

UNITED STATES GOVERNMENT
MEMORANDUM

April 7, 2010

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

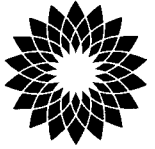
Subject: Public Information copy of plan
Control # - N-09510
Type - Initial Exploration Plan
Lease(s) - OCS-G15610 Block - 782 Green Canyon Area
OCS-G16786 Block - 738 Green Canyon Area
Operator - BP Exploration & Production Inc.
Description - Wells A, B, and U
Rig Type - DP SEMISUBMERSIBLE

Attached is a copy of the subject plan.

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

Elmo Cooper
Plan Coordinator

Site Type/Name	Botm Lse/Area/Blk	Surface Location	Surf Lse/Area/Blk
WELL/A	G16786/GC/738	3428 FSL, 3925 FWL	G16786/GC/738
WELL/B	G16786/GC/738	6729 FSL, 3188 FWL	G16786/GC/738
WELL/U	G16786/GC/738	1212 FNL, 5067 FWL	G15610/GC/782



BP Exploration &
Production Inc
200 Westlake Park Blvd.
Houston, TX 77079

March 23, 2010

U. S. Department of the Interior
Minerals Management Service
Gulf of Mexico OCS Region
1201 Elmwood Park Boulevard
New Orleans, Louisiana 70123

Attn: Plans Section, Office of Field Operations

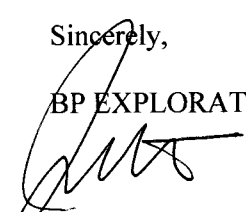
Re: Initial Exploration Plan, Blocks 738 & 782, OCS-G-16786 & 15610, Green
Canyon Area

Dear Sir,

Attached is an Initial Exploration Plan for activities proposed in Green Canyon Area
Blocks 738 & 782. Should additional information be required, please contact Joe
Morton, Tim Morton & Associates, Inc. at 337/735-3881 or email at
jmorton@mortoninc.com.

Sincerely,

BP EXPLORATION & PRODUCTION INC.


Anne-Renee Laplante

jm
Attachments

For

CONTROL No. <i>N-9510</i>
REVIEWER: Elmo Cooper
PHONE: (504) 731-7810

Subject: FW: Pay.Gov Payment Confirmation
From: "Laplante, Anne-Renee" <Anne-renee.Laplante@bp.com>
Date: Mon, 22 Mar 2010 15:21:42 -0500
To: "Joe Morton" <jmorton@mortoninc.com>

Joe:

Attached is proof of payment through payGov for the 3 EP locations at GC 738 and 782.

Anne-Renee Laplante
Regulatory Advisor--Mad Dog Phase II & Paleogene
BP GoM Deepwater Developments
281-366-5155
281-366-1231 (fax)
713-907-7503 (cell)

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-----Original Message-----
From: paygovadmin@mail.doc.twai.gov
[mailto:paygovadmin@mail.doc.twai.gov]
Sent: Monday, March 22, 2010 3:19 PM
To: Laplante, Anne-Renee
Subject: Pay.Gov Payment Confirmation

THIS IS AN AUTOMATED MESSAGE. PLEASE DO NOT REPLY.

Your transaction has been successfully completed.

Transaction Summary

Application Name: MMS Exploration Plan - BF Pay.gov Tracking ID:
250IK39I Agency Tracking ID: 74107718963

Account Holder Name: Anne Renee Laplante Transaction Type: Sale
Transaction Amount: \$10,326.00 Billing Address: 200 Westlake Park Blvd
City: Houston
State/Province: TX
Zip/Postal Code: 77079
Country: USA
Card Type: American Express
Card Number: *****1001
Transaction Date: Mar 22, 2010 4:19:29 PM

Region: Gulf of Mexico
Contact: Anne Renee Laplante 281-366-5155 Company Name/No: BP
Exploration Production, 02481 Lease Number(s): 16786, 15610, , ,
Area-Block: Green Canyon GC, 738: , 782: , : , : , Surface Locations: 3

FOR PUBLIC RELEASE

BP Exploration & Production Inc. Initial Exploration Plan

*Green Canyon Area
Blocks 738 & 782
OCS-G-16786 & 15610*

March 22, 2010

Prepared for BP Exploration & Production Inc.
by Tim Morton & Associates, Inc.

Filename: S:\Jobs\2010\BP Exploration & Production Inc\Green Canyon Area\10-046 Blocks 738 & 782\EP GC738&782.wpd

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Attachment E	Certificate of Coastal Zone Consistency and Environmental Impact Analysis

I. Plan Contents

A. Description of Activities

BP Exploration & Production Inc. proposes to drill three wells in Green Canyon Area Block 738 from two surface locations in Green Canyon Area Block 738 and one surface location in Green Canyon Area Block 782. BP proposes to drill the proposed wells utilizing a dynamically-positioned drillship. BP proposes to drill the wells sequentially, and the anticipated spud date for the first well is May 15, 2010. BP estimates that it will take approximately 50 days to drill each well.

Plan information forms (Form MMS-137) are included as Attachment A.

B. Location

Maps at a scale of 1" = 2,000' on an 8.5" X 11" sheet of paper, that depict the surface locations and water depths of the proposed wells are included in Attachment B. A bathymetry map is also included in Attachment B.

C. Safety and Pollution Prevention Features

Safety and pollution prevention will be accomplished during drilling operations through the use of adequately designed casing programs; blowout preventers, diverters, and other associated well equipment of adequate pressure rating to control anticipated pressures; mud monitoring equipment and sufficient mud volumes to ensure well control; and properly trained supervisory personnel. Pursuant to Coast Guard regulations, fire drills and abandon ship drills will be conducted, and navigational aids, lifesaving equipment, and all other shipboard safety equipment will be installed and maintained.

D. Storage Tanks and Production Vessels

Type of Storage Tank	Type of Facility	Tank Capacity (bbls)	No. of Tanks	Total Capacity (bbls)	Fluid Gravity (API)
Fuel Oil	Drillship	8,536	2	17,072	0.85
Fuel Oil	Drillship	7,893	2	15,796	0.85
Fuel Oil	Drillship	3,729	2	7,458	0.85
Fuel Oil	Drillship	2,663	2	5,326	0.85
Fuel Oil	Drillship	287	2	574	0.85
Fuel Oil	Drillship	777	2	1,554	0.85
Fuel Oil	Drillship	774	2	1,548	0.85
Lube Oil	Drillship	663	2	1,326	0.85
Base Oil	Drillship	3,535	1	3,535	0.93

E. Additional Measures

BP does not propose to utilize safety, pollution prevention, and early spill detection measures beyond those required by 30 CFR Part 250.

II. General Information

A. Applications and Permits

Application/Permit	Issuing Agency	Status
No Individual or Site-specific Permit Required		

B. Drilling Fluids

Type of Drilling Fluid	Estimated Volume of Drilling Fluid to be Used Per Well
Water-based (seawater, freshwater, barite)	41,600
Oil-based (diesel, mineral oil)	NA
Synthetic-based (internal olefin, ester)	3,860

C. Production

Information not required for activities proposed in this Initial Exploration Plan.

D. Oil Characteristics

Information not required for activities proposed in this Initial Exploration Plan.

E. New or Unusual Technologies

Exploration activities in Green Canyon Area Blocks 738 & 782 will not warrant utilizing any new or unusual technology that may affect coastal waters.

F. Bonding Information

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

G. Oil Spill Financial Responsibility (OSFR)

BP Exploration & Production Inc. (MMS Operator No. 2481) has demonstrated oil spill financial responsibility for the facilities proposed in this Initial Exploration Plan according to 30 CFR Part 253, and NTL No. 99-N01, "Guidelines for Oil Spill Financial Responsibility for Covered Facilities".

H. Deepwater Well Control Statement

BP Exploration & Production Inc. (MMS Operator No. 2481) has the financial capability to drill a relief well and conduct other emergency well control operations.

I. Suspensions of Production

BP does not have any approved or anticipated suspensions of production.

J. Blowout Scenario

Information not required for activities proposed in this Initial Exploration Plan.

III. Geological and Geophysical Information

A. Geologic Description

A discussion of the geological objectives, including a brief description of the hydrocarbon trapping elements is included in Attachment C in the “Proprietary Information” copies of this Initial Exploration Plan.

B. Structure Contour Maps

A current structure contour map is included in Attachment C in the “Proprietary Information” copies of this Initial Exploration Plan.

C. Interpreted 2-D and/or 3-D Seismic Lines

Migrated and annotated (shot points, time lines, well paths) 3-D seismic lines with depth scale within 152 meters (500 feet) of the proposed surface locations are enclosed with the Shallow Hazards Assessments included in Attachment C in the “Proprietary Information” copies of this Initial Exploration Plan.

D. Geological Structure Cross-section Maps

An interpreted geological structure cross-section map is included in Attachment C in the “Proprietary Information” copies of this Initial Exploration Plan.

E. Shallow Hazards Report

A Geohazards Assessment of Blocks 639, 737, 738, 739, 740, 781, 782, 783, 784, 825, 826, 827, 828 & 870, Green Canyon Area has been prepared by C&C Technologies, Inc. Two copies of that assessment are enclosed with this Initial Exploration Plan.

F. Shallow Hazards Assessment

Shallow Hazards Assessments for the proposed surface locations are included in Attachment C of this Initial Exploration Plan.

G. High-resolution Seismic Lines

With permission from MMS, 3-D survey information is utilized in lieu of high-resolution survey lines.

H. Stratigraphic Column

A generalized biostratigraphic/lithostratigraphic column is included in Attachment C in the “Proprietary Information” copies of this Initial Exploration Plan.

I. Time vs. Depth Table

Previous wells drilled in the vicinity of Green Canyon Area Blocks 738 and 782 had adequate well control; therefore, no seismic travel time versus depth table is provided.

IV. Hydrogen Sulfide (H₂S) Information

A. Concentration

0 PPM H₂S

B. Classification

Based on previous drilling, no H₂S is known to occur in the project area. BP Exploration & Production Inc., therefore, requests that Green Canyon Area Blocks 738 and 782 be classified as a “Zone where the absence of H₂S has been confirmed”. The correlative well is OCS-G-09982 Well No. 1.

V. Mineral Resource Conservation Information

Information not required for activities proposed in this Initial Exploration Plan.

VI. Biological, Physical, and Socioeconomic Information

A. Chemosynthetic Communities Report

Features or areas that could support high-density chemosynthetic communities are *not* located within 1,500 feet of each proposed muds and cuttings discharge location. The proposed wells will be drilled utilizing a dynamically-positioned semi-submersible rig.

B. Topographic Features Map

All proposed bottom-disturbing activities will occur outside 305 meters (1,000 feet) of the “No Activity Zone” of an identified topographic feature.

C. Topographic Features Statement (shunting)

All proposed bottom-disturbing activities will occur outside of the 3 mile zone of an identified topographic feature.

D. Live Bottoms (Pinnacle Trend) Map

All proposed bottom-disturbing activities will occur outside of 61 meters (200 feet) of any pinnacles.

E. Live Bottoms (Low Relief) Map

Live Bottom (low relief) Stipulation does not apply to this lease.

F. Potentially Sensitive Biological Features

All proposed bottom-disturbing activities will occur outside of 30 meters (100 feet) of any potential sensitive biological features.

G. Remotely Operated Vehicle (ROV) Monitoring Survey Plan

Green Canyon Area Blocks 738 and 782 fall within Grid 13. It has been determined by the Minerals Management Service (MMS) that sufficient remotely operated vehicle (ROV) information has been gathered in Grid 13; therefore, no ROV monitoring survey is required.

BP has conducted an extensive ROV survey in Green Canyon Area Blocks 738, 782, 824 and 825 composed of six survey lines over seafloor fluid expulsion features to assess the presence/absence of chemosynthetic fauna. A report entitled 2009 Remotely Operated Vehicle Seafloor Investigation, Mad Dog Phase 2 Development Area, Blocks 738, 782, 824 and 825 prepared by Berger Geosciences, LLC is enclosed with this Initial Exploration Plan. Where appropriate, the Shallow Hazards Reports, found in Appendix C, reference this ROV survey.

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

Five baleen whales (the northern right (*Eubalaena glacialis*), blue (*B. musculus*), fin (*Balaenoptera physalus*), sei (*B. borealis*), and humpback (*Megaptera novaeangliae*)), one toothed whale (the sperm (*Physeter macrocephalus*)), and one sirenian (the West Indian manatee (*Trichechus manatus*)) occur in the Gulf of Mexico and are listed as endangered under the Endangered Species Act (ESA)(USDOJ, OCS EIS/EA MMS 2007-018). Of the seven or eight extant species of sea turtle, five are known to inhabit the waters of the Gulf of Mexico: the leatherback (*Dermochelys coriacea*), green (*Chelonia mydas*), hawksbill (*Eretmochelys imbricata*), Kemp's ridley (*Lepidochelys kempii*), and loggerhead (*Caretta caretta*). The Gulf sturgeon (*Ancipenser oxyrinchus desotoi*) is the only listed threatened fish species in the Gulf of Mexico. Green Canyon Area Blocks 738 and 782 are not designated as critical habitat for any of these species. BP does not anticipate that any threatened or endangered species will be adversely affected as a result of proposed activities in this Initial Exploration Plan.

I. Archaeological Report

Green Canyon Area Blocks 738 and 782 are not located within the area of high archaeological potential as described in NTL No. 2005-G07 and supplemental NTL's. Therefore, an Archaeological Report is not required for activities proposed in this Initial Exploration Plan.

VII. Waste and Discharge Information

A. Projected Generated Wastes

Type of Waste	Composition	Projected Amount
Trash	Refuse generated during drilling activities	50 bbls/month

B. Projected Ocean Discharges

Type of Waste	Total Amount to be Discharged	Discharge Rate	Discharge Method
Domestic wastes	77 gal/day	0.002 m ³ /person/day	Remove floating solids, discharge overboard

C. Modeling Report

Information not required for activities proposed in this Initial Exploration Plan.

VIII. Air Emissions Information

Air emissions associated with activities proposed in this Initial Exploration Plan have been calculated, and the appropriate emissions information is included in Attachment D.

IX. Oil Spill Information

A. Oil Spill Response Planning

1. Regional OSRP Information

All the proposed activities and facilities in this Initial Exploration Plan will be covered by the OSRP filed by BP America Inc. (MMS Operator No. 21591) in accordance with 30 CFR 254 and approved on July 21, 2009. BP Exploration & Production Inc. is covered under that OSRP.

2. Spill Response Sites

Primary Response Equipment Location	Preplanned Staging Location(s)
Fort Jackson, Louisiana	Fort Jackson, Louisiana

3. OSRO Information

BP is a member of Clean Gulf Associates (CGA), and would utilize CGA equipment in the event of an oil spill at Green Canyon Area Blocks 738 and 782. CGA is an oil spill cooperative which owns a large inventory of oil spill clean-up equipment which is supported by Marine Spill Response Corporation (MSRC). MSRC is responsible for storing, inspecting, maintaining and dispatching CGA's equipment. MSRC will also provide personnel to supervise and operate the equipment.

4. Worst-case Scenario Determination

Category	Regional OSRP	EP
Type of Activity	Exploratory	Exploratory
Facility Location (area/block)	MC 462	GC 738 & 782
Facility Designation		
Distance to Nearest Shoreline (miles)	33 miles	124 miles
Volume		
Storage tanks (total)		
Flowlines (on facility)		
Lease term pipelines		
Uncontrolled blowout (volume per day)	250,000 barrels	184,000 barrels
Total Volume	250,000 barrels	184,000 barrels
Type of oil(s) - (crude oil, condensate, diesel)	crude oil	crude oil
API Gravity(s)	26	

Since BP has the capability to respond to the worst-case spill scenario included in its regional Oil Spill Response Plan approved on July 21, 2009, and since the worst-case scenario determined for their EP does not replace the worst-case scenario in their regional OSRP, BP Exploration & Production Inc. hereby certifies that they have the capability to respond, to the maximum extent practicable, to a worst-case discharge, or a substantial threat of such a discharge, resulting from the activities proposed in their EP.

5. Oil Spill Response Discussion

Information not required for activities proposed in this Initial Exploration Plan.

X. Environmental Monitoring & Mitigation Measures

A. Monitoring Systems

No existing and/or planned monitoring systems that are measuring, or will measure, environmental conditions and/or will provide project-specific data or information on the impacts of the proposed activities will be utilized.

B. Incidental Takes

BP does not anticipate that any protected species might be incidentally taken during operations proposed in this plan. All activities will be conducted in adherence to NTL 2007-G03 "Marine Trash and Debris Awareness Training and Elimination", NTL 2007-G04 "Vessel Strike Avoidance and Injured/Dead Protected Species Reporting" and NTL 2007-G02 "Implementation of Seismic Survey Mitigation and Protected Species Observer Program". Monitoring activities are conducted by all

personnel on vessels, rigs and platforms to prevent accidental loss of materials overboard and to report sightings of injured/dead protected species. Vessel personnel conduct continual watch while underway to prevent takes through avoidance and to immediately report any observations of injured or dead mammals/turtles, regardless of cause.

C. Flower Garden Banks National Marine Sanctuary

Information not required for activities proposed in this Initial Exploration Plan.

XI. Lease Stipulation Information

Lease Stipulation for Protected Species (Sea Turtles, Marine Mammals, Gulf Sturgeon, Brown Pelican, Whooping Cranes, and Other Federally Protected Species)

All activities will be conducted in adherence to NTL 2007-G03 “Marine Trash and Debris Awareness Training and Elimination”, NTL 2007-G04 “Vessel Strike Avoidance and Injured/Dead Protected Species Reporting” and NTL 2007-G02 "Implementation of Seismic Survey Mitigation and Protected Species Observer Program". Mitigation to prevent takes varies based on the activity underway and it can include 1) worker training on waste management and trash and debris containment procedures to avoid accidental loss overboard and it's potential impact on protected species; 2) vessel procedures to slow down or stop when a protected species is observed.

Military Areas Stipulation

In response to the Military Areas Stipulation being invoked in Green Canyon Area Blocks 738 and 782, the vessel contractor will contact the command headquarters for Military Warning Area W-92 for the purposes of entering into an agreement concerning the control of electromagnetic emission and the use of boats and aircraft in the warning area.

XII. Related Facilities and Operations Information

A. Related Facilities and Operations

Information not required for activities proposed in this Initial Exploration Plan.

B. Transportation System

Information not required for activities proposed in this Initial Exploration Plan.

C. Produced Liquid Hydrocarbons Transportation Vessels

No produced liquid hydrocarbons, including well test fluids, will be transported offsite via transportation vessel.

XIII. Support Vessels and Aircraft Information

A. General

Type	Maximum Fuel Tank Storage Capacity	Maximum No. in Area at Any Time	Trip Frequency or Duration
Crew Boat	500 bbls	1	7/week
Supply Boat	500 bbls	1	7/week

B. Diesel Oil Supply Vessels

Information not required for activities proposed in this Initial Exploration Plan.

C. Solid and Liquid Wastes Transportation

Type of Waste Approx. Composition	Total Amount	Name/Location	Rate	Transport Method
Trash and debris	1,350 ft ³	CDI/Various	9 ft ³ /day	Storage bins on crew boat

D. Vicinity Map

A vicinity map depicting the location of the proposed activities is included in Attachment B.

XIV. Onshore Support Facilities Information

A. General

Name	Location	Existing/New/Modified
C-Port 2	Fourchon, LA	Existing

B. Support Base Construction or Expansion

Exploration activities in Green Canyon Area Blocks 738 and 782 will not warrant support base construction or expansion.

C. Waste Disposal

Name/Location of Facility	Type of Waste	Amount	Rate	Disposal Method
CDI/Various	Trash and debris	1,350 ft ³	9 ft ³ /day	Landfill
Golden Sails Agency	Used Oil	22 m ³	0.19 m ³ /day	Recycled onshore

XV. Coastal Zone Management Act (CZMA) Information

Certificate of Coastal Zone Consistency is included as Attachment E.

XVI. Environmental Impact Analysis (EIA)

A project-specific environmental impact analysis (EIA) is provided in Attachment E.

XVII. Administrative Information

A. Exempted Information Description

In accordance with 43 CFR Part 2, Appendix E, sections (4) and (9), the following information has been determined by the MMS GOMR exempt from public disclosure:

- Geologic Objectives (BHL, TVD & MD)
- Production Rates and Life of Reserves
- Proprietary New or Unusual Technology
- Geological and Geophysical Information (except for Shallow Hazards Assessment)
- Hydrogen Sulfide Correlative Well Information

This information is excluded from the “Public Information” copies of the submitted plan.

B. Bibliography

None

ATTACHMENT A
PLAN INFORMATION FORMS

OCS PLAN INFORMATION FORM

General Information												
Type of OCS Plan:		<input checked="" type="checkbox"/>	Exploration Plan (EP)				Development Operations Coordination Document (DOCD)					
Company Name: BP Exploration & Production Inc.						MMS Operator Number: 2481						
Address: 200 Westlake Park Boulevard						Contact Person: Anne-Renee Laplante						
Houston, Texas 77079						Phone Number: 281/366-5155						
						E-Mail Address: anne-renee.laplante@bp.com						
Lease(s): OCS-G-16786&15610			Area: Green Canyon			Block(s): 738 & 782		Project Name (If Applicable): Mad Dog				
Objective(s):		<input checked="" type="checkbox"/>	Oil	<input checked="" type="checkbox"/>	Gas		Sulphur		Salt	Onshore Base: Fourchon		Distance to Closest Land (Miles): 124
Description of Proposed Activities (Mark all that apply)												
<input checked="" type="checkbox"/>	Exploration drilling					Development drilling						
	Well completion					Installation of production platform						
	Well test flaring (for more than 48 hours)					Installation of production facilities						
	Installation of caisson or platform as well protection structure					Installation of satellite structure						
	Installation of subsea wellheads and/or manifolds					Commence production						
	Installation of lease term pipelines					Other (Specify and describe)						
Have you submitted or do you plan to submit a Conservation Information Document to accompany this plan?										Yes	<input checked="" type="checkbox"/>	No
Do you propose to use new or unusual technology to conduct your activities?										Yes	<input checked="" type="checkbox"/>	No
Do you propose any facility that will serve as a host facility for deepwater subsea development?										Yes	<input checked="" type="checkbox"/>	No
Do you propose any activities that may disturb an MMS-designated high-probability archaeological area?										Yes	<input checked="" type="checkbox"/>	No
Have all of the surface locations of your proposed activities been previously reviewed and approved by MMS?										Yes	<input checked="" type="checkbox"/>	No
Tentative Schedule of Proposed Activities												
Proposed Activity						Start Date		End Date		No. of Days		
Drill GC 738 Well A						5/15/10		7/3/10		50		
Drill GC 738 Well B						7/6/10		8/24/10		50		
Drill GC 782 Well U						8/27/10		10/15/10		50		
Description of Drilling Rig						Description of Production Platform						
Jackup		<input checked="" type="checkbox"/>	Drillship				Caisson		Tension leg platform			
Gorilla Jackup			Platform rig				Well protector		Compliant tower			
Semisubmersible			Submersible				Fixed platform		Guyed tower			
DP Semisubmersible			Other (Attach Description)				Subsea manifold		Floating production system			
Drilling Rig Name (If Known): GSF C. R. Luigs						Spar		Other (Attach Description)				
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): Well A			Subsea Completion
Anchor Radius (if applicable) in feet:			Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
	Surface Location	Bottom-Hole Location (For Wells)	
Lease No.	OCS-G-16786		
Area Name	Green Canyon		
Block No.	738		
Blockline Departures (in feet)	N/S Departure: 3428' F <u> </u> S <u> </u> L	N/S Departure: F <u> </u> L	
	E/W Departure: 3925' F <u> </u> W <u> </u> L	E/W Departure: F <u> </u> L	
Lambert X-Y coordinates	X: 2,522,485'	X:	
	Y: 9,887,588'	Y:	
Latitude/ Longitude	Latitude 27° 13' 19.3"	Latitude	
	Longitude 90° 17' 07.9"	Longitude	
	TVD (Feet):	MD (Feet):	Water Depth (Feet): 4,468'

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 =	

Paperwork Reduction Act of 1995 Statement: The Paperwork Reduction Act of 1995 (44 U.S.C. Chapter 35) requires us to inform you that MMS collects this information as part of an applicant's Exploration Plan or Development Operations Coordination Document submitted for MMS approval. We use the information to facilitate our review and data entry for OCS plans. We will protect proprietary data according to the Freedom of Information Act and 30 CFR 250.196. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid Office of Management and Budget Control Number. The use of this form is voluntary. The public reporting burden for this form is included in the burden for preparing Exploration Plans and Development Operations Coordination Documents. We estimate that burden to average 580 hours per response, including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding the burden estimate or any other aspect of this form to the Information Collection Clearance Officer, Mail Stop 4230, Minerals Management Service, 1849 C Street, N.W., Washington, DC 20240.

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

Proposed Well/Structure Location						
Well or Structure Name/Number (If renaming well or structure, reference previous name): Well B					Subsea Completion	
Anchor Radius (if applicable) in feet:					Yes	No
	Surface Location			Bottom-Hole Location (For Wells)		
Lease No.	OCS-G-16786					
Area Name	Green Canyon					
Block No.	738					
Blockline Departures (in feet)	N/S Departure:	6,729' F_s_L		N/S Departure:	F__L	
	E/W Departure:	3,188' F_w_L		E/W Departure:	F__L	
Lambert X-Y coordinates	X: 2,521,748'			X:		
	Y: 9,890,889'			Y:		
Latitude/ Longitude	Latitude 27° 13' 51.1"			Latitude		
	Longitude 90° 17' 15.1"			Longitude		
TVD (Feet):			MD (Feet):		Water Depth (Feet): 4,354'	
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 =		
<p>Paperwork Reduction Act of 1995 Statement: The Paperwork Reduction Act of 1995 (44 U.S.C. Chapter 35) requires us to inform you that MMS collects this information as part of an applicant's Exploration Plan or Development Operations Coordination Document submitted for MMS approval. We use the information to facilitate our review and data entry for OCS plans. We will protect proprietary data according to the Freedom of Information Act and 30 CFR 250.196. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid Office of Management and Budget Control Number. The use of this form is voluntary. The public reporting burden for this form is included in the burden for preparing Exploration Plans and Development Operations Coordination Documents. We estimate that burden to average 580 hours per response, including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding the burden estimate or any other aspect of this form to the Information Collection Clearance Officer, Mail Stop 4230, Minerals Management Service, 1849 C Street, N.W., Washington, DC 20240.</p>						

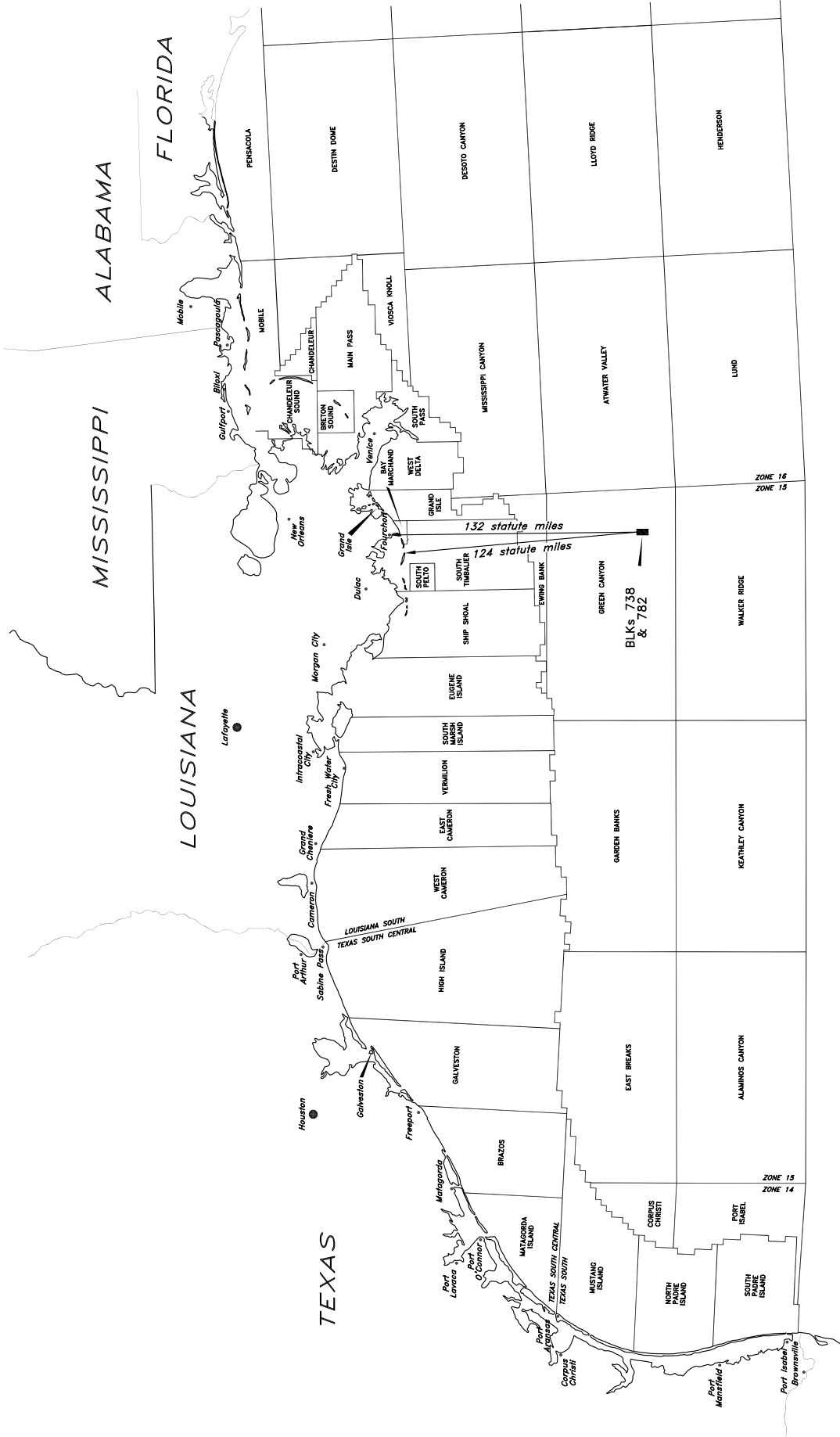
MMS Form MMS-137 (August 2003 - Supersedes all previous editions of form MMS-137, which may not be used.)

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

Proposed Well/Structure Location						
Well or Structure Name/Number (If renaming well or structure, reference previous name): Well U					Subsea Completion	
Anchor Radius (if applicable) in feet:					Yes	No
					<input checked="" type="checkbox"/>	
Surface Location			Bottom-Hole Location (For Wells)			
Lease No.	OCS-G-15610					
Area Name	Green Canyon					
Block No.	782					
Blockline Departures (in feet)	N/S Departure:	1,212' F <u> </u> N <u> </u> L	N/S Departure:	F <u> </u> L		
	E/W Departure:	5,067' F <u> </u> W <u> </u> L	E/W Departure:	F <u> </u> L		
Lambert X-Y coordinates	X: 2,523,627'		X:			
	Y: 9,882,948'		Y:			
Latitude/ Longitude	Latitude 27° 12' 32.1"		Latitude			
	Longitude 90° 16' 56.2"		Longitude			
TVD (Feet):		MD (Feet):		Water Depth (Feet): 4,452'		
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 =		
<p>Paperwork Reduction Act of 1995 Statement: The Paperwork Reduction Act of 1995 (44 U.S.C. Chapter 35) requires us to inform you that MMS collects this information as part of an applicant's Exploration Plan or Development Operations Coordination Document submitted for MMS approval. We use the information to facilitate our review and data entry for OCS plans. We will protect proprietary data according to the Freedom of Information Act and 30 CFR 250.196. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid Office of Management and Budget Control Number. The use of this form is voluntary. The public reporting burden for this form is included in the burden for preparing Exploration Plans and Development Operations Coordination Documents. We estimate that burden to average 580 hours per response, including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding the burden estimate or any other aspect of this form to the Information Collection Clearance Officer, Mail Stop 4230, Minerals Management Service, 1849 C Street, N.W., Washington, DC 20240.</p>						

ATTACHMENT B
VICINITY PLAT
LOCATION PLAT
BATHYMETRY MAP

VICINITY MAP



BP EXPLORATION & PRODUCTION INC.
HOUSTON, TEXAS

VICINITY MAP
GREEN CANYON AREA BLOCKS 738 & 782



TIM MORTON & ASSOCIATES, INC. MAP NO. 10-046 DATE: 3/18/10
730 E. KALISTE SALOOM RD. LAFAYETTE, LOUISIANA

BP U15

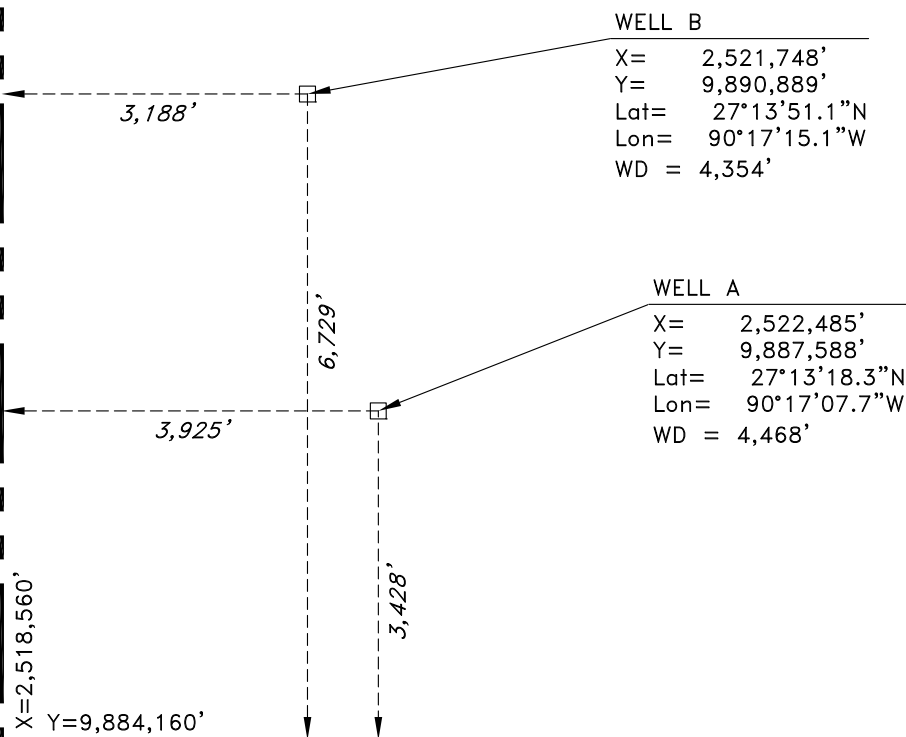
GULF OF MEXICO

GC738

OCS-G-16786

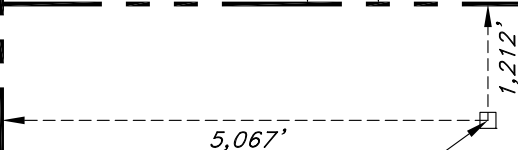
BP EXPLORATION & PRODUCTION INC.
GREEN CANYON AREA
G U L F O F M E X I C O

**Public
Information**



WELL B
 X= 2,521,748'
 Y= 9,890,889'
 Lat= 27°13'51.1"N
 Lon= 90°17'15.1"W
 WD = 4,354'

WELL A
 X= 2,522,485'
 Y= 9,887,588'
 Lat= 27°13'18.3"N
 Lon= 90°17'07.7"W
 WD = 4,468'



WELL U
 X= 2,523,627'
 Y= 9,882,948'
 Lat= 27°12'32.1"N
 Lon= 90°16'56.2"W
 WD = 4,452'

GC782

OCS-G-15610

BP EXPLORATION & PRODUCTION INC.
GREEN CANYON AREA
G U L F O F M E X I C O

BP EXPLORATION & PRODUCTION INC.

200 WESTLAKE PARK BOULEVARD
HOUSTON, TEXAS 77079

INITIAL EXPLORATION PLAN

GREEN CANYON AREA BLOCKS 738 & 782

2000' 0' 2000' 4000'



SCALE IN FEET

TIM MORTON & ASSOCIATES, INC.
730 E. KALISTE SALOOM RD.
LAFAYETTE, LOUISIANA 70508

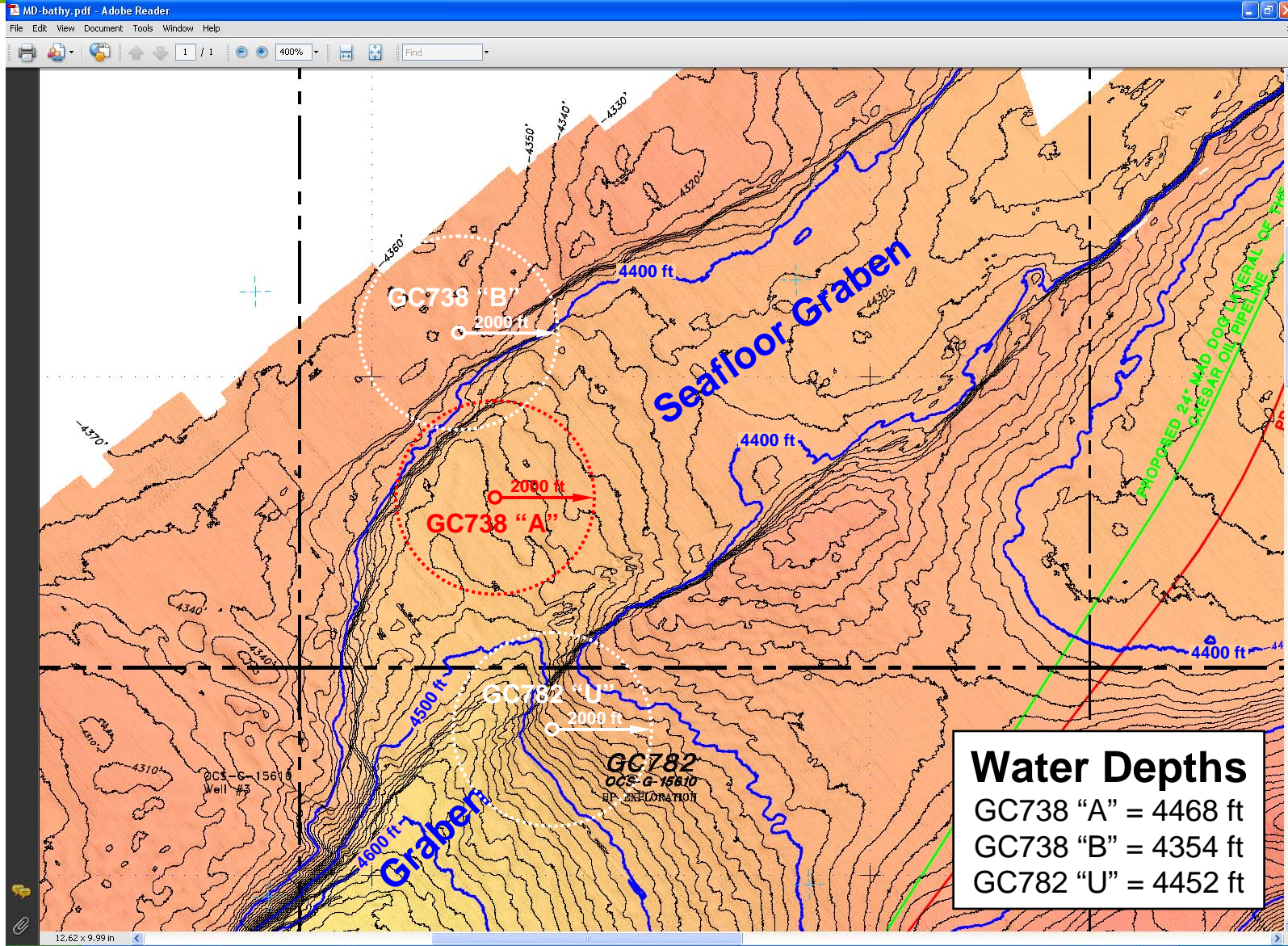
JOB # 10-046
MAP NO. GC738&782

REVISED

DATE 3/18/10

Bathymetry Map

2001 AUV Data



Water Depths
GC738 "A" = 4468 ft
GC738 "B" = 4354 ft
GC782 "U" = 4452 ft

ATTACHMENT C

SHALLOW HAZARDS ASSESSMENTS

GEOLOGIC STRUCTURE MAP

GEOLOGIC DESCRIPTION

CROSS-SECTION MAP

STRATIGRAPHIC COLUMN



SHALLOW HAZARDS ASSESSMENT

PROPOSED GC738 "A" WELL LOCATION BLOCK 738, OCS-G16786 GREEN CANYON AREA GULF OF MEXICO

This document summarizes shallow conditions at the proposed drilling location GC738 "A" in Green Canyon Block 738 (OCS-G16786) in the north-central Gulf of Mexico (Plates 1 and 2).

The surface location of the proposed GC738 "A" well is defined as:

GC738 "A"	
3,925.00 ft FWL	3,428.00 ft FSL
X = 2,522,485.00 ft E	Y = 9,887,588.00 ft N
Latitude: 27° 13' 18.296" N	Longitude: 90° 17' 07.738" W
UTM (US Survey Feet)	Zone 15N
Datum: NAD 1927	Spheroid: Clarke 1866

The above surface location for this proposed well was selected based on the investigation of reprocessed 3D exploration seismic data, HR3D seismic data, AUV data, ROV data, and information from offset wells described and referenced below.

The exploration 3D seismic volume used for the shallow hazards assessments in the area of the proposed well location was acquired and processed by Western Geophysical in 1996 (GC Phase X, XI and XII). This 56-fold seismic data has a line spacing of 65.6 ft (20 m) and a trace spacing of 41.0 ft (12.5 m). The time domain, reflection amplitude volume used (mig3201.3dv) appears to be phase rotated about 90 degrees (minimum phase), as judged from the seafloor wavelet. It is a 32 bit volume with a 4 ms sample rate with a dominant frequency of 25 to 40 Hz in the first second of data below mudline in the vicinity of the proposed well location, and an estimated vertical resolution ($\lambda/4$) of 40 ft, assuming a velocity of 5,500 ft/sec for sediments. This seismic volume is currently loaded in BP Houston's "geohazard" OpenWorks District within the "madpumba" 3D SeisWorks Project. The proposed GC738 "A" (Mad Dog North) well location is sited within half a bin of the intersection of Line 5951 and Trace 4392. This seismic volume was first used for site clearance of the GC823 #1 (Pumba) well (now called Puma) as part of the EP submitted to the MMS (received 14 March 2003, approved 8 April 2003), plan control N-7706). Although, no formal geohazards report based on interpretation of this data exists, exploration 3D



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Shallow Hazards Assessment Narrative
Proposed GC738 "A" Well Location



seismic data examples from this volume are provided in this Shallow Hazards Assessment to supplement findings from the AUV and ROV geohazards reports listed below.

An HR3D seismic volume was acquired over the Mad Dog area in 2000 for BP and partners by Fugro GeoServices Inc. and processed by Ensign Geophysics, now part of Geotrace. This multifold, time domain, reflection amplitude survey has a line spacing of 24.6 ft (7.5 m) and a trace spacing of 20.5 ft (6.25 m) and a record length of 5.0 sec two-way-time. Subsurface imaging quality is very good from mudline to about one second (3100 ft) BML at the proposed well location, but does not image the top of salt in this area. The post-stack, time migrated, floating 8-bit volume used appears to be near zero phase, has a sample rate of 1 ms, a dominant frequency of about 150 Hz in the first second below mudline in the area of the proposed well locations, and an estimated vertical resolution ($\lambda/4$) of 9 ft, assuming a velocity of 5,500 ft/sec for sediments. The proposed GC738 "A" well location is sited within half a bin of the intersection of HR3D Line 2233 and Trace 1300. Although no formal geohazards report based on interpretation of this data exists, HR3D seismic data examples for geohazards site clearance from this seismic volume were most recently used as part of the EP submitted to the MMS (received 2 December 2008, approved 16 January 2009, Plan Control Number S-7290) for the GC826 #5 (Mad Dog South) well. Likewise, HR3D seismic data examples from the above describe volume are provided in this Shallow Hazards Assessment to supplement findings from the AUV and ROV geohazards reports listed below.

The Mad Dog area AUV survey was acquired in 2001 by C&C Technologies Inc. for BP and partners for a proposed floating production platform in GC block 782 and associated seafloor facilities. This survey acquired multibeam echosounder bathymetry, side-scan sonar and sub-bottom profiler data covering all or portions of 13 OCS lease blocks (48 square miles). Fifty-one NW-SE trending primary lines were acquired 200 meters apart, along with 24 orthogonal tie lines spaced 900 m apart and 12 short, curves lines through proposed suction pile locations. Survey specs and the data interpretation are provided in the 2003 C&C geohazards report. Although this report has been used for numerous site clearance letters, it is uncertain if it has ever been submitted to the MMS. Thus, a complete copy is included with the EP for the proposed well location.

The Mad Dog Phase 2 ROV survey was conducted between 27 and 29 November 2009 by Oceaneering at BP's request to investigate apparent seafloor seep features identified in geophysical data, by recording on video and photographing the substrate and associated benthic fauna along six pre-determined survey lines. The findings of this seafloor video survey were documented by Berger Geosciences LLC and used to produce a formal report (B-geO, 2010) which is provided to the MMS for the first time with this EP for the proposed well location. Specific



findings along ROV survey Line 6 are referenced within this Shallow Hazards Assessment, as they are pertinent to MMS NTL No. 2009-G40.

This document is a site-specific shallow hazards review of the proposed GC738 “A” well location and includes data examples from the geophysical data sets and associated reports mentioned above. The proposed well will be drilled using a dynamically-positioned semi-submersible drilling rig, which will not require anchoring or mooring to the seafloor. The depth of investigation is from the seafloor to the top of salt (3,513 ft BML). Drilling hazards within and below salt will be assessed by the subsurface asset team.

The key findings of the shallow hazards assessment for the proposed “A” location are as follows:

Proposed Well Location GC738 “A”:

Water Depth and Seafloor Gradient:

Water depth at the proposed well location is estimated to be 4,468 ft below Mean Sea Level (MSL) using the MBE-derived bathymetry map (C&C, 2003) from the Mad Dog AUV survey (Plate 3).

The seafloor has an average slope of about 0.6° (1.1%) down to the southwest in the immediate vicinity of the proposed well (Plates 3 and 4).

Seafloor Morphology and Shallow Sediments:

The seabed is relatively smooth and featureless in the immediate vicinity of the proposed well. However, numerous southwest-northeast trending normal faults, which are rooted into the top of a local salt high, define the margins of a graben (Plates 5 and 6). The proposed well location is situated within this graben. The closest seafloor faults are located about 1,600 ft northwest and 3,500 ft southeast of the proposed well site (Plates 4, 5 and 6).

No evidence for seafloor fluid expulsion features (i.e. mud volcanoes, pockmarks, etc.) have been identified within 2,000 ft of the proposed well location (Plates 7 through 10).

The seabed sediments are interpreted to be composed of very soft clays (2 to 5kPa at seafloor), which are likely to gradually increase in stiffness with depth (Plates 11 and 12).

Chemosynthetic Communities:

There is no evidence for the presence of seafloor expulsion features, authigenic carbonate or chemosynthetic fauna supported by hydrocarbon seepage within 2,000 ft of the proposed well location based inspection of seafloor amplitudes in HR3D seismic data (Plate 7), AUV sidescan sonar data (Plate 8) and subbottom profiler data (Plates 11 and 12).

AUV data revealed seafloor expulsion features, with underlying acoustic void zones in the south and east of GC738, southeast and northeast of the proposed well location, respectively (Plates 9 and 10). Another area of fluid expulsion to the seafloor was identified



in northwest GC782, south-southwest of the proposed well location.

The 2009 ROV video survey of the seafloor fluid expulsion features in the south of GC738 (Line 6) found authigenic carbonate, asphalt, and chemosynthetic fauna (B-geO, 2010), approximately 2,400 ft southeast of the proposed well location (Plate 13). This ROV survey also found authigenic carbonate, asphalt, and chemosynthetic fauna at the expulsion feature in northwest GC782 (B-geO, 2010), approximately 8,000 ft south-southwest of the proposed well.

Seafloor Obstructions:

No man-made seafloor obstructions are known to exist within a radius of 2,000 ft of the proposed surface location (Plates 2 and 9).

The proposed well will be drilled from a dynamically positioned drilling rig and thus will not be moored to the seafloor.

The proposed well is located in an OCS-lease block that does not require an archeological assessment.

There are no known chemical or munitions dumping sites in the Green Canyon Protraction Area. Thus, unexploded ordinance are not expected at the proposed well location.

The proposed well location lies within Military Warning Area W-92 (Plate 14). Thus, the U.S. Military requires notification of all field operations for the proposed well prior to entering the area. The Military Contact listed for the W-92 area is Navel Air Station, Air Operations Department, Air Traffic Division/Code 52, New Orleans 77034-5586, phone number (504) 678-3100/3101.

Offset Wells and Other Seafloor Infrastructure:

There are no existing wells in GC738. The nearest existing offset wells with their distances from the proposed well location (Plate 2) are listed below:

- GC737 #1 - 2.7 miles to the west
- GC782 #1 - 2.5 miles to the south-southeast
- GC782 #2 - 2.6 miles to the south-southeast
- GC782 #3 - 2.6 miles to the east-southeast (SHL in GC783)
- GC826 #1 - 5.5 miles to the south-southeast
- GC826 #2 - 4.2 miles to the south
- GC826 #3 - 5.5 miles to the south-southeast
- GC826 #4 - 4.2 miles to the south-southwest

The Mad Dog SPAR is located about 2.5 miles south-southeast of the proposed well location (Plate 2). Eleven mooring lines, grouped into three clusters, extend about 5,500 ft out from the spar. The closest mooring anchor is located about 1.8 miles to the south-southeast of the proposed well location.

Oil and gas export lines run northeast from the SPAR and pass approximately 2.2 miles to the southeast of the proposed well location.

A fiber optic communication line runs northwest from the SPAR and passes approximately 0.8 miles to the west of the proposed



well location.

Note that pipelines and or mooring lines show on Plates 3, 4, 8, 9 and 10 were for planning purposes and are not necessarily the as-built location. Plate 2, although less detailed, shows the as-built locations.

Shallow Geology:

The riserless drilling interval in the vicinity of the proposed well location is comprised of well bedded hemipelagic strata and thin turbidites with interlayered mass transport deposits (MTDs) of various sizes (Plates 15 through 18). Lithologies throughout the riserless drilling section are expected to be clay and silt with minor amounts of fine sand. Allochthonous salt in the vicinity has extended the supra-salt strata forming a graben (Plates 17 through 20). The proposed well is located within this graben.

Nine seismic reflectors, i.e. horizons (Hzn) have been mapped in the vicinity of the proposed well. These include the following (with depths at the proposed well):

- Seafloor 4,468 ft SS
- Hzn 10 locally eroded
- Hzn 15 450 ft BML
- Hzn 20 732 ft BML
- Hzn 40 faulted out
- Hzn 50 1,215 ft BML
- Hzn 60 1,399 ft BML
- Hzn 80 1,718 ft BML
- Top Salt 3,513 ft BML

The irregular numbering of these horizons is a result of unconformities which have removed horizons mapped within other parts of the HR3D seismic volume.

Potential shallow drilling hazards discussed below are referenced by depth below mud line (BML), as opposed to specific stratigraphic units, because of the absence/removal of strata along shallow portions of the proposed well bore.

Subsurface Drilling Hazards:

Faulting: The proposed GC738 "A" well bore will intersect four normal faults within the supra-salt section at estimated depths of 1,894 ft, 2,455 ft, 2,671 ft, and 2,991 ft BML (Plates 15 through 18). All four trend southwest-northeast and dip to the southeast. Two of these faults, and others in the vicinity, cut the seafloor and are thus considered active.

Pervasive, smaller-scale, normal faulting is observed in the lower portion of the supra-salt section along the proposed well bore from Hzn 50 to the top of salt, or 1,215 to 3,513 ft BML, as evidenced by the lineations on Plates 19 and 20. These smaller faults generally dip to the southeast. This is a zone of potential bore hole instability during riserless drilling.

Shallower, the proposed well will penetrate an intra-formational slump fault (1,067 ft BML) between Hzn 20 and Hzn 50. Although the displacement along this fault appears large, it is thought to be



inactive and is not considered a risk to drilling.

Shallow Gas: Inspection of exploration and HR3D seismic profiles through the proposed well location (Plates 15 through 18) show no evidence for shallow gas in the supra-salt section. Maximum Negative Amplitude Extractions from these seismic data (Plates 21 through 26) appear to highlight sand/silt prone intervals in the supra-salt section but show no areas of anomalously high amplitudes indicative of shallow gas along the proposed well path, or within 2,000 ft. Thus, the risk of encountering shallow gas in the supra-salt section is considered ***Negligible*** along the proposed well path.

Shallow Water Flow (SWF): At the GC782 #1 (Mad Dog) well, slight SWF was observed from the wellhead on connections at 1,206 and 1,399 ft BML without drilling mud in the hole, i.e. while drilling with seawater. These depths fall between Hzn 50 and Hzn 60, in an interval of bright reflectors interpreted to be silty/sandy (Plate 15). These reflectors correlate back to the proposed well but thin dramatically and are faulted.

Slight SWF observations were reported at the GC783 #1 (Mad Dog) well from 1,123 and 1,274 ft BML (above the sandy interval previously noted), and then again from 1,554 ft BML (within the sandy interval previously noted).

Slight SWF was reported from two 10-ft thick "sands" in the supra-salt section of the GC782 #4 (Mad Dog) well, however their depths are unknown.

The GC825 #1 (Mad Dog Deep) well experienced slight SWF on connections at 1,979 and 2,075 ft BML while drilling with sea water. However, SWF was not observed in this same silty/sandy interval in the GC826 #2 (South West Ridge) well, about half a mile west of the GC825 #1 well. This SWF interval occurs below Hzn 80 but has not been correlated back to the proposed well location.

Most wells drilled in the Mad Dog field and vicinity, with the exceptions listed above, have not experienced any shallow water flow in the supra-salt section.

Thus, the risk of encountering shallow water flow is considered ***Negligible*** from the seafloor to Hzn 20 (732 ft BML) and from Hzn 60 to Hzn 80 (1,399 to 1,718 ft BML), ***Negligible to Low*** from Hzn 80 to the top of salt (1,718 to 3,513 ft BML), ***Low*** from Hzn 20 to Hzn 50 (732 to 1,215 ft BML), and ***Moderate*** from Hzn 50 to Hzn 60 (1,215 to 1,399 ft BML).

Asphalt: Sub-salt asphalt is commonly encountered by wells in the Mad Dog field, south-southeast of the proposed well location. Well-specific details are provided by Romo et al. (2007). However, no supra-salt asphalt has been encountered in the Mad Dog field proper.

The 2009 ROV survey documented seafloor asphalt while investigating fluid expulsion features for chemosynthetic fauna in



the south of GC738, approximately 2,400 ft southeast of the proposed well location and in northwest GC782, approximately 8,000 ft south-southwest of the proposed well (B-geO, 2010).

Nothing resembling a seafloor asphalt mound or flow is observed within 2,000 ft of the proposed well location within the resolution of the AUV MBE bathymetry (Plate 3) and sidescan sonar data (Plate 8). However, the possibility of encountering supra-salt asphalt while drilling riserless cannot be completely ruled out due to the location of the proposed well with respect to seafloor asphalt occurrences listed above and the extensive supra-salt normal faulting. Therefore, the risk of encountering asphalt along the proposed well path is considered **Low** (higher than Negligible) from seabed to the top of pervasive faulting at Hzn 50 (1,215 ft BML), and **Moderate** from the top of pervasive faulting to the top of salt (3,513 ft BML). Although not considered a safety risk while drilling in the supra-salt section, balling of asphalt at the end of the drill bit could reduce drilling efficiency.

Shallow Oil: Active, wide-spread, naturally-occurring oil slicks on the sea surface above the Puma salt structure have been documented with Synthetic Aperture Radar images from satellites (NPA 2006) and in ROV observations of seafloor oil seepage sites in the Puma appraisal area (Plate 22 in Fugro 2007). Additionally, all three wells in the Puma area (GC821 #1, GC823 #1 and GC866 #1) have encountered supra-salt oil while drilling riserless.

The 2009 ROV survey documented active oil seepage at the seafloor in the west of GC825 (Berger Geosciences Inc., 2010), approximately 6.5 miles southwest of the proposed well location.

Sea surface oil slicks, seafloor oil seeps, and supra-salt oil have not been observed in the immediate vicinity of the Mad Dog field, to the south-southeast of the proposed well.

The possibility of encountering shallow oil while drilling riserless cannot be completely ruled out due to the location of the proposed well with respect to active oil seepage and seafloor asphalt in the general area, and pervasive faulting in the supra-salt section. Therefore, the risk of encountering shallow oil along the proposed well path is considered **Low** (higher than Negligible) from seabed to the top of pervasive faulting at Hzn 50 (1,215 ft BML) and **Moderate** from the top of pervasive faulting to the top of salt (3,513 ft BML). Although not considered a safety risk, the release of naturally occurring oil from riserless drill cuttings that result in a sea surface sheen must be reported to the MMS.

Hydrates: Bottom Simulating Reflectors (BSRs) are not observed in seismic profiles through the proposed well bore (Plates 14 through 17). No occurrences of natural gas hydrates were reported while drilling any of the Mad Dog area wells. The risk of encountering hydrates along the proposed well bore is therefore considered **Negligible**.



CONCLUSIONS

This Shallow Hazards Assessment for location "A" in Green Canyon Block 738 (OCS-G16786) supplements the Exploration Plan (EP) to be submitted to the Minerals Management Service (MMS). This narrative defines the proposed location and documents the anticipated tophole drilling conditions within a radius of 2,000 ft of the "A" location. Conditions at the proposed well location have been evaluated primarily on the investigation of reprocessed 3D exploration seismic data, HR3D seismic data, AUV data, ROV data, and information from offset wells. The findings are summarized below and in the Top-hole Formation Forecast (Attachment 1).

Results of the data review indicate,

- The proposed well is located in an OCS-lease block that does not require an archaeological assessment.
- There are no known chemical or munitions dumping sites in the Green Canyon Protraction Area. Thus, unexploded ordinance are not expected at the proposed well location.
- The proposed well location lies within Military Warning Area W-92. Thus, the U.S. Military requires notification of all field operations for the proposed well prior to entering the area.
- No man-made or natural seafloor obstructions are known to exist within a radius of 2,000 ft of the proposed surface location.
- A BP fiber optic line is located 0.8 miles west of the proposed well location. The Mad Dog SPAR is located 2.5 miles to the south-southeast of the proposed well location and the nearest mooring anchor is 1.8 miles to the south-southeast. Oil and gas export pipelines are located 2.2 miles to the southeast of the proposed well location.
- Water depth at the proposed well location is estimated to be 4,468 ft.
- Seafloor slopes to the southwest at an average gradient of 0.6° (1.1%) in the immediate vicinity of the proposed well location.
- Seabed sediments are interpreted to be composed of clays which are likely to increase in stiffness with depth.
- No seafloor-breaching faults are located within 250 ft of the proposed surface location.
- No fluid expulsion features (mounds or pockmarks) are observed within 2,000 ft of the proposed well location.



BP GoM SPU Appraisal Tiger Team
Shallow Hazards Assessment Narrative
Proposed GC738 "A" Well Location



- There is no evidence for the existence of high-density chemosynthetic communities within 2,000 ft of the proposed well location.
- The proposed well bore will intersect four southeast-dipping, normal faults within the supra-salt section, at estimated depths of 1,894 ft, 2,455 ft, 2,671 ft and 2,991 ft BML. Two of these faults, and others in the vicinity, cut the seafloor and are thus considered active.
- The proposed trajectory intersects a pervasive zone of normal faulting from Hzn 50 to top of salt (1,215 to 3,513 ft BML). This is a zone of potential bore hole instability during riserless drilling.
- The risk of encountering **shallow water flow** is ranked as ***Negligible*** from the seafloor to Hzn 20 (732 ft BML) and from Hzn 60 to Hzn 80 (1,399 to 1,718 ft BML), ***Negligible to Low*** from Hzn 80 to the top of salt (1,718 to 3,513 ft BML), ***Low*** from Hzn 20 to Hzn 50 (732 to 1,215 ft BML), and ***Moderate*** from Hzn 50 to Hzn 60 (1,215 to 1,399 ft BML).
- The risk of encountering **shallow gas** is ranked as ***Negligible*** from seafloor to the top of salt (3,513 ft BML).
- The risk of encountering **shallow oil** is ranked as ***Low*** (higher than Negligible) from seafloor to the top of pervasive faulting at Hzn 50 (1,215 ft BML) and ***Moderate*** from the top of pervasive faulting to the top of salt (3,513 ft BML). Although not considered a safety risk, the release of naturally occurring oil from riserless drill cuttings that result in a sea surface sheen must be reported to the MMS.
- The risk of encountering **asphalt** is ranked as ***Low*** (higher than Negligible) from seabed to the top of pervasive faulting (1,215 ft BML), and ***Moderate*** from the top of pervasive faulting to the top of salt (3,513 ft BML). Although not considered a safety risk while drilling in the supra-salt section, balling of asphalt at the end of the drill bit could reduce drilling efficiency.
- The risk of encountering **gas hydrates** is ranked as ***Negligible*** between the seafloor and top of salt (3,513 ft BML) at the proposed well location.

We advise caution, but believe that the risk of danger to personnel and damage to the borehole, equipment and environment is ***Low***, provided strict adherence to proper drilling and cementing procedures is followed concerning these hazards until the first pressure containment string is in place.



BP GoM SPU Appraisal Tiger Team
Shallow Hazards Assessment Narrative
Proposed GC738 "A" Well Location



Prepared By:

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Richard Weiland
Senior Geohazards Specialist,
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12 March 2010

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15 March 2010



SHALLOW HAZARDS ASSESSMENT

PROPOSED GC738 “B” WELL LOCATION BLOCK 738, OCS-G16786 GREEN CANYON AREA GULF OF MEXICO

This document summarizes shallow conditions at the proposed drilling location GC738 “B” in Green Canyon Block 738 (OCS-G16786) in the north-central Gulf of Mexico (Plates 1 and 2).

The surface location of the proposed GC738 “B” well is defined as:

GC738 “B”	
3,188.00 ft FWL	6,729.00 ft FSL
X = 2,521,748.00 ft E	Y = 9,890,889.00 ft N
Latitude: 27° 13' 51.120" N	Longitude: 90° 17' 15.104" W
UTM (US Survey Feet)	Zone 15N
Datum: NAD 1927	Spheroid: Clarke 1866

The above surface location for this proposed well was selected based on the investigation of reprocessed 3D exploration seismic data, HR3D seismic data, AUV data, ROV data, and information from offset wells described and referenced below.

The exploration 3D seismic volume used for the shallow hazards assessments in the area of the proposed well location was acquired and processed by Western Geophysical in 1996 (GC Phase X, XI and XII). This 56-fold seismic data has a line spacing of 65.6 ft (20 m) and a trace spacing of 41.0 ft (12.5 m). The time domain, reflection amplitude volume used (mig3201.3dv) appears to be phase rotated about 90 degrees (minimum phase), as judged from the seafloor wavelet. It is a 32 bit volume with a 4 ms sample rate with a dominant frequency of 25 to 40 Hz in the first second of data below mudline in the vicinity of the proposed well location, and an estimated vertical resolution ($\lambda/4$) of 40 ft, assuming a velocity of 5,500 ft/sec for sediments. This seismic volume is currently loaded in BP Houston’s “geohazard” OpenWorks District within the “madpumba” 3D SeisWorks Project. The proposed GC38 “B” (Mad Dog North) well location is sited within half a bin of the intersection of Line 5940 and Trace 4472. This seismic volume was first used for site clearance of the GC823 #1 (Pumba) well (now called Puma) as part of the EP submitted to the MMS (received 14 March 2003, approved 8 April 2003, plan control N-7706). Although, no formal geohazards report based on interpretation of this data exists, exploration 3D



BP GoM SPU Appraisal Tiger Team
Shallow Hazards Assessment
Proposed GC738 "B" Well Location



seismic data examples from this volume are provided in this Shallow Hazards Assessment to supplement findings from the AUV and ROV geohazards reports listed below.

An HR3D seismic volume was acquired over the Mad Dog area in 2000 for BP and partners by Fugro GeoServices Inc. and processed by Ensign Geophysics, now part of Geotrace. This multifold, time domain, reflection amplitude survey has a line spacing of 24.6 ft (7.5 m) and a trace spacing of 20.5 ft (6.25 m) and a record length of 5.0 sec two-way-time. Subsurface imaging quality is very good from mudline to about one second (3100 ft) BML at the proposed well location, but does not image the top of salt in this area. The post-stack, time migrated, floating 8-bit volume used appears to be near zero phase, has a sample rate of 1 ms, a dominant frequency of about 150 Hz in the first second below mudline in the area of the proposed well locations, and an estimated vertical resolution ($\lambda/4$) of 9 ft, assuming a velocity of 5,500 ft/sec for sediments. The proposed GC738 "B" well location is sited within half a bin of the intersection of HR3D Line 2296 and Trace 1153. Although no formal geohazards report based on interpretation of this data exists, HR3D seismic data examples for geohazards site clearance from this seismic volume were most recently used as part of the EP submitted to the MMS (received 2 December 2008, approved 16 January 2009, Plan Control Number S-7290) for the GC826 #5 (Mad Dog South) well. Likewise, HR3D seismic data examples from the above describe volume are provided in this Shallow Hazards Assessment to supplement findings from the AUV and ROV geohazards reports listed below.

The Mad Dog area AUV survey was acquired in 2001 by C&C Technologies Inc. for BP and partners for a proposed floating production platform in GC block 782 and associated seafloor facilities. This survey acquired multibeam echosounder bathymetry, side-scan sonar and sub-bottom profiler data covering all or portions of 13 OCS lease blocks (48 square miles). Fifty-one NW-SE trending primary lines were acquired 200 meters apart, along with 24 orthogonal tie lines spaced 900 m apart and 12 short, curves lines through proposed suction pile locations. Survey specs and the data interpretation are provided in the 2003 C&C geohazards report. Although this report has been used for numerous site clearance letters, it is uncertain if it has ever been submitted to the MMS. Thus, a complete copy is included with the EP for the proposed well location.

The Mad Dog Phase 2 ROV survey was conducted between 27 and 29 November 2009 by Oceaneering at BP's request to investigate apparent seafloor seep features identified in geophysical data, by recording on video and photographing the substrate and associated benthic fauna along six pre-determined survey lines. The findings of this seafloor video survey were documented by Berger Geosciences LLC and used to produce a formal report (B-geO, 2010) which is provided to the MMS for the first time with this EP for the proposed well location. Specific



findings along ROV survey Line 6 are referenced within this Shallow Hazards Assessment, as they are pertinent to MMS NTL No. 2009-G40.

This document is a site-specific shallow hazards review of the proposed GC738 “B” well location and includes data examples from the geophysical data sets and associated reports mentioned above. The proposed well will be drilled using a dynamically-positioned semi-submersible drilling rig, which will not require anchoring or mooring to the seafloor. The depth of investigation is from the seafloor to the top of salt (4,634 ft BML). Drilling hazards within and below salt will be assessed by the subsurface asset team.

The key findings of the shallow hazards assessment for the proposed “B” location are as follows:

Proposed Well Location GC738 “B”:

Water Depth and Seafloor Gradient:

Water depth at the proposed well location is estimated to be 4,354 ft below Mean Sea Level (MSL) using the MBE-derived bathymetry map (C&C, 2003) from the Mad Dog AUV survey (Plate 3).

The seafloor has an average slope of about 0.3° (0.5%) down to the northwest in the immediate vicinity of the proposed well (Plates 3 and 4).

Seafloor Morphology and Shallow Sediments:

The seabed is relatively smooth and featureless in the immediate vicinity of the proposed well. However, numerous southwest-northeast trending normal faults, which are rooted into the top of a local salt high, define the margins of a graben (Plates 5 and 6). The proposed well location is situated immediately northwest of this graben. The closest seafloor faults are located about 800 ft to the southeast and 1,000 ft to the east of the proposed well site (Plates 4, 5 and 6).

No evidence for seafloor fluid expulsion features (i.e. mud volcanoes, pockmarks, etc.) have been identified within 2,000 ft of the proposed well location (Plates 7 through 10).

The seabed sediments are interpreted to be composed of very soft clays (2 to 5kPa at seafloor), which are likely to gradually increase in stiffness with depth (Plates 11 and 12).

Chemosynthetic Communities:

There is no evidence for the presence of seafloor expulsion features, authigenic carbonate or chemosynthetic fauna supported by hydrocarbon seepage within 2,000 ft of the proposed well location based inspection of seafloor amplitudes in HR3D seismic data (Plate 7), AUV sidescan sonar data (Plate 8) and subbottom profiler data (Plates 11 and 12).

AUV data revealed seafloor expulsion features, with underlying acoustic void zones in the south and east of GC738, southeast and east of the proposed well location, respectively (Plates 9 and 10).



Another area of fluid expulsion to the seafloor was identified in northwest GC782, south-southwest of the proposed well location.

The 2009 ROV video survey of the seafloor fluid expulsion features in the south of GC738 (Line 6) found authigenic carbonate, asphalt, and chemosynthetic fauna (B-geO, 2010), approximately 5,500 ft south-southeast of the proposed well location (Plate 13). This ROV survey also found authigenic carbonate, asphalt, and chemosynthetic fauna at the expulsion feature in northwest GC782 (B-geO, 2010), approximately 11,500 ft south-southwest of the proposed well.

Seafloor Obstructions:

No man-made seafloor obstructions are known to exist within a radius of 2,000 ft of the proposed surface location (Plates 2 and 9).

The proposed well will be drilled from a dynamically positioned drilling rig and thus will not be moored to the seafloor.

The proposed well is located in an OCS-lease block that does not require an archeological assessment.

There are no known chemical or munitions dumping sites in the Green Canyon Protraction Area. Thus, unexploded ordinance are not expected at the proposed well location.

The proposed well location lies within Military Warning Area W-92 (Plate 14). Thus, the U.S. Military requires notification of all field operations for the proposed well prior to entering the area. The Military Contact listed for the W-92 area is Navel Air Station, Air Operations Department, Air Traffic Division/Code 52, New Orleans 77034-5586, phone number (504) 678-3100/3101.

Offset Wells and Other Seafloor Infrastructure:

There are no existing wells in GC738. The nearest existing offset wells with their distances from the proposed well location (Plate 2) are listed below:

- GC737 #1 - 2.7 miles to the west-southwest
- GC782 #1 - 3.2 miles to the south-southeast
- GC782 #2 - 3.3 miles to the south-southeast
- GC782 #3 - 3.2 miles to the southeast (SHL in GC783)
- GC826 #1 - 6.2 miles to the south-southeast
- GC826 #2 - 4.8 miles to the south
- GC826 #3 - 6.2 miles to the south-southeast
- GC826 #4 - 4.8 miles to the south-southwest

The Mad Dog SPAR is located about 3.2 miles south-southeast of the proposed well location (Plate 2). Eleven mooring lines, grouped into three clusters, extend about 5,500 ft out from the spar. The closest mooring anchor is located about 2.3 miles to the southeast of the proposed well location.

Oil and gas export lines run northeast from the SPAR and pass approximately 2.7 miles to the southeast of the proposed well location.

A fiber optic communication line runs northwest from the SPAR and passes approximately 0.5 miles to the northwest of the



proposed well location.

Note that pipelines and or mooring lines show on Plates 3, 4, 8, 9 and 10 were for planning purposes and are not necessarily the as-built location. Plate 2, although less detailed, shows the as-built locations.

Shallow Geology:

The riserless drilling interval in the vicinity of the proposed well location is comprised of well bedded hemipelagic strata and thin turbidites with interlayered mass transport deposits (MTDs) of various sizes (Plates 15 through 18). Lithologies throughout the riserless drilling section are expected to be clay and silt with minor amounts of fine sand. Allochthonous salt in the vicinity has extended the supra-salt strata forming a graben ((Plates 17 through 20). The proposed well is located on the north side of this graben.

Nine seismic reflectors, i.e. horizons (Hzn) have been mapped in the vicinity of the proposed well. These include the following (with depths at the proposed well):

- Seafloor 4,354 ft SS
- Hzn 10 locally eroded
- Hzn 15 421 ft BML
- Hzn 20 750 ft BML
- Hzn 40 unmappable
- Hzn 50 1,221 ft BML
- Hzn 60 1,484 ft BML
- Hzn 80 1,910 ft BML
- Top Salt 4,634 ft BML

The irregular numbering of these horizons is a result of unconformities which have removed horizons mapped in other parts of the HR3D seismic volume.

Potential shallow drilling hazards discussed below are referenced by depth below mud line (BML), as opposed to specific stratigraphic units, because of the absence/removal of strata along shallow portions of the proposed well bore.

Subsurface Drilling Hazards:

Faulting: The proposed GC738 "B" well bore will intersect one normal fault within the supra-salt section at an estimated depth of 1,221 ft BML (Plates 15 through 18). This fault trends southwest-northeast and dips to the southeast. Although this fault does not cut the seafloor and is not considered active; it is in close proximity to, and likely related to, the active fault system that defines the graben.

Shallow Gas: Inspection of exploration and HR3D seismic profiles through the proposed well location (Plates 15 through 18) show no evidence for shallow gas in the supra-salt section. Maximum Negative Amplitude Extractions from these seismic data (Plates 21 through 26) appear to highlight sand/silt prone intervals in the supra-salt section but show no areas of anomalously high amplitudes indicative of shallow gas along the proposed well path.



Scattered amplitude anomalies that could represent shallow gas exist between Hzn 80 and the top of salt (1,910 and 4,634 ft BML) to the west, north, and northeast of the proposed well (Plate 26). However, none of these occur within 500 ft. Thus, the risk of encountering shallow gas in the supra-salt section is considered **Negligible** along the proposed well path.

Shallow Water Flow (SWF): At the GC782 #1 (Mad Dog) well, slight SWF was observed from the wellhead on connections at 1,206 and 1,399 ft BML without drilling mud in the hole, i.e. while drilling with seawater. These depths fall between Hzn 50 and Hzn 60, in an interval of bright reflectors interpreted to be silty/sandy (Plate 15). These reflectors correlate back to the proposed well but thin dramatically and are faulted.

Slight SWF observations were reported at the GC783 #1 (Mad Dog) well from 1,123 and 1,274 ft BML (above the sandy interval previously noted), and then again from 1,554 ft BML (within the sandy interval previously noted)

Slight SWF was reported from two 10-ft thick "sands" in the supra-salt section of the GC782 #4 (Mad Dog) well, however their depths are unknown.

The GC825 #1 (Mad Dog Deep) well experienced slight SWF on connections at 1,979 and 2,075 ft BML while drilling with sea water. However, SWF was not observed in this same silty/sandy interval in the GC826 #2 (South West Ridge) well, about half a mile west of the GC825 #1 well. This SWF interval occurs below Hzn 80 but has not been correlated back to the proposed well location.

Most wells drilled in the Mad Dog field and vicinity, with the exceptions listed above, have not experienced any shallow water flow in the supra-salt section.

Thus, the risk of encountering shallow water flow is considered **Negligible** from the seafloor to Hzn 20 (750 ft BML) and from Hzn 60 to Hzn 80 (1,484 to 1,910 ft BML), **Low** from Hzn 20 to Hzn 50 (750 to 1,221 ft BML) and from Hzn 80 to the top of salt (1,910 to 4,634 ft BML), and **Moderate** from Hzn 50 to Hzn 60 (1,221 to 1,484 ft BML).

Asphalt: Sub-salt asphalt is commonly encountered by wells in the Mad Dog field, south-southeast of the proposed well location. Well-specific details are provided by Romo et al. (2007). However, no supra-salt asphalt has been encountered in the Mad Dog field proper.

The 2009 ROV survey documented seafloor asphalt while investigating fluid expulsion features for chemosynthetic fauna in the south of GC738, approximately 5,500 ft south-southeast of the proposed well location and in northwest GC782, approximately 11,500 ft south-southwest of the proposed well (B-geO, 2010).

Nothing resembling a seafloor asphalt mound or flow is observed within 2,000 ft of the proposed well location within the resolution of



the AUV MBE bathymetry (Plate 3) and sidescan sonar data (Plate 8). However, the possibility of encountering supra-salt asphalt while drilling riserless cannot be completely ruled out due to the location of the proposed well with respect to seafloor asphalt occurrences listed above and the extensive supra-salt normal faulting in the vicinity. Therefore, the risk of encountering asphalt along the proposed well path is considered **Low** (higher than Negligible) from seabed to the top of salt (4,634 ft BML). Although not considered a safety risk while drilling in the supra-salt section, balling of asphalt at the end of the drill bit could reduce drilling efficiency.

Shallow Oil: Active, wide-spread, naturally-occurring oil slicks on the sea surface above the Puma salt structure have been documented with Synthetic Aperture Radar images from satellites (NPA 2006) and in ROV observations of seafloor oil seepage sites in the Puma appraisal area (Plate 22 in Fugro 2007). Additionally, all three wells in the Puma area (GC821 #1, GC823 #1 and GC866 #1) have encountered supra-salt oil while drilling riserless.

The 2009 ROV survey documented active oil seepage at the seafloor in the west of GC825 (Berger Geosciences Inc., 2010), approximately 7 miles southwest of the proposed well location.

Sea surface oil slicks, seafloor oil seeps, and supra-salt oil have not been observed in the immediate vicinity of the Mad Dog field, to the south-southeast of the proposed well.

The possibility of encountering shallow oil while drilling riserless cannot be completely ruled out due to the location of the proposed well with respect to active oil seepage and seafloor asphalt in the general area, and pervasive faulting in the supra-salt section in the vicinity. Therefore, the risk of encountering shallow oil along the proposed well path is considered **Low** (higher than Negligible) from seabed to the top of salt (4,634 ft BML). Although not considered a safety risk, the release of naturally occurring oil from riserless drill cuttings that result in a sea surface sheen must be reported to the MMS.

Hydrates: Bottom Simulating Reflectors (BSRs) are not observed in seismic profiles through the proposed well bore (Plates 14 through 17). No occurrences of natural gas hydrates were reported while drilling any of the Mad Dog area wells. The risk of encountering hydrates along the proposed well is therefore considered **Negligible**.



CONCLUSIONS

This Shallow Hazards Assessment for location "B" in Green Canyon Block 738 (OCS-G16786) supplements the Exploration Plan (EP) to be submitted to the Minerals Management Service (MMS). This narrative defines the proposed location and documents the anticipated tophole drilling conditions within a radius of 2,000 ft of the "B" location. Conditions at the proposed well location have been evaluated primarily on the investigation of reprocessed 3D exploration seismic data, HR3D seismic data, AUV data, ROV data, and information from offset wells. The findings are summarized below and in the Top-hole Formation Forecast (Attachment 1).

Results of the data review indicate,

- The proposed well is located in an OCS-lease block that does not require an archaeological assessment.
- There are no known chemical or munitions dumping sites in the Green Canyon Protraction Area. Thus, unexploded ordinance are not expected at the proposed well location.
- The proposed well location lies within Military Warning Area W-92. Thus, the U.S. Military requires notification of all field operations for the proposed well prior to entering the area.
- No man-made or natural seafloor obstructions are known to exist within a radius of 2,000 ft of the proposed surface location.
- A BP fiber optic line is located 0.5 miles northwest of the proposed well location. The Mad Dog SPAR is located 3.1 miles to the south-southeast of the proposed well location and the nearest mooring anchor is 2.3 miles to the southeast. Oil and gas export pipelines are located 2.7 miles to the southeast of the proposed well location.
- Water depth at the proposed well location is estimated to be 4,354 ft.
- Seafloor slopes to the northwest at an average gradient of about 0.3° (0.5%) in the immediate vicinity of the proposed well location.
- Seabed sediments are interpreted to be composed of clays which are likely to increase in stiffness with depth.
- No seafloor-breaching faults are located within 250 ft of the proposed surface location.
- No fluid expulsion features (mounds or pockmarks) are observed within 2,000 ft of the proposed well location.



- There is no evidence for the existence of high-density chemosynthetic communities within 2,000 ft of the proposed well location.
- The proposed well bore will intersect one southeast-dipping, normal fault within the supra-salt section, at estimated depth of 1,221 ft BML. Although this fault does not cut the seafloor and is not considered active, it is in close proximity to, and likely related to, the active fault system that defines the graben.
- The risk of encountering **shallow water flow** is ranked as ***Negligible*** from the seafloor to Hzn 20 (750 ft BML) and from Hzn 60 to Hzn 80 (1,484 to 1,910 ft BML), ***Low*** from Hzn 20 to Hzn 50 (750 to 1,221 ft BML) and from Hzn 80 to the top of salt (1,910 to 4,634 ft BML), and ***Moderate*** from Hzn 50 to Hzn 60 (1,221 to 1,484 ft BML).
- The risk of encountering **shallow gas** is ranked as ***Negligible*** from seafloor to the top of salt (4,634 ft BML).
- The risk of encountering **shallow oil** is ranked as ***Low*** (higher than Negligible) from seafloor to the top of salt (4,634 ft BML). Although not considered a safety risk, the release of naturally occurring oil from riserless drill cuttings that result in a sea surface sheen is required to be reported to the MMS.
- The risk of encountering **asphalt** is ranked as ***Low*** (higher than Negligible) from seafloor to the top of salt (4,634 ft BML). Although not considered a safety risk while drilling in the supra-salt section, balling of asphalt at the end of the drill bit could reduce drilling efficiency.
- The risk of encountering **gas hydrates** is ranked as ***Negligible*** between the seafloor and top of salt (4,634 ft BML) at the proposed well location.

We advise caution, but believe that the risk of danger to personnel and damage to the borehole, equipment and environment is **Low**, provided strict adherence to proper drilling and cementing procedures is followed concerning these hazards until the first pressure containment string is in place.



BP GoM SPU Appraisal Tiger Team
Shallow Hazards Assessment
Proposed GC738 "B" Well Location



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15 March 2010



SHALLOW HAZARDS ASSESSMENT

PROPOSED GC782 “U” WELL LOCATION BLOCK 782, OCS-G15610 GREEN CANYON AREA GULF OF MEXICO

This document summarizes shallow conditions at the proposed drilling location GC782 “U” in Green Canyon Block 782 (OCS-G15610) in the north-central Gulf of Mexico (Plates 1 and 2).

The surface location of the proposed GC782 “U” well is defined as:

GC782 “U”	
5,067.00 ft FWL	1,212.00 ft FNL
X = 2,523,627.00 ft E	Y = 9,882,948.00 ft N
Latitude: 27° 12' 32.134” N	Longitude: 90° 16' 56.213” W
UTM (US Survey Feet)	Zone 15N
Datum: NAD 1927	Spheroid: Clarke 1866

The above surface location for this proposed well was selected based on the investigation of reprocessed 3D exploration seismic data, HR3D seismic data, AUV data, ROV data, and information from offset wells described and referenced below.

The exploration 3D seismic volume used for the shallow hazards assessments in the area of the proposed well location was acquired and processed by Western Geophysical in 1996 (GC Phase X, XI and XII). This 56-fold seismic data has a line spacing of 65.6 ft (20 m) and a trace spacing of 41.0 ft (12.5 m). The time domain, reflection amplitude volume used (mig3201.3dv) appears to be phase rotated about 90 degrees (minimum phase), as judged from the seafloor wavelet. It is a 32 bit volume with a 4 ms sample rate with a dominant frequency of 25 to 40 Hz in the first second of data below mudline in the vicinity of the proposed well location, and an estimated vertical resolution ($\lambda/4$) of 40 ft, assuming a velocity of 5,500 ft/sec for sediments. This seismic volume is currently loaded in BP Houston’s “geohazard” OpenWorks District within the “madpumba” 3D SeisWorks Project. The proposed GC782 “U” (Mad Dog North) well location is sited within half a bin of the intersection of Line 5964 and Trace 4277. This seismic volume was first used for site clearance of the GC823 #1 (Pumba) well (now called Puma) as part of the EP submitted to the MMS (received 14 March 2003, approved 8 April 2003), plan control N-7706). Although, no formal geohazards report based on interpretation of this data exists, exploration 3D



BP GoM SPU Appraisal Tiger Team
Shallow Hazards Assessment
Proposed GC782 "U" Well Location



seismic data examples from this volume are provided in this Shallow Hazards Assessment to supplement findings from the AUV and ROV geohazards reports listed below.

An HR3D seismic volume was acquired over the Mad Dog area in 2000 for BP and partners by Fugro GeoServices Inc. and processed by Ensign Geophysics, now part of Geotrace. This multifold, time domain, reflection amplitude survey has a line spacing of 24.6 ft (7.5 m) and a trace spacing of 20.5 ft (6.25 m) and a record length of 5.0 sec two-way-time. Subsurface imaging quality is very good from mudline to about one second (3100 ft) BML at the proposed well location, but does not image the top of salt in this area. The post-stack, time migrated, floating 8-bit volume used appears to be near zero phase, has a sample rate of 1 ms, a dominant frequency of about 150 Hz in the first second below mudline in the area of the proposed well locations, and an estimated vertical resolution ($\lambda/4$) of 9 ft, assuming a velocity of 5,500 ft/sec for sediments. The proposed GC782 "U" well location is sited within half a bin of the intersection of HR3D Line 2148 and Trace 1509. Although no formal geohazards report based on interpretation of this data exists, HR3D seismic data examples for geohazards site clearance from this seismic volume were most recently used as part of the EP submitted to the MMS (received 2 December 2008, approved 16 January 2009, Plan Control Number S-7290) for the GC826 #5 (Mad Dog South) well. Likewise, HR3D seismic data examples from the above describe volume are provided in this Shallow Hazards Assessment to supplement findings from the AUV and ROV geohazards reports listed below.

The Mad Dog area AUV survey was acquired in 2001 by C&C Technologies Inc. for BP and partners for a proposed floating production platform in GC block 782 and associated seafloor facilities. This survey acquired multibeam echosounder bathymetry, side-scan sonar and sub-bottom profiler data covering all or portions of 13 OCS lease blocks (48 square miles). Fifty-one NW-SE trending primary lines were acquired 200 meters apart, along with 24 orthogonal tie lines spaced 900 m apart and 12 short, curves lines through proposed suction pile locations. Survey specs and the data interpretation are provided in the report 2003 C&C geohazards report. Although this report has been used for numerous site clearance letters, it is uncertain if it has ever been submitted to the MMS. Thus, a complete copy is included with the EP for the proposed well location.

The Mad Dog Phase 2 ROV survey was conducted between 27 and 29 November 2009 by Oceaneering at BP's request to investigate apparent seafloor seep features identified in geophysical data, by recording on video and photographing the substrate and associated benthic fauna along six pre-determined survey lines. The findings of this seafloor video survey were documented by Berger Geosciences LLC and used to produce a formal report (B-geO, 2010) which is provided to the MMS for the first time with this EP for the proposed well location. Specific



findings along ROV survey Line 6 are referenced within this Shallow Hazards Assessment, as they are pertinent to MMS NTL No. 2009-G40.

This document is a site-specific shallow hazards review of the proposed GC782 “U” well location and includes data examples from the geophysical data sets and associated reports mentioned above. The proposed well will be drilled using a dynamically-positioned semi-submersible drilling rig, which will not require anchoring or mooring to the seafloor. The depth of investigation is from the seafloor to the top of salt (3,593 ft BML). Drilling hazards within and below salt will be assessed by the subsurface asset team.

The key findings of the shallow hazards assessment for the proposed “U” location are as follows:

Proposed Well Location GC782 “U”:

Water Depth and Seafloor Gradient:

Water depth at the proposed well location is estimated to be 4,452 ft below Mean Sea Level (MSL) using the MBE-derived bathymetry map (C&C, 2003) from the Mad Dog AUV survey (Plate 3).

The seafloor has an average slope of about 3.0° (5.3%) down to the southwest in the immediate vicinity of the proposed well (Plates 3 and 4).

Seafloor Morphology and Shallow Sediments:

The seabed is relatively smooth and featureless in the immediate vicinity of the proposed well. However, numerous southwest-northeast trending normal faults define the margins of a graben (Plate 5 and 6), and which are rooted into the top of a local salt high. The proposed well location is situated immediately southeast of this graben. The closest seafloor faults are located about 350 ft to the northwest of the proposed well site (Plates 4, 5 and 6).

No evidence for seafloor fluid expulsion features (i.e. mud volcanoes, pockmarks, etc.) have been identified within 2,000 ft of the proposed well location (Plates 7 through 10).

The seabed sediments are interpreted to be composed of very soft clays (2 to 5kPa at seafloor), which are likely to gradually increase in stiffness with depth (Plates 11 and 12).

Chemosynthetic Communities:

There is no evidence for the presence of seafloor expulsion features, authigenic carbonate or chemosynthetic fauna supported by hydrocarbon seepage within 2,000 ft of the proposed well location based inspection of seafloor amplitudes in HR3D seismic data (Plate 7), AUV sidescan sonar data (Plate 8) and subbottom profiler data (Plates 11 and 12).

AUV data revealed seafloor expulsion features, with underlying acoustic void zones in the south and east of GC738, north and northeast of the proposed well location respectively (Plates 9 and 10). Another area of fluid expulsion to the seafloor was identified



in northwest GC782, southwest of the proposed well location.

The 2009 ROV video survey of the seafloor fluid expulsion features in the south of GC738 found authigenic carbonate, asphalt, and chemosynthetic fauna (B-geO, 2010), approximately 3,400 ft northeast of the proposed well location (Plate 13). This ROV survey also found authigenic carbonate, asphalt, and chemosynthetic fauna at the expulsion feature in northwest GC782 (B-geO, 2010), approximately 4,500 ft southwest of the proposed well.

Seafloor Obstructions:

No man-made seafloor obstructions are known to exist within a radius of 2,000 ft of the proposed surface location (Plates 2 and 9).

The proposed well will be drilled from a dynamically positioned drilling rig and thus will not be moored to the seafloor.

The proposed well is located in an OCS-lease block that does not require an archeological assessment.

There are no known chemical or munitions dumping sites in the Green Canyon Protraction Area. Thus, unexploded ordinance are not expected at the proposed well location.

The proposed well location lies within Military Warning Area W-92 (Plate 14). Thus, the U.S. Military requires notification of all field operations for the proposed well prior to entering the area. The Military Contact listed for the W-92 area is Navel Air Station, Air Operations Department, Air Traffic Division/Code 52, New Orleans 77034-5586, phone number (504) 678-3100/3101.

Offset Wells and Other Seafloor Infrastructure:

Wellheads in GC782 and adjacent OCS lease blocks (Plate 2) include the following, listed together with their distances from the proposed well location:

- GC737 #1 - 3.0 miles to the west-northwest
- GC782 #1 - 1.6 miles to the southeast
- GC782 #2 - 1.7 miles to the south-southeast
- GC782 #3 - 2.1 miles to the east
- GC826 #1 - 4.5 miles to the south-southeast
- GC826 #2 - 3.3 miles to the south-southwest
- GC826 #3 - 4.5 miles to the south-southeast
- GC826 #4 - 3.4 miles to the south-southwest

The Mad Dog SPAR is located about 1.6 miles southeast of the proposed well location (Plate 2). Eleven mooring lines, grouped into three clusters, extend about 5,500 ft out from the spar. The closest mooring anchor is located about 1.1 miles to the east-southeast of the proposed well location.

Oil and gas export lines run northeast from the SPAR and pass approximately 1.5 miles to the southeast of the proposed well location.

A fiber optic communication line runs northwest from the SPAR and passes approximately 1.0 miles to the south and 0.9 miles to



the west of the proposed well location.

Note that pipelines and or mooring lines show on Plates 3, 4, 8, 9 and 10 were for planning purposes and are not necessarily the as-built location. Plate 2, although less detailed, shows the as-built locations.

Shallow Geology:

The riserless drilling interval in the vicinity of the proposed well location is comprised of well bedded hemipelagic strata and thin turbidites with interlayered mass transport deposits (MTDs) of various sizes (Plates 15 through 18). Lithologies throughout the riserless drilling section are expected to be clay and silt with minor amounts of fine sand. Allochthonous salt in the vicinity has extended the supra-salt strata forming a graben ((Plates 17 through 20). The proposed well is located on the south side of this graben.

Nine seismic reflectors, i.e. horizons (Hzn) have been mapped in the vicinity of the proposed well. These include the following (with depths at the proposed well):

- Seafloor 4,452 ft SS
- Hzn 10 148 ft BML
- Hzn 15 232 ft BML
- Hzn 20 382 ft BML
- Hzn 40 856 ft BML
- Hzn 50 1,147 ft BML
- Hzn 60 1,314 ft BML
- Hzn 80 1,692 ft BML
- Top Salt 3,593 ft BML

The irregular numbering of these horizons is a result of unconformities which have removed horizons mapped in other parts of the HR3D seismic volume.

Potential shallow drilling hazards discussed below are referenced by depth below mud line (BML), as opposed to specific stratigraphic units, because of the absence/removal of strata along shallow portions of the proposed well bore.

Subsurface Drilling Hazards:

Faulting: The proposed GC782 “U” well bore will intersect two normal faults within the supra-salt section at estimated depths of 2,004 ft and 2,300 ft BML (Plates 15 through 18). Both trend southwest-northeast and dip to the southeast. Although these faults do not cut the seafloor and are not considered active; they are in close proximity to and could be related to the active fault system that defines the graben.

Shallow Gas: Inspection of exploration and HR3D seismic profiles through the proposed well location (Plates 15 through 18) show no evidence for shallow gas in the supra-salt section. Maximum Negative Amplitude Extractions from these seismic data (Plates 21 through 26) appear to highlight sand/silt prone intervals in the supra-salt section but show no areas of anomalously high amplitudes indicative of shallow gas along the proposed well path,



or within 2,000 ft. Thus, the risk of encountering shallow gas in the supra-salt section is considered **Negligible** along the proposed well path.

Shallow Water Flow (SWF): At the GC782 #1 (Mad Dog) well, slight SWF was observed from the wellhead on connections at 1,206 and 1,399 ft BML without drilling mud in the hole, i.e. while drilling with seawater. These depths fall between Hzn 50 and Hzn 60, in an interval of bright reflectors interpreted to be silty/sandy (Plate 15). These reflectors correlate back to the proposed well but thin dramatically and are faulted.

Slight SWF observations were reported at the GC783 #1 (Mad Dog) well from 1,123 and 1,274 ft BML (above the sandy interval previously noted), and then again from 1,554 ft BML (within the sandy interval previously noted)

Slight SWF was reported from two 10-ft thick "sands" in the supra-salt section of the GC782 #4 (Mad Dog) well, however their depths are unknown.

The GC825 #1 (Mad Dog Deep) well experienced slight SWF on connections at 1,979 and 2,075 ft BML while drilling with sea water. However, SWF was not observed in this same silty/sandy interval in the GC826 #2 (South West Ridge) well, about half a mile west of the GC825 #1 well. This SWF interval occurs below Hzn 80 but has not been correlated back to the proposed well location.

Most wells drilled in the Mad Dog field and vicinity, with the exceptions listed above, have not experienced any shallow water flow in the supra-salt section.

Thus, the risk of encountering shallow water flow is considered **Negligible** from the seafloor to Hzn 20 (382 ft BML) and from Hzn 60 to Hzn 80 (1,314 to 1,692 ft BML), **Low** from the Hzn 20 to Hzn 50 (382 to 1,147 ft BML) and from Hzn 80 to the top of salt (1,692 to 3,593 ft BML), and **Moderate** from Hzn 50 to Hzn 60 (1,147 to 1,314 ft BML)..

Asphalt: Sub-salt asphalt is commonly encountered by wells in the Mad Dog field, south-southeast of the proposed well location. Well-specific details are provided by Romo et al. (2007). However, no supra-salt asphalt has been encountered in the Mad Dog field proper.

The 2009 ROV survey documented seafloor asphalt while investigating fluid expulsion features for chemosynthetic fauna in the south of GC738, approximately 3,400 ft northeast of the proposed well location and in northwest GC782, approximately 4,500 ft southwest of the proposed well (B-geO, 2010).

Nothing resembling a seafloor asphalt mound or flow is observed within 2,000 ft of the proposed well location within the resolution of the AUV MBE bathymetry (Plate 3) and sidescan sonar data (Plate 8). However, the possibility of encountering supra-salt asphalt while drilling riserless cannot be completely ruled out due



to the location of the proposed well with respect to seafloor asphalt occurrences listed above and the extensive supra-salt normal faulting in the vicinity. Therefore, the risk of encountering asphalt along the proposed well path is considered **Low** (higher than Negligible) from seabed to the top of salt (3,593 ft BML). Although not considered a safety risk while drilling in the supra-salt section, balling of asphalt at the end of the drill bit could reduce drilling efficiency.

Shallow Oil: Active, wide-spread, naturally-occurring, oil slicks on the sea surface above the Puma salt structure has been documented with Synthetic Aperture Radar images from satellites (NPA 2006) and in ROV observations of seafloor oil seepage site in the Puma appraisal area (Plate 22 in Fugro 2007). Additionally, all three wells in the Puma area (GC821 #1, GC823 #1 and GC866 #1) have encountered supra-salt oil while drilling riserless.

The 2009 ROV survey documented active oil seepage at the seafloor in the west of GC825 (Berger Geosciences Inc., 2010), approximately 6 miles southwest of the proposed well location.

Sea surface oil slicks, seafloor oil seeps, and supra-salt oil has not been observed in the immediate vicinity of the Mad Dog field, to the south-southeast of the proposed well.

The possibility of encountering shallow oil while drilling riserless cannot be completely ruled out due to the location of the proposed well with respect to active oil seepage and seafloor asphalt in the general area, and pervasive faulting in the supra-salt section in the vicinity. Therefore, the risk of encountering shallow oil along the proposed well path is considered **Low** (higher than Negligible) from seabed to the top of salt (3,593 ft BML). Although not considered a safety risk, the release of naturally occurring oil from riserless drill cuttings that result in a sea surface sheen must be reported to the MMS.

Hydrates: Bottom Simulating Reflectors (BSRs) are not observed in seismic profiles through the proposed well bore (Plates 14 through 17). No occurrences of natural gas hydrates were reported while drilling any of the Mad Dog area wells. The risk of encountering hydrates along the proposed well is therefore considered **Negligible**.



CONCLUSIONS

This Shallow Hazards Assessment for location "U" in Green Canyon Block 782 (OCS-G15610) supplements the Exploration Plan (EP) to be submitted to the Minerals Management Service (MMS). This narrative defines the proposed location and documents the anticipated tophole drilling conditions within a radius of 2,000 ft of the "U" location. Conditions at the proposed well location have been evaluated primarily on the investigation of reprocessed 3D exploration seismic data, HR3D seismic data, AUV data, ROV data, and information from offset wells. The findings are summarized below and in the Top-hole Formation Forecast (Attachment 1).

Results of the data review indicate,

- The proposed well is located in an OCS-lease block that does not require an archaeological assessment.
- There are no known chemical or munitions dumping sites in the Green Canyon Protraction Area. Thus, unexploded ordinance are not expected at the proposed well location.
- The proposed well location lies within Military Warning Area W-92. Thus, the U.S. Military requires notification of all field operations for the proposed well prior to entering the area.
- No man-made or natural seafloor obstructions are known to exist within a radius of 2,000 ft of the proposed surface location.
- A BP fiber optic line is located 1.0 miles south and 0.9 miles west of the proposed well location. The Mad Dog SPAR is located 1.6 miles to the southeast of the proposed well location and the nearest mooring anchor is 1.1 miles to the east-southeast. Oil and gas export pipelines are located 1.5 miles to the southeast of the proposed well location.
- Water depth at the proposed well location is estimated to be 4,452 ft.
- Seafloor slopes to the southwest at an average gradient of 3.0° (5.3%) in the immediate vicinity of the proposed well location.
- Seabed sediments are interpreted to be composed of clays which are likely to increase in stiffness with depth.
- No seafloor-breaching faults are located within 250 ft of the proposed surface location.



- No fluid expulsion features (mounds or pockmarks) are observed within 2,000 ft of the proposed well location.
- There is no evidence for the existence of high-density chemosynthetic communities within 2,000 ft of the proposed well location.
- The proposed well bore will intersect two southeast-dipping, normal faults within the supra-salt section, at estimated depths of 2,004 ft, and 2,300 ft BML. Although these faults do not cut the seafloor and are not considered active; they are in close proximity to and could be related to the active fault system that defines the graben.
- The risk of encountering **shallow water flow** is ranked as ***Negligible*** from the seafloor to Hzn 20 (382 ft BML) and from Hzn 60 to Hzn 80 (1,314 to 1,692 ft BML), ***Low*** from the Hzn 20 to Hzn 50 (382 to 1,147 ft BML) and from Hzn 80 to the top of salt (1,692 to 3,593 ft BML), and ***Moderate*** from Hzn 50 to Hzn 60 (1,147 to 1,314 ft BML).
- The risk of encountering **shallow gas** is ranked as ***Negligible*** from seafloor to the top of salt (3,593 ft BML).
- The risk of encountering **shallow oil** is ranked as ***Low*** (higher than Negligible) from seabed to the top of salt (3,593 ft BML). Although not considered a safety risk, the release of naturally occurring oil from riserless drill cuttings that result in a sea surface sheen is required to be reported to the MMS.
- The risk of encountering **asphalt** is ranked as ***Low*** (higher than Negligible) from seafloor to the top of salt (3,593 ft BML). Although not considered a safety risk while drilling in the supra-salt section, balling of asphalt at the end of the drill bit could reduce drilling efficiency.
- The risk of encountering **gas hydrates** is ranked as ***Negligible*** between the seafloor and top of salt (3,593 ft BML) at the proposed well location.

We advise caution, but believe that the risk of danger to personnel and damage to the borehole, equipment and environment is ***Low***, provided strict adherence to proper drilling and cementing procedures is followed concerning these hazards until the first pressure containment string is in place.



BP GoM SPU Appraisal Tiger Team
Shallow Hazards Assessment
Proposed GC782 "U" Well Location



Prepared By:

A handwritten signature in black ink, appearing to read 'Richard Weiland'.

Richard Weiland
Senior Geohazards Specialist,
BP GoM SPU, Appraisal Tiger Team
12 March 2010

Reviewed By:

A handwritten signature in black ink, appearing to read 'Bernie Care'.

Bernie Care
Senior Geohazards Specialist,
BP GoM SPU, Appraisal Tiger Team
15 March 2010

GEOLOGIC STRUCTURES MAP

PROPRIETARY INFORMATION

GEOLOGIC DESCRIPTION
PROPRIETARY INFORMATION

CROSS-SECTION MAP

PROPRIETARY INFORMATION

STRATIGRAPHIC COLUMN
PROPRIETARY INFORMATION

ATTACHMENT D
AIR QUALITY REPORT

**EXPLORATION PLAN (EP)
AIR QUALITY SCREENING CHECKLIST**

OMB Control No. 1010-0049
OMB Approval Expires: September 30, 2003

COMPANY	BP Exploration & Production Inc
AREA	Green Canyon
BLOCK	738 & 782
LEASE	OCS-G-16786 & 15610
PLATFORM	
WELL	A, B & U
COMPANY CONTACT	Anne-Renee Laplante
TELEPHONE NO.	281/366-5155
REMARKS	

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

If ALL questions are answered "No":

Submit summary information regarding the peak year emissions for both Plan Emissions and Complex Total Emissions, if applicable.

If ANY question is answered "Yes":

Prepare and submit a full set of **EP** spreadsheets with your plan.

**BP EXPLORATION & PRODUCTION INC.
GREEN CANYON AREA BLOCKS 738 & 782
OCS-G-16786 & 15610**

Air Pollutant	Plan Emission Amounts (tons)	Calculated Exemption Amounts (tons)	Calculated Complex Total Emission Amounts (tons)
Carbon monoxide (CO)	160.24	84546.06	160.24
Particulate matter (PM)	21.37	4129.20	21.37
Sulphur dioxide (SO ₂)	98.01	4129.20	98.01
Nitrogen oxides (NO _x)	734.43	4129.20	734.43
Volatile organic compounds (VOC)	22.03	4129.20	22.03

Contact: Joe Morton, P.E., 337/735-3881, jmorton@mortoninc.com

ATTACHMENT E
CERTIFICATE OF COASTAL ZONE CONSISTENCY
ENVIRONMENTAL IMPACT ANALYSIS

COASTAL ZONE MANAGEMENT CONSISTENCY CERTIFICATE

EXPLORATION PLAN

GULF OF MEXICO

FOR

GREEN CANYON AREA BLOCKS 738 & 782

OCS-G-16786 & 15610

SUBMITTED TO:

MS. ANNE-RENEE LAPLANTE

BP EXPLORATION & PRODUCTION INC.

200 WESTLAKE PARK BOULEVARD

HOUSTON, TEXAS 77079

(281/366-5155)

MARCH 22, 2010

PREPARED BY:

TIM MORTON & ASSOCIATES, INC.

REGULATORY & ENVIRONMENTAL CONSULTANTS

PROJECT NO. 10-046

COASTAL ZONE MANAGEMENT
CONSISTENCY CERTIFICATION

EXPLORATION

.....
Type of Plan

GREEN CANYON AREA BLOCKS 738 & 782

.....
Area and Block

OCS-G-16786 & 15610

.....
Lease Number

The proposed activities described in detail in the attached Plan comply with Louisiana's approved Coastal Management Program and all relevant enforceable policies and will be conducted in a manner consistent with such Program.

BP EXPLORATION & PRODUCTION INC.

.....
Lessee or Operator



.....
Certifying Official

March 22, 2010
.....
Date

Environmental Impact Analysis

*Green Canyon Area
Blocks 738 & 782
OCS-G-16786 & 15610*

March 22, 2010

Prepared for BP Exploration & Production Inc.
by Tim Morton & Associates, Inc.

Filename: S:\Jobs\2010\BP Exploration & Production Inc\Green Canyon Area\10-046 Blocks 738 &
782\EIA-GC738&782.wpd

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I. Description of the Proposed Activity

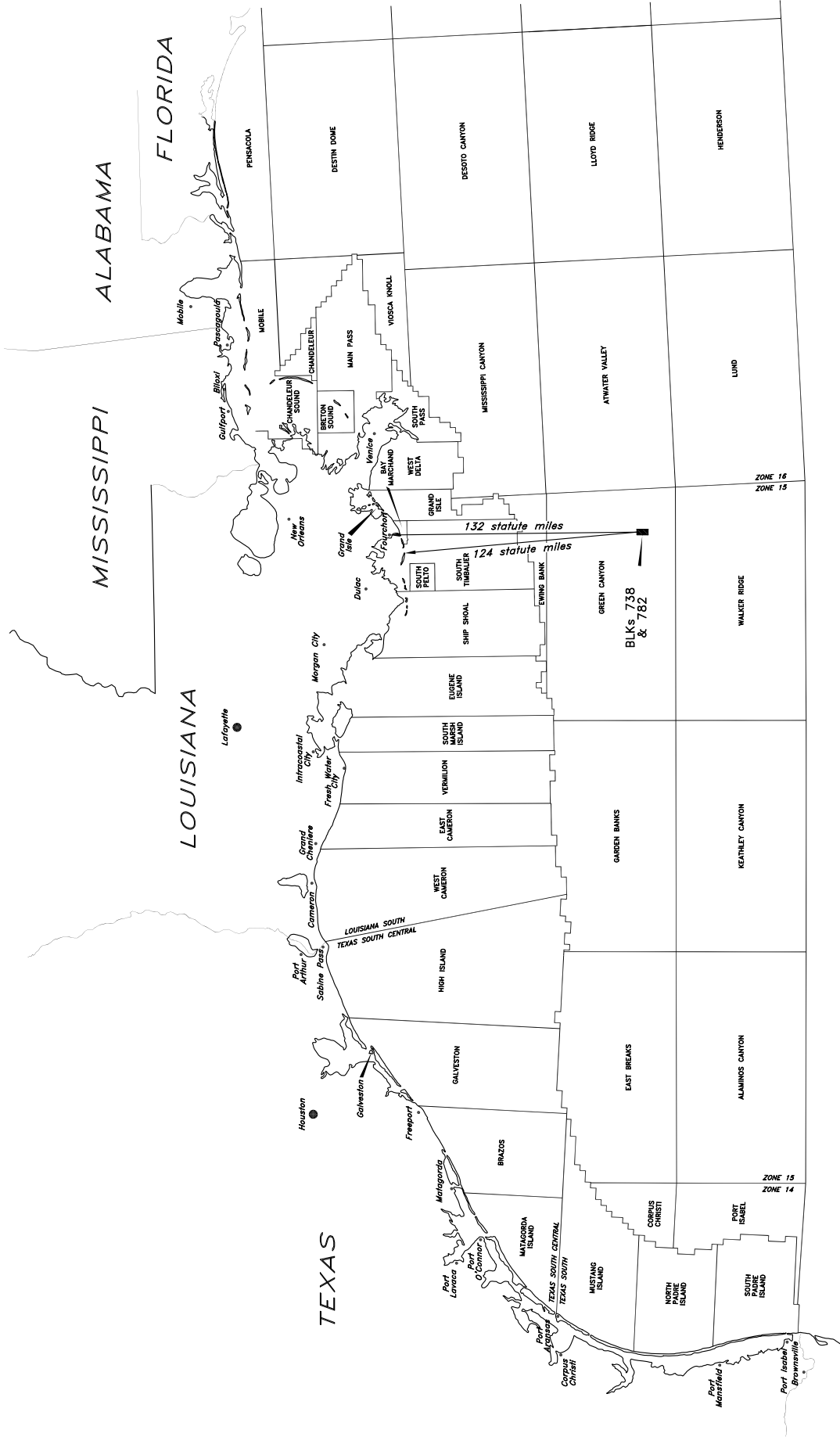
This environmental impact analysis addresses the activity proposed by BP Exploration & Production Inc. (BP) for Green Canyon Area Blocks 738 & 782 (OCS-G-16786 & 15610). The approximate location of the activity is presented on a general vicinity map of the Outer Continental Shelf (OCS) lease areas off the coast of Louisiana (Figure 1).

BP Exploration & Production Inc. proposes to drill three wells in Green Canyon Area Block 738 from two surface locations in Green Canyon Area Block 738 and one surface location in Green Canyon Area Block 782. BP proposes to drill the proposed wells utilizing a dynamically-positioned semi-submersible rig. BP proposes to drill the wells sequentially, and the anticipated spud date for the first well is May 15, 2010. BP estimates that it will take approximately 50 days to drill each well. More specific information can be found in the attached Exploration Plan (EP).

The proposed activities will be carried out by BP with a guarantee of the following:

- The best available and safest technologies will be utilized throughout the projects. This includes meeting all applicable requirements for equipment types, general project layout, safety systems, equipment and monitoring systems.
- All operations will be covered by a Minerals Management Service (MMS) approved Oil Spill Response Plan.
- All applicable Federal, State, and local requirements regarding air emissions, water quality, and discharge for the proposed activities, as well as any other permit conditions, will be complied with.

VICINITY MAP



BP EXPLORATION & PRODUCTION INC.
HOUSTON, TEXAS

VICINITY MAP
GREEN CANYON AREA BLOCKS 738 & 782



TIM MORTON & ASSOCIATES, INC. DATE: 3/18/10
730 E. KALISTE SALOOM RD. MAP NO. BP U15
LAFAYETTE, LOUISIANA

GULF OF MEXICO

II. Impact-Producing Factors

Environmental Resources	Impact Producing Factors (IPF's) Categories and Examples Refer to a recent GOM OCS Lease Sale EIS for a more complete list of IPF's					
	Emissions (air, noise, light, etc.)	Effluents (muds, cuttings, 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, H2S releases)	Other IPF's you identify
Site-specific at Offshore Location						
Designated topographic features						
Pinnacle Trend area live-bottoms						
Eastern Gulf live bottoms						
Chemosynthetic communities			X			
Water quality		X			X	
Fisheries					X	
Marine mammals	X				X	
Sea turtles	X				X	
Air quality	X					
Shipwreck sites (known or potential)						
Prehistoric archaeological sites						
Vicinity of Offshore Location						
Essential fish habitat					X	
Marine and pelagic birds					X	
Public health and safety						
Coastal and Onshore						
Beaches					X	
Wetlands					X	
Shore birds and coastal nesting birds	X				X	
Coastal wildlife refuges					X	
Wilderness areas					X	
Other Resources You Identify						

III. Analysis of Impact-Producing Factors

A. Site-specific at Offshore Location

1. Designated Topographic Features

After a review of impact-producing factors (including effluents, physical disturbances to the seafloor, and accidents) resulting from activities proposed in the EP, there will be no adverse impacts to topographic features. Green Canyon Area Blocks 738 and 782 are located approximately 62 miles south-southeast of Diaphus Bank, the nearest known topographic feature.

The following discussion of topographic features is summarized from the Final Environmental Impact Statement (USDOJ, OCS EIS/EA MMS 2002-052). The Topographic Lease Stipulation has been used on leases since 1973, and this experience shows conclusively that the stipulation effectively prevents damage to the biota of these banks from routine oil and gas activities. In the unlikely event of an accidental surface or subsurface oil spill, concentrated oil is not expected to impact sessile biota on topographic features. Crests of designated topographic features in the northern Gulf of Mexico are found below 10 meters; therefore, concentrated oil from a surface spill is not likely to reach sessile biota. Subsurface spills could result in the formation and settling of oil-saturated material, and oil-sediment particles could come into contact with living coral tissue; however, a subsurface spill should rise to the surface, and any oil remaining at depth would probably be swept clear of the banks by currents moving around the banks (Rezak et al., 1983). Activities proposed in the EP will be covered by BP's Oil Spill Response Plan (OSRP).

2. Pinnacle Trend Area Live Bottoms

After a review of impact-producing factors (including effluents, physical disturbances to the seafloor, and accidents) resulting from activities proposed in the EP, there will be no adverse impacts to pinnacle trend live bottoms. Green Canyon Area Blocks 738 and 782 are located approximately 173 miles southwest of Main Pass Area Block 290, the nearest block protected by the pinnacle trend live bottom stipulation.

The following discussion of pinnacle trend area live bottoms is summarized from the Final Environmental Impact Statement (USDOJ, OCS EIS/EA MMS 2002-052). By identifying the individual pinnacles present at the activity site, the lessee would be directed to avoid placement of the drilling rig and anchors on the sensitive areas. Thus, mechanical damage to the pinnacles is eliminated when measures required by the stipulation are imposed. The stipulation does not address the discharge of effluents near the pinnacles because the pinnacle trend is subjected to heavy natural sedimentation and is at considerable depths. The rapid dilution of drill cuttings and muds will minimize the potential of significant concentration of effluents on the pinnacles.

In the unlikely event of an accidental surface or subsurface oil spill, concentrated oil is not expected to impact biota of the pinnacle trend. Any surface oil spill resulting from a proposed action would likely have no impact on the biota of the pinnacle trend because the crests of these features are much deeper than 20 meters. All evidence to date indicates that accidental oil discharges that occur at the seafloor from a pipeline or blowout would rise in the water column, surfacing almost directly over the source location, and thus not impact pinnacles. Activities proposed in the EP will be covered by BP's Oil Spill Response Plan (OSRP).

3. Eastern Gulf Live Bottoms

After a review of impact-producing factors (including effluents, physical disturbances to the seafloor, and accidents) resulting from activities proposed in the EP, there will be no adverse impacts to eastern gulf

live bottoms. Green Canyon Area Blocks 738 and 782 are located approximately 154 miles from the nearest block protected by the eastern gulf live bottom stipulation.

The following discussion of eastern gulf live bottoms is summarized from the Final Environmental Impact Statement (USDOJ, OCS EIS/EA MMS 2000-077). Through detection and avoidance, the eastern gulf live bottom lease stipulation minimizes the likelihood of mechanical damage from OCS activities associated with rig and anchor emplacement to the sessile and pelagic communities associated with the crest and flanks of such features. Since this area is subject to heavy natural sedimentation, this stipulation does not include and specific measures to protect the pinnacles from the discharge of effluents.

In the unlikely event of an accidental surface or subsurface oil spill, concentrated oil is not expected to impact eastern gulf live bottoms because of the depth of the features and dilution of spills by currents and/or quickly rising oil. Activities proposed in the EP will be covered by BP's Oil Spill Response Plan (OSRP).

4. Chemosynthetic Communities

After a review of impact-producing factors (including effluents, physical disturbances to the seafloor, and accidents) resulting from activities proposed in the EP, there are potential impacts to chemosynthetic communities. Shallow Hazards Assessments for the proposed wells were prepared, and the following discussion of impacts to potential chemosynthetic communities has been extracted from those assessments:

Proposed GC 738 "A" Well Location

There is no evidence for the presence of seafloor expulsion features, authigenic carbonates or chemosynthetic fauna supported by hydrocarbon seepage within 2,000 ft of the proposed well location based on inspection of seafloor amplitudes in HR3D seismic data (Plate 7), AUV side scan sonar data (Plate 8) and sub-bottom profiler data (Plates 11 and 12).

Proposed GC 738 "B" Well Location

There is no evidence for the presence of seafloor expulsion features, authigenic carbonates or chemosynthetic fauna supported by hydrocarbon seepage within 2,000 ft of the proposed well location based on inspection of seafloor amplitudes in HR3D seismic data (Plate 7), AUV side scan sonar data (Plate 8) and sub-bottom profiler data (Plates 11 and 12).

Proposed GC 782 "U" Well Location

There is no evidence for the presence of seafloor expulsion features, authigenic carbonates or chemosynthetic fauna supported by hydrocarbon seepage within 2,000 ft of the proposed well location based on inspection of seafloor amplitudes in HR3D seismic data (Plate 7), AUV side scan sonar data (Plate 8) and sub-bottom profiler data (Plates 11 and 12).

The following discussion of chemosynthetic communities is summarized from the Final Environmental Impact Statement (USDOJ, OCS EIS/EA MMS 2002-052). Impacts to chemosynthetic communities from any oil released would be a remote possibility. Release of hydrocarbons associated with a blowout should not present a possibility for impact to chemosynthetic communities located a minimum of 457 meters (1,500 feet) from well sites. Green Canyon Area Blocks 738 and 782 are located approximately 29 miles south-southeast of Green Canyon Area Block 293, the nearest block with a known

chemosynthetic community. Activities proposed in the EP will be covered by BP's Oil Spill Response Plan (OSRP).

5. Water Quality

After a review of impact-producing factors (including effluents and accidents) resulting from activities proposed in the EP, there are potential impacts to water quality. The discharges generated as a result of drilling activities associated with this EP will be discharged upon successful bioassay test as per National Pollutant Discharge Elimination System (NPDES) permit guidelines. Solids wastes; typically paper, plastic, cloth, and metal, will be collected and transported to shore for disposal at an approved disposal facility. Solid wastes generated from the transportation vessels, normally just garbage, will be collected and returned to shore for disposal with the drilling rig refuse. Scrap metal and other metal wastes will be recycled or sold as scrap and will not be shipped to a disposal facility with the other refuse. Sanitary wastes will be treated in approved marine sanitation devices as required by the Clean Water Act. All biodegradable wastes, such as kitchen food scraps, will be comminuted or ground and discharged in accordance with NPDES permit guidelines and Annex V of MARPOL 73/78. Hazardous wastes from the drilling rig, such as paint, or paint thinner, will be collected in sealed metal containers and transported to an approved disposal site in accordance with RCRA guidelines. All applicable Federal, State, and local requirements regarding water quality and discharge for the proposed activities, as well as any other permit conditions, will be complied with.

The following discussion of potential impacts to water quality is summarized from the Final Environmental Impact Statement (USDOJ, OCS EIS/EA MMS 2002-052). In the unlikely event of an accidental surface or subsurface oil spill, a variety of physical, chemical, and biological processes act to disperse the oil slick, such as spreading, evaporation of the more volatile constituents, dissolution into the water column, emulsification of small droplets, agglomeration sinking, microbial modification, photochemical modification, and biological ingestion and excretion. The water quality would be temporarily affected by the dissolved components and small oil droplets that do not rise to the surface or are mixed down by surface turbulence. Dispersion by currents and microbial degradation would remove the oil from the water column or dilute the constituents to background levels. Activities proposed in the EP will be covered by BP's Oil Spill Response Plan (OSRP).

6. Fisheries

After a review of impact-producing factors (including accidental oil spills) resulting from activities proposed in the EP, there are potential impacts to fisheries. In the unlikely event of an accidental surface or subsurface oil spill, there is the potential for some detrimental effects to fisheries.

The following discussion of potential impacts to fisheries is summarized from the Final Environmental Impact Statement (USDOJ, OCS EIS/EA MMS 2002-052). The Gulf sturgeon (*Ancipenser oxyrinus desotoi*) is the only listed threatened fish species in the Gulf of Mexico. The Gulf sturgeon could be impacted by oil spills. Contact with spilled oil could cause irritation of gill epithelium and disturbance of liver function in Gulf sturgeon. The likelihood of spill occurrence and contact to the Gulf sturgeon is very low.

Should a spill occur in the area of mobile adult finfish or shellfish, the effects would likely be sublethal and the extent of the damage would be reduced to the capability of adult fish and shellfish to avoid a spill, to metabolize hydrocarbons, and to excrete both metabolites and parent compounds. Activities proposed in the EP will be covered by BP's Oil Spill Response Plan (OSRP).

7. Marine Mammals

After a review of impact-producing factors (including vessel traffic, noise, accidental oil spills, and loss of trash and debris) resulting from activities proposed in the EP, there are potential impacts to marine mammals. Endangered or threatened marine mammal species which might occur in the Gulf of Mexico are West Indian manatee (*Trichechus manatus*), northern right whale (*Eubalaena glacialis*), fin whale (*Balaenoptera physalus*), humpback whale (*Megaptera novaeangliae*), sei whale (*B. borealis*), sperm whale (*Physeter macrocephalus*), and blue whale (*B. musculus*)(USDOJ, OCS EIS/EA MMS 2002-052). Several non-endangered and non-threatened mammal species of whales and dolphins also occur in the Gulf of Mexico.

The following discussion of potential impacts to marine mammals is summarized from the Final Environmental Impact Statement (USDOJ, OCS EIS/EA MMS 2002-052). Small numbers of marine mammals could be killed or injured by chance collision with service vessels and by eating indigestible debris, particularly plastic items, lost from service vessels, drilling rigs, and fixed and floating platforms. Sperm whales are one of the 11 whale species that are hit commonly by ships (Laist et al., 2001). Collisions between OCS vessels and cetaceans within the project area are expected to be unusual events.

Deaths due to structure removals are not expected due to existing mitigation measures or those being developed for structures placed in oceanic waters. There is no conclusive evidence whether anthropogenic noise has or has not caused long-term displacements of, or reductions in, marine mammal populations. Contaminants in waste discharges and drilling muds might indirectly affect marine mammals through food-chain biomagnification, although the scope of effects and their magnitude are not known.

Chronic and sporadic sublethal effects could occur that may stress and/or weaken individuals of a local group or population and make them more susceptible to infection from natural or anthropogenic sources. Few lethal effects are expected from oil spills, chance collisions with service vessels and ingestion of plastic material. Oil spills of any size are estimated to be aperiodic events that may contact cetaceans. Disturbance (e.g. noise) may stress animals, weaken their immune systems, and make them more vulnerable to parasites and diseases that normally would not be fatal.

The net result of any disturbance would depend on the size and percentage of the population affected, ecological importance of the disturbed area, environmental and biological parameters that influence an animal's sensitivity to disturbance and stress, and the accommodation time in response to prolonged disturbance (Geraci and St. Aubin, 1980). Routine oil and gas activities are not expected to have long-term adverse effects on the size and productivity of any marine mammal species or population stock endemic to the northern Gulf of Mexico.

8. Sea Turtles

After a review of impact-producing factors (including vessel traffic, noise, accidental oil spills, and loss of trash and debris) resulting from activities proposed in the EP, there are potential impacts to sea turtles. Endangered or threatened sea turtle species which might occur in the Gulf of Mexico are Kemp's ridley turtle (*Lepidochelys kempii*), green turtle (*Chelonia mydas*), hawksbill turtle (*Eretmochelys imbricata*), leatherback turtle (*Dermochelys coriacea*), and loggerhead turtle (*Caretta caretta*) (USDOJ, Region IV Endangered Species Notebook).

The following discussion of potential impacts to sea turtles is summarized from the Final Environmental Impact Statement (USDOJ, OCS EIS/EA MMS 2002-052). Routine activities resulting from a proposed action have the potential to harm individual sea turtles. These animals could be impacted by the degradation of water quality resulting from operational discharges; noise generated by helicopter and

vessel traffic, platforms, and drillships; brightly-lit platforms; explosive removals of offshore structures; vessel collisions; and jetsam and flotsam generated by service vessels and OCS facilities. Lethal effects are most likely to be from chance collisions with OCS service vessels and ingestion of plastic materials. “Takes” due to explosive removals are expected to be rare due to mitigation measures already established (e.g. National Marine Fisheries Service (NMFS) Observer Program) and in development. Most OCS activities are expected to have sublethal effects. Contaminants in waste discharges and drilling muds might indirectly affect sea turtles through food-chain biomagnification; there is uncertainty concerning the possible effects. Chronic sublethal effects (e.g. stress) resulting in persistent physiological or behavioral changes and/or avoidance of impacted areas could cause declines in survival or fecundity, and result in either population declines, however, such declines are not expected. The routine activities of a proposed action are unlikely to have significant adverse effects on the size and recovery of any sea turtle species or population in the Gulf of Mexico.

In the unlikely event of an accidental surface or subsurface oil spill, sea turtles could be adversely impacted. Oil spills and oil-spill-response activities are potential threats that could have lethal effects on turtles. Contact with oil, consumption of oil particles, and oil-contaminated prey could seriously affect individual sea turtles. Oil-spill-response planning and the habitat protection requirements of the Oil Pollution Act of 1990 should mitigate these threats.

9. Air Quality

Estimated air emissions associated with the proposed activities have been calculated and were determined to be below the MMS exemption levels for particulates, sulfur oxides, nitrogen oxides, volatile organic compounds and carbon monoxide. There would be a limited degree of air quality degradation in the immediate vicinity of the proposed activities; however, the emissions associated with the proposed activities are not projected to have significant effects on onshore air quality.

10. Shipwreck Sites (known or potential)

After a review of impact-producing factors (including physical disturbances to the seafloor) resulting from activities proposed in the EP, there are potential impacts to shipwreck sites. The area of proposed activities falls outside the zone designated as an area with a high probability of historic shipwrecks.

11. Prehistoric Archaeological Sites

After a review of impact-producing factors (including physical disturbances to the seafloor) resulting from activities proposed in the EP, there will be no impacts to prehistoric archaeological sites. The area of proposed activities falls outside the zone designated as an area with a high probability of pre-historic archeological resources.

B. Vicinity of Offshore Location

1. Essential Fish Habitat

After a review of impact-producing factors (including accidental oil spills) resulting from activities proposed in the EP, there are potential impacts to essential fish habitat. In the unlikely event of an accidental surface or subsurface oil spill, there is the potential for some detrimental effects to essential fish habitat.

The following discussion of potential impacts to essential fish habitat is summarized from the Final Environmental Impact Statement (USDOI, OCS EIS/EA MMS 2002-052). Should a spill occur in the area of a mobile adult finfish or shellfish, the effects would likely be sublethal and the extent of the damage would be reduced to the capability of adult fish and shellfish to avoid a spill, to metabolize

hydrocarbons, and to excrete both metabolites and parent compounds. Activities proposed in the EP will be covered by BP's Oil Spill Response Plan (OSRP).

2. Marine and Pelagic Birds

After a review of impact-producing factors (including vessel traffic, noise, accidental oil spills, and loss of trash and debris) resulting from activities proposed in the EP, there are potential impacts to marine and pelagic birds.

The following discussion of potential impacts to marine and pelagic birds is summarized from the Final Environmental Impact Statement (USDOJ, OCS EIS/EA MMS 2002-052). The majority of effects on endangered/threatened and non-endangered/non-threatened marine birds are expected to be sublethal: behavioral effects, sublethal exposure to or intake of OCS-related contaminants or discarded debris, temporary disturbances, and displacement of localized groups from impacted habitats. Chronic sublethal stress, however, is often undetectable in birds. As a result of stress, individuals may weaken, facilitating infection and disease; then migratory species may not have the strength to reach their destination. No significant habitat impacts are expected to occur directly from routine activities resulting from a proposed action.

Oil spills pose the greatest potential direct and indirect impacts to marine birds. Birds that are heavily oiled are usually killed. If physical oiling of individuals or local groups of birds occurs, some degree of both acute and chronic physiological stress associated with direct and secondary uptake of oil would be expected. Lightly oiled birds can sustain tissue and organ damage from oil ingested during feeding and grooming or from oil that is inhaled. Stress and shock enhance the effects of exposure and poisoning. Low levels of oil could stress birds by interfering with food detection, feeding impulses, predator avoidance, territory definition, homing of migratory species, susceptibility to physiological disorders, disease resistance, growth rates, reproduction, and respiration. Reproductive success can be affected by the toxins in oil. Indirect effects occur by fouling of nesting habitat, and displacement of individuals, breeding pairs, or populations to less favorable habitats. Dispersants used in spill cleanup activity can have toxic effects similar to oil on the reproductive success of marine birds. Activities proposed in the EP will be covered by BP's Oil Spill Response Plan (OSRP).

3. Public Health and Safety

After a review of impact-producing factors (including an accidental H₂S release) resulting from activities proposed in the EP, there will be no adverse impacts to public health and safety. BP requests that Green Canyon Area Blocks 738 and 782 be classified as an area where the absence of H₂S has been confirmed.

C. Coastal and Onshore

1. Beaches

After a review of impact-producing factors (including accidental oil spills) resulting from activities proposed in the EP, there are potential impacts to beaches. Green Canyon Area Blocks 738 and 782 are located approximately 124 miles from the coast of Terrebonne Parish, Louisiana. Due to the distance from shore and the available oil spill response capabilities, no adverse impacts to beaches are anticipated as a result of the proposed activities. Activities proposed in the EP will be covered by BP's Oil Spill Response Plan (OSRP).

2. Wetlands

After a review of impact-producing factors (including accidental oil spills) resulting from activities proposed in the EP, there are potential impacts to wetlands. Green Canyon Area Blocks 738 and 782 are located approximately 124 miles from the coast of Terrebonne Parish, Louisiana. Due to the distance from shore and the available oil spill response capabilities, no adverse impacts to wetlands are anticipated as a result of the proposed activities. Activities proposed in the EP will be covered by BP's Oil Spill Response Plan (OSRP).

3. Shore Birds and Coastal Nesting Birds

After a review of impact-producing factors (including vessel traffic, noise, accidental oil spills, and loss of trash and debris) resulting from activities proposed in the EP, there are potential impacts to shore birds and coastal nesting birds. Green Canyon Area Blocks 738 and 782 are located approximately 124 miles from the coast of Terrebonne Parish, Louisiana. Due to the distance from shore and the available oil spill response capabilities, no adverse impacts to shore birds and coastal nesting birds are anticipated as a result of the proposed activities.

The following discussion of potential impacts to shore birds and coastal nesting birds is summarized from the Final Environmental Impact Statement (USDOJ, OCS EIS/EA MMS 2002-052). The majority of effects on endangered/threatened and non-endangered/non-threatened shore birds and coastal nesting birds are expected to be sublethal: behavioral effects, sublethal exposure to or intake of OCS-related contaminants or discarded debris, temporary disturbances, and displacement of localized groups from impacted habitats. Chronic sublethal stress, however, is often undetectable in birds. As a result of stress, individuals may weaken, facilitating infection and disease; then migratory species may not have the strength to reach their destination. No significant habitat impacts are expected to occur directly from routine activities resulting from a proposed action. Secondary impacts to coastal habitats will occur over the long-term and may ultimately displace species from traditional sites to alternative sites.

Oil spills pose the greatest potential direct and indirect impacts to shore birds and coastal nesting birds. Birds that are heavily oiled are usually killed. If physical oiling of individuals or local groups of birds occurs, some degree of both acute and chronic physiological stress associated with direct and secondary uptake of oil would be expected. Small coastal spills, pipeline spills, and spills from accidents in navigated waterways can contact and affect the different groups of coastal birds, most commonly marsh birds, waders, waterfowl, and certain shorebirds. Lightly oiled birds can sustain tissue and organ damage from oil ingested during feeding and grooming or from oil that is inhaled. Stress and shock enhance the effects of exposure and poisoning. Low levels of oil could stress birds by interfering with food detection, feeding impulses, predator avoidance, territory definition, homing of migratory species, susceptibility to physiological disorders, disease resistance, growth rates, reproduction, and respiration. Reproductive success can be affected by the toxins in oil. Indirect effects occur by fouling of nesting habitat, and displacement of individuals, breeding pairs, or populations to less favorable habitats. Dispersants used in spill cleanup activity can have toxic effects similar to oil on the reproductive success of marine birds. Activities proposed in the EP will be covered by BP's Oil Spill Response Plan (OSRP).

4. Coastal Wildlife Refuges

After a review of impact-producing factors (including accidental oil spills) resulting from activities proposed in the EP, there are potential impacts to coastal wildlife refuges. Green Canyon Area Blocks 738 and 782 are located approximately 127 miles south of Isles Dernieres Barrier Island Refuge, the nearest coastal wildlife refuge. Due to the distance from this refuge and the available oil spill response capabilities, no adverse impacts to coastal wildlife refuges are anticipated as a result of the proposed activities. Activities proposed in the EP will be covered by BP's Oil Spill Response Plan (OSRP).

5. Wilderness Areas

After a review of impact-producing factors (including accidental oil spills) resulting from activities proposed in the EP, there are potential impacts to wilderness areas. Green Canyon Area Blocks 738 and 782 are located approximately 124 miles from Terrebonne Parish, Louisiana. Due to the distance from shore and the available oil spill response capabilities, no adverse impacts to wilderness areas are anticipated as a result of the proposed activities. Activities proposed in the EP will be covered by BP's Oil Spill Response Plan (OSRP).

D. Other Environmental Resources Identified

None

IV. Impacts on Proposed Activities

The proposed well locations were evaluated for any seafloor and subsurface geological and manmade features and conditions that may adversely affect operations. No impacts are expected from site-specific environmental conditions.

V. Environmental Hazards

BP will fully comply with the guidelines for drilling rig fitness requirements for the hurricane season.

VI. Alternatives

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

VII. Mitigation Measures

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

VIII. Consultation

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

IX. Preparers

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