the limits of the regional Blue and Green shallow water flow Units as defined by Berger et al. (2017).
- Below the previous interpretation limit, two additional horizons, Horizons H and I were mapped in the subsurface study area.
- Five extensional faults have been mapped that affect the sequences bound by the two additional horizons. These faults are extensions of previously mapped faults and are downthrown to the south.
- No amplitude anomalies which could represent shallow gas are identified within 250 ft of the proposed well locations in the extended shallow hazards interpretation.
- The overall potential for the wellbore encountering shallow gas between the seafloor and 5,000 ft bml ranges from negligible to moderate.
- A detailed hazards assessment and a tophole prognosis for each proposed well is included in the Wellsite Discussion section of this report.

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List of Maps (1:12,000)

1. Introduction

Fieldwood Energy, LLC. (Fieldwood) contracted Berger Geosciences, LLC. (Berger) to complete a wellsite assessment for two proposed wells MC 519-A and MC 519-B. This report is an addendum to the Berger 2018 report, which included interpretations to a depth of approximately 3,825 ft bml. These addendum report builds on the information provided to Fieldwood in the following previously prepared document:

- *Shallow Hazards Assessment, Benthic Communities Evaluation, and Archaeological Assessment Review, Mississippi Canyon Area, Blocks 519 (Lease No. G27278) and 563 (Lease No. 21176), Gulf of Mexico*, prepared by Berger and submitted to Fieldwood on November 21, 2018.

Section 2 of this report contains portions of the previous Berger 2018 assessments for convenience. A tophole prognosis specific to each Proposed Well, MC 519-A and MC 519-B, is provided in Section 3: Wellsite Discussion.

Purpose and Scope

The purpose of this addendum report is to provide an extension of the shallow hazards interpretation into subsurface depths greater than the previous report and to provide a discussion of potential drilling hazards. The Subsurface Study Area for this extended shallow hazards assessment is limited to MC 519 and 563 with a 1,000 ft halo into the adjacent blocks. The zone of interest is defined as the subsurface area between the previously interpreted (2018) Horizons and 5,000 ft bml. Two additional horizons, Horizons H and I, have been mapped in the zone of interest. This addendum provides the results of the interpretation across the subsurface study area in the zone of interest, as well as additional assessments at the proposed well locations.

Available Data

Fieldwood provided 3-D seismic data covering MC 519, MC 563, and all or portions of 22 additional blocks (Berger, 2018). The inline and crossline spacing is 12.5 m (41.01 ft) by 12.5 m (41.01 ft), respectively within these data. See the Seismic Data Summary in Appendix A of the Berger 2018 report for the complete acquisition and processing reports for this data.

Berger was also provided the high-resolution geophysical data collected by C & C Technologies for the archaeological survey and report published June 2006. The AUV survey covers all or portions of MC 517-519, 561-563, and 605-607 (C & C, 2006).

Methodology

The detailed interpretative methodology for the previous shallow hazards assessments can be found in the 2018 Berger report. For this addendum report, all seismic lines within the subsurface study area were interpreted to provide a hazards assessment of the zone of interest. The map projection is the Universal Transverse Mercator (UTM) Zone 16 North (16N), using the North American Datum 1927 (NAD27) on the Clarke 1866 Ellipsoid. Map units are in U.S. Survey Feet.

Two additional horizons, Horizon H and I, were mapped within the zone of interest using the 3-D seismic data set. Below Horizon I the limit of this investigation is identified by a horizon marking the approximate depth of 5,000 ft bml.

Anomalous amplitude responses were isolated using volume extractions for absolute minimum amplitude. Three extractions were conducted within MC 519 and 563 in order to isolate anomalous amplitude response. The intervals, bounding horizons, and cut off values are listed below in Table 1:

Table 1. Amplitude extraction intervals and cut-off values

Extraction interval	Anomalous amplitude cut-off value
Horizon G to Horizon H	-35,000
Horizon H to Horizon I	-30,000
Horizon I to 5,000 ft bml	-15,000

Anomalous values were determined for each sequence based upon comparison to the overall seismic character. The results were used as a screening tool to assess the presence of possible shallow gas. The anomalies were investigated further with respect to the local geology.

2. Subsurface Geologic Conditions

This section discusses the subsurface conditions and potential geologic hazards interpreted from the 3-D seismic data between the previous interpretation (see Berger, 2018) and 5,000 ft bml. Seafloor conditions near the proposed wells are discussed in the Wellsite Discussion section of this addendum and shown on Maps 2, 3, 4, and 5 of the Berger 2018 report.

Two additional horizons (Horizons H and I) were interpreted within the zone of interest in the subsurface study area based on seismic characteristics and regional geology (Figures 3 and 4). The significant subsurface geologic features within the zone of interest have been summarized on Map 1. Map 2 is a structure map from the seafloor to Horizon H.

The subsurface conditions and potential drilling hazards specific to proposed wells can be found in the Wellsite Discussion. A shallow hazards assessment and tophole prognosis were prepared for each proposed well based on the specific subsurface conditions at the proposed well location.

Stratigraphy

The subsurface study area is located within the eastern portion of the Mississippi Fan. The stratigraphy is dominated by repeated landslides and channels. The subsurface study area lies within the limits of the shallow water flow (SWF)-prone Blue Unit and Green Unit as mapped by Berger et al., 2017 (Figures 2 and 3). The sediments between the Seafloor and Horizon G are described in detail in Section 1.4 of the Berger report (2018). Below is a discussion of the sediments below Horizon G to 5,000 ft bml.

Horizon G to Horizon H. The sequence between Horizons G and H is represented by intervals of parallel, semi-continuous reflectors alternating with intervals of chaotic to discontinuous reflectors. The reflectors within this sequence are of generally moderate amplitude. The parallel reflectors likely represent turbidite deposits that may contain silt and sand. The chaotic to discontinuous reflectors probably represent landslide and debris flow deposits containing interbedded silt, clay, and sand.

The Horizon G to H sequence varies from 975 ft thick in the southwestern portion of MC 563 to 220 ft thick in southeastern and east-central MC 519. The sequence generally thickens to the southwest but thickens locally in north-central and northeastern MC 519.

Horizon H is a peak reflector that is mapped between 3,313 ft and 4,241 ft bml (9,782 ft and 10,841 ft bsl; Map 2).

Horizon H to Horizon I. The sequence between Horizons H and I is composed of low- to moderate-amplitude, discontinuous to chaotic reflectors. The sediments in this sequence are interpreted to represent silt and clay-dominated mass transport deposits (Figures 3 and 4). The upper portion of this sequence, immediately below Horizon H, displays a moderate-amplitude character as opposed to the lower portion of the sequence which is generally low-amplitude in character. This may indicate a higher silt or sand content in this upper interval.

A channel is identified along Horizon H in the north-central and east-central portion of MC 519 (Figure 4 and Map 1). The channel averages about 1,700 ft in width and extends almost 15,000 ft trending from northwest to southeast across the central portion of the block then turning to the east and exiting the block along the central portion of the block line with MC 520. The low-amplitude character of the channel fill indicates that it is likely clay and silt filled, however; occasional, high-amplitude reflections image potentially sand-prone levee deposits (Figure 4).

The Horizon H to I sequence varies from 1,172 ft thick in the northwestern portion of MC 519 to 514 ft thick in central and western MC 563. The sequence generally thickens to the north.

Horizon I is a peak reflector marking the base of this sequence and is mapped between 4,274 ft and 5,263 ft bml.

Horizon I to Investigation Limit (5,000 ft bml). The sediments below Horizon I to the investigation limit (5,000 ft bml) consists of low-amplitude, chaotic reflectors representing clay-rich mass transport deposits (Figures 3 and 4).

Structure

Salt. Although salt is not identified within the subsurface study area, a salt body located to the east has influenced the location of faults and the deposition of sediments within the study area. Mass transport deposits and channels have been directed into and through the study area due to topographic highs above the salt intrusions to the east.

Faulting. Salt uplift has resulted in extensional faulting throughout the study area. Deep-seated growth faults affecting Horizon G and below are found within both MC 519 and MC 563. These faults are deeper extensions of previously mapped faults and generally trend northeast to southwest with the exception of two faults in southern MC 563 which trend east to west. Lateral extents of these faults range from about 7,500 ft to over 20,000 ft (Map 1 and Map 2). Acoustic voids and high-amplitude anomalies along these deep-seated fault planes may present a potential conduit for fluid migration (see Figures 1-12, 1-13, 1-15, and 1-16 of the Berger 2018 report). Faults affecting Horizon H are displayed on Map 1 and Map 2.

Shallow Gas

Areas of anomalous negative amplitudes, when associated with other hydrocarbon indicators on the seismic data such as acoustic wipe-out, phase reversals, and stratigraphic traps, may indicate locations of shallow gas pockets. Minimum amplitude extractions were produced for subsurface intervals between the Seafloor and Horizon G (See Berger, 2018). The distribution of areas of possible shallow gas for stratigraphic intervals below Horizon G to 5,000 ft bml are discussed below. Anomalous amplitudes for all stratigraphic intervals are shown on Map 1.

Horizon G to Horizon H. Amplitude anomalies within this interval are scattered across both blocks, but are most prevalent in the southern portion of MC 519 and the western portion of MC 563 (Map 1). The largest anomalous areas occur in the central and northeast portions of MC 563 and are not associated with faults. These anomalies appear to be sand bodies that have become gas charged. Gas may have migrated along faults in the vicinity of the anomalies and become trapped in sand-rich deposits within this interval.

Horizon H to Horizon I. Amplitude anomalies identified between Horizons H and I occur throughout the two block area but are most prevalent in the southeastern portion of MC 519 and the northern and western portions of MC 563 (Map 1). The largest anomalies occur in these areas. Most anomalies within this interval are associated with faults and likely indicate sand-rich deposits which are gas charged as a result of gas migration along the faults.

Horizon I to the limit of investigation (5,000 ft bml). Scattered anomalies are identified throughout the two block area, but are more common in MC 519 (Map 1). The densest occurrence and the largest

anomalies are located in the western and southern portions of MC 519. Many of the anomalies are located adjacent to faults, particularly in the southern and southeastern portions of MC 519 and likely represent gas which has migrated along the faults and become trapped in sand-rich sediments.

Shallow Water Flow

The subsurface study area lies inside the limits of the regional SWF Blue Unit and Green Unit as defined by Berger et al. (2017; Figures 2 and 3).

The potential for SWF ranges from low to high for sequences below Horizon G within the subsurface study area, and varies depending on the lithology of the subsurface sediments, depth of burial, thickness of units, and erosion of the sediments. Due to this variability, the proposed wells in the subsurface study area have specific assessments based on the criteria listed in the Wellsite Discussion.

Horizon G to Horizon H. The sequence between Horizons G and H is represented by a mixture of clay, silt, and sand turbidites / landslides. This sequence has an overall moderate-amplitude character. The chaotic nature of the deposits has likely compartmentalized sand bodies within this sequence and the sequence will have a low potential for SWF where reflections are low-amplitude and discontinuous and a moderate to high potential for SWF in area of moderate-amplitude and more continuous reflections.

Horizon H to Horizon I. The sediments between Horizon H and Horizon I are interpreted to be composed predominantly of silt and clay-prone mass transport deposits. The upper portion of this sequence displays an overall higher amplitude character than the lower portion of the sequence. A channel with potentially sand-prone levee deposits has been identified along Horizon H at the top of this sequence trending through the north central and east portion of MC 519 (Figure 4 and Map 1). This sequence is interpreted to have a low to high potential for SWF in the upper portion, a high potential for SWF in proximity to the mapped channel, and a low potential for SWF from the lower portion.

Horizon I to the limit of investigation (5,000 ft bml). The sediments between Horizon I and the investigation limit at 5,000 ft bml are interpreted to be composed of predominantly clays and silts. The interval has an overall low amplitude character and no channels have been identified within this interval. This interval has an overall low risk for SWF.

Conclusions and Recommendations

The following conclusions and recommendations are based on an assessment of 3-D seismic data and the previous Berger shallow hazards report (Berger, 2018). This section addresses the interpreted conditions from Horizon G to the investigation limit (5,000 ft bml).

Previous Shallow Hazards Assessment. For conclusions and recommendations regarding the shallow hazards conditions from the seafloor to Horizon G, refer to the previously completed report (Berger, 2018):

- *Shallow Hazards Assessment, Benthic Communities Evaluation, and Archaeological Assessment Review, Mississippi Canyon Area, Blocks 519 (Lease No. G27278) and 563 (Lease No. 21176), Gulf of Mexico*, prepared by Berger and submitted to Fieldwood on November 21, 2018.

Stratigraphy and Shallow Water Flow. Two additional stratigraphic marker horizons, Horizons H and I, were mapped in the subsurface study area. The subsurface study area lies within the defined limits of the regional SWF Blue Unit as well as the limits of the Green Unit (Berger et al, 2017). Although isolated sands may be encountered in all stratigraphic sequences, the lower half of the Horizon G to Horizon H sequence and the upper portion of the Horizon H to Horizon I sequence are considered to have the highest potential for SWF. These seismic sequences within the investigation limit are assessed with an overall low to high potential for SWF.

Subsurface Faulting. Faulting within the subsurface study area is the result of salt mobilization to the east. Faulting occurs as deep-seated growth faults affecting all horizons below Horizon G (Map 1 and Map 2). All faults mapped within the two block area are downthrown to the south. Mapped amplitude anomalies directly associated with faults indicate a potential for gas migration along the faults. We recommend caution when drilling through faults because of the potential for losses and encountering gas that has migrated from depth.

Shallow Gas. Minimum amplitude extractions were produced for three subsurface intervals between Horizon G and the investigation limit at 5,000 ft bml (Map 1). There is an overall low to high potential for shallow gas in the subsurface study area, with the potential increasing with proximity to anomalous amplitudes. We recommend avoiding amplitude anomalies that likely represent gas pockets within 250 ft of a proposed well location. If drilling within 250 ft of potential gas anomalies, be prepared with mitigation measures such as close ROV observation of the wellhead and possible increases in mud weight should be considered.

3. Wellsite Discussion

Shallow Hazards Assessment for Proposed Wells MC 519-A and MC 519-B

The following shallow hazards discussions are provided for Proposed Wells MC 519-A and MC 519-B with a surface locations in Mississippi Canyon Block 519. The following section assesses the potential hazards within the zone of interest (Horizon G to 5,000 ft bml) described within the previous sections of this report. In addition, previous interpretations have been included for the subsurface interval between the Seafloor and Horizon G from the following report:

- *Shallow Hazards Assessment, Benthic Communities Evaluation, and Archaeological Assessment Review, Mississippi Canyon Area, Blocks 519 (Lease No. G27278) and 563 (Lease No. 21176), Gulf of Mexico*, prepared by Berger and submitted to Fieldwood on November 21, 2018.

This assessment is intended to be used in conjunction with the Berger 2018 report and is not intended to satisfy BOEM NTL requirements as a stand-alone document.

Tophole Prognosis Criteria

The following sections specify the criteria used to develop the tophole prognosis for the proposed wells. The assessment is based on the evaluation of 3-D seismic data, and comparison to regional stratigraphic sequences, as available. The tophole assessments are restricted to the specific proposed well locations.

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

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

HIGH	The wellsite conditions meet ALL of the above stated criteria, and correlates to an existing well that encountered gas hydrates.
MODERATE	The wellsite conditions meet SEVERAL of the above stated criteria. There is no direct evidence of gas hydrates at nearby wells.
LOW	The wellsite conditions meet SOME of the above stated criteria, and does not correlate to nearby wells.
NEGLIGIBLE	The wellsite conditions meet FEW to NONE of the above stated criteria, and there is no evidence of gas hydrates at nearby wells.

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

- Does an anomalous amplitude event exist within 500 ft of the proposed well?
- Is there a phase reversal associated with the high-amplitude event?
- Is the anomalous amplitude within a sequence that may be sand-prone?
- Is there evidence of migration of fluid from depth, such as along a fault plane?
- Does the sequence correlate to other wells within the area that encountered shallow gas?
- Is the proposed well located in a frontier area with little or no offset well control?

HIGH	The amplitude event meets ALL of the above stated criteria, or correlates to an existing well that encountered shallow gas.
MODERATE	The amplitude event meets SEVERAL of the above stated criteria. There is no direct evidence of shallow gas from nearby wells.
LOW	The amplitude event meets SOME of the above stated criteria, and does not correlate to nearby wells.
NEGLIGIBLE	The amplitude event meets FEW to NONE of the above stated criteria, and there is no evidence of shallow gas from nearby wells.

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

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

HIGH	The stratigraphic unit meets ALL of the above stated criteria, or correlates to an existing well that encountered SWF.
MODERATE	The stratigraphic unit meets SEVERAL of the above stated criteria. There is no direct evidence of SWF from nearby wells.
LOW	The stratigraphic unit meets SOME of the above stated criteria, and does not correlate to nearby wells.
NEGLIGIBLE	The stratigraphic unit meets FEW to NONE of the above stated criteria, and there is no evidence of SWF from nearby wells.

Proposed Well MC 519-A

The following is a discussion of Proposed Well MC 519-A with an extended interpretation below Horizon G to 5,000 ft bml. The seafloor assessment considers surface conditions within a 2,000-ft radius from the proposed well. The subsurface assessment considers the conditions within a 500-ft radius of the proposed wellbore from the seafloor to 5,000 ft bml.

The water depth at Proposed Well MC 519-A location is 6,514 ft bsl (Map 3). The proposed well location is within an area of relatively smooth seafloor that slopes to the east at 1.7° (Map 3). The proposed location provided by Fieldwood is as follows:

Table 2. Location, block calls, and seismic lines for Proposed Well MC 519-A

NAD27 UTM Zone 16 North, US Survey ft		Geographic Coordinates	
X	Y	Latitude	Longitude
1,240,181	10,329,335	28° 27' 28.477" N	88° 14' 45.466" W
Block Calls		3-D Seismic Line Reference	
		Line	Trace
4,661’ FWL	1,655’ FSL	11421	11741

Twinned Location

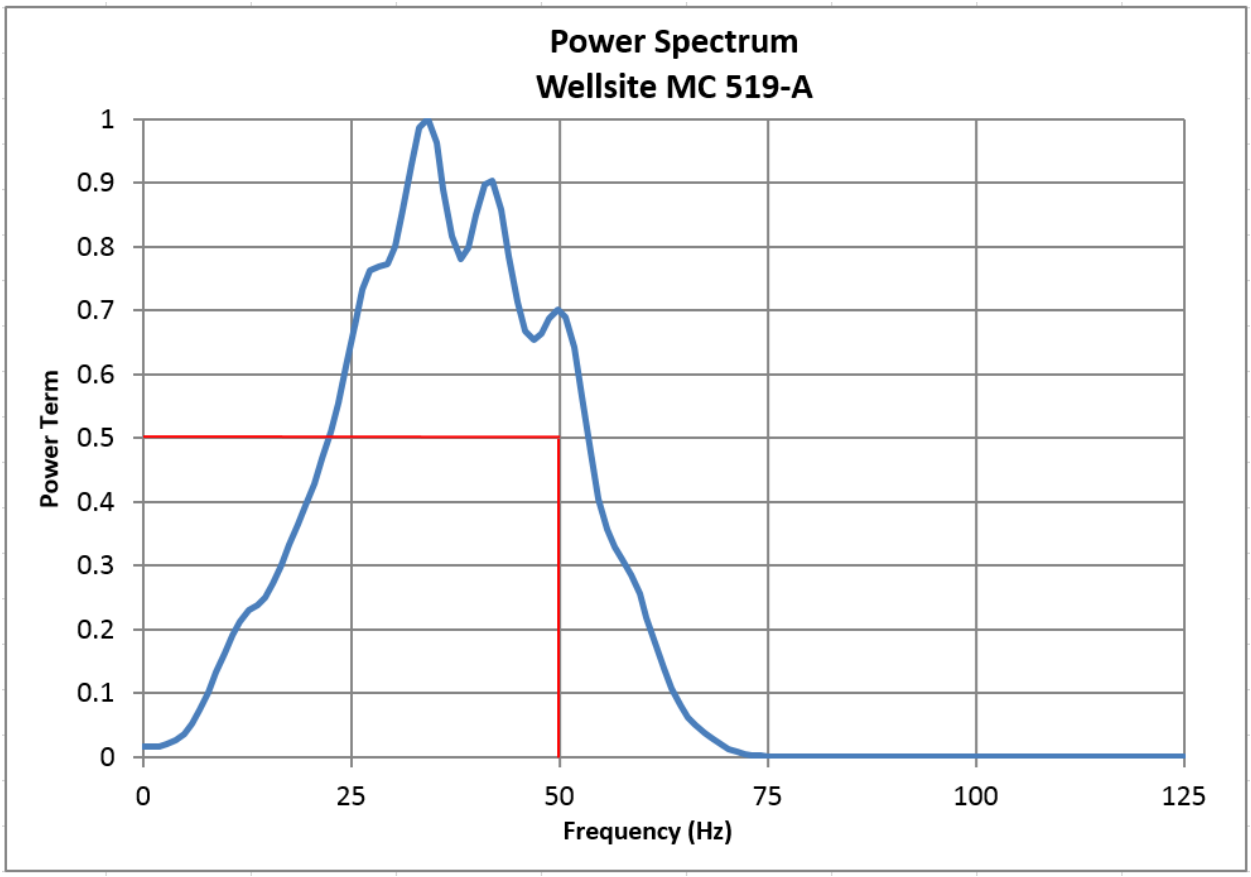
Proposed Well MC 519-Alt-A is 50 ft west from the Proposed Well MC 519-A and is intended to be used as a re-spud location. Seafloor and subsurface conditions at the twinned well are approximately equivalent to conditions at Proposed Well MC 519-A. No separate illustrations of the subsurface conditions were prepared. The proposed alternate drilling location is as follows:

Table 3. Location and block calls for Twinned Well MC 519-Alt-A

NAD27 UTM Zone 16 North, US Survey ft		Geographic Coordinates	
X	Y	Latitude	Longitude
1,240,131	10,329,335	28° 27' 28.472" N	88° 14' 46.026" W
Block Calls			
4,611’ FWL	1,655’ FSL		

Power Spectrum Analysis

The power spectrum for the proposed well was derived through the use of IHS Kingdom Suite's Trace Calculator tools. The frequency content within the upper 1.0 second below the seafloor is of sufficient quality for shallow hazards analysis.



Power spectrum at Proposed Well MC 519-A

Muds and Cuttings Discharge Area

Seafloor Conditions. Proposed Well MC 519-A is located in the southwestern quadrant of MC 519 (Figure 1). The seafloor in this area is hummocky and slopes gently to the east-southeast. Water depths near the proposed well location range from 6,447 ft to 6,581 ft bsl (Map 3)

There are no seafloor faults within 2,000 ft of the proposed well location (Map 3 and Map 4).

Benthic Communities. There is no evidence of fluid migration to the seafloor within 2,000 ft of Proposed Well MC 519-A. There are no seafloor amplitude anomalies identified within 2,000 ft of the proposed well (Map 5).

Features or areas that could support high-density chemosynthetic or other benthic communities are not anticipated within the proposed muds and cuttings discharge area.

Gas Hydrates. There are no BSRs or other seismic indicators of gas hydrates within 2,000 ft of the proposed well. Gas hydrates are not expected at the MC 519-A location.

Gas hydrates are not anticipated at the seafloor within the proposed muds and cuttings discharge area.

Wellbore Location

The water depth at the proposed well is 6,514 ft bsl (Map 3 and Figure 6). The seafloor at the proposed well slopes to the east with a grade of 1.7°.

There are no apparent seafloor faults within 500 ft of the proposed well.

Infrastructure. Based on the database maintained by the BOEM (2019), the following infrastructure is within 1,000 ft of the proposed well (Map 3, Map 4 and Map 5).

Table 4. Existing infrastructure within 1,000 ft of the proposed well MC 519-A location

Infrastructure	Distance	Bearing
MC 519-1 (G27278#1)	78 ft	295°
*Active 8-in Oil Pipeline Segment No. 18265	46 ft	345°
Active 8-in Oil Pipeline Segment No. 16281	52 ft	155°
Active 8-in Oil Pipeline Segment No. 16283	43 ft	14°
*Active 8-in Oil Pipeline Segment No. 16285	38 ft	40°
Inactive 12-in Pipeline Segment No. 16282	51.5 ft	155°
Active Umbilical Segment No. 16284	43 ft	14°
Active Umbilical Segment No. 16277	120 ft	265°

*well and PLEM jumpers not shown on maps

There is one well, four active oil pipelines, one inactive pipeline, and two umbilicals within 1,000 ft of the proposed well.

Unidentified Sonar Contacts. The high-resolution AUV geophysical data were used to evaluate seafloor conditions. No unidentified sonar contacts were reported within 100 ft of Proposed Well MC 519-A (see Map 2 of the Berger 2018 report).

No unidentified sonar contacts are located within 100 ft of the proposed well location.

Archaeological Contacts. A review of the archaeological assessment covering the proposed well location is summarized in Section 3 of the Berger 2018 report. There are no archaeologically significant contacts or archaeological avoidance zones within 1,000 ft of the proposed well (see Map 2 of the Berger 2018 report).

No archaeologically significant sonar contacts have been identified within 1,000 ft of the proposed well.

Stratigraphy. Nine stratigraphic marker horizons were traced within the subsurface study area. All of these marker horizons are defined below Proposed Well MC 519-A. A generalized description of the stratigraphic sequences from the seafloor to a depth of 5,000 ft BML can be found in Section 1.4 of the Berger 2018 report and in the preceding section of this addendum. The following is an assessment of the conditions that will be encountered directly below the surface location.

Seafloor to Horizon A. Horizon A is the first stratigraphic marker horizon traced on the 3-D seismic data; however, the SBP data provided more detailed information about the sediments in the upper half of this sequence.

Seafloor to SBP Penetration Limit. The sediments just below the seafloor are interpreted to consist of high-water-content hemipelagic clays (Figure 5). The high-water-content drape is 15 ft thick at the proposed well. Underlying stratified clays and silts comprise the shallow sediments to the limits of SBP data penetration. These sediments are conformable to the underlying irregular morphology produced by buried mass transport deposits (MTDs). The base of the stratified clays and silt, and top of the MTD's, is expected at 115 ft bml at the proposed well (Figure 5).

SBP Penetration Limit to Horizon A. The lower half of the Seafloor to Horizon A sequence is interpreted from 3-D seismic data to consist of MTDs that likely contain interbedded clays and silts. This portion of the sequence is 143 ft thick at the proposed well. Horizon A is mapped at 258 ft bml (Figure 6).

There is a ***low*** potential for gas hydrates from this sequence. There is a ***negligible*** potential for shallow gas from this sequence. There is a ***negligible*** potential for SWF from this sequence (Figure 6).

Horizon A to Horizon B. The stratigraphic sequence between Horizons A and B is composed of mass transport deposits and is 285 ft thick at the proposed location. This sequence is interpreted as the upper portion of the regionally defined Blue unit (Figure 3) as described by Ostermeier et al. (2002) and Winker and Booth (2000). This sequence likely contains clays and silts with a potential for isolated sand bodies. Horizon B is a prominent reflector at the base of this relatively low-amplitude sequence. A sand layer was identified on offset well data associated with the depth of Horizon B (see Figure 1-13 of the Berger 2018 report). Horizon B is expected at 543 ft bml, whereas the sand layer may occur between 499 ft and 581 ft bml (Figure 6).

There is a ***low*** potential for gas hydrates within this sequence. There is a ***negligible*** potential for shallow gas from within this sequence. There is a ***low*** potential for SWF from within this sequence (Figure 6).

Horizon B to Horizon C. The stratigraphic sequence between Horizons B and C is interpreted as the lower portion of the Blue unit. This portion of the Blue unit also contains MTDs. The top of this sequence is marked by prominent reflectors at and below Horizon B. These high-amplitude reflectors may represent an 82 ft thick interval of sheet sands that may be encountered down to 581 ft bml (Figure 6). The lower MTD portion of this sequence likely contains clays and silts with potential isolated sand bodies. The lower portion of this sequence is 302 ft thick at the proposed well. Horizon C is mapped at 883 ft bml (Figure 6).

There is a ***low*** potential for gas hydrates within this sequence. There is a ***negligible*** potential for shallow gas from within this sequence. There is a ***low*** potential for SWF from within this sequence (Figure 6).

Horizon C to Horizon D. The sequence between Horizons C and D is likely a clay-dominated turbidite deposit. The sequence is 199 ft thick at the proposed well. Horizon D is the base of these parallel-bedded turbidites and is interpreted at 1,082 ft bml (Figure 6).

There is a ***low*** potential for gas hydrates within this sequence. There is a ***negligible*** potential for shallow gas from within this sequence. There is a ***negligible*** potential for SWF from within this sequence (Figure 6).

Horizon D to Horizon E. This sequence is composed of channelized mass transport deposits. The proposed well lies about 3,395 ft north of the nearest prominent channel within this interval (Map 1). At the proposed well, the MTD sediments are interpreted as predominantly silts and clays with possible isolated sands near the base of the sequence. This sequence correlates to a low-severity SWF at the offset well MC 607 G09837-#1 completed in 1997 (Figure 1) and probably represents the Green unit SWF zone. However, no flow was reported from the nearest offset wells in MC 519, G27278#1 and G27278#2, 78 ft to the northwest and 4,108 ft to the north-northwest, respectively, which were completed in 2009 and 2010. Horizon E is expected at 1,706 ft bml (Figure 6) and the sequence is 624 ft thick at the proposed location.

There is a ***low*** potential for gas hydrates within this sequence. There is a ***negligible*** potential for shallow gas from within this sequence. There is a ***low*** potential for SWF from within this sequence (Figure 6).

Horizon E to Horizon F. The sequence between Horizons E and F is interpreted as a mass transport deposit containing interbedded silts, clays, and isolated sands (Figure 6). Horizon F is a prominent reflector mapped at 1,960 ft bml and the sequence is 254 ft thick at the proposed location.

The BGHSZ is estimated to occur at 1,838 ft bml based on Maekawa et al. (1995).

There is a ***low*** potential for gas hydrates from Horizon E to the BGHSZ (1,706 ft to 1,838 ft bml) and a ***negligible*** potential for gas hydrates from 1,838 ft bml to Horizon F (1,960 ft bml). There is a ***low*** potential for shallow gas from within this sequence. There is a ***low*** potential for SWF from within this sequence (Figure 6).

Horizon F to Horizon G. The sequence between Horizons F and G contains an upper unit interpreted as thinly-bedded turbidite deposits consisting of silts and clays and a lower unit of sand-prone mass transport deposits separated by an interface at 2,505 ft bml. The upper unit is 545 ft thick at the proposed well. The lower unit is about 328 ft thick at the proposed well and correlates to the stratigraphic unit at the depth of the reported SWF at the offset well MC 520 G09821-#H001, approximately 4.6 miles to the east. The MC 520 well was completed in 1997. The closest offset wells in MC 519 (#1 and #2), completed in 2009 and 2010, did not experience SWF associated with this lower unit. A second well in MC 520, the #2 well located near MC 520 G09821-#H001, was completed in 2009, also without experiencing SWF (BOEM, 2019). Horizon G is interpreted as an erosional surface at the base of the mass transport deposits and is mapped at 2,833 ft bml (Figure 6).

There is a ***negligible*** potential for gas hydrates within this sequence. There is a ***low*** potential for shallow gas from Horizon F at 1,960 ft to the interface at 2,505 ft bml and a ***moderate*** potential for shallow gas from 2,505 ft to Horizon G at 2,833 ft bml. There is a ***low*** potential for SWF from this sequence (Figure 6).

Horizon G to Horizon H. The sequence between Horizon G and Horizon H is interpreted to comprise intervals of landslide and debris flow deposits containing interbedded silt, clay, and sand alternating with turbidite deposits containing layered silts and sands (Figure 6).

The Horizon G to Horizon H sequence is 746 ft thick at the proposed location and Horizon H is mapped at 3,579 ft bml (10,469 ft bsl) (Map 2).

A fault intersection is expected at the base of this sequence coinciding with the depth of Horizon H at 3,579 ft bml.

There is a ***negligible*** potential for gas hydrates in this sequence. There is a ***moderate*** potential for shallow gas from this sequence. There is a ***low*** potential for SWF from this sequence (Figure 6).

Horizon H to Horizon I. The sequence between Horizons H and I is interpreted to contain an upper unit of interbedded silt and clay-dominated mass transport deposits and sand-prone channel overbank deposits overlying a lower unit of silt and clay-dominated mass transport deposits separated by an interface at 3,955 ft bml (Figure 6). The upper unit of this sequence is 376 ft of thick and the lower unit is 626 ft thick.

The Horizon H to Horizon I sequence is 1,002 ft thick at the proposed location and Horizon I is mapped at 4,581 ft bml.

There is a ***negligible*** potential for gas hydrates in this sequence. There is a ***moderate*** potential for shallow gas from Horizon H at 3,579 ft bml to the interface at 3,955 ft bml and a ***low*** potential for shallow gas from the interface at 3,955 ft bml to Horizon I at 4,581 ft bml. There is a ***low*** potential for SWF from within this sequence (Figure 6).

Horizon I to investigation limit (5,000 ft bml). The sediments below Horizon I to 5,000 ft bml are interpreted to consist of clay-rich mass transport deposits (Figure 6). The sediments are 419 ft thick at the proposed location. The base of this interval coincides with a prominent reflectors at 5,000 ft bml at the proposed wellbore.

There is a ***negligible*** potential for gas hydrates in this sequence. There is a ***low*** potential for shallow gas and a ***low*** potential for SWF from this interval (Figure 6).

Shallow Gas. There are no amplitude anomalies within 250 ft of the proposed well (Map 6). The nearest anomaly is between Horizons F and G about 510 ft northeast of the proposed well. This anomaly is associated with a buried fault and sandy mass transport deposits which may contain accumulated hydrocarbons that may have migrated along the deep-seated fault. Additional amplitude anomalies between Horizons F and G are located 705 ft to the north and 805 ft to the north-northwest.

Amplitude anomalies between Horizons G and H are located 1,050 ft east, 1,067 ft southeast, and 1,080 south-southeast of the proposed well (Map 6). These anomalies are similarly associated with sand-prone deposits and are adjacent to buried faults and likely indicate isolated gas charged sands.

Faults. There are no observed seafloor faults at or near Proposed Well MC 519-A. A vertical wellbore at Proposed Well MC 519-A will penetrate one buried fault within the investigation limit at 3,579 ft bml (10,093 ft bsl) (Figure 6).

There are no apparent seafloor faults within 250 ft of the proposed wellbore. There is one buried fault at 3,579 ft bml at the proposed MC 519-A location.

Proposed Well MC 519-B

The following is a discussion of Proposed Well MC 519-B with an extended interpretation below Horizon G to 5,000 ft bml. The seafloor assessment considers surface conditions within a 2,000-ft radius from the proposed well. The subsurface assessment considers the conditions within a 500-ft radius of the proposed wellbore from the seafloor to 5,000 ft bml.

The water depth at Proposed Well MC 519-B location is 6,515 ft bsl (Map 7). The proposed well is within an area of relatively smooth seafloor that slopes to the east at 0.4° (Map 1). The proposed location provided by Fieldwood is as follows:

Table 5. Location, block calls, and seismic lines for Proposed Well MC 519-B

NAD27 UTM Zone 16 North, US Survey ft		Geographic Coordinates	
X	Y	Latitude	Longitude
1,240,527	10,329,187	28° 27' 27.047" N	88° 14' 41.572" W
Block Calls		3-D Seismic Line Reference	
		Line	Trace
5,007 FWL	1,507' FSL	11424	11733

Twinned Location

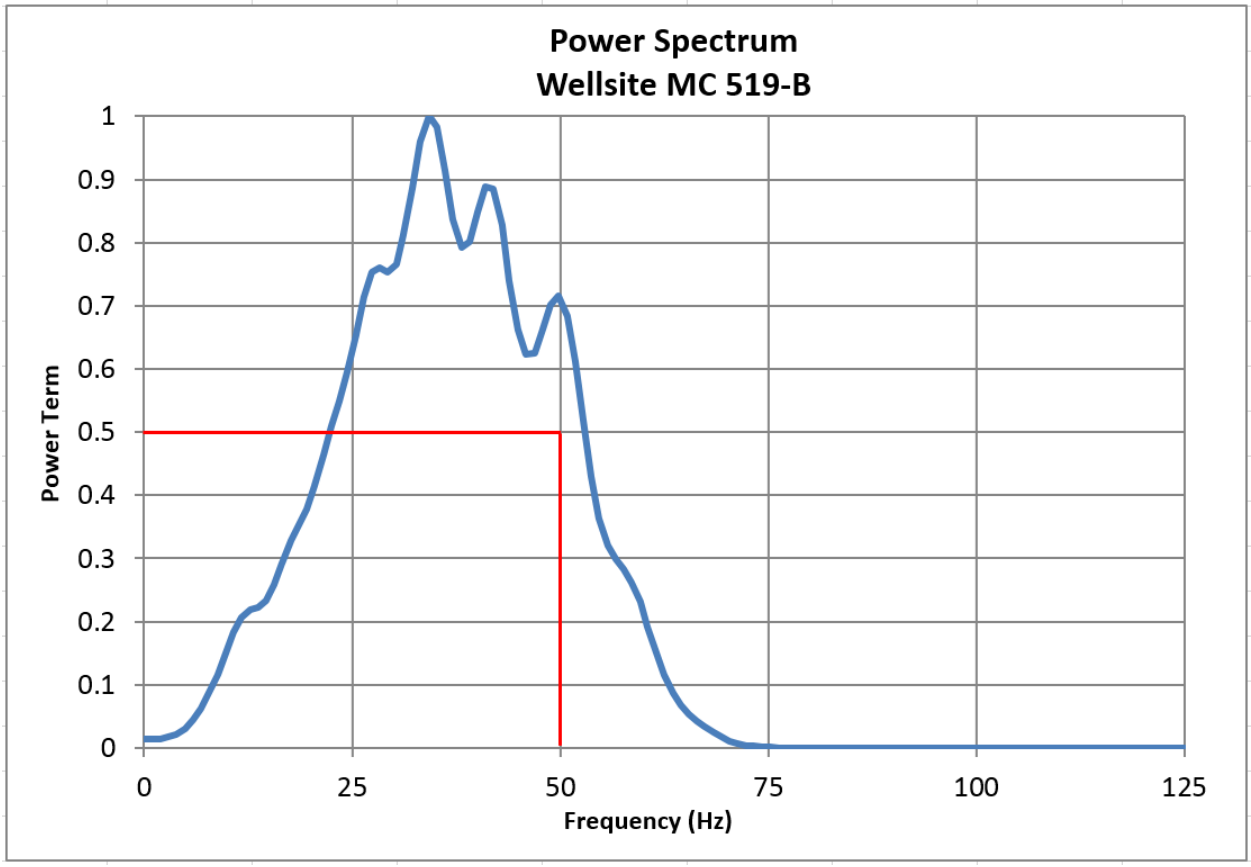
Proposed Well MC 519-Alt-B is 50 ft west from the Proposed Well MC 519-B and is intended to be used as a re-spud location. Seafloor and subsurface conditions at the twinned well are approximately equivalent to conditions at Proposed Well MC 519-B. No separate illustrations of the subsurface conditions were prepared. The proposed alternate drilling location is as follows:

Table 6. Location and block calls for Twinned Well MC 519-Alt-B

NAD27 UTM Zone 16 North, US Survey ft		Geographic Coordinates	
X	Y	Latitude	Longitude
1,240,477	10,329,187	28° 27' 27.042" N	88° 14' 42.132" W
Block Calls			
4,957' FWL	1,507' FSL		

Power Spectrum Analysis

The power spectrum for the proposed well was derived through the use of IHS Kingdom Suite's Trace Calculator tools. The frequency content within the upper 1.0 second below the seafloor is of sufficient quality for shallow hazards analysis.



Power spectrum at Proposed Well MC 519-B

Muds and Cuttings Discharge Area

Seafloor Conditions. Proposed Well MC 519-B is located in the southwestern portion of MC 519 (Figure 1). The seafloor in this area is hummocky and slopes gently to the east-southeast. Water depths near the proposed well location range from 6,456 ft to 6,584 ft bsl (Map 7)

There are no seafloor faults within 2,000 ft of the proposed well location (Map 7 and Map 8**)**

Benthic Communities. There is no evidence of fluid migration to the seafloor within 2,000 ft of Proposed Well MC 519-B. There are no seafloor amplitude anomalies identified within 2,000 ft of the proposed well (Map 9).

Features or areas that could support high-density chemosynthetic or other benthic communities are not anticipated within the proposed muds and cuttings discharge area.

Gas Hydrates. There are no BSRs or other seismic indicators of gas hydrates within 2,000 ft of the proposed well. Gas hydrates are not expected at the MC 519-B location.

Gas hydrates are not anticipated at the seafloor within the proposed muds and cuttings discharge area.

Wellbore Location

The water depth at the proposed well is 6,515 ft bsl (Map 7 and Figure 8). The seafloor at the proposed well slopes to the east with a grade of 0.4°.

There are no apparent seafloor faults within 500 ft of the proposed well.

Infrastructure. Based on the database maintained by the BOEM (2019), the following infrastructure is within 1,000 ft of the proposed well (Map 7, Map 8, and Map 9).

Table 7. Existing infrastructure within 1,000 ft of the proposed well MC 519-B location

Infrastructure	Distance	Bearing
MC 519-1 (G27278#1)	454 ft	293°
*Active 8-in Oil Pipeline Segment No. 18265	396 ft	299°
Active 8-in Oil Pipeline Segment No. 16281	298 ft	294°
Active 8-in Oil Pipeline Segment No. 16283	385 ft	298°
*Active 8-in Oil Pipeline Segment No. 16285	299 ft	294°
Inactive 12-in Pipeline Segment No. 16282	298 ft	294°
Active Umbilical Segment No. 16284	385 ft	298°
Active Umbilical Segment No. 16277	486 ft	286°

*well and PLEM jumpers not shown on maps

There is one well, four active oil pipelines, one inactive pipeline, and two umbilicals within 1,000 ft of the proposed well.

Unidentified Sonar Contacts. The high-resolution geophysical data were used to evaluate seafloor conditions. No unidentified sonar contacts were reported within 100 ft of Proposed Well MC 519-B (see Map 2 of the Berger 2018 report).

No unidentified sonar contacts are located within 100 ft of the proposed well location.

Archaeological Contacts. A review of the archaeological assessment covering the proposed well location is summarized in Section 3 of the Berger 2018 report. There are no archaeologically significant contacts or archaeological avoidance zones within 1,000 ft of the proposed well (see Map 2 of the Berger 2018 report).

No archaeologically significant sonar contacts have been identified within 1,000 ft of the proposed well.

Stratigraphy. Nine stratigraphic marker horizons were traced within the subsurface study area. All of these marker horizons are defined below Proposed Well MC 519-B. A generalized description of the stratigraphic sequences from the seafloor to a depth of 5,000 ft bml can be found in Section 1.4 of the Berger 2018 report and in the preceding section of this addendum. The following is an assessment of the conditions that will be encountered directly below the surface location.

Seafloor to Horizon A. Horizon A is the first stratigraphic marker horizon traced on the 3-D seismic data; however, the SBP data provided more detailed information about the sediments in the upper half of this sequence.

Seafloor to SBP Penetration Limit. The sediments just below the seafloor are interpreted to consist of high-water content hemipelagic clays (Figure 7). The high-water content drape is 18 ft thick at the proposed well. Underlying stratified clays and silts comprise the shallow sediments to the limits of SBP data penetration. These sediments are conformable to the underlying irregular morphology produced by buried mass transport deposits (MTDs). The base of the stratified clays and silts and top of the MTD's is expected at 113 ft bml at the proposed well (Figure 7).

SBP Penetration Limit to Horizon A. The lower half of the Seafloor to Horizon A sequence is interpreted from 3-D seismic data to consist of MTDs that likely contain interbedded clays and silts. This portion of the sequence is 145 ft thick at the proposed well. Horizon A is mapped at 258 ft bml (Figure 8).

There is a ***low*** potential for gas hydrates from this sequence. There is a ***negligible*** potential for shallow gas from this sequence. There is a ***negligible*** potential for SWF from this sequence (Figure 8).

Horizon A to Horizon B. The stratigraphic sequence between Horizons A and B is composed of a mass transport deposits and is 288 ft thick at the proposed location. This sequence is interpreted as the upper portion of the regionally defined Blue unit (Figure 3) as described by Ostermeier et al. (2002) and Winker and Booth (2000). This sequence likely contains clays and silts with a potential for isolated sand bodies. Horizon B is a prominent reflector at the base of this relatively low-amplitude sequence. A sand layer was identified on offset well data associated with the depth of Horizon B (see Figure 1-13 of the Berger 2018 report). Horizon B is mapped at 546 ft bml, whereas the sand layer may occur between 507 ft and 579 ft bml (Figure 8).

There is a ***low*** potential for gas hydrates within this sequence. There is a ***negligible*** potential for shallow gas from within this sequence. There is a ***low*** potential for SWF from this sequence (Figure 8).

Horizon B to Horizon C. The stratigraphic sequence between Horizons B and C is interpreted as the lower portion of the Blue unit. This portion of the Blue unit also contains MTDs. The top of this sequence is marked by prominent reflectors at and below Horizon B. These high-amplitude reflectors may represent a 72-ft thick deposit of sheet sands that may be encountered down to 579 ft bml (Figure 8). The lower MTD portion of this sequence likely contains clays and silts with potential isolated sand bodies. The lower portion of this sequence is 309 ft thick at the proposed well. Horizon C is mapped at 888 ft bml (Figure 8).

There is a ***low*** potential for gas hydrates within this sequence. There is a ***negligible*** potential for shallow gas from within this sequence. There is a ***low*** potential for SWF from within this sequence (Figure 8).

Horizon C to Horizon D. The sequence between Horizons C and D is likely a clay-dominated turbidite deposit. The sequence is 194 ft thick at the proposed well. Horizon D is the base of these parallel-bedded turbidites and is interpreted at 1,082 ft bml (Figure 8).

There is a ***low*** potential for gas hydrates within this sequence. There is a ***negligible*** potential for shallow gas from within this sequence. There is a ***negligible*** potential for SWF from within this sequence (Figure 8).

Horizon D to Horizon E. This sequence is composed of channelized mass transport deposits. The proposed well lies about 3,160 ft north of the nearest prominent channel within this interval (Map 1). At the proposed well, the MTD sediments are interpreted as predominantly silts and clays with possible isolated sands near the base of the sequence. This sequence correlates to a low-severity SWF at the offset well MC 607 G09837-#1 completed in 1997 (Figure 1) and probably represents the Green unit SWF zone. However, no flow was reported from the nearest offset wells in MC 519, G27278#1 and G27278#2, 545 ft to the northwest and 4,425 ft to the north-northwest, respectively, which were completed in 2009 and 2010. Horizon E is expected at 1,715 ft bml (Figure 8).

There is a ***low*** potential for gas hydrates within this sequence. There is a ***negligible*** potential for shallow gas from within this sequence. There is a ***low*** potential for SWF from within this sequence (Figure 8).

Horizon E to Horizon F. The sequence between Horizons E and F is interpreted as a mass transport deposit containing interbedded silts, clays, and isolated sands (Figure 8). Horizon F is a prominent reflector mapped at 1,963 ft bml and the sequence is 248 ft thick at the proposed location.

The BGHSZ is estimated to occur at 1,838 ft bml based on Maekawa et al. (1995).

There is a ***low*** potential for gas hydrates from Horizon E to the BGHSZ (1,715 ft to 1,838 ft bml) and a ***negligible*** potential for gas hydrates from 1,838 ft bml to Horizon F (1,963 ft bml). There is a ***low*** potential for shallow gas from within this sequence. There is a ***low*** potential for SWF from within this sequence (Figure 8).

Horizon F to Horizon G. The sequence between Horizons F and G contains an upper unit interpreted as thinly-bedded turbidite deposits containing silts and clays and a lower unit of sand-prone mass transport deposits separated by an interface at 2,512 ft bml. The upper unit is 549 ft thick at the proposed well. The lower unit is about 334 ft thick at the proposed well and correlates to the stratigraphic unit at the depth of the reported SWF at the offset well MC 520 G09821-#H001 approximately 4.6 miles to the east. The MC 520 well was completed in 1997. The closest offset wells in MC 519 (#1 and #2), completed in 2009 and 2010, did not experience any flow associated with this lower unit. A second well in MC 520 (#H002), located near MC 520 G09821-#H001, was completed in 2009 also without experiencing SWF (BOEM, 2019). Horizon G is the erosional surface at the base of the mass transport deposits and is mapped at 2,846 ft bml (Figure 8).

There is a ***negligible*** potential for gas hydrates within this sequence. There is a ***low*** potential for shallow gas from Horizon F at 1,963 ft to the interface at 2,512 ft bml and a ***moderate*** potential for shallow gas from 2,512 ft to Horizon G at 2,846 ft bml. There is a ***low*** potential for SWF from this sequence (Figure 8).

Horizon G to Horizon H. The sequence between Horizon G and Horizon H is interpreted to comprise intervals of landslide and debris flow deposits containing interbedded silt, clay, and sand alternating with turbidite deposits containing layered silts and sands (Figure 8).

The Horizon G to Horizon H sequence is 756 ft thick at the proposed location and Horizon H is mapped at 3,602 ft bml (10,117 ft bsl) (Map 2).

There is a ***negligible*** potential for gas hydrates in this sequence. There is a ***moderate*** potential for shallow gas from this sequence. There is a ***low*** potential for SWF from this sequence (Figure 8).

Horizon H to Horizon I. The sequence between Horizons H and I is interpreted to contain an upper unit of interbedded silt and clay-dominated mass transport deposits and sand-prone channel overbank deposits overlying a lower unit of silt and clay-dominated mass transport deposits separated by an interface at 4,255 ft bml (Figure 8). The upper unit of this sequence is 653 ft thick and the lower unit is 326 ft thick.

The Horizon H to Horizon I sequence is 979 ft thick at the proposed location and Horizon I is mapped at 4,581 ft bml.

A fault intersection is expected within this sequence coinciding with the depth of of the interface at 4,255 ft bml.

There is a ***negligible*** potential for gas hydrates in this sequence. There is a ***moderate*** potential for shallow gas from Horizon H at 3,602 ft bml to the interface at 4,255 ft bml and a ***low*** potential for shallow gas from the interface at 4,255 ft bml to Horizon I at 4,581 ft bml. There is a ***low*** potential for SWF from this sequence (Figure 8).

Horizon I to investigation limit (5,000 ft bml). The sediments below Horizon I to 5,000 ft bml are interpreted to consist of clay-rich mass transport deposits (Figure 8). The sediments are 419 ft thick at the proposed location. The base of this interval is coincides with a prominent reflector at 5,000 ft BML at the proposed wellbore.

There is a ***negligible*** potential for gas hydrates in this sequence. There is a ***low*** potential for shallow gas and a ***low*** potential for SWF from this interval (Figure 8).

Shallow Gas. There are no amplitude anomalies within 250 ft of the proposed well (Map 10). The nearest anomaly is between Horizons F and G about 623 ft north of the proposed well. This anomaly is associated with a buried fault and sandy mass transport deposits which may contain accumulated hydrocarbons that may have migrated along the deep-seated fault. Additional amplitude anomalies between Horizons F and G are located 920 ft and 1,125 ft to the north-northwest and 1,125 ft to the north.

Amplitude anomalies between Horizons G and H are located 736 ft east-northeast, 765 ft southeast, and 785 south-southeast of the proposed well (Map 6). These anomalies are similarly associated with sand-prone deposits and are adjacent to buried faults and likely indicated isolated gas charged sands.

Faults. There are no observed seafloor faults at or near Proposed Well MC 519-B. A vertical wellbore at Proposed Well MC 519-B will penetrate one buried fault within the investigation limit at 4,255 ft bml (Figure 8).

There are no apparent seafloor faults within 250 ft of the proposed wellbore. There is one buried fault at 4,255 ft bml at the proposed MC 519-B location.

4. References

Berger Geosciences, (Berger) LLC., 2018. *Shallow Hazards Assessment, Benthic Communities Evaluation, and Archaeological Assessment Review, Mississippi Canyon Area, Blocks 519 (Lease No. G27278) and 563 (Lease No. 21176), Gulf of Mexico*. Project number 18-10-29. prepared by Berger and submitted to Fieldwood on November 21, 2018.

Berger, W., Keenan, J., Metz, Z., Ul-Hadi, S., Wedding, D., Sudhakar, R., Mo, D., Qian, Z., Bisrat, S., Deshpande, A., 2017. Seismic Geomorphology and Overpressure Variation in the Shallow Water Flow (SWF) Prone Sand Units in the North-Central Gulf of Mexico. Poster; April 4, 2017 AAPG Annual Convention and Exhibition, Houston, Texas.

Bureau of Ocean Energy Management, 2019. ASCII Data and Geographic Mapping Data. Published on the BOEM Gulf of Mexico Data Center. Accessed: June 2019. Available online at: https://www.data.boem.gov/Main/Mapping.aspx

C & C Technologies, Inc., 2006. *Archaeological and Hazard Study, Isabela Prospect, Block 562 (OCS-G-19966) and Vicinity, Mississippi Canyon Area*. C & C Project No. 8851-061235. June 2006.

Maekawa, T., Itoh, S., Sakata, A., Igari, S.I., and Imai, N., 1995. Pressure and temperature conditions for methane hydrate dissociation in sodium chloride solutions. Geochemical Journal. 29, 325-329.

Ostermeier, R.M., Pelletier, J.H., Winker, C.D., Nicholson, J.W., Rambow, F.H., and Cowan, K.M., 2002. Dealing with shallow-water flow in the deepwater Gulf of Mexico. The Leading Edge. 21, 660-668.

Winker, C.D., and J.R. Booth, 2000. Sedimentary dynamics of the salt-dominated continental slope, Gulf of Mexico: Integration of observations from the seafloor, near-surface, and deep subsurface, in P. Weimer, R. M. Slatt, J. Coleman, N. C. Rosen, H. Nelson, A. H. Bouma, M. J. Styzen, and D. T. Lawrence, eds., Deep-water Reservoirs of the World: SEPM Gulf Coast Section 20th Annual Research Conference, p. 1059-1086.

APPENDIX D
HYDROGEN SULFIDE INFORMATION

A) CONCENTRATION

In accordance with NTL 2008-G04, this information is not applicable to this plan as Talos QN Exploration LLC does not anticipate encountering any H2S during the operations proposed herein.

B) CLASSIFICATION

In accordance with 30 CFR 250.490(c), Mississippi Canyon Block 519 has been, previously, classified by the DOI as H2S absent.

PROPRIETARY INFORMATION

C) H2S CONTINGENCY PLAN

In accordance with NTL 2008-G04, this information is not applicable to this plan as Talos QN Exploration LLC does not anticipate encountering H2S during the activities proposed herein.

D) MODELING REPORT

In accordance with NTL 2008-G04, this information is not applicable to this plan as Talos QN Exploration LLC does not anticipate encountering H2S during the activities proposed herein.

APPENDIX E
MINERAL RESOURCE CONSERVATION INFORMATION

A) TECHNOLOGY & RESERVOIR ENGINEERING PRACTICES & PROCEDURES

In accordance with NTL 2008-G04, this information is not applicable to the activities proposed herein as this is an Exploration Plan.

B) TECHNOLOGY & RECOVERY PRACTICES & PROCEDURES

In accordance with NTL 2008-G04, this information is not applicable to the activities proposed herein as this is an Exploration Plan.

C) RESERVOIR DEVELOPMENT

In accordance with NTL 2008-G04, this information is not applicable to the activities proposed herein as this is an Exploration Plan.

APPENDIX F
BIOLOGICAL, PHYSICAL, & SOCIOECONOMIC INFORMATION

A) CHEMOSYNTHETIC COMMUNITIES REPORT

The activities proposed herein could disturb seafloor areas in water depths of 984 feet or greater. An assessment of chemosynthetic communities associated with the subject lease area is included with the Shallow Hazards and Archaeological Assessment previously approved under Plan Control No. N-9122.

B) TOPOGRAPHIC FEATURES MAP

In accordance with NTL 2008-G04, this information is not applicable to the activities proposed herein as no rig, barge or anchors,etc. will be placed within 1,000 feet of the "No Activity Zone" of an identified topographic feature.

C) TOPOGRAPHIC FEATURES STATEMENT (SHUNTING)

In accordance with NTL 2008-G04, this information is not applicable to the activities proposed herein as Talos QN Exploration LLC is not proposing to drill more than two wells from the same surface location.

D) LIVE BOTTOM (PINNACLE TREND) MAP

In accordance with NTL 2008-G04, this information is not applicable to the activities proposed herein as the Live Bottom (Pinnacle Trend) lease stipulation is not attached to the subject lease(s).

E) LIVE BOTTOM (LOW RELIEF) MAP

In accordance with NTL 2008-G04, this information is not applicable to the activities proposed herein as the Live Bottom (Low Relief) lease stipulation is not attached to the subject lease(s).

F) POTENTIALLY SENSITIVE BIOLOGICAL FEATURES

In accordance with NTL 2009-G39. this information is not applicable to the activities proposed herein as the bottom-disturbing activities are not within 100 feet of potentially sensitive biological features.

G) REMOTELY OPERATED VEHICLE (ROV) SURVEYS

This is not applicable as NTL No. 2008-G06 has expired.

H) THREATENED & ENDANGERED SPECIES, CRITICAL HABITAT, & MARINE MAMMAL INFORMATION

Endangered marine mammal species as listed under the Endangered Species Act that might occur in the Gulf of Mexico are the Gulf of Mexico Bryde's Whale (Balaenoptera edeni), Oceanic Whitetip Shark (Carcharhinus longimanus), Giant Manta Ray (Manta birostris), West Indian manatee (Trichechus manatus), northern right whale (Eubalaena glacialis), fin whale (Balaenoptera physalus), humpback whale (Megaptera novaiangliae), sei whale (Balaenoptera borealis), sperm whale (Physeter macrocephalus), and blue whale (Balaenoptera musculus). Endangered or threatened sea turtle species that might occur in the Gulf of Mexico are Kemp's ridley (Lepidochelys kempii), green turtle (Chelonia mydas), hawksbill (Eretmochelys imbricate), leatherback (Demochelys coriacea), and loggerhead (Caretta caretta) (USDOI, OCS EIS/EA MMS 2007-2012). The only listed threatened fish species in the Gulf of Mexico is the Gulf sturgeon (Ancipenser oxyrincus desotoi).The subject area(s) and block(s) is not designated as a critical habitat for any of these species. Talos Energy Offshore LLC does not anticipate that any threatened or endangered species will be adversely affected as a result of the activities proposed herein. However, in the unlikely event of an accident, adverse impacts to endangered marine mammal species are possible.

Talos Energy Offshore LLC will adhere to the requirements as set forth in the following Notices to Lessees and guidelines, as applicable, to avoid or minimize impacts to any of the species listed in the ESA as a result of the operations conducted herein:

- NTL 2015-G03 "Marine Trash and Debris Awareness and Elimination"
- BOEM NTL 2016-G01 "Vessel Strike Avoidance and Injured/ Dead Protected Species Reporting
- BOEM NTL 2016-G02 "Implementation of Seismic Survey Mitigation Measures and Protected Species Observer Program"
- Biological Opinion 2020:
- Appendix A: Seismic Survey Mitigation and Protected Species Observer Protocols, found in the Biological Opinion issued by the National Marine Fisheries Service on March 13,2020
- Appendix B: Gulf of Mexico Marine Trash and Debris Awareness and Elimination Survey Protocols, found in the Biological Opinion issued by the National Marine Fisheries Service on March 13,2020
- Appendix C: Gulf of Mexico Vessel Strike Avoidance and Injured/Dead Aquatic Protected Species Reporting Protocols, found in the Biological Opinion issued by the National Marine Fisheries Service on March 13,2020
- Appendix J: Sea Turtle Handling and Resuscitation Guidelines, found in the Biological Opinion issued by the National Marine Fisheries Service on March 13,2020

I) ARCHAEOLOGICAL REPORT

An assessment of the archaeological resources associated with the subject lease area is included with the Shallow Hazards and Archaeological Assessment previously approved under Plan Control No. N-9122.

J) AIR & WATER QUALITY INFORMATION

In accordance with NTL 2008-G04, this information is not applicable to the activities proposed herein as the State of Florida is not an affected State.

K) SOCIOECONOMIC INFORMATION

In accordance with NTL 2008-G04, this information is not applicable to the activities proposed herein as the State of Florida is not an affected State.

APPENDIX G
WASTES AND DISCHARGES INFORMATION

A) PROJECTED GENERATED WASTES

In accordance with 30 CFR 250.217 and 30 CFR 250.248, information must be provided on all projected solid and liquid wastes likely to be generated by an operator's proposed activities including operational wastes permitted by the appropriate NPDES permit and any other identified wastes. Attached to this appendix is a table entitled "Wastes you will transport and/or dispose of onshore" which satisfies the requirements set forth by NTL 2008-G04 and the aforementioned CFRs.

B) PROJECTED OCEAN DISCHARGES

In accordance with 30 CFR 250.217 and 30 CFR 250.248, information must be provided on all projected solid and liquid wastes likely to be generated by an operator's proposed activities including operational wastes permitted by the appropriate NPDES permit and any other identified wastes. Attached to this appendix is a table entitled "Wastes you will generate, treat and downhole dispose or discharge to the GOM" which satisfies the requirements set forth by NTL 2008-G04 and the aforementioned CFRs.

C) MODELING REPORT

In accordance with NTL 2008-G04, this information is not applicable to the activities proposed herein as the subject activities do not require an individual NPDES permit. Therefore, a modeling report is not mandated.

D) NPDES PERMITS

The subject rig and/or facility will be covered under Talos QN Exploration LLC's General Permit upon commencement of the activities proposed herein.

E) COOLING WATER INTAKES

In accordance with NTL 2008-G04, this information is not applicable to the activities proposed herein as the associated leases are within the Gulf of Mexico Region.

TABLE 1. WASTES YOU WILL GENERATE, TREAT AND DOWNHOLE DISPOSE OR DISCHARGE TO THE GOM - MC 519

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	Answer yes or no
Will drilling occur ? If yes, you should list muds and cuttings		Yes			
Water-based drilling fluid	Water based drilling fluids used while drilling riserless	45000 bbls/well	9000 bbls/day/well	discharge at seafloor during riserless operations	No
Cuttings wetted with water-based fluid	Cuttings generated while using water based drilling fluids in riserless operations	2400 bbls/well	480 bbls/day/well	discharge at seafloor during riserless operations	No
Cuttings wetted with synthetic-based fluid	Cuttings generated while using synthetic based drilling fluid	3850 bbls/well	110 bbls/day/well	dried & discharge overboard	No
Will humans be there? If yes, expect conventional waste					
Domestic waste	grey water from living quarters	9600 bbls/well	240 bbls/hr/well	USCG approved MSD with chlorination and discharge overboard	No
Sanitary waste	treated sanitary waste from living quarters	7680 bbls/well	192 bbls/hr/well	USCG approved MSD with chlorination and discharge overboard	No
Is there a deck? If yes, there will be Deck Drainage					
Deck Drainage	washwater, rain water and deck drainage	11520 bbls/well	288 bbls/hr/well	discharge overboard	No
Will you conduct well treatment, completion, or workover?					
Well treatment fluids	11.5 Sodium Bromide	N/A	N/A	N/A	N/A
Well completion fluids	Calcium Bromide & Glycol	12,000 bbls	N/A	Completion fluid is recyled from well to well and is not discharged	No
Workover fluids	N/A	N/A	N/A	N/A	N/A
Miscellaneous discharges. If yes, only fill in those associated with your activity.					
Desalinization unit discharge	desalinization unit water	4000 bbls/well	100 bbls/day/well	discharge overboard	N/A
Blowout prevent fluid	Water-based hydraulic control fluid	62 bbls/well	2 bbls/day/well	discharged from vent ports on BOP stack	NA
Uncontaminated Ballast water	Uncontaminated seawater	160000 bbls/well	4000 bbls/day/well	per MARPOL regulations	NA
Rig Wash Water	Fresh Water & Soap	2000 bbls/well	50 bbls/day/well	discharge overboard	NA
Uncontaminated Bilge water	Uncontaminated bilge water	800 bbls/well	20 bbls/day/well	discharge overboard	NA
Excess cement at seafloor	Water, CaCl Class H cement & rheological modifiers	1600 bbls/well	800 bbls/day for 2 days/well (only when the 22" casing are run)	discharge at seafloor	NA
Cement Spacer	Water base fluid, viscosifier, barite & gel	200 bbls/well	100 bbls/day for 2 days/well (only when the 22" casing are run)	discharge at seafloor	NA
Fire water	Seawater	NA	NA	discharge overboard	NA
Uncontaminated Cooling water	Seawater	NA	NA	discharge overboard	NA
Will you produce hydrocarbons? If yes fill in for produced water.					
Produced water (During Well Test)	N/A	N/A	N/A	N/A	N/A
Will you be covered by an individual or general NPDES permit ?		General Permit			

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

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

TABLE 2. WASTES YOU WILL TRANSPORT AND /OR DISPOSE OF ONSHORE, MC 519

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	Used SBM consisting of base oil (isomerized alpha olefin), barite, CaCl, Acrylate Copolymer, Limestone, Lime, and invert emulsifiers and wetting agent, assuming surface volume only	Below deck storage tanks on offshore support vessels	Mud Supplier Facility, Fourchon, LA	6000 bbls/well	Returned to Mud Supplier Facility in Fourchon and reconditioned for future use
Synthetic-based drilling fluid or mud	Contaminated used synthetic-based drilling fluid	Below deck storage tanks on offshore support vessels	ECOSERV/Fourchon	Varies	Recycle / Injection well
Cuttings wetted with Water-based fluid	N/A	N/A	N/A	N/A	N/A
Cuttings wetted with Synthetic-based fluid	Formation cuttings, SBM Base oil (isomerized alpha olefin), barite, CaCl, Acrylate Copolymer, LCM, Limestone, Lime, and invert emulsifiers and wetting agent contaminated with formation oil	Cuttings boxes on supply vessels	ECOSERV/Fourchon	5000 bbls/well	Recycle / Injection well
Cuttings wetted with oil-based fluids	N/A	N/A	N/A	N/A	N/A
Displacement Pills & Interface	Base oil, barite, water wetting agents, surfactants & viscosifyers	Hull Storage tanks or DOT tanks on supply vessels	R360 Environmental Solutions/Fourchon	500 bbls/well	Recycle / Injection well
Excess Water Base Mud	Freshwater, CaCl, NaCl, Barite, Bentonite, Lime, XCD Polymer	Below deck storage tanks on offshore support vessels	Mud Supplier Facility, Fourchon, LA	10000 bbls/well	Returned to Mud Supplier Facility in Fourchon and reconditioned for future use
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	Domestic trash, plastic, paper, aluminum	40 cu ft super sacks transported by boat	Progresso Galliano Waste	800 lbs/week/well	Landfill or recycled and disposed per classification
Contaminated pills & interface	Base oil, barite, water wetting agents, surfactants & viscosifyers, contaminated mud and brine with formation oil	Transport to shore by boat in drums or DOT tanks for disposal at an approved disposal facility	R360 Environmental Solutions/Fourchon	500 bbls/well	Recycle / Injection well
Used oil	Oil	550 gal tote tank transported by boat	Martin Energy/Fourchon	20 bbls/mo/well	Recycle
Wash water from mud tanks	Water, surfactants & solids from mud system if zero discharge	Hull Storage tanks or DOT tanks on supply vessels	R360 Environmental Solutions/Fourchon	1500 bbls/mo/well	Recycle / Injection well
Chemical Product Wastes	Paint & thinner waste	Drums or tote tanks on supply vessels	EDI Environmental Services/ Lafayette LA	10 bbls/mo/well	Recycle
Drums of oily rags & filters	Oily rags and filters impregnated with oil & grease	DOT drums transported by boat	Martin Energy/Fourchon	5 drums/mo/well	Recycle

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

Wastes you will transport and/or dispose of onshore

APPENDIX H
AIR EMISSIONS INFORMATION

A) Attached to this appendix are emissions worksheets showing the emissions calculations for the Plan Emissions, and if different, a set of worksheets showing the emissions calculations for the Complex Total emissions.

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

COMPANY	Talos QN Exploration LLC
AREA	Mississippi Canyon
BLOCK	519
LEASE	OCS-G 27278
FACILITY	N/A
WELL	A
COMPANY CONTACT	Erin Harold
TELEPHONE NO.	713-335-6952
REMARKS	Drilling & completion of Well A using drillship or DP Semisubmersible. This includes potential rig emissions each year to allow for scheduling flexibility.

Air Emissions Spreadsheet

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	https://www3.epa.gov/ttn/chief/ap42/ch13/final/C13S05_02-05-18.pdf
Combustion Flare (light smoke)	lbs/MMscf	2.10	2.10	2.10	0.57	71.40	35.93	N/A	325.5	N/A	AP42 13.5-1, 13.5-2	2/18	
Combustion Flare (medium smoke)	lbs/MMscf	10.50	10.50	10.50	0.57	71.40	35.93	N/A	325.5	N/A	AP42 13.5-1, 13.5-2	2/18	
Combustion Flare (heavy smoke)	lbs/MMscf	21.00	21.00	21.00	0.57	71.40	35.93	N/A	325.5	N/A	AP42 13.5-1, 13.5-2	2/18	
Liquid Flaring	lbs/bbl	0.42	0.0966	0.0651	5.964	0.84	0.01428	5.14E-05	0.21	0.0336	AP42 1.3-1 through 1.3-3 and 1.3-5	5/10	https://www3.epa.gov/ttnchie1/ap42/ch01/final/c01s03.pdf
Storage Tank	tons/yr/tank						4.300				2014 Gulfwide Inventory; Avg emiss (upper bound of 95% CI)	2017	https://www.boem.gov/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	https://www.epa.gov/moves/nonroad2008a-installation-and-updates
On-Ice – Other Construction Equipment	lbs/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model; TSP (units converted) refer to Diesel Recip. <600 reference	2009	
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	
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 Spreadsheet

AIR EMISSIONS CALCULATIONS - 1ST YEAR

COMPANY	AREA		BLOCK	LEASE	FACILITY	WELL					CONTACT		PHONE		REMARKS										
Talos QN Exploration LLC	Mississippi Canyon		519	OCS-G 27278	N/A	A					Erin Harold		713-335-6952		Drilling & completion of Well A using drillship or DP Semisubmersible. This includes potential rig emissions each year to allow for scheduling flexibility.										
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	75	43.60	26.30	25.51	0.63	1044.59	30.03	0.00	163.84	0.30	39.24	23.67	22.96	0.57	940.13	27.03	0.00	147.46	0.27
	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
2024	**Facility Total Emissions**							**43.60**	**26.30**	**25.51**	**0.63**	**1,044.59**	**30.03**	**0.00**	**163.84**	**0.30**	**39.24**	**23.67**	**22.96**	**0.57**	**940.13**	**27.03**	**0.00**	**147.46**	**0.27**
EXEMPTION CALCULATION	**DISTANCE FROM LAND IN MILES**																**2,197.80**			**2,197.80**	**2,197.80**	**2,197.80**		**55,527.51**	
	66.0																								
DRILLING	VESSELS- Crew Diesel		394	20.269724	486.47	18	40	0.28	0.17	0.16	0.00	6.66	0.19	0.00	1.04	0.00	0.10	0.06	0.06	0.00	2.40	0.07	0.00	0.38	0.00
	VESSELS - Supply Diesel		6630	341.08698	8186.09	18	30	4.68	2.82	2.74	0.07	112.06	3.22	0.00	17.58	0.03	1.26	0.76	0.74	0.02	30.26	0.87	0.00	4.75	0.01
	VESSELS - Tugs Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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
2024	**Non-Facility Total Emissions**							**4.96**	**2.99**	**2.90**	**0.07**	**118.72**	**3.41**	**0.00**	**18.62**	**0.03**	**1.36**	**0.82**	**0.80**	**0.02**	**32.66**	**0.94**	**0.00**	**5.12**	**0.01**

Air Emissions Spreadsheet

AIR EMISSIONS CALCULATIONS - 2ND YEAR

COMPANY	AREA		BLOCK	LEASE	FACILITY	WELL					CONTACT		PHONE		REMARKS										
Talos QN Exploration LLC	Mississippi Canyon		519	OCS-G 27278	N/A	A					Erin Harold		713-335-6952		Drilling & completion of Well A using drillship or DP Semisubmersible. This includes potential rig emissions each year to allow for scheduling flexibility.										
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	75	43.60	26.30	25.51	0.63	1044.59	30.03	0.00	163.84	0.30	39.24	23.67	22.96	0.57	940.13	27.03	0.00	147.46	0.27
	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
2025	**Facility Total Emissions**							**43.60**	**26.30**	**25.51**	**0.63**	**1,044.59**	**30.03**	**0.00**	**163.84**	**0.30**	**39.24**	**23.67**	**22.96**	**0.57**	**940.13**	**27.03**	**0.00**	**147.46**	**0.27**
EXEMPTION CALCULATION	**DISTANCE FROM LAND IN MILES**																**2,197.80**			**2,197.80**	**2,197.80**	**2,197.80**		**55,527.51**	
	66.0																								
DRILLING	VESSELS- Crew Diesel		394	20.269724	486.47	18	40	0.28	0.17	0.16	0.00	6.66	0.19	0.00	1.04	0.00	0.10	0.06	0.06	0.00	2.40	0.07	0.00	0.38	0.00
	VESSELS - Supply Diesel		6630	341.08698	8186.09	18	30	4.68	2.82	2.74	0.07	112.06	3.22	0.00	17.58	0.03	1.26	0.76	0.74	0.02	30.26	0.87	0.00	4.75	0.01
	VESSELS - Tugs Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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
2025	**Non-Facility Total Emissions**							**4.96**	**2.99**	**2.90**	**0.07**	**118.72**	**3.41**	**0.00**	**18.62**	**0.03**	**1.36**	**0.82**	**0.80**	**0.02**	**32.66**	**0.94**	**0.00**	**5.12**	**0.01**

Air Emissions Spreadsheet

AIR EMISSIONS CALCULATIONS - 3RD YEAR

COMPANY	AREA		BLOCK	LEASE	FACILITY	WELL					CONTACT		PHONE		REMARKS										
Talos QN Exploration LLC	Mississippi Canyon		519	OCS-G 27278	N/A	A					Erin Harold		713-335-6952		Drilling & completion of Well A using drillship or DP Semisubmersible. This includes potential rig emissions each year to allow for scheduling flexibility.										
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	75	43.60	26.30	25.51	0.63	1044.59	30.03	0.00	163.84	0.30	39.24	23.67	22.96	0.57	940.13	27.03	0.00	147.46	0.27
	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
2026	**Facility Total Emissions**							**43.60**	**26.30**	**25.51**	**0.63**	**1,044.59**	**30.03**	**0.00**	**163.84**	**0.30**	**39.24**	**23.67**	**22.96**	**0.57**	**940.13**	**27.03**	**0.00**	**147.46**	**0.27**
EXEMPTION CALCULATION	**DISTANCE FROM LAND IN MILES**																**2,197.80**			**2,197.80**	**2,197.80**	**2,197.80**		**55,527.51**	
	66.0																								
DRILLING	VESSELS- Crew Diesel		394	20.269724	486.47	18	40	0.28	0.17	0.16	0.00	6.66	0.19	0.00	1.04	0.00	0.10	0.06	0.06	0.00	2.40	0.07	0.00	0.38	0.00
	VESSELS - Supply Diesel		6630	341.08698	8186.09	18	30	4.68	2.82	2.74	0.07	112.06	3.22	0.00	17.58	0.03	1.26	0.76	0.74	0.02	30.26	0.87	0.00	4.75	0.01
	VESSELS - Tugs Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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
2026	**Non-Facility Total Emissions**							**4.96**	**2.99**	**2.90**	**0.07**	**118.72**	**3.41**	**0.00**	**18.62**	**0.03**	**1.36**	**0.82**	**0.80**	**0.02**	**32.66**	**0.94**	**0.00**	**5.12**	**0.01**

AIR EMISSIONS CALCULATIONS - 4TH YEAR

COMPANY	AREA		BLOCK	LEASE	FACILITY	WELL					CONTACT		PHONE		REMARKS										
Talos QN Exploration LLC	Mississippi Canyon		519	OCS-G 27278	N/A	A					Erin Harold		713-335-6952		Drilling & completion of Well A using drillship or DP Semisubmersible. This includes potential rig emissions each year to allow for scheduling flexibility.										
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	75	43.60	26.30	25.51	0.63	1044.59	30.03	0.00	163.84	0.30	39.24	23.67	22.96	0.57	940.13	27.03	0.00	147.46	0.27
	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
2027	**Facility Total Emissions**							**43.60**	**26.30**	**25.51**	**0.63**	**1,044.59**	**30.03**	**0.00**	**163.84**	**0.30**	**39.24**	**23.67**	**22.96**	**0.57**	**940.13**	**27.03**	**0.00**	**147.46**	**0.27**
EXEMPTION CALCULATION	**DISTANCE FROM LAND IN MILES**																**2,197.80**			**2,197.80**	**2,197.80**	**2,197.80**		**55,527.51**	
	66.0																								
DRILLING	VESSELS- Crew Diesel		394	20.269724	486.47	18	40	0.28	0.17	0.16	0.00	6.66	0.19	0.00	1.04	0.00	0.10	0.06	0.06	0.00	2.40	0.07	0.00	0.38	0.00
	VESSELS - Supply Diesel		6630	341.08698	8186.09	18	30	4.68	2.82	2.74	0.07	112.06	3.22	0.00	17.58	0.03	1.26	0.76	0.74	0.02	30.26	0.87	0.00	4.75	0.01
	VESSELS - Tugs Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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
2027	**Non-Facility Total Emissions**							**4.96**	**2.99**	**2.90**	**0.07**	**118.72**	**3.41**	**0.00**	**18.62**	**0.03**	**1.36**	**0.82**	**0.80**	**0.02**	**32.66**	**0.94**	**0.00**	**5.12**	**0.01**

AIR EMISSIONS CALCULATIONS - 5TH YEAR

COMPANY	AREA		BLOCK	LEASE	FACILITY	WELL					CONTACT		PHONE		REMARKS										
Talos QN Exploration LLC	Mississippi Canyon		519	OCS-G 27278	N/A	A					Erin Harold		713-335-6952		Drilling & completion of Well A using drillship or DP Semisubmersible. This includes potential rig emissions each year to allow for scheduling flexibility.										
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	75	43.60	26.30	25.51	0.63	1044.59	30.03	0.00	163.84	0.30	39.24	23.67	22.96	0.57	940.13	27.03	0.00	147.46	0.27
	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
2028	**Facility Total Emissions**							**43.60**	**26.30**	**25.51**	**0.63**	**1,044.59**	**30.03**	**0.00**	**163.84**	**0.30**	**39.24**	**23.67**	**22.96**	**0.57**	**940.13**	**27.03**	**0.00**	**147.46**	**0.27**
EXEMPTION CALCULATION	**DISTANCE FROM LAND IN MILES**																**2,197.80**			**2,197.80**	**2,197.80**	**2,197.80**		**55,527.51**	
	66.0																								
DRILLING	VESSELS- Crew Diesel		394	20.269724	486.47	18	40	0.28	0.17	0.16	0.00	6.66	0.19	0.00	1.04	0.00	0.10	0.06	0.06	0.00	2.40	0.07	0.00	0.38	0.00
	VESSELS - Supply Diesel		6630	341.08698	8186.09	18	30	4.68	2.82	2.74	0.07	112.06	3.22	0.00	17.58	0.03	1.26	0.76	0.74	0.02	30.26	0.87	0.00	4.75	0.01
	VESSELS - Tugs Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FACILITY	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
INSTALLATION	VESSELS - Crew Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS - Supply Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PRODUCTION	VESSELS - Support Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ALASKA-SPECIFIC SOURCES	**On-Ice Equipment**			**GAL/HR**	**GAL/D**																				
	Man Camp - Operation (maximum people per day)		**PEOPLE/DAY**																						
	VESSELS		**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
2028	**Non-Facility Total Emissions**							**4.96**	**2.99**	**2.90**	**0.07**	**118.72**	**3.41**	**0.00**	**18.62**	**0.03**	**1.36**	**0.82**	**0.80**	**0.02**	**32.66**	**0.94**	**0.00**	**5.12**	**0.01**

Air Emissions Spreadsheet

AIR EMISSIONS CALCULATIONS - 6TH YEAR

COMPANY	AREA		BLOCK	LEASE	FACILITY	WELL					CONTACT		PHONE		REMARKS										
Talos QN Exploration LLC	Mississippi Canyon		519	OCS-G 27278	N/A	A					Erin Harold		713-335-6952		Drilling & completion of Well A using drillship or DP Semisubmersible. This includes potential rig emissions each year to allow for scheduling flexibility.										
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	75	43.60	26.30	25.51	0.63	1044.59	30.03	0.00	163.84	0.30	39.24	23.67	22.96	0.57	940.13	27.03	0.00	147.46	0.27
	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
2029	**Facility Total Emissions**							**43.60**	**26.30**	**25.51**	**0.63**	**1,044.59**	**30.03**	**0.00**	**163.84**	**0.30**	**39.24**	**23.67**	**22.96**	**0.57**	**940.13**	**27.03**	**0.00**	**147.46**	**0.27**
EXEMPTION CALCULATION	**DISTANCE FROM LAND IN MILES**																**2,197.80**			**2,197.80**	**2,197.80**	**2,197.80**		**55,527.51**	
	66.0																								
DRILLING	VESSELS- Crew Diesel		394	20.269724	486.47	18	40	0.28	0.17	0.16	0.00	6.66	0.19	0.00	1.04	0.00	0.10	0.06	0.06	0.00	2.40	0.07	0.00	0.38	0.00
	VESSELS - Supply Diesel		6630	341.08698	8186.09	18	30	4.68	2.82	2.74	0.07	112.06	3.22	0.00	17.58	0.03	1.26	0.76	0.74	0.02	30.26	0.87	0.00	4.75	0.01
	VESSELS - Tugs Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FACILITY	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
INSTALLATION	VESSELS - Crew Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS - Supply Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PRODUCTION	VESSELS - Support Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ALASKA-SPECIFIC SOURCES	**On-Ice Equipment**			**GAL/HR**	**GAL/D**																				
	Man Camp - Operation (maximum people per day)		**PEOPLE/DAY**																						
	VESSELS		**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
2029	**Non-Facility Total Emissions**							**4.96**	**2.99**	**2.90**	**0.07**	**118.72**	**3.41**	**0.00**	**18.62**	**0.03**	**1.36**	**0.82**	**0.80**	**0.02**	**32.66**	**0.94**	**0.00**	**5.12**	**0.01**

Air Emissions Spreadsheet

AIR EMISSIONS CALCULATIONS - 7TH YEAR

COMPANY	AREA		BLOCK	LEASE	FACILITY	WELL					CONTACT		PHONE		REMARKS										
Talos QN Exploration LLC	Mississippi Canyon		519	OCS-G 27278	N/A	A					Erin Harold		713-335-6952		Drilling & completion of Well A using drillship or DP Semisubmersible. This includes potential rig emissions each year to allow for scheduling flexibility.										
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	75	43.60	26.30	25.51	0.63	1044.59	30.03	0.00	163.84	0.30	39.24	23.67	22.96	0.57	940.13	27.03	0.00	147.46	0.27
	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
2030	**Facility Total Emissions**							**43.60**	**26.30**	**25.51**	**0.63**	**1,044.59**	**30.03**	**0.00**	**163.84**	**0.30**	**39.24**	**23.67**	**22.96**	**0.57**	**940.13**	**27.03**	**0.00**	**147.46**	**0.27**
EXEMPTION CALCULATION	**DISTANCE FROM LAND IN MILES**																**2,197.80**			**2,197.80**	**2,197.80**	**2,197.80**		**55,527.51**	
	66.0																								
DRILLING	VESSELS- Crew Diesel		394	20.269724	486.47	18	40	0.28	0.17	0.16	0.00	6.66	0.19	0.00	1.04	0.00	0.10	0.06	0.06	0.00	2.40	0.07	0.00	0.38	0.00
	VESSELS - Supply Diesel		6630	341.08698	8186.09	18	30	4.68	2.82	2.74	0.07	112.06	3.22	0.00	17.58	0.03	1.26	0.76	0.74	0.02	30.26	0.87	0.00	4.75	0.01
	VESSELS - Tugs Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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
2030	**Non-Facility Total Emissions**							**4.96**	**2.99**	**2.90**	**0.07**	**118.72**	**3.41**	**0.00**	**18.62**	**0.03**	**1.36**	**0.82**	**0.80**	**0.02**	**32.66**	**0.94**	**0.00**	**5.12**	**0.01**

AIR EMISSIONS CALCULATIONS - 8TH YEAR

COMPANY	AREA		BLOCK	LEASE	FACILITY	WELL					CONTACT		PHONE		REMARKS										
Talos QN Exploration LLC	Mississippi Canyon		519	OCS-G 27278	N/A	A					Erin Harold		713-335-6952		Drilling & completion of Well A using drillship or DP Semisubmersible. This includes potential rig emissions each year to allow for scheduling flexibility.										
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	75	43.60	26.30	25.51	0.63	1044.59	30.03	0.00	163.84	0.30	39.24	23.67	22.96	0.57	940.13	27.03	0.00	147.46	0.27
	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
2031	**Facility Total Emissions**							**43.60**	**26.30**	**25.51**	**0.63**	**1,044.59**	**30.03**	**0.00**	**163.84**	**0.30**	**39.24**	**23.67**	**22.96**	**0.57**	**940.13**	**27.03**	**0.00**	**147.46**	**0.27**
EXEMPTION CALCULATION	**DISTANCE FROM LAND IN MILES**																**2,197.80**			**2,197.80**	**2,197.80**	**2,197.80**		**55,527.51**	
	66.0																								
DRILLING	VESSELS- Crew Diesel		394	20.269724	486.47	18	40	0.28	0.17	0.16	0.00	6.66	0.19	0.00	1.04	0.00	0.10	0.06	0.06	0.00	2.40	0.07	0.00	0.38	0.00
	VESSELS - Supply Diesel		6630	341.08698	8186.09	18	30	4.68	2.82	2.74	0.07	112.06	3.22	0.00	17.58	0.03	1.26	0.76	0.74	0.02	30.26	0.87	0.00	4.75	0.01
	VESSELS - Tugs Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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
2031	**Non-Facility Total Emissions**							**4.96**	**2.99**	**2.90**	**0.07**	**118.72**	**3.41**	**0.00**	**18.62**	**0.03**	**1.36**	**0.82**	**0.80**	**0.02**	**32.66**	**0.94**	**0.00**	**5.12**	**0.01**

Air Emissions Spreadsheet

AIR EMISSIONS CALCULATIONS - 9TH YEAR

COMPANY	AREA		BLOCK	LEASE	FACILITY	WELL					CONTACT		PHONE		REMARKS										
Talos QN Exploration LLC	Mississippi Canyon		519	OCS-G 27278	N/A	A					Erin Harold		713-335-6952		Drilling & completion of Well A using drillship or DP Semisubmersible. This includes potential rig emissions each year to allow for scheduling flexibility.										
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	75	43.60	26.30	25.51	0.63	1044.59	30.03	0.00	163.84	0.30	39.24	23.67	22.96	0.57	940.13	27.03	0.00	147.46	0.27
	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
2032	**Facility Total Emissions**							**43.60**	**26.30**	**25.51**	**0.63**	**1,044.59**	**30.03**	**0.00**	**163.84**	**0.30**	**39.24**	**23.67**	**22.96**	**0.57**	**940.13**	**27.03**	**0.00**	**147.46**	**0.27**
EXEMPTION CALCULATION	**DISTANCE FROM LAND IN MILES**																**2,197.80**			**2,197.80**	**2,197.80**	**2,197.80**		**55,527.51**	
	66.0																								
DRILLING	VESSELS- Crew Diesel		394	20.269724	486.47	18	40	0.28	0.17	0.16	0.00	6.66	0.19	0.00	1.04	0.00	0.10	0.06	0.06	0.00	2.40	0.07	0.00	0.38	0.00
	VESSELS - Supply Diesel		6630	341.08698	8186.09	18	30	4.68	2.82	2.74	0.07	112.06	3.22	0.00	17.58	0.03	1.26	0.76	0.74	0.02	30.26	0.87	0.00	4.75	0.01
	VESSELS - Tugs Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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
2032	**Non-Facility Total Emissions**							**4.96**	**2.99**	**2.90**	**0.07**	**118.72**	**3.41**	**0.00**	**18.62**	**0.03**	**1.36**	**0.82**	**0.80**	**0.02**	**32.66**	**0.94**	**0.00**	**5.12**	**0.01**

Air Emissions Spreadsheet

AIR EMISSIONS CALCULATIONS - 10TH YEAR

COMPANY	AREA		BLOCK	LEASE	FACILITY	WELL					CONTACT		PHONE		REMARKS										
Talos QN Exploration LLC	Mississippi Canyon		519	OCS-G 27278	N/A	A					Erin Harold		713-335-6952		Drilling & completion of Well A using drillship or DP Semisubmersible. This includes potential rig emissions each year to allow for scheduling flexibility.										
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	75	43.60	26.30	25.51	0.63	1044.59	30.03	0.00	163.84	0.30	39.24	23.67	22.96	0.57	940.13	27.03	0.00	147.46	0.27
	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
2033	**Facility Total Emissions**							**43.60**	**26.30**	**25.51**	**0.63**	**1,044.59**	**30.03**	**0.00**	**163.84**	**0.30**	**39.24**	**23.67**	**22.96**	**0.57**	**940.13**	**27.03**	**0.00**	**147.46**	**0.27**
EXEMPTION CALCULATION	**DISTANCE FROM LAND IN MILES**																**2,197.80**			**2,197.80**	**2,197.80**	**2,197.80**		**55,527.51**	
	66.0																								
DRILLING	VESSELS- Crew Diesel		394	20.269724	486.47	18	40	0.28	0.17	0.16	0.00	6.66	0.19	0.00	1.04	0.00	0.10	0.06	0.06	0.00	2.40	0.07	0.00	0.38	0.00
	VESSELS - Supply Diesel		6630	341.08698	8186.09	18	30	4.68	2.82	2.74	0.07	112.06	3.22	0.00	17.58	0.03	1.26	0.76	0.74	0.02	30.26	0.87	0.00	4.75	0.01
	VESSELS - Tugs Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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
2033	**Non-Facility Total Emissions**							**4.96**	**2.99**	**2.90**	**0.07**	**118.72**	**3.41**	**0.00**	**18.62**	**0.03**	**1.36**	**0.82**	**0.80**	**0.02**	**32.66**	**0.94**	**0.00**	**5.12**	**0.01**

Air Emissions Spreadsheet

AIR EMISSIONS CALCULATIONS

COMPANY	AREA	BLOCK	LEASE	FACILITY	WELL	
Talos QN Exploration LLC	519	OCS-G 27278	N/A	N/A	A	

Year	Facility Emitted Substance								
	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3
2024	39.24	23.67	22.96	0.57	940.13	27.03	0.00	147.46	0.27
2025	39.24	23.67	22.96	0.57	940.13	27.03	0.00	147.46	0.27
2026	39.24	23.67	22.96	0.57	940.13	27.03	0.00	147.46	0.27
2027	39.24	23.67	22.96	0.57	940.13	27.03	0.00	147.46	0.27
2028	39.24	23.67	22.96	0.57	940.13	27.03	0.00	147.46	0.27
2029	39.24	23.67	22.96	0.57	940.13	27.03	0.00	147.46	0.27
2030	39.24	23.67	22.96	0.57	940.13	27.03	0.00	147.46	0.27
2031	39.24	23.67	22.96	0.57	940.13	27.03	0.00	147.46	0.27
2032	39.24	23.67	22.96	0.57	940.13	27.03	0.00	147.46	0.27
2033	39.24	23.67	22.96	0.57	940.13	27.03	0.00	147.46	0.27
Allowable	2197.80			2197.80	2197.80	2197.80		55527.51	

(A) AQR SCREENING QUESTIONS –

Screen Procedures for EP's	Yes	No
Is any calculated Complex Total (CT) Emission amount (tons) associated with your proposed exploration activities more than 90% of the amounts calculated using the following formulas: CT = $3400D^{2/3}$ for CO, and CT = 33.3D for the other air pollutants (where D = distance to shore in miles)?		X
Do your emission calculations include any emission reduction measures or modified emission factors?		X
Are your proposed exploration activities located east of 87.5° W longitude?		X
Do you expect to encounter H_2S 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

AQR Screening Questions

APPENDIX I
OIL SPILLS INFORMATION

A) OIL SPILL RESPONSE PLANNING

Pursuant to CFR 250.219 and NTL BOEM 2015-N01, this appendix provides information regarding any potential oil spill(s), the assumptions and calculations used to determine the worst case discharge (WCD) measures scenario.

Below is a reference to and status of Talos QN Exploration LLC's Regional OSRP. A site specific OSRP nor a subregional OSRP is not required with this plan, as the State of Florida is not an affected State for the activities proposed herein.

1) REGIONAL OR SUBREGIONAL OSRP INFORMATION

All of the proposed activities and facilities in this Plan will be covered by the Regional Oil Spill Response Plan filed by Talos Production Inc. (BOEM Company No. 03283) in accordance with 30 CFR 254 and approved on May 4, 2017, OSRP Control No. O-647. By letter dated December 18, 2024, the latest OSRP nonregulatory revision was found to be in compliance. The following operators are covered under this OSRP:

Talos ERT LLC (02899)
Talos Petroleum LLC (01834)
Talos Energy Offshore LLC (03247)
Talos Oil and Gas LLC (03269)
Talos Third Coast LLC (03619)
Talos Gulf Coast Onshore LLC (22691)
Talos Gulf Coast Offshore LLC (03201)
Talos Production Inc. (03283)
Talos Energy Ventures, LLC (03026)
Talos QN Exploration LLC (03672)
Talos Resources (03065)

2) SPILL RESPONSE SITES

The table below provides information on the location of the primary spill response equipment and the location of the planned staging area(s) that would be used should an oil spill occur resulting from the activities proposed herein.

Primary Response Equipment Location	Pre-planned Staging Location
Houma, LA; Harvey, LA; Leeville, LA	Houma, LA; Harvey, LA; Leeville, LA; Fourchon, LA

3) OIL SPILL REMOVAL ORGANIZATION (OSRO) INFORMATION

Talos' primary equipment provider is Clean Gulf Association (CGA). The Marine Spill Response Corporation's (MSRC) STARS network will closest available personnel, as well as a MSRC supervisor to operate the equipment. CGA and MSRC have equipment pre-staged around the Gulf of Mexico. The major locations of this equipment are Lake Charles, Houma, Fort Jackson, and Venice, Louisiana; Galveston and Ingleside, Texas; and Pascagoula, Mississippi.

4) WORST CASE SCENARIO COMPARISON

The table below provides a comparison of the worst-case discharge scenario from the above referenced Regional OSRP with the worst-case scenario from the activities proposed herein. Please note the Regional OSRP distance to shore scenarios are approximate and will be updated as required with modifications to the OSRP. The distance to shore for the proposed activities is accurate and based on survey data.

Worst Case Discharge Comparison Chart				
Category	**DRILLING**		**PRODUCTION**	
	REGIONAL OSRP WCD	DOCD WCD CURRENT PLAN	REGIONAL OSRP WCD	DOCD WCD CURRENT PLAN
Type of Activity	EXPLORATORY WELL	DOCD WCD	Production > 10 miles from shore	DOCD WCD
Facility Location (Area/Block)	GC 39	MC 519	N/A	N/A
Facility Designation	Katmai West #2	Well A	N/A	N/A
Distance to Shore (miles)	73	66	N/A	N/A

Worst Case Discharge Comparison Chart				
Category	**DRILLING**		**PRODUCTION**	
	REGIONAL OSRP WCD	DOCD WCD CURRENT PLAN	REGIONAL OSRP WCD	DOCD WCD CURRENT PLAN
Type of Activity	EXPLORATORY WELL	DOCD WCD	Production > 10 miles from shore	DOCD WCD
Volume				
Flowlines (on facility)				
Lease Term Pipelines				
Uncontrolled Blowout	388000.00	13864.00		
Storage				
Total Volume	**388000.00**	**13864.00**	**0.00**	**0.00**
Type of Oil(s) (crude, condensate, diesel)	Crude	Crude	N/A	N/A
API Gravity	37.9	22.3	N/A	N/A

Since Talos QN Exploration LLC has the capacity to respond to the worst case spill scenario included in our Regional OSRP approved on May 4, 2017 and determined in compliance December 18, 2024, and since the worst case scenario determined for our Plan does not replace the worst case scenario in our Regional
OSRP, Talos hereby certifies that we have the capacity to respond, to the maximum extent practicable, to a worst case discharge, or substantial threat of such a discharge, resulting from the activities proposed in this Plan.

5) WORST CASE DISCHARGE SCENARIOS AND ASSUMPTIONS

Talos provided the assumptions and calculations for the Worst Case Discharge Volume of Mississippi Canyon Block 519 in Plan Control No. N-9122, which established the Worst Case Discharge Volume for the Field. The proposed operations do not supersede the worst case discharge volume previously provided and approved.

6) OIL SPILL RESPONSE DISCUSSION

Talos provided an Oil Spill Response Discussion for the Worst Case Discharge Volume for Lease OCS-G 27278, Mississippi Canyon Block 519 in Plan Control No. N-9122, which established the Worst Case Discharge Volume for the Field.The proposed operations do not supersede the
worst case discharge volume previously provided and approved.

APPENDIX J
ENVIRONMENTAL MONITORING INFORMATION

A) MONITORING SYSTEMS

The proposed drilling units are equipped with Acoustic Doppler Current Profile (ADCP) monitoring equipment. Data from these meters are reported to the National Data Buoy Center website.

B) INCIDENTAL TAKES

There is no reason to believe that any of the endangered species or marine mammals as listed in the ESA will be "taken" as a result of the operations proposed under this plan.To date, it has been documented that the use of explosives and/or seismic devices can affect marine life. Operations proposed in this plan will not be utilizing either of these devices. Operations in this plan will also not be utilizing pile driving. The pipeline proposed in this plan will not be making landfall.

Talos QN Exploration LLC will adhere to the requirements as set forth in the following Notices to Lessees and guidelines, as applicable, to avoid or minimize impacts to any of the species listed in the ESA as a result of the operations conducted herein:

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

2020 Biological Opinion:

- Appendix A: Seismic Survey Mitigation and Protected Species Observer Protocols, found in the Biological Opinion issued by the NAtional Marine Fisheries Service on March 13, 2020
- Appendix B: Gulf of Mexico Marine Trash and Debris Awareness and Elimination Survey Protocols, found in the Biological Opinion issued by the National Marine Fisheries Service on March 13, 2020
- Appendix C: Gulf of Mexico Vessel STrike Avoidance and Injured/Dead Aquatic Protected Species Reporting Protocols, found in the Biological Opinion issued by the National Marine Fisheries Service on March 13, 2020
- Appendix J: Sea Turtle Handling and Resuscitation Guidelines, found in the Biological Opinion issued by the National Marine Fisheries Services on March 13, 2020

C) FLOWER GARDEN BANKS NATIONAL MARINE SANCTUARY

In accordance with NTL 2008-G04, this information is not applicable to the activities proposed herein as the subject area and block(s) are not located within the Protective Zones of the Flower Garden Banks and Stetson Bank.

APPENDIX K
LEASE STIPULATIONS INFORMATION

A) Lease stipulations are developed and implemented on a sale by sale basis and are applied to individual leases based on specific instructions in the applicable Final Notice of Sale Package. Stipulations place restrictions and operating requirements on lessees. This may involve protection of environmentally sensitive organisms or communities that exist in the area covered by the lease, conflicts with other uses such as military operations, LNG or sand extraction. The activities proposed herein are subject to the following stipulations attached to the subject lease(s).

As per Lease Sale 257 Final Notice of Sale Stipulations, Stipulations No. 6 to the MC519 lease.

Stipulation No. 6: Protected Species The Endangered Species Act (16 U.S.C. §§ 1531 et seq.) and the Marine Mammal Protection Act (16 U.S.C. §§ 1361 et seq.) are designed to protect threatened and endangered species and marine mammals and apply to activities authorized under the Outer Continental Shelf Lands Act (OCSLA, 43 U.S.C. §§ 1331 et seq.). The Congressional Declaration of Policy included in OCSLA provides that it is the policy of the United States that the OCS should be made available for expeditious and orderly development, subject to environmental safeguards, in a manner that is consistent with the maintenance of competition and other national needs (see 43 U.S.C. § 1332). Both the Bureau of Ocean Energy Management (BOEM) and the Bureau of Safety and Environmental Enforcement (BSEE) comply with these laws on the OCS.

The lessee and its operators must:
Comply with the Reasonable and Prudent Measures and implementing Terms and Conditions of the Biological Opinion issued by the National Marine Fisheries Service (NMFS) on March 13, 2020 (2020 NMFS BiOp), as amended. This includes mitigation, particularly any appendices to Terms and Conditions applicable to the activity, as well as record-keeping and reporting sufficient to allow BOEM and BSEE to comply with reporting and monitoring requirements under the BiOp; and any additional reporting required by BOEM or BSEE developed as a result of implementation of the 2020 NMFS BiOp and 2021 Amended Incidental Take Statement (ITS) and Revised Appendices.

-The 2020 NMFS BiOp may be found here:https://www.fisheries.noaa.gov/resource/document/biological-opinion-federally-regulated-oil-and-gas-program-activities-gulf-mexico.

-The Appendices and protocols may be found here:https://www.fisheries.noaa.gov/resource/document/appendices-biological-opinion-federally-regulated-oil-and-gas-program-gulf-mexico.

-The 2021 Amended ITS and Revised Appendices are found here:https://www.fisheries.noaa.gov/resource/document/amended-incidental-take-statement-and-revised-appendices.

Immediately report all sightings and locations of injured or dead protected species(e.g., marine mammals and sea turtles) to the appropriate hotlines listed athttps://www.fisheries.noaa.gov/report (phone numbers vary by state), as required in the 2020 NMFS BiOp and 2021 Revised Appendix C. If oil and gas industry activity is responsible for the injured or dead animal (e.g., injury or death was caused by a vessel strike, entrapment or entanglement), the responsible parties must notify BOEM and BSEE within 24 hours of the strike or entanglement/entrapment by email to protectedspecies@boem.gov and protectedspecies@bsee.gov, respectively. Unless previously approved by BOEM or BSEE through a plan or permit issued nder this lease, notify BOEM at least 15 days prior to any proposed vessel transit of the Bryde's Whale area, and receive prior approval for that transit from BOEM. The Bryde’s whale area, as described in the 2020 NMFS BiOp, includes the area from 100- to 400-meter isobaths from 87.5° W to 27.5° N as described in the status review (Rosel, 2016), plus an additional 10 kilometers around that area. The lessee and its operators, personnel, and subcontractors, while undertaking activities authorized under this lease, must implement and comply with the specific mitigation measures outlined in the following Appendices of the 2020 NMFS BiOp and 2021 Amended ITS and Revised Appendices: -Appendix A: “Seismic Survey Mitigation and Protected Species Observer Protocols”

-Appendix B: “Gulf of Mexico Marine Trash and Debris Awareness and Elimination Survey Protocols”

-Appendix C: “Vessel Strike Avoidance and Injured/Dead Aquatic Protected Species Reporting Protocols”

-Appendix I: “Explosive Removal of Structure Measures”

-Appendix J: “Sea Turtle Handling and Resuscitation Guidelines”

Certain post-lease approvals (e.g., for activities proposing new and unusual technologies, certain seismic surveys) will require a step-down review by NMFS, as provided by the 2020 NMFS BiOp and 2021 Amended ITS, and additional mitigations to protect ESA-listed species may be applied at that time. At the lessee’s

option, the lessee, its operators, personnel, and contractors may comply with the most current measures to protect species in place at the time an activity is undertaken under this lease, including but not limited to, new or updated versions of the 2020 NMFS BiOp, the 2021 ITS, and Appendices, or through new or activity-specific consultations. The most current applicable terms and conditions and reasonable and prudent measures from the 2020 NMFS BiOp, 2021 Amended ITS and Appendices or other relevant consultations will be applied to post-lease approvals. The lessee and its operators, personnel, and subcontractors will be required to comply with the mitigation measures identified in the above referenced 2020 NMFS BiOp and 2021 Amended ITS (including the Appendices), and additional measures in the conditions of approvals for their plans or permits.

APPENDIX L
ENVIRONMENTAL MITIGATION MEASURES INFORMATION

A) MEASURES TAKEN TO AVOID, MINIMIZE, AND MITIGATE IMPACTS

In accordance with NTL 2008-G04, this information is not applicable to the activities proposed herein as the State of Florida is not an affected State.

B) INCIDENTAL TAKES

Talos QN Exploration LLC will adhere to the requirements as set forth in the following Notices to Lessees, as applicable, to avoid or minimize impacts to any of the species listed in the ESA as a result of the operations conducted herein:NTL 2015-G03 "Marine Trash and Debris Awareness and Elimination"BOEM NTL 2016-G01 "Vessel Strike Avoidance and Injured/ Dead Protected Species Reporting"BOEM NTL 2016-G02 "Implementation of Seismic Survey Mitigation Measures and Protected Species Observer Program"Biological Opinion 2020:Appendix A: Seismic Survey Mitigation and Protected Species Observer Protocols, found in the Biological Opinion issued by the NAtional Marine Fisheries Service on March 13, 2020Appendix B: Gulf of Mexico Marine Trash and Debris Awareness and Elimination Survey Protocols, found in the Biological Opinion issued by the National Marine Fisheries Service on March 13, 2020Appendix C: Gulf of Mexico Vessel STrike Avoidance and Injured/Dead Aquatic Protected Species Reporting Protocols, found in the Biological Opinion issued by the National Marine Fisheries Service on March 13, 2020Appendix J: Sea Turtle Handling and Resuscitation Guidelines, found in the Biological Opinion issued by the National Marine Fisheries Services on March 13, 2020 Note: The proposed operations will not utilize a casing hammer to drive pipe. Talos does not propose any new pipelines that will make landfall.

Talos will utilize a Drilling Rig with a typical moonpool that is used in all Deepwater Dynamically Positioned Drillships and Semi-submersibles. The moonpool is located on or about the center of the rig. The moonpool's purpose is to allow access to the water level to drill, complete and workover wells. This also allows access to run the Blowout Preventers, Marine Riser and ancillary equipment to the seafloor. There is no closing mechanism for the moonpool area 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 the marine life in case of an incident:

- Talos will provide a dedicated crew member to survey the moonpool area for marine life while moving any equipment in or out of that area.
- If marine life is detected in the moonpool area, we will cease all operations until it is free and clear.
- Monitor video from the camera(s) that is focused on the moonpool area.
- If endangered marine life is seen in the area, a live video feed can be streamed real-time for additional coverage.
- If marine life is entrapped or entangled, we can safely lower someone into the moonpool to free it.

APPENDIX M
RELATED FACILITIES & OPERATIONS INFORMATION

A) RELATED OCS FACILITIES AND OPERATIONS

In accordance with NTL 2008-G04, this information is not applicable to the activities proposed herein as this is an Exploration Plan.

B) TRANSPORTATION SYSTEM

In accordance with NTL 2008-G04, this information is not applicable to the activities proposed herein as this is an Exploration Plan.

C) PRODUCED LIQUID HYDROCARBONS TRANSPORTATION VESSELS

In accordance with NTL 2008-G04, this information is not applicable to the activities proposed herein as no new production is being proposed for transport nor is existing production transporting methods being modified.

APPENDIX N
SUPPORT VESSELS AND AIRCRAFT INFORMATION

A) GENERAL

The most practical and direct route from the shorebase as permitted by weather and traffic conditions will be utilized. The table below provides information on vessels and aircraft that will be used to support the proposed activities.

Type	Maximun Fuel Tank Capacity	Maximun Number in Area at Any Time	Trip Frequency or Duration
Crew Boat	394 bbls	1	4 trips per week
Helicopter	260 gallons	1	3 trips per week
Supply Boat	6630 bbls	2	3 trips per week

B) DIESEL OIL SUPPLY VESSELS

The table below provides information on the vessels that will be used to supply diesel oil. It also includes all vessels that will transfer diesel oil that will be used for purposes other than fuel.

Size of Fuel Supply Vessel	Capacity of Fuel Supply Vessel	Frequency of Fuel Transfers	Route Fuel Supply Vessel Will Take
320 feet	6,000 bbls	Weekly	Most direct route from shorebase

C) DRILLING FLUID TRANSPORTATION

In accordance with NTL 2008-G04, this information is not applicable to the activities proposed herein as the State of Florida is not an affected State.

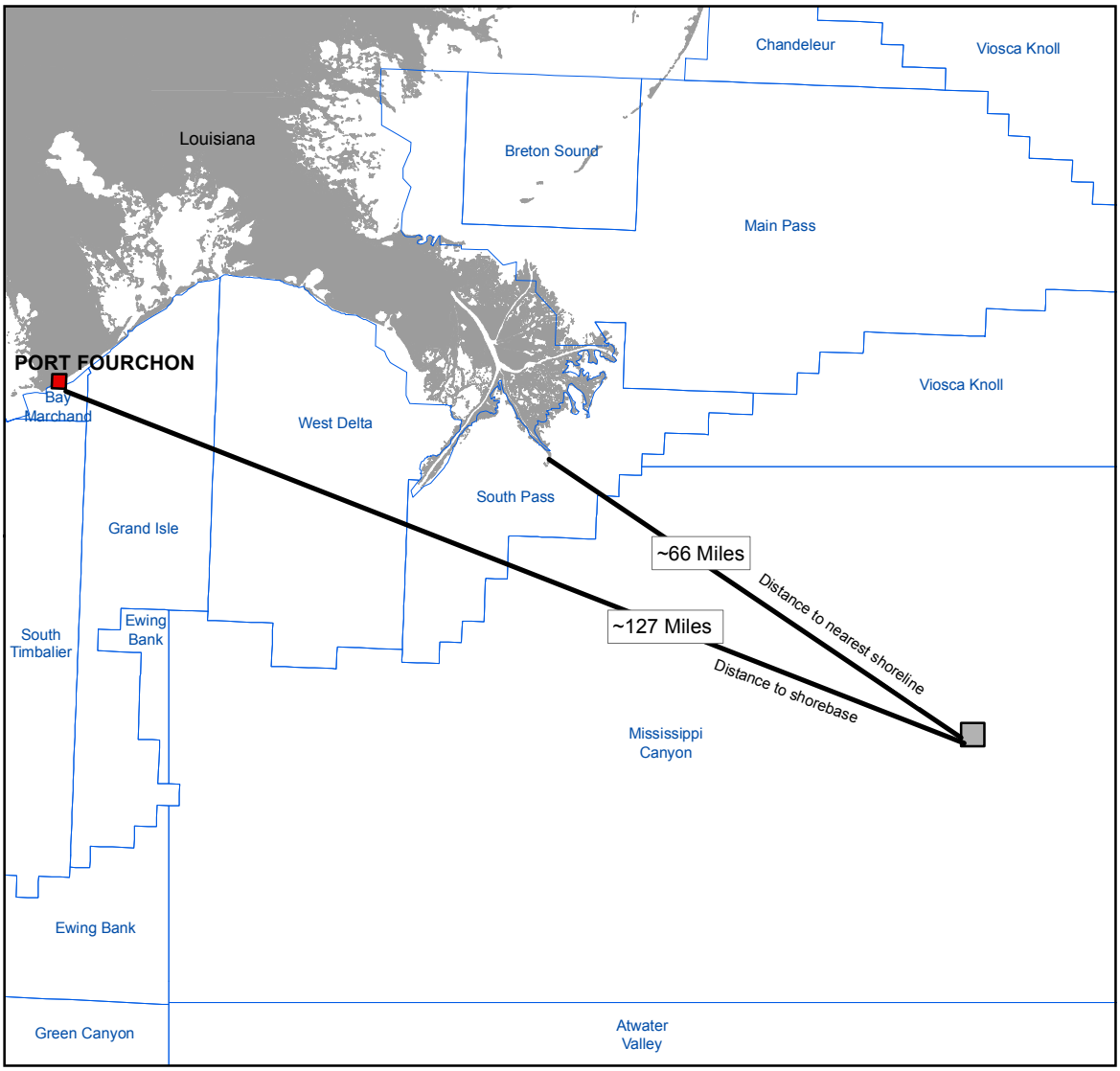
D) SOLID AND LIQUID WASTE TRANSPORTATION

In accordance with BOEM guidance, the required data regarding the solid and liquid waste which will be transported from the site of the activities proposed herein has been incorporated into the Waste & Discharge tables which are included in the attachment(s) to the Waste & Discharge Information appendix.

E) VICINITY MAP

Enclosed as an attachment to this appendix is a vicinity map for the activities proposed herein depicting the location of same 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 which will be used when traveling between the onshore support facilities and the proposed operations.

The vessels, supply boats, etc. utilized for the proposed activities will not transit the Bryde's/Rice whale area.



N
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Projection: UTM 16 N
Datum: NAD 27
Distance Units: Foot US

OCS-G-27278
Mississippi Canyon 519
Offshore Louisiana

Vicinity Plat

0 5 10 20 30
Miles

Vicinity Plat

APPENDIX O
ONSHORE SUPPORT FACILITIES INFORMATION

A) GENERAL

The table below is a list of the onshore facilities that will be used to provide supply and service support for the activities proposed herein.

Name of Shorebase	Location	Existing/New/Modified
Heliport -RCL Galliano Base	Galliano, LA	Existing
Martin Terminal North	Port Fourchon, LA	Existing

B) SUPPORT BASE CONSTRUCTION OR EXPANSION

In accordance with NTL 2008-G04, this information is not applicable to the activities proposed herein as Talos Energy Offshore LLC will use an existing onshore base facility and will not need to expand or modify those facilities to accomodate the operations proposed herein.

C) SUPPORT BASE CONSTRUCTION OR EXPANSION TIMETABLE

In accordance with NTL 2008-G04, this information is not applicable to the activities proposed herein as no land is being acquired to construct or expand an onshore support base.

D) WASTE DISPOSAL

In accordance with BOEM guidance, the required data regarding the facilities that will be used to store and dispose of any solid and liquid wastes generated by the activities proposed herein has been incorporated into the Waste & Discharge tables which are included in the attachment(s) to the Waste & Discharge Information appendix.

E) AIR EMISSIONS

In accordance with NTL 2008-G04, this information is not applicable to the activites proposed herein as the air emissions information in this section is not required for plans where the activities being proposed are within the boundaries of the Gulf of Mexico Region.

F) UNUSUAL SOLID AND LIQUID WASTES

In accordance with NTL 2008-G04, this information is not appliable to the activities proposed herein as the unusual solid and liquid wastes information generated by onshore support facilities is not required for plans that propose activities that fall within the boundaries of the Gulf of Mexico Region.

APPENDIX P
COASTAL ZONE MANAGEMENT (CZMA) INFORMATION

A) This is a supplemental EP that does not affect the states of Florida or Alabama; therefore, consistency certification from the Coastal Zone Management Act is not required.

APPENDIX Q
ENVIRONMETAL IMPACT ANALYSIS

A) In accordance with NTL 2008-G04, Talos QN Exploration LLC has included with this plan an Environmental Impact Analysis (EIA) prepared by J. Connor Consulting, Inc., which addresses the activities proposed herein. A copy of the EIA is included as an attachment to this appendix.

Talos QN Exploration LLC

Supplemental Exploration Plan
Mississippi Canyon Block 519
OCS-G 27278

(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			(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-meter, 1-mile or 3-mile zone of any topographic feature (submarine bank) protected by the Topographic Features Stipulation attached to an Outer Continental Shelf (OCS) lease;
   - Essential Fish Habitat (EFH) criteria of 500 feet from any no-activity zone; or
   - Proximity of any submarine bank (500-foot buffer zone) with relief greater than two 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 H_2S 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 operations 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.

TABLE 1: THREATENED AND ENDANGERED SPECIES, CRITICAL HABITAT, AND MARINE MAMMAL INFORMATION

The federally listed endangered and threatened species potentially occurring in the lease area and along the Gulf Coast are provided in the table below.

Species	Scientific Name	Status	Potential Presence		Critical Habitat Designated in the Gulf of Mexico	Gulf of Mexico Range
			Lease Area	Coastal		
Marine Mammals						
Manatee, West Indian	*Trichechus manatus latirostris*	T	--	X	Florida (peninsular)	Coastal Louisiana, Mississippi, Alabama, and Florida
Whale, Blue	*Balaenoptera masculus*	E	X[1]	--	None	GOM
Whale, Bryde's[4]	*Balaenoptera brydei/edeni*	E	X	--	None	Eastern GOM
Whale, Fin	*Balaenoptera physalus*	E	X[1]	--	None	GOM
Whale, Humpback	*Megaptera novaeangliae*	E	X[1]	--	None	GOM
Whale, North Atlantic Right	*Eubalaena glacialis*	E	X[1]	--	None	GOM
Whale, Rice's[4]	*Balaenoptera ricei*	E	X	--	None	GOM
Whale, Sei	*Balaenopiera borealis*	E	X[1]	--	None	GOM
Whale, Sperm	*Physeter catodon (=macrocephalus)*	E	X	--	None	GOM
Terrestrial Mammals						
Mouse, Alabama Beach	*Peromyscus polionotus ammobates*	E	-	X	Alabama beaches	Alabama beaches
Mouse, Choctawatchee Beach	*Peromyscus polionotus allophrys*	E	-	X	Florida panhandle beaches	Florida panhandle beaches
Mouse, Perdido Key Beach	*Peromyscus polionotus trissyllepsis*	E	-	X	Alabama, Florida (panhandle) beaches	Alabama, Florida (panhandle) beaches
Mouse, St. Andrew Beach	*Peromyscus polionotus peninsularis*	E	-	X	Florida panhandle beaches	Florida panhandle beaches
Jaguarundi, Gulf Coast	*Puma yagouaroundi cacomitli*	E	-	X	None	Texas
Ocelot	*Leopardus (=Felis) pardalis*	E	-	X	None	Texas

Species	Scientific Name	Status	Potential Presence		Critical Habitat Designated in the Gulf of Mexico	Gulf of Mexico Range
			Lease Area	Coastal		
Bat, Florida Bonneted	*Eumops floridanus*	E	-	X	None	Florida
Panther, Florida	*Puma (=Felis) concolor coryi*	E	-	X	None	Florida
Vole, Florida Salt Marsh	*Microtus pennsylvanicus dukecampbelli*	E	-	X	None	Florida
Deer, Key	*Odocoileus virginianus clavium*	E	-	X	None	Florida Keys
Rabbit, Lower Keys Marsh	*Sylvilagus palustris hefneri*	E	-	X	None	Florida Keys
Rat, Silver Rice	*Oryzomys palustris natator*	E	-	X	None	Florida Keys
Birds						
Plover, Piping	*Charadrius melodus*	T	-	X	Coastal Texas, Louisiana, Mississippi, Alabama, and Florida (panhandle)	Coastal GOM
Crane, Whooping	*Grus Americana*	E	-	X	Coastal Texas	Coastal Texas and Louisiana
Crane, Mississippi sandhill	*Grus canadensis pulla*	E	-	X	Coastal Mississippi	Coastal Mississippi
Caracara, Audubon's Crested	*Polyborus plancus audubonii*	T	-	X	None	Coastal Florida Peninsula
Curlew, Eskimo	*Numenius borealis*	E	-	X	None	Coastal Texas
Falcon, Northern Aplomado	*Falco femoralis septentrionalis*	E	-	X	None	Coastal Texas
Prairie-chicken, Attwater's Greater	*Tympanuchus cupido attwateri*	E	-	X	None	Coastal Texas
Scrub-jay, Florida	*Aphelocoma coerulescens*	T	-	X	None	Coastal Florida
Kite, Everglade Snail	*Rostrhamus sociabilis plumbeus*	E	-	X	None	Coastal Southern Florida
Knot, Red	*Calidris canutus rufa*	T	-	X	None	Coastal GOM
Rail, Eastern Black	*Laterallus jamaicensis ssp. jamaicensis*	T	-	X	None	Coastal GOM
Sparrow, Cape Sable Seaside	*Ammodramus maritimus mirabilis*	E	-	X	Everglades	Coastal Florida

Species	Scientific Name	Status	Potential Presence		Critical Habitat Designated in the Gulf of Mexico	Gulf of Mexico Range
			Lease Area	Coastal		
Stork, Wood	*Mycteria americana*	T	-	X	None	Coastal Alabama and Florida
Tern, Roseate	*Sterna dougallii dougallii*	T	-	X	None	Coastal Southern Florida
Warbler, Bachman's	*Vermivora bachmanii*	E	-	X	None	Coastal Southern Florida
Woodpecker, Red-cockaded	*Picoides borealis*	E	-	X	None	Coastal Louisiana and Florida
Marine Reptiles						
Sea Turtle, Green	*Chelonia mydas*	T/E[3]	X	X	None	GOM
Sea Turtle, Hawksbill	*Eretmochelys imbricata*	E	X	X	None	GOM
Sea Turtle, Kemp's Ridley	*Lepidochelys kempli*	E	X	X	None	GOM
Sea Turtle, Leatherback	*Dermochelys coriacea*	E	X	X	None	GOM
Sea Turtle, Loggerhead	*Caretta caretta*	T	X	X	Texas, Louisiana, Mississippi, Alabama, Florida	GOM
Terrestrial Reptiles						
Turtle, Alabama Red-bellied	*Pseudemys alabamensis*	E	-	X	None	Coastal Mississippi and Alabama
Crocodile, American	*Crocodylus acutus*	T	-	X	Everglades and Florida Keys	Coastal Florida
Snake, Eastern Indigo	*Drymarchon couperi*	T	-	X	None	Coastal Mississippi, Alabama, and Florida
Tortoise, Gopher	*Gopherus polyphemus*	T	-	X	None	Coastal Louisiana, Mississippi, and Alabama
Turtle, Ringed Map	*Graptemys oculifera*	T	-	X	None	Coastal Louisiana and Mississippi
Turtle, Yellow-blotched Map	*Graptemys flavimaculata*	T	-	X	None	Coastal Mississippi
Fish						
Sturgeon, Gulf	*Acipenser oxyrinchus (=oxyrhynchus) desotoi*	T	X	X	Coastal Louisiana, Mississippi, Alabama, and Florida (panhandle)	Coastal Louisiana, Mississippi, Alabama, and Florida (panhandle)
Shark, Oceanic Whitetip	Carcharhinus longimanus	T	X	_	None	GOM
Sawfish, Smalltooth	Pristis pectinate	E	-	X	None	Florida
Grouper, Nassau	Epinephelus striatus	T	-	X	Florida[5]	Florida

Species	Scientific Name	Status	Potential Presence		Critical Habitat Designated in the Gulf of Mexico	Gulf of Mexico Range
			Lease Area	Coastal		
Ray, Giant Manta	Manta birostris	T	X	--	None	GOM
Sturgeon, Pallid	Scaphirhynchus albus	E	-	X	None	Louisiana Coastal Rivers
Corals						
Coral, Elkhorn	*Acopora palmate*	T	X[2]	X	Florida[5]	Flower Garden Banks and Florida
Coral, Staghorn	*Acopora cervicornis*	T	X	X	Florida[5]	Florida
Coral, Boulder Star	*Orbicella franksi*	T	X	X	Flower Garden Banks and Florida	Flower Garden Banks and Florida
Coral, Lobed Star	*Orbicella annularis*	T	X	X	Flower Garden Banks and Florida	Flower Garden Banks and Florida
Coral, Mountainous Star	*Orbicella faveolate*	T	X	X	Flower Garden Banks and Florida	Flower Garden Banks and Florida
Coral, Rough Cactus	*Mycetophyllia ferox*	T	-	X	Florida[5]	Florida and Southern Gulf of Mexico
Coral, Pillar	*Dendrogyra cylindrus*	T	-	X	Florida[5]	Florida

Abbreviations: E = Endangered; T = Threatened

1 The Blue, Fin, Humpback, North Atlantic Right, and Sei Whales are rare or extralimital in the Gulf of Mexico and are unlikely to be present in the lease area.

2 According to the 2017 EIS, Elkhorn Coral, while uncommon, has been found in the Flower Garden Banks. (BOEM 2017-009)

3 Green Sea Turtles are considered threatened throughout the Gulf of Mexico; however, the breeding population off the coast of Florida is considered endangered.

4 The Bryde's whale, also known as the Bryde's whale complex, is a collection of baleen whales that are still being researched to determine if they are the same species or if they are individual species of whales. In 2021, the Rice's whale, formerly known as the Gulf of Mexico Bryde's whale, was determined to be a separate species. There are less than 100 Rice's whales living in the Gulf of Mexico year-round. These whales retain all the protections of the Gulf of Mexico Bryde's whale under the Endangered Species Act while the regulations are being updated to reflect the name change. Other Bryde's whales are migratory and may enter the Gulf of Mexico; however, the migratory Bryde's whales are rare or extralimital in the Gulf of Mexico and are unlikely to be present in the lease area.

5 Critical habitat is in the Gulf of Mexico, but outside of planning area. Species may still occur in the Gulf of Mexico.

(B) Analysis

Site-Specific at Mississippi Canyon Block 519
Proposed operations consist of the drilling of Locations A and A-Alt (re-spud location).
The operations will be conducted with a DP Semi-Submersible or Drillship.
There are no seismic surveys, pile driving, or pipelines making landfall associated with the operations covered by this Plan

1. Designated Topographic Features

Potential IPFs to topographic features as a result of the proposed operations include physical disturbances to the seafloor, effluents, and accidents.

Physical disturbances to the seafloor: Mississippi Canyon Block 519 is 63.5 miles from the closest designated Topographic Features Stipulation Block (Sackett Bank); therefore, no adverse impacts are expected. Additionally, a DP Semi-Submersible or Drillship is being used for the proposed operations; therefore, only an insignificant amount of seafloor will be disturbed.

Effluents: Mississippi Canyon Block 519 is 63.5 miles from the closest designated Topographic Features Stipulation Block (Sackett Bank); therefore, no adverse impacts are expected.

Accidents: It is unlikely that an accidental surface or subsurface spill would occur from the proposed operations (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-meter 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 meters, oil from a surface spill is not expected to 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 Talos QN Exploration LLC's Regional OSRP (refer to information submitted in **Appendix H**).

If dispersants were utilized as a response method, the fate and effects of spilled oil would be impacted. Dispersants have been utilized in previous spill response efforts and were used extensively in the response to the Deepwater Horizon oil spill, with both surface and sub-surface applications. Reports on dispersant usage on surface oil indicate that a majority of the dispersed oil remains in the top 10 meters of the water column, with 60 percent of the oil in the top two meters of water (McAuliffe et al, 1981; Lewis and Aurand, 1997; OCS Report BOEM 2017-007). Lubchenco et al. (2010) report that most chemically dispersed surface oil from the Deepwater Horizon explosion and oil spill remained in the top six meters of the water column where it mixed with surrounding waters and biodegraded (BOEM 2017-007). None of the topographic features or

potentially sensitive biological features in the GOM are shallower than 10 meters (33 feet), and only the Flower Garden Banks are shallower than 20 meters (66 feet).

In one extraordinary circumstance with an unusual combination of meteorological and oceanographic conditions, a tropical storm forced a large volume of Deepwater Horizon oil spill-linked surface oil/dispersant mixture to as deep as 75 meters (246 feet), causing temporary exposure to mesophotic corals in the Pinnacle Trend area and leading to some coral mortality and sublethal impacts (Silva et al., 2015; BOEM 2017-007).

Additionally, concentrations of dispersed and dissolved oil in the Deepwater Horizon oil-spill subsea plume were reported to be in the parts per million range or less and were generally lower away from the water's surface and away from the well head (Adcroft et al., 2010; Haddad and Murawski, 2010; Joint Analysis Group, 2010; Lubchenco et al, 2010; BOEM 2017-007).

In the case of subsurface spills like a blowout or pipeline leak, dispersants may be injected at the seafloor. This will increase oil concentrations near the source but tend to decrease them further afield, especially at the surface. Marine organisms in the lower water column will be exposed to an initial increase of water-soluble oil compounds that will dilute in the water column over time (Lee et al., 2013a; NAS 2020).

Dispersant application involves a trade-off between decreasing the risk to the surface and shoreline habitat and increasing the risk beneath the surface. The optimal trade-off must account for various factors, including the type of oil spilled, the spill volume, the weather and sea state, the water depth, the degree of turbulence, and the relative abundance and life stages of organisms (NRC, 2005; NAS 2020).

Chemical dispersants may increase the risk of toxicity to subsurface organisms by increasing bioavailability of the oil. However, it is important to note that at the 1:20 dispersant-to-oil ratio recommended for use during response operations, the dispersants currently approved for use are far less acutely toxic than oil is. Toxicity of chemically dispersed oil is primarily due to the oil itself and its enhanced bioavailability (Lee et al., 2015; NAS 2020).

With the exception of special Federal management areas or designated exclusion areas, dispersants have been preapproved for surface use, which provides the USCG On-Scene Coordinator with the authority to approve the use of dispersants. However, that approval would only be granted upon completion of the protocols defined in the appropriate Area Contingency Plan (ACP) and the Regional Response Team (RRT) Dispersant Plan. The protocols include conducting an environmental benefit analysis to determine if the dispersant use will prevent a substantial threat to the public health or welfare or minimize serious environmental damage. The Regional Response Team would be notified immediately to provide technical support and guidance in determining if the dispersant use meets the established criteria and provide an environmental benefit. Additionally, there is currently no preapproval for subsea dispersant injection and the USCG On-

Scene Coordinator must approve use of this technology before any subsea application. Due to the unprecedented volume of dispersants applied for an extended period of time, the U.S. National Response Team has developed guidance for atypical dispersant operations to ensure that planning and response activities will be consistent with national policy (BOEM 2017-007).

Dispersants were used extensively in the response to the Deepwater Horizon oil spill, both surface and sub-surface applications. However, during a May 2016 significant oil spill (approximately 1,926 barrels) in the Gulf of Mexico dispersants were not utilized as part of the response. The Regional Response Team was consulted and recommended that dispersants not be used, despite acknowledging the appropriate protocols were correctly followed and that there was a net environmental benefit in utilizing dispersants. This demonstrates that the federal authorities (USCG and RRT) will be extremely prudent in their decision-making regarding dispersant use authorizations.

Due to the distance of these blocks from a topographic area and the coverage of the activities proposed in this plan by Talos QN Exploration LLC's Regional OSRP (refer to information submitted in **Appendix H**), impacts to topographic features from surface or sub-surface oil spills are not expected.

There are no other IPFs (including emissions and wastes sent to shore for treatment or disposal) from the proposed operations that are likely to impact topographic features.

2. Pinnacle Trend Area Live Bottoms

Potential IPFs to pinnacle trend area live bottoms from the proposed operations include physical disturbances to the seafloor, emissions (noise / sound), effluents, and accidents.

Physical disturbances to the seafloor: Mississippi Canyon Block 519 is 49.6 miles from the closest live bottom (pinnacle trend) area; therefore, no adverse impacts are expected. Additionally, a DP Semi-Submersible or Drillship is being used for the proposed operations; therefore, only an insignificant amount of seafloor will be disturbed.

Emissions (noise / sound): All routine OCS oil-and gas-related activities have some element of sound generation. Common sound sources include propeller cavitation, rotating machinery, and reciprocating machinery, which are associated with routine OCS oil-and gas-related activities such as vessel traffic, drilling, construction, and oil and gas production, processing, and transport. Sound introduced into the marine environment as a result of human activities has the potential to affect marine organisms. Although there is little information available on sound detection and sound-mediated behaviors for marine invertebrates, the overall impacts on pinnacle and low-relief feature communities from anthropogenic noise are expected to be negligible (BOEM 2017-009). Additionally, Mississippi Canyon Block 519 is 49.6 miles from the closest live bottom (pinnacle trend) area; therefore, no adverse impacts are expected.

Effluents: Mississippi Canyon Block 519 is 49.6 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 operations (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-meter 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 expected to impact pinnacle trend area live bottoms due to the distance of these blocks from a live bottom (pinnacle trend) area and the coverage of the activities proposed in this plan by Talos QN Exploration LLC's Regional OSRP (refer to information submitted in **Appendix H**).

If dispersants were utilized as a response method, the fate and effects of spilled oil would be impacted. A detailed discussion on dispersants, their usage during the Deepwater Horizon oil spill, and their impacts on different levels of benthic communities can be found in **Item 1**.

There are no other IPFs (including wastes sent to shore for treatment or disposal) from the proposed operations that are likely to impact a live bottom (pinnacle trend) area.

3. Eastern Gulf Live Bottoms

Potential IPFs on Eastern Gulf live bottoms from the proposed operations include physical disturbances to the seafloor, emissions (noise / sound), effluents, and accidents.

Physical disturbances to the seafloor: Mississippi Canyon Block 519 is not located in an area characterized by the existence of live bottoms, and this lease does not contain a Live-Bottom Stipulation requiring a photo documentation survey and survey report. Additionally, a DP Semi-Submersible or Drillship is being used for the proposed operations; therefore, only an insignificant amount of seafloor will be disturbed.

Emissions (noise / sound): All routine OCS oil-and gas-related activities have some element of sound generation. Common sound sources include propeller cavitation, rotating machinery, and reciprocating machinery, which are associated with routine OCS oil-and gas-related activities such as vessel traffic, drilling, construction, and oil and gas production, processing, and transport. Sound introduced into the marine environment as a result of human activities has the potential to affect marine organisms. Although there is little information available on sound detection and sound-mediated behaviors for marine invertebrates, the overall impacts on pinnacle and low-relief feature communities from anthropogenic noise are expected to be negligible (BOEM 2017-009). Additionally, Mississippi Canyon Block 519 is not located in an area characterized by the existence of live bottoms; therefore, no adverse impacts are expected.

Effluents: Mississippi Canyon Block 519 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 operations (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-meter 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 expected to impact Eastern Gulf live bottoms due to the distance of these blocks from a live bottom area and coverage of the activities proposed in this plan by Talos QN Exploration LLC's Regional OSRP (refer to information submitted in **Appendix H**).

If dispersants were utilized as a response method, the fate and effects of spilled oil would be impacted. A detailed discussion on dispersants, their usage during the Deepwater Horizon oil spill, and their impacts on different levels of benthic communities can be found in **Item 1**.

There are no other IPFs (including wastes sent to shore for treatment or disposal) from the proposed operations that are likely to impact an Eastern Gulf live bottom area.

4. Deepwater Benthic Communities

There are no IPFs (including emissions (noise / sound), physical disturbances to the seafloor, wastes sent to shore for treatment or disposal, and accidents) from the proposed operations that are likely to impact deepwater benthic communities.

Mississippi Canyon Block 519 is located in water depths of 984 feet (300 meters) or greater. At such depth high-density, deepwater benthic communities may sometimes be found. However, Mississippi Canyon Block 519 is approximately 14.2 miles from a known deepwater benthic community site (Mississippi Canyon Block 426), listed in NTL 2009-G40. Additionally, a DP Semi-Submersible or Drillship is being used for the proposed operations; therefore, only an insignificant amount of seafloor will be disturbed. Due to the distance from the closest known deepwater benthic community and because physical disturbances to the seafloor will be minimized by the use of a DP Semi-Submersible or Drillship, Talos QN Exploration LLC's proposed operations in Mississippi Canyon Block 519 are not likely to impact deepwater benthic communities.

Deepwater benthic communities would potentially be subject to detrimental effects from a catastrophic seafloor blowout due to sediment and oiled sediment from the initial event (BOEM 2017-007). However, this is unlikely due to the distancing requirements described in NTL 2009-G40. Additionally, the potential impacts would be localized due to the directional movement of oil plumes by water currents and the scattered, patchy distribution of sensitive habitats. Although widely dispersed, biodegraded particles of a passing oil plume might impact patchy habitats, no

significant impacts would be expected to the Gulfwide population. Most deepwater benthic communities are expected to experience no impacts from a catastrophic seafloor blowout due to the directional movement of oil plumes by the water currents and their scattered, patchy distribution. Impacts may be expected if a spill were to occur close to a deepwater benthic habitat, however, beyond the localized area of impact particles would become increasingly biodegraded and dispersed. Localized impacts to deepwater benthic organisms would be expected to be mostly sublethal (BOEM 2017-007).

If dispersants were utilized as a response method, the fate and effects of spilled oil would be impacted. A detailed discussion on dispersants, their usage during the Deepwater Horizon oil spill, and their impacts on different levels of benthic communities can be found in **Item 1**.

5. Water Quality

Potential IPFs that could result in water quality degradation from the proposed operations in Mississippi Canyon Block 519 include disturbances to the seafloor, effluents, and accidents.

Physical disturbances to the seafloor: Bottom area disturbances resulting from the emplacement of drill rigs, the drilling of wells and the installation of platforms and pipelines would increase water-column turbidity and re-suspension of any accumulated pollutants, such as trace metals and excess nutrients. This would cause short-lived impacts on water quality conditions in the immediate vicinity of the emplacement operations. Additionally, a DP Semi-Submersible or Drillship is being used for the proposed operations; therefore, only an insignificant amount of seafloor will be disturbed.

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. Additionally, an analysis of the best available information from the National Marine Fisheries Service Endangered Species Act (ESA) Section 7 *Biological Opinion on the Federally Regulated Oil and Gas Program Activities in the Gulf of Mexico* (NMFS, 2020) concludes that exposures to toxicants in discharges from oil and gas activities are not likely to adversely affect ESA-listed species.

Accidents: IPFs related to OCS oil- and gas-related accidental events primarily involve drilling fluid spills, chemical spills, and oil spills.

Drilling Fluid Spills

Water-based fluid (WBF) and Synthetic-based fluid (SBF) spills may result in elevated turbidity, which would be short term, localized, and reversible. The WBF is normally discharged to the seafloor during riserless drilling, which is allowable due to its low toxicity. For the same reasons, a spill of WBF would have negligible impacts. The SBF has low toxicity, and the discharge of SBF is allowed to the extent that it adheres onto drill cuttings. Both USEPA Regions 4 and 6 permit

the discharge of cuttings wetted with SBF as long as the retained SBF amount is below a prescribed percent, meets biodegradation and toxicity requirements, and is not contaminated with the formation oil or PAH. A spill of SBF may cause a temporary increase in biological oxygen demand and locally result in lowered dissolved oxygen in the water column. Also, a spill of SBF may release an oil sheen if formation oil is present in the fluid. Therefore, impacts from a release of SBF are considered to be minor. Spills of SBF typically do not require mitigation because SBF sinks in water and naturally biodegrades, seafloor cleanup is technically difficult, and SBF has low toxicity. (BOEM 2017-009)

Chemical Spills

Accidental chemical spills could result in temporary localized impacts on water quality, primarily due to changing pH. Chemicals spills are generally small volume compared with spills of oil and drilling fluids. During the period of 2007 to 2014, small chemical spills occurred at an average annual volume of 28 barrels, while large chemical spills occurred at an average annual volume of 758 barrels. These chemical spills normally dissolve in water and dissipate quickly through dilution with no observable effects. Also, many of these chemicals are approved to be commingled in produced water for discharge to the ocean, which is a permitted activity. Therefore, impacts from chemical spills are considered to be minor and do not typically require mitigation because of technical feasibility and low toxicity after dilution (BOEM 2017-009).

Oil Spills

Oil spills have the greatest potential of all OCS oil-and gas-related activities to affect water quality. Small spills (<1,000 barrels) are not expected to substantially impact water quality in coastal or offshore waters because the oil dissipates quickly through dispersion and weathering while still at sea. Reasonably foreseeable larger spills (≥1,000 barrels), however, could impact water quality in coastal and offshore waters (BOEM 2017-007). However, based on data provided in the BOEM 2016 Update of Occurrence Rates for Offshore Oil Spills, it is unlikely that an accidental surface or subsurface spill of a significant volume would occur from the proposed operations. Between 2001 and 2015 OCS operations produced eight billion barrels of oil and spilled 0.062 percent of this oil, or one barrel for every 1,624 barrels produced. (The overall spill volume was almost entirely accounted for by the 2010 Deepwater Horizon blowout and subsequent discharge of 4.9 million barrels of oil. Additional information on unlikely scenarios and impacts from very large oil spills are discussed in the Catastrophic Spill Event Analysis white paper (BOEM 2017-007).

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. Dispersants will only be used if approved by the Regional Response Team in coordination with the RRT Dispersant Plan and RRT Biological Assessment for Dispersants.

Oil spills, regardless of size, may allow hydrocarbons to partition into the water column in a dissolved, emulsion, and/or particulate phase. Therefore, impacts from reasonably foreseeable oil spills are considered moderate. Mitigation efforts for oil spills may include booming, burning, and the use of dispersants (BOEM 2017-009).

These methods may cause short-term secondary impacts to water quality, such as the introduction of additional hydrocarbon into the dissolved phase through the use of dispersants and the sinking of hydrocarbon residuals from burning. Since burning and the use of dispersants put additional hydrocarbons into the dissolved phase, impacts to water quality after mitigation efforts are still considered to be moderate, because dissolved hydrocarbons extend down into the water column. This results in additional exposure pathways via ingestion and gill respiration and may result in acute or chronic effects to marine life (BOEM 2017-009).

Most oil-spill response strategies and equipment are based upon the simple principle that oil floats. However, as evident during the Deepwater Horizon explosion, oil spill, and response, this is not always true. Sometimes it floats and sometimes it suspends within the water column or sinks to the seafloor (BOEM 2017-009).

Oil that is chemically dispersed at the surface moves into the top six meters of the water column where it mixes with surrounding waters and begins to biodegrade (U.S. Congress, Office of Technology Assessment, 1990). Dispersant use, in combination with natural processes, breaks up oil into smaller components that allows them to dissipate into the water and degrade more rapidly (Nalco, 2010). Dispersant use must be in accordance with an RRT Preapproved Dispersant Use Manual and with any conditions outlined within an RRT's site-specific, dispersant approval given after a spill event. Consequently, dispersant use must be in accordance with the restrictions for specific water depths, distances from shore, and monitoring requirements. At this time, neither the Region IV nor the Region VI RRT dispersant use manuals, which cover the GOM region, give preapproval for the application of dispersant use subsea (BOEM 2017-009).

The operations proposed in this plan will be covered by Talos QN Exploration LLC's Regional Oil Spill Response Plan, which discusses potential response actions in more detail (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 operations that are likely to impact water quality.

6. Fisheries

There are multiple species of fish in the Gulf of Mexico, including the endangered and threatened species listed in **Table 1** at the beginning of this Environmental Impact Assessment. More information regarding the endangered gulf sturgeon (**Item 20.2**), oceanic whitetip shark (**Item**

20.3), and giant manta ray (**Item 20.4**) can be found below. Potential IPFs to fisheries as a result of the proposed operations in Mississippi Canyon Block 519 include physical disturbances to the seafloor, emissions (noise / sound), effluents, and accidents.

Physical disturbances to the seafloor: The emplacement of a structure or drilling rig results in minimal loss of bottom trawling area to commercial fishermen. Pipelines cause gear conflicts which result in losses of trawls and shrimp catch, business downtime and vessel damage. Most financial losses from gear conflicts are covered by the Fishermen's Contingency Fund (FCF). The emplacement and removal of facilities are not expected to cause significant adverse impacts to fisheries. Additionally, a DP Semi-Submersible or Drillship is being used for the proposed operations; therefore, only an insignificant amount of seafloor will be disturbed.

Emissions (noise / sound): All routine OCS oil-and gas-related activities have some element of sound generation. Common sound sources include propeller cavitation, rotating machinery, and reciprocating machinery, which are associated with routine OCS oil-and gas-related activities such as vessel traffic, drilling, construction, and oil and gas production, processing, and transport. Sound introduced into the marine environment as a result of human activities has the potential to affect marine organisms by stimulating behavioral response, masking biologically important signals, causing temporary or permanent hearing loss (Popper et al., 2005; Popper et al., 2014), or causing physiological injury (e.g., barotrauma) resulting in mortality (Popper and Hastings, 2009). The potential for anthropogenic sound to affect any individual organism is dependent on the proximity to the source, signal characteristics, received peak pressures relative to the static pressure, cumulative sound exposure, species, motivation, and the receiver's prior experience. In addition, environmental conditions (e.g., temperature, water depth, and substrate) affect sound speed, propagation paths, and attenuation, resulting in temporal and spatial variations in the received signal for organisms throughout the ensonified area (Hildebrand, 2009).

Sound detection capabilities among fishes vary. For most fish species, it is reasonable to assume hearing sensitivity to frequencies below 500 Hertz (Hz) (Popper et al., 2003 and 2014; Popper and Hastings, 2009; Slabbekoorn et al., 2010; Radford et al., 2014). The band of greatest interest to this analysis, low-frequency sound (30-500 Hz), has come to be dominated by anthropogenic sources and includes the frequencies most likely to be detected by most fish species. For example, the noise generated by large vessel traffic typically results from propeller cavitation and falls within 40-150 Hz (Hildebrand, 2009; McKenna et al., 2012). This range is similar to that of fish vocalizations and hearing and could result in a masking effect.

Masking occurs when background noise increases the threshold for a sound to be detected; masking can be partial or complete. If detection thresholds are raised for biologically relevant signals, there is a potential for increased predation, reduced foraging success, reduced reproductive success, or other effects. However, fish hearing and sound production may be adapted to a noisy environment (Wysocki and Ladich, 2005). There is evidence that fishes are able to efficiently discriminate between signals, extracting important sounds from background noise (Popper et al.,

2003; Wysocki and Ladich, 2005). Sophisticated sound processing capabilities and filtering by the sound sensing organs essentially narrows the band of masking frequencies, potentially decreasing masking effects. In addition, the low-frequency sounds of interest propagate over very long distances in deep water, but these frequencies are quickly lost in water depths between ½ and ¼ the wavelength (Ladich, 2013). This would suggest that the potential for a masking effect from low-frequency noise on behaviors occurring in shallow coastal waters may be reduced by the receiver's distance from sound sources, such as busy ports or construction activities.

Pulsed sounds generated by OCS oil-and gas-related activities (e.g., impact-driven piles and airguns) can potentially cause behavioral response, reduce hearing sensitivity, or result in physiological injury to fishes and invertebrate resources. However, there are no pulsed sound generation activities proposed for these operations

Support vessel traffic, drilling, production facilities, and other sources of continuous sounds contribute to a chronic increase in background noise, with varying areas of effect that may be influenced by the sound level, frequencies, and environmental factors (Hildebrand, 2009; Slabbekoorn et al., 2010; McKenna et al., 2012). These sources have a low potential for causing physiological injury or injuring hearing in fishes and invertebrates (Popper et al., 2014). However, continuous sounds have an increased potential for masking biologically relevant sounds than do pulsed signals. The potential effects of masking on fishes and invertebrates are difficult to assess in the natural setting for communities and populations of species, but evidence indicates that the increase to background noise as a result of OCS oil and gas operations would be relatively minor. Therefore, it is expected that the cumulative impact to fishes and invertebrate resources would be minor and would not extend beyond localized disturbances or behavioral modification.

Despite the importance of many sound-mediated behaviors and the potential biological costs associated with behavioral response to anthropogenic sounds, many environmental and biological factors limit potential exposure and the effects that OCS oil-and gas-related sounds have on fishes and invertebrate resources. The overall impact to fishes and invertebrate resources due to anthropogenic sound introduced into the marine environment by OCS oil-and gas-related routine activities is expected to be minor.

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 meters of the discharge point and are expected to have negligible effect on fisheries. Additionally, an analysis of the best available information from the National Marine Fisheries Service Endangered Species Act (ESA) Section 7 *Biological Opinion on the Federally Regulated Oil and Gas Program Activities in the Gulf of Mexico* (NMFS, 2020) concludes that exposures to toxicants in discharges from oil and gas activities are not likely to adversely affect ESA-listed species.

Accidents: Collisions between support vessels and ESA-listed fish, would be unusual events, however, should one occur, death or injury to ESA-listed fish is possible. Contract vessel operators can avoid protected aquatic species and reduce potential deaths by maintaining a vigilant watch and a distance of 50 meters or greater, with the exception of animals that approach the vessel. Vessel personnel should use a Gulf of Mexico reference guide that includes identifying information on marine mammals, sea turtles, and other marine protected species (i.e., Endangered Species Act listed species such as Gulf sturgeon, giant manta ray, or oceanic whitetip shark) that may be encountered in the Gulf of Mexico OCS.

Contract vessel operators will comply with the measures included in Appendix C of the NMFS Biological Opinion and requirements of the Protected Species Lease Stipulation, except under extraordinary circumstances when the safety of the vessel or crew is in doubt or the safety of life at sea is in question.

Should an ESA-listed fish (e.g., giant manta ray, oceanic whitetip shark, or Gulf sturgeon) be entrapped, entangled, or injured, personnel should contact the ESA Section 7 biologist at (301) 427-8413 (nmfs.psoreview@noaa.gov) and report all incidents to takereport.nmfsser@noaa.gov. After making the appropriate notifications, Talos QN Exploration LLC may call BSEE at (985) 722-7902 for questions or additional guidance on recovery assistance needs, continued monitoring requirements, and incidental report information which at minimum is detailed below. Additional information may be found at the following website: https://www.fisheries.noaa.gov/report. Any injured or dead protected species should also be reported to takereport.nmfsser@noaa.gov. In addition, if the injury or death was caused by a collision with the operator's vessel, an entrapment within the operator's equipment or vessel (e.g. moon pool), or an entanglement within the operator's equipment, the operator must further notify BOEM and BSEE within 24 hours of the strike or entrapment/entanglement by email to protectedspecies@boem.gov and protectedspecies@bsee.gov. If the vessel is the responsible party, it is required to remain available to assist the respective salvage and stranding network as needed.

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 operations (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 Talos QN Exploration LLC's Regional OSRP (refer to information submitted in **Appendix H**).

There are no other IPFs (including wastes sent to shore for treatment or disposal) from the proposed operations that are likely to impact fisheries.

7. Marine Mammals

The latest population estimates for the Gulf of Mexico 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. The Rice's whale (née Gulf of Mexico Bryde's whale) is the only commonly occurring baleen whale in the northern Gulf of Mexico and has been sighted off western Florida and in the De Soto Canyon region. Florida manatees have been sighted along the entire northern GOM but are mainly found in the shallow coastal waters of Florida, which are unassociated with the proposed operations. A complete list of all endangered and threatened marine mammals in the GOM may be found in **Table 1** at the beginning of this Environmental Impact Assessment. More information regarding the endangered Rice's whale can be found in **Item 20.1** below. Potential IPFs to marine mammals as a result of the proposed operations in Mississippi Canyon Block 519 include emissions (noise / sound), effluents, discarded trash and debris, and accidents.

Emissions (noise / sound): Noises from drilling activities, support vessels and helicopters (i.e., non-impulsive anthropogenic sound) 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). Responses to sound exposure may include lethal or nonlethal injury, temporary hearing impairment, behavioral harassment and stress, or no apparent response. Noise-induced stress is possible, but it is little studied in marine mammals. Tyack (2008) suggests that a more significant risk to marine mammals from sound are these less visible impacts of chronic exposure. There is little conclusive evidence for long-term displacements and population trends for marine mammals relative to noise.

Vessels are the greatest contributors to increases in low-frequency ambient sound in the sea (Andrew et al. 2011). Sound levels and tones produced are generally related to vessel size and speed. Larger vessels generally emit more sound than smaller vessels, and vessels underway with a full load, or those pushing or towing a load, are noisier than unladen vessels. Cetacean responses to aircraft depend on the animals' behavioral state at the time of exposure (e.g., resting, socializing, foraging, or traveling) as well as the altitude and lateral distance of the aircraft to the animals (Luksenburg and Parsons 2009). The underwater sound intensity from aircraft is less than produced by vessels, and visually, aircraft are more difficult for whales to locate since they are not in the water and move rapidly (Richter et al. 2006). Perhaps not surprisingly then, when aircraft are at higher altitudes, whales often exhibit no response, but lower flying aircraft (e.g., approximately 500 meters or less) have been observed to elicit short-term behavioral responses (Luksenburg and Parsons 2009; NMFS 2017b; NMFS 2017f; Patenaude et al. 2002; Smultea et al. 2008a; Wursig et al. 1998). Thus, aircraft flying at low altitude, at close lateral distances and above shallow water elicit stronger responses than aircraft flying higher, at greater lateral distances and over deep water (Patenaude et al. 2002; Smultea et al. 2008a). Routine OCS helicopter traffic would not be expected to disturb animals for extended periods, provided pilots do not alter their

flight patterns to more closely observe or photograph marine mammals. Helicopters, while flying offshore, generally maintain altitudes above 700 feet during transit to and from a working area, and at an altitude of about 500 feet between platforms. The duration of the effects resulting from a startle response is expected to be short-term during routine flights, and the potential effects will be insignificant to sperm whales and Rice's whales. Therefore, we find that any disturbance that may result from aircraft associated with the proposed operations is not likely to adversely affect ESA-listed whales.

Drilling and production noise would contribute to increases in the ambient noise environment of the GOM, but they are not expected in amplitudes sufficient to cause either hearing or behavioral impacts (BOEM 2017-009). There is the possibility of short-term disruption of movement patterns and/or behavior caused by vessel noise and disturbance; however, these are not expected to impact survival and growth of any marine mammal populations in the GOM. Additionally, the National Marine Fisheries Service published a final recovery plan for the sperm whale, which identified anthropogenic noise as either a low or unknown threat to sperm whales in the GOM (USDOC, NMFS, 2010b). Sirenians (i.e., manatees) are not located within the area of operations. Additionally, there were no specific noise impact factors identified in the latest BOEM environmental impact statement for sirenians related to GOM OCS operations (BOEM 2017-009). See **Item 20.1** for details on the Rice's whale.

Impulsive sound impacts (i.e., pile driving, seismic surveys) are not included among the activities proposed under this plan.

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 operations is not expected to substantially harm marine mammals. 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).

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

biodegradable, environmentally persistent materials such as plastic or glass. Talos QN Exploration LLC will also collect and remove flotsam resulting from activities related to proposed operations.

Informational placards will be posted on all vessels and facilities having sleeping or food preparation capabilities. All offshore personnel, including contractors and other support services-related personnel (e.g., helicopter pilots, vessel captains and boat crews) will be indoctrinated on waste procedures, and will view the video (or Microsoft PowerPoint presentation), *Think About It* (*previously All Washed Up: The Beach Litter Problem*). Thereafter, all personnel will view the marine trash and debris training video annually. Offshore personnel will also receive an explanation from Talos QN Exploration LLC 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 marine mammals, including 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 of 500 meters or greater from baleen whales, 100 meters or greater from sperm whales, and a distance of 50 meters or greater from all other aquatic protected species, with the exception of animals that approach the vessel. If unable to identify the marine mammal, the vessel will act as if it were a baleen whale and maintain a distance of 500 meters or greater. If a manatee is sighted, all vessels in the area will operate at "no wake/idle" speeds in the area, while maintaining proper distance. When assemblages of cetaceans are observed, including mother/calf pairs, vessel speeds will be reduced to 10 knots or less. Vessel personnel should use a Gulf of Mexico reference guide that includes identifying information on marine mammals, sea turtles, and other marine protected species (i.e., Endangered Species Act listed species such as Gulf sturgeon, giant manta ray, or oceanic whitetip shark) that may be encountered in the Gulf of Mexico OCS.

Contract vessel operators will comply with the measures included in Appendix C of the NMFS Biological Opinion and requirements of the Protected Species Lease Stipulation, except under extraordinary circumstances when the safety of the vessel or crew is in doubt or the safety of life at sea is in question.

Vessel personnel must report sightings of any injured or dead protected marine mammal species immediately, regardless of whether the injury or death is caused by their vessel, to the NMFS Southeast Marine Mammal Stranding Hotline at (877) WHALE-HELP (877-942-5343). Additional information may be found at the following website: https://www.fisheries.noaa.gov/report. Any injured or dead protected species should also be reported to takereport.nmfsser@noaa.gov. In addition, if the injury or death was caused by a collision with the operator's vessel, an entrapment within the operator's equipment or vessel (e.g. moon pool), or an entanglement within the operator's equipment, the operator must further notify BOEM and BSEE within 24 hours of the strike or entrapment/entanglement by email to

protectedspecies@boem.gov and protectedspecies@bsee.gov. If the vessel is the responsible party, it is required to remain available to assist the respective salvage and stranding network as needed.

These proposed operations will utilize a moon pool(s) to conduct various subsea activities (refer to information submitted in **Appendix L**). Talos QN Exploration LLC's contractor or company representative will provide a dedicated crew member to monitor and continually survey the moon pool area during the operations for marine mammals. If any marine mammal is detected in the moon pool, Talos QN Exploration LLC will cease operations and contact NMFS at nmfs.psoreview@noaa.gov and BSEE at protectedspecies@bsee.gov and 985-722-7902 for additional guidance and incident report information.

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 operations (refer to **Item 5**, Water Quality). Oil spill response activities may increase vessel traffic in the area, which could impact cetacean behavior and/or distribution, thereby causing additional stress to the animals. The effect of oil dispersants on cetaceans is not known. Removing oil from the surface would reduce the likelihood of oil adhering to marine mammals. Laboratory experiments have shown that the dispersants used during the Deepwater Horizon response are cytotoxic to sperm whale cells; however, it is difficult to determine actual exposure levels in the GOM. Therefore, dispersants will only be used if approved by the Regional Response Team in coordination with the RRT Dispersant Plan and RRT Biological Assessment for Dispersants. The acute toxicity of oil dispersant chemicals included in Talos QN Exploration LLC'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 Talos QN Exploration LLC's OSRP (refer to information submitted in accordance with **Appendix H**).

The NMFS Office of Protected Resources coordinates agency assessment of the need for response and leads response efforts for spills that may impact cetaceans. If a spill may impact cetaceans, NMFS Protected Resources Contacts should be notified (see contact details below), and they will initiate notification of other relevant parties.

NMFS Protected Resources Contacts for the Gulf of Mexico:

- Marine mammals – Southeast emergency stranding hotline 1-877-433-8299
- Other endangered or threatened species – ESA section 7 consulting biologist: nmfs.ser.emergency.consult@noaa.gov

There are no other IPFs (including physical disturbances to the seafloor) from the proposed operations that are likely to impact marine mammals.

8. Sea Turtles

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. A complete list of endangered and threatened sea turtles in the GOM may be found in **Table 1** at the beginning of this Environmental Impact Assessment. Additional details regarding the loggerhead sea turtle's critical habitat in the GOM are located in **Item 20.5**. Potential IPFs to sea turtles as a result of the proposed operations include emissions (noise / sound), effluents, discarded trash and debris, and accidents.

Emissions (noise / sound): Noise from drilling activities, support vessels, and helicopters (i.e., non-impulsive anthropogenic sound) may elicit a startle reaction from sea turtles, but this is a temporary disturbance. Responses to sound exposure may include lethal or nonlethal injury, temporary hearing impairment, behavioral harassment and stress, or no apparent response. Vessels are the greatest contributors to increases in low-frequency ambient sound in the sea (Andrew et al. 2011). Sound levels and tones produced are generally related to vessel size and speed. Larger vessels generally emit more sound than smaller vessels, and vessels underway with a full load, or those pushing or towing a load, are noisier than unladen vessels. Routine OCS helicopter traffic would not be expected to disturb animals for extended periods, provided pilots do not alter their flight patterns to more closely observe or photograph marine mammals. Helicopters, while flying offshore, generally maintain altitudes above 700 feet during transit to and from a working area, and at an altitude of about 500 feet between platforms. The duration of the effects resulting from a startle response is expected to be short-term during routine flights and the potential effects will be insignificant to sea turtles. Therefore, we find that any disturbance that may result from aircraft associated with the proposed operations is not likely to adversely affect sea turtles. Construction and operational sounds other than pile driving should have insignificant effects on sea turtles; effects would be limited to short-term avoidance of construction activity itself rather than the sound produced. As a result, sound sources associated with support vessel movement as part of the proposed operations are insignificant and therefore are not likely to adversely affect sea turtles.

Overall noise impacts on sea turtles from the proposed operations are expected to be negligible to minor depending on the location of the animal(s) relative to the sound source and the frequency, intensity, and duration of the source. The National Marine Fisheries Service Endangered Species Act (ESA) Section 7 Biological Opinion Appendix C explains how operators must implement measures to minimize the risk of vessel strikes to protected species and report observations of injured or dead protected species. This guidance should also minimize the chance of sea turtles being subject to the increased noise level of a service vessel in very close proximity.

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 operations is not expected to substantially harm sea turtles. 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).

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

Informational placards will be posted on all vessels and facilities having sleeping or food preparation capabilities. All offshore personnel, including contractors and other support services-related personnel (e.g., helicopter pilots, vessel captains and boat crews) will be indoctrinated on waste procedures, and will view the video (or Microsoft PowerPoint presentation), *Think About It* (*previously All Washed Up: The Beach Litter Problem*). Thereafter, all personnel will view the marine trash and debris training video annually. Offshore personnel will also receive an explanation from Talos QN Exploration LLC 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 of 50 meters or greater when they are sighted, with the exception of sea turtles that approach the vessel. 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 as well as other marine protected species (i.e., Endangered Species Act listed species). Contract vessel operators will comply with the measures included in Appendix C of the NMFS Biological Opinion and requirements of the Protected Species Lease Stipulation, except under extraordinary circumstances when the safety of the vessel or crew is in doubt or the safety of life at sea is in question.

Vessel 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). Additional information may be found at the following website: https://www.fisheries.noaa.gov/report. Any injured or dead protected species should also be reported to takereport.nmfsser@noaa.gov. In addition, if the injury or death was caused by a collision with the operator's vessel, an entrapment within the operator's equipment or vessel (e.g. moon pool), or an entanglement within the operator's equipment, the operator must further notify BOEM and BSEE within 24 hours of the strike or entrapment/entanglement by email to protectedspecies@boem.gov and protectedspecies@bsee.gov. If the vessel is the responsible party, it is required to remain available to assist the respective salvage and stranding network as needed.

These proposed operations will utilize a moon pool(s) to conduct various subsea activities (refer to information submitted in **Appendix L**). Talos QN Exploration LLC's contractor or company representative will provide a dedicated crew member to monitor and continually survey the moon pool area during the operations for sea turtles. If any sea turtle is detected in the moon pool, Talos QN Exploration LLC will cease operations and contact NMFS at nmfs.psoreview@noaa.gov and BSEE at protectedspecies@bsee.gov and 985-722-7902 for additional guidance and incidental report information. The procedures found in Appendix J of the National Marine Fisheries Service Endangered Species Act (ESA) Section 7 Biological Opinion will be employed to free entrapped or entangled marine life safely.

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 operations (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 Talos QN Exploration LLC's Regional Oil Spill Response Plan (refer to information submitted in accordance with **Appendix H**).

The NMFS Office of Protected Resources coordinates agency assessment of the need for response and leads response efforts for spills that may impact sea turtles. If a spill may impact sea turtles, the following NMFS Protected Resources Contacts should be notified, and they will initiate notification of other relevant parties.

- Dr. Brian Stacy at brian.stacy@noaa.gov and 352-283-3370 (cell); or
- Stacy Hargrove at stacy.hargrove@noaa.gov and 305-781-7453 (cell)

There are no other IPFs (including physical disturbances to the seafloor) from the proposed operations that are likely to impact sea turtles.

9. Air Quality
Potential IPFs to air quality as a result of the proposed operations include accidents.

Mississippi Canyon Block 519 is located 89 miles from the Breton Wilderness Area and 66 miles from shore. Applicable emissions data is included in **Appendix G** of the Plan.

There would be a limited degree of air quality degradation in the immediate vicinity of the proposed operations. Plan Emissions for the proposed operations do not exceed the annual exemption levels as set forth by BOEM. 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 Mississippi Canyon Block 519 from the coastline.

There are no other IPFs (including effluents, physical disturbances to the seafloor, and wastes sent to shore for treatment or disposal) from the proposed operations that are likely to impact air quality.

10. Shipwreck Sites (known or potential)
In accordance with BOEM NTL 2005-G07, Talos QN Exploration LLC will submit an archaeological resource report per 30 CFR 550.194 if directed to do so by the Regional Director.

Potential IPFs to known or unknown shipwreck sites as a result of the proposed operations in Mississippi Canyon Block 519 include physical disturbances to the seafloor and accidents.

Physical disturbances to the seafloor: A DP Semi-Submersible or Drillship is being used for the proposed operations; therefore, only an insignificant amount of seafloor will be disturbed. Because physical disturbances to the seafloor will be minimized by the use of a DP Semi-Submersible or Drillship, Talos QN Exploration LLC's proposed operations in Mississippi Canyon Block 519 that are not likely to impact shipwreck sites.

Additionally, Mississippi Canyon Block 519 is not located in or adjacent to an OCS block designated by BOEM as having a high probability for occurrence of shipwrecks. Should Talos QN Exploration LLC discover any evidence of a shipwreck, they will immediately halt operations within a 1000-foot radius, report to BOEM within 48 hours, 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 shipwreck sites if the release were to occur subsea. However, it is unlikely that an accidental oil spill would occur from the proposed operations (refer to **Item 5**, Water Quality). The activities proposed in this plan will be covered by Talos QN Exploration LLC's Regional Oil Spill Response Plan (refer to information submitted in accordance with **Appendix H**).

There are no other IPFs (including emissions, effluents, and wastes sent to shore for treatment or disposal) from the proposed operations that are likely to impact shipwreck sites.

11. Prehistoric Archaeological Sites

In accordance with BOEM NTL 2005-G07, Talos QN Exploration LLC will submit an archaeological resource report per 30 CFR 550.194 if directed to do so by the Regional Director.

Potential IPFs to prehistoric archaeological sites as a result of the proposed operations in Mississippi Canyon Block 519 are physical disturbances to the seafloor and accidents. Should Talos QN Exploration LLC discover any object of prehistoric archaeological significance, they will immediately halt operations within a 1000-foot radius, report to BOEM within 48 hours, and make every reasonable effort to preserve and protect that cultural resource.

Physical Disturbances to the seafloor: Although the operations proposed will be conducted by utilizing a DP Semi-Submersible or Drillship, which would cause only an insignificant amount of seafloor to be disturbed, Mississippi Canyon Block 519 is located inside the Archaeological Prehistoric high probability lines. Talos QN Exploration LLC 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 operations (refer to **Item 5**, Water Quality). The activities proposed in this plan will be covered by Talos QN Exploration LLC's Regional Oil Spill Response Plan (refer to information submitted in accordance with **Appendix H**).

There are no other IPFs (including emissions, effluents, and wastes sent to shore for treatment or disposal) from the proposed operations that are likely to impact prehistoric archeological sites.

Vicinity of Offshore Location

12. Essential Fish Habitat (EFH)

Potential IPFs to EFH as a result of the proposed operations in Mississippi Canyon Block 519 include physical disturbances to the seafloor, effluents, and accidents. EFH includes all estuarine and marine waters and substrates in the Gulf of Mexico.

Physical disturbances to the seafloor: Turbidity and sedimentation resulting from the bottom disturbing activities included in the proposed operations would be short term and localized. Fish are mobile and would avoid these temporarily suspended sediments. Additionally, the Live Bottom Low Relief Stipulation, the Live Bottom (Pinnacle Trend) Stipulation, and the Eastern Gulf Pinnacle Trend Stipulation have been put in place to minimize the impacts of bottom disturbing activities. Additionally, a DP Semi-Submersible or Drillship is being used for the proposed

operations; therefore, only an insignificant amount of seafloor will be disturbed. Therefore, the bottom disturbing activities from the proposed operations would have a negligible impact on EFH.

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 operations (refer to **Item 5**, Water Quality). The activities proposed in this plan will be covered by Talos QN Exploration LLC's Regional OSRP (refer to information submitted in **Appendix H**).

There are no other IPFs (including emissions and wastes sent to shore for treatment or disposal) from the proposed operations that are likely to impact essential fish habitat.

13. Marine and Pelagic Birds

Potential IPFs to marine birds as a result of the proposed operations include emissions (air, noise / sound), accidental oil spills, and discarded trash and debris from vessels and the facilities.

Emissions:

Air Emissions

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

Noise / Sound Emissions

The OCS oil-and gas-related helicopters and vessels have the potential to cause noise and disturbance. However, flight altitude restrictions over sensitive habitat, including that of birds, may make serious disturbance unlikely. Birds are also known to habituate to noises, including airport noise. It is an assumption that the OCS oil-and gas-related vessel traffic would follow regular routes; if so, seabirds would find the noise to be familiar. Therefore, the impact of OCS oil-and gas-related noise from helicopters and vessels to birds would be expected to be negligible.

The use of explosives for decommissioning activities may potentially kill one or more birds from barotrauma if a bird (or several birds because birds may occur in a flock) is present at the location of the severance. For the impact of underwater sound, a threshold of 202 dB sound exposure level (SEL) for injury and 208 dB SEL for barotrauma was recommended for the Brahyramphus

marmoratus, a diving seabird (USDOI, FWS, 2011). However, the use of explosive severance of facilities for decommissioning are not included in these proposed operations, therefore these impacts are not expected.

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 operations (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 Talos QN Exploration LLC'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, 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).

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

Informational placards will be posted on all vessels and facilities having sleeping or food preparation capabilities. All offshore personnel, including contractors and other support services-related personnel (e.g., helicopter pilots, vessel captains and boat crews) will be indoctrinated on waste procedures, and will view the video (or Microsoft PowerPoint presentation), *Think About It* (*previously All Washed Up: The Beach Litter Problem*). Thereafter, all personnel will view the marine trash and debris training video annually. Offshore personnel will also receive an explanation from Talos QN Exploration LLC 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 operations will seldom interact with marine and pelagic birds; therefore, the effects will be negligible.

ESA bird species: Seven species found in the GOM are listed under the ESA. BOEM consults on these species and requires mitigations that would decrease the potential for greater impacts due to small population size.

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

14. Public Health and Safety Due to Accidents.
There are no IPFs (including emissions, effluents, physical disturbances to the seafloor, wastes sent to shore for treatment or disposal, and accidents, including an accidental H_2S release) from the proposed operations that are likely to impact 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 operations be classified by BSEE as H_2S absent.

Coastal and Onshore

15. Beaches
Potential IPFs to beaches from the proposed operations include accidents 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 (66 miles) and the response capabilities that would be implemented, no significant adverse impacts are expected. The operations proposed in this plan will be covered by Talos QN Exploration LLC'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 operations. 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).

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

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

(*previously All Washed Up: The Beach Litter Problem*). Thereafter, all personnel will view the marine trash and debris training video annually. Offshore personnel will also receive an explanation from Talos QN Exploration LLC 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 (including emissions, effluents, physical disturbances to the seafloor, and wastes sent to shore for treatment or disposal) from the proposed operations that are likely to impact beaches.

16. Wetlands

Potential IPFs to wetlands from the proposed operations include accidents and discarded trash and debris.

Accidents: It is unlikely that an oil spill would occur from the proposed operations (refer to **Item 5**, Water Quality). Due to the distance from shore (66 miles) and the response capabilities that would be implemented, no impacts are expected. The operations proposed in this plan will be covered by Talos QN Exploration LLC'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 operations. 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).

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

Informational placards will be posted on all vessels and facilities having sleeping or food preparation capabilities. All offshore personnel, including contractors and other support services-related personnel (e.g., helicopter pilots, vessel captains and boat crews) will be indoctrinated on waste procedures, and will view the video (or Microsoft PowerPoint presentation), *Think About It* (*previously All Washed Up: The Beach Litter Problem*). Thereafter, all personnel will view the marine trash and debris training video annually. Offshore personnel will also receive an explanation from Talos QN Exploration LLC 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 (including emissions, effluents, physical disturbances to the seafloor, and wastes sent to shore for treatment or disposal) from the proposed operations that are likely to impact wetlands.

17. Shore Birds and Coastal Nesting Birds

Potential IPFs to shore birds and coastal nesting birds as a result of the proposed operations include accidents and discarded trash and debris.

Accidents: Oil spills could impact shore birds and coastal nesting birds. However, it is unlikely that an oil spill would occur from the proposed operations (refer to **Item 5**, Water Quality). Given the distance from shore (66 miles) and the response capabilities that would be implemented, no impacts are expected. The operations proposed in this plan will be covered by Talos QN Exploration LLC's Regional OSRP (refer to information submitted in **Appendix H**).

Discarded trash and debris: Shore birds and coastal nesting 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, 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).

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

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 Talos QN Exploration LLC 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 (including emissions, effluents, physical disturbances to the seafloor, and wastes sent to shore for treatment or disposal) from the proposed operations that are likely to impact shore birds and coastal nesting birds.

18. Coastal Wildlife Refuges

Potential IPFs to coastal wildlife refuges as a result of the proposed operations include accidents and discarded trash and debris.

Accidents: An accidental oil spill from the proposed operations could impact coastal wildlife refuges. However, it is unlikely that an oil spill would occur from the proposed operations (refer to Item 5, Water Quality). Due to the distance from shore (66 miles) and the response capabilities that would be implemented, no impacts are expected. The operations proposed in this plan will be covered by Talos QN Exploration LLC'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).

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

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 Talos QN Exploration LLC 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 (including emissions, effluents, physical disturbances to the seafloor, and wastes sent to shore for treatment or disposal) from the proposed operations that are likely to impact coastal wildlife refuges.

19. Wilderness Areas

Potential IPFs to wilderness areas as a result of the proposed operations include accidents and discarded trash and debris.

Accidents: An accidental oil spill from the proposed operations could impact wilderness areas. However, it is unlikely that an oil spill would occur from the proposed operations (refer to **Item 5**, Water Quality). Due to the distance from the nearest designated Wilderness Area (89 miles) and the response capabilities that would be implemented, no significant adverse impacts are expected. The operations proposed in this plan will be covered by Talos QN Exploration LLC'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).

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

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 Talos QN Exploration LLC 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 (including emissions, effluents, physical disturbances to the seafloor, and wastes sent to shore for treatment or disposal) from the proposed operations that are likely to impact wilderness areas.

20. Other Environmental Resources Identified

20.1 – Rice's Whale (née Gulf of Mexico Bryde's Whale)

The Bryde's whale, also known as the Bryde's whale complex, is a collection of baleen whales that are still being researched to determine if they are the same species or if they are individual species of whales. In 2021, the Rice's whale, formerly known as the Gulf of Mexico Bryde's whale, was determined to be a separate species from other Bryde's whales. There are less than 100 Rice's whales living in the Gulf of Mexico year-round. These whales retain all the protections of the Gulf of Mexico Bryde's whale under the Endangered Species Act while the regulations are being updated to reflect the name change.

The Rice's whale (née Gulf of Mexico Bryde's whale) is the only commonly occurring baleen whale in the northern Gulf of Mexico and has been sighted off western Florida and in the De Soto Canyon region. The Rice's whale area is over 36.3 miles from the proposed operations. Additionally, vessel traffic associated with the proposed operations will not flow through the Rice's whale area. Therefore, there are no IPFs from the proposed operations that are likely to impact the Rice's whale. Additional information on marine mammals may be found in **Item 7**.

20.2 – Gulf Sturgeon

The Gulf sturgeon resides primarily in inland estuaries and rivers from Louisiana to Florida and a small population of the species enters the Gulf of Mexico seasonally in western Florida. Potential IPFs to the Gulf sturgeon from the proposed operations include accidents, emissions (noise / sound), and discarded trash and debris. Additional information on ESA-listed fish may be found in **Item 6**.

Accidents: Collisions between support vessels and the Gulf sturgeon would be unusual events; however, should one occur, death or injury to the Gulf sturgeon is possible. Contract vessel operators can avoid protected aquatic species and reduce potential deaths by maintaining a vigilant watch and a distance of 50 meters or greater, with the exception of animals that approach the vessel. Vessel personnel should use a Gulf of Mexico reference guide that includes identifying information on marine mammals, sea turtles, and other marine protected species (i.e., Endangered Species Act listed species such as Gulf sturgeon, giant manta ray, or oceanic whitetip shark) that may be encountered in the Gulf of Mexico OCS.

Contract vessel operators will comply with the measures included in Appendix C of the NMFS Biological Opinion and requirements of the Protected Species Lease Stipulation, except under extraordinary circumstances when the safety of the vessel or crew is in doubt or the safety of life at sea is in question.

Should an ESA-listed fish (e.g., giant manta ray, oceanic whitetip shark, or Gulf sturgeon) be entrapped, entangled, or injured, personnel should contact the ESA Section 7 biologist at (301) 427-8413 (nmfs.psoreview@noaa.gov) and report all incidents to takereport.nmfsser@noaa.gov.

After making the appropriate notifications, Talos QN Exploration LLC may call BSEE at (985) 722-7902 for questions or additional guidance on recovery assistance needs, continued monitoring requirements, and incidental report information which at minimum is detailed below. Additional information may be found at the following website: https://www.fisheries.noaa.gov/report. Any injured or dead protected species should also be reported to takereport.nmfsser@noaa.gov. In addition, if the injury or death was caused by a collision with the operator's vessel, an entrapment within the operator's equipment or vessel (e.g. moon pool), or an entanglement within the operator's equipment, the operator must further notify BOEM and BSEE within 24 hours of the strike or entrapment/entanglement by email to protectedspecies@boem.gov and protectedspecies@bsee.gov. If the vessel is the responsible party, it is required to remain available to assist the respective salvage and stranding network as needed.

Due to the distance from the nearest identified Gulf sturgeon critical habitat (118.1 miles) and the response capabilities that would be implemented during a spill, no significant adverse impacts are expected to the Gulf sturgeon. Considering the information from the National Marine Fisheries Service Endangered Species Act (ESA) Section 7 Biological Opinion, the location of this critical habitat in relation to proposed operations, the likely dilution of oil reaching nearshore areas, and the on-going weathering and dispersal of oil over time, we do not anticipate the effects from oil spills will appreciably diminish the value of Gulf sturgeon designated critical habitat for the conservation of the species. The operations proposed in this plan will be covered by Talos QN Exploration LLC's Regional OSRP (refer to information submitted in **Appendix H)**.

Emissions (noise / sound): All routine OCS oil-and gas-related activities have some element of sound generation. Common sound sources include propeller cavitation, rotating machinery, and reciprocating machinery, which are associated with routine OCS oil-and gas-related activities such as vessel traffic, drilling, construction, and oil and gas production, processing, and transport. Sound introduced into the marine environment as a result of human activities has the potential to affect marine organisms**.** The National Marine Fisheries Service Endangered Species Act (ESA) Section 7 Biological Opinion found that construction and operational sounds other than pile driving will have insignificant effects on Gulf sturgeon (NMFS, 2020). There are no pile driving activities associated with the proposed operations, therefore noise impacts are not expected to significantly affect Gulf sturgeon.

Discarded trash and debris: Trash and debris are not expected to impact the Gulf sturgeon. There will only be a limited amount of marine debris, if any, resulting from the proposed operations. 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).

Talos QN Exploration LLC will operate in accordance with the regulations, agency guidance, and Appendix B of the National Marine Fisheries Service Endangered Species Act (ESA) Section 7

Biological Opinion and also avoid accidental loss of solid waste items by maintaining waste management plans, manifesting trash sent to shore, and using special precautions such as covering outside trash bins to prevent accidental loss of solid waste. Special caution will be exercised when handling and disposing of small items and packaging materials, particularly those made of non-biodegradable, environmentally persistent materials such as plastic or glass. Talos QN Exploration LLC will also collect and remove flotsam resulting from activities related to proposed operations.

Informational placards will be posted on all vessels and facilities having sleeping or food preparation capabilities. All offshore personnel, including contractors and other support services-related personnel (e.g., helicopter pilots, vessel captains and boat crews) will be indoctrinated on waste procedures, and will view the video (or Microsoft PowerPoint presentation), *Think About It* (*previously All Washed Up: The Beach Litter Problem*). Thereafter, all personnel will view the marine trash and debris training video annually. Offshore personnel will also receive an explanation from Talos QN Exploration LLC 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 (including effluents, physical disturbances to the seafloor, and wastes sent to shore for treatment or disposal) from the proposed operations that are likely to impact the Gulf sturgeon.

20.3 – Oceanic Whitetip Shark

Oceanic whitetip sharks may be found in tropical and subtropical waters around the world, including the Gulf of Mexico (Young 2016). According to the National Marine Fisheries Service Endangered Species Act (ESA) Section 7 Biological Opinion, Essential Fish Habitat (EFH) for the oceanic whitetip shark includes localized areas in the central Gulf of Mexico and Florida Keys. Oceanic whitetip sharks were listed as threatened under the Endangered Species Act in 2018 due to worldwide overfishing. Oceanic whitetip sharks had an abundant worldwide population, which has been threatened in recent years by inadequate regulatory measures governing fisheries; therefore, there is little research regarding the impact of oil and gas operations on oceanic whitetip sharks (NMFS, 2020). IPFs that have been determined by NMFS to be discountable to oceanic whitetip sharks include vessel strike, emissions (noise / sound), discharges, entanglement and entrapment, and marine debris. Potential IPFs to oceanic whitetip sharks as a result of the proposed operations in Mississippi Canyon Block 519 include accidents. Additional information on ESA-listed fish may be found in **Item 6**.

Accidents: Collisions between support vessels and the oceanic whitetip shark would be unusual events, however, should one occur, death or injury to the oceanic whitetip shark is possible. Contract vessel operators can avoid protected aquatic species and reduce potential deaths by maintaining a vigilant watch and a distance of 50 meters or greater, with the exception of animals that approach the vessel. Vessel personnel should use a Gulf of Mexico reference guide that includes identifying information on marine mammals, sea turtles, and other marine protected

species (i.e., Endangered Species Act listed species such as Gulf sturgeon, giant manta ray, or oceanic whitetip shark) that may be encountered in the Gulf of Mexico OCS.

Contract vessel operators will comply with the measures included in Appendix C of the NMFS Biological Opinion and requirements of the Protected Species Lease Stipulation, except under extraordinary circumstances when the safety of the vessel or crew is in doubt or the safety of life at sea is in question.

Should an ESA-listed fish (e.g., giant manta ray, oceanic whitetip shark, or Gulf sturgeon) be entrapped, entangled, or injured, personnel should contact the ESA Section 7 biologist at (301) 427-8413 (nmfs.psoreview@noaa.gov) and report all incidents to takereport.nmfsser@noaa.gov. After making the appropriate notifications, Talos QN Exploration LLC may call BSEE at (985) 722-7902 for questions or additional guidance on recovery assistance needs, continued monitoring requirements, and incidental report information which at minimum is detailed below. Additional information may be found at the following website: https://www.fisheries.noaa.gov/report. Any injured or dead protected species should also be reported to takereport.nmfsser@noaa.gov. In addition, if the injury or death was caused by a collision with the operator's vessel, an entrapment within the operator's equipment or vessel (e.g. moon pool), or an entanglement within the operator's equipment, the operator must further notify BOEM and BSEE within 24 hours of the strike or entrapment/entanglement by email to protectedspecies@boem.gov and protectedspecies@bsee.gov. If the vessel is the responsible party, it is required to remain available to assist the respective salvage and stranding network as needed.

There is little information available on the impacts of oil spills or dispersants on oceanic whitetip sharks. It is expected that exposure of oil or dispersants to oceanic whitetip sharks would likely result in effects similar to other marine species, including fitness reduction and the possibility of mortality (NMFS, 2020). Due to the sparse population in the Gulf of Mexico, it is possible that a small number of oceanic whitetip sharks could be impacted by an oil spill. However, it is unlikely that such an event would occur from the proposed operations (refer to **Item 5**, Water Quality). The operations proposed in this plan will be covered by Talos QN Exploration LLC's Regional OSRP (refer to information submitted in **Appendix H**).

Discarded trash and debris: There is little available information on the effects of marine debris on oceanic whitetip sharks. Since these sharks are normally associated with surface waters, they may be susceptible to entanglement. However, due to the small, widely dispersed, and highly mobile population in the Gulf of Mexico, and the localized and patchy distribution of marine debris, it is extremely unlikely that oceanic whitetip sharks would be impacted by marine debris.

There will only be a limited amount of marine debris, if any, resulting from the proposed operations. 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).

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

Informational placards will be posted on all vessels and facilities having sleeping or food preparation capabilities. All offshore personnel, including contractors and other support services-related personnel (e.g., helicopter pilots, vessel captains and boat crews) will be indoctrinated on waste procedures, and will view the video (or Microsoft PowerPoint presentation), *Think About It* (*previously All Washed Up: The Beach Litter Problem*). Thereafter, all personnel will view the marine trash and debris training video annually. Offshore personnel will also receive an explanation from Talos QN Exploration LLC 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 IPFs (including effluents, physical disturbances to the seafloor, and wastes sent to shore for treatment or disposal) from the proposed operations that are likely to impact oceanic whitetip sharks.

20.4 – Giant Manta Ray

According to the National Marine Fisheries Service Endangered Species Act (ESA) Section 7 Biological Opinion, the giant manta ray lives in tropical, subtropical, and temperate oceanic waters and productive coastlines throughout the Gulf of Mexico. While uncommon in the Gulf of Mexico, there is a population of approximately 70 giant manta rays in the Flower Garden Banks National Marine Sanctuary (Miller and Klimovich 2017). Giant manta rays were listed as threatened under the Endangered Species Act in 2018 due to worldwide overfishing. Giant manta rays had an abundant worldwide population, which has been threatened in recent years by inadequate regulatory measures governing fisheries; therefore, there is little research regarding the impact of oil and gas operations on giant manta rays (NMFS, 2020). IPFs that have been determined by NMFS to be discountable to giant manta rays include vessel strike, emissions (noise / sound), discharges, entanglement and entrapment, and marine debris. Potential IPFs to giant manta rays as a result of the proposed operations in Mississippi Canyon Block 519 include accidents. Additional information on ESA-listed fish may be found in **Item 6**.

Accidents: Collisions between support vessels and the giant manta ray would be unusual events, however, should one occur, death or injury to the giant manta ray is possible. Contract vessel operators can avoid protected aquatic species and reduce potential deaths by maintaining a vigilant watch and a distance of 50 meters or greater, with the exception of animals that approach the vessel. Vessel personnel should use a Gulf of Mexico reference guide that includes identifying information on marine mammals, sea turtles, and other marine protected species (i.e., Endangered Species Act listed species such as Gulf sturgeon, giant manta ray, or oceanic whitetip shark) that may be encountered in the Gulf of Mexico OCS.

Contract vessel operators will comply with the measures included in Appendix C of the NMFS Biological Opinion and requirements of the Protected Species Lease Stipulation, except under extraordinary circumstances when the safety of the vessel or crew is in doubt or the safety of life at sea is in question.

Should an ESA-listed fish (e.g., giant manta ray, oceanic whitetip shark, or Gulf sturgeon) be entrapped, entangled, or injured, personnel should contact the ESA Section 7 biologist at (301) 427-8413 (nmfs.psoreview@noaa.gov) and report all incidents to takereport.nmfsser@noaa.gov. After making the appropriate notifications, Talos QN Exploration LLC may call BSEE at (985) 722-7902 for questions or additional guidance on recovery assistance needs, continued monitoring requirements, and incidental report information which at minimum is detailed below. Additional information may be found at the following website: https://www.fisheries.noaa.gov/report. Any injured or dead protected species should also be reported to takereport.nmfsser@noaa.gov. In addition, if the injury or death was caused by a collision with the operator's vessel, an entrapment within the operator's equipment or vessel (e.g. moon pool), or an entanglement within the operator's equipment, the operator must further notify BOEM and BSEE within 24 hours of the strike or entrapment/entanglement by email to protectedspecies@boem.gov and protectedspecies@bsee.gov. If the vessel is the responsible party, it is required to remain available to assist the respective salvage and stranding network as needed.

There is little information available on the impacts of oil spills or dispersants on giant manta rays. It is expected that exposure of oil or dispersants to giant manta rays would likely result in effects similar to other marine species, including fitness reduction and the possibility of mortality (NMFS, 2020). It is possible that a small number of giant manta rays could be impacted by an oil spill in the Gulf of Mexico. However, due to the distance to the Flower Garden Banks (229.4 miles), the low population dispersed throughout the Gulf of Mexico, and the response capabilities that would be implemented during a spill, no significant adverse impacts are expected to impact giant manta rays. Additionally, it is unlikely that such an event would occur from the proposed operations (refer to **Item 5**, Water Quality). The operations proposed in this plan will be covered by Talos QN Exploration LLC's Regional OSRP (refer to information submitted in **Appendix H**).

Discarded trash and debris: There is little available information on the effects of marine debris on giant manta rays. Since these sharks are normally associated with surface waters, they may be

susceptible to entanglement. However, due to the small, widely dispersed, and highly mobile population in the Gulf of Mexico, and the localized and patchy distribution of marine debris, it is extremely unlikely that oceanic whitetip sharks would be impacted by marine debris.

There will only be a limited amount of marine debris, if any, resulting from the proposed operations. 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).

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

Informational placards will be posted on all vessels and facilities having sleeping or food preparation capabilities. All offshore personnel, including contractors and other support services-related personnel (e.g., helicopter pilots, vessel captains and boat crews) will be indoctrinated on waste procedures, and will view the video (or Microsoft PowerPoint presentation), *Think About It* (*previously All Washed Up: The Beach Litter Problem*). Thereafter, all personnel will view the marine trash and debris training video annually. Offshore personnel will also receive an explanation from Talos QN Exploration LLC 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 (including effluents, physical disturbances to the seafloor, and wastes sent to shore for disposal) from the proposed operations that are likely to impact giant manta rays.

20.5 – Loggerhead Sea Turtle

The loggerhead sea turtles inhabit continental shelf and estuarine environments throughout the temperate and tropical regions of the Atlantic Ocean, with nesting beaches along the northern and western Gulf of Mexico. NMFS issued a Final Rule in 2014 (79 FR 39855) designating a critical habitat including 38 marine areas within the Northwest Atlantic Ocean, with seven of those areas residing within the Gulf of Mexico. These areas contain one or a combination of habitat types: nearshore reproductive habitats, winter areas, breeding areas, constricted migratory corridors, and/or *Sargassum* habitats. Winter areas, breeding areas, and constricted migratory corridors are not located in the planning area.

There are multiple IPFs that may impact loggerhead sea turtles (see **Item 8**). However, the closest loggerhead nearshore reproductive critical habitat is located 119.5 miles from Mississippi Canyon Block 519; therefore, no adverse impacts are expected. Additionally, considering the information from the National Marine Fisheries Service Endangered Species Act (ESA) Section 7 Biological Opinion, we do not expect proposed operations to affect the ability of *Sargassum* to support adequate prey abundance and cover for loggerhead turtles.

20.6 - Protected Corals

Protected coral habitats, including designated critical habitats, are noncontiguous and occur in the Flower Garden Banks National Marine Sanctuary and Florida. Five banks in the Flower Garden Banks National Marine Sanctuary have been designated as critical habitats for boulder star (Orbicella franksi), lobed star (Orbicella annularis), and mountainous star (Orbicella faveolate) corals. Elkhorn coral can also be found in the Flower Garden Banks, though the area is not a designated critical habitat for this coral. Various coastal counties in Florida are also designated as critical habitats for protected coral species. These coral habitats are located outside of the planning area and are not expected to be impacted by the proposed operations. The following table comprehensively details the designated critical habitat for each protected coral species in the Flower Garden Banks National Marine Sanctuary and Florida.

		Protected Corals						
		Elkhorn Coral *Acopora palmate*	Staghorn Coral *Acopora cervicornis*	Boulder Star Coral *Orbicella franksi*	Lobed Star Coral *Orbicella annularis*	Mountainous Star Coral *Orbicella faveolate*	Rough Cactus Coral *Mycetophyllia ferox*	Pillar Coral *Dendrogyra cylindrus*
Designated Critical Habitat	**Flower Garden Banks National Marine Sanctuary**							
	East Flower Garden Bank			X	X	X		
	West Flower Garden Bank			X	X	X		
	Rankin Bank			X	X	X		
	Rankin Bank			X	X	X		
	Geyer Bank			X	X	X		
	McGrail Bank			X	X	X		
	Florida (outside of planning area)							
	Martin County					X		
	Palm Beach County	X	X	X	X	X		X
	Broward County	X	X	X	X	X	X	X

	Miami-Dade County	X	X	X	X	X	X	X
	Monroe County	X	X	X	X	X	X	X

Potential IPFs to protected corals from the proposed operations include accidents.

Accidents: It is unlikely that an accidental surface or subsurface spill would occur from the proposed operations (refer to statistics in **Item 5**, Water Quality). Oil spills cause damage to corals only if the oil contacts the organisms. Due to the distance from the Flower Garden Banks National Marine Sanctuary (229.4 miles) and other critical coral habitats, no adverse impacts are expected. The operations proposed in this plan will be covered by Talos QN Exploration LLC's Regional OSRP (refer to information submitted in **Appendix H**).

There are no other IPFs (including emissions, effluents, physical disturbances to the seafloor, and wastes sent to shore for disposal) from the proposed operations that are likely to impact protected corals.

20.7 - Endangered Beach Mice

There are four subspecies of endangered beach mouse that are found in the dune systems along parts of Alabama and northwest Florida. Due to the location of Mississippi Canyon Block 519 and the beach mouse critical habitat (above the intertidal zone), there are no IPFs that are likely to impact endangered beach mice.

20.8 - Navigation

The current system of navigation channels around the northern GOM is believed to be generally adequate to accommodate traffic generated by the future Gulfwide OCS Program. As exploration and development activities increase on deepwater leases in the GOM, port channels may need to be expanded to accommodate vessels with deeper drafts and longer ranges. However, current navigation channels will not be changed, and new channels will not be required as a result of the operations proposed in this plan.

(C) IMPACTS ON PROPOSED OPERATIONS

The site–specific environmental conditions have been taken into account for the proposed operations. No impacts are expected on the proposed operations 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, Mississippi Canyon Block 519 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 operations 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 operations. Therefore, a list of such entities has not been provided.

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(I) REFERENCES
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ABS Consulting Inc. 2016. 2016 Update of Occurrence Rates for Offshore Oil Spills. July 13, 2016. Contract #E15PX00045, Deliverable 7 (ABS, 2016)

Adcroft, A., R. Hallberg, J.P. Dunne, B.L. Samuels, J. A. Galt, C.H. Barker, and B. Payton. 2010. Simulations of underwater plumes of dissolved oil in the Gulf of Mexico. Geophysical Research Letters, Vol. 37, L18605, 5 pp. doi: 10.1029/2010GL044689. (Adcroft et al., 2010)

American Petroleum Institute (API). 1989. Effects of offshore petroleum operations on cold water marine mammals: a literature review. Washington, DC: American Petroleum Institute. 385 pp.

Andrew, R. K., B. M. Howe, and J. A. Mercer. 2011. Long-time trends in ship traffic noise for four sites off the North American West Coast. Journal of the Acoustical Society of America 129(2):642-651.

Balazs, G.H. 1985. Impact of ocean debris on marine turtles: entanglement and ingestion. In: Shomura, R.S. and H.O. Yoshida, eds. Proceedings, Workshop on the Fate and Impact of Marine Debris, 26-29 November 1984, Honolulu, HI. U.S. Dept. of Commerce. NOAA Tech. Memo. NOAA-TM-NMFS-SWFC-54. Pp 387-429.

Burke, C.J. and J.A. Veil. 1995. Potential benefits from regulatory consideration of synthetic drilling muds. Environmental Assessment Division, Argonne National Laboratory, ANL/EAD/TM-43.

Catastrophic Spill Event Analysis: High-Volume, Extended-Duration Oil Spill Resulting from Loss of Well Control on the Gulf of Mexico Outer Continental Shelf, 1st Revision (BOEM 2017-007)

Daly, J.M. 1997. Controlling the discharge of synthetic-based drilling fluid contaminated cuttings in waters of the United States. U.S. Environmental Protection Agency, Office of Water. Work Plan, June 24, 1997.

Engås, A., S. Løkkeborg, E. Ona, and A.V. Soldal. 1996. Effects of seismic shooting on local abundance and catch rates of cod (Gadus morhua) and haddock (Melanogrammusaeglefinus). Canadian Journal of Fisheries and Aquatic Science 53:2238-2249 (Engås et al., 1996)

GOM Deepwater Operations and Activities. Environmental Assessment. BOEM 2000-001.

Gulf of Mexico OCS Oil & Gas Lease Sales: 2017-2022, Gulf of Mexico Lease Sales 249, 250, 251, 252, 253, 254, 256, 257, 259, and 261, Final Multisale Environmental Impact Statement. (BOEM 2017-009)

Gulf of Mexico OCS Oil and Gas Lease Sales 259 and 261: Final Supplemental Environmental Impact Statement. (BOEM 2023-001)

Haddad, R. and S. Murawski. 2010. Analysis of hydrocarbons in samples provided from the cruise of the R/V Weatherbird II, May 23-26, 2010. U.S. Dept. of Commerce, National Oceanographic and Atmospheric Administration, Silver Spring, MD. 14 pp. (Haddad and Murawski, 2010)

Hansen, D.J. 198l. The relative sensitivity of seabird populations in Alaska to oil pollution. U.S. Dept. of the Interior, Bureau of Land Management, Alaska OCS Region, Anchorage. BLM-YK-ES-81-006-1792.

Hildebrand, J.A. 2009. Anthropogenic and natural sources of ambient noise in the ocean. Marine Ecology Progress Series 395:5-20. Internet website: http://www.int-res.com/articles/theme/m395p005.pdf. (Hildebrand, 2009)

Joint Analysis Group. 2010. Review of R/V Brooks McCall data to examine subsurface oil. 58 pp. (Joint Analysis Group, 2010)

Ladich, F. 2013. Effects of noise on sound detection and acoustic communication in fishes. In: Brumm, H., ed. Animal communication and noise. Berlin Heidelberg: Springer-Ver lag. Pp. 65- (Ladich, 2013)

Laist, D.W. 1997. Impacts of marine debris: entanglement of marine life in marine debris including a comprehensive list of species with entanglement and ingestion records. In: Coe, J.M. and D.B. Rogers, eds. Marine debris: sources, impacts, and solutions. New York, NY: Springer-Verlag. Pp. 99-139.

Lee, K., T. Nedwed, R. C. Prince, and D. Palandro. 2013a. Lab tests on the biodegradation of chemically dispersed oil should consider the rapid dilution that occurs at sea. Marine Pollution Bulletin 73(1):314-318. DOI: 10.1016/j.marpolbul.2013.06.005. (Lee et al., 2013a)

Lee, K., M. Boufadel, B. Chen, J. Foght, P. Hodson, S. Swanson, and A. Venosa. 2015. The Behaviour and Environmental Impacts of Crude Oil Released into Aqueous Environments. https://www.cepa.com/wp-content/uploads/2014/01/OIWReport.compressed.pdf. (Lee et al., 2015)

Lewis, A. and D. Aurand. 1997. Putting dispersants to work: Overcoming obstacles. 1997 International Oil Spill Conference. API 4652A. Technical Report IOSC-004. (Lewis and Aurand, 1997)

Løkkeborg, S., E. Ona, A. Vold, and A. Salthaug. 2012. Sounds from seismic air guns: gear-and species specific effects on catch rates and fish distribution. Canadian Journal of Fisheries and Aquatic Sciences 69:1,278-1,291. (Løkkeborg et al., 2012)

Lubchenco, J., M. McNutt, B. Lehr, M. Sogge, M. Miller, S. Hammond, and W. Conner. 2010. BP Deepwater Horizon oil budget: What happened to the oil? 5 pp. (Lubchenco et al. 2010)

Luksenburg, J. and E. Parsons, 2009. The effects of aircraft on cetaceans: implications for aerial whale watching. Proceedings of the 61st Meeting of the International Whaling Commission.

Majors, A.P. and A.C. Myrick, Jr. 1990. Effects of noise on animals: implications for dolphins exposed to seal bombs in the eastern tropical Pacific purse-seine fishery–an annotated bibliography. NOAA Administrative Report LJ-90-06.

Marine Mammal Commission. 1999. Annual report to Congress – 1998.

McAuliffe, C.D., B.L. Steelman, W.R. Leek, D.F. Fitzgerald, J. P. Ray, and C.D. Barker. 1981. The 1979 southern California dispersant treated research oil spills. In: Proceedings 1981 Oil Spill Conference. March 2-5, 1981, Atlanta, GA. Washington, DC: American Petroleum Institute. Pp. 269-282. (McAuliffe et al, 1981)

McKenna, M.F., D. Ross, S.M. Wiggins, and J.A. Hildebrand. 2012. Underwater radiated noise from modern commercial ships. Journal of the Acoustical Society of America 131(1):92-103. (McKenna et al., 2012)

Miller, M. H., and C. Klimovich. 2017. Endangered Species Act Status Review Report: Giant Manta Ray (Manta birostris) and Reef Manta Ray (Manta alfredi). NMFS.

National Academies of Sciences, Engineering, and Medicine 2020. The Use of Dispersants in Marine Oil Spill Response. Washington, DC: The National Academies Press. https://doi.org/10.17226/25161. (NAS 2020)

National Marine Fisheries Service Endangered Species Act (ESA) Section 7 Biological Opinion on the Federally Regulated Oil and Gas Program Activities in the Gulf of Mexico (NMFS, 2020)

NMFS. 2017b. Biological and Conference Opinion on the Issuance of Permit No. 20465 to NMFS Alaska Fisheries Science Center Marine Mammal Laboratory for Research on Cetaceans. Office of Protected Resources, National Marine Fisheries Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce, FPR-2017-9186, Silver Spring, Maryland.

NMFS. 2017f. Letter of concurrence on the issuance of Permit No. 20527 to Ann Pabst for vessel and aerial surveys of blue, fin, North Atlantic right, sei, and sperm whales. Office of Protected Resources, National Marine Fisheries Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce, FPR-2017-9199, Silver Spring, Maryland.

NRC. 2005. Oil Spill Dispersants: Efficacy and Effects. Washington, DC: The National Academies Press. (NRC, 2005)

Patenaude, N. J., W. J. Richardson, M. A. Smultea, W. R. Koski, G. W. Miller, B. Wursig, and C. R. Greene. 2002. Aircraft sound and disturbance to bowhead and beluga whales during spring migration in the Alaskan Beaufort Sea. Marine Mammal Science 18(2):309-335.

Piatt, J.F., C.J. Lensink, W. Butler, M. Kendziorek, and D.R. Nysewander. 1990. Immediate impact of the Exxon Valdez oil spill on marine birds. The Auk. 107 (2): 387-397.

Popper, A.N., R.R. Fay, C. Platt, and O. Sand. 2003. Sound detection mechanisms and capabilities of teleost fishes. In: Collin, S.P. and N.J. Marshall, eds. Sensory processing in aquatic environments. New York, NY: Springer-Verlag. Pp. 3-3 (Popper et al., 2003)

Popper, A.N., M.E. Smith, P.A. Cott, B.W. Hanna, A.O. MacGillivray, M.E. Austin, and D.A. Mann. 2005. Effects of exposure to seismic airgun use on hearing of three fish species. Journal of the Acoustical Society of America 117(6):3958-3971. (Popper et al., 2005)

Popper, A.N., A.D. Hawkins, R.R. Fay, D.A. Mann, S. Bartol, T.J. Carlson, S. Coombs, W.T. Ellison, R. Gentry, M.B. Halvorsen, S. Lokkeborg, P. Rogers, B.L. Southall, D.G. Zeddies, and W.N. Tavolga. 2014. ASA S3/SC1. 4 TR -2014 sound exposure guidelines for fishes and sea turtles. A technical report prepared by ANSI-Accredited Standards Committee S3/SC1 and Registered with ANSI. New York, NY: Springer. 78 pp. (Popper et al., 2014)

Popper, A.N. and M.C. Hastings. 2009. Effects of anthropogenic sources of sound on fishes. Journal of Fish Biology 75:455-498 (Popper and Hastings, 2009)

Radford, A.N., E. Kerridge, and S.D. Simpson. 2014. Acoustic communication in a noisy world: Can fish compete with anthropogenic noise? Behavioral Ecology 00(00):1-9. doi:10.1093/beheco/aru029 (Radford et al., 2014)

Richter, C., S. Dawson, and E. Slooten. 2006. Impacts of commercial whale watching on male sperm whales at Kaikoura, New Zealand. Marine Mammal Science 22(1):46-63. (Richter et al. 2006)

Silva, M., P.J. Etnoyer, and I.R. MacDonald. 2015. Coral injuries observed at mesophotic reefs after the Deepwater Horizon oil discharge. Deep Sea Research Part II: Topical studies in oceanography. doi: 10.1016/j.dsr2.2015.05.013. (Silva et al., 2015)

Slabbekoorn, H., N. Bouton, I. van Opzeeland, A. Coers, C. ten Cate, and A.N. Popper. 2010. A noisy spring: The impact of globally rising underwater sound levels on fish. Trends in Ecology & Evolution 25:419-427. (Slabbekoorn et al., 2010)

Smultea, M. A., J. J. R. Mobley, D. Fertl, and G. L. Fulling. 2008a. An unusual reaction and other observations of sperm whales near fixed-wing aircraft. Gulf and Caribbean Research 20:75-80.

Tyack, P.L. 2008. Implications for marine mammals of large-scale changes in the marine acoustic environment. Journal of Mammology 89(3):549-558 (Tyack, 2008)

U.S. Dept. of Commerce. National Marine Fisheries Service. 2010b. Final recovery plan for the sperm whale (Physeter macrocephalus). U.S. Dept. of Commerce, National Marine Fisheries Service, Silver Spring, MD. 165 pp. Internet website: http://www.nmfs.noaa.gov/pr/pdfs/recovery/final_sperm_whale_recovery_plan_21dec.pdf (USDOC, NMFS, 2010b)

U.S. Dept. of the Interior. Fish and Wildlife Service. 2011. Endangered Species Act – Section 7 consultation on the construction of a second explosive handling wharf at Bangor Navy Base, Kitsap County. Conducted by the U.S. Dept. of the Interior, Fish and Wildlife Service, Lacey, WA. 137 pp. (USDOI, FWS, 2011)

Vauk, G., E. Hartwig, B. Reineking, and E. Vauk-Hentzelt. 1989. Losses of seabirds by oil pollution at the German North Sea coast. Topics in Marine Biology. Ros, J.D, ed. Scient. Mar. 53 (2-3): 749-754.

Vermeer, K. and R. Vermeer, 1975 Oil threat to birds on the Canadian west coast. The Canadian Field-Naturalist. 89:278-298.

Wardle, C.S., T.J. Carter, G.G. Urquhart, A.D.F. Johnstone, A.M. Ziolkowski, G. Hampson, and D. Mackie. 2001. Effects of seismic air guns on marine fish. Continental Shelf Research21(8):1005-1027 (Wardle et al., 2001)

Wursig, B., S. K. Lynn, T. A. Jefferson, and K. D. Mullin. 1998. Behaviour of cetaceans in the northen Gulf of Mexico relative to survey ships and aircraft. Aquatic Mammals 24(1):41-50.

Wysocki, L.E. and F. Ladich. 2005. Hearing in fishes under noise conditions. Journal of the Association for Research in Otolaryngology 6:28-36. (Wysocki and Ladich, 2005)

Young, C. N., Carlson, J., Hutchinson, M., Hutt, C., Kobayashi, D., McCandless, C.T., Wraith, J. 2016. Status Review Report: oceanic whitetip shark (Carcharhinius longimanus). Final report to the National Marine Fisheries Service, Office of Protected Resourses.:162.

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

- Hazard Surveys

APPENDIX R
ADMINISTRATIVE INFORMATION

A) EXEMPTED INFORMATION DESCRIPTION

The bottom-hole location of the well has been removed form the public information copy of the EP as well as any discussions of the target objectives, geologic or geophysical data, and any interpreted geology.

B) BIBLIOGRAPHY

Below is a listing of all referenced material used to development this plan.

- BOEM Notice to Lessees No. 2016-G01 "Vessel Strike Avoidance and Injured/Dead Protected Species Reporting"
- BOEM Notice to Lessees No. 2016-G02 "Implementation of Seismic Survey Mitigation Measures and Protected Species Observer Program"
- BOEM Notice to Lessees No. 2016-N01 "Requiring Additional Security"
- BOEM Notice to Lessees No. 2015-N01 "Information Requirements for Exploration Plans, Development and Production Plans, and Development Operations Coordination Documents on the OCS for Worst Case Discharge and Blowout Scenarios"
- Notice to Lessees No. 2015-G03 "Marine Trash and Debris Awareness and Elimination"
- Notice to Lessees No. 2011-G01 (Joint) "Revisions to the List of OCS Lease Blocks Requiring Archaeological Resource Surveys and Reports"
- Notice to Lessees No. 2009-G40 "Deepwater Benthic Communities"
- Notice to Lessees No. 2009-G39 "Biologically-Sensitive Underwater Features and Areas"
- Notice to Lessees No. 2008-G04 "Information Requirements for Exploration Plans and Development Operations Coordination Documents"
- Notice to Lessees No. 2008-G05 "Shallow Hazards Program"
- Notice to Lessees No. 2005-G07 "Archaeological Resource Surveys and Reports"