



U.S. Army Corps
of Engineers
Alaska District

Department of the Army
Record of Decision

APPLICANT: Exxon Mobil Corporation and PTE Pipeline LLC

ACTIVITY: Point Thomson Development Project (PTP)

APPLICATION NO.: POA-2001-1082-M1

This document records the U.S. Army Corps of Engineers' (Corps) decisions related to the findings and determinations for this action. This document also presents comments received during the public review processes and responses to those comments. The applicant has applied to the Corps for permits under Section 404 of the Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act (RHA) of 1899 for construction activities required for hydrocarbon exploration and development on the North Slope of Alaska. This document presents Corps' findings and determinations for the United States (U.S.) Environmental Protection Agency's (EPA) Section 404(b)(1) Guidelines (Guidelines) compliance; public interest review (PIR); and applicable laws, regulations, and executive orders that were considered in the Environmental Impact Statement (EIS) and permit evaluation processes. It also is the record of decision (ROD) that concludes the Corps' implementation of the National Environmental Policy Act (NEPA) for the action. The EPA, U.S. Fish and Wildlife Service (USFWS), and the Alaska Department of Natural Resources (ADNR) acted as cooperating agencies in the EIS process.

Background

The Corps, Alaska District, Regulatory Division received a draft Department of the Army (DA) permit application from the Exxon Mobil Corporation, (applicant) on October 19, 2009 requesting authorization for the placement of fill material in waters of the U.S., and placement of structures and removal of dredged material in navigable waters of the U.S., in connection with the applicant's proposed Point Thomson Project (PTP). These actions fall under Corps' jurisdiction under Section 404 of the CWA and Section 10 of the RHA of 1899. The Corps, as part of its permit review process, developed a Final EIS in compliance with the NEPA.

Exploration in the Point Thomson area began in the winter of 1969/1970 with the drilling of the first exploration well. To date 21 exploratory wells have been drilled on and off shore in the general Point Thomson area, and several gravel structures remain in the area from those exploration activities.

In 2002, the EPA started a NEPA process in response to the applicant's proposed oil and gas development plans for the Point Thomson area, located on the North Slope of Alaska, 60 miles east of Prudhoe Bay on the Beaufort Sea coast. At the time, the EPA was the lead federal agency because the development plans called for the potential designation of ocean dredged-material disposal sites, which would have required EPA authorization under Section 102 of the Marine Protection, Research, and Sanctuaries Act (MPRSA). Preparation of the EIS was discontinued before its completion at the request of the applicant.

In 2006, the ADNR began an effort to terminate the Point Thomson Unit (PTU) and leases, claiming the leaseholders had failed to drill, develop, and produce the Unit and leases in adequate time. The State of Alaska and the PTU Operator, applicant, and working interest owners were involved in a series of legal disputes concerning the PTU until March 29, 2012, when parties involved signed a settlement agreement. The operators and working interest owners have committed to produce condensate liquids from the Point Thomson Reservoir for delivery into the Trans-Alaska Pipeline System (TAPS) by the end of the 2015-2016 winter. The settlement agreement also outlines scenarios and deadlines for future reservoir development and lease schedules. This settlement does not bind the Corps to a particular timeline nor is the Corps a party to this settlement.

The applicant's current proposed project is substantially different from the 2002 plan, and would not be subject to Section 102 of the MPRSA. However, the current development plan would require authorization from the Corps to construct structures in navigable waters of the U.S. under Section 10 of the RHA of 1899 and to discharge dredge and/or fill material into waters of the U.S., including wetlands under Section 404 of the CWA. Therefore, the Corps is the lead federal agency for the Final EIS and is conducting its review of the DA permit application concurrently with the NEPA process.

The proposed project involves development of hydrocarbon resources (gas condensate and possibly oil) from the Thomson Sand Reservoir in the Point Thomson area. The project area is located on the northern edge of Alaska's Arctic Coastal Plain (ACP), 60 miles east of Deadhorse and Prudhoe Bay and 60 miles west of Kaktovik, on the coast of Lion Bay. It is named after a local geographic landform called Point Thomson. A description of the proposed project, including all activities subject to authorization by the Corps, is located in Section 2.1 of this ROD.

Activities on the North Slope are shaped by the extreme conditions of the climate. The sun does not rise above the horizon for about two months in the winter, which leads to an average minimum winter temperature in the project area of -24°F. In summer, the continuous sunlight only results in an average maximum temperature of 55°F due to the latitude. The project area is covered with snow for about 8 months of the year; however, snow may fall at any time of the year.

The project area is defined to extend eastward from Deadhorse to the Staines River and from the lagoon side of Flaxman Island along the Beaufort Sea coast to approximately 8 miles south of the coast line. Most of the Thomson Sand Reservoir is offshore under state coastal waters, while most of the proposed facilities would be located on land. The western boundary of the Arctic National Wildlife Refuge (ANWR) is approximately 2 miles from the easternmost extent of the proposed project. An export pipeline and transportation routes would extend from the Point Thomson facilities to existing facilities to the west.

According to the applicant, since the 1970s, hydrocarbons from the North Slope have contributed a substantial share of U.S. domestic production. Production at Point Thomson would help offset current declines in North Slope production and maintain efficiency of the TAPS. The primary hydrocarbon resource at Point Thomson is natural gas and liquid gas condensate from the Thomson Sand Reservoir; there is also some oil present. Evaluating these hydrocarbon resources is part of the proposed action and would include identifying and assessing the location, size, and characteristics of the reservoir and the resources contained therein, as well as determining the commercial viability of producing those resources. Short-term and long-term flow tests would be required to further define the formation fluids and their producing characteristics and to understand how the reservoir properties and connectivity vary between wells.

Summary of Decision

The information presented in the Corps' determination of the project's compliance with the Guidelines, the PIR, the EIS, and the comments and other supplemental information considered following the public involvement period have been independently reviewed and evaluated. The process has produced sufficient and accurate assessments of the resources, needs, concerns, and other issues that relate to this action and therefore is appropriate for the PIR and alternative analysis required by 33 CFR 320.4(b)4 and 40 CFR 230.10. Based on these considerations, the Corps finds that Alternative B of the Final EIS (the applicant's Proposed Action), with modifications and incorporation of additional mitigation measures as determined under the Guidelines, is the Least Environmentally Damaging Practicable Alternative (LEDPA), and is not contrary to the public interest. Project impacts resulting from the discharge of fill in waters of the U.S., including wetlands (WOUS), will be permanent filling of 267.1 acres of WOUS. This authorization also requires compensatory mitigation for the direct and indirect impacts to WOUS, as described in Section 7.2 of this ROD. A DA permit will be proffered to the applicant. The authorization will include special conditions to avoid and minimize potential adverse impacts and to compensate for unavoidable adverse impacts to the aquatic ecosystem, and to ensure that the project would not be contrary to the public interest and is in compliance with the Guidelines.

All work will be performed in accordance with the attached plan, sheets 1 - 84, dated October 19, 2012.

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1.0 Authority

This permit action is being taken under authority delegated to the District Engineer by 33 CFR 325.8, pursuant to Section 10 of the RHA of 1899 and Section 404 of the CWA.

2.0 Applicant Proposed Project

The applicant submitted a complete DA permit application on October 26, 2011. The application contained a description of what the Final EIS referred to as *Alternative B: Applicant's Proposed Action*. The EIS analyzed impacts of five alternatives including the No Action Alternative and four Action Alternatives. A public notice (PN) was issued concurrently to the release of the Draft EIS on November 18, 2011.

The applicant revised some of the figures and submitted additional figures to further clarify the project. A second PN was issued by the Corps concurrent to the issuing of the Final EIS on July 27, 2012, in order to give the public an opportunity to examine and comment on the revised and additional figures. Comments received on both PNs are discussed in Section 4.0 of this ROD.

2.1 Proposed Project Description

In the July 27, 2012, PN, the applicant initially proposed a total acreage of fill in WOUS of 273.4 acres, subject to authorization by the Corps under Section 404 of the CWA. Fill would include gravel for the construction of drilling/production pads and connecting roads, airstrip, gravel stockpile, vertical support members (VSM) for infield pipelines and an export pipeline, and pilings for a proposed barge offloading facility and service pier. The project would also include construction and rehabilitation of a gravel mine. Fill material would come from a new mine site located at approximately 2.5 miles inland. Dredging and discharge of fill/dredged material in navigable waters, subject to authorization by the Corps under Section 10 of the RHA, would be required in the barge docking area offshore of the Sealift Bulkhead and Service Pier, with a small amount of fill placed onshore. Construction of the barge facilities would also require placement of structures in navigable waters of the U.S., subject to authorization by the Corps under Section 10 of the RHA,

Table 2.1 describes proposed structures in navigable waters of the U.S. Table 2.2 describes the acreage and type of all proposed infrastructure requiring fill in WOUS.

Table 2.1: Proposed Structures in Section 10 Waters of the U.S.		
Component	Footprint (acres)	Type of Material
Service Pier Piles (6)	<0.1	Steel
Mooring Dolphins (8)	<0.1	Steel
Temporary Ramp Supports (6)	<0.1	Steel

The project would comprise two major components: production facilities and an export pipeline. These would include three gravel pads, 5 development wells, infield gathering lines, 12 miles of infield gravel roads, a 5,600 foot airstrip, a gravel mine, and processing facilities and support infrastructure. Construction of two of the three gravel pads (the Central Pad and the East Pad) would involve the expansion of existing gravel fill. Similarly, two of five proposed wells have already been drilled from existing fill at the proposed Central Pad in 2009-2010 under State and local approval. These wells did not require new fill in WOUS, or additional DA authorization.

The use of Long Reach Directional Drilling (LRDD) would allow development of the primarily offshore Thomson Sand Reservoir from three onshore pads located near the coast. The Central Pad (total 56 acres including 13.2 acres of existing fill) would involve the expansion of the existing PTU-3 pad and would accommodate additional drilling, processing facilities, a Class I injection well, and support infrastructure.

Table 2.2: Proposed Fill in Section 10 and Section 404 Waters of the U.S.

Component	Approximate Initial Placement Volume (cy)	New Fill (acres)	Type of Material Discharged
Fill in Section 404 Waters of the U.S.			
Central Pad ^a	602,000	42.8	Pit run gravel fill
Central Pad Access Road (2.7 miles)	151,000	19.9	Pit run gravel fill
East Pad ^b	120,000	11.0	Pit run gravel fill
East Pad Access Road (2.3 miles)	189,000	25.5	Pit run gravel fill
West Pad	214,000	18.9	Pit run gravel fill
West Pad Access Road (4.4 miles)	271,000	33.4	Pit run gravel fill
Alaska State C-1 Pad ^c	17,000	0.0	Pit run gravel fill
Alaska State C-1 Pad Access Road (0.03 miles)	2,200	0.4	Pit run gravel fill
Emergency Boat Launch (onshore)	880	0.05	Pit run gravel fill/concrete
Dredging and Fill Discharge Area	3,900	0.9	Dredged material
Water Source Pad	6,000	0.7	Pit run gravel fill
Water Source Pad Access Road (0.03 miles)	1,100	0.2	Pit run gravel fill
Badami Auxiliary Pad	2,000	0.25	Pit run gravel fill
Badami Pipeline Crossing Pad	1,000	0.16	Pit run gravel fill
Airstrip and Helipad	414,000	42.3	Pit run gravel fill
Airstrip and Helipad Access Road (0.24 miles)	12,000	1.7	Pit run gravel fill
Navaid Pads	15,000	1.6	Pit run gravel fill
Navaid Pad Access Roads (0.22 miles)	9,000	1.5	Pit run gravel fill
Electrical Trenching	2,670	0.4	Organic/inorganic
Gathering and Export Pipeline VSMs	3,600	0.1	Sand slurry/steel
Culvert Scour Protection	-	0.1	Concrete
Gravel Mine	2,254,000 gravel extracted 1,246,000 overburden replaced	49.6	Pit run gravel fill/ overburden
Gravel Mine Access Road (0.14 miles)	23,000	3.3	Pit run gravel fill
Gravel Stockpile	204,000	12.9	Pit run gravel fill
Fill in Section 10 and Section 404 Waters of the U.S.			
Emergency Boat Launch	80	0.2	Pit run gravel fill/concrete
Dredging and Screeding Area	3,900 CY removed	5.5	Dredged material
Total:	3,507,680^d	273.4	-

^a Central Pad footprint would also include the existing 13.2 acre PTU-3 pad for total acreage of 56.0 acres

^b East Pad footprint would also include 4.63 acres of the existing 4.8 acre North Staines River 1 pad for a total acreage of 15.6

^c Alaska State C-1 Pad would also include the existing 4.1 acre Alaska State C-1 pad

^d Does not include extracted gravel or removed dredged material

The West and East Pads would be strategically located to access the western and eastern extents of the Thomson Sand Reservoir. The West Pad (approximately 19 acres) would be a new pad constructed to support drilling and production. It would be located 4 miles west of the Central Pad at 20+ feet elevation. The East Pad would include a new 11-acre pad on the sea coast at 17+ feet elevation connected to the

existing 4.6 acre North Staines River 1 exploration pad, which would be utilized for temporarily staging equipment and camps during drilling. Gathering pipelines, elevated a minimum of 7 feet above the wetland tundra surface on VSMs, would transport hydrocarbons produced from the West and East Pads to the Central Processing Facility (CPF) at the Central Pad.

The Point Thomson Export Pipeline (PTEP) would be a common carrier pipeline and subject to Federal Energy Regulatory Commission (FERC) regulation. The 22-mile long, 12-inch nominal diameter export pipeline would transport processed liquid hydrocarbons from the CPF at the Central Pad to a connection with the British Petroleum's (BP) Badami Facility, Sales Oil Pipeline. The PTEP would also be elevated a minimum of 7 feet above the wetland tundra surface on VSMs. Other associated facilities would include a small gravel pad at Badami to house leak detection and metering skid infrastructure and a small pipeline crossing pad to allow ice road crossings.

The applicant's proposed mitigation measures are presented in Chapter 4 of the Final EIS. Modifications to the original proposal are discussed in Sections 3.3 and 5.4, as a result of the evaluation by the Corps in determining the LEDPA.

2.2 Location

The project is on Alaska's Beaufort Sea coastline, within the North Slope Borough (NSB), approximately 60 miles east of Prudhoe Bay and 60 miles west of Kaktovik, Alaska. Further descriptions of the project setting and location can be found in Sections 3.0, Alternatives Considered and 7.0, Description of the Permitted Project of this ROD.

2.3 Purpose and Need

This section discusses the purpose and need for the project from the applicant's perspective and the Corps' regulatory requirement. The first section provides the applicant's stated purpose and need. The following sections address the questions of whether the project is water dependent, availability of alternatives outside special aquatic sites that would meet project purpose, and the basic and overall project purpose of the project from a Federal perspective.

Applicant's stated purpose and need

In their DA permit application, the applicant states:

The project will initiate commercial hydrocarbon production of the Thomson Sand Reservoir by the winter season of 2015-16, as dictated by the applicant's legal settlement with the State of Alaska signed on March 29, 2012. The project will deliver liquid hydrocarbons to the TAPS Pump Station No. 1 at Prudhoe Bay for shipment to market. Initial production of liquid hydrocarbons is expected to be approximately 10,000 barrels per day (bpd). The Project will delineate and evaluate hydrocarbon resources in the PTU.

ExxonMobil, as PTU operator, and the PTU owners have committed to the production of liquid hydrocarbons from the Thomson Sand Reservoir by winter season 2015-16. The ADNR has recognized this commitment and has authorized production consistent with this schedule. The State's position is that production is required at the earliest feasible time. The proposed project will achieve this important purpose.

Production of liquid hydrocarbons at Point Thomson serves other public purposes and needs. Development of this resource will help the U.S. meet domestic energy demand and reduce dependence on foreign sources of oil. Production at Point Thomson will help offset declining production from Alaska's North Slope reservoirs, and will help maintain the throughput of TAPS.

The project will provide economic benefits to the state, NSB, and local communities through the creation of new jobs and tax revenues. The project will provide an important source of employment for Alaska businesses, workers, and local residents. This will include both temporary jobs during drilling, engineering, procurement, and construction, and long-term jobs supporting permanent operations. The project will be a source of new

revenue for the State of Alaska and the NSB, helping to offset declining revenue from existing hydrocarbon production and facilities.

ExxonMobil believes the project represents the best plan for field development, considering geological, resource, commercial, and legal uncertainties. A principal goal of the project is to establish a design footprint that facilitates future full development of the reservoir and delineation of the hydrocarbon resources of the PTU with the least practicable environmental impact. The project's design and flexibility accommodates foreseeable options for production by winter season 2015-16 and beyond.

The project features a three-pad configuration, the optimal development design for resource recovery, delineation, and conservation, and encompasses the smallest footprint necessary for these purposes. The configuration of the project is designed to delineate and produce reservoir resources by using LRDD techniques from onshore pads. While more direct access to the reservoir would be provided by offshore platforms, the approach chosen minimizes impacts in marine waters. The CPF is located on an expanded existing Central Pad, incorporating the recently drilled PTU-15 and PTU-16 wells.

Development of the Point Thomson field resources beyond winter season 2015-16 is dependent on many factors that cannot be determined at present. Point Thomson is the largest discovered, undeveloped natural gas field in Alaska. No pipeline exists to bring Alaska North Slope natural gas to market, and there is substantial uncertainty about whether or when such a pipeline may be constructed. Nevertheless, Point Thomson natural gas reserves are essential to the development of a gas pipeline. Should such a pipeline be built, natural gas from Point Thomson would be an important energy source for the U.S. and Alaska. Development of the project can be expected to facilitate potential construction of a natural gas pipeline by providing an infrastructure footprint for potential future production of gas. However, gas production and delivery into a pipeline is not part of the project.

Basic project purpose and water dependency [40 CFR 230.10(a)(3)]

The basic purpose of the PTP as defined by the Corps is to produce and transport hydrocarbon liquids. Production and transport of hydrocarbon resources do not require access or proximity to a special aquatic site. Therefore, the Corps finds that the basic purpose of the project is not water dependent.

Overall project purpose [40 CFR 230.10(a)(2) and 2009 HQ SOP page 15]:

The overall purpose of the PTP, as defined by the Corps, is to produce liquid hydrocarbons from the Thomson Sand Reservoir and further evaluate and delineate the reservoir and evaluate the Brookian Group sandstones.

2.4 Scope of Analysis: 33 CFR 325, Appendix B, 7(b)

The scope of analysis for this action includes the impacts, alternatives, and project benefits resulting from the regulated activities identified above.

The scope of analysis relates to the project components the Corps analyzes to meet requirements of NEPA during the DA permit evaluation. These are based on the following factors:

- 1) Whether or not the regulated activity comprises "merely a link" in a corridor type project;
- 2) Whether there are aspects of the upland facility in the immediate vicinity of the regulated activity that affect the location and configuration of the regulated activity;
- 3) The extent to which the entire project will be within the Corps' jurisdiction; and
- 4) The extent of cumulative Federal control and responsibility.

The proposed PTP does not comprise merely a link in a corridor-type project. There are no upland facilities in the immediate vicinity of any size. The entire project falls within the jurisdiction of the Corps.

Proposed activities subject to Section 404 of the CWA are the placement of fill in WOUS, in and adjacent to the Beaufort Sea, a navigable water of the US. Project components include placement of dredged and fill materials associated with drill pads, access roads, pipelines, other infrastructure, and construction of the barge landing. Section 10 of the RHA applies to the construction of any structure in, under, or over any navigable water of the U.S., the excavating from or depositing of material in such waters, or the accomplishment of work affecting the course, location, condition, or capacity of such waters. The sealift facility and service pier are in the Beaufort Sea, a navigable water of the U. S., and are subject to Section 10 of the RHA.

The extent of cumulative federal control and responsibility warrants federal review of the entire project.

Determined Scope for NEPA:

- Only within the footprint of the regulated activity within the delineated water.
- Over entire property.
- Other

The entire project would be constructed in jurisdictional WOUS, except for components constructed on authorized existing fill. Therefore, the entire project is subject to Corps' NEPA evaluation and review. The Final EIS evaluated direct, indirect/secondary, and cumulative impacts of the entire PTP as required by NEPA (42 U.S.C 4321-4347).

Determined Scope (Permit Area) for National Historic Preservation Act:

Tests: All activities, except those on authorized existing fill, are located in WOUS; therefore, the permit area and scope for the National Historic Preservation Act (NHPA) are the same. The Corps determined that the "Permit Area" and the "Area of Potential Effect (APE)" are essentially the same for the proposed PTP. The entire project would be constructed in jurisdictional WOUS, except for components constructed on authorized existing fill.

Determined Scope (Action Area) for Endangered Species Act:

"Action Area" means all areas to be affected directly or indirectly by the Federal action and not merely the area that falls directly under the Corps' regulatory jurisdiction. The determined scope for Endangered Species Act (ESA) is the Action Area, which may be larger than the scope for NEPA, Section 404 and Section 10. The Action Area for the proposed PTP includes all areas of proposed fill, pipeline corridors, work in navigable waters, and navigable access for barge traffic in the Beaufort Sea from Prudhoe Bay to the PTP.

3.0 Alternatives Considered

The Point Thomson area is north of the Arctic Circle within the ACP, north of the Brooks Range on the North Slope of Alaska. The ACP is an expansive ecoregion bounded by the Arctic Ocean on the north and west and extending across Alaska and into Canada. Soils of the region are dominated by permafrost, which profoundly affects vegetation and wildlife communities in this harsh climate. Wetlands and water bodies cover the vast majority of the project area, with upland areas in the minority.

The Thomson Sand Reservoir itself is located beneath WOUS, with the majority of the reservoir being located offshore. Access to the hydrocarbon reservoir, a zone with defined limits capable of being extracted, necessarily limits the location of potential drilling/well pads. Therefore, due to the location of the Thomson Sand Reservoir, limited practicable alternatives to development of that resource, and the predominance of WOUS throughout the region, it is acknowledged that any practicable alternative for development of this project would affect WOUS.

The PTP Final EIS considered a reasonable range of alternatives to meet the applicant's purpose and need.¹ Initial evaluation of alternatives actively involved agency stakeholders and considered each suggestion received in the scoping process. The initial evaluation eliminated project sites in marine waters, including artificial and barrier islands, causeways, subsea pipelines, etc., and focused alternatives development on locations and facilities that would avoid known critical resources, minimize project extent, and minimize the amount of fill placed in WOUS. The only non-wetlands available to be used in project development would be drill pads and other constructed fills that were authorized in WOUS for previous projects. Those man-made sites were used to the maximum extent feasible, but were not large enough or placed in locations where they could support viable project alternatives without additional fill in WOUS.

Screening of the alternatives that were initially considered led to identification of project components that would be required for any viable alternative and to identification of a range of alternatives for each component. Required components included transportation infrastructure, facilities to support drilling, power sources, sources of material for construction and water for operations, and other materials and facilities essential for developing and operating a project that would meet the stated objectives. The process used to develop alternatives and their descriptions is found in Chapter 2 of the Final EIS.

The applicant's proposed action chose among available project components and brought them together to form a complete project alternative that would have all the materials and facilities to support a drilling program to meet their objectives. The Corps, with the assistance of the applicant and cooperating agencies, developed three additional complete action alternatives that represent different ways to balance project needs with the need to avoid or minimize impacts to important resources. Together, those four alternatives, along with the no-action alternative, represent the range of alternatives that were considered in detail for the PTP.

The Corps also used comments and information developed during the NEPA and public review processes to select and combine project components to support the Section 404 of the CWA and Section 10 of the RHA DA permit evaluation. The Corps considered all project components analyzed in the EIS to determine whether the applicant's proposed project complies with the Guidelines and would be the LEDPA.

3.1 No Action

Under the No Action alternative, the applicant may suspend project engineering and planning activities for the evaluation of hydrocarbon resources at Point Thomson. Two existing, drilled-and-capped production wells on the existing PTU-3 Pad (Central Pad) would continue to be monitored in accordance with Alaska Oil and Gas Conservation Commission (AOGCC) regulations and prudent operator practices until the time that they are closed or brought into production in a future project. The No Action Alternative would result in denial of a DA permit.

3.2 Action Alternatives

Common Components

All four action alternatives consist of common components such as gravel production pads, infield and export pipelines, gravel roads, ice roads, a gravel mine, an airstrip, water sources, and support facilities. Support facilities include offices, warehouses and workshops, maintenance buildings, temporary and permanent personnel camps (size and location may vary by alternative), treatment systems for drinking water and wastewater, waste management facilities, communication facilities, electrical power generation and distribution facilities, and an emergency response boat launch ramp. The differences among the action alternatives are primarily in the placement of components. The Central Pad is a common component for all action alternatives. Other components are placed where they would best support objectives of the four action alternatives.

¹ See Section 2.2, Alternatives Development in the Final EIS

Alternative B: Applicant's Preferred Alternative

Alternative B in the Final EIS is referred to as the applicant's Proposed Action and is based on the applicant's proposed project as defined in their final DA permit application, submitted on October 26, 2011. Alternative B would locate the drilling and production facilities on a three-pad configuration that would consist of an enlarged Central Pad (Central Well/Central Processing Pad) and two drilling pads (the East and West Pads). The Central Pad would be located on an expanded version of the PTU-3 gravel pad and would include processing facilities. Section 2.1 of this ROD describes production pads and pipelines associated with Alternative B.

Alternative B: Access and Transportation

Alternative B would utilize ice roads, marine transport by coastal and oceangoing (sealift) barges, air transport by helicopters and fixed-wing aircraft, and gravel roads. During construction, there would be at least two primary seasonal ice roads and infield ice roads between the pads and water sources. During operations, an ice access road to the Point Thomson area would only be used as needed, which is estimated to be once every 5 years. Infield gravel roads would be constructed to connect the Central, East, and West Pads, airstrip, gravel mine and stockpile, and freshwater supply sources. A gravel airstrip that could accommodate a C-130 cargo planes would be constructed approximately 3 miles south of the Central Pad. This alternative would include construction of a sealift facility and a service pier at the coast.

Alternative B: Support Facilities

Most support facilities would be located at the Central Pad. In addition to the pads common to all action alternatives, Alternative B would require two small gravel pads at Badami. The first pad would be connected to the existing Badami pad and would support tie in of the PTEP to the Badami pipeline. A second pad to facilitate ice road crossing of the export pipeline would be constructed south of the main Badami Pad. These pads and connector road would constitute less than 1 acre.

Temporary camps may be located at the East and West Pads during drilling. Ice pads would also be used for temporary stockpiling of overburden materials. An injection well for waste disposal would be located on the Central Pad. Materials that could not be injected or burned would be stored until they could be shipped to Deadhorse for disposal.

Alternative B: Gravel Sources

Gravel for Alternative B would come from a new gravel mine site approximately 2 miles south of the Central Pad and just north and east of the proposed airstrip. After the completion of gravel mining (two winter seasons), overburden would be replaced and the area would be rehabilitated.

Alternative B: Water Needs and Sources

Fresh water would be required for construction of ice roads and pads, camp operations, and drilling and would be trucked from permitted water sources. Fresh water for camp use during construction, drilling would be transported from the existing C-1 mine site reservoir by truck. The C-1 mine site reservoir would continue to be the primary water source during operations.

Alternative B: Logistics

Ice roads would be constructed between the Endicott Spur Road and Point Thomson for export pipeline construction and movement of pioneer camp modules, equipment, and supplies. The sealift facility and service pier would be used for importing and exporting supplies during the open water, barging season. The gravel airstrip would provide year-round access.

Helicopters from Deadhorse would provide access for personnel when other access modes were not available. Air travel can be limited by weather conditions, which can change very quickly on the North Slope. Buses on the ice roads would transport personnel from late January to mid-April during years ice roads are constructed.

Alternative C: Inland Pads with Gravel Access Road

Alternative C was developed to minimize impacts to coastal resources by locating project components inland from the coastline. The alternative would move CPF inland, requiring use of four gravel drilling/production pads. The alternative would include a gravel access road between Point Thomson and the Endicott Spur Road in lieu of constructing a coastal barge facility at Point Thomson. The gravel access road would allow year-round access to Point Thomson and would replace direct marine transport. This alternative also was intended to minimize impacts to hydraulic connectivity by moving linear facilities farther inland and orienting infield gravel roads in a north-south alignment along the area's predominant hydraulic gradient.

Alternative C: Production Pads

The Central Well Pad would be located on the coast and would be an expansion of the existing PTU-3 gravel pad. The Central Well Pad would contain drilling and well infrastructure. The Central Processing Pad would be located 2 miles inland, southwest of the Central Well Pad. The East Pad would be approximately 4.5 miles east of the Central Processing Pad and about one-half mile inland from the coastline. The West Pad would be located a little more than 3 miles west of the Central Processing Pad, and about one-half mile inland. The East and West Drill Pads, and Central Processing Pad would be located on undeveloped sites. The production pads would be connected by a network of gravel roads and infield gathering pipelines. Two additional pads would be constructed for project support: a small water source pad and a gravel mine stockpile pad.

Alternative C: Pipelines

A 51-mile export pipeline would be constructed from the CPF to the existing Endicott common carrier pipeline. The proposed pipeline route from Point Thomson to Endicott would be 500 feet south of and parallel to the gravel access road. Infield gathering pipelines would be constructed to deliver produced hydrocarbons from the Central, East, and West Well Pads, to the CPF for processing. The support members for the production pipeline and injection flow line for Alternative C would be H-shaped, with two parallel VSMs and a horizontal support member (HSM) spanning the distance between them. The H-shaped support structures would have a minimum 7-foot clearance to allow caribou passage. An injection pipeline would run between the CPF and the Central Well Pad using the same VSMs as the gathering line.

The infield water pipeline to convey fresh water for operations would be constructed above ground on timber supports to raise the pipes 12 inches off the ground. The total height would be approximately 24 inches. The water line would generally follow the infield road from the C-1 mine reservoir to the Central Processing Pad, but would not go to the East and West pads.

Alternative C: Access and Transportation

Transportation to Point Thomson in Alternative C would be by ice roads, gravel roads, and aircraft. No barge facilities would be constructed at Point Thomson and no barges or other watercraft would be used as routine transportation to or from Point Thomson. Within Point Thomson, the infield gravel road network would be the primary way for personnel, materials, and equipment to travel. Modules/equipment would be transported from their fabrication site to Prudhoe Bay via sealift barge, staged at Deadhorse, and then transported to the project area when ice roads were available. Prudhoe Bay infrastructure would need to be evaluated and may require upgrades to accommodate the landing of sealift barges. Studies would have to be completed to determine the maximum size modules that the roads and bridges in the Deadhorse area could support. Either the modules would have to be designed to meet the road/bridge specifications or the roads and bridges would need to be upgraded, depending on the results of the studies.

A gravel access road would be constructed to provide access to and from Point Thomson during operations. This road would be aligned between 3 and 8 miles south of the coastline, beginning at the Endicott Spur Road south of the Badami common carrier pipeline, and continuing eastward to Point Thomson. The gravel access road would be approximately 500 feet to the north of the export pipeline. An ice road would be built to support the construction of the gravel road. Another ice road would be constructed for VSM and export pipeline construction. An ice road would be built parallel to the

pipeline ice road. This ice road would be used for transporting materials, supplies, and modules to and from Point Thomson. Perpendicular ice roads would be built between the pipeline and transport ice roads so that trucks would be able to maneuver around slow moving modules. Other ice roads would be built for construction and as needed during operations.

A gravel airstrip would be constructed at the abandoned West Staines gravel airstrip, which would also be incorporated into the new gravel access road alignment. The new airstrip would accommodate a C-130 cargo plane.

Infield gravel roads would be constructed to connect the Central, East, and West Pads to the CPF, airstrip, gravel mine and stockpile, and freshwater supply sources. Infield gravel roads would be oriented north-south and located, where possible, a minimum of 500 feet from elevated pipelines.

Alternative C: Support Facilities

The gravel access road would require approximately 3 years of construction before it would be ready for use. Until that time, all materials and supplies for construction and drilling, including annual fuel supplies would be delivered to Point Thomson by air or ice road.

A C-1 injection well for waste disposal would be located on the Central Processing Pad. Materials that could not be injected or burned would be stored until they could be shipped to Deadhorse for disposal.

Alternative C would require additional gravel storage pads, including gravel storage pads at each mine site along the gravel access road, a gravel pad at the C-1 mine site reservoir, and a new gravel pad at Deadhorse for module storage. Ice pads would also be used to support construction works.

Alternative C: Gravel Sources

Gravel for pads would come from the new gravel mine site located near the proposed Central Processing Pad. Construction of the gravel access road would require up to 5 additional gravel mines, sited approximately every 10 miles along the proposed road corridor.

Alternative C: Water Needs and Sources

During construction, fresh water would be transported from the C-1 mine site reservoir by truck and stored in onsite tanks. After construction, water would be delivered to the Central Processing Pad via an elevated pipeline. Water needed at the well pads would be delivered by truck and stored in onsite tanks.

Alternative C: Logistics

Construction would begin late in Year 3. The gravel access road would not be available for use until late in Year 6. Prior to that time all supplies and personnel would be transported to Point Thomson via air (helicopter or fixed-wing) or over ice road.

During the first construction season (Year 3/Year 4), the primary means of transporting personnel would be by helicopter from Deadhorse, supplemented by crew busses on the ice access road from late January to mid-April. After the gravel airstrip was completed in late Year 4, personnel transfer would take place primarily by fixed-wing aircraft from Anchorage or Fairbanks for the remainder of construction.

All sealift modules and some truckable modules would be delivered to Deadhorse during open water season of Year 5, staged for 6 to 9 months, and then transported during the following ice road season in Year 6.

Alternative D: Inland Pads with Seasonal Ice Access Road

This alternative was developed to move development away from the coast, as was envisioned in Alternative C, but without providing for year-round road access. It is composed of the same four gravel pads as described in Alternative C. Access to Point Thomson would be via an ice road from the Endicott Spur Road or air. There would be no gravel access roads to Deadhorse or barge facilities.

Alternative D: Production Pads

Alternative D would locate drilling and production facilities onto four gravel pads, similar to Alternative C. The well pads would be connected by a network of infield gravel roads and infield gathering pipelines. Because of the seasonal nature of ice road-only access to Point Thomson, additional on-site storage would be needed through operations as compared with other alternatives.

Alternative D: Pipelines

The infield gathering pipelines, production lines, injection flow lines and their supports would be the same as in Alternative C. Infield gathering pipelines would be constructed to deliver produced hydrocarbons from the Central, East, and West Well Pads to the CPF. The 23-mile export pipeline would be constructed from the Central Pad to connect to the existing common carrier pipeline at Badami. The proposed pipeline route from Point Thomson to Badami would be located more than 4 miles inland.

Alternative D: Access and Transportation

Alternative D would utilize infield ice roads, marine transport by sealift barges to Prudhoe Bay, air transport by helicopters and fixed-wing aircraft, and infield gravel roads. Large modules would be brought to Point Thomson in the same manner as described in Alternative C. Throughout construction and operations ice roads and aircraft would be used to transport materials, equipment, and personnel to and from Point Thomson. The infield gravel roads would be aligned mostly in a north-south orientation to minimize impacts to hydraulic connectivity, as in Alternative C.

Alternative D: Support Facilities

Like Alternative C, Alternative D would have limited access to Point Thomson. Supplies would have to be delivered by air or annually by ice road. Fuel and other supplies would have to be stockpiled at the Central Processing Pad because of the lack of summer access. Additional support facility needs would be similar to those of Alternative C.

Alternative D: Gravel Sources

Gravel for Alternative D would come from the new gravel mine site located approximately 2 miles south of the Central Pad, near the proposed Central Processing Pad. The gravel mine for Alternative D would be larger than in Alternative B.

Alternative D: Water Needs and Resources

Freshwater for camp use during construction would be transported by truck from the C-1 mine site reservoir. After completion of mining activity, the gravel mine site would be rehabilitated, and used as the primary reservoir. To recharge the reservoir, an inlet structure would be constructed to divert water from an adjacent stream during peak discharges. The C-1 mine site reservoir could serve as a secondary water source.

Freshwater for operations would be transported by an insulated water line that would be buried within the gravel of the road between the new mine site reservoir and the Central Processing Pad. Water tanks for drilling activities on the well pads would be refilled by truck from either permitted surface water or the new mine reservoir.

Alternative D: Logistics

The logistics for Alternative D would be similar to those described in Alternative C, although during operations, Alternative D would continue to use an ice access road to resupply drilling and operations activities each year. Construction would begin at the end of Year 3, startup of production would occur towards the end of Year 6, and drilling would continue into Year 9 with the rig being demobilized via ice road in early Year 10.

Alternative E: Coastal Pads with Seasonal Ice Road

Alternative E was developed to reduce impacts to wetlands and surrounding water resources by minimizing the development footprint. Pads for this alternative would be located near the coast, as in Alternative B, but would reduce the amount of gravel fill needed for some of the project components by using ice roads and helicopter support in place of most gravel roads. During drilling, the gravel well pad footprints would be expanded by multiyear ice pads to support all the necessary equipment. Over the longer term during operations, the ice pad footprint would be removed and only the gravel fill would remain.

Similar to Alternative B, Alternative E would locate the drilling and production facilities on a three-pad configuration that would consist of an enlarged Central Pad (Central Well/Central Processing Pad) and two other ice-gravel combination pads (the East and West Pads). The Central Pad would be located on an expanded version of the PTU-3 gravel pad. The gravel footprint of the East and West Pads would allow for adequate pad space for operations and would be supplemented with a multi-season ice pad extension during the drilling phase. The Central Pad would be larger under this alternative to provide more storage and additional support space to compensate for the smaller gravel footprint of and limited access to the East and West Pads. The East Pad would encompass the existing North Staines River 1 Pad, while the West Pad would be located on an undeveloped site near the coastline at the same location as in Alternative B. Access to the East and West Pads would be helicopter, supplemented by ice road access in the winter.

Alternative E: Pipelines

The 22-mile export pipeline would be similar to Alternative B. The pipeline would be routed generally between 1 and 2 miles from the coastline. An ice road would be used to construct the export pipeline. Infield pipelines would be constructed to deliver the produced hydrocarbons from the East and West Pads to the CPF. An infield water pipeline to supply freshwater during operations would be constructed on VSMS between the C-1 mine site reservoir and the operations camp.

Alternative E: Access and Transportation

Under Alternative E, as in Alternative B, both coastal and sealift barging would be used to transport supplies and modules. Supplies would be transported either by barge or over ice roads. Personnel would be flown in and out of Point Thomson by fixed-wing aircraft.

During construction, tundra ice access roads and/or a sea ice access road would be constructed seasonally to bring supplies and equipment and to facilitate the building of the export pipeline. During operations, an ice access road to Point Thomson would only be constructed on an as-needed basis, estimated to be once every five years.

Infield ice roads are essential to Alternative E. Road access to the East and West Pads would be by seasonal ice roads throughout the life of the project. Personnel would travel between pads by helicopter when ice roads were not available. The only infield gravel road would run south from the Central Pad to the airstrip, the C-1 storage pad, and C-1 mine site reservoir. Equipment barged to Point Thomson and meant for the East or West Pad would be stored at the Central Pad until infield ice roads could be built.

Alternative E would include a shorter gravel airstrip than the other alternatives. The shorter airstrip would prevent the use of a C-130 cargo plane, which could limit the ability of the project to bring in large equipment by air. The airstrip would be constructed south of the Central Pad, approximately 2 miles inland from the coast. A seasonal full length sea ice airstrip would be constructed initially until the gravel airstrip is useable. The Central, East and West Pads would also include a helipad and associated support systems, because access to the East and West Pads during the summer would primarily be by helicopter. Low ground-pressure vehicles may also provide occasional access to the East and West Pads.

Alternative E: Support Facilities

Most support facilities would be located at the Central Pad, and would include stockpiling areas to accommodate materials transported by barge in the summer.

An injection well for waste disposal would be located on the Central Pad. Material that could not be injected or burned would be stored until it could be shipped to Deadhorse for disposal.

Development of other gravel pads would include a gravel storage pad, the existing C-1 storage pad, and a water source access pad. Two small gravel pads would also be required at Badami.

Alternative E: Gravel Sources

Gravel for Alternative E would come from the new gravel mine site located approximately 2 miles south of the Central Pad and just north and east of the proposed airstrip. After completion of mining activity, overburden would be placed back in the mine and the area would be rehabilitated.

Alternative E: Water Needs and Sources

Freshwater for camp use during construction, drilling, and operations would be transported from the C-1 mine site reservoir by truck, and the C-1 mine site reservoir would be the primary water source for all activities during operations. The rehabilitated Point Thomson gravel mine would be available as a secondary water source.

Alternative E: Logistics

Logistics of Alternative E would be similar to those described in Alternative B. Additional logistical challenges would be posed by the use of infield ice infrastructure. Because of the lack of access to the East and West Pads throughout much of the year, additional storage and safety modules would need to be constructed. Startup of production would occur at the end of Year 5 with drilling continuing into Year 8 due to the limited window of ice road availability to move the drill rig between pads. The drill rig would be demobilized at the beginning of Year 9.

3.3 Modifications Evaluated During Public Review

As a result of comments generated by the resource agencies and the public, the Corps examined alternate East and West Pad locations and additional mitigation measures for the mine site that would minimize project footprint and adverse project effects on important resources.

The East Pad would be moved approximately 750 feet inland and one mile westward. The modification would also increase distance of the pad from ANWR. Modifications considered for the West Pad would shift the pad approximately 500 feet inland. These alterations lessen effects on coastal resources and inland waterbodies affected by project construction. These alterations would also result in modified access road alignments, which would be shortened and routed along the slightly higher ground between drainages. The modified alignment would eliminate one waterbody crossing. These project modifications would not increase adverse effects on any resource of concern.²

This action is within the scope of alternatives considered in the NEPA, the PIR, and consultation processes performed by the Corps for this action and does not constitute a major change in the Federal action. These minor modifications were coordinated with the cooperating and commenting agencies during the public comment period. Further public NEPA and permit review is not required.

3.4 LEDPA

For the purposes of this document, the discussion and analysis of the Environmentally Preferable Alternative will be included in this discussion of the LEDPA. This section provides a summary of the process used to determine the Environmentally Preferable Alternative and the LEDPA. See Section 5.1,

² HDR, "East and West Drill Pads Options Analysis" (memorandum, Anchorage: 2012).

Finding of Practicable Alternatives, of this ROD for the Corps' determination of whether the applicant's project is the LEDPA.

The DA permit application evaluation requires compliance with the Guidelines. Under Subpart B of the Guidelines, the Corps' evaluation of the proposed project is required to address four tests that the project must meet in order to receive a Section 404 permit. One of these tests results in the identification of the LEDPA. See Section 5.0, Evaluation of Compliance with 404(b)(1) Guidelines of this ROD.

While making a compliance determination, the Corps may gather information sufficient to support and make its decisions by soliciting comments from other Federal, Tribal, State, and local resource agencies and the public. The Corps, however, is solely responsible for reaching a decision on the merits of the permit application including determination of the project purpose, the extent of the alternatives analysis, which alternatives are practicable, the LEDPA, the amount and type of mitigation that is to be required, and all other aspects of the decision-making process.³

4.0 Public Involvement

The public; tribal governments; State, Federal, and local agencies; and, interested non-governmental organizations were notified at the initiation of the NEPA process, during early scoping for the EIS, through direct correspondence required by regulations and Executive Orders, publication of the permit notice, and public review periods for the Draft EIS and Final EIS. Comments received were carefully considered throughout the NEPA process and permitting evaluation.

4.1 Comments Received on the NEPA Process

As part of the NEPA process, the Corps conducted scoping and provided for public comment during the Draft EIS. During the NEPA process, the Corps held public meetings in the villages of Kaktovik, Nuiqsut, and Barrow because of the proximity to the proposed development area and potential for outreach to potentially impacted parties. Meetings were also held in Anchorage and Fairbanks because of the statewide interest in developing the project and potential indirect effects on these communities. The Corps held separate meetings for agencies with regulatory jurisdiction over land or development, or with a permitting nexus. Comments received during the scoping period are summarized in the Final EIS. During the Draft EIS comment period the Corps received 247 comment documents. These documents came in the form of emails, completed comment forms, letters, public testimony, and e-filing through the project Web site. Within the comment documents, over 660 individual comments were recorded and responded to. Appendix W of the Final EIS includes more information on the public comment period, a summary of the category topics of the comments received, and copies of the actual comment submissions with responses.

4.2 Comments Received on the Public Notice

The PN for the DA permit application was announced at the same time (November 18, 2011) as the Draft EIS Notice of Availability (NOA) and the comment period ran concurrently with the Draft EIS comment period. Comments received by the Corps in response to the PN are summarized below along with the Corps' response.

After completion of the Draft EIS, some minor discrepancies were identified and corrected as a result of the Corps' review of the applicant's DA permit application. The Corps' requests for additional information also resulted in the applicant making minor modifications to the application. The project description did not change substantively; however, the Corps as a standard practice with an EIS, publishes a second PN concurrently with the Final EIS NOA to maximize the public's opportunity for comment and to highlight any proposed changes. The Corps issued the second PN and solicited public comments on the applicant's revised DA permit application for a period of 30 days from the Final EIS NOA (July 27, 2012). Summaries of these comments and the Corps' responses are also provided below.

³ U.S. Corps of Engineers, 2009 "Standard Operating Procedures for the US Army Corps of Engineers Regulatory Program."

Copies of the comment letters are provided in the Administrative Record for the project.

Federal Agencies

US Environmental Protection Agency, January 18, 2012

Summary of Comment

The EPA believes that it was premature to conduct the PN review of the project under CWA Sec. 404 at the same time as the public review of the Draft EIS. It is more appropriate and more efficient to have the PN review after the EIS is finalized because changes to the proposed project could result from comments on the Draft EIS. The EPA encourages the Corps to issue a new PN upon completion of the Final EIS.

Corps Response

Comments on the Draft EIS did not result in substantial changes to the PTP. As described above, the public was given a 30-day period to comment on the project after the Final EIS was published.

Summary of Comment

The LEDPA may not be embodied in any single one of the four action alternatives that are analyzed in the Draft EIS. Rather, it may exist in a different combination of project components. If such a hybrid alternative were identified and deemed practicable, a separate and distinct analysis of impacts for this combination of project components would need to be made, so as to compare against other alternatives.

Corps Response

The various components of the alternatives were analyzed and compared against each other in the EIS. The Corps believes that the alternatives analysis was robust and sufficient to meet the Council on Environmental Quality requirements for NEPA analysis. The Corps analyzed the alternative components as part of the process to determine the LEDPA. A hybrid consisting of components of multiple alternatives was not identified as the LEDPA.

Summary of Comment

Gravel pads for drilling, production and processing should be located as far inland as practicable and there is a need for a mix of transportation modes. The LEDPA may consist of the following project components: inland gravel pads (East, Central Processing, and West); sea ice access road; sealift barging and coastal barging; Barge Offloading Pad with emergency boat launch; gravel mine site located near Central Processing Pad that is smaller than proposed by the applicant; water withdrawal sources; infield road system comprised of only ice roads; gravel airstrip with attached helipad; and infield gathering lines and export pipeline.

Corps Response

The Corps thoroughly analyzed multiple alternatives and components to meet CWA requirements. The Corps determined the applicant's proposed project, with modifications, is the LEDPA (See Section 5.4 of this ROD).

Summary of Comment

The EPA identifies some environmental concerns associated with coastal pads to include:

- 1) Noise disturbance, especially from the Central Processing Pad and its compressors, affecting migrating birds, marine mammals, and subsistence hunters;
- 2) Coastal erosion encroaching on oil and gas extraction infrastructure. This is likely to accelerate in the near future due to climate change;

- 3) Visual and noise effects from the East Pad carrying over to users of ANWR; and
- 4) Risk of oil spilling into waters of the U.S., including the tundra, near-shore coastal waters, and the open ocean.

Corps Response

The impacts from coastal pads on these resources were discussed in the Final EIS and the Corps further compared the impacts from coastal pads to the impacts from inland pads in the Coastal Corridor Evaluation.⁴ Results from that comparison found that there were no compelling impact differences that would prompt selection of a location further inland for either of the East and West drilling pads, or the processing components associated with the Central Pad. This comparison of coastal vs. inland resources came from the alternatives within the EIS for the four factors identified below:

- 1) *Birds and Caribou: The primary impacts to birds from the Central Pad would likely occur from disturbance associated with barge activities, which are coastally dependent. Moving the Central Processing Facilities further inland would not decrease impacts to birds. Caribou movements near the Central Pad during the insect relief period tend to be higher inland from the proposed pad location. Moving portions of Central Processing Facilities further inland may increase impacts to caribou movements during this time period. The EIS determined that moving pads further inland could reduce impacts on subsistence hunting for caribou. However, impacts of the proposed project on subsistence hunting are already minor and the Corps determined this would not be a compelling reason to move the pads, taking into consideration other factors.*
- 2) *Erosion: The Final EIS included additional information on potential erosion rates in the project area. The Corps is satisfied that the project is conservatively designed to take into account historic and future rates of erosion at the proposed location.*
- 3) *Visual and Noise: Visual and noise impacts on ANWR would be minor based on the findings of the Final EIS. A more westerly location for the East Pad was identified during the Corps' permit decision process, which would further reduce potential impacts]*
- 4) *Spills: The Final EIS found that small to medium spills would be likely to occur over the project life but would be restricted in geographic extent and would be unlikely to have measureable impacts on resources. Large or very large spills would be very unlikely to occur.*

Summary of Comment

A one-half mile setback distance from the coast for the gravel pads, as is proposed in Alternatives C and D, seems to be an arbitrary distance. Additional evaluation of a reasonable, workable, and justifiable set-back distance needs to be made.

Corps Response

The one-half mile setback distance was selected for the EIS alternatives analysis because it was a large enough distance to assess the concept of inland pads while still generally meeting the purpose and need of the project. The Corps has considered other setback distances in its evaluation of the LEDPA. The Corps primarily focused on distances near the coastline up to 1320 feet inland because of the location of the reservoir and because there were no compelling differences in impacts between pads located on the coast and those located 2640 feet inland.

⁴ HDR, "Coastal Corridor Evaluation" (memorandum, Anchorage: 2012)

Summary of Comment

Keeping in mind that this project is described by ExxonMobil as the “footprint for the future” of oil and gas activities in the area, it is important that the on-shore barge handling facilities include the ability to accept and transport any sealifted modules that may be a part of a future development project.

Corps Response

The barge handling facilities are designed to meet the needs of the proposed project while minimizing environmental impacts to the extent practicable. The barging needs of a future development project have not been evaluated. Even if a larger facility were known to be needed for future development, the Corps would permit only the facilities defined in the permit application for the project currently proposed. If a larger facility is needed in the future the project can be modified and analyzed for impacts as appropriate.

Summary of Comment

An evaluation should be made as to whether the loss of additional acres of wetlands by building a fourth pad creates greater significant adverse environmental consequences when compared to locating the Central Processing Pad on the coast. In addition, further reduction in the sizes of the Central Processing Pad and the Barge Offloading Pad could possibly be made, depending on the layout of facilities on each of these pads.

Corps Response

The Corps evaluated potential impacts of splitting the Central Pad and moving inland those facilities not requiring proximity to the coast. These impacts were considered as part of the Corps’ review of the permit application and determination of the LEDPA. The Corps decided that it was not practicable to split the Central Pad. However, the proposed Central Pad footprint will be reduced to accommodate polar bear movement along the shoreline.

Summary of Comment

Evaluation of a project that results in the development of the smallest gravel mine (e.g. a project supported solely by ice roads) should be made. Further impact avoidance and minimization by project design could be made by employing seasonal ice roads, with no gravel road system. This project component should be evaluated during the LEDPA analysis.

Corps Response

The Corps did not consider an all-ice-road alternative to be practicable because the lack of year-round ground transportation between pads would require a high volume of weather dependent helicopter traffic, prevent movement of drill rigs and equipment outside of the ice road period, and increased impacts to noise and safety.

Summary of Comment

The EPA encourages the applicant to work closely with ADNR in order to avoid major disruption to the hydrology of this large area, which may result in adverse environmental impacts that may not comply with the Guidelines.

Corps Response

The Corps concurs and worked closely with ADNR, as appropriate, to minimize hydrologic impacts from the applicant’s proposed project.

Summary of Comment

The infield roads should run in a predominantly north-south orientation to intercept at right angles the dominant hydrologic gradient that is north-northeast, toward the Beaufort Sea and the Staines/Canning River drainage.

Corps Response

The Corps has determined that the LEDPA appropriately balances impacts to hydrologic gradient associated with north-south orientation of infield roads, with fewer wetland impacts associated with shorter, more northerly located infield roads

Summary of Comment

An evaluation should be done as to whether another airstrip location can be found that would result in the least extent of diversion of break-up sheet flow and summertime stream flow and still meet project needs.

Corps Response

The Corps has determined that the applicant's proposed airstrip location is the LEDPA (see Section 5.4 of this ROD), based on additional evaluation of alternative locations, as discussed elsewhere in the ROD.

Summary of Comment

The Draft EIS presents information on how the project would affect wetlands (Draft EIS Section 5.8, Vegetation and Wetlands) and on the functions performed by wetlands in the project area (Appendix K), but no measure of the effects on wetlands as a result of pipelines built on VSMS is specifically stated. Siting gathering lines and the export pipeline further inland may result in fewer adverse effects on aquatic resources. An evaluation of various gathering line and export pipeline routes to determine the LEDPA should be done, and should consider not only the shortest total lengths, but also layout of the lines to avoid high-functioning wetlands.

Corps Response

The Corps evaluated several alternative routes for both the infield gathering lines and the export pipeline. Impacts considered included placement of VSMS in high-medium-low value wetlands, stream crossings, proximity to infield roads, and, in case of a spill, percentage of high-functioning wetlands downslope/downstream of the spills site. The evaluation also considered spill response, location of pipelines in relation to high functioning wetlands in the event of a catastrophic spill, and changes in the total potential volume of a catastrophic spill. The Corps concluded that the applicant's proposed pipeline routes are the LEDPA.

Summary of Comment

Further avoidance and minimization of adverse effects to aquatic resources could possibly be attained by siting project components differently than proposed by the applicant and should be analyzed as the LEDPA analysis is done. For example, it is possible that setting the three production and drilling pads back from the coast, but adding a fourth barge off-loading pad may result in less loss of aquatic resources, but this needs to be evaluated.

Corps Response

The Corps evaluated potential impacts of splitting the Central Pad and moving inland those facilities not requiring proximity to the coast. These impacts were considered as part of the Corps' review of the permit application and determination of the LEDPA. The Corps also considered different locations for other project components (e.g., East and West Pads, gravel mine, airstrip) as part of the determination of the LEDPA.

Summary of Comment

The applicant's plan to provide for compensatory mitigation for unavoidable losses of aquatic resources as described in the applicant's Mitigation Statement (DA permit application, Tab 23) is vague. The lack of an existing mitigation banking mechanism does not relieve the applicant of its responsibility under the regulations to provide adequate mitigation in advance of, or concurrent with, construction of the proposed project. Other compensatory mitigation options, including permittee-responsible mitigation, in addition to the payment of an in-lieu fee (ILF), should be pursued.

Corps Response

The applicant provided more details on its proposed compensatory mitigation in a Draft Compensatory Mitigation Plan dated July 2012. Section 7.3 of this ROD describes the compensatory mitigation that will be required for the PTP.

Summary of Comment

The EPA requests an active role with the Corps to work on detailed aspects of the mitigation plan. Of particular importance is the establishment of adequate mitigation ratios for unavoidable losses of aquatic resources, taking the following factors into consideration:

- Unless replacement wetlands are found on the North Slope, ILFs are likely to be used to acquire and preserve wetlands south of the Brooks Range that are out-of-kind, not proximal to, in a different watershed than, and that may perform a different suite of functions than those wetlands lost. In any of those cases, higher mitigation ratios would be appropriate and necessary to offset the losses proposed by the project.
- If temporal losses occur, higher mitigation ratios are justified.
- The PTP covers a large area, in a part of Alaska not previously developed.
- The project is located close to ANWR.

Corps Response

The Corps has worked with the EPA throughout the permit process and held a compensatory mitigation meeting with the Alaska Operations office and Region 10 Office of the EPA regarding location of the East and West Pad Access Roads (October 3, 2012) during the final PN comment period. The Corps agrees that compensatory mitigation should be made within the NSB. The Corps has not identified the need for ratios higher than those suggested by District Regulatory Guidance Letter 09-01. Temporal losses are not expected.

US Environmental Protection Agency, August 27, 2012

The EPA submitted comments for the second PN of the Corps' permit application noting that its review was focused on CWA Section 404 impacts resulting from placement of dredged or fill material into waters of the U.S., including wetlands. Because only minor changes had been made to the permit application, the EPA repeated some of the concerns raised during the initial PN period.

Summary of Comment

East Pad and West Pad. Generally, inland locations (provided in diagrams by the applicant on August 8, 2012 as an "Option" at the request of the Corps) for the East Pad and West Pad would result in lesser environmental damage to aquatic resources than the applicant's proposed locations for these pads through:

- less overall fill for both pads and their associated access roads;
- fewer stream crossings;
- shorter access roads resulting in reduced dust shadow effect;
- fewer acres of high-functioning wetlands filled;

- reduced fill in wildlife (bird and mammal) habitat;
- likely decreases of impacts to fish and invertebrates;
- East Pad farther from Stream 28, an anadromous fish stream;
- less risk of oil spills entering marine waters; and
- both the East Pad and the West Pad would be aligned along, and not across, the hydrologic gradient, resulting in less disruption to hydrologic processes.

EPA understands that the oil and gas resources of the Thomson Sand Reservoir could be reached from these inland pad locations, given existing technology. Therefore, EPA encourages the Corps to consider the revised pad locations, as they may constitute the LEDPA.

Corps Response

The Corps concurs. The East and West Pad options were analyzed by the Corps and are part of the LEDPA as described in Section 3.3 of this ROD.

Summary of Comment

Central Pad and a 4-Pad Configuration. Based on new information provided by the applicant during meetings and in a written response to the Corps' July 12, 2012 RFI, EPA concludes that a 4-pad configuration would result in greater impacts to aquatic resources than the applicant's proposed single Central Pad.

Corps Response

The Corps concurs with this conclusion.

Summary of Comment

Gravel Mine. The EPA understands that ADNR intends to approve a reconfigured layout for the gravel mine from that originally proposed. Modifications include:

- the gravel stockpile would be reduced from 12.9 acres to 5.2 acres and moved south to avoid the small ponds west of the excavation area;
- the gravel access road to the northwest corner of the mine site would be eliminated and replaced with access by ice road only; and
- the mine site work area would be reduced by 41 acres.

The EPA agrees that the changes to the gravel mine layout would reduce environmental damage and encourages the Corps to consider the new layout in its determination of the LEDPA.

Corps Response

The Corps concurs; however, the reduction in gravel mine area, including the gravel stockpile pad, was reduced by approximately 15 acres. The reconfigured gravel mine layout is included as part of the LEDPA.

Summary of Comment

Gravel Airstrip and Helipad. The EPA agrees with the applicant that there are logistical considerations, which would make relocation of the proposed airstrip impracticable. These include increased incidence of fog and increased wetland fill. However, EPA does not agree with all of the explanations in the applicant's response to this issue (ExxonMobil Response to Comments on Public Notice of Application for Permit, Point Thomson Project, dated April 24, 2012, pp. 23-24). Specifically, EPA does not agree that hydrologic impacts to Streams 22A, 23, and 24A would be minimal, nor that construction of culverts beneath the runway would be impracticable due to freezing.

Corps Response

The Corps concurs that the airstrip should remain in the location proposed by the applicant. The Corps has determined that the hydrology in the area will be monitored and corrective action will be taken in subsequent years if necessary.

U.S. Fish and Wildlife Service, January 18, 2012*Summary of Comment*

The USFWS noted that it was continuing to work with the Corps and the other cooperating agencies to develop a LEDPA for the Final EIS. In the interim, USFWS referred to its comments regarding the Draft EIS (letter to the Corps dated January 12, 2012) concerning the applicant's proposal. These comments covered the following topics: edits to descriptions of the USFWS's management of the 1002 Area; summary of fish and wildlife resources in the project area, summary of threatened endangered species in the project area, summary of the alternative analyzed in the Draft EIS, proposal of an agency preferred alternative, impacts associated with the project design, and compensatory mitigation. The Draft EIS comments were provided in full in Appendix W of the Final EIS.

Corps Response

The Corps makes its decision on the LEDPA after completion of the Final EIS. The USFWS and other cooperating agencies have supported the Corps with additional information concerning their trust resources. The Corps' responses to the USFWS's comments on the Draft EIS were provided in Appendix W of the Final EIS.

U.S. Fish and Wildlife Service, August 24, 2012

This letter summarizes the USFWS's remaining concerns regarding potential impacts to habitats and fish and wildlife trust resources including threatened species and the USFWS's agency preferred alternative.

Summary of Comment

The proposed project site is within the range of spectacled and Alaska-breeding Steller's eiders, and polar bears, which are listed as threatened pursuant to the ESA, and is within and adjacent to designated critical habitat for polar bears. The proposed project would likely result in take of marine mammals as defined by the Marine Mammal Protection Act (MMPA). The USFWS believes some impacts such as bird collisions, and excessive light, noise, and dust pollution could be mitigated through the incorporation of specific design features during construction of the facilities. Other aspects of project operations (e.g., barging) necessitate long-range planning and should be updated throughout the life of the project to ensure minimal impact to resources.

Corps Response

The Corps concurs with these general statements and incorporated special conditions to address their concerns (see Section 7.3 of this ROD).

Summary of Comment

East and West Pads. The USFWS supports moving the East Pad 1.3 miles west and the East and West Pads approximately 0.25 mile inland from their original locations, as described in conceptual options submitted by the applicant, to address concerns regarding bird collisions and caribou access along the coast.

Corps Response

The Corps concurs. The reconfigured pad layouts are included as part of the LEDPA.

Summary of Comment

Central Pad. The USFWS recommends shifting the Central Pad back away from the coast a short distance to allow free passage of polar bears and minimize their disturbance. Also, facilities on the Central Pad could be adjusted so attractants such as the sewage treatment plant and incinerator are not adjacent to the beach or close to high human use areas such as sleeping and dining areas. The USFWS encourages the Corps to develop a permit condition that limits use of the northern end of the Central Pad to reduce impediments to polar bear movements. The USFWS would work with the applicant to address unforeseen or unexpected impacts to polar bears that may occur as a result of project construction and operations.

Corps Response

Movement of the proposed addition to the Central Pad a distance inland was not found to be less environmentally damaging or practicable due to the need for increased gravel fill in WOUS and an increased footprint of disturbance for terrestrial wildlife (see Central Pad in Section 5.1 of this ROD). A meeting (August 21, 2012) was held with the applicant and the USFWS regarding polar bear movements and human-bear interactions under the ESA consultation process. In a second meeting on September 21, 2012, the USFWS stated that there is no research that addresses minimum corridor width. When asked if something less than 300 feet would be acceptable for polar bear to walk around rather than onto the Central Pad, the USFWS indicated that 100 feet would be better than having fill to within a few feet of the edge of the water. A special condition will require the applicant to establish and maintain a 100-foot corridor for polar bear movement along the eastern edge of the proposed Central Pad. This condition has been coordinated with the USFWS. A permit condition restricting long term storage of equipment and supplies adjacent to the barge offloading facilities will be required (See Section 7.3 of this ROD).

Summary of Comment

Infield Roads. Infield roads should be gravel-based and primarily oriented north-south. This orientation allows for fewer impacts to hydrology and wetlands as well as allows for unimpeded movement of caribou along the coast. All infield roads should be separated from pipelines by at least 700 feet to allow for free-passage of caribou during calving, post-calving and migration periods. The fairly recent application of chip-seal as a surface sealant on some North Slope roads has significantly reduced the amount of dust produced and subsequently the need for constant watering of roadways. The USFWS suggests the applicant investigate the use of chip-seal on the Point Thomson infield roads to reduce dust impacts to adjacent vegetation.

Corps Response

The Corps has determined that the LEDPA appropriately balances impacts to hydrologic gradient associated with north-south orientation of infield roads, with fewer wetland impacts associated with shorter, more northerly located infield roads.

The current standard for a separation distance between roads and pipelines, as concluded from the Alaska Caribou Steering Committee⁵ is 500 feet. The USFWS did not provide justification for an additional 200 feet of separation distance. The proposed action includes a 500' separation distance, which the Corps finds adequate.

The Corps has determined the infield roads should be gravel surfaced based on further research and contact with transportation and industry experts on the North Slope and their past use of chip seal.⁶

⁵ Matthew A. Cronin, Warren B, Ballard, Joe Truett, and Robert Pollard (eds.), "Mitigation of the Effects of Oil Field Development and Transportation Corridors on Caribou- Final Report to the Alaska Caribou Steering Committee," (LGL Alaska Research Associates, Anchorage: 1994).

⁶ HDR, "Use of Chip Seal in Permafrost Regions," (memorandum, Anchorage: 2012).

Summary of Comment

Airstrip. Locating the strip as far south and west as practicable would reduce bird/aircraft collisions, especially during migration. It also could allow for future use by developments further south.

Corps Response

Considering practicability issues and impacts to all resources, the Corps has determined that the applicant's proposed location for the airstrip is part of the LEDPA (see Section 5.1 of this ROD).

Summary of Comment

Barging and Sea Lift Facilities. The barge facility should be strategically located where it can be fully utilized for future projects once the infrastructure on the Central Pad is developed. The USFWS suggests the applicant create a storage plan for the Central Pad whereby supplies and modules are off-loaded and stored in areas that allow for free passage of polar bears along the coast and northern edge of the Central Pad.

Corps Response

Storage of equipment and supplies will be restricted to only occurring while barges are being loaded and offloaded. This is included as a special condition (See Section 7.3 of this ROD).

Summary of Comment

Power Lines. In order to prevent bird collisions with overhead power lines, all electric/communication lines should be strung on VSMs or buried in roads.

Corps Response

All electrical and communication lines will be strung on VSMs or buried in tundra, as proposed by the applicant. The Corps is not requiring that lines be buried under roads due to practicability concerns with line maintenance.

Summary of Comment

Infield Pipelines. Infield oil pipelines should be set back from the coast at least 2 miles to allow free passage of caribou during periods of mosquito harassment. The bottom of the pipe rack should be at least 7 feet above tundra grade and the pipeline should have a dull coating to prevent reflection. Water pipelines from the fresh-water reservoir should be elevated on VSMs at a height of 7 feet or buried in the roadbed.

Corps Response

The Corps believes that it is not practicable to locate infield pipelines 2 miles from the coast due to the coastal locations of the East, West, and Central Pads. The Corps has determined the applicant's proposed locations of the infield pipeline routes to be the LEDPA. The Corps concurs that the pipelines should be at least 7 feet above grade, and should have a dull outward appearance. The applicant has proposed this in their permit application. Water would be trucked rather than transported by pipeline. The Corps has determined that these component features would be part of the LEDPA.

Summary of Comment

Lighting. To mitigate the risk of birds colliding with buildings and drill rigs, the USFWS has requested that lighting of the Point Thomson facilities be shielded from above thereby reducing reflectivity in clouds and fog. Further, where possible, lighting should be shielded on the east side of buildings through the installation of shaded windows.

Corps Response

The Corps concurs. This is included as a special condition (see Section 7.3 of this ROD).

Summary of Comment

Noise. In order to mitigate the potential noise impacts from the facility, the USFWS suggests the applicant utilize the latest technology to muffle the compressors as well as investigate other structural techniques, such as constructing berms, to shield the surrounding area from noise emanating from the facility.

Corps Response

The Corps concurs. This is included as a special condition (see Section 7.3 of this ROD).

Summary of Comment

Barging. The USFWS is concerned that coastal barging and staging may impact brood-rearing and molting birds, especially in waters between the shore and barrier islands. The USFWS suggest the applicant create a yearly barge plan, indicating perspective routes, estimated number of barges, and staging locations, to be shared with the cooperating agencies and resource users from the villages, to avoid potential conflicts.

Corps Response

The applicant submits a yearly barge plan to the Alaska Eskimo Whaling Commission (AEWC) as part of the Conflict Avoidance Agreement (CAA). Submission of this yearly barge plan to the Corps and the USFWS is included as a special condition. The applicant agrees to avoid barging during the whaling season (generally from August 24 to September 23), to the greatest extent possible, in order to minimize potential impacts to subsistence hunting. When barging during the whaling season cannot be avoided, the applicant would follow the protocols defined in the CAA to avoid or minimize interactions with whaling boats and whales (see Section 7.3 of this ROD).

Summary of Comment

Compensatory Mitigation – The USFWS supports compensatory mitigation for the unavoidable impacts associated with the Point Thomson development. Recently, for North Slope projects, the USFWS has used ILFs administered through The Conservation Fund (TCF) for the purchase of at-risk habitats elsewhere in the State, as little private land is available on the North Slope for “in-kind” purchase. Alternatively, there are several abandoned pads and airstrips within the vicinity of the proposed project that may be appropriate for restoration as partial compensation for project impacts. The USFWS is willing to discuss other mitigation alternatives, such as the establishment of a North Slope mitigation bank, with the cooperating agencies for the Point Thomson development.

Corps Response

The Corps agrees with the USFWS on all of this comment in concept. However, an ILF would be used as compensatory mitigation. The applicant has stated they will work with the ILF provider to identify properties on the North Slope.

National Marine Fisheries Service, January 18, 2012

NMFS included comments on the Draft EIS and the PN of the DA permit in the same letter. The Draft EIS comments and the Corps' responses were provided in Appendix W of the Final EIS. The comments specific to the PN are addressed below.

Summary of Comment

The PN indicated that the Corps had made a preliminary determination of not likely to adversely affect three marine mammal species in its Draft Biological Assessment (BA). The MMPA prohibits, with few

exception, injury, harm or harassment of marine mammals. Any unintentional and incidental take of marine mammals by U.S. citizens may be authorized under Section 101(a)(5) of the MMPA.

Corps Response

The Corps acknowledged the MMPA and the details set forth therein.

Summary of Comment

The language regarding impacts on Essential Fish Habitat (EFH) in the Draft EIS and Draft EFH Assessment is not clear; the Final EIS and EFH Assessment should contain a clear statement as to whether the action may affect EFH. The Draft EFH Assessment also did not assess effects of possible spills and invasive species. These should either be included in the Final EFH Assessment or the assessment should reference where this information is located in the Final EIS.

Corps Response

The Corps updated the EFH Assessment section of the Final EIS to reflect NMFS comments. NMFS agreed with the Corps determination that the project may adversely affect EFH, and confirmed that they had no additional EFH Conservation Recommendations in a letter to the Corps dated May 22, 2012. NMFS and the Corps have fulfilled their obligation to consult on EFH.

NMFS, August 28, 2012

Summary of Comment

The Corps determined that the applicant's in-water activities may affect, but are not likely to adversely affect, the bowhead whale, bearded seal, and ringed seal. This consultation is expected to be completed very soon. The Corps determined that the proposed project may adversely affect EFH and submitted an EFH Assessment. NMFS agreed with this determination and had no additional EFH Conservation Recommendations. The EFH consultation obligation has been fulfilled.

Corps Response

The Corps accepted mitigation measures in the NMFS Letter of Concurrence, dated September 14, 2012, and will include them as a special condition (See Section 7.3 of this ROD).

State Agencies

State of Alaska, December 29, 2011

Summary of Comment

The State of Alaska submitted comments on the Draft EIS to the Corps and requested that the Corps also consider these as comments on the PN. These comments requested clarifications and edits to specific text in the Draft EIS sections on alternatives, air quality, hydrology, water quality, vegetation and wetlands, fish, spills, and waste management. More detailed comments were provided about the visual resource assessment, noise, recreation, land use, drilling pad locations, the ANWR, and language regarding wilderness.

Corps Response

The Corps accepted and considered the State's comments on the initial PN. These comments were specific to the Draft EIS and received responses accordingly. Comments and responses can be found in Appendix W of the Final EIS.

State of Alaska, August 27, 2012*Summary of Comment*

Previous federal delays have resulted in a 1-year delay of the PTP, costing hundreds of jobs and new production into the TAPS. Timely completion of the ROD is important to keep point Thomson on schedule for development. As part of its settlement with the State, the applicant has committed to first production of gas condensate no later than the winter of 2015-2016. The State will begin issuing state permits and authorizations for the project next month, however, delayed issuance of the Corps permit could delay any state permit decision that is contingent on the DA permit. The State is committed to being responsive to any information requests or consultation that Corps may require.

Corps Response

The Corps has been aware of the applicant's and State's desired production schedule since the first draft permit application was submitted to us in October 2009. Executive Order 13212 and 33 CFR 320.4 states that oil and gas projects are top priority for permitting.

Summary of Comment

Attachment. ADNR submitted an Alternatives Technical Response as an attachment to their comments on the PN. The attachment discussed spill safety and response, regulatory overview, incident response and maintenance for coastal versus inland locations, technical input on LEDPA, drilling pad placement, coastal erosion, and cultural resources.

Corps Response

The Corps has reviewed the information provided and used it in identification of components of the LEDPA.

Alaska Department of Natural Resources and North Slope Borough, August 27, 2012*Summary of Comment*

ADNR and NSB jointly express concern over the potential delay in issuance of the ROD for the PTP. Previous federal delays have already cost hundreds of jobs and delayed new production into the TAPS. Timely completion of the ROD is important to start construction this winter. The project is expected to sustain 600 to 700 jobs with a peak employment of 2,400. Next month, the State will begin issuing approximately one hundred State permits and authorizations that are required for the project but delayed issuance of the Corps' permit could delay State permit decisions that are contingent on the Corps permit. ADNR and NSB hope that the Corps can issue the ROD and 404 permit on schedule to prevent any delays in issuing State authorizations.

Corps Response

The Corps has been aware of the applicant's and State's desired production schedule since the first draft permit application was submitted to us in October 2009. Executive Order 13212 and 33 CFR 320.4 states that oil and gas projects are top priority for permitting.

State Legislators, six letters dated August 2012

The Corps received comments from Alaska State Representatives Costello, Millett, Freige, and Hawker as well as from Alaska State Senators Giessel and Thomas.

Summary of Comments

These comments expressed support for the PTP in general. Some also expressed concern regarding potential permitting delays.

Corps Response

The Corps acknowledges the importance of the project to the State and the Congressional interest.

Local/Tribal

Iñupiat Community of the Arctic Slope, January 18, 2012

The Iñupiat Community of the Arctic Slope (ICAS) included both comments on the Draft EIS and the PN of the DA permit in the same letter. The Draft EIS comments and the Corps' responses were provided in Appendix W of the Final EIS. The comments on the PN are addressed below.

Summary of Comment

The timeframe for public comment on the PN of the DA permit application is premature and inappropriate until the Final EIS is completed. The public does not have the refined project, including additional mitigation measures or modifications that will be necessary to address the public interest and other requirements. The Draft EIS does not identify the environmentally least damaging alternative or the environmentally preferred alternative. ICAS's analysis of Alternative B indicates that it would not meet the criteria for such an alternative. ICAS formally requests that the public comment period on the permit application be suspended until the Final EIS is completed or at a minimum that it be reopened for another 30 days to public comment once the Final EIS is completed.

Corps Response

The Corps issued a second PN of the applicant's permit application, following completion of the Final EIS. The Final EIS did not determine the LEDPA or the environmentally preferable alternative. These will be identified in this ROD. A second 30-day public comment period on the applicant's proposal was provided after the publication of the Final EIS.

Mayor of Anchorage, August 24, 2012

Summary of Comment

Mayor Sullivan of Anchorage expressed support for the PTP based on the potential for job creation and benefits to both the existing Alyeska Pipeline and the new gas pipeline to south-central Alaska.

Corps Response

The Corps acknowledges the importance of the project for job creation and other benefits, as expressed by the Mayor.

Nongovernment Organizations

Northern Alaska Environmental Center, Alaska Wilderness League, Gwich'in Steering Committee, Sierra Club, The Wilderness Society, Natural Resources Defense Council, Resisting Environmental Destruction of Indigenous Lands (NAEC et al.); January 18, 2012

The Northern Alaska Environmental Center (NAEC) et al. included both comments on the Draft EIS and the PN in the same letter. The Draft EIS comments and the Corps' responses were provided in Appendix W of the Final EIS. The comments on the PN are addressed below.

Summary of Comment

The timeframe for public comment on the Draft EIS and PN is premature and inappropriate until the Final EIS is completed. The public does not have the refined project, including additional mitigation measures or modifications that will be necessary to address the public interest and other requirements. The Draft EIS does not identify the environmentally least damaging alternative or the environmentally preferred alternative. NEAC et al.'s analysis of Alternative B indicates that it would not meet the criteria for such an alternative. NEAC et al. formally requests that the public comment period on the permit application be suspended until the Final EIS is completed or at a minimum that it be reopened for another 30 days to public comment once the Final EIS is completed.

Corps Response

The Corps issued a second PN of the applicant's permit application, following completion of the Final EIS. The Final EIS did not determine the LEDPA or the environmentally preferable alternative. These will be identified in this ROD. A second 30-day public comment period on the applicant's proposal was provided after the publication of the Final EIS.

NAEC et al., August 27, 2012

Summary of Comment

The NEAC et al. express concerns about the following:

- impacts of the project to ANWR, particularly visual and noise impacts;
- impacts to listed species, particularly whales, polar bears, seals;
- impacts to polar bear critical habitat;
- potential for spills; and
- the lack of public review with respect to the settlement between the State and the applicant.

The NAEC et al. request that the Corps' analysis, and especially the LEDPA, adequately consider and protect these resources.

Corps Response

The Corps has completed an analysis of impacts, PIR, and determination of the project's compliance with Section 404(b)(1) of the CWA. The Corps has also considered practical and appropriate mitigation measures and developed extensive permit conditions in order to minimize impacts to the aforementioned resources. The Corps has no authority to regulate legal agreements between the State and the applicant regarding the PTP.

Summary of Comment

The NAEC et al. appreciate that no drilling would be offshore and like the option of moving East and West Pads, as it would help reduce impacts to coastal areas and resources, including those from spills and noise.

Corps Response

Offshore drilling will not be authorized under this proposal. The East and West Pad options are part of the LEDPA. The LEDPA includes optimization of the East and West Pad locations further from the coast than originally proposed.

Summary of Comment

More can be done to reduce impacts to aquatic resources and to the nearby ANWR with a new alternative built from those evaluated in the EIS and the applicant's new alternate map locations that have been submitted to the Corps. It is disappointing that the Final EIS did not present a new alternative that could be the LEDPA so it could be evaluated in a public, transparent process. The NAEC et al.'s preference for a LEDPA includes:

1. Move East Pad west at least 1 mile.

2. Move East and West Pad and CPF inland.
3. No all-season gravel access road.
4. Infield roads oriented primarily north-south and separated from pipelines by 700 feet.
5. Move airstrip as far south and west as practicable.
6. Set back infield pipelines at least 2 miles from the coast and elevate at least 7 feet above ground.
7. Bury electric and communication lines in roads or string on VSMS.
8. No gravel fill causeways, docks, or emergency response boat ramp access.

Corps Response

1. *The reconfigured layout of the East Pad option is included as part of the LEDPA.*
2. *The reconfigured layouts of the East and West Pad options are included as part of the LEDPA. The Corps has determined that it is not practicable to move the CPF inland; however the pad will be modified to accommodate polar bear movement along the coastline.*
3. *A gravel access road to Prudhoe Bay (associated with Alternative C) was not included as part of the LEDPA.*
4. *The Corps has determined that the LEDPA appropriately balances impacts to hydrologic gradient associated with north-south orientation of infield roads, with fewer wetland impacts associated with shorter, more northerly located infield roads. The Corps determined the LEDPA to be the applicant's proposed pipeline routing which is further than 700 feet from the road.*
5. *The Corps has determined that the applicant's proposed airstrip location is the LEDPA (Section 5.4 of this ROD), based on additional evaluation of alternative locations.*
6. *The Corps has determined that it is not practicable to locate infield pipelines 2 miles from the coast due in part to the coastal locations of the East, West, and Central Pads. The Corps has determined that the LEDPA includes the applicant's pipeline as proposed. The Corps concurs that the pipelines should be at least 7 feet above grade, as proposed by the applicant.*
7. *The Corps determined that electric and communication lines should either be buried or placed in cable trays along VSMSs, and has included this as special condition.*
8. *The applicant has not proposed, nor is the Corps authorizing gravel fill causeways or docks. The Corps has determined that a pile-supported emergency boat ramp is not practicable.*

Summary of Comment

The NAEC et al. recommend the following permit conditions:

1. Mitigation, including compensation for unavoidable project impacts, should be done within the North Slope region.
2. No project infrastructure, facilities, or activities will take place on ANWR lands.
3. No causeways or solid fill docks should be constructed for Point Thomson or subsequent projects connecting to its infrastructure.
4. There should be only pilings, no solid fill or wall supports for barge unloading or the emergency response boat ramp.
5. If the project is expanded in the future, there should be no permanent oil and gas facilities or activities on Flaxman Island.
6. There should be appropriate timing restrictions on gravel mining.
7. Drilling should not be done during open-water and broken ice season; caribou calving, post-calving, and insect relief periods; or the bird nesting period.

Corps Response

1. *The Corps will require that compensatory mitigation be completed within the NSB.*
2. *No discharges are proposed within the ANWR.*
3. *Subsequent projects are not under consideration at this time. No causeways or solid fill docks are proposed.*
4. *The sheetpile and fill design of the abutments are necessary for loading and unloading heavy modules, equipment, and supplies.*

5. *Consideration of future project components is outside the scope of this proposal and any modifications would have to be evaluated by the Corps.*
6. *The gravel mine construction would occur in wintertime. Secondary mining activity would occur within the mine footprint during the summer once the mine is constructed.*
7. *Drilling into the hydrocarbon zone will not be done during any of these sensitive periods due to State permitting requirements.*

Summary of Comment

The NAEC et al. listed the following issues that the Final EIS did not adequately address:

1. The Final EIS should acknowledge that the ANWR Comprehensive Conservation Plan (CCP) revision process is ongoing.
2. Baseline air quality data at the actual Point Thomson location remains insufficient.
3. Recommendation from EPA regarding including specific greenhouse gas (GHG) reporting requirements and regulatory definition of facilities.
4. NMFS comments regarding the effects of spills, invasive species, and arctic cod.
5. Segmentation of this project with regard to the Natural Gas Pipeline Project pipeline.
6. Cumulative impact analysis of Shell Oil's Sivilluq Project and exploration and development of other outer continental shelf (OCS) Beaufort Sea leases.
7. Timing of ExxonMobil's Oil Discharge Prevention and Contingency Plan (ODPCP).

Corps Response

1. *Reference to the ANWR's ongoing CCP update in the Final EIS would not affect the Corps decision in this ROD. Therefore, the Corps does not believe the Final EIS needs to be updated in order to make a decision on the permit.*
2. *The Corps disagrees with the commenter's assertion regarding the baseline air quality data in the Final EIS. Numerous relevant sources of baseline data were used in the Final EIS analysis, and the Alaska Department of Environmental Conservation (ADEC) approved the applicant's air permit, a draft of which was reviewed by the Corps' 3rd party contractor.*
3. *This comment inaccurately summarizes the Corp's response to EPA's comment on the Draft EIS. The Corps' response reads: The Corps believes that the general discussion of GHG reporting requirements included in the Draft EIS is appropriate for a NEPA document, which is focused on assessment of environmental impacts. Additional details on specific GHG reporting requirements, including identification of applicable North American Industry Classification System codes, are typically included in the state's air quality permit or associated technical support documents.*
4. *The EFH section and discussion of arctic cod was updated in the Final EIS to address NMFS comments. NMFS concluded consultation on EFH on May 21, 2012, with no additional conservation recommendations beyond those provided in the EFH Assessment.*
5. *The Corps identified the Natural Gas Pipeline Project as a reasonably foreseeable future project, not a connected action. The applicant's proposed project has independent utility and does not require a gas pipeline to be built to meet their purpose and need. Moreover, the project does not propose gas production, nor does the Corps' decision authorize production or transportation of gas.*
6. *The Corps disagrees with the commenter. The Corps believes that OCS activity such as Sivilluq, is appropriately considered and sufficiently analyzed as a reasonably foreseeable future action, especially given the onshore nature and minimal impacts to the marine environment (and thus minimal cumulative impacts) anticipated from the applicant's proposed project.*
7. *The Corps disagrees with the commenter. The Corps reviewed the ODPCP approved by the AOGCC for the existing two wells at the Point Thomson site, and included it in the EIS as background information for assessing potential impacts due to spills. The additional wells proposed as part of this project would be similar to those drilled under the approved ODPCP and was determined by the Corps to be adequate for use in analyzing impacts and determining adequate mitigation measures.*

Resource Development Council, August 22, 2012**Alaska Chamber of Commerce, August 24, 2012****Exxon Seamen's Union, August 25, 2012****Alaska Oil and Gas Association, August 27, 2012**

Due to the similarity of comments, they have been summarized together below.

Summary of Comments

The Corps is urged to approve the PTP as proposed and to issue the DA permit in a timely manner to allow substantial work to proceed this winter and for production to begin in the winter of 2015-2016. The PTP is essential to the success of the Alaska gas pipeline project and will help meet domestic energy, thereby reducing dependence on foreign sources. Development of Point Thomson resources would provide jobs, help meet domestic energy needs, reduce dependence on foreign sources, and increase throughput in the TAPS. The project as proposed by the applicant is the most environmentally sound option for developing Alaska's North Slope natural gas resources. The proposed project with the innovative barge-bridge system is protective of the environment, including polar bears.

Corps Response

The Corps has been aware of the applicant's and State's desired production schedule since the first draft permit application was submitted to us in October 2009. Executive Order 13212 and 33 CFR 320.4 states that oil and gas projects are top priority for permitting.

NANA Development Corporation, August 27, 2012*Summary of Comments*

The PTP should be quickly approved so work can begin this winter. The project as proposed by the applicant is best way of developing the reservoir from an economic and environmental standpoint. We appreciate the applicant's efforts to ensure wildlife are protected. The applicant's polar bear program at Point Thomson has been very effective. Developing Point Thomson will help NANA companies provide jobs for their shareholders and Alaska Natives; provide new revenues to state and local governments; increase throughput for the TAPS; and increase business activity and revenue for the private sector.

Corps Response

The Corps has been aware of the applicant's and State's desired production schedule since the first draft permit application was submitted to us in October 2009. Executive Order 13212 and 33 CFR 320.4 states that oil and gas projects are top priority for permitting

Individuals and Businesses*Summary of Comments*

Thirty-one comments were received from individuals and businesses. One commenter voiced opposition to the project due to environmental damage. The remaining comments described general support for the project and/or concern about delays in permitting. Commenters indicated that the project would provide jobs, add to the TAPS throughput, and be in the best interest of national security.

Corps Response

The Corps acknowledges the public's general interest in the development of this energy related project. The objecting commenter did not provide specific reasons for their opposition.

Applicant

ExxonMobil Development Company, August 27, 2012

Summary of Comment

Timely approval of the permit application is critical to start construction this winter. The applicant has not changed the scope of the project or revised its permit application. All submittals since the October 2011 application have been related to modifying existing figures or providing additional figures and responding to agency requests concerning whether agency-suggested modifications are practicable. Therefore, noticing a second comment period on the application was unnecessary and is contributing to permitting delays.

Corps Response

The Corps has been aware of the applicant's desired construction schedule since their first draft permit application was submitted to us in October 2009. The Corps is complying with Executive Order 13212 notes that oil and gas projects are top priority for permitting.

Summary of Comment

The applicant has provided a large amount of documentation and technical information that supports its proposed project as the LEDPA. The Corps should fully consider ExxonMobil's voluntary mitigation measures to reduce impacts and facilitate timely permitting such as avoiding offshore structures, optimization of the facility footprint and layout to minimize wetland impacts, and proposed use of proven North Slope best practices. The NEPA and Corps permitting processes have been unprecedented in depth and length of review and amount and detail of information provided by the applicant. The PTP should not be held to a higher standard than other projects recently approved on the North Slope. ExxonMobil is not aware of an objective or scientific basis for moving project components inland. Although the applicant has provided information regarding potential project modifications in response to RFIs, it has not proposed a revision to the permit application.

Corps Response

The Corps recognizes the applicant's contribution of technical information in support of their project and voluntary mitigation efforts. The applicant's proposed project is being evaluated on a case-by-case basis as all other permit applications. The Corps is concerned with protection of aquatic and coastal resources along the Beaufort Sea and finds it important to protect these resources.

Summary of Comment

The NSB has approved a Master Plan for the Point Thomson Resource Development District for the proposed project. This is therefore the designated State and local land use and zoning in the area and is entitled to deference under Corps regulations (33 CFR 325.4(j)(2)). The State supports the proposed project and approval of the State Plan of Operations and other permits is pending. These decisions are also entitled to deference under Corps regulations 33 CFR 325.4 (j)(4).

Corps Response

The Corps recognizes and understands the authorities of the state and local governments.

Summary of Comment

The applicant efforts to set the standard for success in implementing compensatory mitigation for unavoidable impacts to aquatic resources include development of a land database and methodology to assist the potential ILF provider, TCF. The applicant believes that it has established world-class standards in design and execution plans for the PTP with respect to environmental performance, health and safety. These should be reflected in the ROD and permit.

Corps Response

The Corps acknowledges the additional effort that the applicant made in assisting an ILF sponsor in our regulatory program. This additional work does not provide any credit toward compensating for unavoidable wetland impacts.

Applicant's Rebuttal to Objectionable Comments

The following sections summarize the applicant's rebuttals and supporting information provided in response to objectionable comments. The applicant provided rebuttals to comments received on both the first and final PN.

Summary of Applicant's Rebuttal to First Public Notice

The applicant was provided an opportunity to respond to the first round of public comments. Their rebuttal was sent to the Corps on April 24, 2012, a summary of which is included below. Additional details are included in their 52-page rebuttal document, which is part of the administrative record.

The applicant did not agree with comments and recommendations by the EPA, USFWS, NAEC, and ICAS to the extent these state or suggest that additional alternatives, site locations, or field configurations beyond those included in the Draft EIS should be formally analyzed in the Final EIS or used to determine the LEDPA

The applicant felt that the EIS Coordinating Agencies had already conducted a systematic and thorough process to develop and evaluate all reasonable alternatives. These alternatives included inland locations, alternative facility sites and configurations, elimination of infield roads to the East and West Pads, and numerous individual components. The applicant felt that many of the suggestions for moving inland were general in nature, without specific sites or technical criteria to identify them. They felt that these suggestions were made during the scoping phase of the EIS process and had been analyzed in the Draft EIS.

The applicant stated that no specific showing had been made of empirical adverse impacts that would be demonstrably mitigated by moving project features inland. Further, no comments had been made to refute their sound project design and environmental mitigation measures. In order to ensure a technically sound result based on full consideration of all parties' views, the applicant requested notice and opportunity to respond to any specific contentions alleged to support such a result.

The applicant felt that moving pads and facilities inland is contrary to the Guidelines because it would have increased adverse impacts to aquatic resources including wetland fill area. Inland facilities generally require longer roads and, in the case of splitting the Central Pad into separate drilling and production facility pads, larger gravel pad and connecting road footprints.

Splitting production facilities from the existing Central Pad to a new inland pad would have required construction of otherwise unnecessary high pressure production and gas reinjection lines between the pads. The gas injection line would need to operate at greater than 10,000 pounds per square inch (psi). While such lines could be constructed, to do so would create additional engineering and operational complexity, with some unquantifiable but inherent additional risk.

The applicant felt that moving project components inland would not only fail to acknowledge the significant mitigation realized by their development of a predominantly offshore project from coastal pads by utilizing long reach drilling at its technical limits, but is unprecedented as a regulatory requirement for oil and gas projects on the North Slope. Such a result would also inevitably raise policy questions about coastal development throughout Alaska.

The applicant felt that development of indeterminate, additional alternatives without clear improvement on those already considered, was not only unwarranted but would needlessly cause the EIS process to recycle to its beginning. They felt this would only serve the goal of delay in issuance of the Final EIS, ROD, and Section 404 permit. In consequence, this would also delay construction of the Project and production from the field. The applicant felt that this would not only result in significantly greater costs with no demonstrated environmental benefit, but conflict with their stated purpose and need and

commitment to the State of Alaska to bring the PTU into production by winter season 2015-16, as required in the recently announced Settlement Agreement. The applicant also felt that this would also conflict with significant public policy objectives of the State of Alaska. State objectives include stemming or reversing the decline of throughput for the TAPS pipeline as well as North Slope production and, by providing access to 8 trillion cubic feet of gas at Point Thomson, establishing an essential prerequisite for construction of a new North Slope natural gas pipeline. These were also issues of national significance.

Summary of Applicant's Rebuttal to Final Public Notice

The applicant was provided an opportunity to respond to the final round of public comments and the Corps received their rebuttal on September 14, 2012. Additional details of their rebuttal are included in their 32-page rebuttal document, which is part of the administrative record.

The applicant noted that many of the comments submitted to the Corps on the second PN were similar or identical to comments made previously in response to the PN of November 18, 2011, on the permit application and Point Thomson Draft EIS.

The applicant provided additional technical information on the practicability of project component options including those suggested by commenters regarding both the first and final PNs. Additional practicability and other technical information were provided regarding the feasibility of modifying the following project components that were under consideration in the determination of the LEDPA:

- Location of the East and West Pads
- The size and location of the gravel mine stockpile and other components of the Gravel Mine Rehabilitation Plan
- Impacts to hydrology from the location and size of the airstrip

Other considerations that the applicant indicated were not practicable included installation of culverts to manage hydrology around the airstrip and splitting of the Central Pad (4-pad configuration).

Specific responses to USFWS and NAEC comments were included in their rebuttal. The applicant stated that comments regarding alternatives, which were brought up during the first PN comment period, were addressed in responses to RFIs. The applicant submitted a response to an RFI regarding the Central Pad, dated July 20, 2012. The applicant also provided to the Corps a summary of Shoreline Erosion that had been provided at the request of the NSB.

5.0 Evaluation of Compliance with 404(b)(1) Guidelines

[33 CFR 320.4(a-r), 33 CFR 325 App B, and 40 CFR 230.11 and 230.20 - 230.77]

The DA permit application evaluation requires compliance with the Guidelines. Under Subpart B of the Guidelines, the Corps' evaluation of the proposed project is required to address four tests that the project must meet in order to receive a Section 404 permit.

5.1 Finding of Practicable Alternatives (40 CFR 230.10 (a))

The first compliance test under the Guidelines states:

Except as provided under Section 404(b)(2), no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences.

The first compliance test of the Guidelines also establishes two presumptions that must be rebutted if a proposed project would have impacts to special aquatic sites⁷ and waters of the U.S. First, the Guidelines state that when an activity associated with the discharge of dredged or fill material in a special aquatic site does not require access or proximity to that special aquatic site to fulfill its basic purpose, then the activity is not “water dependent” and practicable alternatives that do not include impacts to special aquatic sites are presumed to exist unless clearly demonstrated otherwise. Second, the Guidelines also establish that all practicable alternatives to the proposed discharge that do not involve a discharge into a special aquatic site are presumed to have less adverse impact on the aquatic ecosystem, unless clearly demonstrated otherwise. The evaluation of the water dependency of the PTP and the availability of practicable alternatives that do not involve special aquatic sites is discussed in Basic Project Purpose and Water Dependency in Section 2.3 of this ROD. Overall, the Corps finds that that the basic purpose of the project is not water dependent but that practicable alternatives that do not impact waters of the U.S. and/or special aquatic sites do not exist as a result of geographical and technological constraints. The entire project area is composed of jurisdictional wetlands or other waters of the U.S.

After evaluating the water dependency of the proposed project, the Corps must then consider the full range of practicable alternatives that are capable of achieving the overall project purpose. The Guidelines define a practicable alternative as one that is “available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.”⁸ The overall project purpose, as defined by the Corps, is discussed in Overall Project Purpose in Section 2.3 of this ROD. According to the Guidelines, the Corps’ consideration of practicable alternatives should also consider:

- i) Activities which do not involve a discharge of dredged or fill materials into waters of the U.S. or ocean waters; and
- ii) Discharges of dredged or fill material at other locations in waters of the U.S. or ocean waters.

The evaluation of practicable alternatives is based on the range of reasonable alternatives developed through the Final EIS alternatives development process. The Final EIS alternatives development process was implemented in a manner cognizant of the requirements of the Guidelines. Alternatives considered to the proposed project included No Action alternatives and alternatives to constructing and operating all components of the proposed project. All alternatives were considered relative to their technological, logistical, and economic feasibility as well as their apparent likelihood to reduce environmental impacts. The No Action alternative would not meet the purpose of the proposed project; however, it was carried forward in the Final EIS analysis in accordance with NEPA.

As a result, the four action alternatives considered in the Final EIS form the range of reasonable alternatives that establishes the starting point for the Corps’ alternative analysis under the Guidelines. In addition, the four Final EIS action alternatives form the basis from which the Corps has identified practicable alternatives and determined if the applicant’s proposed project is the LEDPA (see Section 5.4 of this ROD).

Analysis of Impacts

Environmental impacts of the EIS alternatives were thoroughly evaluated within the Final EIS. This included evaluation of impacts to twenty-three resources identified by the Corps and the EIS Cooperating Agencies as potential resources of concern. Resources considered include aspects of the physical,

⁷ Special aquatic sites are geographic areas, large or small, possessing special ecological characteristics of productivity, habitat, wildlife protection, or other important and easily disrupted ecological values. These areas are generally recognized as significantly influencing or positively contributing to the general overall environmental health or vitality of the entire ecosystem of a region (40 CFR 230.3). These include wetlands, sanctuaries and refuges, mudflats, vegetated shallows, coral reefs, and riffle and pool complexes.

⁸ 40 CFR 230.10 (a)(2)

biological, and human environment. Impact analysis by resource for each Final EIS alternative may be found in Chapter 5 of the Final EIS.

Following the publication and receipt of comments on the Draft EIS and the PN of the DA permit application, the Corps and the EIS Cooperating Agencies conducted a more focused evaluation of impacts identified within the EIS. The goal was to identify, compare, and weigh impacts to all resources by project component and allow the Corps and the EIS Cooperating Agencies to identify the suite of project components that could make up the Environmentally Preferable Alternative. The impact analysis was conducted as a four-step process that included: 1) identification of alternative component themes from the four action alternatives; 2) differentiating impacts for the component themes; 3) analysis and discussion of differentiating impacts; and 4) selection of environmentally preferred components.

The preliminary findings of the impact evaluation are documented in the Impact Synthesis Discussion (ISD).⁹ Based on these discussions, the Corps and the EIS Cooperating Agencies agreed to consider the following components of an Environmentally Preferable Alternative:

- Near coast drilling pads, with acknowledgement that the precise location may be refined during the permitting process;
- Multi-modal transportation (barging, airstrip, and ice roads) to access Point Thomson;
- Use of a 5,600 foot airstrip; and
- Use of the C-1 Mine site reservoir as the primary project water source during operations.

The Corps and the EIS Cooperating Agencies agreed that the following components would require additional information or consideration before a decision could be made regarding whether it was environmentally preferable:

- Three-pad or four-pad configuration with further evaluation of the relative impacts of splitting the Central Pad and the CPF;
- Inland versus coastal pipeline routes for the export pipeline, with consideration for tradeoffs in impacts between impacts to subsistence activities and pipeline spill response;
- Inland versus coastal infield gravel roads, with consideration for tradeoffs in impacts between overall gravel fill in wetlands and impacts to hydrology;
- Placement of the airstrip in a single drainage to minimize impacts to hydrology with consideration for additional resource impacts related to increasing the length of the airstrip access road;
- Transportation of water to Central Pad via truck, via pipeline installed in the gravel road, or on VSMs; and
- Transmission of power to airstrip via trenched cable or cable elevated on pipeline VSMs.

The findings of the ISD were used to support the Corps' evaluation of the proposed project under the Guidelines.

Determination of the LEDPA

The Corps evaluated the components identified as less environmentally damaging in the ISD¹⁰ to determine whether the applicant's proposed project is the LEDPA (see Section 5.4 of this ROD). This process included:

⁹ HDR, "Impact Synthesis Discussion" (memorandum, Anchorage, 2012). Summarizes the findings of the Corps and EIS Cooperating Agency discussions around potential components of the Environmentally Preferable Alternative.

- 1) Consideration of impacts resulting from combinations of environmentally preferable project components;
- 2) Optimization of infrastructure layout and design including consideration of minor shifts or reconfiguration of project infrastructure to further avoid or minimize specific impacts identified in the EIS; and
- 3) Considerations of practicability including the existence of available technology, logistics, and cost (note: cost was found to not be a deciding factor for determining the practicability of alternatives to this project).

The remainder of this section presents the Corps final step in the evaluation of whether the applicant's proposed project constitutes the LEDPA. The sections below discuss and analyze the applicant's proposed project by the following project components:

- Central Pad
- East and West Pad
- Infield Access Roads
- Transportation Infrastructure
- Dredge Material Disposal
- Point Thomson Export Pipeline
- East and West Pad Gathering Lines
- Gravel Mine
- Other Infrastructure

Sections begin with a description of the component as defined in the applicant's DA permit application. A table summarizes all alternatives considered, and when in the Corps' process they were considered. The table is followed by more detailed descriptions of the component options considered as part of the LEDPA determination and rationale for the Corps either dismissing the options, or identifying them as a component of the LEDPA.

Central Pad

The construction of the proposed Central Pad would result in the placement of gravel fill into 42.8 acres of WOUS. The applicant proposes to incorporate the existing 13.2 acre PTU-3 Pad into the new Central Pad. The PTU-3 Pad was previously authorized under DA permit number 071-OYD-4-810264 issued to Exxon Company, USA in 1981. The proposed Central Pad would be 56.0 acres in total.

The proposed Central Pad represents the center of activity for the proposed project and includes infrastructure to support and promote remote drilling and production operations. The Central Pad would accommodate up to eight wells, including the existing PTU-15 and PTU-16 wells. In addition, it would also house the CPF that includes infrastructure to separate hydrocarbon liquids from the natural gas, re-inject residual gas, and stabilize the liquid hydrocarbons for transport in the PTEP. Additional infrastructure includes camps; offices; maintenance shops; electric power generating and distributing facilities; water treatment facilities; warehouses and storage areas; fuel, water, and chemical storage tanks; vehicles and construction equipment; spill response equipment; waste management facilities; communications facilities; barge facilities; emergency boat launch ramp; and boat storage.

Due to the proximity of the Central Pad to the Beaufort Sea coastline, the applicant proposes to include gravel bag armor slope protection on the north, east, and portions of the west sides of the

¹⁰ HDR, "Impact Synthesis" (2012).

Central Pad. See Figures 7 through 10 of the DA permit application for additional details on the proposed pad location and design.

Alternatives Considered

During the development and evaluation of the EIS alternatives and evaluation of components considered as the LEDPA, the Corps considered alternatives to the applicant’s proposed Central Pad. Table 5.1 summarizes the full range of alternatives considered for the Central Pad.

Table 5.1: Central Pad Alternatives Considered		
Components carried forward for consideration as the LEDPA		
<i>Alternative Components Considered</i>	<i>Where Considered</i>	
Central Pad and CPF located at former PTU-3 site	Applicant’s proposed project	
Split Central Drill Pad and CPF, locate CPF 2 miles inland	Component of Final EIS Alternatives C and D	
Move project elements that do not require coastal location to an inland pad (e.g., Alaska State C-1 Pad)	LEDPA Evaluation	
Reconfigure Central Pad to increase pad distance from shoreline	LEDPA Evaluation	
Further minimize Central Pad size	LEDPA Evaluation	
Components Eliminated Prior to LEDPA Evaluation		
<i>Alternative Components Considered</i>	<i>Where Considered</i>	<i>Reason Eliminated Prior to LEDPA Evaluation</i>
Locate CPF within the gravel mine site	Concept considered in EIS alternatives development	Technological challenges and potential for increased impacts related to constant dewatering of mine site (Final EIS p. 2-8).
Offshore development from barrier or manmade islands or a drilling platform	Concept considered in EIS alternatives development	Potential for increased environmental impacts to offshore and coastal environments (Final EIS p. 2-8).
Location of CPF and personnel support at Badami	Concept considered in EIS alternatives development	Technological infeasibility of separating processing, compression, and injection facilities (Final EIS p. 2-9).
Automated CPF with offsite controls	Concept considered in EIS alternatives development	Technological challenges and impracticability of removing all personnel and support facilities from CPF (Final EIS p. 2-9).
Use of centrifugal compression processing facilities	Concept considered in EIS alternatives development	Did not differ sufficiently from Applicant’s proposed project to warrant full consideration (Final EIS 2-14).

A goal in the Corps’ evaluation of alternatives to the proposed Central Pad was the reduction of the potential for impacts to coastal resources in the project area. This included evaluation of the prevalence of coastal wetlands of high functional value, and the potential for impacts to birds, caribou, polar bears, and other wildlife.¹¹ The Corps’ evaluation of Central Pad alternatives also took into consideration USFWS comments regarding shifting the Central Pad inland a short distance to address potential impacts to polar bear passage along the coast.¹²

In conducting alternatives evaluation and considering the LEDPA, the Corps recognizes that the range of alternatives for movement or minimization of the Central Pad is constrained due to the existing coastal location of the PTU-3 Pad that includes two existing wells. In addition, some infrastructure proposed for the Central Pad, including the emergency boat launch and barge facilities, requires access to the Beaufort Sea to satisfy the specific purpose of that component. As a result, the Corps concluded that coastal location for the surface location of wells, associated

¹¹ HDR, “Coastal Corridor,” (2012). Developed at the direction of the Corps to examine the potential for impacts to coastal resources related to proposed pad locations and other location alternatives.

¹² USFWS, “Comments on the Public Notice of the Application for POA-2001-1082-M1 Beaufort Sea” (letter, Anchorage, 2012).

drilling infrastructure,¹³ barge facilities, and the emergency boat launch cannot practicably be moved inland.

Split Central Processing Facilities from the Central Drill Pad

Based on evaluation of the practicability and environmental impact of splitting the production facilities from the existing Central Pad, the Corps concluded that splitting the CPF from the Central Drill Pad was technologically and logistically feasible, but would increase environmental impacts, safety risks, and practicability concerns.

Splitting the CPF from the Central Pad would require construction of high-pressure production and gas reinjection lines between the Central Pad and CPF Pad. Based on information provided by the applicant and verified by the Corps, the construction of the lines would be technologically feasible. However, it would create additional engineering and operational complexity with additional safety and spill risk due to increased pipeline length and the high pressure at which the additional pipeline would be required to operate.¹⁴ For example, separation of the compression facilities from the injection well would require increasing the compression discharge pressure to above 10,000 psi to account for pressure lost over the length of the pipeline while maintaining an injection wellhead pressure of 10,000 psi. The increase in stored potential energy over the increased length of the injection line has the potential to be substantial and could increase safety risks associated with a pipeline failure.¹⁵

Based on information provided by the applicant and verified by the Corps, movement of the CPF inland would increase the gravel fill footprint by a minimum of 15 acres due to less efficient use of pad space and the need for wider gravel access roads to the CPF for transport of facility modules.¹⁶ Splitting the two pads would require clear space around the perimeter for access and emergencies.¹⁷ Additional space would also be required to duplicate infrastructure and functions required at both pads including handling and storage of wastes; transmission of power and provision of backup power generators; duplication of fire, emergency response, and medical facilities; and storage and staging areas.¹⁸

Furthermore, increasing pad size would increase the overall area of indirect impact. Indirect impacts include buffer zone impacts considered for wetlands, vegetation, hydrology, and wildlife.¹⁹ Additional gravel fill would be needed to almost double the width the access road between the Central Pad barge facilities and the CPF Pad to accommodate facility module transportation. Based on information provided by the applicant and verified by the Corps, doubling the width of the gravel access road would cost approximately \$350,000 per mile.²⁰

¹³ Infrastructure associated with drilling includes a drilling rig, grind and inject facilities, cuttings storage, dry bulk storage, drilling warehouse, tank trailers, drilling fluid tanks, a drilling camp, and a laydown area for pipe material.

¹⁴ ExxonMobil, "ExxonMobil Response to Comments on Public Notice Application for Permit Point Thomson Project," (letter, Anchorage, 2012).

¹⁵ HDR, "Point Thomson EIS Request For Information Response 64- Locational Constraints," (memorandum, Anchorage, 2010).

¹⁶ ExxonMobil, "ExxonMobil's Reponse to Corps RFI of July 12, 2012 on the Central Pad," (letter, Anchorage, 2012).

¹⁷ ExxonMobil, "ExxonMobil March 6, 2012 Response to Corp's February 6, 2012 Request for Information, Point Thomson Project," (letter, Anchorage, 2012).

¹⁸ ExxonMobil, " Reponse to Corps RFI on the Central Pad," (2012).

¹⁹ Ibid.

²⁰ ExxonMobil, "Point Thomson Gas Cycling Project Reponse to EIS Data Information Needs RFI-18," (Anchorage, 2003). RFI response from the 2003 Point Thomson Project EIS provides relevant practicability information regarding current component options considered in evaluating the LEDPA.

Splitting the CPF and Central Pad would have additional impacts on wildlife related to the increase in vehicle traffic along the Central Pad access road and the routing of injection pipeline within 500 feet of the access road. By separating the Central Pad and the CPF, the need to move personnel and materials back and forth between the two locations would increase substantially, increasing the footprint and frequency of disturbance to wildlife sensitive to vehicle and human traffic.²¹ Separation of Central Pad facilities is anticipated to increase intra-field traffic by approximately 1,700 trips during construction and drilling and 350 trips annually during operations.

Move Project Elements that do not Require Coastal Location to an Inland Pad

The Corps considered maintaining the CPF at the coastal Central Pad, but relocating all other non-coastal essential infrastructure, including project camps, warehouses, maintenance facilities, and storage areas, to an inland location such as the Alaska State C-1 Pad (C-1 Pad). The Corps found that while the separation of coastal and non-coastal essential facilities would result in less infrastructure and activity immediately adjacent to the coast, it would result in an inefficient use of pad space, a greater footprint of gravel fill, increased disturbance to wildlife throughout the project area, and greater project costs.

Separation of some facilities would have an effect similar to the separation of the CPF from the Central Drill Pad by potentially decreasing some activity near the coastline but increasing vehicle traffic and thus the potential for wildlife disturbance along the road corridor.

Based on information provided by the applicant and verified by the Corps, moving facilities to the existing C-1 Pad would result in practicability and safety considerations related to the location of fuel storage and camp facilities in close proximity to the existing C-1 reservoir and the proposed gravel mine. State regulations require a 1,500-foot separation between camps and fuel storage and potable water sources. The center of the existing C-1 Pad is currently 800 feet from the C-1 reservoir.²² Camps are also required to be located a minimum of 3,000 feet from mine sites due to safety concerns related to blasting. Locating a communications tower at the C-1 Pad could potentially interfere with the Federal Aviation Administration (FAA) precision approach to the adjacent proposed airstrip.²³ Finally, the C-1 Pad would also require expansion to accommodate the relocated infrastructure in addition to the materials and equipment already proposed for storage at that site.

Reconfiguration of Central Pad to Increase Pad Distance from Coastline

The Corps considered reconfiguration options for proposed Central Pad infrastructure to increase the pad distance from the coastline a few hundred feet based on comment provided by the USFWS. The primary goal was to minimize impacts to polar bear movements along the beach past the facilities. This reconfiguration was focused on infrastructure proposed for the eastern side of the Central Pad as movement of the drill sites and barge offloading facilities located near the coast on the northern portion of the pad would not meet the proposed project's purpose and need.

While the Corps agreed with the USFWS that creation of a 100 to 300 foot buffer from the coastline was preferable, the Corps found that shifting the Central Pad westward a few hundred feet would have major impacts on pad layout and design including the location of existing wellheads. Movement of facilities on the Central Pad is also constrained by the need to avoid locating processing facilities and fuel storage over a closed reserve pit that exists at the PTU-3 site. As a result, the Corps, in consultation with USFWS has added a special condition requiring a 100 foot setback from the coastline along the eastern side of the Central Pad. This setback would be created by limiting the placement of gravel fill along the eastern edge of the existing PTU-3 Pad and by the placement of dredged material to extend the shoreline into the adjacent lagoon.

²¹ HDR, "Coastal Corridor," (2012).

²² Ibid.

²³ Ibid.

Further Minimization of Central Pad Size

The Corps evaluated whether the Central Pad was appropriately sized to meet project purpose and need. The Corps concluded that further reduction in the size of the Central Pad was technologically feasible, but would result in logistical constraints that would impact the construction and long-term operation of the proposed project.

The Corps compared the acreage proposed for the Central Pad to similar pads at ConocoPhillips Alaska Inc.'s (CPAI) Alpine Development Project (Alpine). The Corps concluded that the acreage of the proposed Central Pad would be approximately 25 percent larger than comparable pads at Alpine, but that the increase in size was reasonable given the remote nature and the different engineering and operational constraints specific to the PTP.²⁴ Engineering and operational constraints unique to the proposed project include on-site fuel storage; increased storage requirements; and increased safety spacing requirements, such as 40-foot wellhead spacing, to account for higher reservoir and operating pressures.²⁵

The Corps concluded that further minimization of pad size through reduction in pad space proposed for material and equipment storage and staging would have substantial impacts on project logistics. Based on information provided by the applicant and verified by the Corps, shifting equipment and activities planned for the southern portion of the pad to other locations on the Central Pad would create conflicts with other planned activities and infrastructure.²⁶ During operations, storage and staging areas would be necessary to maintain a sufficient inventory of maintenance materials and supplies on site due to the logistical and seasonal constraints of accessing the remote facility via barge or ice road. Additionally, storage, staging areas, and housing of additional personnel would be of key importance in the event of an incident requiring significant response due to a catastrophic event. Based on this use, the Corps determined that the activities and uses proposed for all portions of the Central Pad are reasonable due to the logistical constraints of constructing, operating, and maintaining a remote facility with seasonal restrictions on access.²⁷

Central Pad Component of the LEDPA

Based on the Corps' evaluation of the environmental impacts and practicability of all reasonable alternatives to the applicant's proposed Central Pad, the Corps concluded that the LEDPA includes:

- Expansion and use of the Central Pad as proposed by the applicant with the following changes to maintain a coastal corridor to minimize impacts to polar bear movement:
 - Limiting the placement of gravel fill along the eastern edge of the existing PTU-3 Pad; and
 - Placement of dredged material in waters of the U.S. along the eastern side of the proposed pad to extend the shoreline into the adjacent lagoon to expand polar bear travel corridor.

East Pad and West Pad

The construction of the proposed East Pad, approximately 250 feet from the coastline, would be 15.6 acres in total. This includes 4.63 acres of existing gravel fill at the North Staines River 1 pad, and

²⁴ HDR, "Review of Pad Sizing for Proposed and Alternative Installation Cases," (memorandum, Anchorage, 2011). Document prepared at the direction of the Corps to provide third party verification of the size of the proposed pads.

²⁵ Ibid.

²⁶ ExxonMobil, "March 6, 2012 Response," (2012).

²⁷ Ibid.

placement of new gravel fill into 11.0 acres of WOUS. The North Staines River 1 Pad was previously authorized under DA permit number 071-OYD-4-910203 issued to Phillips Petroleum Company in 1981. The location and design of the proposed East Pad is shown on Figures 17 and 18 of the DA permit application.

The construction of the proposed West Pad would result in the placement of new gravel fill into 18.9 acres of WOUS, approximately 500 feet from the coastline. The location and design of the proposed West Pad are shown on Figures 19 and 20 of the DA permit application.

The purpose of both the proposed East and West Pads is to provide drilling platforms from which to access the eastern and western portions of the Thomson Sand Reservoir and other hydrocarbon sources. During drilling, the East and West Pads would accommodate infrastructure to support drilling. During production, both pads will house control facilities, power cables and electricity transformers, methanol tanks and injection systems, pipeline inspection gauge (PIG) launching systems for the gathering lines, and other equipment for well pad operations.

Alternatives Considered

During the development and evaluation of the EIS alternatives and evaluation of components considered as the LEDPA, the Corps considered alternatives to the applicant’s proposed East and West Pads. Table 5.2 summarizes the full range of alternatives considered for the East and West Pads.

Table 5.2: East and West Pad Alternatives Considered		
Components carried forward for consideration as the LEDPA		
<i>Alternative Components Considered</i>	<i>Where Considered</i>	
East and West Pads located approximately 250 to 500 feet from coastline	Applicant’s proposed project	
East and West Pad Location Optimization	LEDPA Evaluation	
Use of multi-season ice pad extensions during drilling phase at East and West Pads	Component of Final EIS Alternative E	
Move project elements that do not require coastal location to an inland pad (e.g., Alaska State C-1 Pad)	LEDPA Evaluation	
Components Eliminated Prior to LEDPA Evaluation		
<i>Alternative Components Considered</i>	<i>Where Considered</i>	<i>Reason Eliminated Prior to LEDPA Evaluation</i>
Locate East and West Pads ½ mile inland	Component of Final EIS Alternatives C and D	Increased distance from reservoir would result in decreased reservoir access, increased drilling complexity, and impacts to overall resource recovery with no compelling decrease in other environmental impacts ^a .
Elimination of East Pad	Concept considered in EIS alternatives development	Elimination of East Pad does not meet the project purpose and need to access and delineate entire reservoir (Final EIS p. 2-8).
Use of full ice pad for East and West Pads	Concept considered in EIS alternatives development	Technologically infeasible as activities planned for East and West Pads require production infrastructure on gravel pads to meet project purpose and need (Final EIS p. 2-11).

^a HDR. 2012abc. *Impact Synthesis Discussion*. Anchorage, Alaska.

East and West Pad Location Optimization

Based on evaluation of the practicability and environmental impact of shifting the location of the East and West Pads, the Corps concluded that a small scale shift in pad location could decrease impacts on high value coastal resources and would be practicable in terms of technology, logistics, and cost.

The reconfiguration option considered for the West Pad would increase the pad setback from the coast by an additional 500 feet.²⁸ Based on analysis completed by the applicant and verified by the Corps, sufficient access to the Reservoir would be maintained by shifting the proposed pad location approximately 500 feet west and reconfiguring the pad from a rectangular shape into an “L”-shaped one.²⁹ This would require slight movement of the West Pad access road and would reduce impacts to wetlands of moderate functional value by approximately 1.2 acres.³⁰ Furthermore, while the proposed West Pad is already located 500 feet from the coastline, a distance determined to be sufficient to prevent impacts related to coastal erosion and disruption of coastal processes, location of the pad an additional 500 feet inland would serve to increase the buffer from the coastline. Based on an evaluation of environmental impacts and practicability, the Corps concluded that minor reconfiguration of the West Pad would be less environmentally damaging than the proposed project and is practicable from the standpoint of technology, logistics, and cost.

Similarly, the Corps considered two potential reconfiguration options for the East Pad with consideration for preserving reservoir access while minimizing impacts on aquatic ecosystems. Both East Pad options would eliminate use of the existing gravel fill from the North Staines River 1 Pad. However, the Corps concluded use of the North Staines River 1 Pad is not the LEDPA because of the location of the existing pad relative to the coastline.

The first East Pad reconfiguration option would keep the East Pad in the immediate vicinity of the proposed East Pad, but would shift the pad slightly southwest and inland. This option would increase the coastal setback of the new portion of the East Pad from approximately 250 feet to 500 feet. This East Pad reconfiguration option would increase the overall gravel footprint of the proposed project because the elimination of use of the North Staines River 1 Pad. The shift in location would increase the buffer of the proposed pad from the coastline. The Corps concluded that the first reconfiguration option for the East Pad was practicable in terms of providing sufficient access to the Reservoir, and in terms of other aspects of technology, logistics, and cost.

The second reconfiguration option considered for the East Pad would take advantage of detailed reservoir modeling data that suggests the most productive zone of the Reservoir may run in a northwest/southeast direction in the vicinity of the East Pad. The second option utilizes the parallel orientation of the Beaufort Sea coastline in the East Pad area to relocate the pad inland by moving it both north and west. By moving the pad north, the applicant would be able to preserve access to the Reservoir while achieving the goal of increasing the coastal setback to 1,000 feet. This would result in an overall decrease in impacts to environmental resources. The applicant would no longer have access to existing gravel fill at the North Staines River 1 Pad, and the overall acreage of new gravel fill would increase from 11.0 acres to 20.9 acres. Shifting the East Pad further west would reduce the length of the gravel road to the East Pad by 1.2 miles.

Reconfiguration of the East Pad and East Pad Access Road would have other environmental benefits. The change in route and overall decrease in length of the access road would eliminate the need for the gravel road to cross Stream 27 and would reduce overall impacts to hydrology that could result from impoundment of sheetflow.³¹ Movement of the East Pad away from the coast would increase the pad's buffer from the coastline and further reduce any potential for impacts related to coastal erosion.

Minimization of Gravel Fill at East and West Pads

The Corps evaluated the minimization of the size, and gravel fill needed at the East and West Pads. The Corps considered the practicability and environmental impacts of multiyear ice pad extensions located adjacent to minimized gravel infrastructure and concluded it would not be the

²⁸ ExxonMobil, “ExxonMobil's Response to Corps RFI of June 15, 2012 on East and West Pad Locations,” (letter, Anchorage, 2012).

²⁹ Ibid.

³⁰ HDR, “East and West Pads Options” (2012).

³¹ Ibid.

LEDPA because it would result in little change in environmental impact, but would increase technological uncertainty. While single season ice pads are relatively common construction tools used on the North Slope, the use of multiyear ice pads has been more limited. Multiyear ice pads have been used for two projects on the North Slope, one for an exploration well in Umiat and another for BP's Yukon Gold.³² The ice pads constructed for the 1993 Yukon Gold exploratory project were 2.5 acres in size, six inches thick with insulation board on top, and designed to last two winter drilling seasons.³³

In contrast, the multiyear ice pads required for Point Thomson would need to be about 11 acres in size, and 6 feet thick. The pads would be designed to last for the entire five-year duration of the drilling program. An estimated 3.4 million gallons of water would be required to build the ice pads, and additional water will be needed each year for ice pad maintenance. Over the course of the summer, each of the ice pad extensions would lose between 8 to 10 feet around each exposed edge due to melting and would require maintenance work in early winter to recover the area before drilling could begin. There is currently no prior experience on the North Slope that can inform the technological feasibility of the construction, maintenance, and operation of an ice pad of the required size and thickness.

In addition, no substantial decrease in environmental impacts has been identified to compel selection of the multiyear ice pads over gravel infrastructure.³⁴ Multiyear ice pads can still compact soil, inhibit vegetation regeneration, and cause subsidence along the pad edge, although these impacts would occur over a shorter period of time than for gravel infrastructure. Construction of multiyear ice pads would also result in a substantial increase in water withdrawals.

Move Project Elements that do not Require Coastal Location to an Inland Pad

The Corps evaluated the need for specific infrastructure to be located on the East and West Pads and considered the practicability of locating infrastructure that may not require close proximity to the drilling activities elsewhere in the project area. Based on analysis provided by the applicant and verified by the Corps, it was concluded that the East and West Pads are of reasonable size and that infrastructure proposed for location on the East and West Pads has been minimized to facilities essential to well drilling and production.³⁵

East and West Pad Components of the LEDPA

Based on the Corps' evaluation of the environmental impacts and practicability of all reasonable alternatives to the applicant's proposed East and West Pads, the Corps concluded that the LEDPA includes:

- West Pad reconfiguration to increase pad distance from the coastline;
- East Pad reconfiguration to a location approximately one mile west to decrease impacts to high value wetlands, hydrology, and the potential for impacts related to coastal erosion; and
- Construction and use of the full acreage of gravel for the East and West Pads as proposed to provide sufficient platform from which to conduct proposed drilling activities.

Infield Access Roads

The proposed project includes construction of a network of gravel infield access roads. These include a Central Pad access road, East Pad access road, West Pad access road, and several smaller access

³² Rose Ragsdale, "30 Strong: Insulated Ice Pads Extend Season," (October 14, 2007): <http://www.petroleumnews.com/pntruncate/400894316.shtml>.

³³ ExxonMobil, "March 6, 2012 Response," (2012).

³⁴ HDR, "Impact Synthesis" (2012).

³⁵ HDR, "East and West Pads Options" (2012).

roads. See Figures 43 through 60 and 72 through 74 of the DA permit application for additional details on proposed infield road routes and design.

The proposed Central Pad access road would be 2.7 miles in length and require placement of gravel fill into 19.9 acres of WOUS. Construction would require crossing of two streams, Stream 23 and Stream 24A. The applicant proposes to cross Stream 23 with culverts and to cross Stream 24A with a 65-foot bridge. The construction of the culverted crossing of Stream 23 would include placement of 20-foot by 10-foot, concrete revetment scour protection on the downstream side of the culvert crossing. The road would include placement of culverts at approximately 500-foot intervals to help maintain natural drainage patterns. The purpose of the Central Pad access road is to provide year round access between the airstrip, C-1 pad, C-1 water reservoir and the Central Pad.

The proposed East Pad access road would be 3.5 miles in length and require placement of gravel fill into 25.5 acres of WOUS. Construction would require crossing Stream 24A, Stream 26, and Stream 27. The applicant proposes to use culverts at each stream crossing and would include concrete revetment scour protection on the downstream side of each stream-crossing culvert. The road would also include placement of culverts at approximately 500-foot intervals to help maintain natural drainage patterns.

The proposed West Pad access road would be 4.5 miles in length and require placement of gravel fill into 33.4 acres of WOUS. Construction would require four stream crossings. Stream 18A would be crossed using culverts, while Stream 18B, Stream 22A, and Stream 22B would be crossed using 40-foot, 65-foot, and 65-foot bridges, respectively. Concrete revetment scour protection would be used on the downstream side of each stream crossing culvert.

The purpose of both the East and West Pad access roads would be to provide year round transportation of personnel, equipment (including drilling rigs), materials, and supplies between the three pads and other infield locations in support of drilling, operations, and emergency response. Year round access to the East and West Pads is anticipated to be most crucial during the drilling phase of project development. This includes year round transportation of the drill rig, associated drilling supplies and infrastructure, and drill operators. During operations, the East and West Pad access roads would be used to provide regular access for inspections and any additional well work.

In addition to the main access roads, the proposed project includes several smaller access roads that serve as spur roads to provide access to other project infrastructure from the main access roads. These include the Airstrip Access Road (0.24-mile in length, 1.7 acres of gravel fill); the C-1 Pad Access Road (0.03-mile in length, 0.4-acre of gravel fill); the water access pad access road (0.03-mile in length, 0.2-acre of gravel fill); and the gravel mine access road (0.34-mile in length, 3.3 acres of gravel fill). There would be no stream crossings with construction of the smaller access roads.

Alternatives Considered

During the development and evaluation of the EIS alternatives and evaluation of components considered as the LEDPA, the Corps considered alternatives to the applicant's proposed plan for construction of an infield gravel road system. Table 5.3 summarizes the full range of alternatives considered for the infield gravel road system.

Table 5.3: Infield Access Roads Alternatives Considered

Components carried forward for consideration as the LEDPA		
<i>Alternative Components Considered</i>	<i>Where Considered</i>	
Drill rig capable infield gravel roads connecting Central, East, and West Pads and airstrip	Applicant's proposed project	
Infield roads routed inland	Component of Final EIS Alternatives C and D	
Seasonal ice road access to East and West Pads; gravel access from Central Pad to the airstrip	Component of Final EIS Alternative E	
Routing of roads to minimize high value wetland impacts	LEDPA Evaluation	
Components Eliminated Prior to LEDPA Evaluation		
<i>Alternative Components Considered</i>	<i>Where Considered</i>	<i>Reason Eliminated Prior to LEDPA Evaluation</i>
Seasonal ice road access between East, West, and Central Pads and airstrip	Concept considered in EIS alternatives development	Lack of ground transportation between Central Pad and airstrip would require high volume of weather dependent helicopter traffic, increased impacts to noise and safety (Final EIS p. 2-17).
Light duty infield gravel roads	Concept considered in EIS alternatives development	Light duty roads would not provide substantial mobility and logistical benefits over ice roads while leading to increased impacts (Final EIS p. 2-16).

Use of Seasonal Ice Roads to Access East and West Pads

The minimization of gravel fill through use of seasonal ice roads instead of gravel roads for the East and West Access roads was evaluated as a component of Alternative E of the Final EIS. The Corps concluded that this component alternative was not the LEDPA because of a net increase in environmental impacts, project safety needs, and practicability concerns related to logistics.

Elimination of gravel roads to the East and West Pads would reduce impacts on several resources due to the reduction in gravel infrastructure. However, reliance on seasonal ice roads would increase some environmental impacts as a result of increased water usage to construct the seasonal ice roads. The need for frequent helicopter travel during the approximately nine months of the year when ice road access would not be available would also greatly increase impacts on project noise with subsequent impacts on wildlife and subsistence and traditional land use activities. Based on these factors, the Corps concluded that elimination of gravel roads to the East and West Pads is not less environmentally damaging than the applicant's proposed project.³⁶

The Corps also concluded that use of seasonal ice roads is not as practicable as use of gravel roads in terms of project logistics and safety. The project's drilling window is seasonally limited by the terms and conditions of the applicant's ODPCP. The applicant's drilling schedule, as proposed, makes effective use of the six months of the year when drilling in the hydrocarbon layer is limited by moving the drill rig between pads and drilling well surface holes above the hydrocarbon layer. This allows the applicant to efficiently use the November to April drilling season to target drilling within the hydrocarbon layer and to complete the five proposed wells within three drilling seasons.

The use of seasonal ice roads limits ground access and drill rig movement to the short period of time when the rig-ready ice roads are available, usually between late January and late April. The drill rig would be effectively stranded on the East and West Pads between ice road seasons and could potentially sit idle from late April to the following January each year. This would result in the loss of three months of the winter drilling season (November through January), because the rig is unable to be moved to its next target. Overall, based on analysis conducted by the applicant and

³⁶ HDR, "Impact Synthesis" (2012).

verified by the Corps, the inefficient use of the drill rig would result in the lengthening of time needed to complete the five proposed wells to five years.

Limited ground access to the East and West Pads would impact the transportation of construction and drilling materials and personnel. The drilling program relies on the movement of bulk materials between the Central Pad, where most storage occurs, and the East and West Pads. As material movement via ice road would be limited, an additional 22 acres of additional storage space would be needed at the East and West Pads. In addition, the use of tundra-safe, low-ground-pressure vehicles would likely increase relative to the applicant's proposed project.

Limited access to the East and West Pads would increase project reliance on helicopter transport. Elimination of the gravel roads to the East and West Pads would result in the need for approximately 7,000 additional trips during construction and drilling and an additional 730 annual trips for operations. Helicopter support would be of particular importance in the event of an emergency, such as a medical evacuation or spill event before ice roads were in place. However, helicopter transport is less reliable than ground transport; based on experience gained during the exploratory phase of the project, the applicant estimates that helicopters could be grounded due to weather concerns up 20 percent of the time.³⁷ Overall, the lack of consistent access to the East and West Pads raises substantial safety and environmental concerns as response to environmental or medical emergencies would be reliant on weather dependent helicopter travel for nine months of the year.

Routing of Gravel Access Roads Inland

The Corps evaluated routing the infield road system inland (two to four miles), considered as a component of Final EIS Alternatives C and D, to potentially minimize impacts to WOUS. The Corps concluded that while routing infield roads inland is practicable, when considered in conjunction with the location of other project infrastructure identified as part of the LEDPA, inland roads would result in increased gravel fill and increased environmental impacts relative to the proposed road locations.

The findings of the Final EIS indicate that tradeoffs exist between inland and coastal gravel road locations.³⁸ When road routes are considered in isolation, the Final EIS analysis found that the placement of the infield gravel roads inland is slightly preferable because an inland route would orient roads more parallel to the predominant direction of water flow, require fewer stream crossings and minimize impacts on riparian habitats and the wildlife that use them.

However, identification of the least damaging road routes must consider the location of project components as a whole, including the coastally located pads identified as a component of a LEDPA (See Central Pad in Section 5.1 of this ROD). Connecting coastal pads with inland routed roads would require an increase in the length and the acreage of fill. This would increase secondary impacts of gravel fill placement such as dust generation. The increase in impacts related to road length would outweigh any decrease in impacts that may result from moving the roads further inland.

Routing of Gravel Roads to Minimize Impacts to High Functioning Wetlands

The route of the proposed West Pad access road concentrates impacts in low functioning wetlands with occasional impacts to high and medium functioning wetlands in the vicinity of stream crossings and as the road approaches the West Pad near the coast. Based on analysis conducted by the applicant and verified by the Corps, the West Pad access road avoids impacts to nearby coastal marshes, estuarine habitats, lake basins, and storm surge areas.³⁹ Similarly, the proposed East

³⁷ ExxonMobil, "March 6, 2012 Response," (2012).

³⁸ HDR, "Impact Synthesis" (2012).

³⁹ ExxonMobil, "ExxonMobil's Response to Corps RFI of July 13, 2012 on Infield Pipelines and Other Miscellaneous Items," (letter, Anchorage, 2012).

Pad access road and the Central Pad access road would be routed to balance minimization of gravel fill with minimization of impacts to area hydrology and higher functioning wetlands.

As discussed in the East and West Pad section above, selection of the of the East Pad reconfiguration option (East Pad and West Pad in Section 5.1 of this ROD) would further minimize impacts related to the East Pad access road by reducing road length by over one mile, eliminating need for crossing of Stream 27, and reducing the potential for impacts to hydrology related to impoundment of sheetflow.⁴⁰ In addition, the reconfigured East Pad access road would reduce the acreage of gravel fill needed for the infield access roads by approximately 9.8 acres. Selection of the West Pad reconfiguration option would require a minor change in the West Pad access road configuration. This reconfiguration would reduce the acreage of fill required for the West Pad access road by approximately 1 acre.⁴¹ Based on this analysis, the Corps determined that the reconfigured East Pad access road was less environmentally damaging than the applicant's proposed East Pad access road.

Infield Gravel Road Components of the LEDPA

Based on the evaluation of the environmental impacts of the applicant's proposed infield access roads, the Corps concluded that the LEDPA includes:

- Construction and use of the access roads for the Central Pad, water access, C-1 Pad, and airstrip, as proposed with conditions including monitoring of crossflow drainage and dust abatement; and
- Construction and use of the East and West access roads with modification to accommodate the reconfiguration and movement of the East and West Pads with conditions including monitoring of crossflow drainage and dust abatement.

Transportation Infrastructure

The proposed project includes a tri-modal transportation plan to provide access to and from Point Thomson. This includes the construction and use of barge facilities to provide water-based access during summer barging months from Prudhoe Bay and other ports worldwide; construction and use of seasonal ice roads during the construction and drilling phases of the proposed project; and construction and use of a 5,600-foot long airstrip and attached helipad. Seasonal ice roads would not require placement of fill in WOUS.

Barging Facilities

The proposed project includes the construction and use of barging facilities to accommodate access to the Point Thomson area by both coastal barges and sealift barges. Barge facilities are proposed for construction at the Central Pad and would result in the placement of gravel fill in WOUS. Construction of the sealift barge facilities would accommodate access by oceangoing sealift barges to deliver large, prefabricated sealift facility modules from global manufacturers. Construction of the service pier would accommodate access by coastal barges that would transport goods and materials primarily from Prudhoe Bay. See Figures 11 through 13 of the DA permit application for additional details on proposed barge facilities layout and design.

Development of the sealift barge facilities would include the construction of an onshore sealift bulkhead on the northeastern end of the Central Pad and the placement of four mooring dolphins and six temporary ramp supports offshore. Gravel fill in WOUS is accounted for in the fill required to build the 56.0 acre Central Pad.

⁴⁰ HDR, "East and West Pads Options" (2012).

⁴¹ Ibid.

Construction of both the sealift and coastal barge facilities are anticipated to require dredging and screeding⁴² activities in the area immediately in front of the sealift bulkhead and service pier to provide draft sufficient for barge offloading. The sealift barges closest to the bulkhead would be grounded and would require a level surface and minimum water depth of 6 feet for the barge closest to shore. Coastal barges would require a minimum water depth of 4 feet.

The applicant proposes to use both dredging and screeding as needed to obtain the necessary water depths in an approximately 5.5 acre area in front of both the sealift bulkhead and the service pier. Dredging activities in front of the sealift bulkhead are proposed to occur during the winter season, through the grounded sea ice, preceding the summer arrival of sealift barges. Dredging and screeding in front of the service pier could occur in either the winter or summer months. Dredging and screeding activities are anticipated to produce a maximum of 3,900 CY of material over the first five years of project construction and operations, with a maximum of 2,300 CY of dredged material being generated in any given year. Any additional dredging and/or screeding needed beyond that time would require the issuance of an additional permit for maintenance dredging. Disposal of dredged material is discussed in greater detail in the Dredged Material Disposal in Section 5.1 of this ROD.

Airstrip and Helipad Infrastructure

The proposed project includes construction and use of airstrip and helipad facilities to enable both fixed-wing and helicopter transportation to and from Point Thomson. The airstrip and helipads are proposed for construction approximately 3 miles inland from the Central Pad in the vicinity of the gravel mine. The construction of the 5,600- by 200-foot airstrip and helipad would require the placement of gravel fill in 42.3 acres of WOUS. See Figures 21 through 24 and 75 through 78 of the DA permit application for additional details on proposed airstrip location and design.

The airstrip is designed to accommodate landings by Lockheed C-130 Hercules (C-130) cargo aircraft (45,000 lbs payload; 5,000-foot airstrip plus 300-foot safety zones). However, the typical aircraft planned for use during construction and operations will be a Twin Otter or Beechcraft 1900 for personnel transport, or a DC-C for cargo transport. Fixed-wing aircraft is anticipated to be the normal method of personnel transport during operations and well as a common method of transport of some equipment, materials, and supplies, and for emergency medical evacuations.

Additional gravel infrastructure associated with construction of the airstrip, includes an airstrip access road (discussed in Infield Access Roads in Section 5.1 of this ROD), and four navaid pads and their access roads. In total, construction of the four navaid pads would require the placement of gravel fill in 1.6 acres of WOUS along the north side of the proposed airstrip. The navaid pad access roads, which will provide access from the airstrip to the navaid pads, would require placement of gravel fill into 1.5 acres of WOUS. The purpose of the navaid pads is to provide gravel infrastructure to support navaid equipment requiring regular access by vehicles for inspection and maintenance.⁴³ Additional navaid and approach lighting equipment will be placed on pilings spaced in 200 foot intervals extending approximately 2,100 feet to the west and 2,100 feet to the east of the proposed airstrip. Lighting and navaid equipment will be mounted on these piles on fiberglass towers ranging from 6 to 20 feet in height. The navaid piles are anticipated to impact a total of 22 square feet of WOUS. All navaid equipment would be placed in accordance with FAA advisory circulars regarding instrument approach procedures for safe operation during adverse weather conditions. Power and control cables to the navaid and approach lighting towers will be contained in steel conduit located on timber sleepers spaced at 20-foot intervals extending off the east and west ends of the airstrip. The steel conduit would extend approximately 2,100 feet from both the east and the west ends of the proposed airstrip. The approximately 230 timber sleepers would have a footprint of approximately 1,400 square feet in total.

⁴² Form of maintenance dredging consisting of leveling and smoothing the seabed for landing of a flat bottomed barge.

⁴³ ExxonMobil, "Response on Infield Pipelines and Other Items," (2012).

Alternatives Considered

During the development and evaluation of the EIS alternatives and evaluation of components considered as the LEDPA, the Corps considered alternatives to the applicant’s proposed plan for transportation to and from Point Thomson that could minimize impacts to aquatic ecosystems in the project area.

For all transportation scenarios, seasonal transportation constraints and the capacity of differing transportation methods to move large, prefabricated processing modules and bulk goods and supplies are key considerations for the evaluation of the range of reasonable alternatives. Barge access (load capacity: 4,000 tons) would be available during the ice-free season, usually between July and September. Ice road access (load capacity: 40,000 lbs) would generally be available between January and April. Unrestricted tundra travel, via tundra-safe, low-ground-pressure vehicles (load capacity: 60,000 lbs), would be available in December and January. Within these availability windows, unpredictable weather and seasonal variations may reduce available transportation windows even further. Outside of these availability windows, the Point Thomson site would be accessible only by air (load capacity: 2,000 lbs to 45,000 lbs).⁴⁴

Table 5.4 summarizes the full range of alternatives considered for transportation infrastructure.

Table 5.4: Transportation Infrastructure Alternatives Considered		
Components carried forward for consideration as the LEDPA		
<i>Alternative Components Considered</i>	<i>Where Considered</i>	
Tri-modal with sea lift barging, ice road, and air	Applicant’s proposed project	
5,600 ft by 200 ft gravel airstrip located approximately 3 miles south of Central Pad	Applicant’s proposed project	
Bi-modal with ice road and air transport	Component of Final EIS Alternative D	
5,600 ft by 200 ft gravel airstrip located inland and adjacent to former West Staines 2 airstrip	Component of Final EIS Alternatives C and D	
3,700 ft by 200 ft gravel airstrip located approximately 2 miles south of Central Pad	Component of Final EIS Alternative E	
5,600 ft by 200 ft tundra ice airstrip for use during construction	Component of Final EIS Alternative D	
5,600 ft by 200 ft sea ice airstrip	Component of Final EIS Alternative E	
5,600 ft by 200 ft gravel airstrip located westward of proposed location to place airstrip in single watershed	LEDPA Evaluation	
5,600 ft by 200 ft gravel airstrip in proposed location with additional engineering measures to reduce diversion of water	LEDPA Evaluation	
Components Eliminated Prior to LEDPA Evaluation		
<i>Alternative Components Considered</i>	<i>Where Considered</i>	<i>Reason Eliminated Prior to LEDPA Evaluation</i>
Ice road and air access during construction, construction of 44-mile, all season gravel access road for use during operations	Component of Final EIS Alternative C	Substantial increase in impacts to multiple resources not justified by increased access ^a
Ice airstrip extension to gravel airstrip	Concept considered in EIS alternatives development	Technically more difficult than construction of sea ice airstrip with no reduction in impacts (Final EIS p. 2-15)

^a HDR. 2012abc. *Impact Synthesis Discussion*. Anchorage, Alaska.

⁴⁴ ExxonMobil, “March 6, 2012 Response,” (2012).

Tri-modal Transportation

The tri-modal transportation scenario, as proposed by the applicant, would include the construction and use of 1) barge facilities to provide water-based access during summer barging months from Prudhoe Bay and other ports worldwide; 2) construction and use of seasonal ice roads during the construction and drilling phases of the proposed project; and 3) construction and use of a 5,600-foot long airstrip and attached helipad. Seasonal ice roads would not require placement of fill in WOUS.

Bi-modal Transportation

The bi-modal transportation scenario, evaluated in Final EIS Alternative D, included elimination of barging and reliance on ice road and air transport only to move materials and people to and from Point Thomson. Based on findings in the Final EIS, the Corps concluded that the bi-modal scenario would not result in a substantial decrease in environmental impacts.⁴⁵ Furthermore, the elimination of barging and mobilizing the project over ice road introduces constraints that affect the size and number of prefabricated modules needed for project development, the timing of materials resupply, and the quantity of resupply materials needed to be transported and stored during the seasonal ice road window. Based on analysis conducted by the applicant and verified by the Corps, these impacts result in technological challenges, logistical constraints, and the delay of the overall project schedule.⁴⁶ As a result, The Corps concluded that the bi-modal transportation scenario is not practicable.

The findings of the Final EIS suggest that implementation of the bi-modal transportation scenario would result in tradeoffs between impacts such as increasing impacts to air quality, vegetation and wetlands, marine mammals (polar bears), fish and invertebrates, human health, and spill risk and impacts.⁴⁷ Additional impacts may result from increased water use from annual ice road construction. Elimination of barging would reduce potential impacts to physical oceanography, marine water quality, vegetation and wetlands, birds, marine mammals (primarily whales and seals), fish and invertebrates, and subsistence and traditional land use.⁴⁸

Based on analysis conducted by the applicant and verified by the Corps, the bi-modal transportation scenario and mobilization of the project via ice road would require more complex logistics and construction sequencing which would pose technological challenges, and result in a delay in the start up of project facilities.⁴⁹ The elimination of barging would require movement of prefabricated modules overland from Deadhorse to Point Thomson and placing substantial constraints on the size and weight of modules. Movement of large modules overland via ice road poses numerous technical challenges and safety considerations. Based on analysis conducted by the applicant and verified by the Corps, project mobilization by ice road would impact the logistics of transport of other supplies and bulk materials including fuel and equipment.⁵⁰

Airstrip Location

The Corps evaluated several alternative locations to the applicant's proposed airstrip that could minimize impacts to the aquatic environment. Based on this evaluation, the Corps concluded that

⁴⁵ HDR, "Impact Synthesis" (2012).

⁴⁶ ExxonMobil, "Environmental Report," (Anchorage, 2009); ExxonMobil, "Section 404(b)(1) Practicability Analysis of Point Thomson Project Preliminary Draft Environmental Impact Statement Alternatives Report," (Anchorage, 2011); HDR, "110422_Preliminary Project Logistics Meeting Notes," (Anchorage, 2011).

⁴⁷ HDR, "Impact Synthesis" (2012).

⁴⁸ Ibid.

⁴⁹ ExxonMobil, "Section 404(b)(1) Practicability Analysis of Point Thomson Project Preliminary Draft Environmental Impact Statement Alternatives Report," (Anchorage, 2011).

⁵⁰ Ibid.

while other airstrip locations are practicable, they do not minimize impacts to the aquatic environment when considered in the context of other infrastructure identified as components of a LEDPA.

The proposed airstrip is oriented in a northeast-southwest direction, perpendicular to the dominant hydraulic gradient. Because of the prevailing wind directions, orienting the airstrip parallel to the dominant hydraulic gradient is not feasible. Additionally, the applicant located the airstrip inland to minimize coastal fog related operational down time and in close proximity to the proposed gravel mine and other project facilities to minimize gravel haul distances, minimize travel distances to the airstrip, and minimize infield gravel road length.⁵¹ Location of the airstrip in this location is anticipated to result in diversion of up to 48 percent of water (48 cubic feet per second (cfs)) from Stream 22 into Stream 24.

The Corps evaluated several airstrip location alternatives, including the airstrip locations evaluated as part of Final EIS Alternatives C and D, and airstrip locations at intermediate distances between the applicant's proposed airstrip and the Alternatives C and D airstrips. The Corps concluded that the key consideration to minimizing impacts on hydrology was the extent to which the airstrip could be placed in a single drainage. However, evaluation of each airstrip location required consideration of the location of the airstrip with respect to other project infrastructure, including the gravel mine and the proposed infield access roads.

Selection of the Alternative C airstrip location (southwest of the proposed airstrip) while maintaining the Central Pad and the Gravel Mine in the applicant's proposed location would result in the need to lengthen the airstrip access road by approximately 4 miles. Based on analysis conducted by the applicant and verified by the Corps, this would increase environmental impacts including 30 acres of additional gravel fill for an extended access road, and result in practicability concerns.⁵² Extending the gravel access road would require an additional 2,800 hours of gravel hauling and 116,000 gallons of fuel consumption to mine, haul, and rework the gravel. Over the life of the project, the four miles of additional travel needed to reach the airstrip would impact logistics and environmental impacts by requiring longer travel distances, greater vehicular air emissions, greater water use for dust control, and increased disturbance to wildlife from noise and vehicular movement.⁵³

Relocating the airstrip 1.3 miles west of the applicant's proposed location would place the airstrip entirely within the watershed of Stream 21, minimizing the amount of water diverted from one watershed into another. However, moving the airstrip in this manner would still increase the amount of gravel fill necessary to build the airstrip access road by approximately 10.4 acres, offsetting any reduction in impacts resulting from the shift westward.⁵⁴ Movement of the airstrip further west would shift impacts from Stream 22, a stream not listed as rearing habitat for anadromous species, to Stream 21, an anadromous fish stream.⁵⁵ This has the potential to increase overall project impacts to fish. While the increase in gravel fill would be less than half that required for construction of an access road to the Alternatives C and D airstrip location, similar practicability considerations would apply.

The Corps considered movement of the airstrip further east to a location inland of the East Pad access road between the C-1 mine site and the East Pad. The Corps concluded that moving the airstrip to this location would result in similar impacts to hydrology and would increase impacts to

⁵¹ ExxonMobil, "ExxonMobil Response to Comments on Public Notice Application for Permit Point Thomson Project," (Anchorage, 2012).

⁵² ExxonMobil, "The Practicability of EIS Alternative C Airstrip Location," (Anchorage, 2012).

⁵³ Ibid.

⁵⁴ HDR, "Airstrip Location Memorandum," (Anchorage, 2012).

⁵⁵ Ibid.

wetlands of moderate functional value. Movement of the airstrip to a location east of the C-1 Mine Reservoir is not less environmentally damaging than the applicant's proposed airstrip.⁵⁶

Airstrip Length

The Corps evaluated the potential to minimize gravel fill related to construction of the applicant's proposed airstrip by considering a 3,700-foot airstrip (a component of Final EIS Alternative E). The Corps concluded that reduction of the airstrip length is not practicable due to impacts to project logistics, costs, and safety considerations. A 5,600-foot airstrip would be a key component to the applicant's overall transportation system because it would provide flexibility necessary to safely transport materials, equipment, and personnel during normal project activities and in the event of an emergency situation requiring quick response to reduce threats to human safety.⁵⁷ The 5,600-foot airstrip is designed to accommodate a C-130, a key vehicle for use in transporting equipment and personnel for response during emergencies and to move heavy equipment during periods of the year when ice road or barge access is not available. Use of 5,600-foot airstrips and C-130 aircraft is consistent with other major North Slope developments.⁵⁸

Use of a 5,600-foot ice airstrip (located either on sea ice or tundra) in conjunction with a 3,700-foot gravel airstrip would be an insufficient substitute for a 5,600-foot gravel airstrip, because an ice airstrip would not be available for use for the first few months of the hydrocarbon-drilling season. If a well blowout or other emergency requiring transport of equipment occurred between November and the completion of the ice airstrip (usually in January or February), response options would be limited in the same manner described for a 3,700-foot airstrip above

Use of Additional Engineering Measures to Reduce Diversion of Water

The Corps considered whether implementation of additional engineering measures to reduce the diversion of water by the airstrip was practicable and less environmentally damaging than the proposed project. The Corps considered whether the placement of cross drainage culverts through the airstrip or the placement of gravel bags, or a short gravel berm upstream of the airstrip, would be successful in reducing impacts to natural drainage patterns.

The Corps examined case studies of existing culverted airstrips on the North Slope and consulted with transportation engineers with experience in constructing gravel infrastructure in permafrost environments⁵⁹ and concluded installation of culverts through the 200-foot wide airstrip is technologically feasible pending further investigation of the ice content of permafrost underneath the proposed airstrip location. Success of culvert installation and function would be better served by delaying until after the period of short-term gravel settlement to prevent twisting of the culverts due to differential settlement. The Corps determined that monitoring of surface hydrology, vegetation and wetlands, and fish and invertebrates downstream of the proposed airstrip location to ensure minimal adverse impacts. Should measurable adverse impacts be detected, the Corps will require implementation of additional mitigation measures, such as installation of culverts or construction of a gravel diversion structure to restore natural drainage patterns (See Section 7.3 of this ROD).

⁵⁶ Ibid.

⁵⁷ HDR, "Alternatives Development Component Work Groups: Timeline, Logistics, Modularization July 12, 2010 Meeting Notes," (Anchorage, 2010); ExxonMobil, "March 6, 2012 Response," (2012); and HDR, "110422_Preliminary Project Logistics Meeting Notes," (Anchorage, 2011).

⁵⁸ Alaska Clean Seas, "Alaska Clean Seas Technical Manual Volume 1:Tactics Descriptions," (Prudhoe Bay, 2010).

⁵⁹ HDR, "Feasibility of Culverted Airstrip," (Anchorage, 2012).

Transportation Components of the LEDPA

Based on the Corps’ evaluation of the environmental impacts and practicability of all reasonable alternatives to the applicant’s proposed transportation infrastructure to and from Point Thomson, the Corps concluded that the LEDPA includes:

- Construction and use of tri-modal transportation infrastructure including proposed barge offloading facilities and seasonal ice roads; and
- Construction and use of the proposed 5,600- by 200-foot airstrip with monitoring and potential future mitigation measures to maintain natural drainage patterns.

Dredged Material Disposal

Construction of the proposed barge basin would generate dredged materials requiring disposal. The applicant proposes to discharge 3,900 CY of dredged material on the beach, approximately 0.75-mile west of the Central Pad on the mainland coast above mean high water (MHW). The materials would be placed within an area approximately 50 feet wide by 800 feet long (see Figure 14 of the DA permit application) and will result in the discharge of dredged material in 0.9 acres above high tide line (HTL). The composition of dredge material placement area is saline coastal marsh.

The applicant’s primary consideration for selection of the dredged material disposal location was locating the disposal site far enough away from the barge offloading area such that a westerly storm would not transport material back into the barge area. In addition, the applicant sought to locate the disposal site to the west of the barge site, as westerly storms have historically occurred less frequently than easterly storms, making transport of dredged material back toward the barge area via wave generated erosion and a long shore current, less likely.

The proposed placement site is in a relatively stable location even though active sediment transport does occur in the area. Based on a review of available data, the spit to the west of the dredged material placement area and the spit to the east of the dredge area have been forming and retracting over the last 50 years. Given such conditions, the dredge materials are expected, over time, to contribute a small amount of material to the formation of these local sand spits (Request for Information (RFI) 106 in Final EIS Appendix D).

Alternatives Considered

During the development and evaluation of the EIS alternatives and evaluation of components considered as the LEDPA, the Corps considered alternatives to the applicant’s proposed plan for disposal of dredged material that could minimize impacts to aquatic ecosystems in the project area. Table 5.5 summarizes the full range of alternatives considered for dredged material disposal.

Table 5.5: Dredged Material Disposal Alternatives Considered	
Components carried forward for consideration as the LEDPA	
<i>Alternative Components Considered</i>	<i>Where Considered</i>
Disposal of dredged material onshore approximately .75 miles west of Central Pad	Applicant’s proposed project
Transport of fill material offsite for alternate disposal in Deadhorse or elsewhere	LEDPA Evaluation
Dredged material use in mine site rehabilitation	LEDPA Evaluation
Dredged material reuse in gravel fill construction	LEDPA Evaluation
Use of dredged material to create corridor for polar bear movement	LEDPA Evaluation

The Corps considered options to the applicant’s dredged material disposal plan, including the availability of other on-site beneficial reuse options such as construction of gravel infrastructure,

use in mine site rehabilitation, or transport of the material to an approved upland disposal site. Upon further evaluation, these options were eliminated from further consideration due to either practicability or environmental impact concerns.

Use of the marine fine sediments in the construction of the proposed gravel pads was found to be impracticable because it would affect the drainage and insulating capacity of the gravel pads, leading to issues of permafrost instability and an increased need for gravel maintenance⁶⁰ which would result in an increase in both environmental and maintenance issues.

Reuse of marine sediments in rehabilitation of the gravel mine was eliminated from further consideration based on discussions with ADF&G. Sediments dredged from the barge facility area would be saline in nature and reuse of these sediments at the mine site would introduce saline material to a freshwater environment. This could impact the salinity gradient of water downstream of the mine site and could inhibit use of the mine site as a freshwater reservoir and habitat for fish and other freshwater species.⁶¹

Transport of dredged material to an upland disposal site would contaminate the tundra, adjacent water bodies, and groundwater with salt. Based on information provided by the applicant and verified by the Corps, long distance movement of dredged materials would require increased barge or truck traffic.⁶²

The Corps evaluated use of the dredged material to create a wider coastal corridor to facilitate polar bear movement along the eastern edge of the proposed Central Pad (See Central Pad in Section 5.1 of this ROD). The Corps determined that use of dredged material for a beneficial purpose was preferable and less environmentally damaging than disposal of dredged material as waste material at the proposed location. However, if the quantity of dredged material exceeds the volume needed for disposal needed to construct the polar bear wildlife corridor, the Corps concluded that disposal of excess dredged material at the location proposed by the applicant, 0.75-mile to the west, is acceptable.

Dredged Material Disposal Component of the LEDPA

Based on the Corps' evaluation of the environmental impacts and practicability of all reasonable alternatives to the applicant's proposed dredged material disposal site, the Corps concluded that the LEDPA includes:

- Beneficial reuse of dredged material to create a polar bear wildlife corridor along the eastern edge of the proposed Central Pad in order to facilitate polar bear movement through the area; and
- Placement of dredged material in excess of that needed for beneficial reuse in the location proposed by the applicant.

Point Thomson Export Pipeline

A key component of the proposed project is the construction of an approximately 22-mile long export pipeline. The PTEP would originate from the CPF modules at the Central Pad and would transport stabilized hydrocarbon liquids to the existing Badami Sales Oil Pipeline (Badami pipeline) for delivery to the TAPS. As part of the proposed project, the PTEP would transport approximately 10,000 bpd of gas condensate. The PTEP would be a common carrier pipeline and would be sized to accommodate up to 70,000 bpd of liquid hydrocarbons, including crude oil.

The proposed PTEP would be constructed on VSMs and raised a minimum of 7 feet off ground level to accommodate passage by wildlife and humans. The exception to the proposed minimum pipeline

⁶⁰ HDR, "Applicant Project Update Clarification, March 29, 2011 Meeting Notes," (Anchorage, 2011).

⁶¹ Ibid.

⁶² ExxonMobil, "Response on Infield Pipelines and Other Items," (2012).

height would be the three locations where the PTEP crosses gravel road infrastructure. Road crossings would occur at the Badami Pipeline Crossing Pad, the Badami Mine Site Access Road crossing, and the West Pad Access Road crossing. At these sites, the cased PTEP would be buried in the gravel roadbed to provide structural protection around the pipeline.

The installation of the approximately 2,200 VSM piles along the entire length of the proposed export pipeline would impact 4,200 square feet of WOUS. VSM installation will also result in the production of approximately 3,000 CY of borehole cuttings that the applicant proposes to use in the rehabilitation of the gravel mine site. The proposed pipeline route would run east to west, somewhat parallel to the Beaufort Sea coastline and be more than one mile inland from the Beaufort Sea coastline along most of the route, with the exception of the tie in locations at the proposed Central Pad and at Badami. See Figures 31 through 42 of the DA permit application for additional details on proposed PTEP route and design.

Alternatives Considered

During the development and evaluation of the EIS alternatives and evaluation of components considered as the LEDPA, the Corps considered alternatives to the applicant’s proposed PTEP that could minimize impacts to aquatic ecosystems in the project area. Table 5.6 summarizes the full range of alternatives considered for the PTEP.

Table 5.6: Point Thomson Export Pipeline Alternatives Considered		
Components carried forward for consideration as the LEDPA		
<i>Alternative Components Considered</i>	<i>Where Considered</i>	
22-mi export pipeline to Badami routed approximately 1 mile from coastline	Applicant’s proposed project	
22-mi export pipeline to Badami routed approximately 4 miles from coastline	Component of Final EIS Alternative D	
Components Eliminated Prior to LEDPA Evaluation		
<i>Alternative Components Considered</i>	<i>Where Considered</i>	<i>Reason Eliminated Prior to LEDPA Evaluation</i>
50-mi export pipeline to Endicott routed 3 to 8 miles from coastline	Component of Final EIS Alternative C	Increased environmental impacts and costs resulting from doubling of pipeline length ^a
Export pipeline buried in tundra	Concept considered in EIS alternatives development	Challenges in safe operation and maintenance of buried pipelines including reduced spill detection capacity (Final EIS p. 2-12); Cost increases approximately \$130 million over applicant’ proposed project ^b
Subsea export pipeline to Prudhoe Bay	Concept considered in EIS alternatives development	Increases risks of environmental impacts to coastal and offshore environment (Final EIS p. 2-11).

^a HDR. 2012abc. *Impact Synthesis Discussion*. Anchorage, Alaska.

^b ExxonMobil 2012e.

Inland Pipeline Route

The Corps evaluated use of the Final EIS Alternative D pipeline route, which would move the export pipeline an additional three to four miles inland, and minimize impacts on subsistence and wetlands of high functional value. Movement of the pipeline inland and outside the visible range of coastal subsistence users would result in subsistence use remaining as it currently exists, based on impacts identified in the Final EIS. In addition, the inland route would reduce additive impacts to recreation, visual aesthetics, and cultural resources by reducing visibility of the pipeline from the coast.⁶³

Further examination of the Alternative D pipeline route led the Corps to conclude that while the Alternative D pipeline route was practicable in terms of technology, logistics, and cost, the potential

⁶³ HDR, “Impact Synthesis,” (2012).

for increased environmental impacts related to the lack of access for spill response compelled selection of the applicant's coastal route.

Discussions with the State of Alaska regarding pipeline access for inspections, maintenance, repair, and spill response provided additional information on potential differences in environmental impacts related to moving the export pipeline further inland. Access to the proposed pipeline during ice free months would be logistically easier and have less environmental impact than access to a pipeline four miles inland.⁶⁴

Under normal operating conditions, pipeline access would occur via helicopter. This would include weekly maintenance inspections, scheduled repair, and response to minor incidents if needed. Larger incidents are likely to require the transport of additional response equipment, many of which exceed the sling load capacity of helicopters typically available on the North Slope.⁶⁵ As a result, ground transportation access to a spill site is required. For both the applicant's proposed alternative and Alternative D pipeline routes, winter ground access would be based on vehicles approved for use over snow covered tundra or via ice road.

Ground access to a remote pipeline site during non-winter months would be more challenging. The presence of a permanent gravel road (as evaluated under Final EIS Alternative C) would provide the greatest degree of pipeline access and improve spill response capabilities and logistics if a summer pipeline spill were to occur.⁶⁶ However, no permanent gravel access road is proposed for either the applicant's proposed pipeline route or the Alternative D pipeline route (See Transportation Infrastructure in Section 5.1 of this ROD). Access and creation of a work surface at a remote site would be accomplished using tundra-safe, low-ground-pressure vehicles and tundra mats.

The practicability of rerouting the pipeline inland was evaluated by the applicant as part of the 2003 EIS effort. The applicant examined relocation of the proposed export pipeline approximately 5 miles south of the proposed route to mitigate potential impacts on subsistence activities and resources. Based on the applicant's evaluation, relocation of the export pipeline inland would require increasing the required pipeline length by approximately 2 miles.⁶⁷ The increase in pipeline length would increase the size of a catastrophic spill due to the greater distance between valve pads due to the larger volume of product that would be in the pipeline. Overall, the applicant estimated that the increased pipeline length would increase the cost of the export pipeline by approximately \$1.8 million per mile in 2003 dollars. This would result in an increase of the total pipeline cost by approximately \$4 million in 2003 dollars.⁶⁸ The applicant noted that an inland route would require fewer stream and lake crossings.⁶⁹

Based on this analysis, the Corps concluded that the LEDPA includes the applicant's proposed PTEP route. Selection of the of the East Pad and West Pad reconfiguration options (discussed in East Pad and West Pad in this section) would require slight alteration of the PTEP route as it nears the reconfigured West Pad. The Corps concluded that this reconfiguration would be minor and would not alter the analysis of impacts discussed above.

PTEP Component of the LEDPA

Based on the Corps' evaluation of the environmental impacts and practicability of all reasonable alternatives to the applicant's proposed PTEP, the Corps concluded that the LEDPA includes:

⁶⁴ HDR, "Point Thomson Project EIS Cooperating Agency Meeting, May 30, 2012 Meeting Notes," (Anchorage, 2012).

⁶⁵ Alaska Clean Seas, "Technical Manual," (2010).

⁶⁶ HDR, "Cooperating Agency May 30, 2012 Meeting Notes," (2012).

⁶⁷ ExxonMobil, "Point Thomson Gas Cycling Project: Pipeline Design Modifications to Address Subsistence Hunting and Caribou Issues," (Anchorage, 2003).

⁶⁸ Ibid.

⁶⁹ Ibid.

- Construction of the PTEP as proposed with minor modification to accommodate reconfiguration of the West Pad.

East and West Pad Gathering Lines

The proposed project includes construction of East and West gathering pipelines to transport unprocessed hydrocarbons from wells on the East and West Pads to the Central Pad for processing. For most of its route, the West Gathering Line will be co-located on VSMs with the PTEP and would require minimal additional VSM installation. The East Gathering Line would require the installation of dedicated VSMs between the East Pad and Central Pad. In addition to the West Access Road Pipeline Crossing, which the West Gathering line would share with the PTEP, the construction of the gathering lines would require one additional road crossing in the vicinity of the Central Pad.

Both the East and West Gathering lines are proposed to take a direct and predominately coastal route between the drilling pads and the Central Pad. The typical offset distance between the West Pad access road and the West Gathering line is 2,500 to 3,500 feet with the maximum distance being 3,525 feet. The typical offset distance for the East Gathering Line and the East Pad access road is longer than that proposed for the West Gathering Line; the maximum offset distance for the East Gathering line is 8,100 feet.⁷⁰ Pipeline maintenance and spill response would be conducted by helicopter, ice road, or off road vehicles.

Installation of VSMs to support the East and West Gathering Lines is anticipated to impact 1,700 square feet of WOUS and to generate approximately 600 CY of borehole cuttings. Borehole cuttings would be reused and/or disposed of in the rehabilitation of the gravel mine site. See Figures 31 through 42 of the DA permit application for additional details on proposed gathering lines routes and design.

Alternatives Considered

During the development and evaluation of the EIS alternatives and evaluation of components considered as the LEDPA, the Corps considered alternatives to the applicant’s proposed gathering pipelines that could minimize impacts to aquatic ecosystems in the project area. Table 5.7 summarizes the full range of alternatives considered for the East and West Gathering Lines.

Table 5.7: East and West Gathering Lines Alternatives Considered		
Components carried forward for consideration as the LEDPA		
<i>Alternative Components Considered</i>	<i>Where Considered</i>	
Routing of pipeline along direct path from East and West Pads to Central Pad	Applicant’s proposed project	
Routing of pipeline in closer proximity and either upstream or downstream of infield gravel roads (>500 ft)	LEDPA Evaluation	
Components Eliminated Prior to LEDPA Evaluation		
<i>Alternative Components Considered</i>	<i>Where Considered</i>	<i>Reason Eliminated Prior to LEDPA Evaluation</i>
Burial of pipelines in infield gravel roads	Concept considered in EIS alternatives development	Technological challenges and pipeline integrity uncertainties increase maintenance issues and reduce spill detection (Final EIS p. 2-15);

Inland Pipeline Route

The Corps evaluated movement of gathering lines inland to place them in closer proximity to the infield roads for pipeline inspection, maintenance, and spill response purposes and to mitigate for potential impacts related to subsistence user avoidance near the coast. The Corps considered movement of pipelines both upslope and downslope of the infield roads.

⁷⁰ ExxonMobil, “Response on Infield Pipelines and Other Items,” (2012).

Based on analysis conducted by the applicant, locating the gathering lines upslope of the infield roads would increase the length of the gathering lines by approximately 3.4 miles (24 percent increase in length for the West Gathering Line and 46 percent increase in length for the East Gathering Line). Locating the East Gathering Line downslope of the infield roads, but in closer proximity to the infield roads would increase pipeline length by approximately 1.7 miles.⁷¹ Analysis conducted by the applicant and verified by the Corps, verified the increase in pipeline length and evaluated a wider range of pipeline routes.⁷²

The Corps found that the increase in pipeline length would be partially offset by the decrease in the East Gathering Line length that would result from selection of the East Pad reconfiguration option, which would move the East Pad approximately one mile closer to the Central Pad. Movement of the West Gathering Line inland would either create parallel pipelines as the Gathering Line traverses the same distance between the Central Pad and the West Pad as the PTEP or would require rerouting of the PTEP to accommodate the Gathering Line route change to keep the two pipelines on the same VSMs.

Both alternatives would have similar direct impacts on wetlands, the difference would be negligible. Moving inland would reduce indirect impacts on subsistence activities. Increasing the gathering line lengths would create other potential indirect environmental tradeoffs. It would increase the potential indirect impacts to wetlands in the unlikely event of a catastrophic pipeline spill. This increased spill volume (from longer pipe lengths) would offset the benefit of any spill response capabilities gained by moving the pipeline nearer to the infield road system. Moving the pipeline inland would create tradeoffs between avoidance of impacts to caribou by maintaining a 500-foot buffer between pipelines and roads, and avoidance of impacts to wetlands and waterbodies by locating pipeline VSMs outside of waterbodies. Analysis conducted by the applicant and verified by the Corps indicates that the increase in pipeline length could impact hydraulic performance of the pipeline, resulting in the potential for reduced production at the wellheads.⁷³

Based on the analysis conducted by the applicant and verified by the Corps, the cost of increasing the length of the gathering line would be approximately \$9 million per mile.⁷⁴ The gathering lines would be constructed from corrosion resistant alloy steel in order to handle specific well fluids, which is more expensive than the carbon steel proposed to construct the export pipeline.⁷⁵

In addition to an inland pipeline route, the Corps also considered modification of the East Gathering Line, which would result from selection of the East Pad reconfiguration option (discussed in East Pad and West Pad above in this section). Reconfiguration of the East Pad and subsequent reconfiguration of the East Pad Gathering Line would further minimize impacts related to the gathering lines by reducing the East Gathering Line length by over one mile. This reduction in length would reduce impacts related to VSM placement by reducing the total number of VSMs and the potential volume of a catastrophic spill. To a lesser degree, small modifications to the West Gathering Line would occur as a result of the reconfiguration of the West Pad. These small modifications would not alter impacts identified for the West Gathering Line. Based on this analysis, the Corps determined that the Gathering Lines to the reconfigured East and West Pads would be less environmentally damaging than the applicant's proposed gathering lines.

East and West Gathering Lines Components of the LEDPA

Based on the Corps' evaluation of the environmental impacts and practicability of all reasonable alternatives to the applicant's proposed East and West Gathering Lines, the Corps concluded that the LEDPA includes:

⁷¹ Ibid.

⁷² HDR, "Infield Gathering Line RFI Summary," (Anchorage, 2012).

⁷³ ExxonMobil, "Response on Infield Pipelines and Other Items," (2012).

⁷⁴ 2012 dollar values based on 2003 dollar values reported in ExxonMobil, "Pipeline Design Modifications" (2003).

⁷⁵ ExxonMobil, "Pipeline Design Modifications" (2003).

- Construction of the East and West Gathering Lines as proposed with modification to accommodate reconfiguration of the East and West Pads.

Gravel Mine

The primary gravel source for the proposed project would be a new gravel mine located 1.75 miles south of the Central Pad and one mile northeast of the proposed airstrip. Construction of the gravel mine would result in direct impacts to 49.6 acres of WOUS. The placement of gravel fill for the creation of a gravel stockpile and a gravel mine access road would impact an additional 12.9 acres and 3.3 acres, respectively, of WOUS. See Figures 61 through 66 of the DA permit application for additional details on proposed gravel mine site location and design

Construction of the gravel mine is proposed to occur over two winter seasons, although changes in construction plans may result in additional mining past the second year. The target depth of the mine site would be 50 feet below tundra surface to facilitate the removal of approximately 2,200,000 CY of gravel and 1,000,000 CY of overburden. Approximately 200,000 CY of gravel would be stockpiled in a location adjacent to the gravel mine site to be used for future maintenance activities. Following mining activities, the applicant proposes to rehabilitate the mine according to the "Point Thomson Project Mining and Rehabilitation Plan," submitted to the Corps and the ADNR. Rehabilitation would include replacement of overburden into the mine site to create stable sidewalls with irregular shorelines and depths. The mine site would then be allowed to fill with water from snowmelt and spring runoff from the surrounding area, a process anticipated to take between 10 to 12 years.

Following rehabilitation, the filled mine site would serve as a back-up water source for project activities.

Alternatives Considered

During the development and evaluation of the EIS alternatives and evaluation of components considered as the LEDPA, the Corps considered alternatives to the applicant's proposed gravel mine, which could minimize impacts to aquatic ecosystems in the project area. Table 5.8 summarizes the full range of alternatives considered for the gravel mine.

Table 5.8: Gravel Mine Alternatives Considered	
Components carried forward for consideration as the LEDPA	
<i>Alternative Components Considered</i>	<i>Where Considered</i>
Location of mine and gravel stockpile 1.75 miles south of Central Pad	Applicant's proposed project
Phasing mining to minimize gravel stockpile footprint	LEDPA Evaluation

Phasing Mining Activities to Minimize Gravel Stockpile Footprint

The Corps considered the purpose and need for permanent stockpiling of gravel in 12.9 acres of WOUS for use over the life of the project. The Corps evaluated whether mine site activities could instead be phased, with initial mining consisting of only what is needed for initial construction of project infrastructure. Additional gravel could then be mined from an adjacent cell, as needed. The Corps concluded that phasing of mining activities would result in greater environmental impacts and is not practicable in terms of project logistics.

At the Corps' request, the applicant reevaluated the amount of gravel needed and concluded that the size of the gravel stockpile may be further minimized. The East and West Pads and access roads are unlikely to experience high levels of traffic and anticipated maintenance needs for these roads are likely to be less than for typical gravel infrastructure. As a result, the applicant

anticipates less gravel needed for maintenance.⁷⁶ The Corps concluded that the applicant can further minimize the size of the gravel stockpile by 50 percent, to approximately 100,000 CY, to minimize fill footprint necessary for stockpiling gravel. Reduction in the size of the gravel stockpile would result in a decrease in the acreage of wetlands fill needed by approximately 7.7 acres. In addition, reduction of the stockpile size could allow for minor reconfiguration of the gravel mine access road, resulting in a reduction in the length and footprint of this component by approximately 1.9 acres. Overall, reduction of the gravel stockpile and reconfiguration of the gravel mine access road would result in a reduction of gravel fill in WOUS by approximately 9.6 acres.

Phasing of mining activities has both environmental and practicability impacts. Phasing of mining could minimize the initial footprint of the mine site and gravel stockpile and temporally delay impacts to aquatic ecosystems. Phased mining would ultimately create a larger footprint per cubic yard of gravel mined and would result in a larger mine footprint due to the need to separate mine cells with natural berms left in place. Phased mining could result in logistical constraints, including difficulties ensuring dry and ice free gravel material is available when needed because it would require opening a new mine site and allowing time for mined gravel to season each time additional gravel is needed. Phased mining would require storage and/or remobilization of mining equipment from offsite on a more frequent basis and could delay rehabilitation of the mine site if dewatering of the original mine site were required to mine additional gravel. Dewatering would not be required as a new mine cell is opened. Stockpiling of gravel allows the applicant to complete initial mining activities and commence rehabilitation of the mine site within a two-year period.

Alternative Gravel Mine Locations

The Corps evaluated alternatives to the applicant's proposed gravel mine location. The Corps concluded that few, if any, environmental impacts would be decreased by moving the mine to an alternate location and the applicant's proposed mine location is a component of the LEDPA.

The general location of the applicant's mine site was selected to be situated between the airstrip and other major infrastructure. A key consideration in the siting of the mine is the quantity of high quality gravel resources needed to meet project requirements and to minimize the overall gravel mine footprint. Based on analysis conducted by the applicant and verified by the Corps, the lack of defined trends in geologic structure in the eastern ACP has implications for mine site planning.⁷⁷ Based on the variability in gravel resources and in the thickness of overburden, it is not possible to infer from existing data where other suitable locations for a mine site may exist.

The applicant has conducted several additional years of fieldwork to optimize the mine site location to meet project requirements for quantity and quality of gravel. For example, the applicant has rotated the whole mine from a north/south orientation to an east/west orientation to take advantage of large differences in the depth of overburden that have been found to occur over a small shift in location. Currently, the depth of overburden measured over the proposed mine site is between 8 and 10 feet. This value is substantially less than the 20 feet of overburden measured elsewhere in the project area. The location of an area with minimal overburden further allows the applicant to minimize the size of the entire mine site by allowing more gravel to be mined out of a mine site footprint.⁷⁸

It is unlikely that a second mine location could be practicably found that would similarly minimize the mine site footprint. Based on existing borehole data, moving the mine site to the south, as proposed in Final EIS Alternatives C and D would place the mine site in an area with thicker overburden layers and a higher concentration of inter-bedded silt layers.⁷⁹ As identified in the Final

⁷⁶ HDR, "East and West Pad Optimization, May 29, 2012 Meeting Notes," (Anchorage, 2012).

⁷⁷ ExxonMobil, "ExxonMobil Point Thomson Project Response to Request for Information 107-Borehole Geotechnical Data," (Anchorage, 2011).

⁷⁸ HDR, "Point Thomson Project EIS Gravel Mine Workshop, March 15, 2011 Meeting Notes," (Anchorage, 2011).

⁷⁹ Ibid.

EIS, this would result in additional environmental impacts resulting from a correspondingly larger mine footprint, an increase of approximately 9 acres.⁸⁰ Existing borehole data suggests that movement of the mine site north would result placement in an area of increased overburden.

Gravel Mine Component of the LEDPA

Based on the Corps' evaluation of the environmental impacts and practicability of all reasonable alternatives to the applicant's proposed gravel mine, the Corps concluded that the applicant's proposed gravel mine is a component of the LEDPA with the following conditions:

- Minimization of gravel fill to create gravel stockpile by reducing size of stockpile to 5.2 acres containing 135,000 CY of gravel;
- Minimization of gravel mine access road infrastructure by reducing the road access to the gravel mine stockpile and using an ice road for winter access to the mine site; and
- Construction and use of the proposed gravel mine followed by successful rehabilitation and revegetation of the gravel mine site as habitat suitable for fish, wildlife, and waterfowl. Rehabilitation of this site would be completed in accordance with a special condition on the DA permit, which would require an approved Gravel Mine Rehabilitation Plan (see Section 7.3 of this ROD). The Gravel Mine Rehabilitation Plan would include the following measures:
 - Backfill of the overburden material to construct a wide littoral zone along the east side of the reservoir which would include a water retention berm along the western edge where the slope to the deep water zone begins.
 - Compensatory mitigation for the footprint of the gravel mine site, access road, and permanent gravel stockpile is included in the compensatory wetland mitigation plan submitted by the applicant.

Other Infrastructure

In addition to the primary project components described above, the proposed project includes several secondary components. These components include:

- Pipeline infrastructure at Badami
- Alaska State C-1 Pad
- Emergency boat launch
- Water sources and transportation
- Power generation and transmission
- Communication and lighting towers

The following sections discuss alternatives analyzed for these project components.

Pipeline infrastructure at Badami

The applicant proposes to construct two small gravel pads near Badami to accommodate the PTEP route and tie in to the existing Badami pipeline. These include the placement of gravel fill into WOUS to construct a 0.25-acre Badami Auxiliary Pad and a 0.16-acre Pipeline Crossing Pad. See

⁸⁰ ExxonMobil, "Response 107 on Borehole Geotechnical Data," (2011).

Figures 29 and 30 of the DA permit application for additional details on proposed Badami infrastructure location and design.

The Badami Auxiliary Pad, located adjacent to the existing Badami Pad, would facilitate PTEP connection to the existing Badami pipeline without impinging on the existing Badami infrastructure. The Auxiliary Pad would house a module containing a leak detection metering skid. Other PTEP infrastructure at Badami includes isolation valves, data acquisition equipment, and control and safety systems.

The 0.16-acre Pipeline Crossing Pad is proposed for construction 450 feet south of the existing Badami pad. The proposed PTEP route between Point Thomson and Badami crosses the ice road routing between Prudhoe Bay and the existing Badami Pad. The purpose of the Pipeline Crossing Pad is to provide the Badami Unit operator with the ability to cross the PTEP with ice roads in a manner that protects the integrity of the pipeline. The pad would serve a function similar to the PTEP gravel road crossing sites proposed in other locations along the PTEP route. The Pipeline Crossing Pad would allow the Badami Operator to mobilize and demobilize drill rig and other work equipment via ice road along the same direct alignment that has been approved and used for ice road construction to support the Badami project in the past.

Table 5.9 summarizes the full range of alternatives considered for Badami infrastructure.

Table 5.9: Badami Infrastructure Alternatives Considered	
Components carried forward for consideration as the LEDPA	
<i>Alternative Components Considered</i>	<i>Where Considered</i>
Construction of the Pipeline Crossing Pad to allow ice road transit of the PTEP	Applicant's proposed project
Construction of the Badami Auxiliary Pad	Applicant's proposed project
Use of the proposed pipeline crossing near the Badami Gravel Mine in lieu of construction of the Badami Pipeline Crossing Pad	LEDPA Evaluation

The Corps evaluated minimization of the applicant's proposed gravel infrastructure at Badami. This included the practicability of using the proposed PTEP crossing near the Badami Mine Site in lieu of construction of the Pipeline Crossing Pad. This would require over three miles of additional ice road to be constructed and more than six miles of additional rig travel for each season that a mobilization or demobilization is required. This would include one mile of travel on the Badami airstrip thereby preventing use of the airstrip for flight operations for the time that the rig is in transit.

The Badami Unit Operator has an ongoing need to mobilize and de-mobilize drilling rigs, well work-over equipment, and other equipment for work at the Badami facility. The safest and most efficient route of travel for this equipment is along an ice road that connects directly to the Southeast corner of the Badami facility pad. Installing the Pipeline Crossing Pad affords the Badami Unit Operator continued direct access to the Badami Pad via the same alignment as the ice road that has been approved and used for that purpose for the past several years. The top of the pad is sized to approximately match the width of an ice road and is the minimum necessary to provide safe transit for drilling rigs.

Based on practicability considerations related to the use of the Badami mine access road crossing for ice road transit of the PTEP, the Corps concluded that the LEDPA included construction and use of the proposed Pipeline Crossing Pad.

Alaska State C-1 Pad

In addition to construction of the three coastally located drilling pads, the applicant proposes to use the existing C-1 Pad. The C-1 Pad was constructed in 1980 as an exploration drilling well site. The proposed fill was authorized under DA permit number 071-OYD-4-800015 issued to Exxon Company, USA. The Alaska State C-1 well has since been plugged and abandoned and is

currently meet the conditions for a plugged and abandoned well specified under AOGCC regulations.

As part of the proposed project, the applicant has requested a permit modification to alter the use of the 4.1 acre C-1 Pad. The applicant proposes to use the C-1 Pad as a long-term storage pad for equipment, materials, and ancillary facilities such as construction equipment and machinery. As part of the use change, the applicant would place an additional 2 to 2.5 feet of gravel on the existing pad to create a uniform and level surface. Placement of additional gravel on the C-1 Pad would not require placement of fill outside of the existing pad footprint. See Figures 25 and 26 of the DA permit application for additional details on the C-1 Pad location and design. Table 5.10 summarizes the full range of alternatives considered for the C-1 Pad.

Table 5.10: Alaska State C-1 Pad Alternatives Considered	
Components carried forward for consideration as the LEDPA	
<i>Alternative Components Considered</i>	<i>Where Considered</i>
Use of the existing Alaska State C-1 Pad for equipment laydown and storage	Applicant's proposed project
Use of Alaska State C-1 Pad to house non-coastal essential infrastructure proposed for Central Pad	LEDPA evaluation

The Corps evaluated whether potential expansion of the C-1 Pad site might be preferable to the construction of the full acreage of the proposed Central Pad or other project facilities. As discussed previously, an analysis was conducted regarding the consolidation of some of the functional areas at the East, West, and Central Pads, to the C-1 Pad to reduce coastal impacts. It was determined it is not practicable based on the proximity of the pad to the mine site, C-1 reservoir, and airstrip. Location of additional infrastructure on the C-1 Pad would require expansion of the pad size to avoid conflicting use with material and supply infrastructure already planned for the C-1 Pad.

The Corps concluded that the LEDPA included use of the C-1 Pad with removal of gravel to reestablish a 100-foot vegetative buffer along the creek as was required by the applicant's previous permit (see Section 7.3 of this ROD). Use of the C-1 Pad would require modification to the existing DA Permit for that site.

Emergency Boat Launch

The purpose of the emergency boat launch ramp is to provide a launching platform from which smaller emergency response boats stationed at the Central Pad can access the Beaufort Sea. The construction of the proposed emergency boat launch would result in the placement of 880 CY of gravel fill into 2,200 square feet of WOUS. An additional 80 CY of gravel fill would be placed into 6,950 square feet of navigable waters of the U.S. The emergency boat launch ramp would be located on the east side of the Central Pad and would extend approximately 165 feet into an adjacent protected lagoon of the Beaufort Sea. The emergency boat launch ramp would be 24 feet wide and would consist of a 108-foot long gravel ramp with concrete planks extending into the water. The ramp would extend to approximately 3.5 feet below Mean Lower Low Water (MLLW). Construction of the boat launch would include the placement of gravel bag erosion protection at elevation 0 feet MLLW and below. See Figures 15 and 16 of the DA permit application for additional details on the proposed boat launch location and design.

Table 5.11 summarizes the full range of alternatives considered for the Emergency Boat Launch.

Table 5.11: Emergency Boat Launch Alternatives Considered

Components carried forward for consideration as the LEDPA	
<i>Alternative Components Considered</i>	<i>Where Considered</i>
Approximately 24 foot by 165 foot concrete and gravel panel ramp	Applicant's proposed project
Construction of emergency boat launch on piles	LEDPA Evaluation

Based on NMFS comments on the Draft EIS, the Corps evaluated the use of piles in construction of the emergency boat launch to reduce impacts on fish passage. The findings of the Final EIS indicate that impacts to fish and invertebrates related to the construction of the emergency boat launch are anticipated to be minor. The boat launch would have a low profile (sitting 0 to 6 inches above the seafloor) and would be unlikely to impede fish passage. Based on this evaluation, the Corps concluded that construction of the boat launch on piles is not practicable. As a result, the Corps determined that construction of the applicant's proposed emergency boat launch was the LEDPA.

Water Source and Transportation

As part of the proposed project, the applicant would use the existing C-1 Mine Site reservoir as the primary source for project water. To provide access, the applicant proposes the placement of gravel fill into WOUS to create a 0.7-acre water access pad adjacent to the reservoir, and a 0.2-acre access road. See Figures 27, 28, and 71 of the DA permit application for additional details on proposed water source and transmission infrastructure location and design.

The water access pad would provide year round access to the C-1 Mine Site water source, a naturalized waterbody, and would support a permanent water intake structure to provide truck-fill capacity. The water intake structure would include power cables, water pipes, and submersible pumps. Pipe supports proposed to construct the water intake structure would impact 44 square feet of WOUS in addition to gravel fill necessary to build the pad. Additional on-pad infrastructure may include a generator and a warm-up shack.

Table 5.12 summarizes the full range of alternatives considered for provision of a water source and water delivery.

Table 5.12: Water Source and Transportation Alternatives Considered

Components carried forward for consideration as the LEDPA	
<i>Alternative Components Considered</i>	<i>Where Considered</i>
Use of C-1 mine reservoir as primary water source	Applicant's proposed project
Transportation of water to Central Pad by water truck	Applicant's proposed project
Transportation of water to Central Pad by water pipeline buried in gravel road	Component of Final EIS Alternative D

Components Eliminated Prior to LEDPA Evaluation		
<i>Alternative Components Considered</i>	<i>Where Considered</i>	<i>Reason Eliminated Prior to LEDPA Evaluation</i>
Use of new gravel mine site as water source	Component of Final EIS Alternative D	Increased impacts to fish and hydrology related to diversion of Stream 24 to fill new mine site reservoir ^a .
Transportation of water to Central Pad by water pipeline on 12 inch timbers	Component of Final EIS Alternative C	Increased impacts to caribou movements in project area ^a .
Transportation of water to Central Pad by pipeline elevated on VSMS	Component of Final EIS Alternative E	Routing of export pipeline identified as part of LEDPA would not parallel water pipeline route ^a .

^a HDR. 2012abc. *Impact Synthesis Discussion*. Anchorage, Alaska.

The Corps evaluated several alternatives to use of the C-1 Mine reservoir and water transportation by truck. Ultimately, use of the C-1 Mine reservoir was determined to be a component of the LEDPA. The Corps continued to consider the practicability of a water transportation alternative to the Central Pad via a water pipeline buried in the gravel access road.

The burial of a pipeline in a gravel road has the potential to create numerous technological and operational issues. To keep water flowing, the water pipeline would need to be kept warm. The placement of a warm pipeline in gravel makes it difficult to keep the tundra foundation, on which the road is built, frozen. As a result permafrost thaw beneath the road would be likely. Thaw settlement would create operational and maintenance issues with the water pipeline and the road through which it runs. Based on past industry experience placing pipelines in roads, upheaval or lateral bucking of the pipeline is also possible as a result of loss of gravel cover due to frequent vehicle traffic.⁸¹ The presence of a water pipeline within the roadbed would make the installation of additional culverts to address cross drainage issues more difficult.

Based on the technological and operational issues identified, the Corps concluded that placement of the water pipeline within the Central Pad road would not be carried forward for consideration as a component of the LEDPA based on the minimal difference in environmental impacts identified in the Final EIS between trucking water and placement of the water pipeline within the road and the substantial increase in practicability concerns.

Power Generation and Transmission

The applicant proposes to transmit power from the Central Pad to the Airstrip and the Water Access Pad via cables trenched in the tundra outside of the toe of the Central Pad-airstrip access road. Trenching of power cables would directly impact 0.41-acre of WOUS. Power transmission via trenched cables would require the placement of junction boxes, extending above the tundra surface at approximately 1,000 foot intervals. At road crossings, power cables would be installed through casings through the gravel roadbed. At stream crossings, the cable would be trenched under Stream 23 and would be suspended from cables from the bridge over Stream 24B. See Figures 67 and 69 of the DA permit application for additional details on proposed power transmission infrastructure location and design. Power cables to the East and West Pads would be co-located on the pipeline VSMs.

Table 5.13 summarizes the full range of alternatives considered for power generation and transmission.

⁸¹ ExxonMobil, "ExxonMobil Technical Brief #7: Buried Pipelines in Gravel Roads on the North Slope," (Anchorage, 2010).

Table 5.13: Power Generation and Transmission Alternatives Considered

Components carried forward for consideration as the LEDPA		
<i>Alternative Components Considered</i>	<i>Where Considered</i>	
Trenching of power cables in tundra between Central Pad and airstrip	Applicant's proposed project	
Placement of power cables between Central Pad and East and West Pads on pipeline VSMS	Applicant's proposed project	
Placement of power cable between Central Pad and airstrip in gravel road	Component of Final EIS Alternative C	
Components Eliminated Prior to LEDPA Evaluation		
<i>Alternative Components Considered</i>	<i>Where Considered</i>	<i>Reason Eliminated Prior to LEDPA Evaluation</i>
Placement of power cable between Central Pad and airstrip on export pipeline VSMS	Component of Final EIS Alternative D	Routing of export pipeline as part of LEDPA would not traverse distance between Central Pad and airstrip ^a
Placement of power cables between Central Pad and airstrip in tray on elevated water pipeline	Component of Final EIS Alternative E	Elevated water pipeline eliminated as component of LEDPA due to increased environmental impacts ^a
Generation of Power at Badami	Concept considered in EIS alternatives development	Existing power supply at Badami is insufficient to supply anticipated needs at Point Thomson ^b

^a HDR. 2012abc. *Impact Synthesis Discussion*. Anchorage, Alaska.

^b Corps. 2012. Point Thomson Project Final EIS. p. 2-10

The Corps evaluated several alternatives to trenching of power cables between the Central Pad and the airstrip. These included placement of power cables in the prism of the gravel road, placement of power cables on export pipeline VSMS, and placement of power cables on the elevated water pipeline.

The placement of power cables on the export pipeline VSMS, as considered in Final EIS Alternative D, was not found to be practicable. As discussed in PTEP in Section 5.1 of this ROD, the applicant's proposed export pipeline route has been selected as a component of the LEDPA. As a result, the use of an elevated power line, elevated on an export pipeline or water line, would require the use of a near-airstrip export pipeline route (as evaluated in Final EIS Alternative E) or an elevated water distribution option (as suggested for Final EIS Alternative D). Each of these pipeline options would have greater environmental impacts and were dismissed, eliminating the availability of a pipeline for power line placement.

Burying power lines in the road would introduce practicability considerations including safety concerns due to potential vehicle collision with transmission boxes along the road shoulder and the logistical challenges of placement of the power cable in green (un-worked) gravel. Placing the cable in green gravel would require delaying road construction until the gravel has been worked all summer. This would mean that the airstrip would not be connected to the main generator at the Central Pad and would have to operate separate generators for that period of time. The placement of the power cable in the gravel road would impact road maintenance and the ease of installing additional cross drainage structures if needed.⁸²

Based on these safety and logistical concerns, the Corps concluded that placement of power cables within the prism of the gravel road is not a practicable alternative. As a result, the applicant's proposed plan to trench power cables between the Central Pad and airstrip is the power transmission option moved forward for consideration as a component of the LEDPA for all transmission routes that do not parallel gathering or export pipeline routes.

⁸² HDR, "110422_Preliminary Project Logistics Meeting Notes," (2011).

Towers

The proposed project includes the installation and/or modification of multiple communications and lighting towers, all located on existing or proposed gravel infrastructure. These include:

- A CPF main communication tower located on the Central Pad. The lattice structure tower is proposed to extend approximately 200 feet above ground level.
- Three towers, ranging in height from 35 to 55 feet above ground level, located at the airstrip. Of the three towers, two are proposed for lattice design (30 foot and 45 foot) and one tower (50 foot) is proposed to be of monopole design. The three towers would be used for communications, lighting, nav aids, and mounting of speakers.
- Addition of communications equipment to the existing communications tower at Badami. The existing Badami tower extends approximately 240 feet above ground level.
- A temporary 75-foot tall lattice structure, guy wire-supported tower to be used for temporary voice and data telecommunications during construction. The guy wires would be equipped with high visibility guards. The temporary tower would be removed once the permanent CPF communication tower is installed.
- Additional temporary telecommunications towers located at temporary camps during construction. These towers would extend approximately 55 feet above ground level.

Table 5.14 summarizes the full range of alternatives considered for project towers.

Table 5.14: Towers Alternatives Considered	
Components carried forward for consideration as the LEDPA	
<i>Alternative Components Considered</i>	<i>Where Considered</i>
Construction of five permanent lattice-style towers at the Central Pad and airstrip	Applicant's proposed project
Use of tubular monopole towers in lieu of lattice towers for all tower structures	LEDPA Evaluation

Based on comment provided by USFWS, the Corps evaluated the practicability of using tubular monopole structures in lieu of a lattice design to reduce potential impacts to birds. The use of a tubular monopole structure was not found to be a practicable alternative for proposed towers over 100 feet due to technological constraints and safety concerns.

As stated in Section 7.3 of this ROD, the applicant would be required to manage raven nest sites on both lattice and monopole tower structures to reduce predation and depredation of nests of other bird species. This includes removal of nest material from all infrastructures before any eggs are laid and the development of a predator management plan in collaboration with the USFWS and the Corps.

Other Infrastructure Components of the LEDPA

Based on the Corps' evaluation of the environmental impacts and practicability of all reasonable alternatives to other components of the applicant's proposed project, the Corps concluded that the LEDPA includes:

- Construction and use of the proposed Badami Auxiliary Pad and Pipeline Crossing Pad;
- Incorporation of the existing DA Permit 071-OYD-4-800015 for the C-1 Pad into new permit;
- Proposed use of the C-1 Mine Site Reservoir as the primary project water source and transportation of water from the C-1 Mine Site Reservoir to the Central Pad via water truck;

- Construction and use of the proposed emergency boat launch;
- Generation of power at the Central Pad facilities and proposed transmission of power to the Water Access Pad via trenched cables for transmission routes that do not parallel gathering or export pipeline routes; and
- Construction and use of proposed project towers including a 200-foot above ground level lattice communication tower at the Central Pad, two lattice towers (30 foot and 45 foot) and one monopole tower (50 foot) at the airstrip, use of the existing lattice tower structure at Badami, and use of temporary lattice communication towers at the Central Pad and at temporary camps during construction.

Determination of the LEDPA

Based on the Corps' evaluation of all components of the applicant's proposed project, the Corps concluded that the following project components are components of the LEDPA:

- Expansion and use of the Central Pad as proposed by the applicant with the following changes to minimize impacts to polar bear movement:
 - Limiting the placement of gravel fill along the eastern edge of the existing PTU-3 Pad;
 - Placement of dredged material to extend the shoreline into the adjacent lagoon.
- West Pad reconfiguration to increase pad distance from the coastline;
- East Pad reconfiguration to a location approximately one mile west to decrease impacts to high value wetlands, hydrology, and the potential for impacts related to coastal erosion;
- Construction of the East and West Pads as described in the reconfiguration option;
- Construction of the Central Pad, Water, C-1 Pad, and Airstrip access roads as propose with conditions including monitoring of crossflow drainage and dust abatement;
- Construction of the East and West gravel access roads with modification to accommodate the reconfiguration and movement of the East and West Pads with conditions including monitoring of crossflow drainage and dust abatement;
- Construction of tri-modal transportation infrastructure including proposed barge offloading facilities and seasonal ice roads;
- Construction of the proposed 5,600- by 200-foot airstrip with monitoring and potential future mitigation measures to maintain natural drainage patterns;
- Beneficial reuse of dredged material to create a wider coastal corridor along the eastern edge of the proposed Central Pad in order to facilitate polar bear movement through the area;
- Placement of dredged material in excess of that needed for beneficial reuse in the location proposed by the applicant;
- Construction of the PTEP as proposed with minor modification to accommodate reconfiguration of the West Pad;
- Construction of the East and West Gathering Lines as proposed with modification to accommodate reconfiguration of the East and West Pads;

- Minimization of gravel fill to create gravel stockpile by reducing size of stockpile to 5.2 acres containing 135,000 CY of gravel;
- Minimization of gravel mine access road infrastructure by reducing the road access to the gravel mine stockpile and using an ice road for winter access to the mine site;
- Construction and use of the proposed gravel mine followed by successful rehabilitation and revegetation of the gravel mine site as habitat suitable for fish, wildlife, and waterfowl. Rehabilitation of this site would be completed in accordance with a special condition on the DA permit, which would require an approved Gravel Mine Rehabilitation Plan (see Section 7.3 of this ROD). The Gravel Mine Rehabilitation Plan would include the following measures:
 - Backfill of the overburden material to construct a wide littoral zone along the east side of the reservoir which would include a water retention berm along the western edge where the slope to the deep water zone begins.
 - Compensatory mitigation for the footprint of the gravel mine site, access road, and permanent gravel stockpile is included in the compensatory wetland mitigation plan submitted by the applicant;
- Construction of the proposed Badami Auxiliary Pad and Pipeline Crossing Pad;
- Incorporation of the existing DA Permit 071-OYD-4-800015 for the C-1 Pad into new permit;
- Construction of access to the C-1 Mine Site Reservoir;
- Construction of the proposed emergency boat launch;
- Construction of proposed power transmission cable via trenching; and
- Construction of proposed project towers.

5.2 General Description of Dredged or Fill Material

General Characteristics of Material

The material proposed for discharge includes gravel fill removed from the proposed gravel mine site, marine sediments dredged from the vicinity of the proposed barge facilities, and sand slurry to support steel VSMS, and concrete scour protection features. Table 5.15 provides detail on the footprint and volume of proposed fill in WOUS.

	Navigable Waters of the U.S. ^a		Waters of the U.S., including Wetlands ^b	
	Footprint (acres)	Placement Volume (CY)	Footprint (acres)	Placement Volume (CY)
Gravel Fill	0.16	80	209.91	2,298,680
Sand Slurry and Steel	-	-	0.13	3,500
Dredged Materials	5.85	1,580	1.65	4,380
Organic/Inorganic Overburden	-	-	49.31	804,670
Concrete	-	-	0.09	-

^a Subject to authorization by the Corps under Section 10 and Section 404

^b Subject to authorization by the Corps under Section 404

To construct the proposed project, approximately 2,298,760 CY of clean gravel fill would be placed in 0.16-acres of navigable waters of the U.S and 209.91 acres of WOUS. Approximately 5,960 CY of dredged material would be placed in 5.85 acres of navigable waters of the U.S. and 1.65 acres of WOUS to construct the proposed barge facilities. Approximately 3,500 CY of sand slurry would be placed at VSM locations along the PTEP route to secure the steel VSMs. Approximately 804,670 CY of organic and inorganic overburden is proposed to be removed and replaced at the gravel mine site and to trench electrical utility lines. Concrete fill (approximately 0.09 acres) would be used as scour protection on the downstream side of culverts located at stream crossings and to support a water intake pipe at the C-1 Mine Reservoir.

Quality of Material

Gravel fill material proposed for placement would be pit run gravel mined from the proposed new gravel mine site. Based on testing performed at Point Thomson in 1980, the target materials have an average dry density of 70 pounds per cubic foot and an average ice content of 25 percent. Material would be mined when frozen using "blast and shoot" methods and either moved directly to the site of placement or stored on a pad depending on the amount of gravel required.

The composition of dredged material would be primarily silt, poorly graded gravel, and sand. No natural rock outcrops occur in the dredging area. Sediment testing of materials in the vicinity of the proposed dredged area range in the percent of fines ranged from 1.8 to 33 percent with a mean of 9.8 percent.⁸³ Material with greater than 20 percent of fines material was primarily limited to a 1- to 2-foot thick layer of silt near the seafloor and to testing sites located closest to the coastline. Sediment below this layer and in borings further offshore consisted of predominantly gravel and sand with lower fines content.⁸⁴

Description of Proposed Discharge Site

The proposed sites for placement of gravel fill include the Central Pad; East Pad; West Pad; infield access roads; barge facilities; airstrip and associated facilities; gravel stockpile; Badami pipeline pads; water access pad; and emergency boat launch (See Figure 4 of the DA permit application). The total acreage of gravel fill placement would be 210.07 acres.

Dredged materials would be used as beach replenishment material at a location approximately 0.75-mile west of the Central Pad on the mainland coast above MHW. The dredged materials would be placed within an area approximately 50 feet wide by 1000 feet long (See Figure 14 of the DA permit application). The sand slurry fill will be placed around each steel VSM along the PTEP route (See Figures 31 through 34 of the DA permit application).

The aquatic ecosystems of the project area are characterized by extensive wetland and waterbody habitats. Mapped areas include terrestrial and marine areas in and near where infrastructure is proposed for all alternatives. Seventy-one percent (45,796 acres) of the mapped study area is covered by wetlands, notably wet tundra (28 percent), moist tundra (22 percent), and moist/wet tundra complexes (17 percent).

Waterbodies include unvegetated intertidal and subtidal bays and inlets, rivers, streams, lakes, ponds, and their associated barren mud flats, gravel bars, and drained lake basins. Waterbodies and their associated barrens occupy approximately 29 percent (18,354 acres) of the study area and comprise areas of open water (26 percent), river gravels/beaches (2 percent), wet mud (1 percent) and bare peat (less than 0.1 percent) associated with lakes, ponds, and coastal areas.

Areas not classified as water bodies or wetlands are considered uplands. Uplands occupy less than one percent (205 acres) of the study area. **Error! Reference source not found.**5.18 describes the type and amount of WOUS filled by the proposed action. See Impacts on Special Aquatic Sites in Section 5.3 of this ROD for addition detail on the vegetation and wetland types filled by project component.

⁸³ ExxonMobil, "Point Thomson Gas Cycling Project, Ocean Dumping Evaluation Sediment Quality Results," (Anchorage, 2003).

⁸⁴ Ibid.

Description of Discharge and Disposal Methods

The primary means of placement of gravel fill for the construction of the Central Pad; East Pad; West Pad; infield access roads; barge facilities; airstrip and associated facilities; gravel stockpile; Badami pipeline pads; water access pad; and emergency boat launch would be via dump trucks, fill dozers, and graders. Fill placement would occur during winter months.

To place gravel, the fill site, would be surveyed and staked. Gravel would be transported in belly dump units to the site and spread with a fill dozer in one-foot lifts. Each lift would be compacted by multiple passes with a vibratory compactor; traffic would be routed over the area to assist in compaction. Subsequent lifts would be installed and compacted in the same way, until the road or pad achieves its design elevation. To speed the process of gravel seasoning (drying and settling) the applicant proposes to farm the gravel by turning the upper layers of gravel once or twice in a single season to expose the buried areas and facilitate drying. During this process, water would be placed on the gravel for both compaction and dust suppression.

Culvert installation would primarily occur during the winter with construction of the gravel roads. The multi-plate fish passage culverts, proposed for several stream crossings, would be placed during the summer after spring breakup has occurred. Summer work on placement all gravel fill, culvert, and concrete revetment would be completed by equipment operating from within the permitted permanent project footprint.

Gravel fill and concrete planks used to construct the boat launch would be placed during the winter and start with excavation of grounded ice within the work area and placement of gravel and erosion protection including concrete planks. Gravel fill placed above elevation 0 feet MLLW would be reworked and compacted during summer months.

Dredged materials would be placed using dump trucks and fill dozers. Dredging activities would occur during the winter and would require removal of grounded sea ice prior to excavation of marine sediments. The ice in the designated dredge area cannot be removed at the same time; therefore, dredging and screeding would be conducted sequentially in different areas. In order to achieve the desired seabed profile, the applicant may temporarily place some of the dredged material into the dredged material disposal area, but then remove the dredged materials from the disposal area to place on a newly exposed area of sea bed if additional material is required.

Sand slurry fill would be placed around the steel VSMS during the first winter construction season. Following marking of VSM locations, the applicant proposes to use, an air drill auger to drill the VSM holes to the depth required. The VSMS are then placed using hydraulic cranes, side boom tractors, or hydraulic forklifts. The hole is then filled with sand slurry from mixer trucks and allowed to freeze. All work involving VSM installation would take place on gravel or ice infrastructure.

5.3 Factual Determinations and Technical Evaluation Factors

Construction of the proposed project would include the discharge of dredged or fill material in WOUS. This section addresses the potential short-term and long-term effects of the proposed discharges of dredged or fill material on the physical, chemical, and biological components of the aquatic environment as required by the Guidelines.⁸⁵ These factual determinations and the technical evaluation factors on which they are based⁸⁶ form the basis of the determination whether there is minimal potential for short-term or long-term significant adverse environmental effects of the proposed discharge.

Physical Substrate Determinations (40 CFR 230.11 (a))

Physical substrate determinations include an evaluation of effect that the proposed discharge would have, individually and cumulatively, on the substrate at the proposed disposal site. Sections 3.1, Geology and Geomorphology and 3.2, Soils and Permafrost of the Final EIS describe the existing substrate under the proposed disposal site within the project area. Section 5.2, Soils and Permafrost of the Final EIS,

⁸⁵ 40 CFR 230.11, Subpart B

⁸⁶ 40 CFR 230.11 Subparts C through F

summarized below, form the basis for the Corps' evaluation of impacts of the applicant's proposed project on the physical substrate of the project area.

The proposed project would adversely impact the physical substrate through gravel mining, gravel fill placement for pads and roads, trenching for power cables, placement of VSMs, dredging and dredge material disposal. The spray of dust and gravel from roads and pads onto the surrounding tundra would adversely impact soils and permafrost adjacent to project infrastructure over time. Seasonal ice pad and ice road construction are anticipated to cause little change to the thermal regime or compaction of soil. The project has the potential to adversely impact substrate through the discharge of wastewater to the tundra surface. Tundra travel, particularly if it occurs during summer months or traverses wet tundra with multiple passes, also has the potential to adversely impact substrate outside of the direct project footprint.

Table 5.16 provides detail on the impacts on soil and permafrost substrate by project component.

Table 5.16: Impacts to Physical Substrate		
Component	Direct Impact (acres)	Indirect Impacts (acres)
<i>Permanent Impacts</i>		
Gravel Fill Placement	210.07	1013.6 ^a
VSM Installation	0.13	
Dredging Area	5.5	
<i>Temporary Impacts</i>		
Electrical Trenching	0.41	
Seasonal Ice Roads and Pads	1095.78 ^b	

^a Includes dust fallout, snowplow spray deposition, and gravel spray. Indirect impacts calculated using a 300 foot buffer around gravel infrastructure

^b Seasonal ice roads and pads generally fall within the 300 foot buffer calculated for indirect impacts resulting from gravel roads but are listed here separately as impacts differ in duration and magnitude. Direct impacts associated with seasonal ice roads and pads are not subject to compensatory mitigation.

Overall, impacts to the physical substrate in the project area would range from minor and temporary (impact would last less than 10 years; i.e. seasonal ice roads and pad) to major and long term (impact would last more than 100 years; i.e. development of the gravel mine site and gravel fill placement; see Table 5.2.3 of the Final EIS).⁸⁷ Impacts identified as major would not extend beyond the project footprint and/or the project area. The Corps found that none of the impacts identified would cause or contribute to significant degradation of WOUS.

Actions Taken to Minimize Impacts

All mitigation measures proposed by the applicant and considered by the Corps to minimize impacts on substrate are detailed in Final EIS Section 5.2.7, Soils and Permafrost- Mitigative Measures and in Section 4.1 of the applicant's Environmental Mitigation Report.⁸⁸

The applicant has proposed numerous measures as part of the project design to avoid or minimize impacts on substrate. These include the prevention of permafrost thaw and substrate subsidence through the avoidance of ice rich permafrost, designing infrastructure to minimize water

⁸⁷ The severity of impacts varies based on the specific component of project infrastructure evaluated. The methodology and definitions of impact criteria used for the impact analysis may be found in Table 5.2.1, Impact Criteria- Soils and Permafrost, of the Final EIS.

⁸⁸ ExxonMobil, "Point Thomson Project Environmental Mitigation Report, June 17, 2011," (Anchorage, 2011).

impoundments, insulating underlying permafrost through use of gravel pads, and the elevation of project infrastructure off the tundra surface, when possible. Other minimization measures include implementing dust control measures, reducing wastewater discharge, and implementing operating procedures to minimize disturbance.

In addition to applicant proposed measures, certain Best Management Practices (BMPs) and stipulations are also required to comply with other state and federal agencies permit and lease agreements. These include implementation of erosion control measures as part of the Storm Water Pollution Prevention Plan (SWPPP) and specific stipulations required by the State Pipeline Coordinators Office (SPCO) as part of the pipeline Right-of-Way (ROW) lease.

As part of its determination of the LEDPA, the Corps would require additional mitigation measures to further minimize impacts. These conditions are described in Section 7.3 of this ROD. The Corps would require additional mitigation measures to compensate for unavoidable wetland impacts. These measures are described in Section 7.2 of this ROD.

Water Circulation, Fluctuation, and Salinity Determinations (40 CFR 230.11 (b))

Water circulation, fluctuation, and salinity determinations include evaluation of the nature and degree of effect that the proposed discharge would have individually and cumulatively on water, ocean current patterns, circulation including downstream flows, and normal water fluctuation. Consideration is given to water chemistry, salinity, potential diversion or obstruction of flow, alterations of bottom contours, or other significant changes in the hydrologic regime. Sections 3.5, Physical Oceanography and Coastal Processes; 3.6, Hydrology; and 5.7, Water Quality of the Final EIS describe the existing hydrology, coastal water circulation, and salinity gradients of streams, lakes, and nearshore lagoons and basins in the project area.

Water Quality and Chemistry (40 CFR 230.22)

Details regarding the impacts of the proposed PTP activities on water quality and chemistry in the project area are found in Sections 5.7, Water Quality of the Final EIS.

Marine Water

Construction of the proposed project has the potential to impact water quality in marine waters. As discussed in Suspended Particulates and Turbidity in Section 5.3 of this ROD, the project has the potential to increase turbidity and suspended particulates, which would increase trace metal and organic nutrients concentrations. The concentrations of trace metals and organic nutrients entering marine waters would be small and difficult to differentiate from materials introduced naturally, primarily during spring breakup.

An increase in turbidity has the potential to impact marine water temperatures, which would decrease dissolved oxygen (DO) concentrations in the marine water column. The impact of increased turbidity on water temperature would be small since sediment transport in the water column is naturally high during breakup as sediments enter the water column and an increase would be difficult to differentiate from natural levels. Barge operations, which would include the release of ballast water, would alter pH and DO in the immediate barge offloading area.

Additional impacts on marine water quality may occur during project operations as a result of the operation of the CPF on the Central Pad. The gas cycling process would take place in a fully-enclosed modular building, which would contain most leaks or spills. Emergency flaring and emissions from the natural gas-fired equipment could send minute quantities of trace metals into the atmosphere and deposit them in local waterbodies.

Overall, impacts to marine water quality and chemistry are anticipated to be minor and temporary in duration (see Table 5.7.2 of the Final EIS).⁸⁹ As a result, the Corps found that none of the impacts identified were of a severity which would cause or contribute to significant degradation of WOUS.

Freshwater

An increase in turbidity in the freshwater environment has the potential to impact freshwater water quality through the introduction of increased trace metals and organic nutrients to the freshwater column. Increased turbidity has the potential to increase water temperatures which would decrease DO concentrations. These impacts would occur primarily during spring breakup, as sediments enter the water column following snow and icemelt. The impact of increased turbidity on other water quality measures would be small as sediment transport in the water column is naturally high during breakup and an increase would be difficult to differentiate from natural levels.

Additional impacts to freshwater water quality and chemistry may occur as a result of discharge of treated domestic and pipeline hydrostatic testing wastewater. As proposed, wastewater would be treated and discharged to the tundra or marine environment, as permitted, until completion of the Class 1 disposal well at the Central Pad. The discharge may impact water temperature, organic nutrients, and DO. However, the discharged water would have to meet the effluent limit requirements of the Alaska Pollution Discharge Elimination System (APDES) permit, minimizing potential impacts to water quality.

Water withdrawal may also alter the quality of freshwater in the waterbodies that serve as water sources. Increased turbidity, and associated water quality issues may result from water withdrawal methods. Water withdrawal may also impact DO, alkalinity and pH, and the concentration of organic nutrients. These impacts are expected to be minor and temporary.

Additional infrastructure with potential to impact freshwater water quality include: processing facilities, tundra ice roads, fuel tanks, and storage areas. As discussed for marine water quality, emergency flaring and emissions from the natural gas-fired equipment at the processing facilities would send minute quantities of trace metals into the atmosphere and deposit them in local water bodies. If water is taken from lakes near the coast for tundra ice roads, there would be a local effect on alkalinity and/or pH in the surrounding freshwater waterbodies. Lakes near the coast have higher total dissolved solids (TDS) concentrations, which would increase the alkalinity.

Fuel tanks and storage areas would be located in secondary containment units on gravel pads. While it is highly unlikely that a large spill of fuel or other materials would occur, it is possible that a medium sized spill could have a moderate, but temporary effect on freshwater quality.

Overall, impacts to water quality and chemistry are anticipated to be minor to moderate and temporary (see Table 5.7.2 of the Final EIS). As a result, the Corps found that none of the impacts identified were of a severity which would cause or contribute to significant degradation of WOUS.

Water Circulation, Current Patterns (40 CFR 230.23), and Fluctuations (40 CFR 230.24)

Information regarding the impacts of the proposed PTP activities on water circulation, current patterns, and fluctuations in the project area are found in Sections 5.5, Physical Oceanography and Coastal Processes; and 5.6, Hydrology of the Final EIS.

Marine Environment

Impacts on marine water circulation and current patterns would result from the construction and operation of the barge offloading facilities, Central Pad, and emergency response boat launch.

⁸⁹ The severity of impacts varies based on the specific component of project infrastructure evaluated. The methodology and definitions of impact criteria used for the impact analysis may be found in Table 5.7.1, Impact Criteria- Water Quality, of the Final EIS.

The barge offloading facilities are anticipated to have minor impacts on water circulation as a result of bulkhead location and proposed dredging and screeding activities. While the structure for the offloading facility is located above HTL, there are dolphins and piles associated with the facility which would be below MHW and cause negligible impacts to water circulation.

Dredging and screeding needed to achieve the water depth necessary for barge access to the barge offloading facilities is anticipated to have minor impacts on water circulation and current patterns. The depth of dredging may approach the permafrost zone, which would result in the formation of a thaw bulb around the dredged area. Due to the fine grained nature of the soils, the resulting thawed sediments would be subject to transport.

The location of the Central Pad near the shoreline could result in minor impacts as a result of some degree of ice ride-up during fall freeze and in early spring thaw. The applicant has proposed to mitigate this impact by orienting the Central Pad away from areas with stronger wave action towards the west and adding gravel bag armoring to the seaward facing slopes to minimize coastal erosion and help protect the pad from erosion by the ice. Grading of the beach face for the construction of the emergency boat launch at the Central Pad would have negligible impacts on water circulation and current patterns. Impacts related to construction of the emergency boat launch are anticipated to be minor.

Freshwater Environment

Project activities with the potential for impacts to water circulation and fluctuations include the construction of gravel infrastructure, ice roads, ice pads, pipelines, and a new gravel mine site. Impacts would result from water withdrawals and the disposal of wastewater to the tundra. Impacts to water circulation and fluctuations include changes in stream stage; changes in erosion and sedimentation conditions; impoundment of sheetflow and shallow ground water; ponding of water; inundation up gradient of gravel fill; and drying of areas down gradient, particularly if culverts are not properly placed.

Gravel infrastructure with the potential to impact water circulation and drainage patterns include gravel pads, gravel roads, and the gravel airstrip. The proposed gravel pads would have permanent impacts on water circulation. Impacts are limited to areas without stream connections, waterbodies of great size, or critical value.⁹⁰ This includes the potential to impound or redirect water up gradient of the pads, particularly in poorly defined channels between lakes in the vicinities of the Central Pad and the West Pad.

The proposed gravel roads would have permanent impacts on drainage patterns, stream stage, and erosion or sedimentation processes. Impacts would occur in areas where gravel road infrastructure crosses existing streams but may occur where gravel roads traverse the hydrological gradient. The proposed project would include 10.1 miles of infield gravel roads, which would require 4 culverted stream crossings and 4 bridged stream crossings. The applicant has proposed to mitigate impacts by designing all stream crossing structures for a 50-year flood event and proposing use of a bridge to cross all streams with a 50-year flood discharge of 500 cfs or greater. Streams with a 50-year flood discharge less than 500 cfs have been designed to be crossed with a culvert battery.

Despite these design measures, crossing structures on the ACP are typically narrower than streams at flood flow as stream channel capacity is usually small and the majority of breakup flows outside of the stream channel. Some structures designed for a 50-year magnitude flood would impact stream stage and modify erosion and sedimentation conditions due to constriction of the stream channel during annual breakup. Constriction of the stream channel could have upstream and downstream effects including increasing stage and decreasing velocities upstream of the crossing and decreasing stage and increasing velocities downstream of the crossing. Impacts to stream channels could affect other connected water bodies through changes in stage.

⁹⁰ See Table 5.6-2 of the Final EIS for further discussion on the methodology of the hydrology impact assessment. Section 5.6.3 of the Final EIS provides thorough discussion of impacts to hydrology that may occur as a result of the applicant's proposed project.

Gravel roads would impact sheetflow and the movement of shallow groundwater. Despite the placement of culverts approximately every 500 feet along all gravel roads, the proposed project would have secondary impacts on 1,130 acres of WOUS as a result of ponding upstream of gravel roads and 433 acres of reduced water input downstream of gravel roads. The period of increased ponding upstream would be approximately 4.4 days, in addition to normal sheetflow duration during annual breakup or higher flows. The applicant has proposed to add additional culverts if observations during spring breakup identify that the roads are not allowing sufficient water flow through the area.

The proposed airstrip is oriented perpendicular to the dominant hydraulic gradient and would have permanent impacts on drainage patterns. The airstrip would divert drainage away from Stream 22 and toward Stream 24, effectively increasing the drainage area of Stream 24 by 1.8 mi² and decreasing Stream 22's drainage area by the same amount. This drainage area corresponds to roughly 48 cfs of runoff, which would decrease flood flows in Stream 22 by 48 percent and increase flow in Stream 24 by 25 percent. Changes in flow could affect stream morphology if the channel narrows, widens, or deepens. These changes could impact vegetation and wetlands through changes in vegetation communities or moisture regimes, fish dispersal, and other aquatic resources downstream.

Ice roads and pads would have temporary impacts on natural drainage patterns, stream stage, and streamflow. Impacts would likely occur during spring breakup because the ice would melt more slowly than the surrounding tundra and streams, and would increase spring runoff locally as they melt. Impacts may be mitigated by proper slotting of ice roads at stream crossings. Infield ice roads used for construction would require 33 stream crossings. The proposed tundra ice road, sea ice road, and pipeline construction ice road proposed for project mobilization from Deadhorse would require 45, 18, and 34 stream crossings respectively. The construction of ice pads used for construction would have similar impacts to drainage patterns as ice roads, but would not require stream crossings.

Pipeline construction would have permanent impacts on drainage patterns through the placement of VSMs within river channels and floodplains. Pipelines would be designed to be above the 200-year floodwater surface. Construction of the gathering lines would require 18 stream crossings while construction of the PTEP would require 32 stream crossings. As stated in Section 7.3 of this ROD, the applicant would avoid placement of VSMs in stream channels to the maximum extent practicable, and impacts would be minor.

The withdrawal of water from the C-1 Reservoir, the new gravel mine site, and other area water sources would have a permanent impact on lake levels. The applicant anticipates needing 231.5 million gallons during construction, 97.6 million gallons during drilling, and 2.7 million gallons during operations. The impact of water withdrawal from tundra lakes depends on the capacity of the water bodies to recharge annually from snowmelt and the volume of water withdrawn from each approved water source would be stipulated by a temporary water use permit from ADNIR. While water withdrawals could lower lake levels, water use permits require recharge monitoring and would not allow continued withdrawal from lakes that do not fully recharge.

Construction of a gravel mine has the potential to modify existing drainage patterns by creating a deep reservoir where none currently exists. The mine site would have a permanent impact to Stream 24 and to Stream 23 through changes in drainage patterns. These impacts would extend beyond the immediate waterbody affected due to hydrological connections downstream and upstream.⁹¹

Treated wastewater would be discharged to a pond south of the Central Pad until completion of the Class 1 disposal well. Impacts to drainage patterns related to treated wastewater would be minor.

⁹¹ See Table 5.6-2 of the Final EIS for further discussion on the methodology of the hydrology impact assessment. Section 5.6.3 of the Final EIS provides thorough discussion of impacts to hydrology that may occur as a result of the applicant's proposed project.

Salinity Gradients (40 CFR 230.25)

Sections 3.5, Physical Oceanography and Coastal Processes; 3.6, Hydrology; and 3.7, Water Quality of the Final EIS describe salinity gradients in aquatic environments in the project area.

The salinity of nearshore waters along the Beaufort Sea coast is strongly influenced by seasonal sea ice and meteorological conditions. The location of offshore barrier islands and major rivers play a role in influencing fresh, brackish, and marine waters mixing in the Lion Bay area. The Canning/Staines River is the major freshwater input into the bay. The barrier islands act as a natural barrier for brackish water entering the greater Lion Bay marine environment. When the wind originates from the west, fresh water from the Sagavanirktok and Shaviovik Rivers, located approximately 40 miles west of Lion Bay, moves eastward along the surface and shoreline. This freshwater thoroughly mixes with marine water at lower depths to become brackish water by the time it reaches Lion Bay.

In the freshwater environment, the salinity and water quality of streams in the project area are influenced by spring breakup, precipitation events, surface runoff, and saltwater intrusions from the Beaufort Sea. Several lakes and ponds along the coastal area and near the pad locations are influenced by saline water from storm surges, ocean spray, and inundated troughs connecting the Beaufort Sea estuaries to coastal lakes. Concentrations of TDS in both lakes and streams in the project area increase the closer they are to the Beaufort Sea. Where streams empty into the bay, conductivity values reflect mixing of freshwater with marine waters. Closer to the coast, waterbodies tend to be dominated by sodium chloride (ocean-derived salt). Farther from the coast, waterbodies are dominated by calcium bicarbonates, indicative of freshwater.

Sections 5.6, Hydrology; and 5.7, Water Quality of the Final EIS describe potential impacts of project infrastructure on salinity gradients. The applicant has proposed locating dredged materials in a coastal location (See Dredged Material Disposal in Section 5.2 of this ROD). The salinity of materials at the disposal site would be similar to that of the dredged materials and no impacts to salinity would occur.

Salinity concentrations could be temporarily impacted by the introduction of freshwater melt used for the construction of the sea ice road. This impact would be minor as the meltwater from the ice road would be a small percentage of the freshwater entering the marine environment.

Actions Taken to Minimize Impacts

All mitigation measures proposed by the applicant and considered by the Corps to minimize impacts on water circulation, fluctuations, and salinity gradients are detailed in Final EIS Section 5.5.6, Physical Oceanography and Coastal Process- Mitigative Measures; Section 5.6.7 Hydrology- Mitigative Measures; and Section 5.7.8 Water Quality- Mitigative Measures.

The applicant has proposed numerous measures as part of the project design to avoid or minimize impacts on water circulation, fluctuations, and drainage patterns. To minimize impacts to marine ecosystems, the applicant proposes use a barge bridge system over use of a solid fill causeway/dock for barge offloading and has minimized use of structures in marine waters including locating the service pier and sealift bulkheads above MHW. The applicant would minimize use of dredging and screeding, incorporate slope protection into the design for the Central Pad and the emergency boat ramp.

Measures to minimize impacts to freshwater include designing and routing project infrastructure with consideration for hydrologic impacts, including minimization of footprint, avoidance of major stream crossings, designing stream crossings for 50-year flood design flow, and incorporating use of cross drainage culverts. Other measures include use of sheet pile for bridge abutments to minimize tundra footprint and embankment erosion, and slotting of ice roads at stream crossings to facilitate drainage during breakup.

Impacts to hydrology would be avoided or minimized by BMPs and permit requirements such as water use permit requirements, project-specific stipulations required by the SPCO as part of the ROW lease, and the Alaska Division of Oil and Gas' (ADOG) mitigation and lessee advisories that would be applied to the project. ADF&G has design and installation standards for culverts, bridges, and pipeline crossings of fish streams, which minimize hydrology impacts.

As part of its determination of the LEDPA, the Corps would require additional mitigation measures to further minimize impacts. These conditions are described in Section 7.3 of this ROD. In addition, the Corps would require additional mitigation measures to compensate for unavoidable wetland impacts. These measures are described in Section 7.2 of this ROD. The Corps found that none of the impacts identified would cause or contribute to significant degradation of WOUS.

Suspended Particulates and Turbidity Determinations (40 CFR 230.11 (c))

Suspended particulates and turbidity determinations include an evaluation of the nature and degree of effect that the proposed discharge would have on the kinds and concentrations of suspended particulates and turbidity in the vicinity of the disposal site. Sections 3.5, Physical Oceanography and Coastal Processes; 3.6, Hydrology; and 3.7 Water Quality of the Final EIS describe existing characteristics of water quality, including suspended particulates and turbidity in both marine and freshwater in the project area.

Suspended Particulates and Turbidity (40 CFR 230.21)

Details regarding the impacts of the proposed PTP activities on suspended particulates and turbidity in the project area may be found in Sections 5.5, Physical Oceanography and Coastal Processes; 5.6, Hydrology; and 5.7, Water Quality of the Final EIS.

Marine Environment

The proposed project would impact turbidity and suspended particulates in the marine environment through the construction and operation of infrastructure in and adjacent to the Beaufort Sea. Minor impacts to marine water quality would result due to construction and use of barge offloading facilities at the Central Pad. While the majority of the proposed dredging activities would take place through the ice during the winter, summer screeding and construction activities at the barge offloading facility would increase turbidity and total suspended solids (TSS) concentrations in the marine waters. Grounding of barges at the offloading facility and release of ballast water would disturb sediments and cause a temporary increase in TSS concentrations in the vicinity of the barge. Impacts related to barge facility construction and operations are anticipated to be minor and temporary.⁹²

Additional impacts to the turbidity and suspended particulates in the marine environment would occur as a result of the construction and maintenance of gravel infrastructure near coastal environments. The construction of gravel infrastructure, including the emergency boat ramp, gravel roads, and gravel pads would cause the deposition of increased dust and sediments onto snow, sea ice, or directly into the marine water column. Dust and sediments on snow and sea ice would remain until spring breakup, at which time they would move into the water column. The impact of these increased sediments would be minor and temporary, because of the large quantities of sediments that are naturally moved from land into the marine environment during spring breakup.

Freshwater Environment

The proposed project would impact turbidity and suspended particulates in the freshwater environment as a result of the construction and operation of gravel infrastructure, export and infield pipelines, a tundra ice road, and water withdrawals.

Winter construction activities, including gravel mining and the placement of piles and pipeline VSMSs, would result in the tracking of sediments and dust onto the ice and snow. The increase in sediments from construction activities in the winter would result in a minor increase in turbidity in

⁹² See Table 5.7-1 of the Final EIS for further discussion on the methodology of the water quality impact assessment. Section 5.7.4 of the Final EIS provides thorough discussion of impacts to water quality that may occur as a result of the applicant's proposed project.

comparison to the high quantity of sediments that naturally occur in the water column during the breakup season.

Summer construction activities, such as gravel compaction, would result in impacts to freshwater turbidity and suspended solids because of lower water flows and lower natural turbidity concentrations. Summer construction activities would increase the potential for fine-grained sediment to move from gravel roads into adjacent waterbodies, and would increase the turbidity and TSS concentrations when flows are low. Impacts to freshwater quality as a result of gravel and pipeline infrastructure construction would be temporary. Over the life of the project, impacts associated with the maintenance of pipeline and gravel infrastructure would be similar to those described for construction, but smaller in magnitude.

Water withdrawal would impact freshwater turbidity. Water withdrawal would stir up sediment located at the bottom of the water source. The method used for water withdrawal would affect the amount of turbidity generated. Regulations and permit stipulations associated with water withdrawal activities would limit turbidity impacts from water withdrawal. Water withdrawal impacts would be temporary.

Actions Taken to Minimize Impacts

Details regarding all mitigation measures proposed by the applicant and considered by the Corps to minimize impacts on suspended particulates and turbidity are detailed in Final EIS Section 5.7.8, Water Quality- Mitigative Measures and Section 4.4 of the applicant's Environmental Mitigation Report.⁹³

The applicant has proposed numerous measures as part of the project design to avoid or minimize impacts on suspended particulates and turbidity. Spill prevention and response planning and treatment of wastewater to meet the regulatory criteria for permitted surface discharge under the ADPES are key mitigation measures to protect both marine and freshwater quality. Other proposed project design measures include reduction of surface discharge of wastewater through use of a Class 1 disposal well and designing storage and transfer systems for fuels and other fluids with appropriate secondary containment.

Additional measures planned for marine waters include project design to minimize impacts. This includes optimization of module weight to eliminate the need for extensive dredging and the avoidance of the placement of gravel fill in marine waters to create barge offloading facilities. The applicant has proposed mooring dolphin and service pier piling installation and most dredging activities, during the winter through the ice to minimize sedimentation. The applicant has proposed to limit summer screeding and dredging activities to the minimum amount necessary to maintain the appropriate seabed profile.

To minimize impacts to freshwater quality, the applicant has proposed design measures for bridges and culverts to maintain existing drainage patterns and minimize erosion. The applicant proposes to manage snow melt and runoff under a site specific SWPPP and implement dust control measures for roads and construction areas. SWPPPs are required by the ADEC - Division of Water (in accordance with the APDES).

In addition to applicant proposed measures, certain BMPs and stipulations are required to comply with other state and federal agencies permit and lease agreements. These include implantation of erosion control measures as part of the SWPPP and specific stipulations required by the SPCO as part of the pipeline ROW lease. Fugitive dust is regulated by the ADEC Division of Air Quality (DAQ) under Statute 18 AAC 50. The states air quality standards are compliant with the Federal Clean Air Act. Compliance with the state regulations is enforced by the ADEC-DAQ.

As part of its determination of the LEDPA, the Corps would require additional mitigation measures to further minimize impacts. These conditions are described in Section 7.3 of this ROD. In addition, the Corps would require mitigation measures to compensate for unavoidable impacts to WOUS. These

⁹³ ExxonMobil, "Environmental Mitigation Report," (2011).

measures are described in Section 7.2 of this ROD. The Corps found that none of the impacts identified would cause or contribute to significant degradation of WOUS.

Contaminant Determinations (40 CFR 230.11 (d))

The factual determinations within the Guidelines require a determination of the degree to which the material proposed for discharge could introduce, relocate, or increase contaminants. This determination considers the material to be discharged, the aquatic environment at the proposed disposal site, and the availability of contaminants. Sections 3.2, Soils and Permafrost and 3.24, Contaminated Sites and Spill History of the Final EIS, provide information regarding the character of the materials proposed for discharge and the potential for contamination in discharge material in the project area.

Construction of gravel infrastructure as part of the applicant's proposed project would include placement of clean gravel fill that has been determined to be free of deleterious materials, including contaminants. The majority of fill material would come from a new gravel mine located approximately 1.75 miles south of the Central Pad and north and east of the proposed airstrip. The area around the proposed mine site is currently undeveloped.

The applicant's proposed project would involve dredging of marine sediments in the vicinity of the barge offloading facilities at the Central Pad. Dredged materials would be used as replenishment material at a beach along the eastern edge of the Central Pad and potentially 0.75-mile west of the Central Pad on the mainland coast above MHW (See Dredged Material Disposal in Section 5.2 of this ROD).

Evaluation of Dredged or Fill Material (40 CFR 230.60)

To determine if additional chemical or biological testing is required, the Corps must consider available information regarding the proposed dredged and fill material, including prior evaluations, chemical and biological tests, scientific research, and past experience. The Corps evaluated the following information for the potential presence and biological availability of contaminants in the proposed dredged and fill material.

Physical characteristics of materials

Materials in the vicinity of the proposed gravel mine site are characterized by an upper layer of organic peat and/or organic silt. These layers overlay massive ice, sand, and gravel layers with varying amounts of fines and silt/clay layers.⁹⁴ Based on testing performed at Point Thomson in 1980, the target materials have an average dry density of 70 pounds per cubic foot and an average ice content of 25 percent (Final EIS Section 3.2, Soils and Permafrost).

Materials in the proposed dredged material extraction site include fine-grained soils and permafrost with no natural rock outcrops (Final EIS Section 3.3, Physical Oceanography and Coastal Processes). Sediment testing of materials in the vicinity determined the percent of fines in the proposed dredged area ranged from 1.8 to 33 percent with a mean of 9.8 percent. Material with greater than 20 percent of fines material was primarily limited to a 1- to 2-foot thick layer of silt near the seafloor and to testing sites located closest to the coastline. Sediment below this layer and in borings further offshore consisted of predominantly gravel and sand with lower fines content. The physical characteristics of the proposed dredged material were consistent with characteristics of other marine areas tested in the Point Thomson vicinity.⁹⁵

Pertinent results from previously tests

The Corps may evaluate pertinent results from tests previously carried out on the material at the proposed dredge material extraction site. As a result, the Corps considered baseline sediment sampling data collected in support of the 2003 Point Thomson EIS effort. The sampling effort did not target the specific footprint of the proposed dredging area; however, the samples were collected within 1000 feet. No substantial differences in physical characteristics exist between the

⁹⁴ ExxonMobil, "Response 107 on Borehole Geotechnical Data," (2011).

⁹⁵ ExxonMobil, "Sediment Quality Results," (2003).

testing sites and the currently proposed extraction site. In addition, no major changes or spills are known to have occurred in the dredge material extraction area since the time that the sampling was conducted.⁹⁶ Screening levels were based on the *Dredged Material Evaluation Framework*, which was developed for the Lower Columbia and other Pacific Northwest estuaries.⁹⁷ The 2003 sediment sampling indicated the chemical compositions of sediments in the vicinity of the Central Pad are naturally occurring with no evidence of anthropogenic contribution. The chemical characteristics of the sediments in the vicinity of the Central Pad are similar to other marine areas tested in the Point Thomson vicinity.⁹⁸

Spill records for petroleum products or designated hazardous substances

The Corps evaluation reviewed records of spills and/or disposal of petroleum products or substances designated as hazardous under Section 311 of the CWA (40 CFR 116). The Bullen Point DEW line station is the only site in the vicinity of the project area included in the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database by the EPA.⁹⁹ The primary responsible party for the site is the U.S. Air Force 611th. The Bullen Point DEW site is located approximately 13 miles west of the proposed project. The site is not suspected as being a source of contamination for either the dredged material site or the proposed gravel mine site. Additional federal databases did not identify any other sites within the project area associated with a spill or release of hazard materials.

Other Federal, State, and local records of significant introduction of contaminants

The applicant has reported about 25 spill incidents at or directly associated with the project area, most of which occurred onshore at the gravel pads in 2009.¹⁰⁰ Six spills were reported over 5 gallons. The largest spill reported was 284 gallons of diesel; the entire amount was recovered. Other larger spills included drilling muds, seawater, and hydraulic oil. There have been no blowouts or uncontrolled releases of produced fluids at the project's exploration pads since drilling was initiated.¹⁰¹ No spill summaries were identified that required further action.

The ADEC's contaminated sites database includes two contaminated sites in the project area. These occurred at the PTU-1 Pad and the North Staines River 1 Pad. The PTU-1 Pad is located near the coast, approximately 3 miles west and downstream from the proposed mine site and approximately 2 miles west of the proposed dredging area. The North Staines River 1 Pad is located near the coast approximately 3 miles east and downstream from the proposed mine site and 3.5 miles east of the proposed dredging area. Both sites involved contamination by diesel. Site closure of the PTU 1 Pad site was approved by ADEC in 1995. The North Staines River 1 Pad was granted conditional closure in 1996. Final closure of the site is still pending and thus the site currently retains its active status. Neither site is anticipated to be a source of contamination for either the dredged material site or the proposed gravel mine site.

Contaminant Determination

Based on evaluation of this information above, the Corps concluded that the proposed dredged or fill material is not a carrier of contaminants and that levels of contaminants are substantively similar at the

⁹⁶ ExxonMobil, "Summary of Barging Activities in Support of the Point Thomson Drilling Program (2008-2010)," (Anchorage, 2012).

⁹⁷ USACE, *Dredged Material Evaluation Framework: Lower Columbia River Management Area*, (November, 1998), URL <https://www.nwp.usace.army.mil/ec/h/hr/final/toc.htm>; ExxonMobil, "Sediment Quality Results," (2003).

⁹⁸ ExxonMobil, "Sediment Quality Results," (2003).

⁹⁹ AK2570028652

¹⁰⁰ ADEC, "North Slope Oil Spill Database (1994-2010)," (Alaska, 2010).

¹⁰¹ Ibid.

extraction and disposal sites. As a result, the proposed barge facility dredged material and the gravel fill proposed for placement during construction of all gravel infrastructure material meets the testing exclusion criteria. The Corps found that none of the impacts identified would cause or contribute to significant degradation of WOUS.

Aquatic Ecosystems and Organism Determinations (40 CFR 230.11 (e))

The determination of impacts on the aquatic ecosystems includes an evaluation of potential changes in substrate characteristics and elevation, water or substrate chemistry, nutrients, currents, circulation, fluctuation, and salinity on the existence or recolonization of indigenous aquatic organisms or communities. The aquatic ecosystems of the Point Thomson area include both freshwater and marine habitats. These ecosystems support wetland vegetation, fish, invertebrate, bird, terrestrial and marine mammal populations. Sections 3.8, Vegetation and Wetlands; 3.9, Birds; 3.11, Marine Mammals; and 3.12, Fish, Essential Fish Habitat, and Invertebrates of the Final EIS describe the existing aquatic ecosystems in the project area. In addition, Appendix J, Mapped Land Cover of the Final EIS, and Appendix K, Wetland Functional Assessment of the Final EIS provide supporting information on vegetation classification and function assessment.

The Corps' determination of impacts on the structure and function of the aquatic ecosystem is based on the impact analysis found within Sections 5.8, Vegetation and Wetlands; 5.9, Birds; 5.11, Marine Mammals; and 5.12, Fish, Essential Fish Habitat, and Invertebrates of the Final EIS. The Corps' factual determination includes information based on the Evaluation of the Dredged or Fill Material in Section 5.2 of this ROD.

Fish, Crustaceans, Mollusks, and other Aquatic Organisms in the Food Web (40 CFR 230.31)

Section 5.12, Fish, Essential Fish Habitat, and Invertebrates of the Final EIS discuss potential impacts to aquatic ecosystems and organisms in the project area. For the proposed project, key considerations in the evaluation of impacts on aquatic ecosystems include the maintenance of adequate winter habitat, suitable feeding and spawning habitats, and passage to and from these areas for fish and invertebrates. Impacts on the aquatic food web may occur as a result of water withdrawals; the alteration of flow patterns and fish passage through placement of fill, bridges, and culverts; spills or releases of contaminants; and alteration of water quality. Impacts to project area hydrology and water quality resulting from gravel and ice infrastructure are discussed in Water Circulation, Fluctuation, and Salinity Determinations in Section 5.3 of this ROD.

Project infrastructure, including gravel pads, gravel roads, the gravel airstrip, and ice roads and pads alter water flow patterns which would result in temporary and permanent impacts to fish and invertebrate passage and habitat. The restriction of flow at stream crossing sites, changes in water quality, and increased sedimentation that would occur as a result of gravel infrastructure would negatively impact fish, invertebrates, and aquatic habitat, and ultimately reduce fish access to spawning, summer feeding, and overwintering habitats upstream of crossing structures. Culverts tend to have a higher impact on fish than bridges. Minor and medium term (longer than two years) to long term impacts may also occur as a result of the gravel mine, which could seasonally trap fish in between spring flood events.

Water withdrawals from area lakes and reservoirs may result in impacts to winter fish habitat quality and quantity. Temporary water use permits regulate the amount of water that can be extracted from water sources such that they sufficiently recharge before additional use. Other impacts of water withdrawal may include changes in the quality of water in fish overwintering habitats (Water Quality and Chemistry in Section 5.3 of this ROD). The exposure of the liquid water to the air through a hole in the ice could have a beneficial impact on water quality by allowing increased oxygen exchange. While fish and invertebrates could be killed or injured by water withdrawal processes, the applicant has proposed use of screens and other measures to avoid impacts related to entrapment, entrainment, and injury. Impacts to aquatic food webs from water withdrawals are anticipated to be moderate and medium term.

The construction and operation of the barge offloading facilities and emergency boat launch could have minor impacts on marine habitat, fish, and invertebrates. The applicant proposes to minimize impacts to fish by conducting most construction and dredging activities in the winter when fish would

not be present in the nearshore zone in the bottom-fast ice. Despite this measure, dredging and screeding would result in the mortality of invertebrates overwintering in the affected substrate. Fish and invertebrate habitat down-current of the dredged material disposal site would experience impacts if increased sedimentation from dredged material runoff occurs. Dredged sediments would be similar to that of the nearshore environment in the dredged material disposal area and are anticipated to have a minor impact.

Barge operations, including the construction of a temporary barge bridge, would have temporary impacts on aquatic food webs. Impacts to fish passage are unlikely as gaps would exist between barges and between the first barge and the shore. Observation of fish movement around marine infrastructure elsewhere on the North Slope suggests that fish effectively move around man-made objects over twice the length of the proposed barge bridge.

Barge and vessel traffic would disturb fish and invertebrates through noise and prop wash. Most impacts related to vessel traffic would be limited to the immediate area surrounding the service pier and sealift bulkhead, however impacts in the barge transit corridor would affect a more extensive area. The release of ballast water could also introduce non-native invertebrate species to the marine waters of the project area. However, most potential non-native species would be unlikely to survive and proliferate in the harsh environment of the study area. Impacts due to barge traffic would be minor. Pile driving (used to install mooring dolphins, service pier pilings, bulkhead sheet piles, and bridge sheet piles) and blasting (used to excavate the mine) activities would result in temporary impacts to fish and invertebrates. Pile driving and blasting have been documented to cause hearing loss, mask biologically important sounds, increase stress levels, impact immune systems, and kill fish, larvae, and eggs. To minimize impacts, the applicant has proposed to conduct most pile driving and blasting during the winter when few fish would be located in frozen nearshore and freshwater impact areas. If fish were found to be present, ADF&G permit stipulations regarding blasting near anadromous streams would limit impacts.

Actions Taken to Minimize Impacts

Details regarding all mitigation measures proposed by the applicant and considered by the Corps to minimize impacts on aquatic organisms are detailed in Final EIS Section 5.12.7, Fish, Essential Fish Habitat, and Invertebrates- Mitigative Measures. The applicant has proposed numerous measures as part of the project design to avoid or minimize impacts on aquatic ecosystems. These primarily include measures to minimize impacts on area hydrology, water quality, and coastal processes as well as impacts specific to minimizing impacts on fish and fish habitats. In addition, BMPs and permits from ADNR, ADF&G, and the NSB also address impacts to fish and fish passage.

As part of its determination of the LEDPA, the Corps would require additional avoidance and minimization measures. These include measures developed through consultation with NMFS as required under the Magnuson-Stevens Fishery Conservation and Management Act. These measures are described in Section 7.3 of this ROD. In addition, the Corps will also require additional mitigation measures to compensate for unavoidable wetland impacts. These measures are described in Section 7.2 of this ROD. The Corps found that none of the impacts identified would cause or contribute to significant degradation of WOUS.

Threatened and Endangered Species (40 CFR 230.30)

An endangered species is a plant or animal in danger of extinction throughout all or a significant portion of its range. A threatened species is one in danger of becoming an endangered species in the foreseeable future throughout all or a significant portion of its range. Threatened and endangered species that may be affected by the proposed project are described in Sections 3.9, Birds, and 3.11, Marine Mammals of the Final EIS.

Birds

Coastally located project infrastructure and marine traffic could present collision hazards, especially for spring and fall migrating Steller's eiders. However, the project area is generally east of Steller's eiders distribution in Alaska. Steller's eiders are rare in the Point Thomson study area and are

unlikely to occur near the proposed project or in the vicinity of barge traffic. The applicant's proposed project would potentially affect less than one Steller's eider. As a result, impacts are expected to be negligible.

Spectacled eiders may occur near the proposed Central Pad, West Pad, East Pad, or in the vicinity of barge traffic between Prudhoe Bay and Central Pad, but they are unlikely to be abundant. Impacts to spectacled eiders may result from the creation of collision hazards with project infrastructure and traffic; habitat loss and alteration for nesting and brood-rearing birds; and disturbance to nesting and brood-rearing birds from air and vehicle traffic. One spectacled eider was documented within 0.5-mile of proposed gravel infrastructure during 2001 near the West Pad and a few spectacled eiders are likely to nest in the study area. Based on nesting, breeding, and post-nesting abundance, the impacts of proposed project would affect up to five spectacled eiders. Because few spectacled eiders are likely to occur in the study area, potential effects of the proposed project on threatened spectacled eiders would be minor.¹⁰²

Yellow-billed loons, a candidate species for federal ESA listing, may occur near the Central Pad, East Pad, and in the vicinity of barge routes, but they are unlikely to be abundant. Impacts to yellow-billed loons would occur as a result of temporary disturbance and collision hazards created by project infrastructure. Foraging yellow-billed loons are likely to be present along the shoreline or in the lagoon near the Central Pad, East Pad, and along the barge route between West Dock and the Central Pad. Three yellow-billed loon sightings have been documented within 0.5-mile of proposed gravel infrastructure. Estimated habitat alteration and disturbance would impact less than one yellow-billed loon. Collision hazards resulting from project infrastructure exist due to the coastal location of infrastructure associated with the CPF. Because few yellow-billed loons are likely to nest near project facilities, the potential effects of the proposed projects components on yellow-billed loons would be minor.

Marine Mammals

Bowhead whales would be impacted by barging as a result of vessel noise, the potential for vessel-marine mammal collisions, and by barge facility construction-related noise. Water disturbance caused by ships towing or pushing objects can create strong underwater sound at frequencies audible to cetaceans underwater, which could alter whale behavior. However, barge facility construction and barging would occur in areas and during periods of relatively low bowhead densities in the study area. Most activities associated with the construction of barge facilities, including dredging and pile driving, are scheduled to occur during the winter, when bowhead whale are not expected to be in the project area.

During the early portion of the barging season, most bowhead whales are foraging east or northeast of the study area. Bowhead whales are most likely to pass through the study area later in the late summer and fall, during which time barging would be restricted by the AEWC's Open Water Season CAA to avoid potential conflicts with bowhead subsistence hunts. The applicant has committed to using marine mammal observers on barges in arctic and subarctic waters to spot marine mammals and direct the vessel captain to make speed and course corrections to avoid collisions with animals. Bowhead whales may also experience minor disturbance as a result of aircraft operations. Overall, impacts to bowhead are anticipated to be minor and temporary.¹⁰³

Impacts to polar bears under all action alternatives include the long-term loss or alteration of designated polar bear critical habitat as a result of project infrastructure. Construction of project infrastructure (i.e., gravel roads, airstrip, and pads and ice roads) would have long-term (lasting longer than five denning seasons) impacts to polar bears by incrementally decreasing available denning critical habitat (see Table 5.17). In addition to habitat loss, polar bears would experience

¹⁰² See Table 5.9-1 of the Final EIS for further discussion on the methodology of the bird impact assessment. Section 5.9.3 of the Final EIS provides thorough discussion of impacts to birds that may occur as a result of the applicant's proposed project.

¹⁰³ See Table 5.11-1 of the Final EIS for further discussion on the methodology of the marine mammal impact assessment. Section 5.11.3 of the Final EIS provides thorough discussion of impacts to marine mammals that may occur as a result of the applicant's proposed project.

habitat alternations as a result of disturbance from barge facility construction (including pile driving), and barging operations, vehicle and equipment use, and noise from aircraft overflights.

Table 5.17: Polar Bear Habitat Lost or Disturbed by Action Alternative	
Structures/Roads	Acres Impacted
Loss: Designated polar bear critical habitat from construction of gravel and ice project features (acres)	1,363
Altered Habitat: Disturbance area around roads and facilities (820-foot buffer) (acres)	28,311
Altered Habitat: Flight path from Deadhorse (1,320-foot buffer) (acres)	17,312
Total Lost and Altered Habitat (acres)	46,985

While adverse effects may occur, according to USFWS they are not expected to substantially impact the conservation role of the Terrestrial Denning Unit because: 1) they expect development in areas where topographic relief produces optimal denning habitat, such as river and coastal bluffs to be very limited; 2) terms and conditions associated with authorizations under the MMPA, and measures in the PTP Polar Bear and Wildlife Interaction plan would minimize the level of persistent disturbance that may result from the Action; and 3) the scale of the potentially affected area would be small relative to the extent of the Terrestrial Denning Unit such that the function of the unit as a whole would not be compromised.

Impacts to ringed seals include the temporary alteration and fragmentation of winter ice habitat as a result of near coast ice road construction. Ice road construction occurs on grounded ice, and would be unlikely to impact ringed seals, which rarely inhabit grounded ice. Disturbance may occur as a result of noise from aircraft overflight, ice road construction, vehicles and equipment, drilling, and human activity. Disturbance and habitat fragmentation from barge facility construction (including noise from pile driving), and barging operations could also occur. Impacts to ringed seals are anticipated to be minor and temporary.

Impacts to bearded seals may occur as a result of disturbance from aircraft overflight noise. Barge noise may also cause additional disturbance. However, bearded seals occur in smaller number in the study area than ringed seals. They generally occur only in summer, offshore and beyond the barrier islands, and in unstable, broken sea ice. As most construction activities that might impact seals occur during the winter, impacts to bearded seals are unlikely. Impacts to bearded seals are anticipated to be minor and temporary.

Actions Taken to Minimize Impacts

Details regarding all mitigation measures proposed by the applicant and considered by the Corps to minimize impacts on other wildlife are detailed in Final EIS Section 5.9.7, Birds- Mitigative Measures, and Section 5.11.7, Marine Mammals- Mitigative Measures.

The applicant has proposed numerous measures as part of the project design to avoid or minimize impacts on threatened and endangered species. Measures proposed to minimize impacts on waterbirds, including threatened and endangered species that occur in the project area, include designing facilities to minimize the potential for bird strikes, implementation of controls to minimize nesting opportunities for predatory and nuisance birds, installing mooring dolphins and offshore service piles through ice in winter to minimize disturbance to birds. In addition, the applicant proposes to rehabilitate the gravel mine site to enhance habitat for waterfowl, and monitor water withdrawals and employ operational controls for area lakes.

Measures proposed to mitigate impacts to marine mammals include minimization of offshore infrastructure, installation of mooring dolphins and offshore service piles through ice in winter to minimize disturbance to marine mammals, use of Marine Mammals Observers to avoid marine mammal collisions, planning of sealift barging to be completed prior to the main fall bowhead whale migration and routing coastal barges inside the barrier islands. Additional measures proposed to minimize impacts on polar bears include updating and implementing the project's *Polar Bear and*

Wildlife Interaction Plan with detailed measures to avoid adverse encounters with wildlife, conducting surveys for maternal polar bear dens along ice road routes and closing and rerouting ice roads if an active polar bear den is discovered. The applicant proposes to monitor polar bear activity in the project area using bear monitors and deterring bears from project activities as necessary using USFWS approved deterrent methods.

Impacts to threatened and endangered species would also be avoided or minimized by BMPs and permit requirements. These include North Slope area-wide lease sale mitigation measures related to birds, and federal laws, including the Migratory Bird Treaty Act (MBTA) and MMPA.

As part of its determination of the LEDPA, the Corps would require avoidance and minimization measures. These include measures developed through consultation with NMFS and USFWS. These measures include those developed based on the USFWS' Biological Opinion and NMFS' letter of concurrence. Additional avoidance and minimization measures are described in Section 7.3 of this ROD. In addition, the Corps will also require additional mitigation measures to compensate for unavoidable wetland impacts. These measures are described in Section 7.2 of this ROD.

Other Wildlife (40 CFR 230.32)

Wildlife associated with aquatic ecosystems includes resident and transient mammals and birds. Sections 3.9, Birds; 3.10, Terrestrial Mammals; and 3.11, Marine Mammals of the Final EIS describe other wildlife present in the PTP area. Sections 5.9, Birds; 5.10, Terrestrial Mammals; and 5.11, Marine Mammals of the Final EIS details anticipated impacts to wildlife.

Birds

The proposed project would affect birds, bird behavior, and their nesting, brood-rearing, foraging, and molting habitats through habitat loss, alternation, and disturbance; habitat fragmentation; vehicle or infrastructure collision mortality; altered survival or productivity; and exposure to spills or leaks of toxic materials.

Impacts to birds as a result of habitat loss and alternation would be minor. Habitat loss and alternation would occur as a result of gravel extraction, placement of gravel fill, construction of the barge facilities, disposal of dredged material, and construction of ice roads. Altered sites would be used by some birds. Habitat loss and alternation would have the greatest impact to nesting songbirds and shorebirds.

Boat and air traffic disturbance would cause minor impacts to birds and would displace birds from bird habitats. Sources of disturbance would include noise and activity related to project construction, vessel traffic in nearshore and offshore habitats, air traffic, and vehicle traffic. These impacts would only occur when project activities overlap with bird presence at Point Thomson. As a result, impacts related to construction in particular will be minimized as most construction activity is planned for winter months. Disturbance from barges, aircraft, and vehicles would likely effect birds in both nesting and post-breeding stages.

Impacts to birds related to altered survival or increased mortality are anticipated to be minor and limited in geographic extent. Bird collision with vehicles and infrastructure (particularly towers, the drilling rig, and the flare stack) by large flocks during spring and fall migration is possible. Disturbance could lead to nest abandonment or facilitate predation when nesting adults abandon nests or when flushing birds attract predators to the nest. Increased local abundance of predators, such as ravens, gulls, foxes, and weasels, may result from the production of food waste at the Central Pad and the creation of predator perching habitat in the form of project infrastructure.

Terrestrial Mammals

The proposed project would impact terrestrial mammals as a result of loss and alternation of habitat, habitat fragmentation, disturbance, altered survival or productivity, and increased mortality. Impacts related to habitat loss are minor due to the abundance of like habitat. Habitat loss would occur within the footprint of gravel fill placement while habitat alternation would occur adjacent to gravel fill where habitats are altered by dust and snow accumulation, and changes in hydrology.

Habitat fragmentation would occur where project infrastructure, including pipelines and gravel roads are constructed, which would alter movement of caribou through the project area.

Noise and disturbance would cause minor impacts to terrestrial mammals and would displace terrestrial mammals from their habitats. Sources of noise and activity disturbance are related to project construction, air traffic, and vehicle traffic. Project activities would disturb terrestrial mammals if they cause a change in behavior or stress in the animals. Some project activities would cause animals to avoid an area or be completely displaced from an area such that they would not return. Disturbance impacts for calving caribou, brown bear, arctic fox, arctic fox dens and muskoxen would be minor due to the abundance of like habitat in the area.

Additional impacts to terrestrial mammals may occur as a result of increased mortality and altered survival. Increased mortality may occur through collisions with vehicles, burial of den sites by ice or gravel roads, or in defense of human life. Altered survival may occur through displacement from preferred habitat, access to food wastes, or the creation of denning habitat for predators.

Marine Mammals

Impacts to bowhead whales, ringed seals, bearded seals, and polar bears are discussed in Threatened and Endangered Species (40 CFR 230.30) in Section 5.3 of this ROD. Other marine mammals that may occur in the project area include beluga whales, gray whales, and spotted seals. Impacts to these cetaceans and pinnipeds are anticipated to be similar to impacts described for threatened and endangered cetaceans and pinniped species. Overall, the infrastructure and activities proposed would result in minor habitat loss and disturbance effects on marine mammals and their habitats.

Actions Taken to Minimize Impacts

Details regarding all mitigation measures proposed by the applicant and considered by the Corps to minimize impacts on other wildlife are detailed in Final EIS Section 5.9.7, Birds- Mitigative Measures, and Section 5.11.7, Marine Mammals- Mitigative Measures. Applicant proposed measures to avoid or minimize impacts to other wildlife are similar to those described for threatened or endangered species in the project area (See Threatened and Endangered Species in Section 5.3 of this ROD). These primarily include measures to minimize loss of habitat; disturbance; and barriers to wildlife movement. In addition, BMPs and permits from ADNR, ADF&G, and the NSB also address minimization of impacts to wildlife.

As part of its determination of the LEDPA, the Corps would require additional mitigation measures to further minimize impacts. These conditions are described in Section 7.3 of this ROD. The Corps would require additional mitigation measures to compensate for unavoidable wetland impacts. These measures are described in Section 7.2 of this ROD.

Impacts on Special Aquatic Sites

Special aquatic sites are areas which possess special ecological characteristics of productivity, habitat, wildlife protection, or other important and easily disrupted ecological values. These areas are generally recognized as significantly influencing or positively contributing to the general overall environmental health or vitality of the entire ecosystem of a region.¹⁰⁴

Sanctuaries and Refuges (40 CFR 230.40)

Sanctuaries and refuges consist of areas designated under State or Federal laws or local ordinances to be managed principally for the preservation and use of fish and wildlife resources. Section 3.14, Arctic Refuge of the Final EIS, discusses the only sanctuary in proximity to the project area. Sections 5.14, Arctic Refuge of the Final EIS details anticipated impacts to the ANWR. Impacts to the ANWR would occur as a result of impacts to wildlife populations, hydrocarbon resources, subsistence and traditional land use, recreation, wilderness qualities and values, and scientific research.

¹⁰⁴ See 40 CFR 230.10(a)(3)

Impacts to wildlife populations in the ANWR are anticipated to no more than minimal. Impacts would occur as oil and gas development beyond the ANWR's borders affects movements and behaviors of wildlife that use ANWR lands or if human recreational use patterns shift. No impacts to the aquatic food web of the ANWR are anticipated.

Indirect permanent impacts to subsistence and traditional land use activities in the ANWR are anticipated to be minor based on direct impacts from proposed project. Impacts would occur through displacement of hunting from the coast near Point Thomson, potentially increasing hunting activities and pressure on wildlife populations within the ANWR.

Indirect permanent impacts to recreation are anticipated to be minor based on direct impacts from proposed project. The impacts are primarily based on the potential for displacement of a portion of recreationists outside the project area, specifically from the Canning River to other areas which could prompt a management response related to ANWR recreation. Visual or noise impacts that would affect the backcountry or wilderness qualities of the recreation experience would apply only in the far northwest corner of the ANWR.

Wetlands (40 CFR 230.41)

Wetlands consist of areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Section 3.8, Vegetation and Wetlands of the Final EIS and Appendices J, Mapped Land Cover and Wetlands, and K, Wetland Functional Assessment of the Final EIS, discuss the prevalence and location of wetlands in the project area.

Sections 5.8, Vegetation and Wetlands of the Final EIS details anticipated impacts to wetlands in the project area. The proposed project would result in direct and indirect long-term impact to wetlands through the placement of gravel fill, excavation of gravel from the proposed mine site; indirect modification of wetlands adjacent to gravel fill; and loss and alternation of wetland functions performed. Impacts would be permanent and temporary.

The excavation and placement of gravel fill would directly cover and kill tundra vegetation. Direct impacts from excavation and fill would be permanent as restoration and revegetation of wetland plant communities on the North Slope is a slow and gradual process and may not be possible for all habitat types. The proposed project would result in the direct loss of 267.1 acres of WOUS, including wetlands. Table 5.18 details direct impacts of fill by vegetation and wetland type.

Table 5.18: Estimated Fill Footprint by Vegetation Type		
Vegetation Type	Cowardin Classification	Footprint of Fill (Acres)
Ia: Water (ponds, lakes, rivers, streams, saltwater)	E1UBL, R1UBV, R2UBH, R3UBH, L1UBH, L2UBH, PUBH	12.46
IIb: Aquatic Graminoid Tundra (permanently flooded emergent marshes)	L2EM2H, PEM1H	0.06
IIId: Water/Tundra Complex (interconnected ponds with emergent vegetation)	L2UB/EM2H, PUB/EM2H	< 0.1
IIIa: Wet Sedge Tundra	PEM1B, PEM1E, PEM1H, PEM1F	9.33
IIIb: Wet Graminoid Tundra (wet saline tundra, saltmarsh)	E2EM1N, E2EM1P	1.68
IIIc: Wet Sedge Tundra/Water Complex (interconnected ponds with no emergent vegetation)	L2EM2/UBH, PEM1/UBH	< 0.1
IIId: Wet Sedge/Moist Sedge, Dwarf Shrub Tundra Complex (wet patterned ground complex)	PSS/EM1B, PEM1B, PEM1E, PEM1H, PEM1F	80.95
IIIe: Wet Graminoid, Dwarf Shrub Tundra/Barren Complex (frost-scar tundra complex)	PSS/EM1B, PEM1B, PEM1E, PEM1H, PEM1F	3.33
IVa: Moist Sedge, Dwarf Shrub/Wet Graminoid Complex (moist patterned ground complex)	PSS/EM1B, PEM1B, PEM1E, PEM1H, PEM1F	56.45
Va: Moist Sedge, Dwarf Shrub Tundra	PSS/EM1B	72.95
Vc: Dry Dwarf Shrub, Crustose Lichen Tundra (Dryas tundra, pingos)	PEM1B, PEM1E, PEM1H, PEM1F	4.62
Vd: Dry Dwarf Shrub, Fruiticose Lichens	PEM1B, PEM1E, PEM1H, PEM1F	< 0.1
Ve: Moist Graminoid, Dwarf Shrub Tundra/Barren Complex (frost-scar tundra complex)	PSS/EM1B	15.93
IXb: Dry Barren/Dwarf Shrub, Forb Grass Complex (forb-rich river bars)	PSS/EM1A	<0.1
IXc: Dry Barren/Forb Complex (river bars in active channels)	PEM1/USD	< 0.1
IXi: Dry Barren/Forb, Graminoid Complex (saline coastal barrens)	PSS/EM1B	3.46
Xa: River Gravels	R2USC, R3USC	1.00
XIa: Wet Mud	L2USD, PUSD	2.34
Total		264.64^a

^a This analysis does not include any fill in navigable waters of the U.S.

Indirect impacts to wetlands adjacent to gravel fill would occur as a result of dust deposition, gravel spray, altered snow distribution, hydrological impoundments, and thermokarst effects. Adjacent impacts include variable effects such as the elimination or reduction of vegetation due to burial; earlier snowmelt and green-up of plants due to lower albedo of snow surface; changes in vegetation composition; delayed plant growth; changes in soil moisture and nutrient levels; increase in thaw depth; thermokarst; and thermo-erosion. Dust and gravel spray would impact wetlands and vegetation within 35 feet of gravel infrastructure. These indirect impacts are anticipated to impact approximately 1013.6 additional acres of WOUS.

Impacts from the placement of fill or dredged material disposal and VSM placement would be permanent. The total acreage of wetlands impacted by VSM placement would be less than one acre. The site proposed for dredged material disposal is a saline coastal marsh. The footprint of the dredged material disposal area would be 1.4 acres. The dredged material would have

secondary impacts on adjacent wetlands through increased sedimentation leading to decreased plant vitality from dust deposition on the leaves of individual plants, plant mortality from physical burial, or alteration of the vegetation community currently present.

The construction of ice infrastructure would disturb wetlands and vegetation. When compared to the placement of gravel fill, seasonal ice infrastructure has less of an impact to tundra vegetation communities; however seasonal ice infrastructure would still cause disturbance such as delayed plant development (phenology), plant stress, freezing of plant tissues, and physical damage resulting in “traces” or “brown trails” on the tundra surface. The degree of impact and recovery period needed following the construction of an ice road depends on the vegetation community type impacted, with less impact occurring from winter ice roads constructed on wetter vegetation types. The construction of seasonal ice infrastructure would impact approximately 1095.8 acres. These impacts are anticipated to be minor.

Other project activities, including water withdrawal, wastewater disposal, and trenching for power cable lines may impact wetlands and wetland vegetation through impacts to hydrology and substrate (see Water Circulation, Fluctuation, and Salinity Determinations and Physical Substrate Determinations in Section 5.3 of this ROD). Impacts to wetlands and vegetation as a result of these activities would be temporary.

Off-road tundra travel using tundra-safe vehicles would occur for regular and emergency maintenance of pipelines and other infrastructure. Off-road tundra travel would result in impacts to wetlands and vegetation ranging from light impacts such as compression, to more severe impacts such as vegetation displacement or removal. The degree of impacts generally depends on the vegetation type and the number of passes. Winter off-road tundra travel generally results in lower amounts of damage to tundra vegetation than summer travel. On lands owned by the State, permits must be acquired from the ADNR, Division of Mining, Land, and Water for any vehicle traveling on tundra during any season to minimize the effects to vegetation and wetlands. Impacts to wetlands and vegetation would be minor.

Mudflats (40 CFR 230.42)

Mudflats are broad flat areas along the sea coast and in coastal rivers to the head of tidal influence and in inland lakes, ponds, and riverine systems. The substrate of mudflats contains organic material and particles smaller in size than sand. They are either un-vegetated or vegetated only by algal mats. The prevalence and location of mudflats in the project area is also discussed in Section 3.8, Vegetation and Wetlands and Appendix J, Mapped Land Cover and Wetlands of the Final EIS.

Mudflats are not common in the project area and are primarily found near the mouths of the Sagavanirktok and Shaviovik Rivers. Mudflats were captured in vegetation mapping of the project area in the Wet Barren/Wet Graminoid Tundra Complex (barren/saline tundra complex/saltmarsh; vegetation class IXh) and River Gravels and Beaches (vegetation class Xa). Wet Barren/Wet Graminoid Tundra Complexes include Estuarine Intertidal, Regularly Flooded Mud Flats (NWI classes E2USN and E2USP) as the dominant cover present as large patches of wet mud interspersed among Emergent Intertidal (E2EM1P) saline tolerant plants. River Gravels and Beaches include Riverine, Seasonally Flooded Areas (NWI classes R2USC and R3USC) and Estuarine, Intertidal, Irregularly Flooded Areas (NWI class E2US1P). Mudflats captured by vegetation class Xa were identified by aerial interpretation and proximity to the coast and were distinguished from river gravels and beaches within this class.

No direct impacts to mudflats would occur as the result of the placement of the proposed gravel fill. Ice road infrastructure would have a larger footprint of overlap with mudflats in the project area, with the potential to overlay approximately 27 acres depending on the ice road route selected. This overlap is unlikely to create any measurable impacts on the structure and function of mudflats in the project area. Ice road construction and operation would occur during the winter, when the mudflat substrate, freshwater, and nearshore marine waters are generally frozen. Ice roads would be slotted prior to breakup to allow normal water drainage to occur. Ice road infrastructure would have little to no impact on biota in mudflats in the project area.

Vegetated Shallows (40 CFR 230.43)

Vegetated shallows are permanently inundated areas that under normal circumstances support communities of rooted aquatic vegetation, such as turtle grass and eel grass in estuarine or marine systems as well as a number of freshwater species in rivers and lakes. Vegetated shallows do not exist in the project area.

Coral Reefs (40 CFR 230.44)

Coral reefs consist of the skeletal deposit, usually of calcareous or siliceous materials, produced by the vital activities of anthozoan polyps or other invertebrate organisms present in growing portions of a reef. Corals are rare in the Alaskan Beaufort Sea due to the lack of hard rock substrates needed for attachment. The Alaskan Beaufort Sea shelf is blanketed predominantly by silty sands and muds.¹⁰⁵

A small population of corals exists, however, in the Boulder Patch, an unusual Beaufort Sea ecosystem offshore of the Endicott causeway in Stefansson Sound. The Boulder Patch is not within the immediate vicinity of Point Thomson, but is considered within the project area as it may be traversed by coastal barges transporting goods and materials from Deadhorse to Point Thomson.¹⁰⁶

The Boulder Patch has been extensively studied for potential impacts related to the oil and gas development at Endicott, located in the immediate vicinity of the Boulder Patch. No adverse effects have been detected on the community health or diversity¹⁰⁷ as a result of the Endicott project and no impacts are anticipated as a result of the relatively minor amount of coastal barge activity that would occur in support of the proposed project.

Riffle and Pool Complexes (40 CFR 230.45)

Riffle and pool complexes are steep gradient sections of streams are sometimes characterized by riffle and pool complexes. Such stream sections are recognizable by their hydraulic characteristics. There are no riffle and pool complexes identified in the project area at this time.

Actions Taken to Minimize Impacts

Details regarding all mitigation measures proposed by the applicant and considered by the Corps to minimize impacts on special aquatic sites are detailed in Final EIS Section 5.14.4, Arctic National Wildlife Refuge- Mitigative Measures, and Section 5.8.7, Vegetation and Wetlands- Mitigative Measures.

The applicant has proposed numerous measures as part of the project design to avoid or minimize impacts on to special aquatic sites. Measures proposed to minimize impacts on the ANWR include those discussed to minimize impacts on wildlife, recreation, aesthetics; and subsistence and traditional land use (See Other Wildlife and Impacts on Human Use Characteristics in Section 5.3 of this ROD).

Applicant proposed measures to avoid or minimize impacts on wetlands and mudflats in the project area include minimization of the footprint of gravel excavation and fill through use of existing fill; optimization of the proposed project design and equipment layout; use of a temporary barge bridge to avoid placement of fill for a barge offloading dock; and optimization of gravel road layouts to balance overall gravel fill footprint with avoidance of impacts to high value wetlands and the need

¹⁰⁵ K.H. Dunton, E. Reimnitz, and S. Schonberg, "An Arctic Kelp Community in the Alaskan Beaufort Sea." *Arctic*: 35, no. 4: 465-484 (1982).

¹⁰⁶ ExxonMobil, "Project Update: February 11, 2011," (Anchorage, 2011).

¹⁰⁷ L.R. Martin and B.J. Gallaway, "The Effects of the Endicott Development Project on the Boulder Patch, and Arctic Kelp Community in Stefansson Sound, Alaska." *Arctic*: 47, no 1: 54-64, (1994)

for stream crossings. Use of ice roads and pads during construction of the pipeline and for operations in some areas during winter months minimize permanent impacts to wetlands.

The applicant proposes to minimize impacts of ice infrastructure by routing ice roads to avoid tussock tundra areas, steep stream banks, and deep water holes by varying road routes and locations year to year. Impacts related to water discharge would be minimized by directing treated discharge water toward a natural drainage gradient to minimize near-surface soil warming and surface water ponding. Volume and rate of discharges would be controlled to avoid erosion of tundra or tundra vegetation. The applicant proposes to strictly enforce training, driving, road maintenance, and equipment operation protocols among all employees to avoid direct, indirect, or other incidental impacts to the tundra.

Impacts to special aquatic sites would be avoided or minimized by implementation of BMPs and permit requirements. These include management for dust control, erosion, equipment operation and staging, and management of invasive species. Specific BMP's, and Corps, ADNR, and NSB permit requirements, address construction of ice roads, water withdrawals, and tundra travel. For example, water sources must be permitted by ADNR for water withdrawal and must recharge sufficiently during the summer for the same water source to be used again the following winter. Similarly, permit requirements pertaining to ice road construction and use of tundra travel vehicles include stipulations to minimize potential impacts.

As part of its determination of the LEDPA, the Corps would also require additional mitigation measures to further minimize impacts. These conditions are described in Section 7.3 of this ROD.

The applicant would also compensate for all remaining unavoidable and otherwise unmitigated losses to WOUS in the form of payment to an authorized in-lieu-fee program for permanent conservancy or preservation of comparable lands in accordance with Corps requirements (see Section 7.2 of this ROD).

Proposed Disposal Site Determination (40 CFR 230.11 (f))

The proposed disposal sites for dredged and fill materials are described in detail in Section 2.3, Alternatives Descriptions of the Final EIS and the applicant's Final DA Permit Application.¹⁰⁸ As part of the applicant's proposed project, fill materials would be placed for the construction of project components and facilities including gravel infrastructure for roads, pads, and airstrips; gravel infrastructure for export and gathering pipeline supports; bridges and culverts associated with the gravel roads, and the emergency boat ramp facility. In addition to these project components, the proposed project would include the placement of fill for the construction of the barge offloading facilities and the disposal of dredged materials from the barge offloading area. The location of the proposed disposal sites for all action alternatives can be seen in Figures 2.4-5 and 2.4-6 of the Final EIS.

Mixing Zone Determination

The Guidelines state that the mixing zone associated with each specified disposal site shall be confined to the smallest practicable area consistent with the type of discharge dispersion being used. There are no open water disposal sites associated with this proposed project.

Determination of Compliance with Applicable Water Quality Standards

The project would not exceed current applicable water quality standards for the State of Alaska.¹⁰⁹

Impacts on Human Use Characteristics

Human use characteristics include the availability and quality of municipal and private water supplies; recreational and commercial harvest of fish, invertebrates, and other aquatic organisms; water related

¹⁰⁸ ExxonMobil, "Point Thomson Project Draft Department of the Army Application for Permit," (Anchorage, 2011).

¹⁰⁹ See Section 401 Water Quality Certification issues by the ADEC, dated September 13, 2012

recreation; aesthetics associated with the aquatic ecosystem; and existing parks, monuments, seashores, wilderness areas, research sites, and preserves.

Municipal and Private Water Supplies (40 CFR 230.50)

Municipal and private water supplies consist of surface or ground water that is directed to the intake of a municipal or private water supply system. There are no municipal or private water supplies in the project area at this time. However, under the development of the proposed project, the C-1 reservoir would be used as a potable water source during project construction and operations. The gravel mine, developed during construction, would serve as a secondary water source following the rehabilitation of the site.

The use of the C-1 reservoir as a water source, existing water quality in the project area, and potential impacts to water quality from the PTP are discussed in Final EIS Sections 2.4, Alternative Descriptions; 3.7, Water Quality; and 5.7 Water Quality. Water quality is also discussed in Water Quality and Chemistry in Section 5.3 of this ROD. The development of the PTP would not impact water quality in the C-1 reservoir.

Recreational and Commercial Fishing (40 CFR 230.51)

Recreational and commercial fisheries consist of harvestable fish, crustaceans, shellfish, and other aquatic organisms used by man. The aquatic ecosystem in the project area supports human use through commercial and recreational fishing, including recreational fishing by non-local residents and subsistence fishing by local residents. Subsistence fishing by local residents is the most common consumptive use of the aquatic resources. Final EIS Sections 3.11, Marine Mammals; 3.12, Fish, Essential Fish Habitat, and Invertebrates; 3.18, Recreation; and 3.22 Subsistence and Traditional Land Use discusses the availability and harvest of marine mammals and fish in the project area. Final EIS Sections 5.11, Marine Mammals; 5.12, Fish, Essential Fish Habitat, and Invertebrates, 5.18, Recreation; and 5.22 Subsistence and Traditional Land Use discuss the potential impacts of the proposed project on fish, fish habitats, invertebrates, marine mammals, and consumptive use of these aquatic organisms through recreational and subsistence fishing.

Impacts to commercial and recreational fishing would occur as a result of impacts to fish, invertebrates, or marine mammal populations or as a result of changes in human use of the project area. Impacts to fish, invertebrates, and marine mammals are discussed in Aquatic Food Web and Other Wildlife in Section 5.3 of this ROD.

Impacts to subsistence fish harvest by local residents would occur as result of changes in subsistence use areas and user access for the community of Kaktovik and resource availability for the community of Nuiqsut. While fish, including Dolly Varden, whitefish, and arctic cisco contribute highly to material and cultural importance of both of these communities, impacts to fish harvesting activities would be minor. Zero percent of Nuiqsut harvesters and only 8 percent of Kaktovik harvesters, report fishing in the vicinity of the project.

Commercial fishing in the NSB is limited. In 2010, five NSB residents held commercial fishing permits to harvest arctic cisco in the Colville River. While the Colville River is located west of the proposed project area, arctic cisco harvested in the Colville River use the project area as feeding, rearing, and migration habitat as they travel from Canadian spawning grounds to overwintering habitat in the Colville River. As discussed in Aquatic Food Web in Section 5.3 of this ROD, impacts resulting from the construction and use of the barge offloading facilities and barge traffic would be minor.

Non-local resident recreational fishing in the project area is focused on fish populations in the Canning River drainage. The proposed project would not affect fish and fish habitat of the ANWR. However, the development of the proposed project in close proximity to the Canning River and the ANWR, may alter overall recreational experience along the Canning River. As most non-local recreationalists do not travel to the Canning River specifically to fish, but participate in recreational fishing while in the area, recreational fishing would decrease if recreational visitation to the area decreases. Impacts to recreational use of the project area are further discussed in Water-Related Recreation in Section 5.3 of this ROD.

Water-Related Recreation (40 CFR 230.52)

Water-related recreation encompasses activities undertaken for amusement and relaxation. Activities encompass two broad categories of use: consumptive, e.g., harvesting resources by hunting and fishing; and non-consumptive, e.g., canoeing and site seeing. Key water-related recreation areas in the proposed project area include the Canning River and the Beaufort Sea Coastline. The Canning River, which forms the boundary between state land and the ANWR, is primarily used by non-resident river floaters and float hunters. The coastal waters of the Beaufort Sea are primarily used by local residents traveling by boat for subsistence hunting and fishing but also sees occasional use by non-resident kayakers and by ice-breaker cruise boats. All water-related recreation is infrequent, and limited to a small number of users. Final EIS Sections 3.18, Recreation and 3.22, Subsistence and Traditional Land Use describe water-related recreation in the project area.

Impacts on water-related recreation in the project area are detailed in Final EIS Sections 5.18, Recreation and 5.22, Subsistence and Traditional Land Use. Impacts on water-related recreation would occur as a result of reduction of land area and shoreline available for recreation and public use; avoidance of recreational activities in the project area because of proximity to project features; changes in recreational experience related to changes in the visual and audible environment in the project area; and changes in wildlife movement that effect hunting and wildlife viewing. Though the impacts to an individual user would be major, overall impacts would be minor due to the low levels of recreational use in the coastal and Canning River corridors.

Impacts to recreation would result in changes to user access and resource availability for resident subsistence and traditional land use activities. These impacts are anticipated to be minor. See Recreational and Commercial Fishing in Section 5.3 of this ROD.

Aesthetics (40 CFR 230.53)

Aesthetics associated with the aquatic ecosystem consist of the perception of beauty by one or a combination of the senses of sight, hearing, touch, and smell. Aesthetics of aquatic ecosystems apply to the quality of life enjoyed by the general public and property owners. Final EIS Sections 3.18, Recreation; 3.19, Visual Aesthetics; and 3.20, Noise discusses the existing aesthetics of the project area. Final EIS Sections 5.19, Visual Aesthetics and 5.20, Noise describe impacts on aesthetics in the project area.

Impacts to visual aesthetics would occur as a result of the placement of fill for project infrastructure. The fill would change the natural appearance of the existing undeveloped PTP area to one of an industrial development area. Highly visible project infrastructure includes infrastructure that would be located on site during project construction (i.e. drilling rig and temporary communications towers) and infrastructure that would be located on site for the duration of the project (i.e. permanent communications towers, facility modules, and pipelines). Most of the visual aesthetics study area is located on state land designated as low and medium visual sensitivity areas. A small portion of the visual aesthetics study area is located within the ANWR, designated as a high sensitivity area.

Impacts to the audible environment of the project area would occur during construction due to: barge operations, fixed-wing airplane and helicopter flights, blasting, road, airstrip, gravel mine, and pipeline construction. Project-related noise impacts would be greater during the winter than during the summer. Noise from construction would dominate the ambient landscape in the immediate vicinity (within 0.5 miles) of its source and may be audible in nearby areas up to 8 miles away. Areas further away from construction activities (up to 19 to 20 miles away) would experience a slight increase in existing noise, which would be below the threshold of human perception. No increase in noise level would be expected at a distance more than 8 to 20 miles from the project area.

Overall, fill placement related to construction activities would have major but local impacts on area aesthetics.

Parks, National and Historical Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves (40 CFR 230.54)

Parks, national and historic monuments, national seashores, wilderness areas, research sites, and similar preserves consist of areas designated under Federal or State laws or local ordinances to be managed for their aesthetic, educational, historical, recreational, or scientific value. The only congressionally designated Wilderness area in proximity to the project area is the Molly Beattie Wilderness, located in the ANWR approximately 30 miles from the proposed project area at its closest point. The ANWR as a whole is discussed in Final EIS Section 3.14, Arctic Refuge, and in Sanctuaries and Refuges in Section 5.3 of this ROD.

Impacts to the ANWR in the project area are detailed in Final EIS Sections 5.14, Arctic Refuge. Because of its distance, impacts to the Molly Beattie Wilderness would be limited to visual resources. Past exploratory drilling operations at Point Thomson were relatively invisible at a distance of 20 miles away and would be even more difficult to see at 30 miles away, at the wilderness boundary. However, it is possible that areas within the wilderness boundary that have unobstructed views to the coast at Point Thomson would be affected by a direct view of lights from the project in dim and dark conditions. During the summer season, when visitors to the wilderness would be in the area, 24 hour daylight, atmospheric moisture, and fog or clouds would keep the project from being visible on most occasions. No visibility during daylight is expected anywhere within the wilderness boundary, unless there were perfect sun angles to cause a bright reflection or there was a large plume of dark smoke from an unusual flare event that called attention to the site. Overall these impacts are expected to be negligible.

Actions Taken to Minimize Impacts

Details regarding all mitigation measures proposed by the applicant and considered by the Corps to minimize impacts on human use characteristics are detailed in Final EIS Section 5.14, Arctic Refuge -Mitigative Measures; Section 5.18, Recreation-Mitigative Measures; Section 5.19, Visual Aesthetics-Mitigative Measures; Section 5.20, Noise-Mitigative Measures; Section 5.21, and Section 5.22 Subsistence and Traditional Land Use-Mitigative Measures.

The applicant has proposed numerous measures as part of the project design to avoid or minimize impacts on human use characteristics. A partial list of mitigation measures includes:

- Designing project features to minimize visual impact;
- Minimization of noise from construction and operations through use of silencers, low noise equipment, and noise enclosures;
- Implementation of aircraft flight path and height protocols to minimize noise and visual impacts on coastal areas;
- Consultation with subsistence users including employment of a subsistence representative, communication with Native Allotment owners/heirs;
- Implementation of applicable protective measures of the CAA with the AEWG and Kaktovik and Nuiqsut Whaling Captains' Associations including avoiding barge interference with bowhead whales during the fall migration subsistence hunts; and
- Developing protocols and supporting subsistence access to the project area including designing the PTEP to withstand accidental bullet strike and to facilitate continuation of current hunting patterns.

As part of its determination of the LEDPA, the Corps would require additional mitigation measures to further minimize impacts. These conditions are described in Section 7.3 of this ROD. The Corps would require additional mitigation measures to compensate for unavoidable wetland impacts. These measures are described in Section 7.2 of this ROD.

Determination of Cumulative Effects on the Aquatic Ecosystem (40 CFR 230.11 (g))

Cumulative impacts are the changes in an aquatic ecosystem that are attributable to the collective effect of a number of individual discharges of dredged or fill material. Although the impact of a particular discharge may constitute a minor change in itself, the cumulative effect of numerous such piecemeal changes can result in a major impairment of the water resources and interfere with the productivity and water quality of existing aquatic ecosystems. Cumulative effects attributable to the discharge of dredged and fill material in waters of the U.S. should be predicted to the extent reasonable and practicable.

Past and present actions in the project area that have affected the aquatic ecosystem include oil and gas exploration and development, roads, community development, military infrastructure, scientific research, and the release of air pollutants worldwide. Reasonably foreseeable future actions include additional oil and gas developments, additional transportation infrastructure; and continued use of the area for tourism, recreation, subsistence uses, and scientific research. Section 4.2, Cumulative Impacts Methodology of the Final EIS, details all past, present, and reasonably foreseeable future actions in the project area considered in the cumulative impacts analysis of the proposed project.

Sections 5.2, Soils and Permafrost; 5.5, Physical Oceanography and Coastal Processes, 5.6, Hydrology; 5.7, Water Quality; 5.8, Vegetation and Wetlands; 5.9, Birds; 5.11, Marine Mammals; and 5.12, Fish, Essential Fish Habitat, and Invertebrates of the Final EIS contain detailed analysis of potential cumulative impacts to the aquatic ecosystem from past, present, and reasonably foreseeable future actions that could result under all Final EIS alternatives.

In 2001, the North Slope of Alaska consisted of 19 producing fields with a network of 115 gravel drill sites, 20 pads with processing facilities, 91 exploration sites, 16 airstrips, 1,395 culverts, 596 miles of roads and permanent trails, 450 miles of pipeline corridors, and 219 miles of transmission lines.¹¹⁰ Gravel roads and pads covered more than 8,800 acres and gravel mines covered nearly 6,400 acres. Approximately 17,700 acres have been cumulatively affected from all past and present oil industry infrastructure on the North Slope.¹¹¹ Construction and use of infrastructure have resulted in impacts to aquatic ecosystems including changes in drainage patterns; loss of wetlands and other waterbodies; loss and alteration of wildlife habitat; disturbance of wildlife; and increased wildlife mortality. In terms of acres affected by direct impacts, construction causes more than 99 percent of the impacts to vegetation and wetlands, with spills having a very minor role.¹¹²

Despite these impacts, aquatic ecosystems and special aquatic sites are still abundant on the North Slope. Roughly 8 million of the over 12 million acres that make up the ACP have been identified as having wet tundra or moist tundra vegetation cover. The cumulative loss of bird habitat from all past and present projects on the North Slope have reduced available nesting habitat for all species, affecting an estimated 4 to 5 percent within the unitized lease sale areas but affecting less than 1 percent of North Slope bird breeding populations.

In the eastern portion of the North Slope past and present oil and gas development has been relatively limited. In 2001, approximately 398 acres of gravel infrastructure existed on the North Slope east of Foggy Island amounting to approximately 0.20 percent of the total area.¹¹³ Construction of the proposed project would result in an additional 267.1 acres of infrastructure, increasing the total developed area to approximately 0.33 percent.

Cumulative impacts to aquatic ecosystems as a result of the proposed project include incremental loss of wetlands and habitat, fragmentation of habitat, loss or degradation of wetland function, and increased potential for the introduction of invasive species. Fish and invertebrates would be impacted by additive impacts to water quality, disturbance, direct harvest or mortalities, degradation of fish and invertebrate

¹¹⁰ NRC, *Cumulative Environmental effects of oil and gas activities on Alaska's North Slope*, (Washington, D.C.: National Academies Press, 2003), 288p.

¹¹¹ Ibid.

¹¹² BLM, *Alpine Satellite Development Plan: Final Environmental Impact Statement*, (Anchorage, 2004)

¹¹³ NRC, *Cumulative Effects on Alaska's North Slope*, (2003).

habitat, impairment of fish passage or migration routes, and bioaccumulation of chemicals in fish tissue. Impacts on other wildlife in the aquatic ecosystem would include the incremental habitat loss, alteration, and disturbance, including increased disturbance from aircraft and increased mortality from collisions with project infrastructure and vehicles.

While aquatic ecosystem impacts are additive, the total and incremental amount of disturbed area is small compared to the total resources within the North Slope region, and no substantial concerns related to adverse cumulative impacts have been identified at this time.

Actions Taken to Minimize Impacts

Sections 5.2, Soils and Permafrost; 5.5, Physical Oceanography and Coastal Processes, 5.6, Hydrology; Section 5.7, Water Quality; Sections 5.8, Vegetation and Wetlands; 5.9, Birds; 5.11, Marine Mammals; and 5.12, Fish, Essential Fish Habitat, and Invertebrates of the Final EIS describe actions proposed to avoid and minimize cumulative impacts to the aquatic ecosystem. These include applicant proposed measures, BMPs, permit requirements, and Corps required special conditions. In addition, the Corps would require additional mitigation measures to compensate for unavoidable wetland impacts. These measures are described in Section 7.2 of this ROD.

Determination of Secondary Effects on the Aquatic Ecosystem (40 CFR 230.11 (h))

Secondary effects are effects on an aquatic ecosystem that are associated with a discharge of dredged or fill materials, but do not result from the actual placement of the dredged or fill material. For the proposed PTP, a consideration of secondary effects include the potential for a spill of hydrocarbon or other toxic materials; impacts to wetlands, vegetation, and water bodies as a result of dust, snow buildup, impoundments and thermokarst effects; the disturbance of wildlife populations as a result of noise or human activity; and a change in wildlife survival or productivity.

Sections 5.8, Vegetation and Wetlands; 5.9, Birds; 5.11, Marine Mammals; 5.12, Fish, Essential Fish Habitat, and Invertebrates; and 5.24, Spill Risk and Impact Assessment of the Final EIS contain detailed analysis of potential secondary impacts to the aquatic ecosystem. Secondary impacts on the aquatic ecosystem include the potential for a spill of hydrocarbons or other toxic materials; impacts to wetlands, vegetation, and water bodies as a result of dust, snow buildup, impoundments and thermokarst effects; the disturbance of wildlife populations as a result of noise or human activity; and a change in wildlife survival or productivity.

A spill of hydrocarbons or other toxic material would result in secondary effects on the aquatic ecosystem. These impacts are discussed in detail in Final EIS Section 5.24, Spill Risk and Assessment Impact. Possible spill materials would include produced fluids, produced water, export hydrocarbons, refined oil, and other hazardous materials. Sources of spill materials include infrastructure on gravel pads, infield gathering and the export pipelines, vehicles and construction equipment, and barges and vessels. The impact of a spill would vary based on the size, rate at which the spill occurs, and the fate and behavior of the spilled material. Numerous environmental factors, such as the season, weather, environmental degradation processes acting directly on the spilled materials, and location of spills relative to sensitive habitats and resources would influence the overall impact of a spill. The relative proximity of the PTEP to the Beaufort Sea coastline provides an additional transportation option for access by water. During the three to four months of open water each year, incident response could be mobilized to the coastline closest to the incident and then transported overland. Depending on the spill location, this transportation option could reduce the overland travel distance required to access a site. Due to the increased distance from the coastline, spill response mobilization is more difficult for the Alternative D pipeline route via watercraft.

Numerous prevention, detection, and response measures, outlined in the applicant's ODPCP would minimize the likelihood and potential impacts of spills. Small spills would occur under all action alternatives, but would be restricted in geographic area and remain confined to gravel pads, roads, or ice infrastructure. This would limit impacts on the aquatic environment. Medium and large spills may also occur but are less likely. These spills would reach the tundra or waterbodies adjacent to roads, pads, and airstrips and could have minor to moderate impacts on aquatic ecosystems. Very large spills would be highly unlikely events such as a major blowout or uncontrolled release at the drilling site, a complete

failure of a containment berm around several fuel storage tanks, or from a fuel barge delivering diesel fuel. These spills would reach tundra and adjacent waterbodies, especially if the spill occurs in the ice-free seasons. Large and very large spills are very unlikely, but, if they occur, the impacts on the aquatic ecosystem could be moderate to catastrophic. Impacts would be greatest on marine water quality, wetlands and vegetation, birds, and marine mammals.

Secondary impacts to wetlands, waterbodies, and vegetation would occur as a result of fugitive dust, snow buildup, impoundments, and thermokarst effects. These impacts are discussed in Final EIS Section 5.8, Wetlands and in Wetlands in Section 6.11 of this ROD.

Secondary impacts to wildlife would occur as a result of the disturbance and alternation of habitat for wildlife populations that use the project area as a result of noise, disturbance, alteration of habitat quality, or reduced survival or productivity. These impacts are discussed in Final EIS Sections 5.9, Birds; 5.10, Terrestrial Mammals; and 5.11, Marine Mammals. Impacts on these wildlife populations are summarized in Threatened and Endangered Species and Other Wildlife in Section 5.3 of this ROD.

Actions Taken to Minimize Impacts

Sections 5.2, Soils and Permafrost; 5.5, Physical Oceanography and Coastal Processes, 5.6, Hydrology; Section 5.7, Water Quality; Sections 5.8, Vegetation and Wetlands; 5.9, Birds; 5.11, Marine Mammals; and 5.12, Fish, Essential Fish Habitat, and Invertebrates of the Final EIS describe actions proposed to avoid and minimize secondary impacts to the aquatic ecosystem. These include applicant proposed measures, BMPs, permit requirements, and Corps required special conditions.

Mitigation measures specific to the prevention of spills include design of all facilities and pipelines to ensure safe containment of all hydrocarbons, implementation of project-specific spill prevention programs and trainings; establishment of trained response teams to response to spills of varying sizes; design of pipelines based on state of the art arctic design specifically tailored for the proposed project; and general design, construction and operations measures. In addition, the Corps would require mitigation measures to compensate for unavoidable wetland impacts. These measures are described in Section 7.2 of this ROD.

5.4 Determination of Compliance or Non-compliance with the Restrictions on Discharge

The following sections summarize the evaluation of anticipated impacts from the proposed project, as mitigated by the applicant's proposed environmental mitigation¹¹⁴, with the specific regulatory criteria on restriction of discharge as listed in 40 CFR 230.10.

Finding of LEDPA (40 CFR 230.10(a))

Overall, the Corps finds that that the basic purpose of the project is not water dependent but that practicable alternatives that do not impact waters of the U.S. and/or special aquatic sites do not exist as a result of geographical and technological constraints on project siting.

Furthermore, the Corps finds that the applicant's proposed project is the LEDPA (see Section 5.4 of this ROD) with the following modifications:

- Limiting the placement of gravel fill along the eastern edge of the proposed Central Pad;
- Placement of dredged material to extend the shoreline in the lagoon adjacent to the east side of the proposed Central Pad for the beneficial reuse to create a wider coastal corridor along the eastern edge of the proposed Central Pad in order to facilitate polar bear movement through the area;
- West Pad reconfiguration to increase pad distance from the coastline;

¹¹⁴ ExxonMobil, "Environmental Mitigation Report," (2011).

- East Pad reconfiguration to a location approximately one mile west to decrease impacts to high value wetlands, hydrology, and the potential for impacts related to coastal erosion;
- Modification of the East and West Pad access roads to accommodate the reconfiguration and movement of the East and West Pads with conditions to include monitoring of crossflow drainage and dust abatement;
- Construction and use of the proposed 5,600- by 200-foot airstrip with monitoring and potential future mitigation measures to maintain natural drainage patterns;
- Minimization of gravel fill to create gravel stockpile by reducing size of stockpile to 5.2 acres containing 135,000 CY of gravel;
- Minimization of gravel mine access road infrastructure by reducing the road access to the gravel mine stockpile and using an ice road for winter access to the mine site; and
- Construction of the proposed gravel mine followed by successful rehabilitation and revegetation of the gravel mine site for fish and wildlife habitat. Rehabilitation shall include prohibition of water withdrawal until the mine site is fully filled with water. If necessary to meet rehabilitation goals, use of the existing overburden pile at the old C-1 Mine site shall be used. In addition to measures outlined in the rehabilitation plan, the Corps will also require a water retention berm in the littoral zone on the east side of the mine site.

Restrictions on Discharge (40 CFR 230.10(b))

The second compliance test under the Guidelines considers specific impacts that may warrant additional restrictions on discharge. Specifically, the Guidelines state that no discharge of dredged or fill material may be permitted if it will:

- Causes or contributes to violations of any applicable State water quality standard;
- Violate any applicable toxic effluent standard or prohibition under Section 307 of the CWA;
- Jeopardize the continued existence of species listed as endangered or threatened under the ESA of 1973, or result in the potential for adverse impacts (destruction or adverse modification) of a habitat, which is determined by the Secretary of the Interior or Commerce to be a critical habitat under the ESA of 1973. If an exemption has been granted by the Endangered Species Committee, the terms of the exemption shall apply, in lieu of this paragraph; or
- Violate any requirement imposed by the Secretary of Commerce to protect any marine sanctuary designated under title III of the MPRSA of 1972.

The Corps finds that the proposed disposal of dredged and fill material would not violate any applicable state water quality standards. In addition, the proposed project would not involve any toxic effluents or violate the toxic effluent standards under Section 307 of the CWA. The proposed project would not jeopardize endangered or threatened species or their critical habitat. The proposed disposal of dredged or fill material would not violate any requirements imposed to protect designated marine sanctuaries. This determination is based on the findings outlined in Section 5.3 of this ROD and the impact analysis of the Final EIS.

Finding of No Significant Degradation (40 CFR 230.10 (c))

The third compliance test under the Guidelines considers the potential for the proposed discharge to cause or contribute to the degradation of waters of the U.S. The Guidelines state that except as provided under Section 404(b)(2), no discharge of dredged or fill material shall be permitted which will cause or contribute to significant degradation of waters of the U.S. may. The Guidelines further define the types of effects that may, either individually or collectively, contribute to the significant degradation of waters of the U.S. These include:

- 1) Significant adverse effects of discharge of pollutants on human health or welfare, through pollution of municipal water supplies, fish, shellfish, wildlife and special aquatic sites;
- 2) Significant adverse effects of discharge of pollutants on life stages of aquatic wildlife and other wildlife dependent on aquatic ecosystems, to include the transfer, concentration, and spread of pollutants or their byproducts outside of the disposal site through biological, physical, and/or chemical processes;
- 3) Significant adverse effects of discharge of pollutants on aquatic ecosystem diversity, productivity, and stability including but not limited to the loss of fish and wildlife habitat, or the loss of the capacity of wetland to assimilate nutrients, purify water, or reduce wave energy; and
- 4) Significant adverse effects of discharge of pollutants on recreational, aesthetic, and/or economic values.

The Corps finds that with the inclusion of the mitigation measures identified by the applicant as part of the proposed project and additional mitigation measures, in the form of special conditions, applied by the Corps (Section 7.3 of this ROD), the proposed project would not cause or contribute to significant degradation of the waters of the U.S. The proposed project would not discharge pollutants resulting in significant adverse effects on: 1) human health or welfare; 2) life stages of aquatic life and other wildlife dependent of aquatic ecosystems; 3) aquatic ecosystem diversity, productivity; and stability; or 4) recreational, aesthetic, and economic values.

This determination is based on the conclusions of Section 5.3, Factual Determinations and Technical Evaluation Factors of this ROD and takes into account the detailed analysis of impacts on specific physical, chemical, biological and human characteristics of the aquatic ecosystem conducted as part of the Final EIS. In addition, this conclusion also considers all actions to minimize adverse impacts, including those proposed by the applicant in the Environmental Mitigation Report¹¹⁵ and additional measures considered by the Corps (Section 4.4 Impact Avoidance, Minimization, and Mitigation, in the Final EIS).

Minimization of Potential Adverse Impacts (40 CFR 230.10(d))

The fourth compliance test under the Guidelines considers the extent to which steps have been taken to minimize potential adverse effects. The Guidelines state that except as provided under Section 404(b)(2), no discharge of dredged or fill material shall be permitted unless appropriate and practicable steps have been taken which will minimize potential adverse impacts of the discharge on the aquatic ecosystem.

The applicant has identified several potential measures to minimize adverse impacts. These measures are outlined in the applicant's Environmental Mitigation Report¹¹⁶ and DA Permit Application.¹¹⁷ These measures are also discussed in detail in Section 4.4, Impact Avoidance, Minimization, and Mitigation, in the Final EIS and by resource section in Chapter 5, Environmental Consequences, of the Final EIS. These measures are incorporated into Factual Determinations and Technical Evaluation Factors (Section 5.3 of this ROD) on which the finding of no significant degradation is based.

The Corps has reviewed the minimization measures proposed by the applicant and considers them to be a reasonable starting point for developing the list of all appropriate and practicable steps which can be taken to minimize the potential adverse impacts of the proposed project. In addition to the applicant's proposed mitigation measures, and additional BMPs, the Corps would require additional conditions and stipulations to further minimize impacts. These conditions are described in Section 7.3, Special Conditions and Rationale for Inclusion of this ROD. The Corps would require additional mitigation

¹¹⁵ ExxonMobil, "Environmental Mitigation Report," (2011).

¹¹⁶ Ibid.

¹¹⁷ ExxonMobil "Final Department of the Army Permit," (2011)

measures to compensate for unavoidable wetland impacts. These measures are described in Section 7.2, Mitigation Discussion of this ROD.

Summary of Findings of Compliance

The proposed discharge complies with the Guidelines, with inclusion of the applicant's proposed mitigation measures, additional appropriate and practicable mitigation measures required by the Corps to minimize pollution or adverse effects to the affected ecosystem.

6.0 Public Interest Review Factor Assessment

The discussion for each of the following public interest factors includes a general description of the existing resource and summary of both beneficial and detrimental effects. Mitigation to compensate for any negative effects is addressed in the ROD. The PTP Final EIS is the primary source of information for this assessment; however, other resources are used as noted. The factor conclusion includes a summary of the impact on the public interest, derived from the evaluation of the positive, negative, and mitigative components. Mitigation actions are included in Section 7.2 of this ROD.

6.1 Needs and Welfare of People: Environmental Justice and Subsistence

This section of the PIR considers factors relevant to the needs and welfare of the people that are not otherwise addressed elsewhere in this assessment. Specifically included here are environmental justice and subsistence.

Environmental Justice

Environmental justice requires that Federal agencies consider impacts on minority and low-income populations¹¹⁸ and determine if a project would result in a "disproportionately high and adverse effect on minority or low-income populations." Because of the minority status of the communities in the NSB, environmental justice is considered very important. Section 5.16, Environmental Justice of the Final EIS documents the following impacts within the proposed project area.

Beneficial Effects

Beneficial effects are attributed to the creation of jobs and state and local revenues and are addressed in Economics in Section 6.9 in this ROD. There are no other beneficial effects anticipated from the construction of the proposed project.

Detrimental Effects

The applicant's proposed project is not anticipated to result in disproportionately high adverse impacts to minority and low-income populations in the study area. There are no residences within the proposed project area.

Subsistence

Subsistence hunting, fishing, and gathering are central aspects of North Slope culture and life, which is rooted in the traditional relationship of the Iñupiat people with their environment. Residents of the North Slope rely on subsistence harvests of plant and animal resources for nutritional sustenance and cultural and social wellbeing.

The two communities closest to the proposed project, Kaktovik and Nuiqsut, use areas in or adjacent to the proposed PTP area for subsistence purposes. Residents from these communities harvest subsistence resources, such as caribou and waterfowl, which may migrate through the proposed project area. Direct uses of the proposed project area by Nuiqsut residents are limited; however, Nuiqsut whaling crews hunt for whales offshore from the proposed project area, primarily to the west in an area surrounding Cross Island. Kaktovik residents use the proposed project area primarily for the harvest of

¹¹⁸ Executive Order No. 12898

caribou, although subsistence harvest of other resources such as seals, waterfowl, and fish occur in the proposed project area primarily in conjunction with the summer caribou hunt. Section 3.22, Subsistence and Traditional Land Use of the Final EIS addresses existing subsistence and traditional land use patterns in the project area. Section 5.22, Subsistence and Traditional Land Use of the Final EIS documents the following impacts within the proposed project area.

The proposed project would impact the subsistence harvest of marine mammals including bowhead whales and seals. These marine mammals have moderate to high material and cultural importance to both Kaktovik and Nuiqsut. Impacts to user access and resource availability of marine mammals for the community of Kaktovik are anticipated to be minor. Impacts to user access and resource availability of marine mammals for the community of Nuiqsut are anticipated to be minor. Impacts to the harvest of marine mammals would be mitigated by the applicant's voluntary signature of the CAA with the AEWC to avoid conducting marine activities prior to or after the Kaktovik and Nuiqsut fall bowhead whale subsistence hunts.

The applicant has voluntarily signed a CAA in which the applicant agrees to avoid barging during the whaling season (generally from August 24 to September 23), to the greatest extent possible, in order to minimize potential impacts to subsistence hunting. When barging during the whaling season cannot be avoided, the applicant would follow the protocols defined in the CAA to avoid or minimize interactions with whaling boats and whales.

Beneficial Effects

There are no beneficial effects to subsistence use of the project area anticipated from the construction of the proposed project.

Detrimental Effects

Adverse impacts may occur relative to subsistence caribou hunting for Kaktovik residents and bowhead whale hunting for Nuiqsut residents.

There are detrimental effects to subsistence hunting and fishing activities and possible interruption or displacement of hunting and fishing activities. Minor impacts to the harvest amount of caribou for Kaktovik and bowhead whale for Nuiqsut would occur and last throughout the life of the project. Seasonal subsistence impacts to fish and seal harvests for Kaktovik would occur during the open water season to a limited extent. Impacts to other subsistence activities are not expected.

It is traditionally held knowledge that the reflective glare of the sun off of metal pipelines with a shiny finish is distracting to caribou and can impact subsistence hunting of caribou from the coast.

Factor Conclusion

The Corps finds that the proposed project would have a minimal detrimental effect on the needs and welfare of the people. Applicant proposed mitigation is discussed in Section 5.0 of this ROD. Corps-considered mitigation is included in a Programmatic Agreement and in Section 7.2 of this ROD. The Corps would also require additional mitigation measures to further minimize impacts. These conditions are described in Section 7.3 of this ROD.

6.2 Fish and Wildlife Values

Sections 3.9 through 3.12 of the Final EIS discuss the existing environment for fish and wildlife populations within the proposed project area. Sections 5.9 through 5.12 of the Final EIS document the impacts to fish and wildlife values. Subheaded below are discussions on the proposed project's impact in general, as well as specific to birds, terrestrial mammals, marine mammals, and fish and EFH. Threatened and Endangered species are also discussed in both Birds and Marine Mammals sections below.

Beneficial Effects: General

Beneficial effects to fish and wildlife habitat resulting from the proposed project would include development of fish and bird habitat created by the eventual rehabilitation of the proposed gravel mine site. Gravel fill infrastructure may provide insect relief habitat for caribou and possibly muskoxen.

Detrimental Effects: General

Construction of the applicant's proposed project would result in detrimental effects due to the permanent loss of wildlife habitat due to placement of gravel for roads, pads, and an airstrip. Long term impacts are considered permanent with regard to the consideration of compensatory mitigation. Disturbance to wildlife would occur due to noise and activities associated with facility operations, vehicles, planes, helicopters, and barges.

Birds

More than 70 bird species have been documented in the project area. Of these, 29 are listed as species of concern by the USFWS, ADF&G, Audubon, and/or Alaska Shorebird Group because of small population sizes, population declines, sensitivity to disturbance, or other reasons. Two of these 29 species, the spectacled and Steller's eider, are also listed as threatened under the ESA and one of them, the yellow-billed loon, is a candidate species for ESA listing. These three species are considered uncommon in the project area as discussed in Section 3.9, Birds of the Final EIS. Most bird species are migratory and use the project area, primarily the shoreline and coastal lagoons, between May and September for spring and fall migration (resting and foraging), nesting, and molting.

Beneficial Effects: Birds

There are some beneficial effects to birds anticipated due to the rehabilitation of the gravel mine site. In general, agencies have agreed that converted habitats that increase the edge effect, such as addition of open water habitat within the tundra complex are beneficial within the ACP.

Detrimental Effects: Birds

Detrimental effects to birds would occur as a result of the proposed project. Effects include habitat loss, alteration, and disturbance; habitat fragmentation; vehicle or infrastructure collision mortality; altered survival or productivity; and/or exposure to spills or leaks of toxic materials.

The applicant's proposed project is anticipated to impact less than four percent of the total bird population in the Point Thomson area, and less than one half percent of the overall ACP population of birds found in the Point Thomson study area. Endangered Species are discussed in Threatened and Endangered Species in Section 5.3 of this ROD.

Terrestrial Mammals

The terrestrial mammals of concern for the proposed project are caribou, muskoxen, brown bears, fox, and small mammals, including arctic ground squirrels, collared and brown lemmings, root voles, and barren ground shrews. Terrestrial mammals use the proposed project area year round, including riverine, riparian, and other habitat throughout the proposed project area. The proposed project area is used for foraging, hunting, breeding, and migrating, as discussed in Section 3.10, Terrestrial Mammals of the Final EIS.

Beneficial Effects: Terrestrial Mammals

Gravel fill infrastructure may provide insect relief habitat for caribou and possibly muskoxen.

Detrimental Effects: Terrestrial Mammals

Potential detrimental effects to terrestrial mammals would include habitat loss and alteration due to physical habitat changes. This would result in displacement from or attraction to altered habitats; disturbance from noise or activity; habitat fragmentation; mortality associated with gravel and ice

placement, vehicles, and other causes; altered survival or productivity through changes in predator abundance, distribution, or predation risk; and/or exposure to spills and leaks of toxic materials.

Marine Mammals

There are documented occurrences of 16 marine mammal species within or adjacent to the project area: five baleen whale species, four toothed whale species, six pinniped species, and the polar bear. Seven species have an expected occurrence within or adjacent to the project area, while the other nine do not regularly occur in the Beaufort Sea and are not likely to occur in the PTP area. Due to the anticipated timing of construction schedules, location of proposed project activities, and the known distributional ranges of the marine mammal species, the bearded seal, beluga whale, bowhead whale, polar bear, and ringed seal are of greatest concern in the PTP area.

Beneficial Effects: Marine Mammals

There are no documented direct beneficial effects to marine mammals anticipated from the construction of the proposed project.

Detrimental Effects: Marine Mammals

Detrimental effects to marine mammals and their habitats from the proposed project include: 1) habitat loss due to construction of the proposed project components; 2) displacement from habitat due to noise or human activity; 3) impacts to animal movement patterns and land use resulting from habitat fragmentation; 4) land/ice vehicle and ocean vessel collision injury mortality; 5) altered survival and/or productivity related to changes in predator/prey abundance, distribution, feeding strategies, predation, exposure to garbage, and/or spills or leaks of toxic materials.

A minor portion of marine mammal populations (primarily ringed seals and polar bears, and possibly bowhead and beluga whales and bearded seals) could be temporarily disturbed by year-round aircraft over flights and open-water, summer-fall barge use. The latter effects would be limited in geographical and temporal extent to close passes by the barge or aircraft. Individuals may become habituated to this ongoing activity, or may already be habituated given existing and past similar activities in the region.

Effects to polar bears would include changes to their coastal travel routes. Design considerations mitigating these effects are discussed in Analysis of Impacts and Central Pad in Section 5.1 and in Other Wildlife in Section 5.3 of this ROD.

Fish and Invertebrates

Fifty-eight fish species have been found in the Alaskan Beaufort Sea and nearshore environment of the proposed project, as defined from Prudhoe Bay to Point Thomson. Thirteen fish species have been documented in freshwater habitats. Fish species of the greatest concern include arctic cisco, least cisco, Dolly Varden, arctic grayling, broad whitefish, humpback whitefish, arctic cod, and Pacific salmon. These species are important contributors to subsistence and sport fisheries in the vicinity of the proposed project area.

Beneficial Effects: Fish and Invertebrates

There are some beneficial effects to fish anticipated due to the rehabilitation of the gravel mine site.

Detrimental Effects: Fish and Invertebrates

Detrimental effects to fish and invertebrate habitat would result from ice roads, gravel pads, infield road systems, the airstrip, a gravel mine site, barging facilities; and export and infield pipelines. Ice or sea ice roads would impede fish movements within streams and at the mouths of streams during breakup by trapping or precluding fish from movement between nearshore marine habitats. Impacts from ice pads on fish, invertebrates, and their habitat would be similar to impacts from ice roads, except that there would be no stream crossings.

Overwintering habitat could be impacted by freeze down (due to compaction) of deep water pools harboring overwintering fish. If the hydrology of receiving waters was altered by the ice road, some sensitive invertebrate taxa would also be affected.

Factor Conclusion

The Corps finds that the proposed project would have a moderate detrimental effect on fish and wildlife. Applicant proposed mitigation is discussed in Section 5.0 of this ROD. Corps-considered mitigation is included in Section 7.2 of this ROD. The Corps would require additional mitigation measures to further minimize impacts. These conditions are described in Section 7.3 of this ROD.

6.3 Aesthetics

The Corps considered aesthetics to include the visual resources and soundscape in the area of the proposed project. The primary, unifying visual characteristics of the landscape of the ACP are its essentially flat nature, expansive views, and very low vegetation—all evident year round—as well as the many lakes, ponds, and ground and vegetation patterns influenced by permafrost. The characteristic landscape is wide open and exposed. Typical viewing distances are not limited by landforms or vegetation. Exceptions are in the river valleys and the ocean shoreline, from which low bluffs may obscure distant views.

Impacts to visual aesthetics would occur as a result of the presence of project infrastructure. Highly visible project infrastructure includes infrastructure that would be located on site during project construction (i.e. drilling rig and temporary communications towers) and infrastructure that would be located on site for the duration of the project (i.e. permanent communications towers, facility modules, and pipelines). Most of the visual aesthetics study area is located on state land designated as low and medium visual sensitivity areas. A small portion of the visual aesthetics study area is located within the ANWR, designated as a high sensitivity area.

During daylight, visibility of project components would extend well beyond 5 miles while nighttime lighting of pads would create strong contrasts over long distances. The visual effect of the project would be permanent. Those portions of the ANWR and state lands nearest to the project site would experience the greatest visual contrast when the drill rig was present; the daylight visual contrast would be reduced, particularly when viewed from greater than 5 miles away, when the drill rig is removed. However, permanent communications towers, the flare stack, the visual bulk of the CPF, and movement of exhaust plumes, road dust, snowplow plumes, aircraft, and vehicles would continue to create contrast beyond the 5-mile zone. Overall, impacts to visual resources in low and medium sensitivity areas would be minor to moderate. Impacts to visual resources in high sensitivity areas would be major.

In the proposed project area, during the summer season the natural, baseline soundscape includes sounds associated with surface water features such as flowing rivers and streams, and the sound of waves crashing from the ocean. Sounds from animals including birds, mammals, and insects that travel along rivers, coastlines, and streams and animals near small lakes are also components of this soundscape. Weather events including storms, wind, and rain also attribute to the soundscape. During wintertime, the surface water features are frozen, minimizing the noise associated with water movement. Wind is the primary contributor to the soundscape in the winter. Year round, other sounds that may be audible include occasional seasonal use of boats and snowmobiles by Kaktovik residents or cruise ships originating from Kaktovik or Prudhoe Bay.

The broad coastal area surrounding the project is principally undeveloped, with low levels of noise from human activity. Subsistence users in the area by North Slope residents and the project's proximity to the ANWR heighten sensitivity to noise effects compared to other North Slope developments. Noise from human activities, other than currently permitted industrial activities, is largely absent from the ambient soundscape. Generally, sound levels in the coastal plains near surface water features are the loudest in the study area, while upland coastal plains without the influence of surface water features are the lowest.

Impacts to the audible environment of the project area would occur from drilling, barge operations, fixed-wing airplane and helicopter flights, blasting, road construction and maintenance activities, and CPF module turbines. Project-related noise impacts would be greater during the winter than during the summer. Noise from construction and drilling, would dominate the ambient landscape in the immediate vicinity (within 0.5 miles) of the noise sources and may be audible in nearby areas up to 8 miles away.

Areas further away from construction and drilling activities (up to 19 to 20 miles away) would experience a slight increase in existing noise, which would be below the threshold of human perception. During operations, a slight increase in noise levels relative to pre-project conditions may be audible approximately 3 miles away. No increase in noise level would be expected at a distance more than 8 to 20 miles from the project area. Overall, impacts related to construction, operation, and drilling activities on land would have major but local impacts on area noise levels.

Appendices N and O of the Final EIS describe baseline conditions of existing sound and visual environment. Additionally, visual and noise impacts are documented in Section 5.19, Visual Aesthetics and 5.20, Noise of the Final EIS.

Aesthetic related impacts and mitigation measures to address those impacts are also discussed in Impacts on Human Use Characteristics in Section 5.3 of this ROD.

Beneficial Effects

There are no beneficial effects to aesthetics anticipated as a result of this project.

Detrimental Effects

Detrimental effects to visual aesthetics in the proposed project area with the most visual contrast would include vertical structures, particularly towers. During daylight, the visibility of proposed project components would extend well beyond 5 miles. Nighttime pad lighting would create strong contrasts over long distances in an area without existing manmade lights.

The proposed project would cause an increase in noise above existing levels during construction, drilling, and operations. These noise effects are not anticipated to reach beyond the Canning River, into the ANWR. While noise is considered a detrimental effect to wildlife within the proposed project area, the noise would be most concentrated during facility construction and thus the major detrimental effects would be considered temporary. The noise analysis in the Final EIS indicates that the noise from operations is predicted to dominate the soundscape near noise sources (within 0.5-mile) and may be audible 2 to 3 miles from the Central Pad, particularly when winds are below 11 miles per hour. When winds are higher, wind-induced noise may potentially mask project-related noise.

Helicopter and fixed-wing aircraft are expected to make the greatest contribution to noise during operations. Air traffic would be most frequent during construction but would continue intermittently during operations.

Factor Conclusion

The Corps finds that the proposed project would have a moderate detrimental effect on aesthetics. Applicant proposed mitigation is discussed in Section 5.0 of this ROD. Corps-considered mitigation is included in Section 7.2 of this ROD. The Corps would require additional mitigation measures to further minimize impacts. These conditions are described in Section 7.3 of this ROD.

6.4 Safety

The DA permit application, the applicant's Plan of Operations, and other supporting materials included in the Final EIS appendices document the following impacts to safety within the proposed project area. Impacts to health and human safety are detailed in the Health Impact Assessment (HIA), described in Section 5.23, Human Health of the Final EIS. Safety as an evaluation factor encompasses the workers at the project site, workers involved in project transportation, and the members of the public who might be exposed to potential danger from the project operation and activity, including transportation. This topic includes the prevention of and response to accidents, such as spill or other release events that endanger important environmental resources.

Beneficial Effects

The operation phase of the proposed project would generate tax revenues collected by the NSB, which provides most of the services and employment in the borough and funds most of the capital improvement proposed projects in the region, including improved health care delivery and infrastructure.

Additionally, response to accidents and injuries would be improved through improved access to the proposed project area, via the airstrip, road, and barge facilities, for medical attention and evacuation of injured workers.

Detrimental Effects

Human health impacts to employees and nearby residents would occur; however, these detrimental effects are anticipated to be minor. Impacts specific to health issues related to accidents and injuries; food, nutrition, and subsistence; and noncommunicable chronic diseases are expected to be low. During operations, potential impacts to human health would occur as a result of exposure to hazardous materials, reduced consumption of subsistence resources, and changes in social determinants of health e.g., depression/anxiety prevalence.

The HIA documents exposure to hazardous materials during construction/drilling and operations as a medium threat, primarily because of the presence of incinerators with no documented plan for monitoring stack emissions. While emissions would be regulated through the air permitting process and would be rapidly diffused over a wide area, byproducts of incomplete combustion would escape the stack and some wildlife and human exposure could exist.

Factor Conclusion

The Corps finds that the proposed project would have a minimal detrimental effect on safety. Applicant proposed mitigation is discussed in Section 5.0 of this ROD. Corps-considered mitigation is included in Section 7.2 of this ROD.

6.5 Water Supply and Conservation

During construction and drilling, freshwater would be required for the construction and maintenance of ice roads and pads; compaction of gravel for new roads and pads; dust suppression; drilling fluids; and camp use. Groundwater is present at depth below the permafrost in the proposed project area, but it is highly saline and therefore nonpotable, as discussed in Section 3.1, Geology and Geomorphology of the Final EIS. Freshwater would be supplied from existing, year-round surface sources located between Endicott and Point Thomson. Sources in the vicinity of the Central Pad include lakes and the existing C-1 reservoir. Sources in the vicinity of Badami include the previously permitted Shaviovik Pit, Turkey Lake, and Badami Reservoir. Existing water sources in the vicinity of the Endicott causeway landfall include the Duck Island Mine Site and Sag Mine Site C (Vern Lake). Other sources could be identified as needed to support construction. Potable water would be acquired from the C-1 Mine Site and the newly constructed gravel mine site, once complete and reclaimed. These sources of water, once routed through a treatment system, would be the potable supply for the camps.

Municipal and private water supply (40 CFR 230.50) related impacts and mitigation measures to address those impacts are also discussed in Impacts on Human Use Characteristics in Section 5.3 of this ROD.

Beneficial Effects

There are no beneficial effects to water supply or conservation anticipated to result from the construction of the proposed project.

Detrimental Effects

Conservation of groundwater is not of concern within the project area. However, water use associated with ice infrastructure, such as ice roads and ice pads, may have detrimental effects if systems fail to recharge.

Factor Conclusion

The Corps finds that the proposed project would have a minimal detrimental effect on water supply or conservation. Applicant proposed mitigation is discussed in Section 5.0 of this ROD. Corps-considered mitigation is included in Section 7.2 of this ROD.

6.6 Energy Needs

According to the U.S. Energy Information Administration,

*The United States consumes more energy from petroleum than from any other energy source. In 2010 total U.S. petroleum consumption was 19.2 million barrels per day, or 37% of all the energy consumed...Over 2/3 of total U.S. petroleum consumption is for transportation, and almost 2/3 of transportation sector petroleum consumption is gasoline...In addition, petroleum may be used as a raw material (a "feedstock") to create products such as plastics, polyurethane, solvents, asphalt, and hundreds of other intermediate and end-user goods.*¹¹⁹

Alaska's crude oil production peaked in 1988 at about 738 million barrels, which was equal to about 25 percent of total U.S. oil production. In 2011, it was about 209 million barrels, or about 10 percent of total U.S. production.

Beneficial Effects

Development of the hydrocarbon resource would help the U.S. meet domestic energy demand and reduce dependence on foreign sources of oil. Production at Point Thomson would help offset declining production from Alaska's North Slope reservoirs, and would help maintain the throughput of TAPS. The commitment of energy resources is based on the premise that the proposed project would help to meet U.S. domestic energy demand, maintain the efficiency of TAPS, and meet the landowner's land use objectives for resource development.

Detrimental Effects

There are no detrimental effects to energy needs anticipated from the construction of this project.

Factor Conclusion

The Corps finds that the proposed project would have a beneficial effect on energy needs.

6.7 Conservation

Federal laws, executive orders, and agency regulations and policy guidance frequently address the need for conservation of natural resources. Conservation of water is addressed in Section 6.5, Fish and Wildlife in Section 6.2, Cultural Resources in Section 6.1 and 6.12, Water Supply and Conservation in Section 6.5, Minerals in Section 6.20, and Energy in Section 6.6, of this ROD. Other than these, resources requiring special consideration for conservation are not substantially represented at the project site or on other lands affected by the proposed project.

Beneficial Effects

There are no beneficial effects related to conservation anticipated to result from the implementation of this proposed project.

Detrimental effects

There are no detrimental effects related to conservation that would occur as a result of this proposed project.

Factor Conclusion

The Corps finds that the proposed project would have minor to moderate detrimental effects on conservation of resources, but these effects are discussed elsewhere in this ROD, as noted above.

¹¹⁹ U.S. Energy Information Administration. July 2012. Use of Oil: Crude and petroleum products explained. U.S. Department of Energy. http://www.eia.gov/energyexplained/index.cfm?page=oil_use. Accessed July 17, 2012

6.8 Recreation

Recreation in and near the project area includes river rafting, backpacking, wildlife viewing, fishing, recreational flying, ocean boating (including cruise ships) and kayaking. Most recreation occurs during the summer. The undeveloped and wild nature of the project area, with its associated opportunities for encountering wildlife and solitude, draws people to visit and recreate in the area. It is estimated that fewer than 100 non-local recreationists visit the area, including adjacent ANWR lands in a year.

The land managed by the State of Alaska, including the immediate project area, is not managed for recreation, but recreation activities such as camping, hunting, and berry picking are allowed. Lands, including portions of the ANWR are managed in part for their wilderness qualities and for recreation suited to such an area. Section 3.18, Recreation of the Final EIS details the affected area for its recreational properties and uses and Section 5.18, Recreation of the Final EIS documents the following impacts on recreation within the proposed project area.

Water related recreation (40 CFR 230.52) impacts and mitigation measures to address those impacts are also discussed in Impacts on Human Use Characteristics in Section 5.3 of this ROD.

Beneficial Effects

There are no beneficial effects to recreation expected as a result of this project.

Detrimental Effects

Detrimental effects would be experienced by recreationists beyond the ACP and the coastal and Canning River recreation corridors. These effects include visible and audible and/or other sensory perceptible presence of industrial facilities in an otherwise undeveloped setting, changes in access, and changes in wildlife movements that affect hunting and wildlife viewing.

Public access for activities such as beach walking, kayaking, hunting, or hiking along the coast to the general Point Thomson area would not be excluded, though it would be managed to ensure public and facility safety and security. Restricted areas should be identified in the applicant's Plan of Operations, but physically and by terms of the state lease, permits, and/or company policy, public access would be restricted across the emergency boat ramp. Other effects to subsistence hunting are discussed in Section 6.1, Needs and Welfare of the People of this ROD.

Factor Conclusion

The Corps finds that the proposed project would have a minor detrimental effect on recreation. Applicant proposed mitigation is discussed in Section 5.0 of this ROD. Corps-considered mitigation is included in Section 7.2 of this ROD.

6.9 Economics

Economics are discussed in Sections 3.15 and 5.15, Socioeconomics of the Final EIS. The proposed project purpose and need is to initiate commercial liquid hydrocarbon production and delineate and evaluate hydrocarbon resources in the Point Thomson area. The purpose is driven by the applicant's desire to return a profit. The development of the project would impact state and regional economies. This assessment includes a review of the economic impact to the residents and workers in the NSB.

Beneficial Effects

The economic benefits of the proposed project are far reaching and affect the NSB, State, and national economies. Generation of short- and long-term employment opportunities and added tax revenue would positively affect population demographics and personal incomes. The proposed project would have high direct and indirect beneficial effects on tax base, including assessed property values for the NSB. The State would receive financial benefit from monies paid for the lease of the land and material sale of gravel from the gravel mine. Moderate beneficial effects on employment, income, and tax base for the NSB are expected and would be long term.

Other economic benefits would be incurred by residents of the NSB. These benefits include employment opportunities, such as contracting and business opportunities for North Slope and other Alaska residents and companies. The applicant would be making financial contributions to schools and other local organizations.

Detrimental Effects

Detrimental effects on economics are not expected as a result of this proposed project.

Factor Conclusion

The Corps finds that the proposed project would have a beneficial effect on economics.

6.10 General Environmental Concerns

During the formal scoping period, more than 660 issue-specific comments were received from the public and local, state, and federal agencies. Specific environmental concerns are discussed elsewhere in this assessment, including Section 6.11, Wetlands and Vegetation, Section 6.2, Fish and Wildlife Values, Section 6.17, Shore Erosion and Accretion, and Section 6.18, Water Quality of this ROD. Concerns that may be addressed under "General Environmental Concerns" would include those not addressed elsewhere. The Corps has identified air quality as a matter of general environmental concern not addressed in a specific public interest topic and has chosen to address it in this section.

Several studies were referenced for establishing the ambient air quality for the project area, included in Table H-4 in Appendix H of the Final EIS. Section 3.4, Air Quality of the Final EIS notes that the available data confirm that pollutant concentrations in the study area are in compliance with the respective state and federal ambient air quality standards.

Beneficial Effects

There would not be any beneficial effects to air quality as a result of this proposed project.

Detrimental Effects

Construction, drilling, and operations associated with the proposed project would result in air emissions that would negatively affect air quality. Emissions are associated largely with the combustion of fossil fuels, though other impacts would be derived from dust generated in gravel mining and operation and maintenance of gravel roads and pads.

During the past 50 years, Alaska has warmed at more than twice the rate of the rest of the U.S. due to increased emissions of CO₂ and other GHG. While emission of GHG would occur as a result of the proposed project, the direct annual CO₂ emissions increase associated with construction, drilling, and operation phases of the proposed project would contribute approximately 0.001 percent to the global CO₂ emissions, as discussed in Section 5.4, Air Quality of the Final EIS.

Factor Conclusion

The Corps finds that the proposed project would have a minimal detrimental effect on general environmental concerns not discussed elsewhere, including air quality. Applicant proposed mitigation is discussed in Section 5.0 of this ROD. Corps-considered mitigation is included in Section 7.2 of this ROD. The Corps would require additional mitigation measures to further minimize impacts. These conditions are described in Section 7.3 of this ROD.

6.11 Wetlands and Vegetation (320.4(a)(1), 320.4(b)(2)(iv), 320.4(b)(2)(vi))

The proposed project area, comprised primarily of moist and wet tundra, is dominated by wet/moist sedges and dwarf shrubs, and occupies wet environments such as drained lake basins and poorly drained river terraces throughout the project area. Small intermixed patches of aquatic sedges and

grasses may occur in flooded areas. Section 5.8, Vegetation and Wetlands of the Final EIS documents the following impacts to wetlands within the proposed project area.

Wetlands are also discussed in Wetlands in Section 5.3 of this ROD. Effects to shallow groundwater recharge (320.4(b)(2)(vi)) and wetlands that may be involved with wave action, erosion, or storm damage (320.4 (b)(2)(iv)) are discussed in Section 5.6, Hydrology of the Final EIS.

Beneficial Effects

There are no beneficial effects to wetlands resulting from this proposed project.

Detrimental Effects

The applicant's proposed project would result in permanent loss of wetlands and vegetation, including those wetlands that may be involved with shallow groundwater recharge (320.4(b)(2)(i)) and wetlands that may be involved with wave action, erosion, or storm damage (320.4(b)(2)(iv)), through the placement of gravel fill for roads, pads, and from excavation of a gravel mine. These effects are also discussed in the Section 5.6, Hydrology of the Final EIS.

The proposed project would result in approximately 267.1 acres of direct, permanent wetland loss for construction of proposed project. Indirect effect would be incurred to an additional 1013.6 acres.

Other impacts may be incurred from water removal, dredge material disposal, erosion, wastewater discharge, ice road use, and off-road tundra travel. Other impacts incurred from trenching and VSM and other support member installation are estimated to total less than one acre for each activity and would be considered minor. The effects on vegetation and wetlands from altered drainage patterns associated with the gravel airstrip would change the drainage area approximately 1.8 square miles. Approximately 48 percent of the drainage water from Stream 22 watershed will be diverted to Stream 24B. This would cause dehydration in the Stream 22 watershed and change the character of the wetlands and vegetation to a drier state. Conversely, extra water in the Stream 24B watershed would further hydrate the wetlands and vegetation causing changes to vegetative communities in this watershed.

Indirect impacts would result from dust deposition, snow accumulation, impoundments, and thermokarst in proximity to gravel infrastructure.

The only wetlands maintaining base flows for aquatic resources that would be affected by construction of this project are in the small watershed around the airstrip (320.4(b)(2)(vi))

Factor Conclusion

The Corps finds that the proposed project would have a moderate detrimental effect on wetlands and vegetation. Applicant proposed mitigation is discussed in Section 5.0 of this ROD. Corps-considered mitigation is included in Section 7.2 of this ROD. The Corps would require additional mitigation measures to further minimize impacts. These conditions are described in Section 7.3 of this ROD.

6.12 Historic Properties & Cultural Resources

Impacts to cultural resources in the project area are detailed in Final EIS Section 5.21, Cultural Resources. Cultural resources include sites and materials of prehistoric Native American, historic European and Euro-American, and historic Iñupiat origin. Impacts to cultural resource sites would primarily occur during the construction phase of the proposed project. However, no documented cultural resource sites are located within the footprint of proposed project infrastructure. As a result, direct effects to cultural resources are unlikely. Given the number of previous surveys conducted in the study area, the relatively few number of cultural resources documented, and the low probability of the construction footprint areas for containing cultural resources, impacts to inland cultural resources are unlikely. A Programmatic Agreement (PA) has been developed and executed by the Corps in accordance with Section 106 of the NHPA to specifically address identification, documentation, and mitigation of historic properties.

The APE was a region used for hunting, where settlements were focused on hunting and trading for subsistence use. Comments were made during the public scoping period concerning the importance of investigating traditional cultural properties and/or cultural landscapes in the project area. There was an

emphasis in comments received on the importance of consultation with local tribal governments and organizations, nongovernmental agencies, and other interested parties.

Beneficial effects

There would be some beneficial effects to cultural resources as a result of the research identified for mitigation purposes in the Section 106 PA. This research, to be funded by the applicant as part of the requirements of the NHPA and developed in consultation with the Alaska State Historic Preservation Officer, will focus research efforts on documenting identified archaeological sites that are outside of the project area and subject to erosion.

Detrimental Effects

There are no documented historic properties or cultural resource sites located within the direct footprint of proposed project components; however construction could affect unidentified cultural resource sites within these areas. The likelihood of impacting unidentified historic properties or cultural resource sites would be low given the number of previous surveys conducted in the project area, the relatively few sites documented in nearby areas, and the low potential for construction footprint areas to contain historic properties or cultural resource sites.

Factor Conclusion

The Corps has determined that the proposed project would have no adverse effect on historic properties as concluded in the PA.

6.13 Flood Hazards

There are no identified flood hazards within the proposed project area. There are no buildings or habitable structures proposed to be located within established floodplains in the proposed project area. Gravel pads and roads would not be constructed within floodplains, except where stream crossings would occur. Structures including VSMs, stream crossings via culverts or bridges, and ice roads would be designed for the 50-year flood, and therefore would not have an impact on flood hazards in the proposed project area.

Beneficial Effects

There are no beneficial effects anticipated from the construction of the proposed project.

Detrimental Effects

There are no flood hazards in the proposed project area.

Factor Conclusion

The Corps finds that the proposed project would have no effect on flood hazards.

6.14 Floodplain Issues

There are no identified floodplain issues that exist already or would be incurred from the construction of this project. There are no National Flood Insurance Program designated floodplains within the proposed project area and no existing Floodplain Management Plans. There are many small streams within the project area that flood in the spring and during storm events. Seasonal ice roads and the proposed pipelines would cross these waters.

There are no buildings or habitable structures proposed to be located within floodplains within the proposed project area. Gravel pads and roads would not be constructed within floodplains, except where road crossings would occur. These effects would be mitigated with installation of suitably sized culverts.

Beneficial effects

There are no beneficial effects to floodplains anticipated from the construction of this proposed project.

Detrimental effects

Gravel fill would eliminate 267.1 acres of wetlands where flood waters may be stored. Proposed fill areas that would adversely impact the hydrologic regime include placement of gravel fill; construction of pipelines; and construction of a new gravel mine site.

Ice roads, particularly those with cross gradient alignments, would alter sheetflow during spring snowmelt, in some areas impounding water up-gradient, temporarily reducing flows to basins that detain runoff. These ice roads would be slotted at the creek crossings to facilitate break up in spring.

Factor Conclusion

The Corps finds that the proposed project would have a minimal detrimental effect on floodplain issues. Applicant proposed mitigation is discussed in Section 5.0 of this ROD. Corps-considered mitigation is included in Section 7.2 of this ROD. The Corps would require additional mitigation measures to further minimize impacts. These conditions are described in Section 7.3 of this ROD.

6.15 Land Use

The State of Alaska manages the land in and around the proposed project area for oil and gas development, and the proposed project is expected to lead to substantial new hydrocarbon production in accordance with the management intent for the area. State land in the project area has been designated as Resource Management Land and intended management uses include resource development and general public uses, with the exception of overland motor vehicle use unless for subsistence. The proposed project area is subject to recent land use permits and leases intended to develop these lands for oil and gas leasing and production. These leases are currently held by the applicant.

Current land uses in the study area include subsistence and traditional uses by local residents, outdoor recreation, industrial land uses, and transportation. There are no settlements or residents in the area between Kaktovik and Deadhorse.

In Alaska land below MHW (the "beach") typically is open for public access, except where permitted for specific uses such as large commercial or public docks or ports, or similar developments. The Alaska Constitution provides that "waters are reserved to the people for common use." Submerged lands constitute part of the State's public domain.

The State asserts that a public highway right-of-way exists across state and federal lands under RS2477 with a 100-foot-wide public access right-of-way. The Bullen-Staines River Trail (RST 1043), including two main routes and a spur trail, passes directly through the proposed project area. The route is listed as about 22 miles long, from Bullen Point to the Staines River/Canning River delta.

Prior to the proposal of this project, the lands were zoned by the NSB as a "conservation district" but were recently approved to be rezoned as a "resource development district" to accommodate the proposed project.

Subsistence hunting, as a land use, is addressed in Section 6.1, Needs and Welfare of the People of this ROD. Recreation is discussed in Section 6.8, Recreation of this ROD.

In practice, the land within the project area is mostly undeveloped and is in a near wilderness state. With the construction of the proposed project, the land use will shift to industrial and active.

Beneficial Effects

The proposed project would fulfill the landowner's intent for use of the land for resource development. Minor benefits from construction of ice and gravel roads, barge facilities, and the boat launch would improve shipping and emergency access to North Slope communities including the Village of Kaktovik. The seasonal sea ice road would also pass immediately adjacent to the Bullen Point federal property and could provide access to the Bullen Point property for expected building demolition and for any future use.

Detrimental Effects

The proposed project includes a 22-mile export pipeline to Badami. In an area about 2 miles wide along this corridor, existing land uses such as subsistence hunting and other general public recreation and wildlife activity would be altered but not disallowed. This corridor would lie 1 to 2 miles inland from the coast.

The pipeline and ice road routes cross the Bullen-Staines River Trail (RS 2477) right-of-way four times by the pipeline. Use of the trail would not be impeded by the infrastructure.

Factor Conclusion

The Corps finds that the proposed project would have a beneficial effect on land use. Applicant proposed mitigation is discussed in Section 5.0 of this ROD. Corps-considered mitigation is included in Section 7.2 of this ROD.

6.16 Navigation

Navigation in the general area includes barge traffic with supplies, materials, and cargo supporting both industrial activity as well as goods for Native villages (specifically Kaktovik, 62 miles east of the proposed project area), subsistence hunting for whale and caribou; and recreational purposes including ice-breaking and cruise ships, sea kayakers, and tour boats from Kaktovik.

Marine transportation is vitally important for the transport of equipment and materials to Point Thomson during the open water seasons when ice roads are not available or when heavy loads are not able to be transported via aircraft. Depending on nearshore ice conditions, the open water season is generally from late July or early August through the end of September.

There are no navigable rivers in the proposed project area, and most hunters and recreationists travel by foot or snowmobile. Other smaller streams and creeks within the proposed project area are not considered navigable by the Corps in accordance with 33 CFR Part 329, Definition of Navigable Waters of the U.S., because they have not, cannot, and would not support transportation for interstate or foreign commerce.

Beneficial effects

Navigational access to this area would be improved by dredging a basin for barge and boat access. The navigational basins would be maintained by periodic dredging. Loading and offloading facilities and mooring dolphins would also be constructed to aid vessels. Other navigational aids including lighting and signage would be added. While use of these facilities would be access restricted, they could be available for use in emergency situations as necessary, in an area that currently has no marine facilities. The applicant's Plan of Operations should establish access and use of the facilities in accordance with the terms of the state lease, permits and/or company policy.

Detrimental effects

No detrimental effects to navigation have been identified.

Factor Conclusion

Based on consideration of these factors, the proposed project would have a beneficial effect on navigation. Corps-considered mitigation is included in Section 7.2 of this ROD. The Corps would require additional mitigation measures to further minimize impacts. These conditions are described in Section 7.3 of this ROD.

6.17 Shore Erosion and Accretion

Most of the Beaufort Sea shoreline is erosional. The coastal bluffs contain large quantities of ice and fine-grained organic material and, consequently, provide little sediment to replenish the beaches as they erode. Within Lion Bay, barrier islands limit the amount of shoreline erosion by sheltering the mainland coast from extensive wave action. Aerial photos of the study area indicate average annual shoreline

erosion rates of 1.2 to 4.1 feet per year, with the highest rates occurring at the proposed West Pad location, as noted in Section 3.5, Physical Oceanography and Coastal Processes of the Final EIS. During a strong storm surge with persistent winds and sustained wave conditions, standing waves could develop in front of the bulkhead. Wave run-up on the vertical face of the bulkhead could be as much as twice the incident wave height, about 10 to 12 feet, exposing the seabed at the bulkhead base to intense bottom-scouring. Substantial scouring could result in the exposure and cutting into the underlying permafrost. Within the PTP area, the shoreline is composed of fine-grained soils and permafrost with no natural rock outcrops. Any manmade structures, such as the boat launch ramp or Central Pad, are capable of disrupting the natural longshore current response of the shoreline to effects of wave and water level fluctuations.

Beneficial Effects

There would be no beneficial effects to shoreline erosion and accretion as a result of this project.

Detrimental Effects

These facilities are designed such that they would not appreciably affect longshore current transport of sediments or other erosional materials. Detrimental effects to shoreline erosion and accretion would not occur as a result of this project.

Factor Conclusion

The Corps finds that the proposed project would have a minimal detrimental effect on shore erosion and accretion. Applicant proposed mitigation is discussed in Section 5.0 of this ROD. Corps-considered mitigation is included in Section 7.2 of this ROD. The Corps would require additional mitigation measures to further minimize impacts. These conditions are described in Section 7.3 of this ROD.

6.18 Water Quality

Water quality in the project area is good according to Section 3.7, Water Quality of the Final EIS. No marine or freshwater bodies are listed as impaired. No elevated concentrations of trace metals, nitrogen, or hydrocarbons have been detected in freshwater bodies or water sampled from Lion Bay. Increased turbidity is typically observed during spring breakup.

Temperature and salinity in the Beaufort Sea varies depending on location and time of year. Sea ice typically begins to form in late September and remains on the Beaufort Sea until spring breakup, usually in June. At the beginning of the open-water season there is a stratified water column that has a freshwater layer resulting from sea ice melt and freshwater runoff, up to 13 feet thick, over a marine water layer. During the summer, these layers mix together and the water gradually becomes more saline.

Additional discussion on water quality and chemistry (40 CFR 230.22) related impacts and mitigation measures to address those impacts are discussed in Water Circulation, Fluctuation, and Salinity Determinations in Section 5.3 and 8.4 of this ROD.

Beneficial Effects

There are no beneficial effects to water quality anticipated to result from the construction of this proposed project.

Detrimental Effects

Increased sedimentation in the project area would temporarily increase turbidity concentrations in localized areas, particularly during spring breakup. Sediments and dust would be disturbed and deposited on snow and ice during the winter or on tundra and open water during the summer during construction and general travel on gravel roads, airstrip, and pads, and during the course gravel mining and VSM installation. The sediments and dust would then be introduced into the water column, causing an increase in turbidity. Other activities that would contribute to increased turbidity and TSS include pile driving, dredging, and screeding for the barge service pier and sealift facility as well as during barge loading and offloading.

An increase in turbidity has the potential to increase trace metals concentrations, depending on their concentrations in the sediments. These would be small and difficult to differentiate from trace metals introduced naturally during spring breakup.

An increase in turbidity also has the potential to change water temperature, which in turn would decrease the DO concentrations in the water column. Impacts would occur during spring breakup, when water would be present and sediments would enter the water column, which would decrease DO concentrations. The impact would be small during this particular time of year, when sediment transport in the water column is high.

Tundra ice roads would have a local effect on alkalinity and pH in the surrounding freshwater bodies during spring melt near the road footprint. Lakes adjacent to the coast have higher TDS concentrations than lakes inland. If water for ice roads is drawn from lakes near the coast, alkalinity would increase under and adjacent to the road during spring melt.

Small to medium spills would occur over the proposed project life but would be restricted in geographic extent unlikely to have measureable impacts on resources. Large or very large spills would be unlikely to occur. In the unlikely event that a large or very large spill were to occur, it would result in major to catastrophic impacts to water quality.

Factor Conclusion

The Corps finds that the proposed project would have a minor detrimental effect on water quality. Applicant proposed mitigation is discussed in Section 5.0 of this ROD. Corps-considered mitigation is included in Section 7.2 of this ROD. The Corps would require additional mitigation measures to further minimize impacts. These conditions are described in Section 7.3 of this ROD.

6.19 Food and Fiber Production

The proposed project does not include lands suitable for the agricultural production of food or fiber products; therefore, the public interest would not be affected by the proposed project. Subsistence activities, including the harvesting of wild food (such as berries) and fibers (such as grasses and sedges), are conducted within and near the area of the proposed project and are discussed in Section 6.1, Needs and Welfare of the People of this ROD. There would be no beneficial or detrimental effects to food and fiber production as a result of the proposed project.

6.20 Mineral Needs

Gravel mining would be required to construct the proposed project. The applicant's Gravel Site Mining and Rehabilitation Plan states that the gravel mine site is required to supply an estimated 2.25 million cubic yards of gravel for the proposed project's infrastructure.

Beneficial Effects

The applicant would benefit from the presence of gravel onsite. There are no other beneficial effects to mineral needs anticipated from the construction of the proposed project.

Detrimental Effects

Mineral needs are related to the extraction and use of nonrenewable resources, including gravel, for construction and operation of the facility. The material would be retrievable and it is common practice to reclaim gravel material for use on other projects.

Approximately 2.25 million cubic yards of gravel would be required for the construction of the airstrip, roads, pads, and other required infrastructure. Gravel extraction may leave the area vulnerable to thermokarsting and slope failure and loss of habitat. Gravel resources are plentiful in the proposed project area and use of these resources would not have a measurable effect on the abundance of the resource. Gravel material may be reclaimed for use on other sites or for future projects. Contaminated gravel would have to be hauled off site or treated.

The mine site preparation, operation, subsequent closure and rehabilitation would occur over several years and would be done in a manner that minimizes the extent of wetland and vegetation disturbance at the site.

Factor Conclusion

The Corps finds that the proposed project would have a moderate detrimental effect on mineral needs. Applicant proposed mitigation is discussed in Section 5.0 of this ROD. Corps-considered mitigation is included in Section 7.2 of this ROD. The Corps would require additional mitigation measures to further minimize impacts. These conditions are described in Section 7.3 of this ROD.

6.21 Considerations of Property Ownership

Land ownership in the project area is dominated by the State of Alaska. The proposed project is located exclusively on state land. Section 3.13, Land Ownership, Land Use, and Land Management of the Final EIS addresses land ownership. Section 5.13, Land Ownership, Land Use, and Land Management of the Final EIS addresses impacts to property ownership within the proposed project area.

Beneficial Effects

The proposed project is in alignment with the land owner's intent for use of the land. The applicant and State have a lease agreement and settlement agreement which require implementation of the proposed project.

Detrimental Effects

There are no detrimental effects or other changes to property ownership anticipated from implementation of this proposed project.

Factor Conclusion

The Corps finds that the proposed project would have no detrimental effect on land ownership. Land use is also discussed in Section 6.15 of this ROD.

6.22 Climate Change

Climate change is described in Section 4.3 of the Final EIS. Because the proposed action for the PTP would result in emissions from power generation that would exceed 25,000 metric tons per year, and because the project area is in the Arctic, an area in which climate change effects are currently being observed, an analysis of climate change effects is warranted (See Section 4.3, Climate Change of the Final EIS). The effects of climate change on natural systems within the ACP are further discussed in detail throughout Chapter 5 of the Final EIS.

Resources affected by climate change include water resources, ecosystems, society, weather and atmosphere, transportation, and public health.

The environmental consequences of climate change, characterized by changes in air and soil temperature and winter and summer precipitation patterns, include impacts on construction and operational components of the proposed project. In particular are changes in the physical and hydrological properties of soils and permafrost and the changes in oceanic processes and surface hydrology, which could affect both gravel and ice infrastructure throughout the project area, in both coastal and inland areas.

Beneficial Effects

Beneficial effects of climate change, resulting in a longer open-water season, include an increase in the availability to use the port for transportation of materials, supplies, and people.

Detrimental Effects

Detrimental effects of the project on the advancement of climate change are possible through the emission of GHG resulting from the burning of liquid hydrocarbons in the construction of the proposed project. Based on estimates provided by the applicant, the direct annual CO₂ emissions increase associated with construction, drilling, and operation phases of the alternatives would contribute approximately 0.001 percent to the global CO₂ emissions, and therefore have negligible effect on the contribution to climate change. Additional impacts would be incurred from the burning of the resulting liquid hydrocarbons produced as a result of the project.

Detrimental effects of climate change, in the form of warming temperatures includes early thaw of ice roads, minimizing the functional use of this mode of transportation during winter months. Changes in hydrologic flow from changes in air temperature or increase in precipitation may affect the structural integrity of roads and culverts.

Climate change effects on marine mammals, particularly polar bears, would be the reduction in sea ice during the summer. USFWS anticipates that polar bear use of the Beaufort Sea coast for denning would increase during the open-water season (June through October) due to changing ice conditions. This would increase the likelihood of wildlife-human interaction, especially around the Central Pad and other coastal infrastructure.

Coastal erosion would increase as a result of a longer open water season, except in areas where there are barrier islands. Since there are barrier islands across the extent of the project area, this would not have a detrimental effect in the project area.

Factor Conclusion

The Corps finds that climate change may have an adverse effect on the proposed project. However, the project contribution to climate change is anticipated to be minimal.

6.23 Cumulative and secondary affects on the aquatic ecosystem

A discussion and determination of cumulative (40 CFR 230.11(g)) and secondary (40 CFR 230.11(h)) effects on the aquatic ecosystem are included in Cumulative Impacts in Section 5.3 of this ROD.

6.24 Other factual determinations and Technical evaluation Factors

The following factual determinations and technical evaluation factors are drawn from the PTP Final EIS and subsequent supplemental information reported in Section 5.3, Factual Determinations and Technical Evaluation Factors of this ROD.

Physical substrate determinations and Substrate related impacts and mitigation measures to address those impacts are discussed and determined in Physical Substrate Determinations in Section 5.3 of this ROD.

Water circulation, fluctuation and salinity related impacts and mitigation measures to address those impacts are discussed and determined in Water Circulation, Fluctuation, and Salinity Determinations in Section 5.3 of this ROD.

Suspended particulate/turbidity related impacts and mitigation measures to address those impacts are discussed and determined in Suspended Particulates and Turbidity Determinations in Section 5.3 of this ROD.

Contaminants including the evaluation of dredged and fill material, and their related impacts and mitigation measures to address those impacts are discussed and determined in Contaminant Determinations in Section 5.3 of this ROD.

Aquatic ecosystem structure and function related impacts and mitigation measures to address those impacts are discussed and determined in Aquatic Ecosystems Structure and Function Determinations in Section 5.3 of this ROD.

Special aquatic site (including sanctuaries and refuges (40 CFR 230.40), wetlands (40 CFR 230.41), mudflats (40 CFR 230.42), vegetated shallows (40 CFR 230.43), coral reefs (40 CFR 230.44), and riffle

and pool complexes (40 CFR 230.45) related impacts and mitigation measures to address those impacts are discussed in and determined Impacts on Special Aquatic Sites in Section 5.3 of this ROD.

Proposed disposal site related impacts and mitigation measures to address those impacts are discussed and determined in Proposed Disposal Site Determinations in Section 5.3 of this ROD.

Recreation and commercial fishery related impacts and mitigation measures to address those impacts are discussed and determined in Recreational and Commercial Fishing in Section 5.3 in this ROD.

Wild and Scenic Rivers, National Wilderness Areas, National Seashores, National Parks, estuarine and marine sanctuaries, Parks, national and historic monuments, wilderness areas, research sites, and similar preserves (40CFR 230.54) related impacts and mitigation measures to address those impacts are discussed and determined in Parks, National and Historic Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves (40 CFR 230.54) in Section 5.3 in this ROD.

The proximity of development at Point Thomson to the ANWR may influence management by the USFWS, particularly if oil and gas development beyond the ANWR's borders affects movements and behaviors of wildlife that use ANWR lands or if recreation use patterns shift. No ANWR lands would be lost to recreation as a result of the proposed project. Since the proposed project is located more than 2 miles from the western boundary of the ANWR, it is not anticipated that the proposed project would affect recreation east of the Canning River.

Effects on limits of the territorial sea (320.4(f)) there are no limitations of the territorial sea anticipated from the construction of this project.

Activities affecting coastal zones (320.4(h)): By operation of Alaska State law, the federally approved Alaska Coastal Management Program expired on July 1, 2011, resulting in a withdrawal from participation in the Coastal Zone Management Act's (CZMA) National Coastal Management Program. The CZMA Federal consistency provision, section 307, no longer applies in Alaska. Federal Register Notice published July 7, 2011, Volume 76, No. 130, page 39857.

Prime and unique farmland (7CFR Part 658): This law requires that Federal agencies take into account the adverse effects of their programs on the preservation of farmland and to consider alternative actions, as appropriate, that could lessen such adverse effects. The Natural Resources Conservation Service advises that there is no Prime or Unique Farmland designated in the State of Alaska.

6.25 Public Interest Review General Criteria

The relative extent of the public and private need for the proposed structure or work: There is a large public and private need for the project to produce energy resources. A positive effect on economic needs of this project was determined in Section 6.9, Economics of this ROD. The purpose of the proposed project is driven, in part, by the applicant's desire to return a profit. The project would also generate short and long term employment, added tax revenue at the local, state, and federal levels. The addition of transportation infrastructure at this location would improve access and safety response to Kaktovik and other areas of the eastern ACP.

The practicability of using reasonable alternative locations and/or methods to accomplish the objective of the proposed structure or work is discussed in Section 5.1, Finding of Practicable Alternatives in this ROD. Five alternatives were thoroughly described in Chapter 5 of the Final EIS. Minor modifications of the applicant's preferred alternative were further considered in response to comments received from the second Public Comment period. Fill pads and roads have been modified to balance access to the reservoir and protection of aquatic resources. It is not practicable to use alternative locations or methods for this proposal because of the location of the hydrocarbon reservoir.

The extent and permanence of the detrimental effects that the proposed structures or work may have on the public and private uses to which the area is suited is discussed in Section 5.25 of the Final EIS. Detrimental effects of the project on subsistence harvests, lifestyle, habitat use and spill potential would continue at least as long as the project related infrastructure is in place. The extent of this project is approximately 267.1 acres of fill in WOUS for gravel pads, roads, an airstrip, and a gravel mine. Structures would be placed in marine waters and pipelines would extend approximately 30 miles through WOUS. The permanence of this development would be a minimum of 30 years. The area is suited for oil and gas production, subsistence use by Natives, and recreation by the general public. It would change from a subsistence use and recreation area to an industrial area. Detrimental effects would also include

air pollution, loss of wetland functions including fish and wildlife habitat, flood storage and other effects discussed in the 6.0 of this ROD, and would be considered permanent.

7.0 Description of the Permitted Project

This section identifies the major features of the project that would be permitted by the Corps. The description includes modifications incorporated into the LEDPA during public review and the mitigation measures and special conditions that the Corps permit would require for this action.

7.1 Description of Project Features

The permitted project is the applicant's proposed action (which is described in detail in Section 2.4.2 and 2.4.3 of the Final EIS and is summarized in Section 2.1, Project Description of this ROD) modified to incorporate changes in location and configuration of project features as described in Section 5.4, Determination of Compliance or Non-compliance with Restrictions on Discharge and summarized in Section 3.4, LEDPA of this ROD. The East and West Pad modifications considered after public review are addressed in Section 3.3, Options Considered following Public Review.

Locations of the major components of the project are as follows:

- The Central Pad would be located at approximate Latitude 70.171° N., Longitude 146.257° W. in Sec. 34, T. 10 N., R. 23 E. and Sec. 3, T. 9 N., R. 23 E., Umiat Meridian.
- The East Pad would be located at approximate Latitude 70.153° N., Longitude 146.164° W., in Sec. 6, T. 9 N., R. 24 E. and Sec. 7, T. 9 N., R. 24 E. and Sec. 12, T. 9 N., R. 23 E., Umiat Meridian.
- The West Pad would be located at approximate Latitude 70.178° N., Longitude 146.444° W., in Sec. 36, T. 10 N., R. 22 E., Umiat Meridian.
- The gravel mine would be located at approximate Latitude 70.146° N., Longitude 146.254° W., in Sec. 10, T. 9 N., R. 23 E. and Sec. 11, T. 9 N., R. 23 E., Umiat Meridian.
- An equipment and supply staging area would be located at the existing Alaska State C-1 Pad site located at approximate Latitude 70.139° N., Longitude 146.244° W., in Sec. 14, T. 9 N., R. 23 E., Umiat Meridian.
- The airstrip would be located between approximate Latitude 70.139° N., Longitude 146.269° W., in Sec. 15, T. 9 N., R. 23 E., Umiat Meridian and Latitude 70.133° N., and Longitude 146.312° W., in Sec. 16, T. 9 N., R. 23 E., Umiat Meridian.
- An auxiliary pad supporting the junction of the Point Thomson Export Pipeline with the Badami Pipeline would be located at the existing Badami Site located at approximate Latitude 70.150° N. Longitude 147.100° W., in Sec. 8, T. 9 N., R. 20 E., Umiat Meridian.
- A pipeline crossing pad would be located at approximate Latitude 70.148° N., Longitude 147.095° W., in Sec. 9, T. 9 N., R. 20 E., Umiat Meridian.
- A water access pad would be located at approximate Latitude 70.138° N., Longitude 146.252° W., in Sec. 15, T. 9 N., R. 23 E., Umiat Meridian.
- A dredging and screeding area located at approximate Latitude 17.175° N., Longitude 146.257° W., in Sec. 34, T. 10 N., R. 23 E., Umiat Meridian.
- A dredge material disposal site would be located at approximate Latitude 70.177° N., Longitude 146.289° W., in Sec. 34, T. 10 N., R. 23 E., Umiat Meridian.
- Two dredge material and gravel fill sites to accommodate wildlife movement at approximate Latitude 70.170° N., Longitude 146.250° W., in Sec. 2, T. 9 N., R. 23 E., Umiat Meridian and Latitude 70.173° N., Longitude 146.252° W., in Sec. 34, T. 10 N., R. 23 E., Umiat Meridian.
- An export pipeline would extend west 22 miles from the Central Pad (Latitude 70.171° N., Longitude 146.257° W., in Sec. 34, T. 10 N., R. 23 E. and Sec. 3, T. 9 N., R. 23 E., Umiat Meridian) to connect with an existing common carrier pipeline to Badami (Latitude 70.150° N.,

Longitude 147.100° W., in Sec. 8, T. 9 N., R. 20 E., Umiat Meridian) as shown on Figures 31 through 33 of the attached DA permit figures dated October 2012.

- Infield gathering pipelines would connect between the East (Latitude 70.171° N., Longitude 146.257° W., in Sec. 34, T. 10 N., R. 23 E., and Sec. 3, T. 9 N., R. 23 E., Umiat Meridian), Central (Latitude 70.171° N., Longitude 146.257° W., in Sec. 34, T. 10 N., R. 23 E. and Sec. 3, T. 9 N., R. 23 E., Umiat Meridian) and West Pads (Latitude 70.178° N., Longitude 146.446° W., in Sec. 36, T. 10 N., R. 22 E., Umiat Meridian) along the routes shown in Figures 33 and 34 of the attached DA permit figures dated October 2012.
- Infield gravel roads would run between the pads (locations listed above), gravel mine (Latitude 70.146° N., and Longitude 146.254° W., in Sec. 10, T. 9 N., R. 23 E. and Sec. 11, T. 9 N., R. 23 E., Umiat Meridian), and airstrip (Latitude 70.139° N., Longitude 146.269° W., in Sec. 15, T. 9 N., R. 23 E. and Sec. 16, T. 9 N., R. 23 E., Umiat Meridian) as shown on Figures 21 of the attached DA permit figures dated October 2012.
- Eight mooring dolphins placed in the following approximate locations in Sec. 34, T. 10 N., R. 23 E., Umiat Meridian:
 - Latitude 70.174° N., Longitude 146.255° W.
 - Latitude 70.174° N., Longitude 146.256° W.
 - Latitude 70.175° N., Longitude 146.257° W.
 - Latitude 70.175° N., Longitude 146.258° W.
 - Latitude 70.175° N., Longitude 146.258° W.
 - Latitude 70.175° N., Longitude 146.255° W.
 - Latitude 70.176° N., Longitude 146.254° W.
 - Latitude 70.177° N., Longitude 146.253° W.
- Service pier with six service pier piles located at approximate Latitude 70.175° N., Longitude 146.257° W., in Sec. 34, T. 10 N., R. 23 E., Umiat Meridian.

Table 7.1 describes proposed structures in navigable waters of the U.S. Table 7.2 details the type and acreage of all permitted infrastructure requiring fill in WOUS.

Table 7.1: Permitted Structures in Section 10 Waters of the U.S.		
Component	Footprint (acres)	Type of Material
Service Pier Piles (6)	<0.1	Steel
Mooring Dolphins (8)	<0.1	Steel
Temporary Ramp Supports (6)	<0.1	Steel

Table 7.2: Permitted Discharge Material Type, Volume, and Acreages			
Component	Approximate Initial Placement Volume (cy)	New Fill (acres)	Type of Material Discharged
Fill in Section 404 Waters of the U.S.			
Central Pad ^a	576,000	42.4	Pit run gravel fill
Central Pad Access Road (2.7 miles)	152,000	19.4	Pit run gravel fill
East Pad	294,000	20.9	Pit run gravel fill
East Pad Access Road (2.3 miles)	137,000	17.3	Pit run gravel fill
West Pad	238,000	20.6	Pit run gravel fill
West Pad Access Road (4.4 miles)	275,000	33.4	Pit run gravel fill
Alaska State C-1 Pad ^b	17,000	0.0	Pit run gravel fill
Alaska State C-1 Pad Access Road (0.03 miles)	2,200	0.4	Pit run gravel fill
Emergency Boat Launch (onshore)	980	0.05	Pit run gravel fill/concrete
Wildlife Corridor (onshore)	480	0.25	Dredged material/gravel
Dredged Material Disposal	3,900	1.4	Dredged material
Water Source Pad	7,100	0.7	Pit run gravel fill
Water Source Pad Access Road (0.03 miles)	1,100	0.2	Pit run gravel fill
Badami Auxiliary Pad	2,000	0.25	Pit run gravel fill
Badami Pipeline Crossing Pad	1,000	0.16	Pit run gravel fill
Airstrip and Helipad	414,000	42.3	Pit run gravel fill
Airstrip and Helipad Access Road (0.24 miles)	12,000	1.7	Pit run gravel fill
Navaid Pads	15,000	1.6	Pit run gravel fill
Navaid Pad Access Roads (0.22 miles)	9,000	1.5	Pit run gravel fill
Electrical Trenching	2,670	0.41	Organic/inorganic
Gathering and Export Pipeline VSMS	3,500	0.13	Sand slurry/steel
Culvert Scour Protection	-	0.09	Concrete
Gravel Mine	2,296,000 gravel extracted 782,000 overburden replaced	48.9	Pit run gravel fill/ overburden
Gravel Mine Access Road (0.14 miles)	8,600	1.2	Pit run gravel fill
Gravel Stockpile	135,000	5.2	Pit run gravel fill
Gravel Stockpile Access Road (0.04 miles)	1,700	0.65	Pit run gravel fill
Fill in Section 10 and Section 404 Waters of the U.S.			
Emergency Boat Launch	80	0.16	Pit run gravel fill/concrete
Wildlife Corridor	1,580	0.35	Dredged material/gravel
Dredging and Screeding Area	3,900 CY removed	5.5	Dredged material
Total	3,112,890 ^c	267.10	-

^a Central Pad footprint would also include the existing 12.9 acre PTU-3 pad for total acreage of 55.3 acres

^b Alaska State C-1 Pad would also include the existing 4.1 acre Alaska State C-1 pad

^c Does not include extracted gravel or removed dredged material

7.2 Mitigation Discussion

Direct and indirect impacts to special aquatic sites, in the form of wetlands as described in 40 CFR 230 Subpart E, would occur as a result of construction of the proposed project. These impacts are described in Chapter 5 of the Final EIS and summarized in Section 5.0, Evaluation of Compliance with 404(b)(1) Guidelines and Section 6.0 Public Interest Review Factor Assessment in this ROD.

The project would affect the following key aquatic resource functions: flood flow moderation and conveyance, shoreline and bank stabilization, maintenance of natural sediment transport processes, production and export of organic matter, maintenance of thermal regimes, waterbird support, terrestrial mammal support, resident and diadromous fish support, threatened and endangered species support (spectacled eider and polar bear), and scarce and valued habitats.

Impacts to these functions and values would occur by the direct filling of wetlands with gravel material to construct the project, excavation of a gravel mine, water withdrawal, trenching, drilling, construction of ice roads and pads, tundra travel, and other operational activities. These activities would result in secondary impacts such as: deposition of dust, creation of impoundments, development of thermokarsts, and both temporary and permanent changes to wetland vegetation and hydrology within the project area.

Moderate impacts to vegetation and wetlands are probable and would last beyond the life of the project.¹²⁰ The LEDPA would affect several types of wetlands and waterbodies (bay, lagoons, inlets, subtidal rivers, rivers, stream, lakes, and ponds).

The LEDPA would result in the direct loss of 267.1 acres of WOUS and result in secondary impacts to 1013.6 acres of WOUS. Impacts from the LEDPA would generally be minor and ranging in geographic extent from the project footprint to the project area, considering the expanse of wetlands present in the ACP.¹²¹

Avoidance/Minimization

Marine impacts were avoided by eliminating previously proposed causeways and artificial islands. Wetland impacts would be reduced through minimization of the total project footprint and through application of BMPs during construction and operation activities. Avoidance and minimization are described in detail in the 404(b)(1) analysis included in Section 5.0, Evaluation of Compliance with 404(b)(1) Guidelines of this ROD.

Compensatory Mitigation Determination

The applicant has avoided and minimized to the maximum extent practicable, however there would be unavoidable impacts to WOUS as a result of the construction of this project. Since unavoidable wetland impacts cannot be wholly compensated for through avoidance or minimization, the Corps has agreed that the remaining impacts would be mitigated through payment of an ILF as described in Section 7.3, Special Conditions and Rationale for Inclusion.

Compensatory wetland mitigation is appropriate because there are still unavoidable impacts to WOUS that cannot be otherwise mitigated. Payment to an ILF entity would ensure the conservation of wetlands according to the ILF agreement with TCF and in compliance with 33 CFR 320.4(r), 33 CFR 332, and the Alaska District RGL 09-01.

ILF Program Credits: There are no approved mitigation banks within the ACP. There is an approved ILF program available through TCF; therefore, the applicant would be allowed to satisfy its compensatory wetland mitigation requirements through an arrangement with TCF. See Section 7.3 of this ROD. Table 7.3 details mitigation ratios required.

¹²⁰ Section 5.8 of the Final EIS describes the impacts associated with the applicant's proposed project (Alternative B). Changes to the applicant's proposed project as part of the LEDPA further reduce impacts to wetlands and vegetation. The change in impacts would reduce impacts to vegetation and wetlands to minor.

¹²¹ Section 5.8 of the Final EIS

	Acres	Exchange Ratio	Debits/Credits
Category I	267.1	3:1	801.3
Secondary	1013.6	0.3:1	304.1
Total	-	-	1105.4

The applicant has been coordinating with TCF to voluntarily develop a screening process to help select priority lands that would serve to best match the function and region in which mitigation would be applied. The applicant expressed a preference to purchase land or conservation easement on property located along the Beaufort Sea coast within the critical habitat of polar bear in order to gain “in-kind” credits.

A total of 1,115.6 credits shall be purchased from the ILF program operator.

7.3 Special Conditions and Rationale for Inclusion

Pre-construction Meeting

1. The permittee shall convene a one-time pre-construction meeting with their contractor representatives responsible for work authorized by the Department of the Army permit, a minimum of 15 days prior to commencement of construction in waters of the U.S. The permittee shall notify the Corps 15 days prior to the meeting of the meeting date and time. The permittee shall provide copies of the Department of the Army permit, figures, and other documents incorporated into the permit, to all contractor representatives.

Rationale: To ensure clarification of all permit requirements with the permittee and their contractors. (33 CFR 325.4)

Navigation

2. The permittee's use of the permitted activity must not interfere with the public's right to free navigation on all navigable waters of the U.S.

Rationale: Protection of navigation and the general public's right of navigation on the water surface is a primary concern of the federal government. This condition is required by regulation. [33 CFR PART 320.4(o)(3)].

3. The permittee must install and maintain, at the permittee's expense, any safety lights and signals prescribed by the U.S. Coast Guard, through regulations or otherwise, on authorized facilities. The U.S. Coast Guard may be reached at the following address and telephone number: Commander (oan), 17th Coast Guard District, P.O. Box 25517, Juneau, Alaska 99802, (907) 463-2272.

Rationale: The facility must be lighted to prevent navigation hazards and this condition is required by regulation. [33 CFR PART 320.4(o)(3)]

4. The permittee understands and agrees that, if future operations by the U.S. require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work will cause unreasonable obstruction to the free navigation of the navigable waters, the permittee shall be required, upon due notice from the Corps, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the U.S. No claim will be made against the U.S. on account of any such removal or alteration.

Rationale: This condition is required by regulation to protect free navigation and the interests of the United States in existing or future federal projects. [33 CFR PART 320.4(o)(3) and HQ memorandum].

5. Driving of all offshore piles shall occur during winter, when sea ice is well established in the work area to minimize disturbance to marine mammals, fish, essential fish habitat, and invertebrates. After

construction, all temporary ramp supports used in the construction of the sealift facility shall be removed.

Rationale: This condition is added to prevent suspended particulates and protect coastal substrates, water quality, fish, wildlife (including marine mammals) and essential fish habitat, and the needs and welfare of the people in accordance with 40 CFR 230.11 (a), 40 CFR 230.21, 40 CFR 230.22, 33 CFR 320.4(a), 33 CFR 320.4(d), 40 CFR 230.11(f)(2), 40 CFR 230.11(e), 40 CFR 230.31, 33 CFR 320.4(c), 40 CFR 230.32, 40 CFR 230.32, and 33 CFR 320.4(a)(1).

6. Construction dredging of the service pier and sealift barge basins shall be done through the ice during the winter.

Rationale: This condition is being included to protect coastal substrates, marine wildlife habitat, aquatic organisms, 40 CFR 230.11(f)(2), 40 CFR 230.31, 40 CFR 230.11(e), 40 CFR 230.32, 33 CFR 320.4(c)

7. Maintenance dredging of the constructed navigation basins for the sea lift and service barge berths is authorized for 5 years from the date of this permit issuance. The permittee shall advise the Corps in writing, at least two weeks before starting maintenance dredging activities under the authority of this permit. Maintenance dredging (screeding) necessary during the open water season shall be conducted using a suspended silt curtain on floats that reaches to the sea floor and completely surrounds the dredged area. The curtains shall be installed prior to any maintenance dredging (screeding) work in the waters of the Beaufort Sea. The suspended silt curtain shall remain in place until all suspended sediments are settled and the water column returned to pre-dredged clarity. No dredged material shall be allowed to measurably accumulate from the screeding (dredging) process whereby substrates accumulate along the basin margins or elsewhere to prevent navigational hazards and/or environmental impacts.

Rationale: This condition is being included to protect coastal substrates, marine wildlife habitat, aquatic organisms, 40 CFR 230.11(f)(2), 40 CFR 230.31, 40 CFR 230.11(e), 40 CFR 230.32, 33 CFR 320.4(c)

8. Fill material used for the wildlife corridor shall be pit run gravel from the Point Thomson mine site or, where practicable, dredged material. The wildlife corridor fill shall be protected using standard erosion protection materials such as concrete revetment or armor rock.

Rationale: This condition is being included to protect coastal substrates, marine wildlife habitat, aquatic organisms, 40 CFR 230.11(f)(2), 40 CFR 230.31, 40 CFR 230.11(e), 40 CFR 230.32, 33 CFR 320.4(c). Unfrozen dredged spoils will have high water content and easily drain to sea waters with high silt content. This condition will prevent siltation of the Beaufort Sea clear water conditions.

Compensatory Mitigation

9. As compensatory mitigation, the permittee shall make payment of an in-lieu fee (ILF) to The Conservation Fund (TCF), a Corps approved ILF Sponsor, to compensate for unavoidable direct and indirect impacts to aquatic resources. A ratio of 3 debits per 1 acre (3:1) is required for loss of 267.1 acres of waters of the U.S. A ratio of 3 debits per 1 acre prorated by 10 percent (0.3:1) is required for the indirect impacts to 1,013.6 acres of waters of the U.S. The total number of credits required to offset the debits of this project is 1,105.4. The fee shall be paid to TCF and proof of payment shall be provided to the Corps prior to commencement of any discharges or work authorized by this permit.

While TCF will be responsible for implementation of mitigation, the permittee and the Corps will coordinate with TCF to ensure that best efforts are made to utilize coastal land within the North Slope Borough for preservation and include establishment of a conservation easement. TCF can hold the permittee's ILF payment for a maximum of one year to obtain the coastal property and secure the conservation easement on that property. After one year has passed from TCF's receipt of the permittee's in-lieu fee payment, TCF may use the funds for purchase of another property in the Arctic coastal plain of the North Slope Borough.

Rationale: This condition is required to compensate for the unavoidable losses important to the human and aquatic environment [33 CFR 320.4(6), 33 CFR 320.4(r), 40 CFR 230.41, and 33 CFR 332.3].

Fill Placement

10. All fill material authorized under this permit must consist of suitable material free from toxic pollutants in toxic amounts.

Rationale: This condition is added to protect adjacent wetlands from direct or secondary impacts in accordance with 40 CFR 230.41, 40 CFR 230.42, 33 CFR 320.4(a).

11. Transportation vehicles and equipment shall not be operated off of authorized fill placement areas, except as authorized by state and local permits to operate on winter ice pads/roads or for tundra travel.

Rationale: This condition is added to protect adjacent wetlands from direct or secondary impacts in accordance with 40 CFR 230.41, 40 CFR 230.42, 33 CFR 320.4(a).

12. With the exception of the gravel roads which shall be staked at centerline; all authorized fill placement area boundaries shall be clearly delineated (staked, flagged, or otherwise) prior to the placement of fill.

Rationale: This condition is added to protect adjacent wetlands from direct or secondary impacts in accordance with 40 CFR 230.41, 40 CFR 230.42, 33 CFR 320.4(a).

13. Surface water flow throughout the project area shall be monitored for impoundments caused by roads, pads, or other gravel fill and additional culverts shall be installed to facilitate spring break-up sheet flow throughout the authorized project area. Natural drainage patterns shall be maintained using appropriate culverts to prevent ponding or drying outside the permitted authorized fill project boundaries. Evidence of ponding in wetlands areas, dewatering of wetlands, erosion, or stream channel changes are indicators of locations requiring corrective action.

Rationale: This condition is added to protect adjacent wetlands and surface waters from direct or secondary impacts in accordance with 40 CFR 230.41, 40 CFR 230.11(c), 33 CFR 320.4(d).

14. All discharges of fill material into waters of the U.S., including wetlands, shall be completed in the winter. An exception to this condition is for installation of fish passage culverts as authorized by Alaska Department of Fish and Game. All fill slopes according to project design shall be stabilized during summer to prevent erosion into streams and wetlands. Active sloughing of fill material or on-going erosion, sedimentation, and erosion scars (on slopes or around culverts) shall be indicators that stabilization is not adequate. Where specified in the attached figures, sideslopes to be vegetated shall be seeded with seed mixes containing only plant species native (i.e., indigenous) to the project area.

Rationale: This condition is added to protect adjacent wetlands, soils, and coastlines from direct or secondary impacts in accordance with 40 CFR 230.41, 40 CFR 230.11(a), 40 CFR 230.20, and 33 CFR 320.4(a)(1).

15. Dust reduction and snow removal plans shall be developed and submitted to the Corps for approval within 60 days of permit issuance. Any plan to be provided under these conditions shall be considered approved in 30 days after submission by the permittee unless the Corps provides written notice to the contrary.

- a. Dust reduction – the plan for dust suppression on all gravel surfaces shall be described and criteria established for implementation. Visible dust accumulation on vegetation shall be a clear indicator that further dust suppression is needed.
- b. Snow removal – the plan shall identify locations where snow will be pushed off of permitted fill surfaces and disclose how the gravel content in the snow shall be minimized. The snow removal plan shall also describe how any fill material that is inadvertently discharged into areas beyond the project footprint shall be removed the following spring.

Rationale: This condition is added to protect adjacent wetlands, surface waters, and soils from direct or secondary impacts in accordance with 40 CFR 230.41, 40 CFR 230.11(a), 40 CFR 230.20.

Utilities

16. Buried utility installation in the tundra wetlands shall be conducted in winter. The permittee shall use trenching, cable placement, and backfilling methods that minimize snow in the trench. The permittee shall remove snow from the trench before backfilling to minimize settling impacts and the subsequent effort needed for rehabilitation. The material removed from the trench shall be used as backfill. All sand and gravel backfill material shall be reduced in size to clumps no greater than 3 inches in diameter for backfill. The permittee shall mound excess excavated material over the trench following backfilling to ensure that the trench is filled to ground level after settlement.

Hand tools shall be used to move excess excavated materials remaining on the tundra wetlands back into the trench during the first spring following trenching completion. Mechanized equipment shall not be used to perform final clean up on adjacent tundra wetland surfaces. Remedial work shall be completed, as needed, to restore pre-project ground contours, to prevent surface water from flowing along the surface of the backfilled trench. Revegetation shall be completed using transplanted sprigs, cultivars, or seed either gathered onsite or otherwise obtained that match the native plant species that occur in the habitat adjacent to the trenched area. Revegetation work shall be completed by the end of the first growing season following the utility installation.

Rationale: This condition is added to protect adjacent wetlands from direct or secondary impacts in accordance with 40 CFR 230.41, 40 CFR 230.42, 33 CFR 320.4(a).

17. Placement of pipeline VSMs in ponds and in active low flow stream channels (defined by July/August flows) shall not occur except where necessary at East Badami Creek, L Stream, and E Stream.

Rationale: This condition is added to protect adjacent wetlands, surface waters, fish, and essential fish habitat from direct or secondary impacts in accordance with 40 CFR 230.41, 40 CFR 230.11(c), 40 CFR 230.20, 40 CFR 230.31, 33 CFR 320.4(c), and 33 CFR 320.4(d).

Gravel Mine

18. In the construction and rehabilitation of the gravel mine site, the following special conditions shall apply:

- a. The permittee shall provide the Corps a final gravel mining and rehabilitation plan. The mining and rehabilitation plan must be approved by the Corps prior to the permittee commencing construction of the gravel mine. The final gravel mine plan shall include the following details:
 - i. Vegetated areas along the north, west, and south sides of the mine shall be constructed with the placement of at least 6 inches of organic overburden over inorganic overburden at a slope of 3H:1V to a depth of 3 feet below the target water level at full capacity. Materials placed shall be roughly placed, thereby creating an irregular shoreline, and only roughly graded by equipment as needed to reach target slopes.
 - ii. A littoral shelf shall be constructed on the east side of the reservoir using inorganic overburden, to the extent available from the mine site, top dressed with no less than 6 inches of organic overburden. The littoral shelf shall have a slope of 5H:1V or flatter and the side slope from the edge of the littoral shelf to the bottom of the pit shall be 3H:1V. A berm shall be constructed along the western edge of the littoral shelf to facilitate water retention on the shelf. The berm shall be 3 to 4 feet in height greater than the target bottom elevation (this berm may be up to 1-foot below the target water elevation). After initial placement, further maintenance of the berm will not be required. The material for the berm shall be gravel or gravel with a 6-inch cover of organic overburden. Once the target water level has been reached in all areas of the mine site, then the berm shall be breached or otherwise modified to allow for a static water level between the deep water portion of the reservoir and fish passage into the deep water habitat.
 - iii. Landforms in the larger littoral area on the east side of the mine site shall include a general depth of no more than 3 feet below the surface of the adjacent tundra; five or more appropriately sized, irregularly shaped islands, designed to emerge above the final water level, shall have slopes no steeper than 3H:1V. The west-facing slope from the larger littoral area to the deeper basin shall be no steeper than 3H:1V.

- iv. Terrestrial areas shall be vegetated with a mix of *Poa glauca* (40 percent), *Arctagrostis latifolia* (40 percent), and *Poa alpina* (20 percent). *Deschampsia caespitosa* will be considered as an alternate to *P. alpina* based on availability. The seed mix shall be applied at a rate of 20 lbs/acre on slopes and islands, and 5-10 lbs/acre on relatively level surfaces. Fertilizer in terrestrial areas shall be applied at an appropriate rate based on site specific analysis conducted after mining is completed. In wet and/or shallowly flooded areas, transplanting (sprigging) of native (indigenous) plant species from the project area (i.e., the Arctic coastal plain) shall be used. As deemed necessary, a 0-45-0 NPK slow release tablet may be applied with aquatic sprigs. Progress reports shall describe seeding and fertilizing activities as appropriate.
 - v. By the tenth year following the application of the cultivation treatments, terrestrial areas will be expected to support at least 10 percent total live vascular cover comprised of at least five naturally colonizing species with at least 0.2 percent cover each.
 - vi. Monitoring shall be performed in Years 1, 2, 3, and biennially afterward until following initiation of rehabilitation. Reports shall be submitted to the Corps at the address specified on the accompanying transmittal letter. The rehabilitation and revegetation of the mine site shall not be complete until approved by the Corps in writing.
- b. Withdrawal of water from the mine site shall not occur, except as required for dewatering in between gravel mining seasons, until the site is filled to capacity and the habitat in the littoral zone of the reservoir is established to the satisfaction of the Corps. Following complete filling of the reservoir, the permittee shall place the intake end of a water withdrawal pipe in the reservoir deep water zone.

Rationale: This condition is added to facilitate successful rehabilitation of affected project areas for wildlife use once they are no longer in use in accordance with the public interest factors identified in 40 CFR Part 230 and 33 CFR Part 320.

19. The permittee shall direct discharge of mine dewatering water and hydrostatic test water down gradient toward a natural drainage and prevent scouring and erosion from occurring.

Rationale: The applicant proposed this condition as part of 402 requirements. This condition is added to protect adjacent wetlands, surface waters, and soils from direct or secondary impacts in accordance with 33 CFR 320.4, 40 CFR 230.41, 40 CFR 230.11(a), 40 CFR 230.20.

Endangered Species

20. The barge offloading area, which connects the Central Pad with the sealift bulkhead and service pier, shall be kept free of materials and equipment except while barges are being loaded or offloaded and this area is being used for short term (< 24 hours) storage of cargo. This area shall not be used for long term (>24 hours) storage of cargo, equipment, or materials. When large modules are offloaded, it may be necessary to store material for longer than 24 hours. However, this will be infrequent and the permittee shall provide the U.S. Fish and Wildlife Service a report when this occurs. The report, which shall be included as part of the annual report of polar bear observations to the U.S. Fish and Wildlife Service, shall briefly describe the type of materials stored, the length of time the offload area was used for storage, and any observations of polar bears that occurred during this time period.

Rationale: This condition is being included at the request of the U.S. Fish and Wildlife Service and agreed to by the applicant (33 CFR 320.4).

21. The permittee shall comply with all sections of the Incidental Take Statement, including the Reasonable and Prudent Measures and the Terms and Conditions, in the "Biological Opinion for ExxonMobil's Point Thomson Project," signed September 14, 2012 by the U.S. Fish and Wildlife Service, Alaska Region. The U.S. Fish and Wildlife Service, Alaska Region shall be informed of, and responsible for enforcing, any known violations of the incidental take statement.

Rationale: This condition is being included at the request of the U.S. Fish and Wildlife Service as stated in the "Biological Opinion for ExxonMobil's Point Thomson Project" dated September 14, 2012 (33 CFR 320.4).

22. The permittee shall comply with all sections of the "Letter of Concurrence for ExxonMobil's Point Thomson Project," signed September 14, 2012 by the National Marine Fisheries Service, Alaska Region. The permittee shall comply with all mitigative measures described in the "Biological Assessment of the Bowhead Whale (*Balaena mysticetus*), Ringed Seal (*Phoca hispida*) and Bearded Seal (*Erignathus barbatus*)" dated November 2011.

Rationale: This condition is being included at the request of the National Marine Fisheries Service as stated in the "Letter of Concurrence for ExxonMobil's Point Thomson Project" dated September 14, 2012 (33 CFR 320.4).

23. The permittee shall coordinate with the U.S. Fish and Wildlife Service to locate and avoid, to the maximum extent practicable as described in applicable Letters of Authorizations, active polar bear dens prior to winter construction activities.

Rationale: This condition is added at the request of the U.S. Fish and Wildlife Service. The Corps has accepted this condition because it would protect maternal sow bears and their cubs (33 CFR 320.4).

24. The permittee shall construct and maintain a 100-foot corridor from the extent of fill areas to the high tide line, as depicted in figure 83, for polar bear movement by placing pit run gravel, and if practicable dredged material, along the shoreline and lagoon adjacent to the east side of the proposed Central Pad. The corridor shall be maintained for the life of the project. This area shall be left vacant to allow for polar bear movements. Note: no dredged material will be placed seaward of the baseline, therefore not subject to the Marine Protection Research and Sanctuaries Act.

Rationale: This condition is added to address concerns of the U.S. Fish and Wildlife Service. The Corps has accepted this condition because it would maintain Polar bear access to the coastline around the Central Pad and reduce human/bear interactions (33 CFR 320.4).

Cultural Resources

25. All conditions contained within the Programmatic Agreement made under the National Historical Preservation Act shall apply to the construction of this project.

Rationale: The programmatic agreement is included at the request of the Alaska State Historic Preservation Officer and the Advisory Council on Historic Preservation and in accordance with 33 CFR 320.4(e) and Section 106 of the National Historic Preservation Act.

Fish and Wildlife

26. If placement of road fill material is not completed within any winter season, sufficient openings shall be incorporated in the road to maintain cross-drainage. Side slopes of temporary road openings shall be stabilized and maintained to prevent erosion of the fill material. Road opening widths shall be of sufficient length to prevent scour of the adjacent tundra. Roads shall be maintained without pushing material off of the embankments into waters of the U.S., including wetlands.

Rationale: This condition is included to protect water quality and fish habitat in accordance 40 CFR 230.22, 33 CFR 320.4(a-d), 40 CFR 230.31, and 40 CFR 230.4(e).

27. Prior to the first spring season following commencement of winter construction, permittee shall submit to the Corps, a Bird Strike Avoidance and Lighting Plan for approval by the Corps in consultation with the U.S. Fish and Wildlife Service. This plan shall be considered approved after 30 days of receipt by the Corps unless the Corps provides written notice to the contrary.

- a. Windows on the east sides of buildings and all lighting shall be shaded so that light is cast downward. Light emanating from east-facing windows shall be shielded during the migratory bird season. Any protocol developed shall be in compliance with Federal Aviation Administration regulations.
- b. Permanent communications towers shall be located on facility pads, be less than 200 feet above ground level (AGL), and be constructed without guy wires. Strobe lighting shall be used during the day and beacons shall be used at night. The permittee shall remove all bird nests from all towers and other structures annually prior to egg-laying to discourage nesting.

- c. The permittee shall build all structures associated with the development in such a manner as to discourage nesting of avian predators such as gulls and ravens, and to discourage fox denning.
- d. Temporary towers requiring guy wires for support shall have bird diverters on the wires to minimize collisions.
- e. The permittee shall prepare and implement an Air Traffic Plan to be provided to the U.S. Fish and Wildlife Service and the Corps, prior to start of construction. This plan shall be considered approved after 30 days of receipt by the Corps unless the Corps provides written notice to the contrary. The plan shall include procedures for hazing waterfowl and seabirds from the vicinity of the airstrip. The plan shall also include how flights will be routed to avoid caribou calving areas during caribou calving period, large post-calving caribou aggregations, and insect relief habitats. Overflights shall be restricted to more than 1,000 feet during caribou calving and to more than 500 feet in spring and fall except during takeoffs and landings and as required to protect human safety and to meet specific operation requirements such as Forward Looking Infrared surveys for polar bear den detection or monitoring of the export pipeline.
- f. The permittee shall, to the extent practicable, coordinate vessel, aircraft, and vehicle trips during construction, drilling, and operations to minimize the number of trips.
- g. The permittee shall summarize barge operations in a report to be submitted to the Corps and the U.S. Fish and Wildlife Service by December 1 each year, for the life of the project. This report shall include numbers and types of barge trips, dates of operations, and routes utilized.
- h. Before construction begins the permittee shall submit a Predator Management Plan, including a waste management strategy, to the Corps and U.S. Fish and Wildlife Service.

Rationale: This condition is added at the request of the U.S. Fish and Wildlife Service as noted in the comment letter attached to the "Biological Opinion for the Point Thomson Project" and in accordance with 40 CFR 230.30.

- 28. Ground disturbing activities such as mechanized land clearing and filling of wetlands within the permit area shall not be conducted between June 1 and July 31. If off-pad/road activities must be conducted during the June 1 – July 31 time window, the permittee shall notify the Corps, U.S. Fish and Wildlife Service, and the State of Alaska to evaluate potential effects of these activities to migratory birds. In such case, ground disturbing activities shall not take place until authorized by the Corps.

Rationale: This condition is being included at the request of the U.S. Fish and Wildlife Service to avoid pre-nesting and nesting seasons. The Migratory Bird Treaty Act prohibits actions that kill migratory birds and their eggs.

- 29. The permittee shall develop a bird mortality reporting process in consultation with the U.S. Fish and Wildlife Service to assess bird mortality associated with project facilities. The permittee shall report documented sea duck and other migratory bird mortalities to the Endangered Species Branch, Fairbanks Fish and Wildlife Field office on a monthly basis.

Rationale: This condition is added at the request of the U.S. Fish and Wildlife Service as noted in the comment letter attached to the "Biological Opinion for the Point Thomson Project" and in accordance with 40 CFR 230.30.

- 30. The permittee shall comply with the following provisions to minimize wildlife impacts from visual and lighting aspects during construction of the project:
 - a. Hard-sided external facilities buildings enclosures shall utilize the pre-approved "Pacific Blue" color. The soft sided warehouse shall be an off-white color. External airstrip building colors shall be dictated by Federal Aviation Administration requirements. Any other external building siding colors used shall be low-reflective and generally minimize contrast with the natural landscape, except where another color may be required to meet safety and/or industry standard requirements.
 - b. All building and stack heights shall be designed at the minimum height and footprint needed to perform their functions. All pilot flames for gas flares shall be shielded where practicable and established as low as possible on towers. Large flares and smoke plumes associated with flaring shall be minimized.

- c. All power lines and fiber optic cables must be buried or supported by VSMS to avoid additional overhead structures except for the airstrip lighting cables that may be placed on timber sleepers due to Federal Aviation Administration requirements prohibiting VSMS in this area.
- d. The permittee shall implement the noise mitigation measures described in Section 4.17 of permittee's Environmental Mitigation Report (June 17, 2011).

Rationale: Permittee agreed to mitigation measures (33 CFR 325.4). This condition has been added to minimize impacts to fish and wildlife, aesthetics, recreational values, safety, and needs and welfare of the people in accordance 33 CFR 320.4(a)(1), 33 CFR 320.4(e), and 40 CFR 230.53.

Hydrology

- 31. The permittee shall notify the Corps within 24 hours if failure of any section of road (i.e., washout) or culvert is discovered.

Rationale: This condition is added to protect water quality, wetlands, fish and wildlife habitat in accordance 40 CFR 230.22, 33 CFR 320.4(a), (b), and (d), 40 CFR 230.41, 40 CFR 230.42, and 33 CFR 320.4(a).

- 32. The permittee shall prepare and submit an annual culvert monitoring report to the Corps prior to December 31. The report shall include an evaluation of areas where additional culverts are necessary to retain existing drainage patterns and where culvert maintenance, repair, or replacement is necessary. Evidence of ponding in wetlands areas, dewatering of wetlands, erosion, or stream channel changes are indicators of locations requiring corrective action.

Rationale: This condition is added to protect wetlands and water quality from direct or secondary impacts of the project in accordance with 40 CFR 230.22 and 33 CFR 320(d), 40 CFR 230.41, 33 CFR 320.4(a).

- 33. The permittee shall develop and implement an environmental monitoring plan that includes monitoring of watersheds for Streams 22A and 24B where they may be affected by construction of the airstrip. These areas include: 1) waters of the U.S., including wetlands, up and down gradient of the airstrip; 2) the Stream 22A channel upstream of the West Pad Access Road bridge; 3) the lagoon west of the Central Pad that is the receiving water for Stream 22; and 4) the Stream 24B channel downstream of the airstrip.

Following the first winter of civil construction but prior to March 31, 2014 the permittee shall submit the environmental monitoring plan to be approved by the Corps. The environmental monitoring plan shall detail sampling methodology, frequency, and locations needed to document potential changes in the physical, chemical, and biological (vegetative) features of the watersheds associated with airstrip construction. Characteristics of concern should include, but are not limited to, the following:

- a. Observations regarding breakup events and water flow in all areas of concern. This shall include documentation of ponding, coverage of water, erosion, sediment deposition, and general water flow direction and magnitude collected in such a manner to allow comparison of changes through the 5 year monitoring period.
- b. Existing vegetation and changes in vegetation types (species composition and density) shall be monitored 1) immediately upgradient of the airstrip within 200 feet; 2) immediately downgradient from the airstrip within 200 feet; and 3) in the lagoon west of the Central Pad that is a receiving water for Stream 22A. Field data shall be collected in such a manner to allow comparison of changes through the 5 year monitoring period. The scope of the monitoring shall be adjusted if material effects on the study areas are observed.
- c. Changes in stream channel morphology including sedimentation and erosion conditions in Streams 22A and 24B collected in such a manner to allow comparison of changes through the 5 year monitoring period.
- d. Flow volume, flow velocity, and water depth throughout breakup in Streams 22A and 24B.
- e. Water depth, ponding duration, and drainage patterns in the vicinity of the airstrip collected in such a manner to allow comparison of changes through the 5 year monitoring period.

- f. Water velocities and volumes at the two cross drainage culverts in the Central Pad access road located immediately south of the junction of the airstrip access road, the three cross drainage culverts in the airstrip access road, and at the Stream 24B bridge crossing throughout break up. The first spring following completion of the mine excavation, subject to applicable State permit approval, the three cross drainage culverts in the airstrip access road shall be plugged to prevent breakup water flows and to establish the volume of diverted flow through the Central Pad cross drainage culverts, discussed above.

Existing conditions and potential changes in physical, chemical, and biological conditions shall be documented through regular sampling (i.e. sampling at peak stage during break up, immediately following break up; and at regular intervals as necessary to establish baseline conditions and identify changes in existing conditions). Physical, chemical and biological conditions shall also be documented through aerial and ground photography of all areas of concern noted above.

Following approval of the monitoring plan, the permittee shall perform monitoring annually for a minimum of five years. The permittee shall submit an annual report prior to December 31. After five years, the Corps will decide whether to continue monitoring or direct corrective actions. Should the Corps determine that degradation of Stream 22A or Stream 24B watersheds has occurred, corrective action shall be directed.

Rationale: This condition is added to protect water quality and fish and wildlife habitat in accordance with 40 CFR 230.4(e), 40 CFR 230.22, 40 CFR 230.31, and 33 CFR 320(c-d).

34. The permittee shall remove all gravel fill down to the underlying tundra grade from the southeast corner of the C-1 Pad to create a 100-foot, vegetated buffer between the existing pad and Stream 24A. The permittee shall submit a fill removal and revegetation plan for the fill removal area to the Corps for approval by December 1, 2013. The rehabilitation plan shall include fill removal and disposal areas, placement of organic overburden onto the fill removal area to maintain the thermal stability of the underlying permafrost to reestablish vegetation in the fill removal area. The fill shall be removed by June 1, 2014. Permittee shall thereafter be given two years to complete the fill removal and initial revegetation efforts.

Rationale: This condition is included to ensure the authorized project herein complies with DA permit number 071-OYD-4-800015 issued to Exxon Company U.S.A. on April 9, 1980.

As-Built Figures

35. As-built figures for all discharges and construction of all structures authorized under this permit shall be submitted to the Corps for determination of permit compliance. Figures shall be submitted by December 31 of the year following completion of construction activities authorized by this permit. State Plane Coordinates at the centerline shall be provided for all roads and pipeline routes authorized under this permit. As-built figures for all structures in marine waters authorized under this permit shall also be provided.

Rationale: This condition is included to ensure that the permittee constructs the project to be in compliance with the terms and conditions of the DA permit (33 CFR 325.4).

Abandonment

36. To ensure any portions of fills and structures authorized under this permit are not abandoned, a report shall be submitted to the Corps every five years, beginning after the completion of construction of facilities authorized by this permit, detailing hydrocarbon production plans. If any sites are determined to be abandoned, a rehabilitation plan shall be submitted to the Corps within 90 days of abandonment. The plan shall include, at a minimum: goals and objectives, site treatments, performance standards, reporting, remedial work plans, and monitoring to ensure performance standards are met. An assessment of potential site abandonments will be made every five years by the Corps, in consultation with the State of Alaska and the permittee.

Rationale: This condition is necessary to make a determination following General Condition 2 on page 1 of this permit (33 CFR 325 (Appendix A)).

Existing DA Permits

37. Previously approved discharges of dredged and/or fill material placed into waters of the U.S. by the permittee, as detailed below and authorized herein, are incorporated into this permit. The existing fill placed at the PTU-3 (Central Pad) site is also incorporated into this permit. All terms and conditions of Beaufort Sea 81,204, and 204 modification are expressly adopted into this permit. Henceforth, any modifications or actions concerning these permits or their conditions must be based on this permit.

1. Permit number 071-OYD-4-800015, Beaufort Sea 81;
2. Permit number 071-OYD-4-810264, Beaufort Sea 204;
3. Permit number 071-OYD-4-810264, Beaufort Sea 204 permit modification;
4. The existing fill material from development of the PTU-3 exploration well pad

Rationale: The proposed action includes re-use of these existing fill areas. The old permits, and PTU-3 non-permitted fill area, were issued for differing purposes.

8.0 Statement of Findings**8.1 Public Interest Determination**

I find that issuance of a Department of the Army permit, as prescribed by regulations published in 33 CFR 320 to 330:

Is not contrary to the public interest. Is contrary to the public interest.

8.2 Findings of Compliance or Non-compliance with the 404(b)(1) Guidelines (40 CFR 230.12)

The discharge complies with the guidelines, with the inclusion of the appropriate and practicable conditions listed above to minimize pollution or adverse effects to the affected ecosystem.

8.3 National Environmental Policy Act of 1969 [42 U.S.C. 4321 - 4347]

The Corps has independently reviewed and evaluated the information presented in the Point Thomson Project Final EIS and the comments and other supplemental information provided following the July 12, 2012 release of the Final EIS. The Corps finds that the EIS process has produced sufficient and accurate assessments of the resources, needs, concerns, and other issues that relate to this action and that therefore is appropriate for the purpose interest review and alternative analysis required by 33 CFR 320.4 (b) 4 and 40 CFR 230.10.

Signature of this ROD by the authorizing official completes the Corps' NEPA requirements and responsibilities.

8.4 Clean Water Act (33 USC Section 1341) Section 401 Certificate of Reasonable Assurance [33 CFR 320.4(d)]

In accordance with 33 U.S.C. 1341(d), all conditions of ADEC's Certification are incorporated as part of the DA permit.

Date Issued: September 13, 2012 Issued Denied Waived

Special Conditions: Yes No

1. Reasonable precautions and controls must be used to prevent incidental and accidental discharge of petroleum products or other hazardous substances. Fuel storage and handling activities for equipment must be sited and conducted so there is no petroleum contamination of the ground, surface runoff or water bodies.

2. During construction, spill response equipment and supplies such as sorbent pads shall be available and used immediately to contain and cleanup oil, fuel, hydraulic fluid, antifreeze, or other pollutant spills. Any spill amount must be reported in accordance with Discharge Notification and Reporting Requirements (AS 46.03.755 and 18 AAC 75 Article 3). The applicant must contact by telephone the DEC Area Response Team for Northern Alaska at (907) 451-2121 during work hours or 1-800-478-9300 after hours. Also, the applicant must contact by telephone the National Response Center at 1-800-424-8802.
3. If gravel washing occurs, the silt laden wash water shall not be allowed to enter nearby water bodies. Silts must be removed from the wash water prior to its direct or indirect discharge to any natural body of water.
4. During the work construction equipment shall not be operated below the ordinary high water mark if the equipment is leaking fuel, oil, hydraulic fluid, or any other hazardous material. Tracked or wheeled equipment shall not be operated in any flowing water. Equipment shall be inspected on a daily basis for leaks. If leaks are found the equipment shall not be used and pulled from service until the leak is repaired.
5. Fill placed during winter construction within wetlands that during the summer contain surface water that is connected to natural bodies of water, must be stabilized or contained in the spring prior to breakup. This action is to ensure that silts are not carried from the fill to the natural bodies of water in the spring and summer.
6. Prior to fill placement in the spring or summer, a silt fence or similar structure shall be installed on a line parallel to and within five feet of the proposed fill toe of slope within all wetland areas that contain standing water that is connected to any natural body of water or where the fill toe is within 25 feet of such a water body. This structure shall remain in place until the fill has been stabilized or contained in another manner.
7. Any disturbed ground and exposed soil not covered with fill must be stabilized and revegetated with endemic species, grasses, or other suitable vegetation in an appropriate manner to minimize erosion and sedimentation, so that a durable vegetative cover is established in a timely manner.
8. All work areas, material access routes, and surrounding wetlands involved with the expansion of the airstrip, pads, infield gravel roads, and gravel mine site shall be clearly delineated and marked in such a way that equipment operators do not operate outside of these corridors.
9. Natural drainage patterns shall be maintained, to the extent practicable, without introducing ponding or drying. Culverts shall be placed in the access roads as needed to provide cross drainage.
10. The material site(s) shall be designed, constructed, operated, and closed so runoff does not directly enter surface water untreated. If runoff from the material site(s) is discharged, fines must be removed prior to direct or indirect discharge to any body of water.

8.5 Endangered Species Act of 1973 [16 U.S.C. 1531]

The USFWS concluded formal consultation on September 14, 2012. The NMFS concluded consultation on September 14, 2012.

8.6 Fish and Wildlife Coordination Act [16 U.S.C. 661]

Coordination with the USFWS and completion of the process and analysis contained within this ROD and signature by the authorizing official completes the Corps FWCA responsibilities.

8.7 Magnuson-Stevens Fishery Conservation and Management Act

Essential Fish Habitat consultation concluded May 21, 2012.

8.8 National Historic Preservation Act of 1966 [16 U.S.C. 470 et seq.]

Completion of consultation with the Alaska Office of History and Archaeology and completion of this ROD completes the Corps NHPA requirements.

8.9 Clean Water Act [33 U.S.C. 1251 et seq.] Section 404 [33 U.S.C. 1344] and 404(B)(1) Guidelines 40 CFR 230 Subpart B]

Completion of the process and analysis contained within this ROD and signature by the authorizing official completes the Corps CWA 404 requirements.

8.10 Rivers and Harbors Appropriation Act of 1899 [33 U.S.C. 401, 403, 407]

Completion of the process and analysis contained within this ROD and signature by the authorizing official completes the Corps RHA requirements.

8.11 Marine Mammal Protection Act of 1972 [16 U.S.C. 1361 et seq, 1401-1407, 1538, 4107]

The permittee will be required to obtain a letter of incidental take of polar bears from the USFWS before construction.

8.12 Executive Order 13175 Consultation and Coordination with Indian Tribal Governments

Consultation with Federally recognized Tribes and completion of the process and analysis contained within this ROD and signature by the authorizing official completes the Corps Executive Order 13175 requirements.

8.13 Clean Air Act [42 U.S.C. 7401 - 7671 Section 176(c)]

The proposed project activities subject to USACE approval do not include air pollutant emissions in any area designated as "nonattainment" or "maintenance" with respect to National Ambient Air Quality Standards. Therefore, Air Quality General Conformity requirements, under Section 176(c) of the Clean Air Act, and as implemented in regulations under 40 CFR 93, Subpart B, do not apply to the USACE's review of the PTP because the project area is not within a non-attainment or maintenance area.¹²²

8.14 Executive Order 12898 (Environmental Justice)

The Point Thomson Final EIS considered direct and indirect impacts to minority and low-income populations and determined that the proposed action will not cause disproportionate impacts to those populations. Completion of the process and analysis contained within this ROD and signature by the authorizing official completes the Corps Executive Order 12898 requirements.

8.15 Executive Order 11988 (Flood Plain Management)

The proposed action will not be constructed in designated floodplains and will not create flood hazards in floodplains. Completion of the process and analysis contained within this ROD and signature by the authorizing official completes the Corps Executive Order 11988 requirements.

APPROVING OFFICIAL:

¹²² Email correspondence from Jennifer Curtis, EPA and Debra Suzuki, EPA to Charlene Johnson, HDR and Harry Baij, Jr., USACE (September 27, 2012).

October 19, 2012

Record of Decision

APPROVING OFFICIAL:

A handwritten signature in black ink, appearing to read "C. D. Lestochi", written over a horizontal line.

Christopher D. Lestochi
Colonel, Corps of Engineers
District Commander

25 OCTOBER 2012

Date