United States Department of the Interior

BUREAU OF OCEAN ENERGY MANAGEMENT
Alaska Outer Continental Shelf Region
3801 Centerpoint Drive, Suite 500
Anchorage, Alaska 99503-5823

MAR 2 2 2013

James W. Balsiger, Ph.D.
Administrator, Alaska Region
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

Dear Dr. ~~Balsiger~~ Jim:

On February 21, 2013, BOEM received from BP Exploration (Alaska) Inc. (BPXA) a notification for ancillary activities to be conducted on one of its Liberty prospect lease tracts (enclosure 1). The purpose of BPXA's activities is to evaluate soils information to support a future development and production plan.

BOEM's environmental review of these activities indicated no potential for significant impacts to the environment. However, it was determined that these activities could adversely affect designated Essential Fish Habitat (EFH) for Arctic cod. Accordingly, BOEM has prepared a supplemental EFH Assessment, which describes the project, analyzes potential effects on designated EFH, (enclosure 2) identifies proposed mitigation measures, and requests NOAA Fisheries to provide any appropriate Conservation Recommendations.

These impacts analyzed in this supplemental EFH assessment – resulting from temporary and localized increases in noise and turbidity – are similar to impacts previously evaluated by BOEM and NOAA Fisheries in prior EFH consultations. BOEM is nevertheless providing this supplemental EFH Assessment to allow NOAA Fisheries an opportunity to determine whether any additional project-specific Conservation Recommendations are appropriate.

We look forward to your response. If you have any questions or require additional information, please contact Dr. Dan Holiday, Wildlife Biologist, at 907-334-5244 / Dan.Holiday@boem.gov or Richard Knowles, Chief, Environmental Analysis Section II, Office of the Environment, at 907-334-5268 Richard.Knowles@boem.gov.

Sincerely,

James Kendall, Ph.D
Regional Director

2 Enclosures

BOEM Alaska OCS Region
Supplemental EFH Assessment
March 22, 2013

This Essential Fish Habitat (EFH) Assessment supplements previous EFH consultation with respect to certain oil and gas-related activities in the Beaufort Sea. It specifically addresses ancillary activities scheduled to occur on the Liberty prospect during April and May of 2013.

ACTIVITY

BPXA plans to conduct a 2013 Winter Geotechnical and Seabottom (benthic) Investigation in support of a potential development project at the Liberty Prospect. The ancillary activities proposed in the proponents' Notification (Attachment 1) include drilling five 8-10 inch geotechnical boreholes and deploying a remote operated vehicle (ROV).

A field team will drill geotechnical boreholes from the sea ice to depth of approximately 100 feet below the benthic surface. Approximately five geotechnical boreholes—8 to 10" in diameter—are to be drilled within Federal waters. A visual inspection of the benthic surface using ROVs would also occur in the vicinity of the geotechnical boring activities.

Drilling muds or additives will not be used for the geotechnical program. The program will use seawater to circulate the in-situ soil (cuttings) to the mudline during drilling and casing operation. During casing operations, drill cuttings will be placed on the ice surface where the cuttings will either freeze on the ice surface or be returned down the bore hole. Typically, when drilling through floating ice, soil cuttings are not brought to the surface. However, in near-shore areas where the sea ice is bottom fast or near bottom fast, some cuttings may come to the surface of the ice. This material (generally less than a cubic yard) will be left on the ice surface to be naturally redistributed as the ice melts in spring. Upon borehole completion, the site will be inspected to verify all debris is collected and properly disposed. Closed PVC pipe will be placed in boreholes and left in place when the borings are backfilled with natural soil cuttings.

The project area encompasses approximately 0.36 square miles on OCS lease block YO1650, and activities would begin April 1 and conclude prior to breakup (May 2013). Operations would be supported by the use of two Rolligons, one for pulling the drill and enclosure trailer, one for hauling two double-walled 500 gallon fuel tanks for fuel re-supply. These vehicles travel relatively quietly over the ice surface. A Tucker vehicle equipped with smooth tracks to reduce vibrations will also be used for personnel support and environmental observations. The drilling operation utilizes a wooden floor elevated about 5 feet above sea ice to reduce noise transference onto the ice surface. Further, hollow stem augers are used as "conductors" in which the sampling rods are lowered. The sampling rod is driven below the auger tip by a 140- or 340-lb hammer with 30 inches of free fall. The frequency and duration of sampling are about 4 times per hour for about 3-5 minutes each time. Casing actions will be isolated from the sea ice and the water column by inserting a 6-inch or 8-inch diameter conductor pipe through the ice to provide a sound break. The 4-inch casing is advanced through this conductor to isolate noise from activities.

The action area is not within the Boulder Patch, a recognized unique biological area. The closest potential Boulder Patch area is approximately 1.5 nautical miles to the west.

EFH DESIGNATIONS

The area of these activities has been identified as Essential Fish Habitat (EFH) for all five species of Pacific salmon as well as Arctic cod. Additional information on designated EFH within the action area is provided in Table 1, below:

TABLE 1: Designated EFH within the Action Area

Arctic Fishery Management Plan: EFH Species	Eggs EFH	Larvae EFH	Late Juvenile EFH	Adults EFH
Arctic cod (*Boreogadus saida*)			x	x
Salmon Fishery Management Plan for Coastal Alaska: EFH Species	**Eggs EFH**	**Larvae EFH**	**Late Juvenile EFH**	**Adults EFH**
Pink salmon (*Oncorhynchus gorbuscha*)	x	x	x	x
Chum salmon (*O. keta*)	x	x	x	x
Coho salmon (*O. kisutch*)	x	x	x	x
Sockeye salmon (*O. nerka*)	x	x	x	x
King salmon (*O. tshawytscha*)	x	x	x	x

ASSESSMENT

BOEM has identified three aspects of the proposed activities that warrant further analysis for potential adverse effects to designated EFH. These are the vibration and noise from Rolligons and coring activities; any sedimentation from dispersion of cuttings during the boring process and meltout of cuttings piles; and the possibility of an accidental vehicle fuel spill.

This assessment incorporates by reference pertinent information from several prior analyses of Essential Fish Habitat and potential adverse effects. These documents are:

- Environmental Assessment, Liberty Development and Production Plan Ultra Extended Reach Drilling from Endicott – Satellite Drilling Island, and Finding of No Significant Impact (2007),
- Supplementary Essential Fish Habitat Analysis, Beaufort and Chukchi Sea Planning Areas - Arctic Cod, Saffron Cod and Opilio Crab, May (2010)
- Environmental Assessment, Shell Offshore, Inc., 2012 Revised Outer Continental Shelf Lease Exploration Plan, Camden Bay, Beaufort Sea, Alaska (2011)
- Impacts to Essential Fish Habitat from Non-Fishing Activities in Alaska, prepared by the National Marine Fisheries Service, Alaska Region (2011)

Arctic cod

Arctic cod is widely distributed in the pelagic, demersal, and nearshore U.S. Arctic environments, depending on the time of year and the stage of life history. The absolute numbers of Arctic cod and their biomass are among the highest of any finfish in the region (Frost and Lowry, 1983). Arctic cod are associated with sea ice, using it at various life stages and seasons for shelter and as a forage habitat to feed on organisms on the underside of the ice. Amphipods are an important food source for Arctic cod on the underside of ice (Lonne and Gulliksen, 1989; Gradinger and Bluhm, 2004). Because the Arctic cod is ice-obligate it is highly likely they will be present in the action area during the time of the project. Noise produced by Rolligons and coring activities could lead to localized and temporary disruption of Arctic cod habitat. Similarly, the drilling of boreholes would redistribute sediments resulting in localized and temporary loss of seafloor habitat. A fuel spill is not expected. If a small spill were to occur, diesel spilled on ice would evaporate prior to ice melt.

Pacific salmon

Pink and chum salmon are the most common of the five species of Pacific salmon documented in the Beaufort Sea (ADFG, 2012). Substantial populations of salmon may have a difficult time establishing and persisting in the Arctic, most likely because of the limitation of freshwater spawning habitats which freeze in winter and are therefore not suitable for overwintering eggs and young (Craig, 1989; Fechhelm and Griffiths, 2001). Because of the location and timing of the project (April through May, during ice covered conditions) it is unlikely that any salmon would be present in the action area.

DETERMINATION

There could be adverse effects to designated EFH for Arctic cod. These effects would occur in the form of temporary noise within or near the action area, and increased turbidity in the immediate vicinity of drilling operations. No adverse effects to designated EFH for salmon are expected.

PROPOSED MITIGATION

BOEM has identified two potential mitigation measures to reduce the impacts of the above activities on designated EFH. Both are adopted from Conservation Recommendations provided in Chapter 5 of "Impacts to EFH from Non-Fishing Activities in Alaska" (NMFS, 2011):

- *Avoid discharge of muds and cuttings into the marine and estuarine environment.* Use methods to re-inject such wastes down the borehole or use onshore disposal wherever possible. When not possible, provide for a monitoring plan to ensure that the discharge meets EPA effluent limitations and related requirements.
- *Remove or treat all fluids or wastes released from operation.* Remove or treat any fluids released from drill outfits, as well as any trash and debris from human activities associated with operations. Apply standards of catchments under machinery in place as defined by North Slope safety manuals and any up-to-date methodologies for reducing discharges.

BOEM did not identify feasible additional mitigation measures with respect to potential noise impacts.

REFERENCES

ADFG (Alaska Department of Fish and Game). 2012. Anadromous Waters Catalog. Juneau, AK: ADFG. http://www.adfg.alaska.gov/sf/SARR/AWC/.

Craig, P. and L. Haldorson. 1986. Pacific salmon in the North American Arctic. *Arctic* 39(1), 2-7.

Fechhelm, R.G., and W.B. Griffiths. 2001. Status of Pacific Salmon in the Beaufort Sea, 2001. Anchorage, AK: LGL Alaska Research Assocs. 13 pp.

NMFS. 2011. Impacts to Essential Fish Habitat from Non-Fishing Activities in Alaska. National Marine Fisheries Service, Alaska Region.

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bp

BP Exploration (Alaska) Inc.
P. O. Box 196612
900 E. Benson Boulevard
Anchorage, AK 99519-6612
USA

February 21, 2013

Dr. Bill Ingersoll
Chief, Plans Section
Bureau of Ocean Energy Management
Alaska OCS Region
3801 Centerpoint Drive , Suite #500
Anchorage, Alaska 99503-5823

Request for Approval for Ancillary Activities
2013 Winter Geotechnical and Seabottom Investigation
Liberty Development
Beaufort Sea, Alaska

Dear Dr. Ingersoll:

BP Exploration (Alaska) Inc. (BPXA) requests approval to conduct a 2013 Winter Geotechnical and Seabottom Investigation in support of the Liberty Development. The purpose of the investigations are to provide soils information for possible future pad locations, for evaluating proposed pipeline routing, and to provide a visual inspection of the seabottom environment.

In support of this request, attached is the Project Description/Plan of Operations and Figures 1 and 2.

If you have any questions or need additional information regarding this project, please contact me at (907) 564-4941 or via email at *mike.brock@uk.bp.com* or Erika Denman at (907) 564-4646 or via email at *erika.denman@bp.com*.

Sincerely,

Mike Brock, Environmental Team Lead
HSE-Alaska

2013 Winter Geotechnical & Seabottom Investigation
Project Description / Plan of Operations

Introduction

BP Exploration (Alaska) Inc. (BPXA) proposes to conduct a geotechnical investigation and a visual inspection of the seabottom in support of the Liberty development. See Figure 1.

Purpose

The purpose of the investigations is as follows:

- Provide soils information for the possible future pad locations
- Provide soils information for evaluating proposed pipeline routing
- Provide a visual inspection of the seabottom environment

Scope of Work

Geotechnical Investigation:

The field team will drill approximately 40 geotechnical boreholes from the sea ice to depths of approximately 100 feet below the seabottom in the vicinity of the Liberty Development to explore the subsurface conditions. Approximately five geotechnical boreholes are planned to be drilled in federal waters.

A drill specifically configured for shallow soils exploration will be used for this project. The drill will be mounted in an enclosed trailer so that the drill and work area are protected from the weather by an enclosure. A generator and all support tools will be carried on the trailer or accompanying Rolligon. Additionally, a second Rolligon will provide support and include two 500 gallon double walled fuel tanks for fuel re-supply. The drill enclosure also has a 250 gallon double walled day tank.

Drilling muds or additives will not be used for the geotechnical program. The program proposes to use seawater to circulate the in-situ soil (cuttings) to mudline during drilling and casing operations.

During casing operations, drill cuttings would be placed on the ice surface where cutting would either freeze on the ice surface or return down hole. Typically, when drilling through floating ice, soil cuttings are not brought to the surface. However, in near-shore areas where the sea ice is bottom fast or near bottom fast, some cuttings may come to the surface of the ice. This material (generally less than a cubic yard) will be left on the ice surface to be naturally redistributed as the ice melts in the spring. Upon borehole completion, the site is inspected to verify all debris is collected and properly disposed.

Closed PVC pipe will be placed in boreholes and left in place when the borings is backfilled with natural soil cuttings. Temperature acquisition cables (TAC) placed in the PVC pipe will be used to measure the ground temperature profile. PVC pipe and TACs will be removed above the seabottom where practicable (e.g., sea ice movement doesn't prevent removal).

A roller-driven Rolligon will pull the enclosed drill trailer within the project area. A second Rolligon will support the drilling operation by assisting drill moves, providing fuel, and act as a

personnel carrier, when needed. A tucker will also be used for personnel support and environmental observations. The Rolligons will access the borehole locations by crossing frozen sea ice from the Endicott access road. Snow clearing activities (e.g., drag) may be conducted to maintain the route. The field team may also utilize a conventional pumper unit (used for ice road construction and equipped with a large auger) to make holes for water to thicken the ice and construct ice pads as necessary. A 200 foot by 25 foot ice pad is proposed to be constructed off the existing Endicott bypass ice road as shown in Figure 2.

Seabottom Investigation:

A visual inspection of the seabottom is proposed using a remotely operated vehicle (ROV). The ROV will be tethered to the controlling unit at the surface capable of capturing video images of the seafloor.

The field team will utilize a conventional pumper unit and a Tucker vehicle to accomplish the work. The access routes and work areas will be the same as the geotechnical boring program.

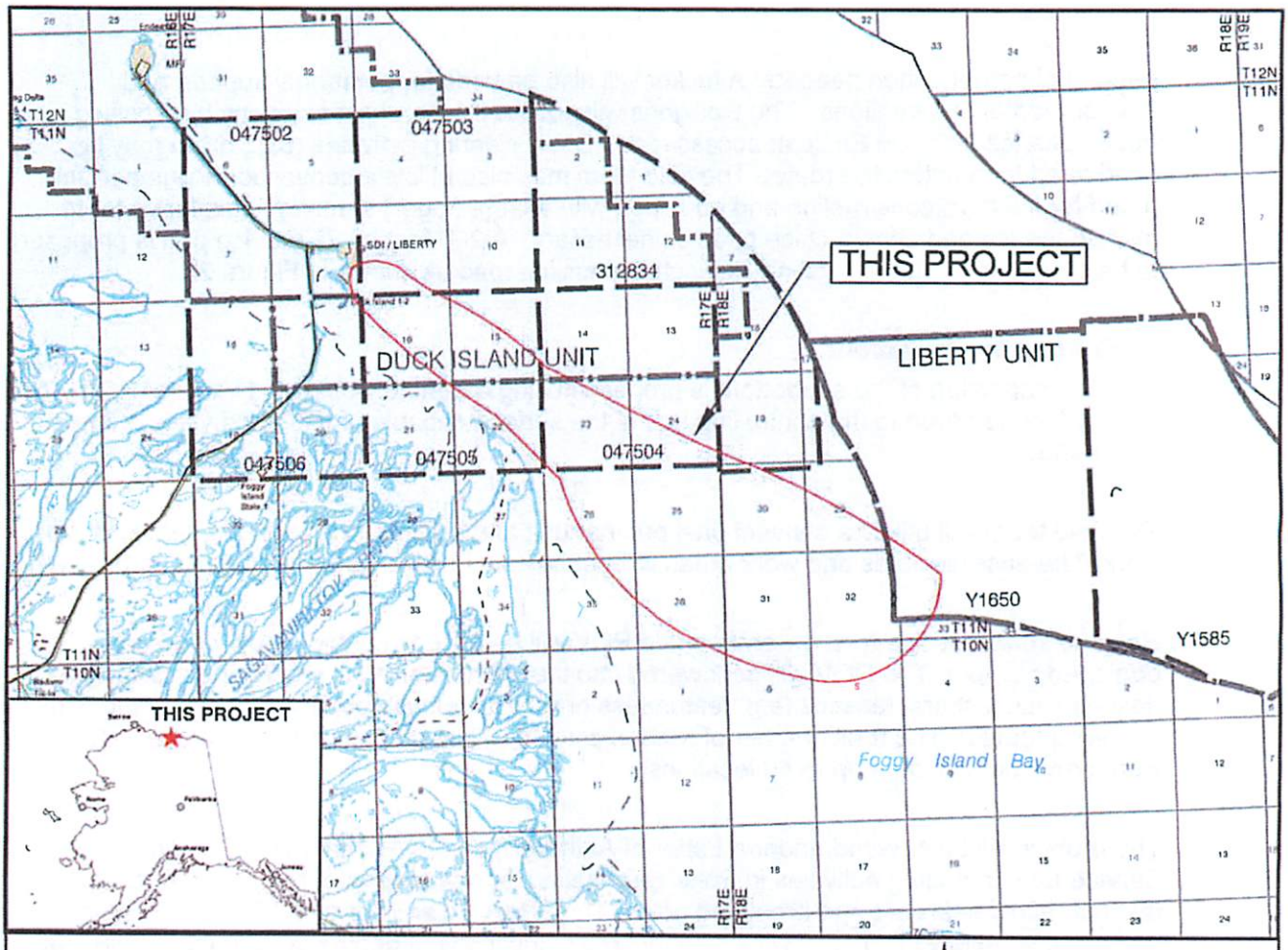
Holes of sufficient size to allow entry of the ROV will be drilled into the ice by the auger-equipped pumper. The ROV will be lowered into the ice hole and will search the seafloor to define its local characteristics (e.g. featureless or rock cover with observed concentrations of biota/kelp cover). The total number of sites examined will be a function of the productivity of the work crew, but could be up to 40 locations.

The project will be covered under a Letter of Authorization (LOA) from the U.S. Fish and Wildlife Service for conducting activities in Polar Bear habitat and appropriate mitigation efforts will be taken to avoid seal liars and breathing holes. The BPXA Polar Bear and Wildlife Interaction Plans will be followed. Travel will be conducted to locations at depths greater than the 6 foot bathymetry. Where possible, a single off road travel route will be maintained for on ice travel to avoid impacts to possible seal lairs. Protected Species Observers (PSO's) will assist in establishing the travel route.

As provided in Dr. Richard Reanier's report Entitled "Cultural Resources in the Liberty Seismic Program Area, North Slope, Alaska" submitted to the State Historic Preservation Office March 17, 2008 for the Liberty Shallow Water Seismic Survey, there are no reported submerged sites (to include prehistoric and shipwrecks) within the Liberty Seismic Program Area. The area for the 2013 Winter Geotechnical & Seabottom Investigation is within a portion of the Liberty Seismic Program Area.

3.0 Schedule

The activities will begin April 1 and will conclude prior to breakup (May 2013).



This map is based on U.S.G.S quad Beechey Point (B-1, B-2) and on the Unit Operator's Facility Maps.

NORTH

PROJECT LOCATION:

DUCK ISLAND UNIT - SATELLITE DRILLING ISLAND

NAD83
LAT. = 70° 19' 18.786" / DD 70.321885
LONG. = -147° 51' 56.266" / DD -147.865629

ALASKA STATE PLANE ZONE 4, NAD83
X = 1,903,616.63 FEET
Y = 5,971,775.36 FEET

SEC. 1 T10N, R17E UMIAT M.
SEC. 4-6 T10N, R18E UMIAT M.
SEC. 8, 9, 14-17, 21-26, 35, 36 T10N, R18E UMIAT M.
SEC. 19, 29, 30-33 T11N, R18E UMIAT M.

ADL # 047502, 047503, 047504, 047505, 047506, 312834
OCS # Y1650, Y1585

DATUM: MEAN SEA LEVEL

PURPOSE: GEOTECHNICAL INVESTIGATION

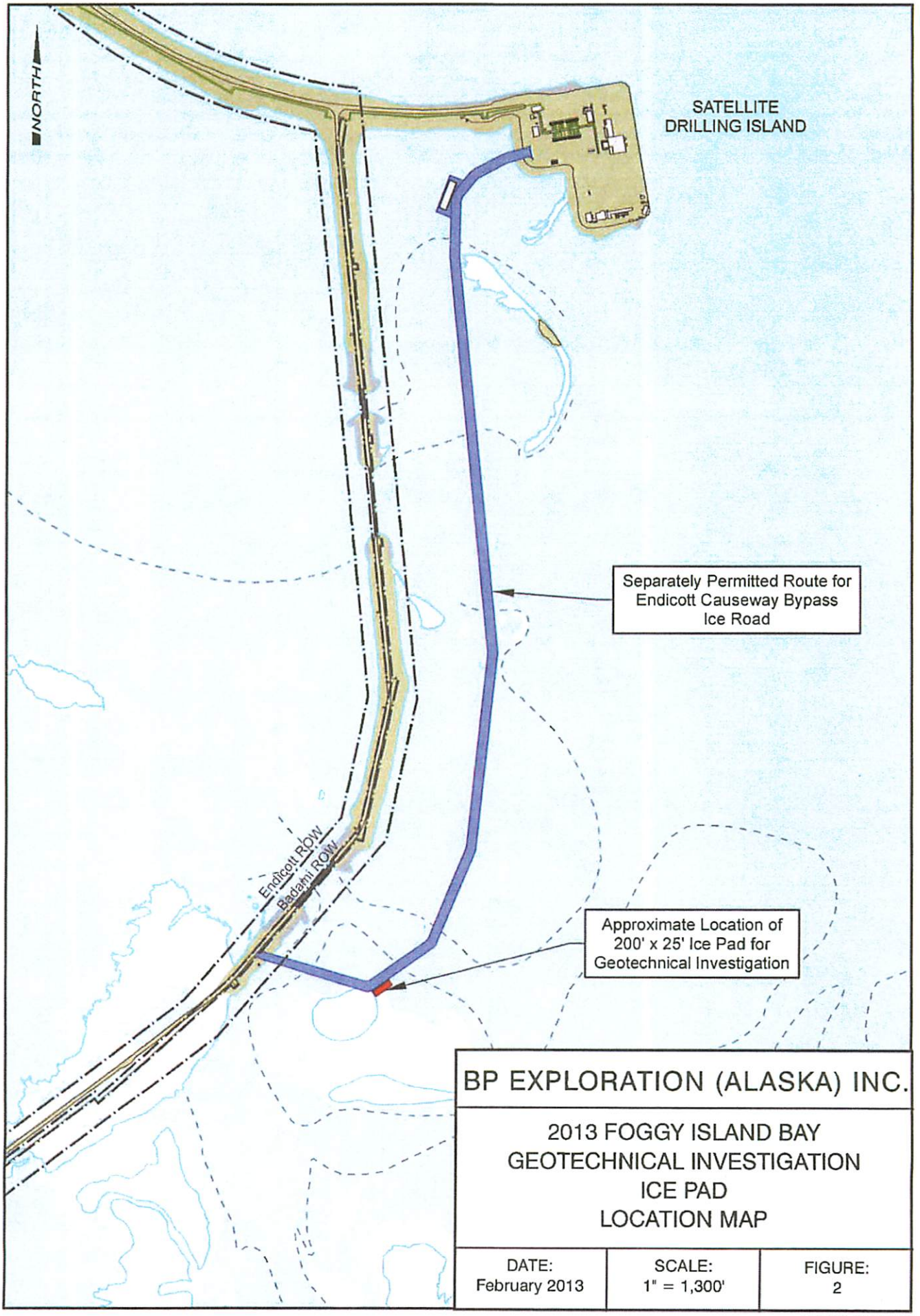
ADJACENT PROPERTY OWNER:
STATE OF ALASKA

BP EXPLORATION (ALASKA) INC.

2013 FOGGY ISLAND BAY GEOTECHNICAL INVESTIGATION VICINITY MAP

DATE:	SCALE:	FIGURE:
February 2013	1" = 2 Miles	1

lp16299-V.mxd



BP EXPLORATION (ALASKA) INC.

2013 FOGGY ISLAND BAY GEOTECHNICAL INVESTIGATION ICE PAD LOCATION MAP

DATE:	SCALE:	FIGURE:
February 2013	1" = 1,300'	2

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