Great Bear Petroleum

PLAN OF OPERATIONS

NORTH SLOPE ALASKA

2014-2015 WINTER EXPLORATION PROGRAM

Great Bear Petroleum Operating LLC
601 West 5th Avenue, Suite 505
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October 3, 2014

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ABBREVIATIONS

AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
ADF&G	Alaska Department of Fish and Game
AOGCC	Alaska Oil & Gas Conservation Commission
AS	Alaska Statute
AES	ASRC Energy Services Alaska, Inc.
Bbl	Barrels
DNR	Alaska Department of Natural Resources
EPA	U.S. Environmental Protection Agency
G&I	Grind and Inject
Great Bear	Great Bear Petroleum Operating LLC
LiDAR	Light Detection and Ranging
LNO	Letter of Non-Objection
LOA	Letter of Authorization
MTRS	Meridian Township Range Section
NSB	North Slope Borough
NSTC	North Slope Training Cooperative
ODPCP	Oil Discharge Prevention and Contingency Plan
PBU	Prudhoe Bay Unit
ROW	Right of Way
Sag	Sagavanirktok River
Solsten	SolstenXP Inc.
SPCC	Spill Prevention, Control, and Countermeasures
TAPS	Trans Alaska Pipeline System
TLUI	Traditional Land Use Inventory
TWUP	Temporary Water Use Permit
USFWS	U.S. Fish & Wildlife Service

1.0 PROJECT DESCRIPTION

1.1 Winter Exploration Program Summary

This plan of operations describes exploration activities to drill for conventional oil resources, while continuing to test and accumulate data on the unconventional plays, on three locations planned for the 2014-2015 winter season (**Winter Exploration Program**) on leases operated by Great Bear Petroleum Operating LLC (Great Bear). Great Bear also has a Plan of Operations dated September 29, 2011, as amended by Amendments 1, 2 and 3, which is separate and apart from this plan of operations.

Drilling operations are proposed for three prospect areas, named Alkaid, Phecda, and Talitha, at locations set forth below in Table 1 and shown on the maps as Attachments 1 and 2. All three proposed wells are located within leases issued by the State of Alaska and will be accessed by ice roads and/or ice driveways from the Dalton Highway. Equipment and materials for drilling will be located on the same pad as the drill rig.

Table 1 Drill Site Locations

Drill Site	Lease Number	Location (MTRS)	AREA
Alkaid #1	ADL 391704	U07N013E23	Dalton Highway Transportation Corridor
Phecda #1	ADL 391704	U07N013E36	Dalton Highway Transportation Corridor
Talitha #1	ADL 391660	U05N013E10	Dalton Highway Transportation Corridor

This Winter Exploration Program is expected to include the following major activities, with all activities to take place between December 2014 and May 2015:

- Build ice driveways and roads from the Dalton Highway to the locations of Alkaid #1 (approximately 3 miles) and Talitha #1 (approximately 3 – 4 miles) and an ice driveway off the Dalton Highway to Phecda #1.
- Build ice pads at all 3 locations.
- Transport equipment, materials and personnel from North Slope oilfield infrastructure to and between the well site locations along the Dalton Highway and ice roads.
- Possibly perform short-term production flow tests and, depending on well results, stimulating production using hydraulic fracturing and pumping.
- Truck limited liquids production, if any, to Prudhoe Bay and flare or vent associated gas, using a vertical flare approximately 100 feet off the ground.
- Demobilize rig and equipment at end of winter drilling season.

These activities may overlap in certain instances, such as drilling at one well while the ice road or pad is being built for another location. Great Bear expects that Alkaid #1 will be the first well drilled followed by Talitha #1 and then Phecda #1; however, the order in which the wells are drilled may depend upon various circumstances such as weather, drilling time of prior well, well results, additional analysis, etc. Great Bear intends to place the camp facilities at the Phecda pad

location for the duration of the 2014-2015 Winter Exploration Program; however, if Great Bear deems advisable, the camp may be relocated to Alkaid #1 or Talitha #1 during drilling of those wells.

1.2 Pre-Operations Activities

In preparation for the Winter Exploration Program, the following activities were conducted:

- Cultural resource studies conducted over the relevant leases by AES archeologists and Reanier & Associates, Inc. during 2012 and 2013.
- AES wetlands biologists conducted studies to identify wetlands and uplands on relevant leases in summers of 2011 and 2013.
- AES scientists conducted lake studies in summers of 2011 and 2013.
- LiDAR conducted by The University of Texas at Austin, Bureau of Economic Geology during summers of 2012 and 2014 over the relevant leases.
- 3D seismic acquired over the relevant leases on behalf of Great Bear by CGGVeritas (Land) Inc. during 2012, 2013 and 2014.

2.0 PERMIT REQUIREMENTS

A list of permits and plans associated with the Winter Exploration Program is listed in Table 2 below. All required Federal, State of Alaska and North Slope Borough (**NSB**) permit applications for proposed 2014-2015 work have been submitted, or will be prepared and submitted as planning and preparation for the Winter Exploration Program evolves, to such agencies.

Table 2. Winter Exploration Program Permits, Plans and Approvals

AGENCY	PERMIT/PLAN	AUTHORIZATION TYPE
Federal Government		
Environmental Protection Agency (**EPA**)	Spill Prevention, Control and Countermeasure (SPCC)	Rig contractor's spill prevention control and countermeasures. Must be kept on-site.
US Fish & Wildlife Service (**USFWS**)	Letter of Authorization (**LOA**)	Incidental Takes of Polar Bears.
State Government		
Alaska Oil & Gas Conservation Commission (**AOGCC**)	Permit to Drill	Authorization to perform drilling operations.
Alaska Department of Fish and Game (**ADF&G**)	Title 16 Fish Habitat Permit	Allows water withdrawal from fish bearing lakes.
	Public Safety Permit	Allows hazing brown bears and hazing or taking of arctic foxes.
Alaska Dept. of Environmental Conservation (**ADEC**)	Oil Discharge Prevention & Contingency Plan (C-Plan) Amendment	Defines spill prevention/response scenarios and organization. Amending Great Bear's existing C-Plan.

AGENCY	PERMIT/PLAN	AUTHORIZATION TYPE
ADEC (cont.)	Minor General Permit MG1	Provides air quality coverage under general permit for rigs.
	Temporary Storage of Drilling Waste Plan	Allows on-site temporary storage of drilling waste (cuttings & fluids).
	Temporary Storage of Non-Drilling Waste Plan	Allows on-site temporary storage of non-drilling waste prior to hauling to North Slope facilities for proper treatment & disposal.
	Certificate of Financial Responsibility	Required for activities and facilities that could result in oil discharges, including drilling oil wells.
Alaska Department of Natural Resources (**DNR**) – Division of Oil and Gas (**DOG)**	Plan of Operations	Approves plan for land use activities on state O&G leases.
	Statewide Oil & Gas Bond	Bond must be posted before exploring or developing a state oil and gas lease.
DNR – Division of Mining, Land, and Water **(ML&W)**	Temporary Water Use Permits	Authorization to use water from permitted sources.
	Land Use Permit	Authorizes construction of ice roads across state land.
DNR – Office of History & Archaeology (**OHA**)	Field Archaeology Permit	Authorized cultural resource field studies.
	Cultural Resource Concurrence	Concurrence of no adverse effects to historic properties
Alaska Department of Transportation and Public Facilities (**DOTPF**)	Driveway Permit	Authorization to construct an ice driveway off the Dalton Highway
Local Government		
North Slope Borough (**NSB**)	Form 500 – Certificate of IHLC/TLUI Clearance	Authorizes earth-moving activities, including placement of new structures that cover previously undisturbed sites.
	Development Permit	Permit required for activities within the borough.
Other Authorizations and Agreements		
Alaska Clean Seas (**ACS**)	Customer Services Agreement	To provide oil spill response personnel to Great Bear as may be required by Great Bear's Oil Discharge Prevention and Contingency Plan or as may otherwise be specifically requested.

AGENCY	PERMIT/PLAN	AUTHORIZATION TYPE
Alyeska Pipeline Service Company (**APSC**)	Letter of Non-Objection (**LNO**)	Access around & across TAPS ROW and fuel line.
BP Exploration (Alaska), Inc. ("BPXA"), as operator of the Prudhoe Bay Unit (**PBU**)	PBU Road Use Agreement	Non-exclusive access to and use of the road system at PBU.
	PBU Grind and Inject Facility User Contract	To dispose of waste through the grind and inject facility at PBU.
	PBU Equipment and Services Contract	Use of excess capacity that may be available on an ad hoc basis for various PBU equipment and services.

3.0 LOCATIONS AND SITE ACCESS

3.1 Project Locations

The general location of the proposed Winter Exploration Program is the 15 mile strip of Great Bear's leases west of the north-south Transportation Corridor of the Dalton Highway. This area is between Deadhorse and the Franklin Bluffs pad on Alaska's North Slope. The exact drill site coordinates are shown in Table 3 below.

Table 3. NAD 83 Coordinates For Proposed Drill Sites

Well Name	Latitude (DD)	Longitude (DD)	Latitude (DMS)	Longitude (DMS)
Alkaid #1	69.95061436	-148.83545505	69 deg 57 min 2.211690 sec	-148 deg 50 min 7.638180 sec
Phecda #1	69.91550798	-148.79126908	69 deg 54 min 55.82871 sec	-148 deg 47 min 28.56871 sec
Talitha #1	69.79617964	-148.87540451	69 deg 47 min 46.24672 sec	-148 deg 52 min 31.45624 sec

3.2 Site Access, Staging, and Mobilization

Site access will be via ice roads or an ice driveway off the Dalton Highway. Great Bear ice roads and drill sites will be closed to the general public to ensure their safety. Great Bear will have security/restricted access signage at the junctions of each ice road or ice driveway and the Dalton Highway and will comply with Project Journey Management/Safe Vehicle Operations. Further, signage will be posted at the well sites to alert visitors that they have entered a secured restricted work site. All authorized visitors and workers will be given a Health, Safety, and Environmental (HSE) orientation upon arrival. Great Bear will provide emergency assistance to persons, including subsistence hunters, as necessary to ensure human safety, such as protection from severe weather.

3.2.1 Ice Roads

Approximately 3 miles of ice road off the Dalton Highway will be required to access the Alkaid #1 site. Another 3 - 4 miles of ice road off the Dalton Highway will be required to access the Talitha #1 site. Each road will be approximately 35 feet wide and will have a minimum of 0.5 feet of ice cover over the tundra. The Phecda #1 site is located adjacent to the Dalton Highway and will not require an ice road but a short ice ramp driveway to access the ice pad.

Ice road routes have been identified based on topography determined by Great Bear's LiDAR surveys and summer field studies over the area. The routes have been designed to minimize the impacts to vegetation and hydrology. For example, the ice road to the Alkaid site runs between two lakes, a larger non-fishbearing lake, and a smaller fishbearing lake. The presence of fish in each lake was determined from field studies completed by Great Bear. As a result of this knowledge, the route for the ice road will be placed more than 500 feet from the fishbearing lake. In addition, standard methods will be used to minimize impacts to vegetation, such as filling in small streambeds with extra snow for additional insulation. The routes will be surveyed to ensure that the approved route is followed during construction activities. Some minor re-routes may be required depending on site specific conditions at the time of construction. Great Bear plans to have thermistor strings placed along ice road routes and at proposed ice pad locations and will be used to monitor ground temperatures.

Ice roads will be built using a combination of existing snow along the route, water, and ice chips from approved water sources. Ice road and pad construction will take place from December 2014 through possibly March 2015, including possible pre-packing of ice road routes and ice pad locations with snow prior to tundra opening. Upon tundra opening (expected to be between December and January depending upon weather and snow conditions), ice chips and water from freshwater lakes will be used to complete construction of ice roads. Ice construction activities, including pre-packing, will be performed in accordance with DNR approvals. Additional water and ice from permitted sources will be used to maintain ice roads in good condition throughout the 2014-2015 winter drilling season.

3.2.2 Ice Pads

Ice pads will be used at each drill site. Ice pads will be up to 600 feet by 600 feet to accommodate the drilling rig, camp, and associated equipment and materials. Smaller ice pads will likely be used at Alkaid and Talitha if the camp facility is placed at the Phecda site for the duration of the winter exploration program.

3.2.3 Support Facilities

Support facilities will include a satellite office camp, storage areas (e.g., fuel storage, drilling waste or fluid components storage), a 58-bed camp and maintenance buildings. The 58-bed camp will consist of offices, bathroom facilities, dining area, kitchen and food storage, recreation areas, and laundry facilities. The camp will be equipped with a wastewater treatment plant and powered by a generator set with one stand-by generator set. Great Bear will likely place the camp facility at the Phecda ice pad location for the duration of the 2014-2015 Winter

Exploration Program to minimize the amount of camp de-mobilization and mobilization during the Program, and to facilitate timely movement of the rig to and from each drill site.

Twenty-four hour phone service and internet will be available at the field camp. Operational radio communications will be provided using fixed base stations and truck-mounted, mobile "bread-board" radios. Operational frequencies will be coordinated between the various Great Bear field supervisors, ice road and support contractors, and well service providers. Small communications towers will be placed at each pad. All communication towers are temporary and will be removed at demobilization.

In the event of a serious emergency, resources would be mobilized from Deadhorse. Medical evacuation, if necessary, would be provided to the clinic in Deadhorse for patient stabilization and/or transfer to Fairbanks or Anchorage hospital facilities.

3.3 Project Timeline

The schedule for Great Bear's Winter Exploration Program is presented below in Table 4.

Table 4. Schedule of Activities

DATE	ACTIVITY	DESCRIPTION
Summers 2013 and 2014	Field Studies	To support the Winter Exploration Program, summer field study programs were conducted during two summer field seasons to gather information. The programs obtained environmental data to support engineering and define ice road routes and ice pad locations. Specific activities included ground surveys to delineate wetlands and waters of the United States, lake surveys to determine locations and availability of water for ice road and pad construction, and archaeological and cultural resource investigations. LiDAR surveys were also acquired to cover a larger area, produce more accurate water-volume estimates, and guide ground-based labor-intensive wetland surveys.
October 2014	Installation of Thermistors	Thermistor strings will be placed along ice road routes and proposed ice pads locations and will be used to monitor ground temperatures to help identify when the proposed routes and pad locations meet DNR requirements for tundra opening and closing.
December 2014 – January 2015	Pre-packing of ice roads and pads	The ice road routes will be pre-packed prior to tundra opening using tundra-approved vehicles.

DATE	ACTIVITY	DESCRIPTION
December 2014 – March 2015	Construction of ice roads, ice ramp and pads	Upon tundra opening, the following activities will take place: • Approximately 6 - 7 miles of ice roads will be constructed to allow transportation of drilling rigs and equipment to support drilling operations. • An ice ramp will be constructed at the Phecda site to provide access to the pad from the Dalton Highway. • Ice pads will be constructed to support drilling operations: one each of the three drill sites.
January – April 2015	Exploration Drilling	Exploration drilling operations will be conducted at three drill sites: Alkaid #1, Phecda #1, and Talitha #1
April – May 2015	Demobilization	Demobilize equipment and materials from the drill sites and camp pads. Perform cleanup operations at all locations (ice pads and ice roads) in accordance with permit requirements.
July – September 2015	Summer Activities	Conduct summer activities including cleanup operations to remove any remaining debris not identified and removed during demobilizations activities, summer studies, and agency visits.

4.0 WATER REQUIREMENTS

Water requirements for the Winter Exploration Program are expected to be approximately 9.0 million gallons for ice road and ice pad construction, plus 1.2 million gallons for drilling, and 0.4 million gallons for camp operations.

Table 5 Estimated Water Needs for Ice Roads and Ice Pads

Location	Approx. Water Required (M Gal)
Ice Road to Alkaid #1	1.9
Alkaid #1 Ice Pad	2.5
Ice Road to Talitha #1	1.9
Talitha #1 Ice Pad	2.5
Ice Driveway to Phecda #1	0.2
TOTAL	9.0

Potable water will be obtained from service providers in Deadhorse. The remaining water will be obtained from existing sources within the oilfield infrastructure at Deadhorse and the Prudhoe Bay Unit or from permitted waterbodies near the drill sites. Great Bear has current Temporary Water Use Permits for the intended water sources, and may acquire permits for additional sources, if necessary.

5.0 DRILLING OPERATIONS

5.1 Drilling and Testing Operations

Drilling operations will be conducted at the three separate locations using the same drilling rig, the Nabors 106AC rig. If available and deemed more appropriate, a different rig may be used to drill one or more laterals at any of the sites. In the event this occurs, Great Bear will advise DNR-DOG of the specific rig prior to mobilization of the rig.

The planned well designs will be similar to that employed in previous Great Bear North Slope exploration wells and in accordance with Permits to Drill from the AOGCC. Due to the exploratory nature of the wells, nearly all information regarding the downhole aspects of the well is confidential.

Depending on results from initial drilling, and time remaining in the drilling season, Great Bear may drill lateral wells, sidetracks, or additional penetrations from the same exploration pad. In addition, Great Bear may stimulate production using hydraulic fracturing techniques.

Production tests may be performed as deemed appropriate. Testing may include extended flow periods to determine the productivity of the well. Testing will be accomplished in accordance with approved techniques and approved by the AOGCC. Testing will likely be conducted after the rig has been moved to a different drill site.

A designated Great Bear representative will be located onsite during operations.

5.2 Personnel

Great Bear plans to utilize a modular camp to house approximately 58 personnel. About 24 will work a shift of 12 hours per day and the rest will work and sleep as needed. The expediter will be Deadhorse-based. The camp may be moved to each pad along with the rig, or it may be located at the Phecda pad for the duration of the exploration season. If the camp remains located at the Phecda pad, crew transportation activities will follow established safety protocols associated with winter operations.

5.3 Fuel Storage

Fuel will be stored on the drilling pads and possibly at emergency shelters (if used). Fuel storage tanks will include secondary containment that will hold a minimum of 110 percent (110%) of the single largest tank or any group of tanks permanently manifold together. Fuel flow diagrams, fuel transfer procedures, valving details and safety precautions for the drilling rig are listed in the drilling contractor's Spill Prevention, Control, and Countermeasures (SPCC) Plan. Fuel storage, handling, transfers, and spill reporting will be conducted in accordance with the regulatory requirements as described in the great Bear Exploration Project C-Plan), North Slope Environmental Field Handbook, and Alaska Safety Handbook. All bulk fuel and fluid transfers in excess of 500 gallons will be monitored by an Alaska Clean Seas (ACS) Spill Technician.

The size of the day tank on the rig may vary, but it will be less than a 10,000-gallon capacity. The maximum amount of fuel stored at a drill site will be 9,000 gallons. All fuel and hazardous materials stored at the drill site will be kept more than 100 feet from a waterbody. Drip pans will be placed under vehicles and equipment capable of leaking hazardous fluid. No

vehicle refueling will take place in an active river floodplain. All independent fuel and hazardous substance containers will be marked with the contents and the lessee's or contractor's name using paint or a permanent label.

5.4 Waste Management and Disposal

5.4.1 Disposal of Drilling Wastes

Drill cuttings will be promptly trucked to an approved G&I facility when generated. Waste drilling fluids and produced reservoir fluids will be processed on-site for reuse where possible, or trucked to an approved facility in Prudhoe Bay for injection. Used oil will be recycled or packaged in drums and hauled to Prudhoe Bay for shipment to an approved recycle facility. A metal temporary drill cuttings storage container will be located on the pad to facilitate backhaul operations and continuity of off-site annular injection.

Drilling wastes include drilling mud and cuttings. Wastewater will be stored in tanks until taken to the Prudhoe Bay Unit (PBU) Grind & Inject (G&I) facility for disposal. The wastewater will be hauled off to G&I as frequently as possible so as not to create build-up at site location. The PBU G&I is a Class II facility. The majority of wastewater will be sent there for disposal. A small amount of wastewater will be Class I and will be sent to a facility at Prudhoe Bay Pad 3. Cuttings will be immediately hauled to G&I for disposal when generated.

After the removal of drilling waste from the storage area, a visual site inspection will be performed to verify that all drilling waste has been removed. A final site inspection report including drilling waste volume and final disposition of waste will submitted to ADEC within seven days of the site inspection as required under 18 AAC 60.430.

All drilling waste will be disposed of prior to completion of winter operations.

5.4.2 Non-Drilling Wastes

All waste disposal procedures will conform to local, state and Federal requirements. The general approach to waste management will be to temporarily store wastes and periodically haul waste materials to existing North Slope facilities for proper treatment and disposal.

Solid, non-burnable waste will be deposited in dumpsters located at each site. These containers will be hauled to the NSB landfill at Prudhoe Bay. The food waste that could attract wildlife will be stored in enclosed containers pending periodic hauling or such wastes will be hauled each day to an approved disposal center (such as PBU).

To reduce the amount of trash that must be hauled from the drilling location, all solid, burnable waste may be incinerated at the location in accordance with 18 AAC 50. The ash will be hauled to the NSB landfill.

Camp wastewater will be hauled to an approved disposal facility on the North Slope. The rig camp should generate less than 7,000 gallons (159 bbls) per day of domestic wastewater.

Used oil will be recycled or packaged in drums and hauled to Kuparuk River Unit or Prudhoe Bay Unit for shipment to an approved recycle facility.

5.5 Air Emissions

Sources of air emissions from the operation are rig engines, camp generator engines, steam generators, waste oil burners, hot-air heaters, light plants and well test flaring equipment. Great Bear will obtain the ADEC General Permit MGP1 for Oil & Gas Drilling Rigs and will comply with the stipulated parameters established under this authorization. Under the conditions of the permit, Great Bear will request to have the State of Alaska approve posting a sign to the general public indicating that access to the area is restricted.

6.0 CLEANUP, RESTORATION, AND MONITORING

6.1 Well Disposition and Site Closure

Upon completion of drilling and evaluation operations, wells will either be plugged and abandoned or suspended in accordance with AOGCC regulations. As part of site closure activities, any remaining debris will be hauled to an approved disposal site. Any spills discovered as part of site closure activities, or ice pads and roads with contaminated ice or snow, will be chipped or scraped to remove the contaminated material. This material will be transported to an appropriate facility for disposal.

6.2 Site Restoration, Rehabilitation, and Monitoring

Cleanup operations will be conducted the summer after the winter drilling program to remove any remaining debris not identified and removed during demobilization activities and to identify any issues not identified during the winter drilling program. Agency personnel will be invited on site visits to verify that cleanup operations are complete and that any issues identified are addressed.

In the event that tundra damage is discovered at any point during the winter drilling program or during summer cleanup operations, Great Bear will notify DNR and NSB in accordance with permit requirements (DNR will be notified within 72 hours of discovery; NSB will be notified within 24 hours of discovery). Reports of tundra damage will include the date, time, and location of damage, the size of the impacted area, and cause of damage (if known). Great Bear will coordinate with DNR to identify the level of tundra damage and develop a plan for restoration, rehabilitation, and monitoring. The plan will address the area, type, and extent of damage and will be developed in accordance with the Alaska Coastal Revegetation & Erosion Control Guide developed by the State of Alaska Plant Materials Center, the Streambank Revegetation and Protection Guide developed by the Alaska Department of Fish and Game, and other relevant guidance documents.

7.0 HEALTH, SAFETY, ENVIRONMENTAL

7.1 Bear Avoidance and Interaction Plan

Great Bear has prepared a "Bear Avoidance, Interaction, Mitigation, and Monitoring Plan", attached as Attachment 7. Great Bear will also have a renewed LOA for the incidental take of polar bears and a Public Safety Permit from ADF&G for the hazing of brown bear. Trained individual(s) will be on each of the well site during operations. Although an encounter with bears is not common especially during winter, Great Bear and its contractors will exercise caution while establishing transportation routes and drill pads and watch for signs of any bear. If a sign is observed or a den identified, the ADF&G (for brown bears) and/or USF&WS (for polar bears) will be notified and the transportation route altered as appropriate to avoid any disturbance; drilling operations will be maintained at least a half-mile away from brown bear dens unless otherwise approved by ADF&G.

7.2 Spill Prevention Control and Countermeasure Plan and Training

The drilling contractor holds a SPCC plan for their fuel storage facilities associated with drilling operations. Additional SPCC requirements will be handled in the C-Plan as appropriate. Great Bear will require all North Slope employees and contractors to complete an 8-hour unescorted training program provided by the North Slope Training Cooperative (NSTC). All trainees receive a North Slope Environmental Field Handbook and the Alaska Safety Handbook. This course provides the North Slope standard introduction to personal protective equipment, camps and safety orientation, hazard communication, basic awareness Hazwoper Level 1 training, and Environmental Excellence.

7.3 Oil Spill Contingency Plan

Great Bear has an approved Oil Discharge Prevention and Contingency Plan (C-Plan). The approved C-Plan will be amended to address Great Bear's 2014-2015 Winter Exploration Program activities, and a copy of the approved amended C-Plan will be maintained onsite.

Information related to immediate response actions, receiving environments, spill cleanup mobilization response times and well control can be found in the C-Plan.

Alaska Clean Seas will be Great Bear's Primary Response Action Contractor.

7.4 Environmental Resources

Great Bear's 2014-2015 Winter Exploration Program will be located along the Dalton Highway transportation corridor within 4.5 miles of the highway and TAPS. The area is relatively flat tundra marked by occasional lakes and thaw ponds.

7.4.1 Baseline Environmental Data Acquisition

Although still in the exploration phase, Great Bear has undertaken significant baseline reconnaissance activity, including wetland delineation, lake studies, archaeological surveys, and LiDAR acquisition. The data collected by these projects has been utilized to determine the location of the ice roads to minimize impacts to the surrounding vegetation and hydrology.

7.4.2 Wildlife

Wildlife that may be found in the vicinity of the Dalton Highway Transportation Corridor include caribou, moose, muskox, brown (grizzly) bear, wolverine, red fox, arctic fox, wolves, Hoary marmot and the Arctic ground squirrel. Ground squirrels and grizzly bears hibernate during the winter. Key species of birds that may be found in the area include waterfowl and other water birds (swans, geese eiders, ducks, loons, grebes, gulls, terns), and terrestrial birds (passerines, ptarmigan, raptors, owls, and ravens)**.** Almost all of the waterfowl and water birds are migratory and are found in the North Slope Borough generally from May through October. Animals that are most likely to be active in the project area during winter exploration drilling activities include owls, ravens, foxes, and brown bear.

Great Bear's activities were designed to minimize impacts on fish and wildlife. These include mitigation measures outlined in the State of Alaska lease stipulations, adherence to State of Alaska and NSB land management regulations, permit requirements, and Great Bear-developed mitigation measures. Mitigation measures include the following:

- Siting of ice pads and access routes to avoid environmental resources (e.g., cultural resources, fish-bearing tundra lakes).
- Maintaining appropriate food and waste management systems, instructing personnel in ways (e.g., prohibiting feeding) to avoid attracting wildlife, and developing a bear watch and notification system to ensure that personnel are aware of bears near project activities. These systems are detailed in the Bear Avoidance, Interaction, Mitigation, and Monitoring Plan.
- Screening and frequent inspections of water intake structures for water withdrawal for fish-bearing water bodies.
- Great Bear will have a Field Environmental Coordinator onsite to ensure that agreed upon mitigation measures are in place and that reporting and recordkeeping requirements are met.

7.5 HSE & Cultural Awareness Training

Great Bear and all contractor and subcontractor personnel will receive a HSE orientation. Additionally, the training program will be designed to inform each individual of the environmental, social and cultural concerns that relate to their job functions. Training components will include permit stipulations and requirements, cultural awareness, spill prevention and reporting, wildlife interaction, site specific safety, etc. All personnel will participate in a specific training program for bear safety and a briefing of the Bear Avoidance, Interaction, Mitigation, and Monitoring Plan.

The Winter Exploration Program is near existing oil and gas infrastructure and reduced public interest in these activities is expected. The permitting actions associated with the exploration wells will be public noticed as part of the permitting processes. Further, Great Bear management has and continues to practice two-way educational outreach with potentially affected local inhabitants. If there are concerns with regards to the project, Great Bear will be receptive and pro-active.

8.0 LOCAL HIRE AND COMMUNITY ENGAGEMENT

8.1 Local Hire

Great Bear is committed to Alaska and local hire. Great Bear relocated its offices to Anchorage in 2011 and has no other focus than Alaska. To the best of its ability, Great Bear has strategically contracted with service providers already located in Alaska with employees resident in Alaska. It has strived to utilize Alaska contractors in its project development work, and it will continue to make all efforts to maximize Alaska hire in all aspects of its operations. Great Bear will work with the North Slope Borough to attempt to recruit local residents for the project and impress upon its contractors to hire locals and Alaska residents to the best of their ability.

With an eye toward its workforce of the future, Great Bear was a founding partner, and remains a primary sponsor of GeoFORCE Alaska at the University of Alaska Fairbanks, a program introducing high school students from villages throughout the North Slope Borough to geosciences. The program is designed to increase the number and diversity of students pursuing STEM degree programs and entering the future high-tech workforce. GeoFORCE students travel to spectacular geological locations in Alaska and the lower 48 to engage in hands-on field projects designed to bring textbook science to life. Students are recruited in the 8th grade and then remain in the program for all four years of high school provided they maintain good grades. The program is already enjoying great success and is entering its fourth year.

8.2 Stakeholder Engagement

Great Bear has met with officials and representatives of the North Slope Borough since 2010, and visited multiple North Slope villages prior to beginning exploration activities in 2012. Great Bear sponsored the screening of the documentary “Switch” in the village of Barrow during the summer of 2012, educating the community on various energy sources. Great Bear is scheduled to meet with the Planning Commission of the North Slope Borough on October 17, 2014, in Anchorage to present its proposed 2014 Winter Exploration Program. Great Bear intends to meet with the communities of the villages of Barrow, Nuiqsut and Anaktuvuk Pass to discuss the 2014-2015 Winter Exploration Program prior to beginning operations.

One of Great Bear’s key contractors for environmental field studies and permitting is ASRC Energy Services, Inc. (AES), a wholly owned subsidiary of Arctic Slope Regional Corporation (ASRC), a private, for profit Alaska Native Regional Corporation. ASRC is owned by and represents the business interests of its approximately 11,000 Inupiat shareholders. Through AES, during its 2011 field studies, Great Bear retained the services of subsistence advisors and a native village liaison to assist Great Bear with its planning of its E&E Program, which is also in the Dalton Highway Transportation Corridor. Great Bear has used the information received during those activities to help plan the Winter Exploration Program.

9.0 RESPONSIBLE PARTIES - CONTACT INFO, AND EQUIPMENT LIST

9.1 Responsible Parties – Contact Information

The following persons may be contacted for details on the project:

Name	Responsibility	Telephone	Email
Ed Duncan	Technical work program	907-868-8070	ed@greatbearpetro.com
Bret Chambers	Technical work program	907-868-8070	bret@greatbearpetro.com
Karen Duncan	Permitting & Regulatory	907-868-8070	karen@greatbearpetro.com
Pat Galvin	Permitting & Regulatory	907-868-8070	pat@greatbearpetro.com
Steve Lewis	Drilling Manager	907-264-6114	steve.lewis@solstenxp.com
Kirk Fisher	HSE Manager	907-279-6900	kirk.fisher@solstenxp.com

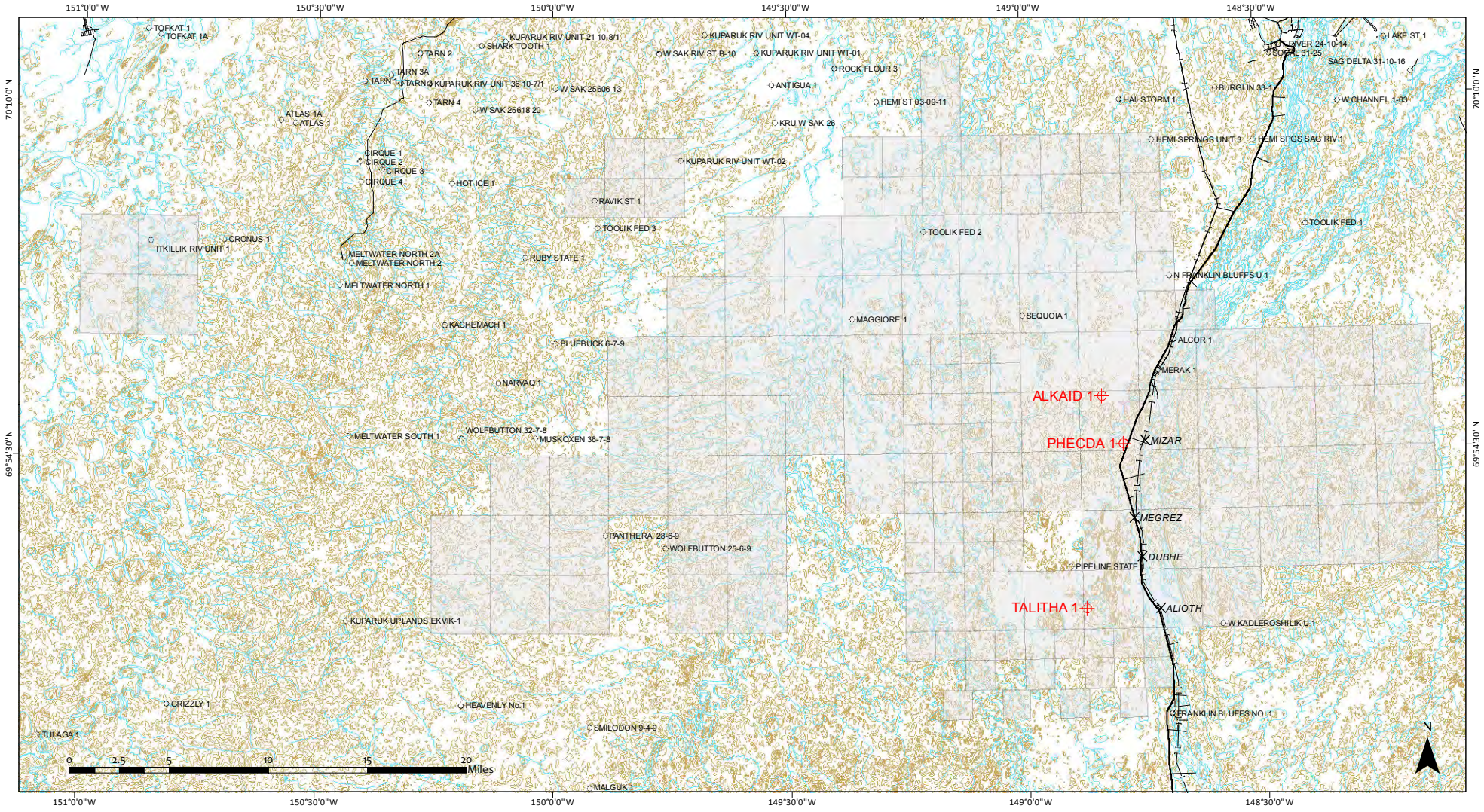
Twenty-four (24) hour phone service will be available at the drilling camp and these numbers will be available to local regulatory agencies. Emergency notifications can also be made through the contacts above.

9.2 Equipment List

OPERATIONS	RIG/ CAMP SUPPORT AND MOBILIZATION	CONDUCTOR INSTALLATION
14 G Motor Grader Trimmer 966 loader TerraGator Heater 700,000btu 275/325bbl Tanker Tucker Water Buffalo 730 rock truck Snow Blower Pump House Portable Shop T-800 Tractor fuel service truck mechanic truck crew bus portable office envirovac light plants pick-up	Fuel Truck Water Trucks ATV Vehicles Loaders Cement Pump Unit Bulk Cement Truck Vac Truck Super Sucker Side Dump Tractor Trailers Bed Truck Crane	Conductor Auger Crane Cement Truck Welding Truck Excavator Tractor Trailer

Attachments

Attachment 1: Area Map Showing Great Bear Leases
Attachment 2: 2014-2015 Winter Exploration Program Drill Site Locations Map
Attachment 3: Sample diagram showing drilling equipment layout on a 600’ by 600’ pad
Attachment 4: Sample diagram showing hydraulic fracturing equipment on a 600’ by 600’ pad
Attachment 5: Preliminary placement of drill pad for each site
Attachment 6: Mitigation Measure Analysis
Attachment 7: Bear Avoidance, Interaction, Mitigation, and Monitoring Plan

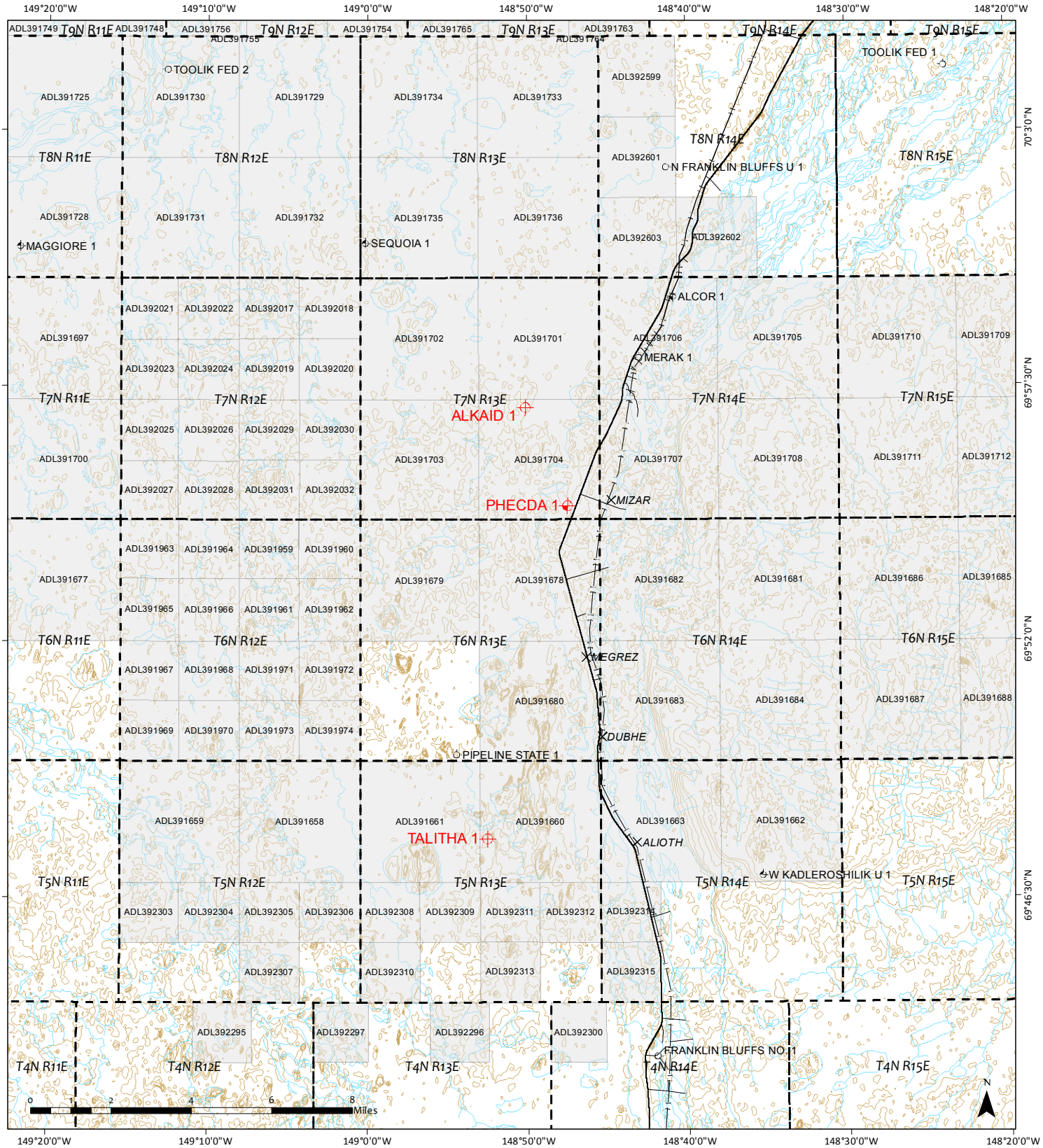


- Current Exploration Well
- Dalton Highway
- Industry Road
- TAPS
- GBP 2014-2015 Proposed Well Location
- GBP Previously Permited Well Location
- GBP Current Lease

GREAT BEAR PETROLEUM

AREA SHOWING GREAT BEAR LEASES

SCALE 1:462,315	CONTOUR INTERVAL 20 METERS	ATTACHMENT 1
NORTH AMERICAN DATUM 1983, ALASKA STATE PLANE ZONE 4		



Current Exploration Well
Dalton Highway
Industry Road
TAPS
GBP 2014-2015 Proposed Well Location
GBP Previously Permitted Well Location
GBP Current Lease

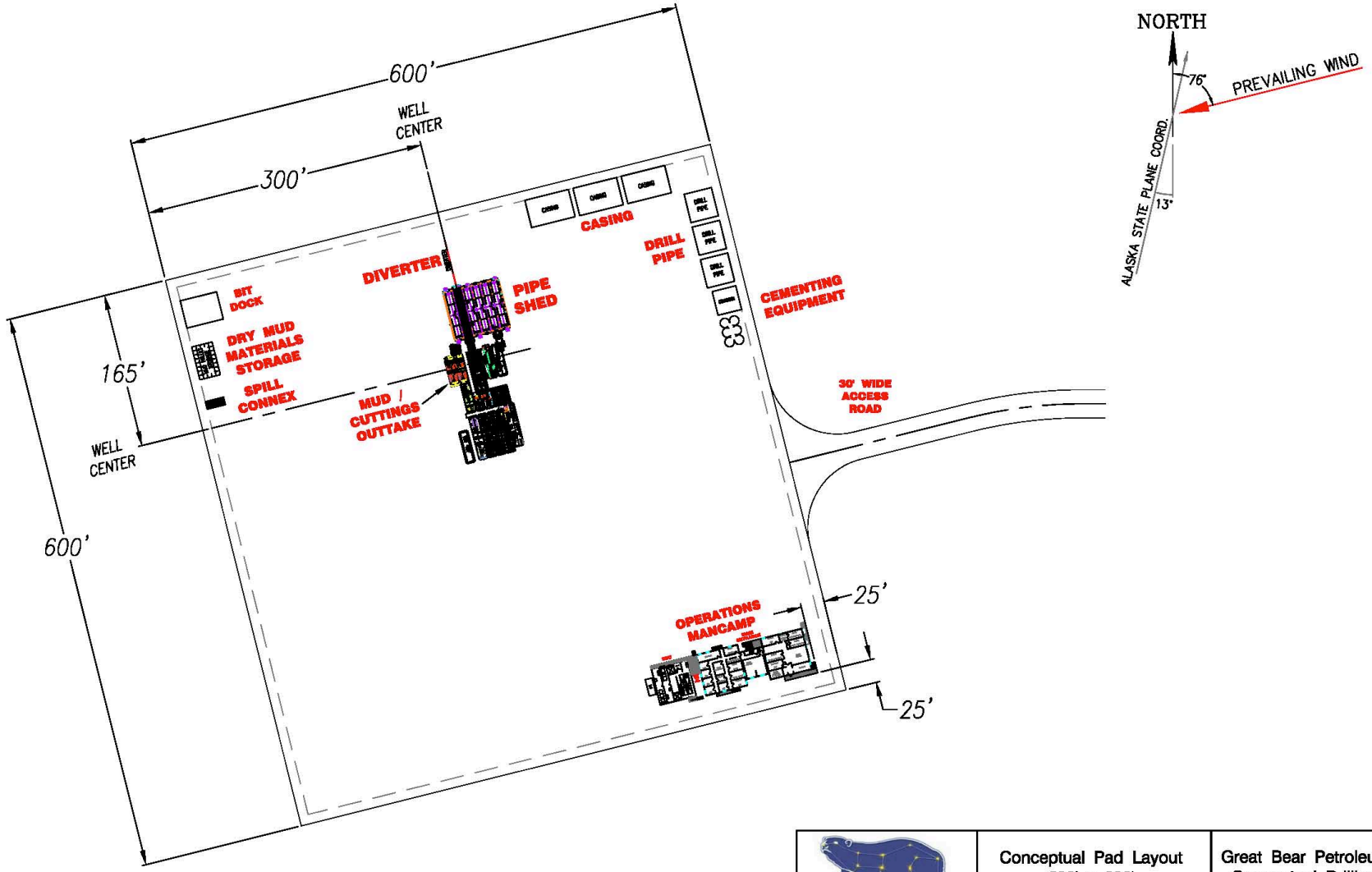
UMIAT MERIDIAN

GREAT BEAR PETROLEUM

TITLE

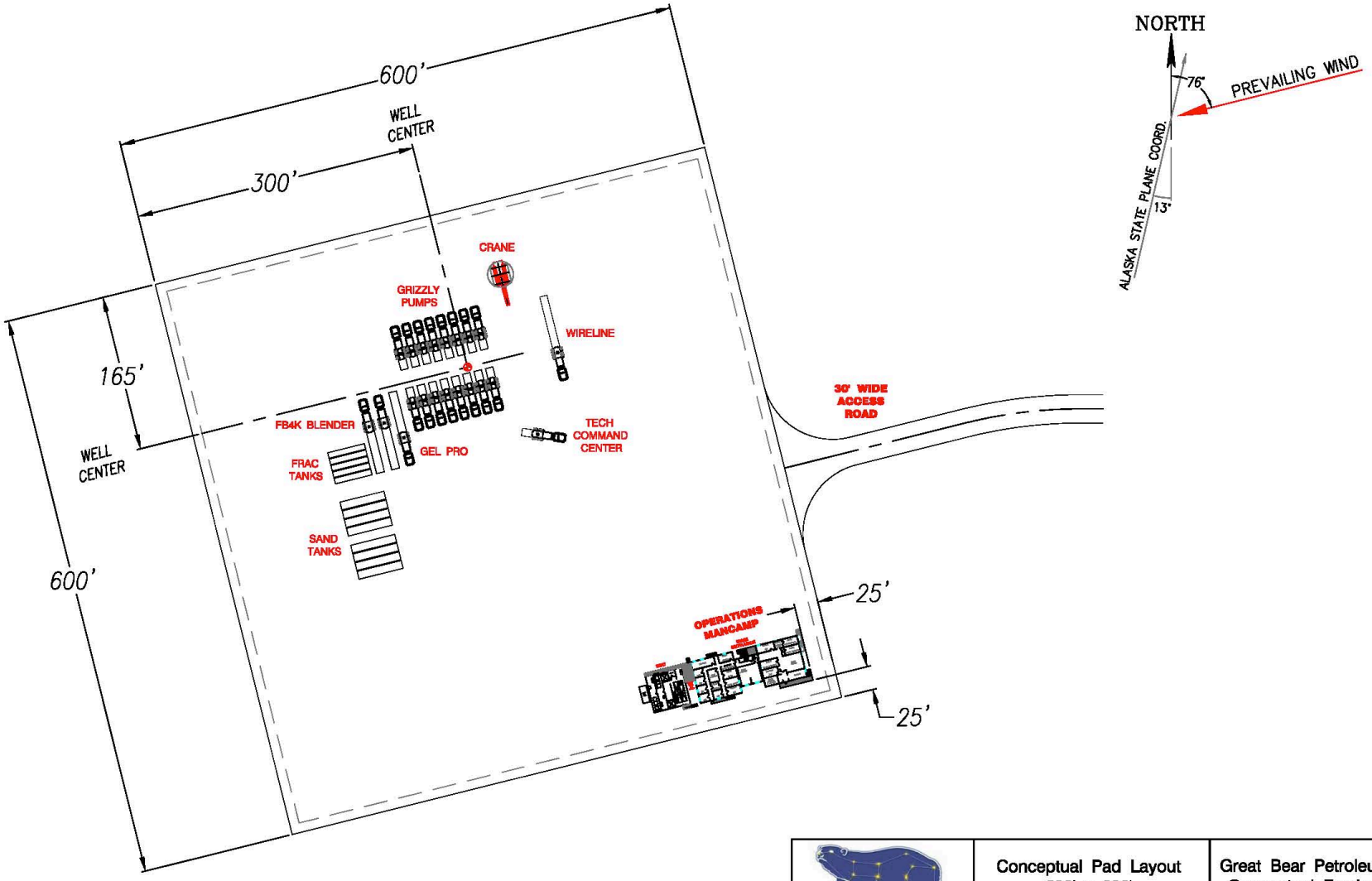
Subtitle

SCALE 1:211,565	CONTOUR INTERVAL 20 METERS	FIGURE:
NORTH AMERICAN DATUM 1983, ALASKA STATE PLANE ZONE 4		



Great Bear Petroleum

Conceptual Pad Layout 600' x 600'		Great Bear Petroleum Conceptual Drilling Plan
Issue Date: 2 October 2014	Drawn By: Joe Alston	100 50 0 100 Feet
Revision: - Date: -	Sheet 1 of 1	75 25 50



Great Bear Petroleum

Conceptual Pad Layout
600' x 600'

Great Bear Petroleum
Conceptual Fracing Plan

Issue Date: 2 October 2014
Revision: -
Date: -

Drawn By: Joe Alston
Sheet 1 of 1

100 50 0 100 Feet
75 25 50

Attachment 5
Preliminary placement of drill pad for each site

Location of Alkaid and Phecda Pads

Showing Two Alternate Ice Road
Routes to Alkaid (only one would be constructed)

Attachment 5
Preliminary placement of drill pad for each site

Location of Talitha Pad

Attachment 6 – Mitigation Measure Analysis

Mitigation Measure/Lessee Advisory	Analysis/Response
A. Mitigation Measures **1. Facilities and Operations**	
a. A plan of operations must be submitted and approved before conducting exploration, development or production activities, and must describe the lessee's efforts to minimize impacts on residential, commercial, and recreational areas, Native allotments and subsistence use areas. At the time of application, lessee must submit a copy of the proposed plan of operations to all surface owners whose property will be entered.	A plan of operations is being submitted to ADNR for the Great Bear 2014-2015 Winter Exploration Program on or about October 3, 2014. Preparation for exploration activities are proposed to begin in December 2014. There are no Native allotments or residential areas in the proposed project area. Other than the State of Alaska, there are no other surface or subsurface owners within the project area. Alyeska Pipeline Service Company (APSC) is a holder of a significant surface interest in the project area, and Great Bear will provide a copy of the proposed plan of operations to APSC, and seek a Letter of Non-Objection from APSC.
b. Facilities must be designed and operated to minimize sight and sound impacts in areas of high residential, commercial, recreational, and subsistence use and important wildlife habitat. Methods may include providing natural buffers and screening to conceal facilities, sound insulation of facilities, or by using alternative means approved by the Director, in consultation with ADF&G and the NSB. 1 The Office of Habitat Management and Permitting (OHMP) of the Alaska Department of Natural Resources became the Division of Habitat, a part of the Alaska Department of Fish and Game (ADF&G), effective July 1, 2008, as a result of Executive Order 114.	There are no residential areas in the proposed project area. Although it is an industrial area and recreational hunting with bow and arrow is allowed, Great Bear does not believe that the proposed project area is characterized as an area of high use for such activities. Great Bear has proposed to locate its operations in a previously disturbed, active industrial corridor to minimize impacts to subsistence users and to important wildlife habitat. Access to the ice roads and ice pads will be restricted to authorized visitors and personnel only.
c. To the extent practicable, the siting of facilities will be prohibited within 500 feet of all fish-bearing streams and waterbodies and 1,500 feet from all current surface drinking water sources. Additionally, to the extent practicable, the siting of facilities will be prohibited within one-half mile of the banks of the main channel of the Colville, Canning, Sagavanirktok, Kavik, Shaviovik, Kadleroshilik, Echooka, Ivishak, Kuparuk, Toolik, Anaktuvuk and Chandler Rivers. Facilities may be sited within these buffers if the lessee demonstrates to the satisfaction of the Director, in consultation with ADF&G, that site locations outside these buffers are not practicable or that a location inside the buffer is environmentally preferred. Road, utility, and pipeline crossings must be consolidated and aligned perpendicular or near perpendicular to watercourses.	None of the three proposed drill sites is within the ½ mile buffer from the main channel of the Sagavanirktok River. None of the sites are within 500 feet of a fish-bearing stream, or 1,500 feet of a current drinking water source.
d. No facilities will be sited within one-half mile of identified Dolly Varden overwintering and/or spawning areas on the Canning, Shaviovik, and Kavik rivers. Notwithstanding the previous sentence, road and pipeline crossings may only be sited within these buffers if the lessee demonstrates to the satisfaction of the Director and ADF&G in the course of obtaining their respective permits, that either (1) the scientific data indicate the proposed crossing is not within an overwintering and/or spawning area; or (2) the proposed road or pipeline crossing will have no significant adverse impact to Dolly Varden overwintering and/or spawning habitat.	Not applicable.
e. Impacts to important wetlands must be minimized to the satisfaction of the Director, in consultation with ADF&G and ADEC. The Director will consider whether facilities are sited in the least sensitive areas. Further, all activities within wetlands require permission from the US Army Corps of Engineers (see Lessee Advisories).	Great Bear is conducting this exploration activity in the winter from ice pads accessed by ice roads. In addition, all locations are within the North Slope Borough's designated transportation corridor, and not within the subsistence conservation district.
f. Exploration facilities, including exploration roads and pads, must be temporary and must be constructed of ice unless the Director determines that no practicable alternative exists. Re-use	The 2014-2015 Winter Exploration Program will be conducted on ice pads accessed by ice roads in compliance with this measure.

of abandoned gravel structures may be permitted on a case-by-case basis by the Director, after consultation with the director, DMLW, and ADF&G. Approval for use of abandoned structures will depend on the extent and method of restoration needed to return these structures to a usable condition.	
g. Pipelines must utilize existing transportation corridors where conditions permit. Pipelines must be designed to facilitate the containment and cleanup of spilled fluids. Where practicable, onshore pipelines must be located on the upslope side of roadways and construction pads, unless the director, DMLW, determines that an alternative site is environmentally acceptable. Wherever possible, onshore pipelines must utilize existing transportation corridors and be buried where soil and geophysical conditions permit. All pipelines, including flow and gathering lines, must be designed, constructed and maintained to assure integrity against climatic conditions, geophysical hazards, corrosion and other hazards as determined on a case-by-case basis.	There are no pipelines associated with the 2014-2015 Winter Exploration Program.
h. Pipelines shall be designed and constructed to avoid significant alteration of caribou and other large ungulate movement and migration patterns. At a minimum, above-ground pipelines shall be elevated 7 feet, as measured from the ground to the bottom of the pipe, except where the pipeline intersects a road, pad, or a ramp installed to facilitate wildlife passage. Lessees shall consider increased snow depth in the sale area in relation to pipe elevation to ensure adequate clearance for wildlife. ADNR may, after consultation with ADF&G, require additional measures to mitigate impacts to wildlife movement and migration.	There are no pipelines associated with the 2014-2015 Winter Exploration Program.
i. The state of Alaska discourages the use of continuous-fill causeways. Environmentally preferred alternatives for field development include use of buried pipelines, onshore directional drilling, or elevated structures. Approved causeways must be designed, sited, and constructed to prevent significant changes to nearshore oceanographic circulation patterns and water quality characteristics (e.g., salinity, temperature, suspended sediments) that result in exceedances of water quality criteria, and must maintain free passage of marine and anadromous fish. ii. Causeways and docks shall not be located in river mouths or deltas. Artificial gravel islands and bottom founded structures shall not be located in river mouths or active stream channels on river deltas, except as provided for in (iii). iii. Each proposed structure will be reviewed on a case-by-case basis. Causeways, docks, artificial gravel islands and bottom founded structures may be permitted if the Director, in consultation with ADF&G, ADEC, and the NSB determines that a causeway or other structures are necessary for field development and that no practicable alternatives exist. A monitoring program may be required to address the objectives of water quality and free passage of fish, and mitigation shall be required where significant deviation from objectives occurs. (See also Lessee Advisories regarding U.S. Army Corps of Engineers requirements.)	There are no causeways or docks associated with the 2014-2015 Winter Exploration Program.
j. Dismantlement, Removal and Rehabilitation (DR&R): Upon abandonment of material sites, drilling sites, roads, buildings or other facilities, such facilities must be removed and the site rehabilitated to the satisfaction of the Director, unless the Director, in consultation with DMLW, ADF&G, ADEC, NSB, and any non-state surface owner, determines that such removal and rehabilitation is not in the state's interest.	This measure will be met. See Section 6.2 of the Plan of Operations.
k. Gravel mining sites required for exploration and development activities will be restricted to the minimum necessary to develop the field efficiently and with minimal environmental damage. Where practicable, gravel sites must be designed and constructed to function as water reservoirs for future use. Gravel mine sites required for exploration activities must not be located within an active floodplain of a watercourse unless the director, DMLW, after consultation with ADF&G, determines that there is no practicable alternative, or that a floodplain site would enhance fish and wildlife habitat after mining operations are completed	There are no new gravel mine sites associated with the 2014-2015 Winter Exploration Program.

and the site is closed. Mine site development and rehabilitation within floodplains must follow the procedures outlined in McLean, R. F. 1993, North Slope Gravel Pit Performance Guidelines, ADF&G Habitat and Restoration Division Technical Report 93-9, available from ADF&G.	
2. Fish and Wildlife Habitat	
a. Detonation of explosives within or in proximity to fish-bearing waters must not produce instantaneous pressure changes that exceed 2.7 pounds per square inch in the swim bladder of a fish. Detonation of explosives within or in close proximity to a fish spawning bed during the early stages of egg incubation must not produce a peak particle velocity greater than 0.5 inches per second. Blasting criteria have been developed by ADF&G and are available upon request from ADF&G. The location of known fish-bearing waters within the project area can also be obtained from ADF&G. The lessee will consult with the NSB prior to proposing the use of explosives for seismic surveys. The Director may approve the use of explosives for seismic surveys after consultation with the NSB.	There are no explosives being detonated as part of the 2014-2015 Winter Exploration Program.
b. Water intake pipes used to remove water from fish-bearing waterbodies must be surrounded by a screened enclosure to prevent fish entrainment and impingement. Screen mesh size shall be no greater than 1 mm (0.04 inches), unless another size has been approved by ADF&G. The maximum water velocity at the surface of the screen enclosure may be no greater than 0.1 foot per second, unless an alternative velocity has been approved by ADF&G.	Water withdrawals associated with the 2014-2015 Winter Exploration Program are currently anticipated to be from lakes that have been determined to not bear fish. Such lake studies were conducted in August 2011 by ASRC Energy Services, Inc. Any water taken from fish-bearing waterbodies will comply with this measure.
c. Removal of snow from fish-bearing rivers, streams and natural lakes shall be subject to prior written approval by ADF&G. Compaction of snow cover overlying fish-bearing waterbodies is prohibited except for approved crossings. If ice thickness is not sufficient to facilitate a crossing, ice or snow bridges may be required.	Great Bear will consult with ADF&G to ensure that this measure is met.
d. Bears: i. Before commencement of any activities, lessees shall consult with ADF&G (907-459-7213) to identify the locations of known brown bear den sites that are occupied in the season of proposed activities. Exploration and production activities must not be conducted within one-half mile of occupied brown bear dens, unless alternative mitigation measures are approved by ADF&G. A lessee who encounters an occupied brown bear den not previously identified by ADF&G must report it to the Division of Wildlife Conservation, ADF&G, within 24 hours. Mobile activities shall avoid such discovered occupied dens by one-half mile unless alternative mitigation measures are approved by the Director, with concurrence from ADF&G. Non-mobile facilities will not be required to relocate. ii. Before commencement of any activities, lessees shall consult with the USFWS (907-786-3800) to identify the locations of known polar bear den sites. Operations must avoid known polar bear dens by 1 mile. A lessee who encounters an occupied polar bear den not previously identified by USFWS must report it to the USFWS within 24 hours and subsequently avoid the new den by 1 mile. If a polar bear should den within an existing development, off-site activities shall be restricted to minimize disturbance. iii. For projects in proximity to areas frequented by bears, lessees are required to prepare and implement a human bear interaction plan designed to minimize conflicts between bears and humans. The plan should include measures to: A. minimize attraction of bears to facility sites; B. organize layout of buildings and work areas to minimize interactions between humans and bears; C. warn personnel of bears near or on facilities and the proper actions to take; D. if authorized, deter bears from the drill site; E. provide contingencies in the event bears do not leave the site; F. discuss proper storage and disposal of materials that may be toxic to bears; and G. provide a systematic record of bears on the site and in the immediate area.	This measure will be met. See also Attachment 7: Bear Avoidance, Interaction, Mitigation, and Monitoring Plan.

Attachment 6 – Mitigation Measure Analysis

e. Permanent, staffed facilities must be sited to the extent practicable outside identified brant, white-fronted goose, snow goose, tundra swan, king eider, common eider, Steller's eider, spectacled eider, and yellow-billed loon nesting and brood rearing areas.	There are no permanent facilities associated with the 2014-2015 Winter Exploration Program.
3. Subsistence, Commercial and Sport Harvest Activities	
a. i. Exploration, development and production operations shall be conducted in a manner that prevents unreasonable conflicts between lease-related activities and subsistence activities. Lease-related use will be restricted when the Director determines it is necessary to prevent conflicts with local subsistence, commercial and sport harvest activities. In enforcing this term DO&G will consult with other agencies, the affected local borough(s) and the public to identify and avoid potential conflicts that are brought to the division's attention both in the planning and operational phases of lease-related activities. In order to avoid conflicts with subsistence, commercial and sport harvest activities, restrictions may include alternative site selection, requiring directional drilling, seasonal drilling restrictions, and other technologies deemed appropriate by the Director. ii. Prior to submitting a plan of operations for either onshore or offshore activities which have the potential to disrupt subsistence activities, the lessee shall consult with the potentially affected subsistence communities and the NSB (collectively "parties") to discuss the siting, timing, and methods of proposed operations and safeguards or mitigating measures which could be implemented by the operator to prevent unreasonable conflicts. The parties shall also discuss the reasonably foreseeable effect on subsistence activities of any other operations in the area that they know will occur during the lessee's proposed operations. Through this consultation, the lessee shall make reasonable efforts to assure that exploration, development, and production activities are compatible with subsistence hunting and fishing activities and will not result in unreasonable interference with subsistence harvests. iii. A discussion of agreements reached or not reached during the consultation process and any plans for continued consultation shall be included in the plan of operations. The lessee shall identify who participated in the consultation and send copies of the plan to participating communities and the NSB when it is submitted to the division. iv. If the parties cannot agree, then any of them may request the Commissioner of DNR or his/her designee to intercede. The commissioner may assemble the parties or take other measures to resolve conflicts among the parties. v. The lessee shall notify the Director of all concerns expressed by subsistence hunters during operations and of steps taken to address such concerns.	Great Bear is very sensitive to the interests of the local residents, particularly as it relates to subsistence activities. Great Bear is scheduled to meet with the NSB on October 17, 2014, to present its proposed activities under its Winter Exploration Program. Great Bear intends to schedule meetings with the leadership and communities of Barrow, Nuiqsut and Anaktuvuk Pass during November 2014. During the planning of its E&E Program under its Plan of Operations dated September 29, 2011, which is also in the Dalton Highway Transportation Corridor, Great Bear met with local leadership and communities and the NSB and collected input into how the E&E Program could be conducted in a manner that minimizes impacts to subsistence activities. Also in connection with its Plan of Operations dated September 29, 2011, Great Bear engaged and consulted extensively with a subsistence advisor, who participated in field evaluation visits to select the drill sites proposed in that Plan of Operations. Great Bear also presented its proposed E&E Program to the leadership and communities. Great Bear has utilized the knowledge and understanding it gained in connection with the E&E Program to the Winter Exploration Program. See also Section 8.2 of the plan of operations for a discussion of Great Bear's stakeholder engagement efforts.
b. Traditional and customary access to subsistence areas shall be maintained unless reasonable alternative access is provided to subsistence users. "Reasonable access" is access using means generally available to subsistence users. Lessees will consult the NSB, nearby communities, and native organizations for assistance in identifying and contacting local subsistence users.	Access to subsistence areas should not be affected by the activities under the 2014-2015 Winter Exploration Program.
4. Fuel, Hazardous Substances and Waste	
a. Secondary containment shall be provided for the storage of fuel or hazardous substances.	Measure will be met, See Sections 5.3 and 5.4 in the plan of operations.
b. Containers with an aggregate storage capacity of greater than 55 gallons which contain fuel or hazardous substances shall not be stored within 100 feet of a waterbody, or within 1,500 feet of a current surface drinking water source.	Measure will be met. [Need cross reference to storage in plan of operatons or can we just say no storage will be within such distances from waterbody or drink source?]
c. During equipment storage or maintenance, the site shall be protected from leaking or dripping fuel and hazardous substances by the placement of drip pans or other surface liners designed to catch and hold fluids under the equipment, or by creating an area for storage or	Measure will be met, See Sections 5.3 and 5.4 in the plan of operations.

maintenance using an impermeable liner or other suitable containment mechanism.	
d. During fuel or hazardous substance transfer, secondary containment or a surface liner must be placed under all container or vehicle fuel tank inlet and outlet points, hose connections, and hose ends. Appropriate spill response equipment, sufficient to respond to a spill of up to five gallons, must be on hand during any transfer or handling of fuel or hazardous substances. Trained personnel shall attend transfer operations at all times.	Measure will be met, See Sections 5.3 and 5.4 in the plan of operations.
e. Vehicle refueling shall not occur within the annual floodplain, except as addressed and approved in the plan of operations. This measure does not apply to water-borne vessels.	Measure will be met, See Sections 5.3 and 5.4 in the plan of operations.
f. All independent fuel and hazardous substance containers shall be marked with the contents and the lessee's or contractor's name using paint or a permanent label.	Measure will be met, See Sections 5.3 and 5.4 in the plan of operations.
g. A fresh water aquifer monitoring well, and quarterly water quality monitoring, is required down gradient of a permanent storage facility, unless alternative acceptable technology is approved by ADEC.	There are no permanent facilities associated with the 2014-2015 Winter Exploration Program.
h. Waste from operations must be reduced, reused, or recycled to the maximum extent practicable. Garbage and domestic combustibles must be incinerated whenever possible or disposed of at an approved site in accordance with 18 AAC 60. (See Lessee Advisories, ADEC.)	Measure will be met, See Sections 4.4 and 4.5 in the plan of operations.
i. New solid waste disposal sites, other than for drilling waste, will not be approved or located on state property during the exploration phase of lease activities. Disposal sites may be provided for drilling waste if the facility complies with 18 AAC 60. (See Lessee Advisories, ADEC.)	Measure will be met, See Sections 5.3 and 5.4 in the plan of operations.
j. The preferred method for disposal of muds and cuttings from oil and gas activities is by underground injection. Drilling mud and cuttings cannot be discharged into lakes, streams, rivers, or important wetlands. On pad temporary cuttings storage will be allowed as necessary to facilitate annular injection and/or backhaul operations. Impermeable lining and diking, or equivalent measures, will be required for reserve pits. Surface discharge of drilling muds and cuttings into reserve pits shall be allowed only when the Director, in consultation with ADF&G, determines that alternative disposal methods are not practicable. Injection of non-hazardous oilfield wastes is regulated by AOGCC through its Underground Injection Control (UIC) Program for oil and gas wells. See also Mitigation Measure 8.a.vi.	Measure will be met, See Sections 5.3 and 5.4 in the plan of operations.
k. Proper disposal of garbage and putrescible waste is essential to minimize attraction of wildlife. The lessee must use the most appropriate and efficient method to achieve this goal. The primary method of garbage and putrescible waste is prompt, on-site incineration in compliance with state of Alaska air quality regulations. The secondary method of disposal is on-site frozen storage in animal-proof containers with backhaul to an approved waste disposal facility. The tertiary method of disposal is on-site non-frozen storage in animal proof containers with backhaul to an approved waste disposal facility. Daily backhauling of non-frozen waste must be achieved unless safety considerations prevent it.	Measure will be met, See Sections 5.3 and 5.4 in the plan of operations.
5. Access	
a. Except for approved off-road travel, exploration activities must be supported only by ice roads, winter trails, existing road systems or air service. Wintertime off-road travel across tundra and wetlands may be approved in areas where snow and frost depths are sufficient to protect the ground surface. Summertime off-road travel across tundra and wetlands may be authorized subject to time periods and vehicle types approved by DMLW. Exceptions may be granted by the director of the DMLW, and the Director, if an emergency condition exists; or, if it is determined, after consulting with ADF&G that travel can be accomplished without damaging vegetation or the ground surface. Exceptions, including the use of gravel, may also	The 2014-2015 Winter Exploration Program will use ice pad accessed by ice roads. The ice roads will be permitted through a land use permit issued by the DMLW.

be granted on a site specific basis, if it is determined, after consulting with ADF&G and DMLW, that no practicable alternatives exist for constructing an exploration road or pad in the area south of the boundary described below and depicted in the map below: Figure 7.1: Gravel Consideration Boundary Beginning at the NPR-A boundary, from the northeast corner of T 1N, R 2E, · east to the northwest corner of T 1N, R 9E, then · north to the northwest corner of T 4N, R 9E, then · east to the northwest corner of T 4N, R 23E, then · south to the southwest corner of T 4N, R 23E, and then · east along the top of T 3N to the ANWR boundary.	
b. Public access to, or use of, the lease area may not be restricted except within the immediate vicinity of drill sites, buildings, and other related facilities. Areas of restricted access must be identified in the plan of operations. Lease facilities and operations shall not be located so as to block access to or along navigable or public waters as defined in AS 38.05.	The 2014-2015 Winter Exploration Program will only result in restrictions to public access on the ice roads and ice pads constructed as part of the operation. No other restrictions to public access to the lease area will result from the 2014-2015 Winter Exploration Program.
6. Prehistoric, Historic, and Archeological Sites	
a. Prior to the construction or placement of any structure, road, or facility resulting from exploration, development, or production activities, the lessee must conduct an inventory of prehistoric, historic, and archeological sites within the area affected by an activity. The inventory must include consideration of literature provided by the NSB, nearby communities, Native organizations, and local residents; documentation of oral history regarding prehistoric and historic uses of such sites; evidence of consultation with the Alaska Heritage Resources Survey and the National Register of Historic Places; and site surveys. The inventory must also include a detailed analysis of the effects that might result from the activity.	Cultural, historical, and archaeological resources field studies for site clearance were conducted in the summer of 2011 within the area associated with Great Bear's E&E Program to assess any known sites, and to locate unknown sites. Additional studies were conducted in the summers of 2012 and 2013 in association with Great Bear's seismic program. These studies included the areas that will be part of the 2014-2015 Winter Exploration Program. The studies included a records review and a field survey of the access routes, staging locations and drilling sites. The records review included the Alaska Heritage Resources Survey (AHRS) database, maintained by the Office of History and Archeology within ADNR; and the Traditional Land Use Inventory (TLUI) database, maintained by the NSB. No sites were identified in the studies that indicate that the E&E Program, seismic program, or Winter Exploration Program would impact cultural, historical, or archaeological resources.
b. The inventory of prehistoric, historic, and archeological sites must be submitted to the Director, and to SHPO who will coordinate with the NSB for review and comment. If a prehistoric, historic, or archeological site or area could be adversely affected by a lease activity, the Director, after consultation with SHPO and the NSB, will direct the lessee as to the course of action to take to avoid or minimize adverse effects.	See response to subsection 6(a), above.
c. If a site, structure, or object of prehistoric, historic, or archaeological significance is discovered during lease operations, the lessee must report the discovery to the Director as soon as possible. The lessee must make reasonable efforts to preserve and protect the discovered site, structure, or object from damage until the Director, after consultation with the SHPO and the NSB, has directed the lessee as to the course of action to take for its preservation.	If such a discovery is made, this section will be followed.
7. Local Hire, Communication, and Training	
a. Lessees are encouraged to employ local and Alaska residents and contractors, to the extent they are available and qualified, for work performed in the lease area. Lessees shall submit, as part of the plan of operations, a proposal detailing the means by which the lessee will comply with the measure. The proposal must include a description of the operator's plans for partnering with local communities to recruit, hire and train local and Alaska residents and contractors. The lessee is encouraged, in formulating this proposal, to coordinate with employment and training services offered by the State of Alaska and local communities to train and recruit employees from local communities.	Measure will be met, See Section 8.1 in the plan of operations.
b. A plan of operations application must describe the lessee's past and prospective efforts to communicate with local communities and interested local community groups.	Measure met, See Section 8.2 in the plan of operations.

Attachment 6 – Mitigation Measure Analysis

c. A plan of operations application must include a training program for all personnel including contractors and subcontractors. The program must be designed to inform each person working on the project of environmental, social, and cultural concerns that relate to that person's job. The program must use methods to ensure that personnel understand and use techniques necessary to preserve geological, archeological, and biological resources. In addition, the program must be designed to help personnel increase their sensitivity and understanding of community values, customs, and lifestyles in areas where they will be operating.	Measure met, See Section 7.5 in the plan of operations.
8. **Definitions** a. In this document: i. "Facilities" means any structure, equipment, or improvement to the surface, whether temporary or permanent, including, but not limited to, roads, pads, pits, pipelines, power lines, generators, utilities, airstrips, wells, compressors, drill rigs, camps and buildings; ii. "Important wetlands" means those wetlands that are of high value to fish, waterfowl, and shorebirds because of their unique characteristics or scarcity in the region or that have been determined to function at a high level using the hydrogeomorphic approach; iii. "Minimize" means to reduce adverse impacts to the smallest amount, extent, duration, size, or degree reasonable in light of the environmental, social, or economic costs of further reduction; iv. "Plan of operations" means a lease Plan of operations under 11 AAC 83.158 and a unit Plan of operations under 11 AAC 83.346; v. "Practicable" means feasible in light of overall project purposes after considering cost, existing technology, and logistics of compliance with the standard; vi. "Secondary containment" means an impermeable diked area or portable impermeable containment structure capable of containing 110 percent of the volume of the largest independent container plus 12 inches of freeboard. Double walled tanks do not qualify as Secondary Containment unless an exception is granted for a particular tank. vii. "Temporary" means no more than 12 months.	

Great Bear Petroleum

Bear Avoidance, Interaction, Mitigation, and Monitoring Plan North Slope, Alaska

Great Bear Petroleum Operating LLC
601 West 5th Avenue, Suite 505
Anchorage, AK 99501

October 3, 2014

TABLE OF CONTENTS

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ABBREVIATIONS

ADF&G	Alaska Department of Fish and Game
AES	ASRC Energy Services
ADNR	Alaska Department of Natural Resources
Great Bear	Great Bear Petroleum Operating LLC
HSE	Health, Safety, and Environment
km	kilometer(s)
LOA	Letter of Authorization
MMPA	Marine Mammal Protection Act of 1972
NSB	North Slope Borough
Plan	Bear Avoidance, Interaction, Mitigation, and Monitoring Plan
TAPS	Trans Alaska Pipeline System
USC	U.S. Code
USFWS	U.S. Fish and Wildlife Service

1 Introduction

Great Bear Petroleum Operating LLC (Great Bear) presents this Bear Avoidance, Interaction, Mitigation, and Monitoring Plan (Plan) for its Winter Exploration Program. This Plan has been developed for the following purposes:

- Guide Winter Exploration Program personnel, including Great Bear employees and contractors to:
    - Prevent bears from associating humans and facilities with food;
    - Prevent or minimize the potential for human-bear interactions;
    - Understand controls to prevent interaction;
    - Protect workers and bears; and
    - Implement observation and reporting procedures.
- Fulfill requirements of Mitigation Measure 2(d)(i) for North Slope Areawide Oil and Gas Lease Sales; and
- Fulfill requirements for obtaining a Letter of Authorization (LOA) from the U.S. Fish and Wildlife Service (USFWS) for incidental and intentional (hazing) takes of polar bears in the northernmost portion of the Winter Exploration Program area.

1.1 Project Description

The general location of the proposed Winter Exploration Program is the 15-mile strip of Great Bear's leases all within the north-south Transportation Corridor of the Dalton Highway, which also includes the Trans Alaska Pipeline System (TAPS) and spur gravel access roads. This area is between Deadhorse and the Franklin Bluffs on Alaska's North Slope. This corridor was chosen for initial exploration because it is a pre-disturbed, active industrial area with existing infrastructure, and as such, potential environmental impact is minimized.

This Winter Exploration Program is expected to include the following major activities, with all activities to take place between December 2014 and May 2015:

- Build ice driveways and roads from the Dalton Highway to the locations of Alkaid #1 (approximately 3 miles) and Talitha #1 (approximately 3 – 4 miles) and an ice driveway off the Dalton Highway to Phecda #1.
- Build ice pads at all 3 locations.
- Transport equipment, materials and personnel from North Slope oilfield infrastructure to and between the well site locations along the Dalton Highway and ice roads.
- Possibly perform short-term production flow tests and, depending on well results, stimulating production using hydraulic fracturing and pumping.
- Truck limited liquids production, if any, to Prudhoe Bay and flare or vent associated gas, using a vertical flare approximately 100 feet off the ground.
- Demobilize rig and equipment at end of winter drilling season.

The locations of the three potential drill sites are listed in Table 1 Drill Site Locations.

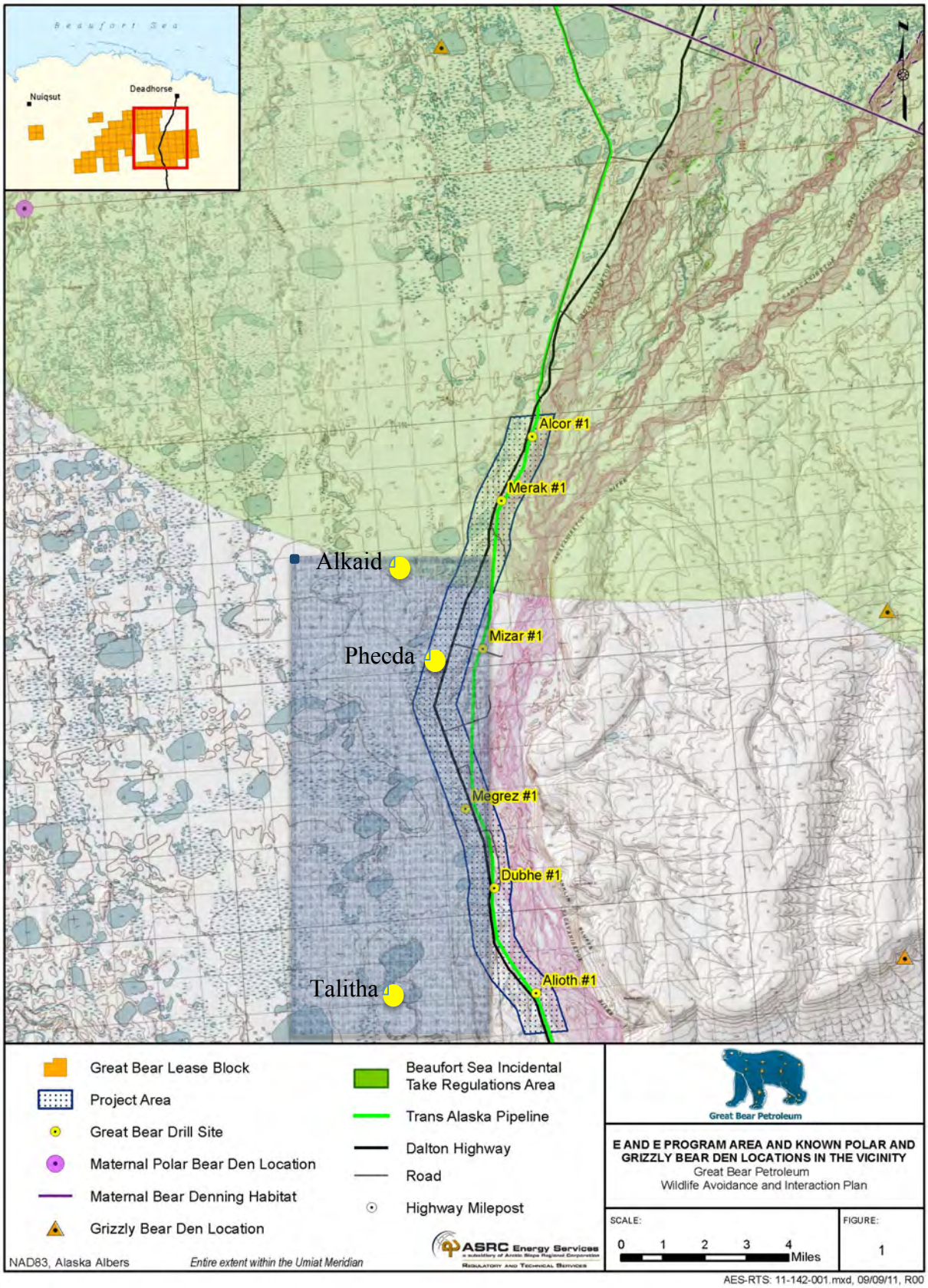
Table 1 Drill Site Locations

Well Name	Latitude (DD)	Longitude (DD)	Latitude (DMS)	Longitude (DMS)
Alkaid #1	69.95061436	-148.83545505	69 deg 57 min 2.211690 sec	-148 deg 50 min 7.638180 sec
Phecda #1	69.91550798	-148.79126908	69 deg 54 min 55.82871 sec	-148 deg 47 min 28.56871 sec
Talitha #1	69.79617964	-148.87540451	69 deg 47 min 46.24672 sec	-148 deg 52 min 31.45624 sec

Additional drill sites may be identified as the Winter Exploration Program proceeds. Any additional sites will be located within the Project Area identified on Figure 1.

Only the Alkaid #1drill site may be within the geographic area covered by the current Beaufort Sea Incidental Take Regulations for polar bears.

Figure 1 Map of Winter Exploration Activity and Known Bear Dens



1.2 Mitigation Measures and Regulatory Requirements

The Alaska Department of Natural Resources (ADNR) applies mandatory mitigation measures to all leases acquired during the North Slope Areawide Oil and Gas Lease Sale. Great Bear will comply with all the following mitigation measures related to grizzly and polar bears:

- Lessees are required to prepare and implement a human-bear interaction plan designed to minimize conflicts between bears and humans. The plan should include measures to:
    - Minimize the attraction of bears to facility sites, including containing garbage and food waste;
    - Organize the layout of buildings and work areas to minimize interactions between humans and bears;
    - Warn personnel of bears near or on facilities and the proper actions to take;
    - Deter bears from the drill site (if lessees are authorized to do so);
    - Provide contingencies in the event bears do not leave the site;
    - Discuss proper storage and disposal of materials that may be toxic to bears; and
    - Provide a systematic record of bears on site and in the immediate area.
- Before commencement of any activities, lessees shall consult with the Alaska Department of Fish and Game (ADF&G) to identify the locations of any known brown bear den sites that are occupied in the season of proposed activities. Exploration and development activities started between September 20 and May 15 may not be conducted within one-half mile of known occupied brown bear dens, unless alternative mitigation measures are approved by the ADF&G. A lessee who encounters an occupied brown bear den not previously identified by the ADF&G must report it to the Division of Wildlife Conservation, ADF&G, within 24 hours. Mobile activities shall avoid such discovered occupied dens by one-half mile unless alternative mitigation measures are approved by DO&G with concurrence from ADF&G. Nonmobile facilities will not be required to relocate.

In addition to the mitigation measures above, Great Bear will comply with the all applicable local, state, and federal codes, statutes, and regulations including the Marine Mammal Protection Act of 1972 (MMPA) (16 U.S. Code [USC] 1361-1407) and the Endangered Species Act of 1973 (16 USC 1531-1544). Great Bear is coordinating with the ADF&G and USFWS to identify the locations of known grizzly bear and polar bear dens near Great Bear's drill sites and develop additional mitigation measures, if necessary, to protect bears and humans.

Great Bear is requesting an extension to its LOA from the USFWS for coverage under the current Beaufort Sea Incidental Take Regulations as per the MMPA for the incidental (50 CFR Part 18) and intentional (hazing) (Sections 109(h) and 112(c) of the MMPA) take of polar bears.

2 Bears and Exploration/Development Activities: Impacts of Human Activity

Human activity may attract wildlife. The biggest attractant for wildlife is associated with food and waste-handling practices. Bears will generally avoid human activities if they are not attracted by food and wastes. Bears can learn to associate humans and facilities with a food source. This association can be passed down from generation to generation. Food, associated by-products, and dumpsters are major attractants for bears.

Proper food and waste management are critical to prevent bears from becoming conditioned to associate human activity as a food source. When female bears and their cubs emerge from dens (April/May), they start looking for food. Extra care is necessary to properly store and dispose of food waste to prevent bear attraction and their entry into work areas at these times.

3 General Policies and Mitigation

Winter Exploration Program personnel will be trained and required to adhere to several general procedures to deter all wildlife species from entering, and remaining in, work areas for the safety of personnel and wildlife. Also, the Drill Site Manager or Shift Supervisor will maintain a file of wildlife observation forms that will be submitted to the appropriate agency (ADF&G or USFWS).

3.1 Food Handling and Food Waste Management

Nothing attracts wildlife like food; therefore, proper food handling and food waste management is imperative. The following measures will be implemented to minimize bear attraction:

- Winter Exploration Program personnel will NOT feed wildlife. Any personnel observed doing so will be subject to disciplinary action, up to and including dismissal from the project.
- Winter Exploration Program personnel will NOT eat outside of buildings or vehicles.
- Winter Exploration Program personnel will segregate food waste from non-food waste and discard the food waste only in designated receptacles.
- Food waste will not be placed in dumpsters or other receptacles that are not secure from wildlife access.
- Food in vehicles is discouraged, but if Winter Exploration Program personnel must take food into vehicles, the food will be stored in containers that minimize odors, such as plastic bags or plastic containers with lids.
- Winter Exploration Program personnel will remove all garbage, including used food containers, from vehicles at the end of each shift, or more frequently if appropriate disposal receptacles are available.
- Kitchen grease will not be discarded in receptacles marked for food waste.
- Winter Exploration Program personnel will contact the Drill Site Manager or Shift Supervisor if any improperly managed food waste is observed or for answers to questions on refuse management.

3.2 Handling Non-Food Materials and Non-Food Waste

Non-food materials (e.g., plastic, sanitary waste from rooms and restrooms, rubber, motor oil, and chemicals such as antifreeze) can be attractive to some wildlife species, and if these materials are not handled properly, they can increase the likelihood of wildlife encounters. Proper waste handling procedures will include the following:

- Potentially harmful materials will be stored in secure containers (e.g., 55-gallon steel drums) or inside a secure building.
- Storage containers will be inspected periodically to ensure that they are secure, in good condition, and no spills have occurred.
- All waste will be properly disposed of.
- Winter Exploration Program personnel will contact the Drill Site Manager or Shift Supervisor if any improperly managed non-food materials or waste is observed or for answers to questions on waste management.

3.3 Infrastructure Design and Maintenance

Infrastructure can potentially provide nesting or denning cover for wildlife. Listed below are some examples of infrastructure design and maintenance activities that can help minimize the attraction of wildlife. Great Bear will implement these where practicable.

- The design of the infrastructure of any site should incorporate modifications to reduce the attractiveness of the site to wildlife (e.g., installation of skirting under elevated buildings where practicable, proper lighting, capping of all pipes, blocking culverts in the winter, and the placement of gates or other barriers on stairwells).
- Elevated structures, including roads and pads, can collect drifting snow that can serve as artificial denning habitat if not properly managed. The prevailing wind is from the northeast, and the direction of drifting should be taken into account when placing barriers or storing materials.
- If materials must be stored outdoors, they should be arranged in a way to minimize the space where bears could be concealed.
- Personnel areas, including all entrance areas, should be illuminated during working hours of darkness.

3.4 Injured Bears

If a bear that is injured or stressed is observed, Winter Exploration Program personnel will maintain a safe distance from the bear and will not approach it to provide assistance in any form. Injured bears can be aggressive. Winter Exploration Program personnel must instead immediately notify the Drill Site Manager or Shift Supervisor to provide observation details, such as the species, the location of the bear, and the type of injury or problem.

The Drill Site Manager or Shift Supervisor will contact the appropriate agency immediately, either the ADF&G or the USFWS, and work with that agency to take the necessary action. The presence of a potentially dangerous predatory species may require actual agency supervision

before any action can be taken. Figure 2 (at the end of this section) provides agency contact information.

If an animal is severely injured, it may be dispatched (i.e., killed), with permission from either the ADF&G or USFWS. A firearm will be kept on the Winter Exploration Program site in the control of the Drill Site Manager or the Shift Supervisor for this purpose, but only authorized Winter Exploration Program personnel will be allowed to use the firearm. Authorized Winter Exploration Program personnel include only those individuals who have completed an 8-hour firearm safety course and have been identified for dispatch tasks by the Drill Site Manager or Shift Supervisor.

3.5 Grizzly Bears

Brown bears (*Ursus arctos*), commonly referred to as grizzly bears, occur throughout northern Alaska from the Brooks Range to the Arctic Ocean. They are present in small populations in and around the Winter Exploration Program area; therefore, there exists a possibility that Winter Exploration Program personnel may encounter a grizzly bear.

Typically, grizzly bears are active in the summer and occupy dens during the late fall (October or November), throughout winter, and into early spring (April) (Craighead and Craighead 1972). All occupy winter dens, with pregnant females entering earlier and emerging later with their cubs, as compared to males and non-pregnant females, whose hibernation duration is somewhat shorter (Craighead and Craighead 1972).

Winter construction of access roads, infrastructure sites, and facilities could result in den disturbance and/or destruction. All practicable measures will be taken in order to avoid den disturbance. Construction and Winter Exploration Program operations could also cause direct or indirect sensory disturbance of denning grizzly bears due to noise from Winter Exploration Program activities. Den destruction or abandonment can cause mortality since a bear that has been displaced from its den may not be able to dig a new den in frozen ground. Additionally, the next spring's cubs could also be lost if a replacement den is not found quickly.

3.5.1 Early Detection and Avoidance

To minimize the potential for human-grizzly bear interactions, early detection and avoidance procedures will be followed. Great Bear has contacted the ADF&G to identify known den locations in and around the Winter Exploration Program area and winter access roads.

Winter Exploration Program-related attractants for grizzly bears will be food and waste; however, even when garbage and other nonnatural foods are not available, grizzly bears are curious about their surroundings and will investigate camps, vehicles, and buildings. Darkness, vegetation cover, blind corners, noise, wind, precipitation, fog, and other conditions may make it difficult to see or hear a bear. Winter Exploration Program personnel should remain alert for the presence of grizzly bears in and near Winter Exploration Program facilities. The following are general precautions to be taken during Winter Exploration Program operations:

- Manage all potential bear attractants, particularly food, waste, and chemicals, in accordance with Great Bear waste management and chemical storage policies. Refer to sections 3.1 and 3.2 for associated guidance.

- Inspect the work site for bear or bear sign from the safety of a vehicle or building before entering the work site. Check stairs and access areas, as well as below structures, to avoid a surprise encounter. Be aware that bears can also be concealed behind dumpsters, conexes, and stacked materials.
- Be especially alert when beyond illuminated areas or when weather prevents good visibility. Make lots of noise before walking into an area with poor visibility.
- Use the buddy system when working outdoors and, if necessary, designate a “Bear Guard” to regularly inspect the work area and scan for bears.
- Work with other operations being conducted simultaneously on pad to assure each other’s actions are compatible with providing protection from and avoidance of bears.
- Check with the Drill Site Manager or Shift Supervisor before working outside in areas not secure from grizzly bears for the latest information on bear sightings in the area.
- Maintain visual or radio contact with the Drill Site Manager or the Shift Supervisor when working outdoors to receive any grizzly bear sighting alerts.
- Report all grizzly bear sightings to the Drill Site Manager or Shift Supervisor.

3.5.2 Interaction and Response

If a bear is observed in the Winter Exploration Program area, the following precautions should be taken:

- Depending on the distance between the bear and the activities, retreating to vehicles, emergency shelter, or temporary buildings for safety may be necessary.
- Personnel must never approach or crowd a bear. Each bear is unique in its comfort level with humans; the more distance between personnel and the bear, the better for conflict avoidance.
- If a bear is encountered at a close distance, remain calm. Attacks are rare. Most bears are interested only in protecting food, cubs, or their "personal space." Once the threat is removed, they will move on. Remember the following:
    - *Identify Yourself*: Let the bear know you are human. Talk to the bear in a normal voice. Wave your arms. Help the bear recognize you. If a bear cannot tell what you are, it may come closer or stand on its hind legs to get a better look or smell. A standing bear is usually curious, not threatening. You may try to back away slowly diagonally, but if the bear follows, stop and hold your ground.
    - *Don't Run*: You can't outrun a bear. They have been clocked at speeds up to 35 mph, and like dogs, they will chase fleeing animals. Bears often make bluff charges, sometimes to within 10 feet of their adversary, without making contact. Continue waving your arms and talking to the bear. If the bear gets too close, raise your voice and be more aggressive. Make noise, but never imitate bear sounds or make a high-pitched squeal.
    - *If Attacked*: If a bear actually makes contact, surrender! Fall to the ground and play dead. Lie flat on your stomach, or curl up in a ball with your hands behind

your neck. Typically, a bear will break off its attack once it feels the threat has been eliminated. Remain motionless for as long as possible. If you move, and the bear sees or hears you, it may return and renew its attack. In rare instances, an attacking bear may perceive a person as food. If the bear continues biting long after you assume a defensive posture, it likely is a predatory attack. Fight back vigorously.

Grizzly bear hazing will be done or approved by the Drill Site Manager or Shift Supervisor after consultation with the ADF&G. Designated bear hazers will be properly trained and authorized to haze bears. Personnel other than the designated bear hazer will not attempt to haze a bear. Vehicles may be used to herd bears away from work locations. In addition, noisemakers such as horns and sirens may be used to cause the bear to avoid the work locations. Firearms will not be used to haze bears.

3.5.3 Monitoring and Reporting

Winter Exploration Program personnel will likely be the primary source of grizzly bear sighting information. If a bear or bear sign (e.g., tracks or scat) is observed in or near work areas, camp buildings, or storage locations, the observer must first ensure his/her own safety by returning to a secure location, if necessary, and then immediately report the sighting to the Drill Site Manager or Shift Supervisor. Personnel should never remain in an exposed position in order to view or photograph a bear.

When a bear sighting is reported to the Drill Site Manager or Shift Supervisor, he/she will initiate the alert system. Workers in the area will be contacted immediately and directed to move to a secure location. Secure areas may include buildings (but not light structures) or the cab of either a large work vehicle or heavy machinery. If only a pickup or other similarly sized vehicle is available, personnel should drive at least 50 yards from the bear and observe the bear with the vehicle engine running.

The alert will consist of voice communication that provides specific information on the location of the bear, instructions on where to move to for safety, and other evacuation instructions. Only when the Drill Site Manager or Shift Supervisor determines that the bear is no longer present in the work area will the alert be lifted.

The Drill Site Manager or Shift Supervisor will verify the grizzly bear sighting and complete an ***Oilfield Grizzly Observation Form*** (Appendix A). A copy of the completed report will be retained on site, and a copy will be faxed to Dick Shideler with the ADF&G (refer to Figure 2 for contact information).

3.6 Polar Bears

Polar bears (*Ursus maritimus*) are considered arctic marine mammals and are protected from hunting or harassment under the MMPA. They are also designated a threatened species under the Endangered Species act of 1973. Polar bears are excellent swimmers and can run up to 25 miles per hour. Because of their size, speed, and curious nature, any encounter with a polar bear is potentially dangerous. During the summer months, polar bears normally hunt seals for food far out on the pack ice. As winter approaches, newly formed ice bridges may bring them closer to

land. Only pregnant females use dens during the winter months, and they emerge with their cubs in March.

In their natural setting, polar bears eat only meat, mostly seals. However, in areas with human activity, they may be attracted to plastic, rubber, motor oil, and chemicals such as antifreeze. Bears may visit work sites because of curiosity or food odor, but their visits will be transitory if they are not rewarded with food.

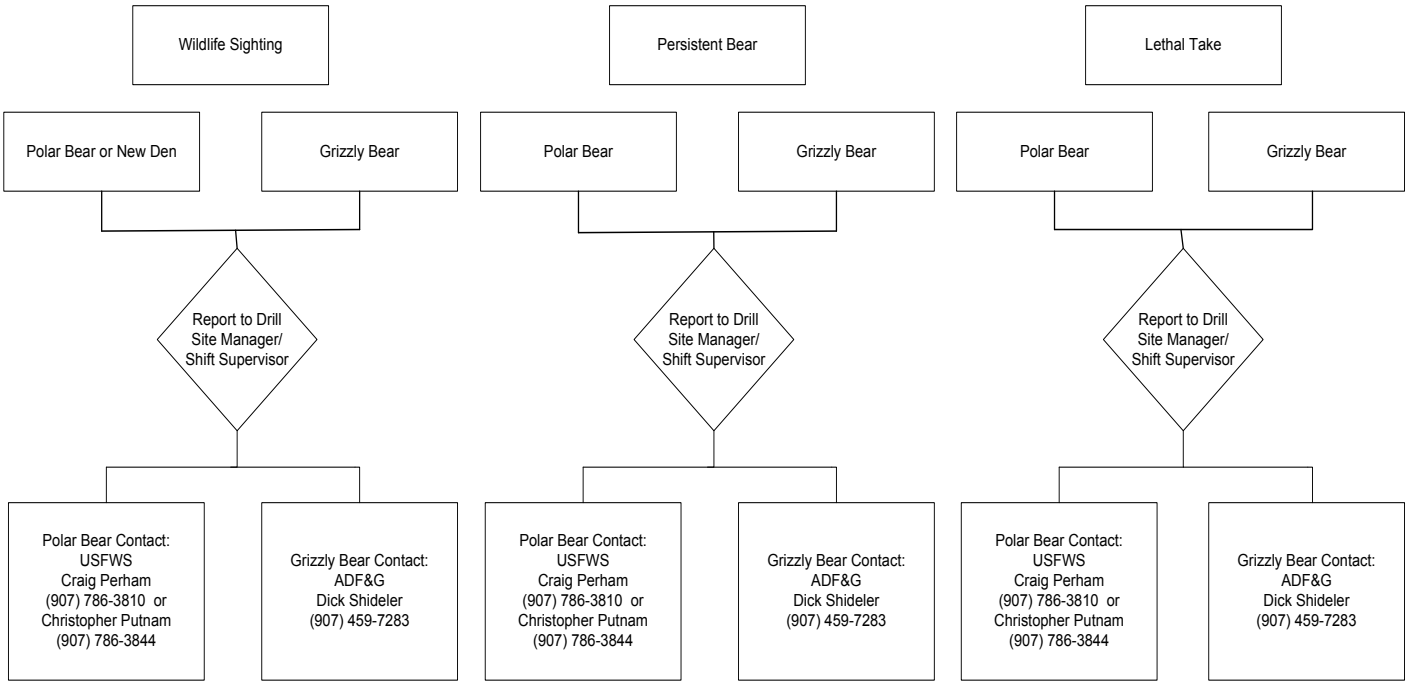
The likelihood of a polar bear encounter in the Winter Exploration Program area is low. Polar bears are coastal animals, and the Winter Exploration Program's northernmost exploratory well location is approximately 25 miles from the coast. Polar bears have been documented far inland, but this is a rare occurrence. The most likely case of a polar bear occurring near the Winter Exploration Program area would be a bear traveling up the Sagavanirktok River bed.

Figure 1 shows the closest known polar bear den location to the Winter Exploration Program Area. However, more importance will be placed on evaluating habitat within the Winter Exploration Program area that is similar to habitat where bear den locations have been congregated in the past. Great Bear will work with the USFWS to identify habitat within the Winter Exploration Program area that may be important to polar bears, and additional mitigation measures will be implemented if necessary.

3.6.1 Early Detection and Avoidance

Polar bear early detection and avoidance procedures are similar to those for grizzly bears. Polar bears, like grizzly bears, are attracted to food and waste. They are also curious creatures that may investigate camp sites, vehicles, and buildings simply because of their curiosity. The polar bear's white fur makes it exceptionally difficult to be seen when there is snow cover. Darkness, blind corners, noise, wind, precipitation, and fog will also add to the difficulty to see or hear a polar bear. Winter Exploration Program personnel must be alert to the possibility that a polar bear may enter the Winter Exploration Program area, and all personnel shall follow the general early detection and avoidance precautions presented for grizzly bears in Section 3.5.1.

Figure 2 Bear Notification Chart



3.6.2 Interaction and Response

Refer to Section 3.5.2 for guidance on interaction and response in the event a polar bear is sighted.

Polar bear hazing will be done or approved by Drill Site Manager or Shift Supervisor only after consultation with the USFWS. Designated bear hazers will be properly trained and authorized to haze bears. Personnel other than the designated bear hazer will not attempt to haze a bear. Vehicles may be used to herd bears away from work locations. In addition, noisemakers such as horns and sirens may be used to cause the bear to avoid the work locations. Firearms will not be used to haze bears. Great Bear has requested a hazing authorization under sections 109(h)(1) and 112(c) of the MMPA to intentionally take (haze) polar bears by harassment (deterrent activities) for the protection of both human life and polar bears while conducting Winter Exploration Program activities in 2014-2015.

3.6.3 Monitoring and Reporting

Refer to Section 3.5.3 for the alert system that will be implemented if a bear (grizzly or polar) or bear sign is sighted.

If a previously unknown occupied den is discovered within 1.6 kilometers (km) (1 mile) of Winter Exploration Program activities, work will cease, and the USFWS will be contacted for guidance.

Reporting for a polar bear sighting will differ slightly from the required reporting for grizzly bear. When a polar bear is sighted, the Drill Site Manager or Shift Supervisor will verify the sighting and complete a ***Polar Bear Activity/Sighting Form*** (Appendix B). A copy of the completed report will be retained on site, and a copy will be faxed to Craig Perham of the USFWS. As a courtesy, a copy should also be sent to Dick Shideler with the ADF&G. Figure 2 provides agency contact information.

Any observation of a polar bear during Winter Exploration Program activities will be reported to the USFWS (Craig Perham) within 24 hours. The results of monitoring effort will be submitted to the USFWS for review within 90 days of completing the year's activities. The report will include:

- A summary of the monitoring efforts, including total hours, total distances, and distribution throughout activities;
- Analysis of factors affecting the visibility and detectability of polar bears by specified monitoring;
- Analysis of the distribution, abundance, and behavior of polar bear sightings in relation to date, location, weather conditions, and operational state; and
- Documentation of any "take" (by hazing) of polar bears.

3.6.4 Polar Bear "Take" Actions

Early detection and worker awareness will reduce chance encounters with a polar bear. If a bear remains on site for an extended period, the USFWS (Craig Perham) will be contacted for advice. Great Bear has requested authorization under sections 109 (h)(1) and 112 (c) of the MMPA to intentionally take polar bears by harassment (deterrent activities) for the protection of both human life and polar bears while conducting Winter Exploration Program activities.

If a "take" occurs despite preventive actions, the USFWS (Craig Perham) will be contacted (Figure 2 shows contact information). If there is a lethal "take," due to an encounter with a severely injured bear described in Section 3.4, the entire animal carcass will be transported to Deadhorse for sealing and processing under the direction of a responsible USFWS agent designee. The USFWS will determine disposition of useable meat (e.g., donation to a Native village).

The designated and trained bear watch (Drill Site Manager or Shift Supervisor) is responsible for completing the following:

- Record all the event details including time, exact location, bear's behavior, preventive measures followed, etc.
- Record all witness statements.

4 TRAINING AND MEETINGS

All Great Bear and contractor personnel working on the Winter Exploration Program will receive an environmental orientation before beginning work. This orientation will cover the information included in this Plan and will reinforce the importance of proper waste-handling and food management to minimize the potential for human-wildlife interactions. Additionally, information

specific to human-wildlife interactions will be disseminated to Winter Exploration Program personnel in the form of environmental alerts and updates, safety bulletins, and safety meeting briefings for the duration of the Winter Exploration Program. The Drill Site Manager or Shift Supervisor will oversee the dissemination of this information. The Drill Site Manager or Shift Supervisor will also be responsible for maintaining completed copies of Winter Exploration Program-specific human-wildlife interaction forms on site and routing the forms as necessary to the ADF&G or the USFWS. Blank copies of all applicable forms are provided as appendices.

5 AT-RISK LOCATIONS AND SITUATIONS

The following are lists of locations, situations, and activities where bear encounter risks may be higher and where attention to mitigating risks is essential.

Possible bear encounter locations include:

- drill pad and drill rig;
- access roads;
- camp facilities;
- food consumption areas; and
- "blind" areas that are obscured by facilities, equipment, or other obstacles.

At-risk bear encounter situations and activities include:

- survey work;
- site cleanup;
- solid waste handling and disposal;
- construction;
- drilling support;
- maintenance;
- inexperienced crews; and
- dark/unlighted and visually obscured areas.

6 SUBSISTENCE PLAN OF COOPERATION

Native subsistence hunters sometimes kill polar bears near the Beaufort Sea coast and brown bears further inland. Caribou are also hunted by local community residents. The portion of the Dalton Highway Corridor Management Area where Winter Exploration Program activities are proposed already has hunting restrictions. The area is open for the taking of big game, small game, and fur animals by bow and arrow only.

Great Bear is committed to minimizing the potential for Winter Exploration Program activities to interfere with subsistence activity. It is not anticipated that subsistence hunters will be active near Great Bear's proposed Winter Exploration Program activities. However, in the event that subsistence hunters are present, Great Bear's Drill Site Manager will be responsible for mitigating potential subsistence hunting conflicts. Drill Site Manager duties will include the following:

- Accompany staff during fall and winter activities in the Program area.

- Provide guidance on avoiding potential impacts to subsistence users, areas, and resources.
- Observe and document wildlife including caribou and bears.
- Act as a liaison between Great Bear staff and local residents; relay concerns and information from residents to Great Bear staff.

The following mitigation measures will be implemented in order to protect subsistence harvest by local community residents:

- Comply with North Slope Areawide Lease Sale Mitigation Measures and Lessee Advisories.
- Conduct exploration, development, and production activities in a manner that prevents unreasonable conflicts between lease-related activities and subsistence activities.

Great Bear demonstrates its commitment to establishing stakeholder trust and respect by conducting community meetings and community leadership meetings in potentially affected subsistence communities. During these meetings, comments and concerns about Great Bear activities in the Transportation Corridor were shared by community members and leadership. Great Bear has conducted several meetings in the past and has plans to continue engagement with a meeting with the North Slope Borough on October 17, 2014 and meetings in November 2014 with leaders and the communities of Nuiqsut, Barrow and Anaktuvuk Pass. Table 2 lists meetings already conducted.

Table 2 Great Bear Stakeholder Engagement Meetings Already Held

Meeting	Location	Date
North Slope Borough (NSB)	Anchorage	November 2010
NSB	Anchorage	April 2010
NSB Planning Commission	Barrow	May 26, 2011
Leadership Meeting	Nuiqsut	August 23, 2011
Community Meeting	Nuiqsut	August 23, 2011
Leadership Meeting	Barrow	August 24, 2011
Community Meeting	Barrow	August 25, 2011
NSB Planning Commission	Barrow	August 25, 2011
Leadership Meeting	Anaktuvuk Pass	August 26, 2011
Community Meeting	Anaktuvuk Pass	August 26, 2011

To supplement community input collected during leadership and community meetings, and to fulfill community cooperation requirements under the Beaufort Sea Incidental Take Regulations, AES, on behalf of Great Bear, contacted community leadership representatives to identify any potential impacts from Winter Exploration Program Activities on polar bear subsistence hunting. The feedback received by community representatives from Barrow, Nuiqsut, and Anaktuvuk Pass, such as the Alaska Nanuuq Commission, the Native village of Barrow Wildlife Director, and the Mayor of Anaktuvuk Pass indicated that subsistence hunting for polar bears does not

occur near Great Bear's potential drill sites. Appendix C includes Records of Communication documenting those conversations.

Great Bear will continue to gather feedback from community representatives from potentially-affected subsistence communities. If a concern regarding the subsistence hunting of polar bears arises, Great Bear will engage in open communication to identify and evaluate potential measures to mitigate and minimize identified conflicts between the Winter Exploration Program and polar bear subsistence activities.

7 REFERENCES

Craighead, F.C., Jr., and J.J. Craighead. 1972. "Grizzly bear prehibernation and denning activities as determined by radio tracking." *Wildl. Monogr. 32*. 35 pp.

Appendix A
Grizzly Bear Reporting Form

Oilfield Grizzly Bear Reporting Form

Bear ID# (ADF&G use)__ 6/2011 rev.

OBSERVER _____ **COMPANY/AGENCY** _____

OBSERVATION DATE _____ **TIME**: Start _____ Stop _____

OBSERVATION FROM: ☐ Vehicle ☐ Ground ☐ Building ☐ Other _____

OBSERVER DISTANCE FROM BEAR _____ meters

GENERAL LOCATION: ☐ Deadhorse ☐ EOA ☐ WOA ☐ Kuparuk ☐ Endicott

☐ Milne ☐ Badami ☐ Alpine ☐ Pt. Thomson ☐ TAPS (MP #) _____

Other (latitude/longitude if known) _____

SPECIFIC LOCATION [*Example: 500 meters N of DS 14*]: _____ meters

_____[direction] of _____[facility name]

DUMPSTER PRESENT? ☐ Yes ☐ No ☐ Unknown

WEATHER: _____ºF Wind direction_____ at _____mph

☐ Clear/partly cloudy ☐ rain ☐ fog ☐ snow

BEAR IDENTIFICATION: EAR FLAG COLOR [**Note**: right & left of bear, not observer]

_____ Color right _____ Color left NATURAL MARKINGS [scars, torn ears, ETC.] _____

OTHER BEARS PRESENT? ☐ None No. of new cubs _____ No. of yearlings _____

No. of 2 year olds _____ Number of other adults _____ No. unknown _____

BEAR ACTIVITY WHEN FIRST SEEN: ☐ Resting ☐ Feeding (natural food)

☐ Feeding (garbage) ☐ Traveling ☐ Traveling/feeding

☐ Other [describe]: _____

BEAR REACTION TO OBSERVER: ☐ Ignore ☐ Approach ☐ Avoid

Were other people in area (not with observer)? ☐ Yes ☐ No ☐ Unknown

BEAR REACTION TO OTHER PEOPLE: ☐ Ignore ☐ Approach ☐ Avoid

REACTION COMMENTS _____

_____

DETERRENCE ACTION TAKEN? ☐ Yes ☐ No

If yes, did you use: ☐ Horn ☐ Siren ☐ Rubber slug ☐ Bean bag

☐ Cracker shell ☐ Other [describe] _____

BEAR'S REACTION TO DETERRENT: ☐ Ignore ☐ Approach ☐ Withdraw

ADDITIONAL REMARKS _____

_____

Dick Shideler, Alaska Dept. Fish & Game; FAX 907-459-7332, or email **dick.shideler@alaska.gov**

Appendix B
Polar Bear Reporting Form

United States Department of the Interior

Fish and Wildlife Service
1011 E. Tudor Road
Anchorage, Alaska 99503-6199

Polar Bear Sighting Report

Company: _____ LOA #: _____
Date: _____ **Observer Name:** _____
Time: _____am / pm / 24 **Phone/Email:** _____

Location: _____
_____

Latitude: _____ **Longitude:** _____ **Datum:** _____

Weather Conditions: Fog_____ Snow_____ Rain_____ Clear_____ Temperature_____°F / °C

Wind Speed_____ mph / kts Wind Direction (from)_____ N NE E SE S SW W NW

Visibility: Poor_____ Fair_____ Good _____ Excellent_____

Number of Bears: (total number of bears & how many of each type**) Total # Bears**_____

	adult	sub-adult		2 year-old	yearling	cub of year
Male	_____	_____	_____	_____	_____	
Female	_____	_____	_____	_____	_____	
Unknown		_____	_____	_____	_____	_____

Closest Distance of Bear(s): from personnel_____ facility_____ m / yd / ft

Bear Behavior (Initial Contact): curious ignore aggressive walk run swim hunt feed rest
other _____

Bear Behavior (After Contact): curious ignore aggressive walk run swim hunt feed rest
other _____

Description of Encounter: _____
_____
_____
_____

Duration of Encounter: _____ Possible Attractants Present: Y / N

Describe Attractants: _____

Deterrents Used & Distance: Y /
N m / yd/ ft

_____ Vehicle	_____ Crackershell	_____ Other (describe)
_____ Horn/Siren/Noise	_____ Rubber Bullet	_____
_____ Spotlight/Headlight	_____ Bean Bag	__

Agency/Contacts:
USFWS Craig Perham (786-3810) (Fax 786-3816)_____ Time_____ Date _____
ADF&G Dick Shideler (459-7283) (Fax 459-7332)_____ Time_____ Date _____
Other_____ Time_____ Date_____

Appendix C
Records of Communication with Community Leadership Representatives Regarding Polar Bear Subsistence Harvest

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Regulatory and Technical Services

RECORD OF COMMUNICATION

☒ **TELEPHONE COMMUNICATION**

☐ **Incoming** ☒ **Outgoing**

☐ **CONVERSATION**

Date/Time	Monday, September 12, 2011; 10:23am
Author	Elizabeth Rexford
Project Number	**15362**
Individual	**Isaac Nukapigak**
Phone Number	**907.480.6220**
Organization	**Kuukpik Corporation**
Location	**Nuiqsut, AK**

SUBJECT: LOA for polar bears

NOTES:
I left a message with Mr. Nukapigak last week, but he was at Cross Island finishing up whaling activities for the season. He answered the phone this morning when I called him again.

I informed Mr. Nukapigak that Great Bear will be applying for a Letter of Authorization from the USFWS for coverage under the current 5-year Beaufort Sea Incidental Take Regulations for the incidental (non-lethal), and intentional (hazing) take of polar bears. I explained that as part of the LOA application process, Great Bear will gather input from representatives of Nuiqsut, Barrow, and Anaktuvuk Pass to identify any potential impacts on subsistence hunting of polar bears. I told him we are contacting him as a representative of the community of Nuiqsut and President of Kuupik Corporation.

I asked Mr. Nukapigak if residents of Nuiqsut hunt for polar bears near Great Bear's potential drill sites. He replied that people from the community of Nuiqsut do not go that far south to hunt polar bears so there would be no impact on polar bear subsistence activities as a result of the proposed E&E Program activities. He also responded that he does not think polar bears travel that far south.

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RECORD OF COMMUNICATION

☒ **TELEPHONE COMMUNICATION**

☒ **Incoming** ☐ **Outgoing**

☐ **CONVERSATION**

Date/Time	Friday, September 09, 2011; 11:35am & 1:13pm
Author	Elizabeth Rexford
Project Number	**15362**
Individual	**Thomas Olemaun**
Phone Number	**907.852.4411**
Organization	**Native Village of Barrow**
Location	**Barrow, AK**

SUBJECT: LOA for polar bears

NOTES:

I left a message on Mr. Olemaun's voicemail and he returned my phone call in the afternoon. I informed Mr. Olemaun that Great Bear will be applying for a Letter of Authorization from the USFWS for coverage under the current 5-year Beaufort Sea Incidental Take Regulations for the incidental (non-lethal), and intentional (hazing) take of polar bears. I explained that as part of the LOA application process, Great Bear will gather input from representatives of Nuiqsut, Barrow, and Anaktuvuk Pass to identify any potential impacts on subsistence hunting of polar bears. I told him we are contacting him as a representative of the Native Village of Barrow.

I asked Mr. Olemaun if residents of Barrow hunt for polar bears near Great Bear's potential drill sites. Thomas replied that Great Bear's drill sites are on the road system, and no one harvests polar bears that far south.

Mr. Olemaun forwarded an email to Joe Sage, Native Village of Barrow Wildlife Director and an alternate representative for the Alaska Nanuuq Commission, requesting input.

PROJECT: 15362<u>15362</u>

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RECORD OF COMMUNICATION

☒ TELEPHONE COMMUNICATION

☐ Incoming ☒ Outgoing

☐ CONVERSATION

Date/Time	Friday, September 09, 2011; 11:45am
Author	Elizabeth Rexford
Project Number	15362
Individual	**Ester Hugo**
Phone Number	**907.661.3612**
Organization	**City of Anaktuvuk Pass**
Location	**Anaktuvuk Pass, AK**

SUBJECT: LOA for polar bears

NOTES:

I called Ms. Hugo and told her I was calling on behalf of Great Bear. I informed her that Great Bear will be applying for a Letter of Authorization from the USFWS for coverage under the current 5-year Beaufort Sea Incidental Take Regulations for the incidental (non-lethal), and intentional (hazing) take of polar bears. As part of the LOA application process, Great Bear will gather input from representatives of Nuiqsut, Barrow, and Anaktuvuk Pass to identify any potential impacts on subsistence hunting of polar bears. I told her we are contacting her as a representative of the City of Anaktuvuk Pass.

I asked Ms. Hugo if the community of Anaktuvuk Pass hunts for polar bears near Great Bear's proposed drill sites. She responded that Anaktuvuk Pass does not hunt for polar bears, because they are too far inland.

PROJECT: 15362

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