Alaska District

United States Army Corps of Engineers, Alaska District

Record of Decision

Applicant: ConocoPhillips Alaska, Inc.
File number: POA-2013-461
Waterway: Colville River
Project: Greater Moose's Tooth 1

This document constitutes the United States (US) Army Corps of Engineers, Alaska District (USACE) Record of Decision (ROD) in accordance with Section 404 of the Clean Water Act (CWA), compliance determination with the U.S. Environmental Protection Agency's (EPA) Section 404(b)(1) Guidelines (Guidelines), and the USACE public interest review (PIR) for the ConocoPhillips Alaska, Inc. (CPAI) Greater Moose's Tooth 1 (GMT1) proposed project (POA-2013-461).

Background

The Bureau of Land Management (BLM) prepared a Supplemental Environmental Impact Statement (SEIS) to analyze an application by CPAI to construct, operate, and maintain a drill site, access road, pipelines, and ancillary facilities to support development of petroleum resources at the proposed GMT1site, within the National Petroleum Reserve in Alaska (NPR-A). Portions of the project would also be constructed on State of Alaska and Kuukpik Corporation lands. The purpose of the FSEIS was to evaluate any relevant new circumstances and information that have arisen since the Alpine Satellite Development Plan (ASDP) Final EIS, dated September 2004. The BLM published a Draft Supplemental Environmental Impact Statement (DSEIS) on February 21, 2014 and the Final Supplemental Environmental Impact Statement (FSEIS) on October 29, 2014. The BLM was the lead Federal agency (LFA) and the USACE was a cooperating agency.

The USACE, Alaska District, Regulatory Division received an Department of the Army (DA) permit application from CPAI (applicant) on August 1, 2013 requesting authorization for the placement of fill material in waters of the U.S. in connection with the applicant's proposed GMT1 project. The DA permit application was determined to be complete on September 9, 2014. A public notice for the applicant's proposed project was issued for a 45-day comment period on September15, 2014 and ended on October 30, 2014.

Regulatory 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 Rivers and Harbors Act of 1899
- ☒ Section 404 of the Clean Water Act, 33 USC 1344
- ☐ Section 103 of the Marine Protection, Research, and Sanctuaries Act of 1972

The Record of Decision (ROD) for the DA permit is based on information contained in the FSEIS for the GMT1 Project, prepared by BLM, dated October 29, 2014. I have independently reviewed and evaluated the information in the FSEIS and have found it to be sufficient and accurate

assessments, and therefore appropriate for the public interest review and the alternatives analysis required by 33 CFR 320.4(b)(4) and 40 CFR 230.10. The USACE hereby adopts the FSEIS for the GMT1 Project prepared by BLM (http://www.blm.gov/ak/st/en/prog/energy/oil_gas/npra/GMTU_proposed_dev_proj.html).

Department of the Army Permit Decision Summary

A Department of the Army (DA) permit is being issued to ConocoPhillips Alaska, Inc. (applicant) pursuant to Section 404 of the CWA, for the applicant's proposed project (Alternative A in the FSEIS) and as described in Section 1.0 below. This alternative incorporates all practicable avoidance and minimization measures. This permit would authorize the discharge of fill into 72.6 acres of jurisdictional waters and wetlands for the Greater Moose's Tooth 1 project.

Direct impacts resulting from work in, and the placement of fill into waters of the US, including wetlands, include the permanent filling of 72.6 acres of wetlands. This work will result in impacts to the aquatic ecosystem in area, function, and value as described below in section 5.0 under 40 CFR Part 230 and section 6.0 under 33 CFR Part 320.

The authorization includes special conditions to further avoid and minimize potential adverse impacts and to compensate for unavoidable adverse impacts to the aquatic ecosystem. It also ensures the project will be in compliance with the Guidelines and not be contrary to the public interest. This authorization requires compensatory mitigation for the direct and indirect impacts to of waters of the US, including wetlands, as described in Sections 1.0, 5.0, and 6.0, and Special Conditions 1-9.

All work will be performed in accordance with the attached plan, sheets 1-33, dated 09-08-14.

1.0 Proposed Project.

1.1 Description: CPAI proposes the placement of 628,050 cubic yards (cy) of clean fill material into 72.6 acres of waters of the U.S., including wetlands (see Table 1 below), to construct:
- A 7.7 mile-long access road (59.2 acres), including bridges and abutments (no fill material placed below the ordinary high water mark of the two bridged creek/river crossings);
- An 11.8-acre drillsite gravel fill pad with a 33-well capacity at Greater Mooses Tooth 1 (GMT1);
- Placement of fill in 0.1 acre of wetlands for vertical support members (VSMs) for pipelines (8.4 miles of pipelines from GMT1 to CD5 (Colville River Delta-5), 3.3 miles of pipeline from CD4N (Colville River Delta-4 North) to ACF (Alpine Central Facility), and 6.1 miles of pipeline from CD4N to CD5);
- A 0.35 acre fill area for the west manual pipeline valve pad; and
- A 0.35 acre fill area for the east manual pipeline valve pad.
- 3 Vehicle Pullout Pads (0.9 acre total) for safety and subsistence activity access.

Oil, gas, and water produced from the reservoir would be carried from the GMT1 drill site via pipelines that tie into the CD5 pipeline going to the ACF for processing. Sales quality crude would be transported from the ACF 1 via the Alpine Oil Pipeline and Kuparuk Pipeline to the Trans Alaska Pipeline System (TAPS) for shipment to market. Lean gas and Kuparuk-supplied seawater would be delivered to the drill sites via pipelines from CD1 for injection into the reservoirs. The proposed drill site would be operated and maintained by Alpine (ACF) staff and supported by using existing infrastructure.

Table 1: Size and Volume of Fill in Waters of the U.S.

Component	Fill Type	Area (acres)	Quantity (cubic yards)	Notes/Dimensions
GMT1 Drill Site	Gravel	11.8	131,000	290 feet to 463 feet wide by 1,200 feet long
Access Road (includes bridge abutments)	Gravel	59.1	482,000	7.7 miles long; 32-foot crown width and minimum 5-foot depth
Vehicle Pullout Pads	Gravel	0.9	8,550	Three vehicle pullout pads at 0.3 acres each. The pullouts would be 50-feet wide by 200-feet long.
Manual Valve Pads	Gravel	0.7	6,500	Two valve pads measuring 100 feet by 100 feet with a 20-foot by 25-foot extension
GMT1 to CD5 Pipeline VSMs	Sand Slurry/Steel	0.07	3,000[b]	8.4-mile pipeline requiring approximately 1,000 new VSMs spaced 55 feet apart
CD1 to CD4N Pipeline VSMs	Sand Slurry/Steel	0.03	1,200[b]	3.3-mile pipeline requiring 400 new VSMs aligned to match existing VSMs
Total Fill	All types	**72.6**	**632,250**	

Note: Values are approximate and may change during final design.
VSM = Vertical Support Member
VSM fill quantity is estimated to be approximately 3 cubic yards per VSM.

1.2 Location. The project site is located within the following areas:

Section 6, T. 10 N., R. 3 E; Sections 24-29, 31, 32, and 33, T. 11 N., R. 3 E; Sections 1, 12-18 and 19, T. 11 N., R. 4 E; Umiat Meridian, US Geological Survey Quadrangle Maps Harrison Bay A-3, Harrison Bay B-3; and Harrison Bay B-2;

Start of GMT1 proposed project from the proposed the road intersection with the existing CD-5 Access Road: Latitude 70.304687 and Longitude -151.210979 NAD 83 decimal degrees.

End of GMT1 proposed project at the drillsite gravel pad: Latitude 70.256952 and Longitude -151.479496 NAD 83 decimal degrees.

Arctic Coastal Plain of Alaska in the National Petroleum Reserve-Alaska (NPR-A) near the Beaufort Sea and west of the Colville River, approximately 12 miles northwest of Nuiqsut, Alaska.

1.3 Design Revisions.

There have been no revisions to the proposed action since the publication of the USACE public notice on September 15, 2014.

1.4 Project Purpose.

1.4.1 Applicant's stated purpose and need. To construct a road-accessible drill site, associated pipelines, and ancillary facilities to safely develop, produce, and transport hydrocarbons from the GMTU to the existing ACF and eventually to market at a reasonable rate of financial return. The project would produce 3-phase hydrocarbons (oil, gas, and water) which would be carried by pipeline to the ACF for processing. Sales quality crude oil produced at the ACF would be transported via the existing Alpine Sales Oil Pipeline and Kuparuk Pipeline to the TAPS for shipment to market.

1.4.2 Basic project purpose and water dependency. We have determined the basic project purpose is to produce, deliver, and sell hydrocarbons from the GMTU. The production and transport of hydrocarbon resources does not require access or proximity to a water of the US and wetlands (special aquatic site). Therefore, the basic purpose of the project is not water dependent.

1.4.3 Overall project purpose. The overall project purpose, to be used for determination of practicable alternatives under the Section 404(b)(1) Guidelines, is defined as: "To drill for and safely produce and transport commercial quantities of hydrocarbon liquids from the GMT1 reservoir by pipeline to market for sale."

2.0 <u>Scope of Analysis for USACE Jurisdiction.</u>

2.1 National Environmental Policy Act (NEPA).
Reference: FSEIS section 1.4.4 Scope of FSEIS

The BLM was the lead federal agency (LFA) for NEPA and the USACE was a cooperating agency (CA) in developing the FSEIS for the GMT1 project. The BLM has jurisdiction over the entire land area of the NPR-A and most of the GMT1 proposed project area. Smaller portions of the applicant's proposal are located outside of the NPR-A to the north-east and located on State of Alaska and private lands owned by Kuukpik Corporation (Kuukpik), an Alaska Native Regional Corporation. The BLM's scope of analysis for NEPA included the evaluation of direct, indirect/secondary, and cumulative impacts of the proposed action.

USACE has jurisdiction over the waters of the US on all three properties and is responsible for evaluating the direct and indirect impacts caused by authorized discharges of the fill material within these jurisdictional waters of the U.S.

2.1.1 Discharge of fill material. 72.6 acres of the total 72.7 acres of fill for the proposed project would be located in jurisdictional waters and wetlands. All proposed fills within waters of the US are under the USACE jurisdiction and responsibility to be regulated. The remaining 0.1 acre is uplands.

2.1.2 Construction of seasonal ice roads and pads: The proposed project includes construction of 660 acres of single-season ice roads and ice pads. Construction of ice roads and pads does not constitute a discharge of dredged or fill material and therefore is not under USACE jurisdiction and USACE will not regulate their construction.

2.1.3 Fill material source. The proposal includes obtaining gravel fill material from the Arctic Slope Regional Corporation (ASRC) located adjacent to the east bank of the Colville River. The applicant would purchase gravel from ASRC and not be responsible for the associated discharges at the mine site. The ASRC Mine Site has an existing DA permit but will require additional authorization to open a new cell in wetlands adjacent to the Colville River.

3.0 NEPA Alternatives.

3.1 Alternatives considered but not carried forward to the FSEIS.

During the BLM FSEIS GMT1 NEPA alternatives analysis process, the BLM and cooperating agencies considered a wider range of alternatives and alternative components than were considered in the 2004 Alpine Satellite Development Plan FEIS but they were not carried forward for further detailed analysis. During alternatives development and screening meetings, the BLM and cooperating agencies concluded that the alternatives considered but not carried forward for analysis in BLM offer no new or different environmental benefit and would not be carried forward in the current SEIS. The alternatives considered but not carried forward include:

1. *Buried pipelines.* Pipeline burial can result in thermokarsting, corrosion, erosion, leak risk, and pipeline movement. Because of the environmental risks associated with buried pipelines, burying pipelines in a road or the tundra does may contribute to additional overall environmental impact and was not a reasonable alternative carried forward for further consideration.
2. *Pipelines elevated more than 7 feet.* Higher pipeline elevation would make pipelines more visible at distances and may increase construction and maintenance costs. As a result, raising the minimum pipeline level was not found to be a reasonable alternative.
3. *Pile supported production pads.* Pile-supported production pads currently are used only experimentally for relatively shallow exploratory wells with drill rigs much smaller than those needed to reach target depths for the proposed project. As a result, pile-supported production pads currently are not technologically capable of providing the structures necessary to meet the project purpose and need, and therefore were not found to be a reasonable alternative.
4. *Drill pads at substantially different locations.* Drilling from substantially different locations using extended reach drilling (ERD) is an evolving technology. However, ERD is still not feasible for the proposed GMT1 project based on well completion requirements to develop the reservoir and variations in the subsurface geology, including unstable shale in the area that tends to collapse. As a result, drilling from a substantially different location was not found to be a reasonable alternative carried forward for further consideration.
5. *Supporting western ASDP from a Nuiqsut Operations Center (NOC).* Supporting GMT1 development from a Nuiqsut Operations Center (NOC) would require duplication of numerous pieces of equipment and infrastructure that are already in place at the Alpine Processing Facility (ACF). The size and extent of the GMT1 project and other proposed developments west of the Nigliq Channel do not support the level of activity that would justify the capital investment required for a NOC. Therefore, an alternative dependent on a NOC would not be economically viable and was eliminated from detailed analysis as an alternative.
6. *Development with access other than gravel road or air.* Boat access is not available to the GMT1 site. Access limited to low-pressure vehicles and ice roads for all but emergency purposes would fail to provide adequate continuous access necessary to achieve the project purpose and need. Based on these considerations, alternative access other than air or road access is not considered feasible and were not considered in detail.

3.2 Alternatives carried forward to the FSEIS.

The alternatives analysis process for the proposed GMT1 project was conducted to meet the BLM's requirements under NEPA to consider alternatives capable of meeting the project purpose and need. BLM identified Alternative B as the BLM Preferred Alternative in the FSEIS. The NEPA alternatives analysis process was also conducted in consideration of the USACE permit evaluation process under Section 404(b)(1) Guidelines, which require determination of a least environmentally damaging practicable alternative (LEDPA). USACE evaluates whether an alternative is practicable based on whether it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of the overall project purpose.

3.3 No Action Alternative.

Under the No Action Alternative E, the applicant's right-of-way application, application for permit to drill, and related authorizations would not be approved by BLM and/or would result in denial of a DA permit. However, under the No Action Alternative, exploration work, including exploratory drilling, would continue as required under the Greater Moose's tooth Unit Agreement. Alternative E would not meet the overall project purpose and need.

3.4 Action Alternatives.

Action alternatives evaluated in the 2004 BLM ASDP FEIS were all determined to continue to be conceptually reasonable alternatives for the proposed development. The action alternatives were updated and modified to reflect existing conditions and potential benefits based on footprint size, on-site activity, reduction of subsistence and other environmental impacts, reservoir development, and support for future development. The updated action alternatives, including the applicant's updated proposed project, are identified in the FSEIS as the range of reasonable alternatives. The action alternatives are described immediately below.

3.4.1 Alternative A - Applicant's Proposed Project. (Based in the information in this ROD, Alternative A is also the USACE Environmentally Preferred Alternative and the Least Environmentally Damaging Practicable Alternative)

The applicant's proposed project is also summarized in the Proposed Project section 1.0 above. The project contains the following components requiring authorization by USACE under Section 404 of the CWA:

1. An 11.8-acre gravel drill site with capacity for 33 wells and designed to allow space for drill site facilities, valve shelters, rig movements, drilling material storage, well work equipment, and additional modules and equipment.

2. A 7.7-mile-long gravel access road from CD5. The proposed road includes a 350-foot bridge across the Ublutuoch River and a 40-foot bridge across Crea Creek. The road would also include a culvert battery at Barely Creek to maintain flow, and installation of cross-drainage culverts to maintain natural surface drainage patterns. The access road would pass through the designated 3-mile setback for Fish Creek. In total, 3.1 miles of the proposed road and 3.5 miles of the proposed pipeline traverse the Fish Creek Setback. The proposed pipeline lies 2.5 miles southeast of Fish Creek at the nearest point and the proposed road lies greater than 2.5 miles from Fish Creek for its entire length. The access road would also pass through the 0.5-mile setback for the Ublutuoch River and 0.32 miles of road would cross the Ublutuoch River setback area.

3. An 8.3-mile-long pipeline elevated a minimum of 7 feet on Vertical Support Members (VSM) with approximately 1,000 VSMs and approximately a 0.07-acre total footprint from the GMT1 drill site to pipeline tie-ins at CD5. VSMs would carry pipelines transporting produced fluids, injection water, gas, and injectant, as well as power and fiber optic cables suspended from the Horizontal Support Members via messenger cables. The pipeline would cross the Ublutuoch River on the proposed bridge and would cross other creeks, including Crea Creek, on a straight line elevation between VSMs located on each side of the crossing. Where possible, the pipeline would be constructed at least 500 feet north of the proposed gravel access road.

4. A 3.1 mile-long injection water pipeline on new VSMs (approximately 400 VSMs, with an approximately 0.03-acre total footprint) from CD1 to CD4N. This pipeline is required because there is insufficient capacity on the existing VSMs for additional pipe. Injection water would be carried between CD4N and CD5 in a new 6.1-mile-long pipeline placed on existing VSMs.

5. Two 0.35-acre manual valve gravel pads (0.7 acre total) located on either side of the Ublutuoch River to allow isolation of the production pipeline on either side of the bridge to minimize potential spill impacts in the event of a leak or a break.

6. Three 0.3-acre vehicle pullout pads for safety and subsistence access.

Gravel fill needed for the proposed project would come from the existing ASRC Mine Site gravel source (POA-1996-869-M5, Colville River). The ASRC Mine Site is located approximately 6 miles southeast of CD4 and 4.5 miles east-northeast of Nuiqsut on the East Channel of the Colville River (§2.4.4, BLM 2014a).

The applicant's proposed project has been updated since the 2004 BLM ASDP FEIS to move the proposed drill site outside of the Fish Creek setback area; reduce the access road and pipeline length as a result of the drill site relocation; increase the length of the Ublutuoch River Bridge in response to agency, community, and village corporation concerns; increase the overall pad footprint in order to accommodate an increase in the number of wells from 17 to 33; reduce the overall net acreage and volume of gravel fill in Waters of the US needed for project development; and add a water injection pipeline from the ACF to the proposed drill site to accommodate enhanced reservoir recovery.

The BLM and cooperating agencies considered the updates to the applicant's proposed project as well as changes in existing conditions such as the modified location and design of the CD5 satellite development, land status, oil field practice and technology, and regulatory controls. Also considered were new biological surveys, oil and gas resource evaluations, and subsistence surveys. Based on this information, the BLM and cooperating agencies reconsidered, modified, and updated alternatives carried forward for detailed analysis.

3.4.2 Alternative B - Conformance with Stipulations - BLM Preferred Alternative

The theme of Alternative B was "Conformance with Stipulations," and included design of project facilities similar to those described in the 2004 BLM ASDP FEIS Preferred Alternative. Alternative B was updated to reflect current project area conditions and BLM stipulations but to maintain the theme of "Conformance with Stipulations." Alternative B is based on keeping all GMT1 related permanent oil and gas infrastructure outside of the 3-mile setback from Fish Creek per the K-1(e) Lease Stipulation/Best Management Practice–Rivers. Other Lease Stipulation/Best Management Practices would also apply.

Alternative B includes project facilities similar to the applicant's proposed project but differs from Alternative A by routing the access road and pipeline south of the Fish Creek Setback. Both road and pipeline would tie-in to existing facilities at a new 0.7-acre tie-in pad located east of the CD5 drill site. Alternative B would eliminate the need for a road bridge over Crea Creek and a culverting of Barely Creek because these creek channels do not extend that far south. The Alternative B access road would be slightly longer than in the applicant's proposed project and the pipeline would be similar in length. Overall, Alternative B would result in a slightly larger overall fill footprint in Waters of the US, primarily wetlands, as compared with Alternative A. Construction and maintenance of the Alternative B road route may be more technically challenging due the extent of thaw basins composed of marshes, and flooded areas within the Crea and/or Barely Creek headwater areas.

Alternative B does not keep all infrastructure at least 500 feet from water bodies due to their prevalence in the area. This is similar to Alternative A but potential impacts are associated with different water bodies.

BLM Lease Stipulation/Best Management Practices apply only to federal public lands managed by the BLM. Property access rights for non-federal lands must be obtained from

individual landowners, i.e., State of Alaska, Kuukpik Corporation, who may condition access on their lands.

Also stated in the FSEIS section 2.3, "while the BLM is identifying Alternative B as its Preferred Alternative, it is important to note that the Corps has not yet determined which alternative is the Least Environmentally Damaging Practicable Alternative (LEDPA) in implementing its responsibilities under the CWA. The Corps' determination will be considered by the BLM in making a final decision, and could result in the modification or change in the alternative ultimately selected by BLM in its ROD."

3.4.3 Alternative C - Alternative Access via Nuiqsut

The theme of Alternative C was the "Alternative Access Route." This alternative was based on Alternative C of the BLM 2004 ASDP FEIS and updated to reflect current project area conditions. It evaluated impact to the Village of Nuiqsut for use as a hub for industrial activities to support the GMT1 development.

Alternative C includes the same GMT1 drill site location and facility design, access road route from CD5 to the GMT1 drill site, and pipeline route from CD5 to the GMT1 drill site as the applicant's proposed project. However, Alternative C would also require an upgrade of the currently proposed Nuiqsut Spur Road, a 5.8-mile road between the CD5 access road and the Nuiqsut Dump Road. The upgrade would expand the road from a 24-foot wide roadway to a 32-foot width. The purpose of the road upgrade would be to upgrade the road to allow industrial activity to occur with large vehicles and loads. Note that Kuukpik Corporation, the land owner of the Nuiqsut Spur Road, stressed in its public comments that it would not allow the applicant property access and rights to enlarge the Nuiqsut Spur Road. This made the Alternative C not available to the applicant as a practicable alternative. The Native Village of Nuiqsut (NVN), a federally recognized Tribe, and a cooperating agency during development of the BLM 2014 GMT1 FSEIS, encouraged BLM to carry this alternative forward from the BLM 2004 ASDP FEIS.

Upgrades to the existing Nuiqsut Airport would allow for its use as a logistics center for the GMT1 Project, allowing personnel, materials, parts, food, camp supplies, and other supplies needed to support the GMT1 project to be flown into Nuiqsut rather than to the Alpine Central Facility (ACF) airstrip. Personnel and materials would then be transported to GMT1 by road.

BLM does not have jurisdiction over the Nuiqsut Airport which is located on private land, and the Applicant has stated their intention to continue to use the ACF airstrip as the primary location of air logistics regardless of upgrades to the Nuiqsut Airport.

Other design features and upgrades evaluated as part of Alternative C include:
1. Upgrade of the Nuiqsut Dump Road and the airport access road from a 24-foot wide roadway to a 32-foot wide roadway between the intersection of the Nuiqsut Spur Road.
2. Construction of a new approximately 1.2-mile-long, 32-foot-wide airport access road between the Nuiqsut Dump Road and a new logistics pad.
3. Construction of a 3.7-acre logistics pad with a 1.4-acre taxiway apron connected to the existing airstrip at the Nuiqsut Airport to store vehicles, fuel, and other dispensary and warehouse items.
4. Construction of a 500-foot 1.6-acre runway extension at the Nuiqsut Airport.
Alternative C would have a larger overall footprint of fill compared to the applicant's proposed project.

3.4.4 Alternative D1 - Roadless Development

The theme of Alternative D was "Roadless Development" with no year-round road access and includes all-season drilling capabilities. Alternative D1 is based on Alternative D of the BLM 2004 ASDP FEIS but has been updated to reflect current project area conditions. Alternative D1 includes the same GMT1 drill site location and pipeline route to CD5 as the applicant's proposed project.

Alternative D1 would require access by aircraft during approximately 9 months of the year and by ice road for approximately 3 months of the year. Construction of an annual ice road for resupply during drilling and operations would require approximately 1,019 MG of freshwater (660 MG of water more than the applicant's proposed project) over the lifetime of the project. Development of GMT1 under Alternative D1 would require construction of a 5,000-foot-long, 46.14-acre airstrip and associated facilities.

Drilling at the GMT1 site would continue year-round to achieve the economic and production goals outlined in the project purpose and need. Certain services, equipment, and supplies would need to be duplicated at the drill site to support drilling and operations when ice road access is not available. These services would include drilling support and permanent camp facilities to support a full-time workforce during drilling and operations, space for long-term storage of drilling and operating fluids and supplies, a tank farm to provide storage of all operating fluids, a new mud plant and bulk cement facilities, diesel fuel transport via a new diesel fuel pipeline from ACF, an on-site potable water supply, a wastewater treatment plant, and new Class 1 disposal well.

The additional facilities would need to be arranged to maintain separation between housing and drilling sites to comply with safety regulations. On-site manned camp requirements would cause greater power requirements. The Alternative D1 drill-site pad would be expanded to 15.7 acres and require an additional 14.9-acre occupied structure pad in addition to the 0.7 acres for the pipeline valve pads to accommodate increased facilities footprint and safety requirements.

Alternative D1 air transport would be the only mode of transport available year round, weather permitting. The operations center for the project would continue to be the ACF and most personnel and supplies would continue to fly to the ACF before being transported via a shorter flight to the GMT1 airstrip. Construction related activities would require up to 15 flights each month in 2016 and up to 111 flights per month in 2017 to support personnel transport and other logistics. This would be in addition to helicopter and cargo transport aircraft. The heaviest volume of flights would occur between May through December when an ice road is not available. Operations support would require between 74 and 90 flights per month in addition to helicopter and cargo transport flights.

3.4.5 Alternative D2 – Roadless Alternative Seasonal Drilling

Alternative D2 was added to the alternatives evaluation following publication of the Draft SEIS as a result of public comments. The theme of Alternative D2 is "Roadless Development with Winter Seasonal Drilling Only."

Alternative D2 would be similar in project infrastructure layout and size as Alternative D1. Drilling under Alternative D2 would be seasonally restricted to the winter season when ice road access is available. This would extend completion of drilling from 4 seasons under the other action alternatives to 24 seasons under Alternative D2. The total gravel pad acreage for Alternative D2 would be reduced by 1.7 acres, relative to Alternative D1, for a total pad acreage of 29.6 acres (15.7-acre drill pad, 13.2-acre occupied structure pad, and 0.7-acre valve pads). The seasonal drilling facility could operate using a drilling mud mixing facility in lieu of a mud plant and use a smaller capacity manned camp.

Alternative D2 would also require construction of a 46.1-acre airstrip and associated facilities to support emergency response. Alternative D2 would require construction of a drilling ice pad for 24 years and annual ice road through operations. Alternative D2 would require approximately 1,256 MG of freshwater (897 MG of water more than the applicant's proposed project) over the lifetime of the project.

3.5 Determination of the less (least) environmentally damaging practicable alternative (LEDPA)/USACE environmentally preferred alternative.

USACE identifies Alternative A as the LEDPA for the reasons further described below. This alternative meets the overall project purpose, is practicable in consideration of costs, logistics, and existing technology, and would result in: the smallest footprint impacts to aquatic resources; no direct fill in streams/fish habitat; smaller overall impacts to wildlife habitat; and presents drier wetlands to construct access due to its location in the watershed, would result in the have a comparatively low level of potential impacts to most of the specific resource categories, including the least fill footprint in waters of the U.S. as reflected in Table 2.0 below. In addition, Alternative A is the LEDPA because it has the smallest footprint and has the fewest direct and indirect impacts on aquatic resources. Although Alternative A would result in crossings of Crea and Barely Creeks, the road would cross these waterbodies in a channelized location, with no fill would be placed below the ordinary high water marks, and fewer culverts would be required along the road route. This would better accommodate the natural hydrology of the area. Wetland characteristics of Alternative A are overall drier wetland types. Additional comparison of the alternatives follows this section. With the inclusion of this information, the project complies with this factor of the 404(b)(1) guidelines.

We have used additional information as part of our evaluation of compliance or non-compliance with the restrictions on the discharge and determination of the LEDPA. This information includes the following:

1. Aquatic Site Assessments (ASAs) provided by the applicant, as modified with corrections and/or best professional judgments by USACE, for Alternatives A and B and the Fish Creek Delta mitigation site.
2. Field visit by helicopter (with landings) to all FSEIS action alternative sites and the Fish Creek Delta mitigation site.
3. Department of the Army (DA) permit application and attachments.
4. Applicant's Environmental Evaluation Document and Figures, July 2013
5. Applicant's Mitigation Plan December 2014
6. Applicant's LEDPA letter to USACE, November 2014
7. Applicant's response to comments letter December 2014
8. Applicant's Alternatives A and B comparison memo, November 2014

The FSEIS at section 4.1.5 provides a Summary of Impact Levels for Alternatives. Section 4.4.5.2 describes Impacts Common to all Alternatives. A summary comparison of alternatives for physical characteristics, biological environment, and social systems impacts is present in the corresponding sections of Chapter 4 of the FSEIS. Alternatives C, D1, and D2 were determined to not be practicable in consideration of costs, logistics, and/or existing technology and had larger direct and indirect wetland and other environmental impacts. Alternatives A and B were determined practicable, and evaluated below in further detail to determine the LEDPA.

The acreage of fill for each action alternative is presented in Table 2 below.

Table 2. Footprint and Fill Requirements for Project Alternatives (HDR, 2014)

Alternative	Pads (ac)a	Roads (ac)b	Airstrip (ac)	Pipelines VSMs (ac)	Total Footprint in WOUS	Total Footprint c (ac)	Total Gravel Fill (cy)
A	12.5	60.1		0.1	72.6	72.7	628,050
B	13.2	67.0		0.1	80.1	80.3	684,550
C	12.5	85.7	7.4	0.1	105.6	105.7	862,250
D1	31.3	9.6	46.4	0.1	87.4	87.4	845,600
D2	29.8	9.7	46.1	0.1	85.7	85.7	830,800

3.5.1 Alternative A – CPAI Proposed Project

Alternative A is the applicant's proposed action and is described in the FSEIS in section 2.5 and summarized above in section 3.5. Impacts under Alternative A are described in the FSEIS in section 4.4.5.3 and further compared below.

3.5.2 Alternative B in Comparison with Alternative A- Conformance with Stipulations

Alternative B is the Lead Federal Agency's Preferred Alternative and described in the FSEIS in section 2.6 and summarized above in section 3.5. Impacts under Alternative B are described in the FSEIS in section 4.4.5.4.

Table 3. Comparison of Features of GMT1 Alternatives A and B (HDR, 2014)

Project Feature	Alternative A	Alternative B
Total gravel footprint (acres)[a]	72.7 acres	79.4 acres
Gravel drill site acreage (acres)	11.8 acres	11.8 acres
Gravel pipeline tie-in pad acreage (acres)		0.7
Gravel pads for valves (number, acreage)	2 pads, 0.35 acre each, total of 0.7 acre	2 pads, 0.35 acre each, total of 0.7
Gravel pads for vehicle pullouts (number, acreage)[b]	3 pads, 0.3 acre each, 0.9 acre total	
Gravel access road length (miles, acreage)	7.7 miles 59.2 acres	8.5 miles 66.1 acres
Length of road within Fish Creek setback	3.1 miles	0.0 miles
Pipeline length(s) (miles) VSM footprint (acres)	GMT1 to CD5 pipeline: 8.3 miles CD1 to CD4N pipeline: 3.1 miles Total VSM footprint: 0.1 acre	GMT1 to CD5 pipeline: 8.4 miles CD1 to CD4N pipeline: 3.1 miles Total VSM footprint:
Length of pipeline within Fish Creek setback	3.6 miles	1) 0.0 miles
Stream crossings (number, stream name, type of crossing structure)	1) Ublutuoch River bridge, 350 feet 2) Crea Creek bridge, 40 feet 3) Barely Creek culvert battery	2) Ublutuoch River bridge, 350 feet
Gravel source(s)	ASRC Mine Site	ASRC Mine Site
Ice road length (miles and water requirements in millions of gallons [MG])	Year 1: 45 miles; 67.5 MG water Year 2: 36 miles; 54 MG water	Year 1: 43 miles; 64.5 MG water

Ice pads (size [acres] and water requirements [MG])	Year 1: 130 acres total; 32.5 MG water Year 2: 50 acres total; 13.8 MG water Drilling: 16-acre pad per year; 4.0 MG water per year	Year 1: 130 acres total; 32.5 MG water Year 2: 50 acres total; 13.8 MG Water Drilling: 16-acre pad per year; 4.0 MG water per year
Total water use (construction, drilling, and operating period)	358.7 MG over the life of the project	355.7 MG over the life of the project

[a] The total acreage of Alternative B reported in this memo is lower than the 80.4 acres reported in the BLM's FSEIS. The acreage in the FSEIS includes 0.9 acre of gravel for vehicle pullouts (see note below) as well as minor differences (0.1 acre) in the GIS layers used by the BLM and CPAI. These differences do not affect the results of the alternative comparison.

[b] Gravel pads for vehicle pullouts are not included in the total acreage for Alternative B at this time as a location for these features have not been determined. If Alternative B would be authorized, vehicle pullouts would be included in the final design, adding an additional 0.9 acres of gravel to Alternative B and bringing the total gravel footprint to 80.3 acres.

Alternative B, similar to all alternatives in the study area, would be constructed predominantly in wetlands with placement of fill to construct the access road, gravel pads, and the installation of pipeline VSMs. Indirect effects to waters and wetlands located adjacent to proposed gravel fill would include changes in hydrologic regime (e.g., wetlands becoming wetter or drier), gravel and dust spray, noise, and visual related impacts.

Fill acreages. Alternative B would have a larger total fill area than Alternative A (79.2 vs. 72.6 acres); larger indirect impact (651.9 vs. 582.0 acres); and larger direct impact in wetlands of higher functional value (36.4 vs. 28.6 acres of Category I). Alternative B would have less direct impact in moderate value (Category II) wetlands (42.80 vs. 44.00 acres).

Access road route: Alternative B is identical to Alternative A in the northeast portion of the access road from the CD5 drillsite to and over the Ublutouch River bridge as is the drillsite location. Alternative B would have slightly greater impacts due to a longer and more sinuous access road route past the Ublutouch River bridge to the drillsite over wetter areas. Alternative B would avoid construction of permanent infrastructure within the Fish Creek Setback by routing the road and pipeline further south via a slightly longer route (8.5 miles versus 7.7 miles). Alternative B would eliminate crossings over channelized portions of Crea and Barely Creeks compared to Alternative A. The pipeline tie-in site for Alternative B would be located along the CD5 access road, as opposed to the at the CD5 drill site for Alternative A, requiring an additional 0.7 acre tie-in pad. The cost of construction for Alternative B would approximately 4% higher than Alternative A due to the increased length of the gravel access road, with estimated costs expected to be approximately $1.5 billion in capital expenditure.

Hydrology. The Alternative B access road route would cross through the Crea and Barely Creek watersheds higher in the watershed (further upstream). The Alternative A road alignment would cross in their lower (downstream) areas where channelized flow occurs. The Alternative B access road fill area would be similar to Alternative A in the Crea Creek watershed (11.2 acres) but about twice as much in the Barely Creek watershed (11. 2 acres versus 5.8 acres).

Due to small drainage basin sizes, combined with limited runoff volumes (annual snow water equivalent in the region is about 3 inches), flat topography, and available lake water storage, no substantial inundation upstream of either alternative is expected with proper culvert placement and design. Correct placement of culverts in both alternatives would minimize ponding and ensure runoff remains within its existing watershed. With adequate culverting, the area and volume of ponding would be relatively minor.

No persistent channelization is apparent higher in the Crea or Barely Creek watersheds. Spring break-up flood waters upstream of the Alternative B road fill alignment mostly occur by overland flow. Conveyance of this widespread shallow flow may require approximately 25 more culverts under Alternative B. Alternative B may cause increased water diversion along the roadway to

reach the culverts. Spring break-up flood water ponding upstream and drying downstream of the road under Alternative B could be 355 acres more than Alternative A.

Flow through the access road with Alternative B would be less efficient. Channelized flow typically has enough volume and hydraulic head to pass through an appropriately designed structure without ponding. Overland (sheet) flows are widespread and shallow, often requiring more culverts. Without enough culverts, correct locations, or improper placement can cause water diversion along the roadway to reach culverts. Crea Creek has less potential for upstream ponding under Alternative A because of channelized flow and the bridge. Alternative B would require a greater number of culverts and could result in minor ponding upstream of the road.

Alternative A and B cross the Ublutouch River watershed at a channelized and narrow location with elevated firm river banks and no immediately adjacent flooded wetland areas. With well designed and constructed crossings at all watersheds, the impacts to hydrology would be less. Adequate bridges and culverts for channelized flowing waters and cross-drainage for passing overland waters at all times is critical to retaining separate watershed hydrology characteristics and reducing adverse impacts caused by road construction. A project authorization would require that all river/creek crossings be optimized for retaining the physical characteristics of the channels, banks, and vegetation.

Construction and maintenance. The Alternative B road alignment would be constructed in wetter and softer (organic) soils within thaw basin areas of poor structural soils and thaw instability. Additional fill amounts for settling or constructing to higher elevations may be necessary. These challenges could result in a slight increase of indirect impacts from road maintenance from a saturated road bed, fill slumping, or erosion. Alternative B may generate slightly more gravel spray and dust generation because of its longer length.

Fish and other aquatic organisms. The Alternative B road would cross the Barely and Crea Creek in their headwaters, upstream of channelized flows where fish habitat is undocumented. The Alternative A access road would cross over 3 fish-bearing stream channels (bridges at the Ublutuoch River and Crea Creek; culvert battery at Barely Creek). The access road and pipeline routes for Alternatives A and B would be located close to Lake 9824, a fish bearing lake near the Ublutouch River crossing. The Alternative A access road would pass within 500-feet downstream of Lake 9819, a documented fish bearing (floating ice regime) water for Arctic grayling and least cisco. The Alternative B pipeline route would be located near (less than 500-feet upstream) the south shoreline of Lake 9819, a documented fish bearing (floating ice regime) water for Arctic grayling and least cisco. The Alternative A pipeline would be located north of its proposed access road route and beyond the 500-foot buffer from lakes 9821 and 9820.

With Alternative B, the channelized fish habitats of Crea and Barley Creeks are removed from the intensity of road-caused impacts. All proposed river/creek crossing structures have been designed to provide and maintain fish passage. No fill material would be placed in Crea or Barely creeks under Alternative A, but the fill proximity to fish habitat would be closer under this alternative because of the crossings, and there would be associated indirect impacts from road dust fallout, noise, and visual impact of traffic. With Alternative A, other aquatic organisms and wildlife species (field observed bird populations) may be impacted more. A project authorization would require all river/creek crossings be optimized for retaining the physical and biological characteristics of the channels, banks, vegetation, and aquatic ecology. The overall impacts for both alternatives are expected to be relatively minor, with protective design and construction restrictions imposed.

Birds and bird habitat. Alternative B would cause slightly higher impacts to birds from the additional access road length through bird habitats. Alternatives A and B would directly impact similar acreages of the wetland habitats (patterned wet meadow, old basin-wetland complex, moist sedge-shrub tundra, and tussock tundra) preferred by focal bird species (spectacled and king eiders, tundra swan, and greater white-fronted goose). Alternative B would have slightly

more impacts on wetland type interspersion (habitat edge effect). Impacts to birds and bird habitat would be slightly higher with Alternative B.

Pipelines. The Alternative B pipeline routing would be located entirely south and up-gradient of the access road to serve as a containment barrier to an oil spill. The Alternative A pipeline routing would be located primarily north of the access road and down-gradient toward important aquatic resources of the Ublutouch River. The gravel access road would provide year-round access for surveillance monitoring and repair. Areas of the pipeline greater than 1,000 feet from the road would have surveillance monitoring with snow machine or all terrain vehicle (ATV). Large spills from a pipeline breakage or separation migrating overland would pose the greatest risk. If such a spill did occur during the summer season at or near one of the river/creek crossings, it would cause substantial adverse impacts to the aquatic ecosystems and local environment. Based on the applicant's pipeline spill records and overall oil industry across the North Slope, the risk of a large spill is very low, given the precautionary measures in place for monitoring, inspections, and maintenance. Most all crude oil spills have been leaks impacting small areas. To date, a large catastrophic crude oil spill has not occurred on the North Slope.

Fish Creek Buffer. The Fish Creek Buffer (FCB) was established by the BLM on the NPR-A lands by their federal land management plan as a lease stipulation to protect the area from permanent development which could affect subsistence resources and harvesting activities. The BLM also established a lease stipulation exception process where an applicant has an opportunity to demonstrate their permanent development into the FCB would still meet the intent of the restriction and the project authorized. The FCB area is well known as highly productive of fish and wildlife populations used as important food sources for local residents. The FCB extends for 3-miles on each side of the Fish Creek main channel.

The Alternative B route would divert south from the Alternative A route to avoid all disturbance from permanent development caused by the proposed access road. The Alternative B route would run south of 2 large lakes to avoid the impacts associated with the discharges of fill material in these waters and documented fish habitat areas. This southern route (Alternative B) would avoid 2 bridge and 1 culvert crossings of the 2 seasonal creek waters and the perennial flowing river fish water. Alternative B (southern route) would be constructed in wetter marshy areas within the headwaters of the 2 seasonal creeks. No bridges or culvert would be needed for flowing waters but the wet area would need many culverts to retain drainage, water levels, and the ecological characteristics of the area.

The applicant has applied for an exception to lease stipulation K-1(e) to construct a portion of the access road within the FCB. The BLM will make a decision on the application in their GMT1 ROD. This decision must be made by the federal land manager in evaluation of their permit decisions for Permits to Drill and/or a Right-of-Way Grant. USACE cannot regulate or control land-use activities within the FCB as we have no regulatory authority to regulate land use, zoning, or the like.

Overall, Alternative B would have more direct and indirect impacts to the aquatic ecosystem causing a greater acreage of fill placement and longer road routing through high value wetlands. Strict regulatory protections would be necessary to ensure the aquatic ecosystem is protected to the maximum extent possible and practicable. Routing the access road by the northern route (Alternative A) would impact less valuable wetlands, entail less fill area, and result in a shorter length. With optimal designed crossing structures, direct impacts to the fish waters could be avoided and indirect impacts would be less than alternative B.

3.5.3 Alternative C - Alternative Access Routes

Alternative C is described in the FSEIS in section 2.7 Alternative C and summarized above in section 3.5. Impacts under Alternative C are described in the FSEIS in section 4.4.5.5 Impacts Under Alternative C.

Alternative C would serve as a hub for industrial activity. It would upgrade the Nuiqsut Spur Road, airstrip, and construct and/or upgrade other roads and facilities in the community of Nuiqsut. Transport of materials and personnel destined for GMT1 would be flown or trucked into Nuiqsut and then transported over the Nuiqsut Spur Road and GMT1 access road to the drill site. This access plan would require use of utility services in Nuiqsut for electricity, water, sewer, and trash disposal for a logistics center. Development of some facilities in Nuiqsut would duplicate existing facilities available at the ACF. The applicant has stated their intention to continue to use the ACF airstrip as the primary location for air transportation regardless of upgrades to the Nuiqsut Airport. This may negate or limit increasing the economic benefits for residents in Nuiqsut.

Extending the Nuiqsut Airport Runway westward would cross a small stream requiring a long-length culvert and drainage maintenance. Alternative C would include larger fill acreages and result in greater direct and indirect adverse impacts on aquatic resources.

Alternative C is estimated to cost an additional 13 percent more than Alternative A. An independent third-party predicted Alternative C would not be a viable economic project. However, USACE does not consider Alternative C to be rejected from consideration from the referenced economic analysis or cost of construction.

Necessary upgrade of the Nuiqsut Spur Road under Alternative C would require property access rights from the landowner, Kuukpik Corporation who provided written notification they do not support Alternative C and will not allow property access to construct the project. Kuukpik's denial to grant property access rights to construct Alternative C effectively removes Alternative C from being an available alternative under the CWA Section 404(b)(1) Guidelines. Additionally, Alternative C would result in a larger gravel footprint (105.8 acres of gravel area versus 72.6 acres for Alternative A) and greater associated impacts to aquatic resources as compared with Alternative A. Therefore, Alternative C is not practicable and therefore not further evaluated in this ROD.

3.5.4 Alternative D1 - Roadless Development

Alternative D1 is described in the FSEIS in section 2.8 Alternative D1 and summarized above in section 3.5. Impacts under Alternative D1 are described in the FSEIS in section 4.4.5.6 Impacts Under Alternative D1.

Alternative D1 provides a roadless project design where no year-round road access would be constructed. A pipeline would be constructed from the CD5 drillsite to the proposed BMT1 drillsite. Fill would be placed to construct an airstrip and pad for drilling and support facilities.

Alternative D1 would reduce impacts related to construction of the gravel access road and bridge crossings but would cause an additional 15-acres of wetland fill for the airstrip and support pad and road access to the drillsite. Alternative D1 would require the duplication of several facilities present at the ACF. These include a drilling mud and cement plant with storage silos, a tank farm, and diesel fuel delivery pipeline, with a potential for fuel spills or leak from storage and transfer. The airstrip would be oriented in an east-west alignment with the prevailing wind direction, but perpendicular to the general south to north water drainage pattern. The airstrip would not cross any creeks but may cause surface water ponding without substantial cross-drainage culverting.

Without an all-season road access to the drillsite, air access would be necessary for approximately 9 months of the year. Transport of oil spill and emergency response equipment, supplies, medical evacuation, and personnel by air access to the GMT1 drillsite would be impacted by weather conditions and restricted 13 to 22 percent of the year. The GMT1 site is not accessible by response watercraft from the ACF. During the thaw season, and without air

access, specialized overland tundra travel equipped, slow moving vehicles would be the transportation mode.

Non-emergency access by air for 9 months of the year would result in increased air traffic. The ACF would remain the operations center for all Alpine satellite facilities. Most scheduled air traffic would continue to fly first to the ACF and personnel and materials needing access to the drillsite would continue on. Alternative D1 would cause a greater adverse noise impact to caribou, subsistence activities, and recreation because of air traffic disturbances near local resident hunting areas. Alternative D1 would also require annual winter ice road construction and facility resupply during the time when many Nuiqsut residents are active with subsistence activities. The increased air and ice road traffic and additional support facilities would lead to higher air quality impacts. Accordingly, air quality was rated as major for Alternative D1 in the FSEIS.

Alternative D1 would cause a higher fuel spill risk from increased aircraft operations and fuel storage. Additional area and facilities for tools and heavy equipment necessary for spill response requires warm storage buildings, and space for maintenance work, and camps to house workers. Spill response also requires a significant number of trained volunteers and access to specialized equipment, including a relief drill rig, mobilized and deployed by a well control specialist company. Winter season ice road access to the three-phase pipeline would complicate all-year daily operations for inspections, repairs, testing, and pigging, including emergency spill response and firefighting. It would not be practicable to have a complete incident response station prepared at the drill site.

The need for additional facilities under Alternative D1 would result in substantially larger capital and operating expenditures. The total capital cost of Alternative D1 would be 27 percent higher than Alternative A. The increased capital expenditure would result in a negative EMV of about $274 million and a discounted profitability index of less than 1.0, indicating that Alternative D1 would not be an economically viable project (Northern Economics, 2014).

We have determined Alternative D1 is not a practicable alternative based on the cost of construction and operations. It would also cause greater adverse environmental impacts to the aquatic ecosystem and general environment, including human uses.

3.5.5 Alternative D2 - Roadless Development with Winter Seasonal Drilling Only

Alternative D1 is described in the FSEIS in section 2.8 Alternative D2 and summarized above in section 3.5. Impacts under Alternative D1 are described in the FSEIS in section 4.4.5.7 Impacts Under Alternative D2.

Alternative D2 would be similar to Alternative D1 but drilling into the hydrocarbon zone restricted to winter season. Drilling would be restricted to an 80-day ice road season. Past experience with the challenging drilling conditions encountered within the GMTU and the enhanced well design necessary to safely develop the reservoir, the applicant estimates each well would require 53 days to drill, meaning that only 1.5 wells could be completed annually.

Under Alternative D2, first oil production requiring 7 completed wells (1 disposal, 3 producing, and 3 injection) would be delayed until April or May of 2023, nearly 5 years after construction is completed and 5.5 years later than the startup date anticipated for Alternative A. Approximately 24 ice road seasons would be needed to drill the planned 33 wells as compared to the 4.75 years for all other alternatives. Use of two rigs would require seasonal ice pad expansion at the drillsite, increasing water requirements, and damage to tundra wetlands if multi-season the ice pads were built in the same location.

Use of 2 drill rigs each season was determined impracticable by the applicant. Presently, there are not 2 drill rigs available on the North Slope capable of drilling all of the wells at GMT1 and crossing the ice bridge over the Colville River. Drilling resupply, cuttings disposal, and other

logistics would need support from both the ACF and the Kuparuk Operations Center (approximately 50 miles from the ACF). Simultaneous operation of 2 drill rigs on highline power would need substantial upgrades to generation facilities at the ACF, with larger impacts to birds, aesthetics, and air quality with increased cost. A second rig could be powered using a diesel generator, but more air emissions would occur.

A maximum of 3 wells could be drilled per year using two drill rigs simultaneously. This timeframe includes the increased drilling time necessary for the enhanced well designs to successfully develop the reservoir. First oil production would be delayed until April or May of 2020, approximately 2.5 years after the completion of construction and 2.5 years after first production anticipated for Alternative A.

Alternative D2 would have similar construction costs to Alternative D1, but seasonal drilling would further increase costs during drilling and production, such that the project would be economically impracticable per the applicant. Added capital costs needed for required infrastructure and seasonal drilling would result in a negative EMV of about $363 million and a discounted profitability index of less than 1.0, indicating that Alternative D2 would not be a viable project economically. Total capital expenditures for Alternative D2 are estimated to cost about 50 percent more than the expected $1.5 billion capital expenditure estimated under Alternative A. Intangible drilling costs (i.e., administrative costs with drilling contracts, ice road construction costs, drill rig moving and setting, drillsite grading, drilling, technical services, supplies, equipment rental, and obtaining an operating agreement for drilling operations) are expected to cost twice as much over the expected 22 drilling seasons (Northern Economics, 2014).

We have determined Alternative D2 is not a practicable alternative based on the cost of construction and operations and is therefore not further addressed in this ROD. It would also cause greater adverse environmental impacts to the aquatic ecosystem.

3.5.6 Comparison of remaining practicable Alternatives A and B

3.5.6.1 Direct and indirect effects by aquatic resource type and functional category.

Wetland functions were presumed to perform functions equally due to the proximity to each other. Both alternatives are located in an area with little landscape fragmentation with essentially no human disturbance. Therefore, both alternatives would perform at similar capacities in any of the eight (8) functions evaluated in the aquatic site assessments. The 8 functions included: 1) flood flow regulation; 2) sediment, nutrient, and toxicant, reomoval; 3) erosion control and shoreline stabilization; 4) organic matter production and export; 5) general habitat suitability; 6) fish habitat; 7) educational, scientific, recreational, or subsistence use; and 8) uniqueness and special status. Wetland types determined to perform at high capacity in Alternative A were also assigned high performance scores within Alternative B.

Direct effects are a loss of aquatic resources and their functions resulting from the discharge of fill material which converts an aquatic resource to an upland resource. Alternative B would result in the permanent loss of 79.2 acres of waters of the U.S., including wetlands, whereas Alternative A would result in the permanent loss of 72.6 acres. Alternative B would result in 6.6 acres more direct impacts compared to Alternative A.

Indirect effects do not result in a total loss of aquatic resource area but cause impacts resulting from the discharge which reduce levels of function. Indirect impacts were estimated within a 300-foot distance as measured from all sides of direct impact areas. Alternative B would result in 652 acres of indirect impacts, whereas Alternative A would result in an area of 582 acres. Alternative B would result in 70 acres more of indirect impacts when compared to Alternative A. Alternative B would result in 14.8 acres of indirect impacts on open waters, whereas Alternative A would result in 10 acres. Alternative B would indirectly impact 4.8 acres more of open waters than Alternative A.

Table 4. Comparison of Alternatives A and B direct and indirect effects by aquatic resource type and functional category (HDR 2014).

NWI Type	NWI Description	Functional Category	Alternative A		Alternative B	
			Direct Impact (acres) [%] [a]	Indirect Impact (acres) *[%]* [b]	Direct Impact (acres) *[%]* [a]	Indirect Impact (acres) [%] [b]
Wetlands						
PEM1/ SS1B	Saturated persistent emergent and broad-leave deciduous scrub shrub wetland	II	43.4 [60]	281.6 *[48]*	42.3 [53]	284.2 [43]
PEM1/ SS1E	Seasonally flooded/saturated persistent emergent and broad-leave deciduous scrub shrub wetland	I	20.7 [28]	176.2 *[30]*	23.2 [29]	201.7 [31]
PEM1F	Semi-permanently flooded persistent emergent wetland	I	6.9 [9]	85.7 *[15]*	13.2 [17]	131.6 [20]
PEM1H	Permanently flooded persistent emergent wetland	I	0.8 [1]	22.4 [4]	<0.1 [d]	16.6 [<3]
PSS1C	Seasonally flooded broad-leave deciduous scrub shrub wetland	II	0.4 [<1]	3.4 [<1]	0.4 [<1]	3.0 [<1]
R2EME	Seasonally flooded/saturated lower perennial riverine system with emergent vegetation	I	0.2 [<1]	2.6 [<1]	<0.1 [d]	<0.1 [d]
PEM1T	Semi-permanently flooded tidal persistent emergent wetland	I	<0.1 [d]	<0.1 [d]	<0.1 [d]	<0.1 [d]
PUSR	Seasonally flooded tidal palustrine unconsolidated shore	III	<0.1 [d]	<0.1 [d]	<0.1 [d]	<0.1 [d]
Wetland Impacts [c]			**72.4** [>99]	**571.9** [97]	**79.1** [>99]	**637.1** [97]
Open Waters						
L1UBH	Permanently flooded limnetic lacustrine system with an unconsolidated bottom (Lakes)	II	—	3.8 *[<1]*	<0.1 [d]	5.3 [<1]
R2UBH	Permanently flooded lower perennial riverine system with an unconsolidated bottom (Streams/Waterways)	II	0.2 [d]	2.5 *[<1]*	0.10 [<1]	1.2 [<1]
PUBH	Permanently flooded palustrine unconsolidated bottom (Ponds)	I	<0.1 [d]	3.7 *[<1]*	<0.1 [d]	8.3 [1]
Open Water Impacts [c]			**0.2** [<1]	**10.0** [<2%]	**0.1** [<1]	**14.8** [2]
Total Open Water & Wetland Impacts [c]			**72.6** [~99.9%]	**582** [>99%]	**79.2** [>99]	**652** [>99]
UPL	Uplands [c]		0.10 [d]	5.4 [<1%]	0.2 [<1]	2.5 [<1]
Total Open Water, Wetland, & Upland Impacts			**72.7**	**587.4**	**79.4**	**654.50**

[a] *The percentage of impacts by wetland type is indicated in brackets [%] .*
[b] *Indirect impact acreages were determined in a 300-foot buffer from edge of proposed gravel fill. Percentage of indirect impacts by wetland type is indicated in brackets [%] below acreages of impacts.*
[c] *Total acreage present may not reflect the sum of the individual cells due to rounding.*
[d] *Percentage of impacts by wetland types are less than 0.1%.*

3.5.6.2 Comparison of Alternatives A and B direct effects by aquatic resource types and project component.

Alternative B would result in the permanent loss of 79.1 acres of wetlands, and 0.1-acre of open waters. Alternative A would result in the permanent loss of 72.4 acres of wetlands and 0.2-acre of open waters. Alternative B would result in 6.7 acres more of direct impacts on wetlands, but 0.1-acre less of direct impacts on open waters. The higher direct impact on open waters caused by Alternative A is associated to the crossing of two streams not crossed under Alternative B.

Table 5. Comparison of Alternatives A and B direct effects by aquatic resource types and project component.

NWI-Code	Road (acres)		Drillsite (acre)		Tie-in Pad (Acres)		Manual Valves (acres)		Pullout (acres)		VSMs		Fill (acres)	CAT
	A	B	A	B	A	B	A	B	A	B	A	B		
WETLANDS														
PEM1/SS1B	31.1		11.8				0.5				<0.1		43.4	II
		29.9		11.7				0.6				0.1	42.3	
PEM1/SS1E	20.5						0.2				<0.1		20.7	I
		22.6		0.1		0.4		0.1				<0.1	23.2	
PEM1F	6.9										<0.1		6.9	I
		12.9				0.2						0.1	13.2	
PEM1H	0.8										<0.1		0.8	I
		<0.1										<0.1	<0.1	
PSS1C	0.4										<0.1		0.4	II
		0.4										<0.1	0.4	
R2EME	0.2										<0.1		0.2	I
												<0.1	<0.1	
PEM1T											<0.1		<0.1	I
												<0.1	<0.1	
PUSR											<0.1		<0.1	III
												<0.1	<0.1	
OPEN WATERS														
R2UBH	0.2										<0.1		0.2	II
		0.1										<0.1	0.1	
PUBH											<0.1		<0.1	I
												<0.1	<0.1	
A TOTAL FILL	**60.1**		**11.8**				**0.7**				**<0.1**		**72.6**	
B TOTAL FILL		**65.9**		**11.8**		**0.6**		**0.7**	**?**	**?**		**0.2**	**79.2**	

3.5.6.3 Summary comparison of Alternatives A and B direct and indirect effects by functional category.

Table 6. Summary of direct and indirect Impacts by wetland types and functional category (Appendix B)

Functional Category	Wetland Types	Alternative A Impacts		Alternative B Impacts	
		Direct (acres)	Indirect (acres)	Direct (acres)	Indirect (acres)
I	PEM1/SS1E, PEM1F, PEM1H, R2EME, PEM1T, PUBH	28.60	290.60	36.40	358.20
II	PEM1/SS1B, PSS1C, L1UBH, R2UBH	44.00	291.30	42.80	293.70
III	PUSR	<0.10	<0.10	<0.10	<0.10
Total		**72.60**	**582**	**79.20**	**652**

Direct effects to high functioning aquatic resources (Category I) under Alternative B would be larger by acreage than under Alternative A. Alternative B would result in the permanent loss of 36.40 acres of high functioning wetlands, whereas Alternative A would result in the permanent

loss of 28.60 acres (Table 6). Alternative B would result in 7.8 acres more of impacts in high functioning aquatic resources when compared to Alternative A.

Direct effects to moderate functioning aquatic resources (Category II) under Alternative B would be smaller by acreage than under Alternative A. Alternative B would result in the permanent loss of 42.80 acres of moderate functioning aquatic resources, whereas Alternative A would result in the permanent loss of 44.00 acres. Alternative B would result in 1.2 acres less of moderate functioning aquatic resources when compared to Alternative A.

Direct effects on low functioning aquatic resources (Category III) would be less than 0.1-acre for both Alternative B and Alternative A.

Indirect effects on high functioning aquatic resources (Category I) would be higher under Alternative B than under Alternative A. Alternative B would result in 358.20 acres of high functioning aquatic resources, whereas Alternative A would result in 290.60 acres. Alternative B would have 67.60 acres more of indirect impacts on high functioning aquatic resources when compared to Alternative A.

Indirect effects on moderate functioning aquatic resources (Category II) would be higher under Alternative B than under Alternative A. Alternative B would result in 293.70 acres of moderate functioning aquatic resources, whereas Alternative A would result in 291.30 acres. Alternative B would result in only 2.4 acres more of indirect impacts on moderate functioning aquatic resources than Alternative A.

Indirect effects on low functioning aquatic resources (Category III) would be minor (<0.10-acre) for both Alternative A and Alternative B.

4.0 Public Involvement.

The USACE public notice (PN) soliciting comments for the applicant's proposed project, as described in their DA permit application, was published on September 15, 2014. All comments received are identified and addressed in Appendix A. Full copies of all comments are available in the Administrative Record.

4.1 Public meeting.
No requests for a public meeting were received. During the development of the FSEIS, several public meetings were held at several locations in Alaska just after publication of the DSEIS.

4.2 Public Hearing.
No requests for a public hearing were received and none were held.

4.3 Site visit.
A site visit was conducted by helicopter with select site landings on July 8, 2014. Participants included representatives from the NVN, USFWS, EPA, NSB, applicant, and their contractor. The areas surveyed included the Alternative A and B road and pipeline routes from the CPAI CD-5 newly constructed pad to the proposed new GMT1 drillsite. Several stops and landings took place and included the Ublutouch River, GMT1 drillsite, Alternative D1 and D2 pad and airstrip, and the Alternative B.

4.4 Other Issues identified by USACE.
None identified.

4.5 Evaluation and consideration of comments.

Summary of comments and responses can be found in Appendix A.

4.6 Applicant response.

The applicant provided a 39-page response to comments raising concerns or objections to their proposal. All applicant responses can be found in Appendix A.

4.7 Comments not discussed further in this document as they are outside USACE's purview. None known.

4.8 Consideration of comments within USACE's purview.

All comments received have been addressed and can be found in Appendix A. Substantial comments have been addressed in the detail appropriate with the issues raised.

5.0 Clean Water Act Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material 40 CFR Part 230 (Guidelines): The FSEIS contains appropriate analysis of all the factors within the Guidelines, except as supplemented here-in as specifically needed to comply with the 404(b)(1) Guidelines.

5.1 Subpart A - General

§230.1- 230.7 These sections provide general information regarding Purpose and policy, Applicability, Definitions, Organization, General procedures to be followed, Adaptability, and General permits. No project specific analysis is required in this section.

5.2 Subpart B - Compliance with the Guidelines

5.2.1 §230.10 Restrictions on discharge.

5.2.1.1 §230.10(a) This section defines the use of and restrictions for the Guidelines application to evaluate proposed discharges of dredged and fill material into waters of the US. 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 environmental consequences. An alternative is practicable if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of the overall project purposes.

5.2.1.2 §230.10(b) The proposed discharge of dredged or fill material would not:
(1) Violate any applicable State water quality standard. The state water quality agency, Alaska Department of Environmental Conservation (ADEC) issued their Certificate of Reasonable Assurance for placement of the fill material for the applicant's proposed project described in our public notice.
(2) Violate toxic effluent standards or prohibitions under section 307 of the Clean Water Act. The fill material would come from a local source gravel mine known to be free of human or natural pollution.
(3) Jeopardize the continued existence of any species listed as endangered or threatened species under the Endangered Species Act of 1973 or their critical habitat. The proposed action, as well as the alternative actions, have been coordinated with the USFWS with a no jeopardy determination for all listed species in the project area.
(4) Violate any requirement imposed by the Department of Commerce to protect marine sanctuaries under Title II of the Marine Protection, Research, and Sanctuaries Act of 1972. This is not applicable as there are no marine sanctuaries in the project area.

5.2.1.3 §230.10(c) 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 US. Findings of significant degradation related to the proposed discharge shall be based upon appropriate factual determinations, evaluations, and tests required by subparts B and C, after consideration of subparts C through F. The discharge shall not be permitted if it:

(1) Causes significant adverse effects through pollutants on human health or welfare, municipal water supplies, plankton, fish, shellfish, wildlife, and special aquatic sites. These factors for the proposed action, as well as the alternative actions have been thoroughly evaluated. See sections 5.6.1 - 5.6.4 below.
(2) Causes significant adverse effects through pollutants on life stages of aquatic life and other wildlife dependent on aquatic ecosystems. These factors for the proposed action, as well as the alternative actions have been thoroughly evaluated. See sections 5.2.2.4, 5.2.2.7, 5.4.1, 5.4.2, 5.4.3 below.
(3) Causes significant adverse effects through pollutants on aquatic ecosystem diversity, productivity, and stability to the loss of fish and wildlife habitat or loss of the capacity of a wetland to assimilate nutrients, purify water, or reduce wave energy?: These factors for the proposed action, as well as the alternative actions have been thoroughly evaluated. See sections 5.3.1 - 5.3.6 below.
(4) Causes significant adverse effects through pollutants on recreational, aesthetic, and economic values. These factors for the proposed action, as well as the alternative actions have been thoroughly evaluated. See sections 5.6.1 - 5.6.4 below.

5.2.1.4 §230.10(d) 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. Subpart H (below) identifies such possible steps.

5.2.2 §230.11 Factual determinations.

5.2.2.1 §230.11 (a) Physical Substrate Determinations.

The proposed project would place fill over 72.6 acres of water and wetland substrates. Gravel fill for the construction of the drillsite pad, access road, and valve pads would be placed using standard North Slope construction techniques. The first step in gravel road construction is for surveyors to stake out the road and pad limits. Next, ice roads are built to provide transportation of equipment and trucks for gravel hauling. Gravel would then be placed using a bulldozer, B-70-type haul trucks, a grader, and vibratory compactors. Pad and road construction would entail placing gravel off the end of the gravel road in a 24-inch initial lift (layer) until the entire footprint is covered. Gravel would be placed during winter months, but would be allowed to settle through the following summer to allow for gravel seasoning (drying and thaw settling) before it can be finish-graded and compacted to produce a stable driving surface. Re-grading is not expected to require additional gravel. Culvert installation would primarily occur during the winter with construction of the gravel roads.

Direct impacts of the placement of fill on the substrate include compaction and damage to soil during construction of gravel pads and roads and installation of VSMs. Construction of the 60.1 acre gravel road (including pullouts) and 11.8 acre GMT1 gravel pad represents the majority of the area of impact from the proposed project. Although the substrate would be covered with the discharge of fill material, the underlying permafrost would remain frozen due to the depth of fill material (average of 5 feet thick). Pipeline construction would displace soil during installation of VSMs. VSMs are installed in winter and spoil material is collected from the surface for proper disposal.

The ice-rich soils near the fill area may also be indirectly impacted by vegetation changes, water impoundment, gravel spray, dust deposition, salinity effects from gravel, snowdrifts,

and blockage of or changes to natural drainage patterns resulting in the substrate becoming either wetter or drier. Direct or indirect exposure of permafrost to the air and sunlight can result in permafrost degradation and thaw settlement (thermokarst). Substrate adjacent to proposed pipeline could be indirectly affected by altered snow accumulation patterns and by shading of vegetation. The area potentially impacted by indirect effects, estimated using a 300-foot buffer from proposed gravel fill, is approximately 582 acres.

The applicant has incorporated measures to avoid or minimize impacts of the proposed project to the physical substrate. These include use of existing infrastructure, reducing the size of the footprint of fill needed for roads, and reducing the overall pipeline length to minimize the amount of substrate altered by fill and other surface disturbances. Avoidance and minimization measures include development of the project during winter months and utilization of ice infrastructure to facilitate construction access and to stage construction equipment to minimize impacts to aquatic substrate.

1. Placing a minimum of 5 feet of gravel fill to insulate the underlying permafrost.
2. Elevating heated buildings or structures on pilings, to prevent or reduce heat transfer to underlying soils and preserve the thermal integrity of the permafrost.
3. Elevating all on- and off-pad pipelines above grade on VSMs.

Designing bridges and culverts to maintain existing surface drainage patterns, prevent erosion, and ensure adequate water flow to maintain soil ice features.

4. Installing well conductor piles and thermosyphons around wells to remove unavoidable heat transfer from wellbore fluids.
5. Applying dust control measures to fill areas to protect insulating vegetation and minimize dust settlement on vegetation or snow which could increase thermal conductivity and promote earlier spring thaw.
6. Implementing operating procedures and maintenance programs to ensure the design measures remain in effect throughout the life of the project. These include maintaining gravel depth according to design measurements, maintaining culverts and bridges to provide unimpeded water flow, and maintaining the well thermosyphons.
7. Additional avoidance or reduction of impacts is provided through best management practices (BMPs) and BLM lease stipulations.

With the inclusion of special conditions, the proposed project would comply with this factor of the 404(b)(1) guidelines.

5.2.2.2 §230.11 (c) Suspended particulate/turbidity determinations.

Direct impacts. 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. Coarse mineral fill material composed primarily of sand and gravel would be discharged during winter when frozen conditions would substantially reduce the introduction of fine materials in the fill to the water column.

Indirect impacts. Increased suspended particulates and turbidity of water bodies adjacent to the fill discharge sites would result from generated road and fill pad dust fallout, runoff , erosion at fill slopes, or flooding. Provided best management practices for erosion control and dust abatement are ensured, the adverse impacts to water resources from suspended particulates and turbidity are anticipated to be relatively minor.

With the inclusion of special conditions, the proposed project would comply with this factor of the 404(b)(1) guidelines.

5.2.2.3 §230.11 (d) Contaminant determinations.

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.

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 ASRC Mine Site is proposed as the primary source of gravel fill for the proposed project. The existing ASRC Mine Site has been evaluated and previously permitted; therefore, there is no reason to anticipate that the proposed fill material would contain contaminants that could affect surrounding water quality or cause State of Alaska water quality standards to be exceeded.

Based on evaluation of the information above, there is no reason to believe the material to be discharged into WOUS would contain contaminants.

With the inclusion of special conditions, the proposed project would comply with this factor of the 404(b)(1) guidelines.

5.2.2.4 §230.11 (e) Aquatic ecosystems and organisms determinations.

Direct impacts to fish and fish habitat would not occur from the proposed action. Indirect impacts would occur to fish and fish habitats adjacent to the proposed action. For more information see sections 5.2.2.7 and 5.4.2 below.

With the inclusion of special conditions, the proposed project would comply with this factor of the 404(b)(1) guidelines.

5.2.2.5 §230.11 (f) Proposed disposal site determinations.

Not applicable (N/A) because no dredged materials will be discharged into open waters subject to mixing zone confinements. There are no open water disposal sites associated with this proposed project. Discharges of fill material would be placed into limited areas of frozen waters during winter time where effect to water quality would be minimal.

5.2.2.6 §230.11 (g) Determination of cumulative effects on the aquatic ecosystem.

An assessment of cumulative impacts takes into consideration the consequences that past, present, and reasonably foreseeable future projects had, have, or will have on an ecosystem. Its impacts on the environment must be assessed in light of historical permitting activity, along with anticipated future activities in the area. Although a particular project may constitute a minor impact in itself, the cumulative impacts that result from a large number of such projects could cause a significant impairment of water resources and interfere with the productivity and water quality of existing aquatic ecosystems. We have reviewed the cumulative effects discussion in the FEIS and find it to be a sufficient and accurate assessment.

The impacts expected from the proposed project are permanent impacts to 72.6 acres of waters/wetlands. Reasonably foreseeable future actions include the Greater Moose's Tooth 1 development that the applicant has been conducting hydrocarbon exploration activities on in the most recent years.

The placement of the fill material due to the reasonably foreseeable future action listed above, would directly impact the physical substrate, water, vegetation, and also cause indirect impacts to

the aquatic ecosystem. These other potential impacts would be similar to those identified for the proposed project. Overall, the project when combined with past, present, and reasonably foreseeable future projects, with the appropriate avoidance, minimization and compensatory mitigation measures, would not result in significant adverse cumulative impacts to aquatic resources within the area of cumulative effect.

Any proposed future projects requiring a DA permit would be evaluated as separate permit actions and the appropriate environmental analysis would be required, including a cumulative effects analysis. Permitting of these projects would be subject to Section 404 of the Clean Water Act (33 U.S.C. 1344), including the Guidelines, and/or other appropriate laws and regulations. If the appropriate avoidance, minimization and compensatory mitigation measures do not result in a project in compliance with the above regulations, authorization under Section 404 of the Clean Water Act could not be granted.

Proposed and required BMPs and mitigation measures considered to reduce direct and secondary impacts related to the proposed project would serve to reduce cumulative impacts to those same resources. Actions taken to minimize impacts are discussed sections 5.2.2.1 and 6.1.48 below.

With the inclusion of special conditions, the proposed project would comply with this factor of the 404(b)(1) guidelines.

5.2.2.7 §230.11 (h) Determination of secondary effects on the aquatic ecosystem.

Potential secondary effects on the aquatic ecosystem would be avoided and minimized to the maximum extent practicable by requiring special conditions for construction as described in section 6.1.48.

Secondary effects are effects on an aquatic ecosystem associated with a discharge of fill materials, but that does not result from the actual placement of the dredged or fill material. Secondary effects to the aquatic environment include impacts to physical substrate, water quality, vegetation, and aquatic ecosystems and organisms.

Impacts may include effects on 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. Secondary effects could also include potential increases in resource competition among aquatic species due to habitat loss resulting from to water withdrawal, increases in turbidity associated with erosion or discharge, or barriers to movement. These impacts are discussed in sections 5.3, 5.4, and 5.5 below.

Measures to mitigate potential secondary effects to the aquatic ecosystem, including physical substrate, water quality, vegetation, and aquatic ecosystems and organisms and human use characteristics are discussed in section 6.1.48.

Consideration of secondary effects also includes the potential for a spill of hydrocarbon or other toxic materials from the discharges associated with the placement of fill for the pipeline VSMs. A major oil spill during the summer, however unlikely, would be the greatest single or cumulative threat to aquatic resources and wildlife. Based on the 34 years of North Slope experience, the vast majority of spills has been less than 10 gallons or between 10 and 100 gallons and was contained within secondary containment or on gravel pads and roads. Overall, large spills were determined to have a low probability. Tanks and heavy equipment/mobile equipment/vehicles were the sources with both the highest percentage of spill incidents and volume; pipelines followed after these two sources. From 1998 and 2012 the majority of spills resulting from operations at Alpine were small events contained on gravel pads. The overall risk from increased production that would result from GMT1 would remain low.

Most spills would be expected to occur and be contained on or near ice, gravel pads, or roads and would generally be cleaned up before reaching tundra or water bodies. Should a pipeline leak occur at a river crossing, there would be a greater potential for pipeline spills to reach open water. The largest pipeline crossing for the proposed GMT1 project would occur at the Ublutuoch River. There is a 335-foot (measured at the abutments) bridge proposed for this crossing. Should a spill occur at this crossing, there would be many opportunities to intersect the majority of the oil prior to the intersection with Fish Creek, or to the delta of the Fish Creek at Harrison Bay. Manual valves located at either side of the Ublutuoch River would minimize potential leaks.

Depending on the season, the impacts from a potential spill would vary. Should a large spill, occur during an ice-covered season, the effects on water resources would be minor. If the spill occurred during a broken-ice season, there could be a short-term and localized exceedance of acute-toxic criteria during the initial spill period.

A spill that reached water could have major impacts if subsistence resources were affected. The likelihood of this would be low with the many prevention measures that would be in place.

The applicant's proposed project provides a 7.7-mile gravel road that would mostly parallel the 8.3-mile pipeline alignment. This allows enhanced year-round access for surveillance monitoring and repair. The applicant has identified alternative surveillance measures for the small portion of the pipeline that does not parallel the road. The approximately 1.82 miles of pipeline that would be greater than 1,000 feet from the road would be monitored with snow machine, ATV, or fixed-wing aircraft.

Mitigation measures would be placed on an authorization to reduce the potential of an onshore spill reaching marine waters. These would include contingency planning, setback requirements, and standard handling procedures for fuel and other pollutants. The general spill prevention and response plan for the Alpine Field includes several sites for boom pre-deployment which would also be implemented for the proposed GMT1 project.

With the inclusion of special conditions, the proposed project would comply with this factor of the 404(b)(1) guidelines.

5.2.2.8 §230.12(a) Findings of compliance or non-compliance with the restrictions on the discharge.

This section requires a finding of compliance with the Guidelines be set forth in writing by the permitting authority for each proposed discharge and made available to the applicant.

See below section 5.9.4.7, §230.12(a), Findings of compliance or non-compliance with the restrictions on the discharge. The finding is made on the basis of the guidelines, Subparts C through G (below) after consideration of Subparts B (above) through H and J (below). An evaluation of all practicable alternatives is also provided in section 5.9.4, §230.10(a).

5.3 Subpart C-Potential Impacts on Physical and Chemical Characteristics of the Aquatic Ecosystem

5.3.1 §230.20 Substrate.

The discharge of dredged or fill material can result in changes to the complex physical, chemical, and biological characteristics of the substrate. The amount and composition of the discharged material and the location, method, and timing of discharges influence the degree of impact on substrates.

72.6 acres of productive saturated water and wetland organic soil substrates would be converted to dry lands and permanently lost and replaced with coarse permeable gravel fill material. This effectively covers the substrate surface from light penetration to allow vegetation to exist, smothers exiting vegetation, and compresses the softer substrates through compaction by the weight of a minimum of 5-feet of fill material.

With the inclusion of special conditions, the proposed project would comply with this factor of the 404(b)(1) guidelines.

5.3.2 §230.21 Suspended particulates/turbidity.

With the inclusion of special conditions, the proposed project would comply with this factor of the 404(b)(1) guidelines.

5.3.3 §230.22 Water.

This section addresses how the discharge of dredged or fill material can change the chemistry and physical characteristics of a receiving water. Changes to water quality could occur from the construction of gravel infrastructure.

Direct impacts. A permanent loss of waters would occur from the discharge of fill material to convert waters and wetlands to drylands for transportation and facilities. Discharges of gravel fill material into waters would occur for construction of the access road and placement of VSMs (pipeline support piles). Most discharges would occur in saturated or moist tundra wetland areas.

Indirect impacts. The fill material would be placed during the winter when water bodies are ice covered (Ublutouch River) frozen solid (shallow ponds and wetlands) and impacts to water quality from siltation would be minimized. The drillsite pad is located on moist wetland substrates, approximately 0.5 mile from the nearest drainage. The closest large waterbody to the drillsite is Lake M9925, approximately 400 feet away. During the first seasonal thaw period following fill placement, the potential for erosion and siltation of waters would be increased due to fill material melt, settling, precipitation, and erosion. Siltation of waters adjacent to constructed fill areas could be reduced with careful fill placement, containment, and effective erosion control techniques and maintenance.

With the inclusion of special conditions, the proposed project would comply with this factor of the 404(b)(1) guidelines.

5.3.4 §230.23 Current patterns and water circulation

Current patterns and water circulation are the physical movements of water in the aquatic ecosystem. The discharge of dredged and fill materials can obstruct flow, change the direction of velocity, or dimensions of a water body, including wetland areas.

Alterations to current patterns and water circulation would occur with the construction of gravel pads, gravel roads, ice roads, and VSMs. The proposed project has the potential for long-term impacts to local water resources resulting from construction of a new gravel road and drillsite pad for changes in drainage patterns and stream flows.

The proposed gravel infrastructure road could impact hydrology through changes in natural drainage patterns, changes in stream stage, and changes in stream velocity which can affect erosion and sedimentation rates. These effects would most likely occur as a result of the proposed gravel access road, which traverses the Fish Creek and Ublutuoch River watersheds and the Barely Creek and Crea Creek sub-watersheds. The proposed gravel access road has been designed to accommodate predicted water flow by incorporating culverts and bridge structures in areas of channelized flow that would sustain both low and high water flows. The

structures would accommodate fluctuating water levels and maintain circulation and faunal movement.

Bridges would be constructed where a single channelized flow occurs with a 50-year recurrence interval of 500 cubic feet per second (CFS) or greater. Proposed bridge crossings include a 335-foot bridge opening (measured from between vertical sheet pile abutments) over the Ublutuoch River and a 25-foot bridge opening over Crea Creek. The Ublutuoch River Bridge would be wide enough to span a 50-year flood (approximately 10.9 feet British Petroleum Mean Sea Level (BPMSL)) and include construction of five pier sections below the ordinary high water mark (OHWM). No piers would be located within the main channel. The proposed 25-foot bridge opening at Crea Creek would similarly span the channel with no fill placed below the OHWM.

The proposed access road would cross Barely Creek (a small drainage with 50-year and 100-year discharge events calculated at 68 and 78 CFS, respectively) using a culvert battery. The Barely Creek culvert battery and other cross-drainage culverts would be designed to prevent raising the water level on the upstream side of the crossing by more than 6 inches compared to the down-gradient side for more than one week after peak discharge. The culvert battery would also be designed to meet fish habitat and passage criteria required by ADF&G Title 16 Fish Habitat permit stipulations.

The proposed gravel road would impound springtime break-up sheet flows and shallow groundwater migrations, resulting in increased ponding upstream and drying downstream of the road. A computer model showed the maximum area potentially affected by ponding/drying would be 2,630 acres up-gradient from the proposed road and 470 acres down-gradient from the road. These potential impacts would be minimized by installing cross-drainage culverts to mitigate the risk of sheet flow interruption and thermokarst. Culverts locations would be field located by verifying spring breakup to visually locate culverts based on sheet flow patterns. Cross-drainage culverts would also be installed at spaced intervals. Approximately 50 cross-drainage culverts along the 7.7 mile gravel access road would be placed.

Impacts to current patterns and water circulation would occur from construction of the proposed drill pad. The drillsite pad would be located on a relatively drier wetland (tussock tundra). The closest water body to the drillsite pad would be Lake M9925, approximately 400 feet south. Blackfish Creek, the nearest fish habitat creek, would be located approximately 0.5 mile northwest.

Indirect impacts from ice structures. There would also be short-term, temporary impacts from ice infrastructure (e.g., roads and pads). Water would be withdrawn from local lakes. As the ice roads melt in the spring, the water would be dispersed across the road corridors and drain into one of the many lakes or other areas of natural inundation. Drilling operations also typically require large amounts of water to create drilling fluids but the drilling for the proposed GMT1 project would be supported by an off-site drilling mud plant at the existing ACF.

With the inclusion of special conditions, the proposed project would comply with this factor of the 404(b)(1) guidelines.

5.3.5 § 230.24 Normal water fluctuations.

Normal water fluctuations in a natural aquatic system consist of daily, seasonal, and flood fluctuations in water level. The discharge of dredged or fill material can alter the normal water-level fluctuations pattern of an area resulting in periods of inundations and exaggerating high and low water stages, or a static nonfluctuating water level.

The proposed action would alter normal water fluctuations from permanent placement of fill material across several drainages. The access road and drillsite pad fill areas would impede or impound down gradient water flow if not adequately bridged and culverted.

The hydrocarbon delivery pipeline would be constructed with pipe pile placements at relatively long intervals such that normal water fluctuations would not be effected. The dredged material removed during winter time auguring would be removed and disposed of at an upland location and fill material placed for backfill support would not exceed the existing ground contours. This would protect the area from hydrologic changes in water levels.

With the inclusion of special conditions, the proposed project would comply with this factor of the 404(b)(1) guidelines.

5.3.6 §230.25 Salinity gradients.

Salinity gradients primarily occur where salt waters from oceans meet and mix with fresh water from lands. On Alaska's North Slope, some substrates have a natural component of salts present at the discharge site or from placement of local source fill materials. Alterations to salinity gradients could occur with the construction of freshwater ice roads, gravel pads, gravel roads, and VSM sand slurry materials if saline material was used as fill. Increased salinity at a site as a result of water draining off of or leaching through gravel roads or pads could alter water quality or soil properties in the immediate vicinity of the gravel structure. The ASRC Mine is similar in character to the proposed disposal site and an increase in the salinity of water or soils at the proposed disposal site is unlikely.

With the inclusion of special conditions, the proposed project would comply with this factor of the 404(b)(1) guidelines.

5.4 Subpart D - Potential Impacts on Biological Characteristics of the Aquatic Ecosystem.

5.4.1 §230.50 Threatened and endangered species.

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.

The discharge of dredged or fill material may cause covering or killing of species, the impairment of destruction of habitat to which these species are limited, or facilitate incompatible activities for their habitation.

Threatened or endangered species present in or near the project area are listed below. The proposed project would not be located in any designated critical habitat area for any of these Endangered Species Act (ESA) species.

Species common name	Scientific name	Critical habitat (Y/N)
Spectacled eider	Somateria fischeri	No
Steller's eider	Polysticta stelleri	No
Polar bear	Ursus maritimus	No

The proposed action area for evaluation under Section 7 of the ESA includes all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action.

With the inclusion of special conditions, the proposed project would comply with this factor of the 404(b)(1) guidelines.

5.4.1.1 Spectacled and Steller's eiders.

Direct effects. Spectacled and Steller's eiders occur at low densities within the project area. Impacts to eiders could include potential injury or death from collisions with vehicles, aircraft, and infrastructure (if illumination associated with the project attracts birds during low light conditions), and from potential toxicity from oil spills and leaks.

Spectacled eiders have been observed in the project vicinity but not within the 1-mile action area of proposed project infrastructure. Potential high-value habitats for spectacled eiders within the project area include grass marshes, shallow open water with islands or polygonized margins, and shallow open water without islands. The proposed project would not directly impact any of these habitats directly.

Indirect effects. A potential for an Indirect affect to 6.1 acres of the preferred eider habitats through noise disturbance, gravel spray, or dust deposition. Impacts to Spectacled eiders include potential increases in competition for dietary or habitat resources resulting from the loss or alteration of preferred habitats. Indirect effects to Spectacled eiders also includes potential increases in nest depredation from potential increases in predators associated with development. Spectacled eiders may be affected, but are not likely to be adversely affected by the proposed GMT1 project.

Impacts to Steller's eiders are not expected to occur due to very low habitat use in the project area. Nest searches in the Colville River Delta, Kuparuk River Unit, and northeast NPR-A over approximately 20 years have found no nests or indications of breeding Steller's eiders. Only a few sightings of individuals have been recorded.

5.4.1.2 Polar bears.

Impacts to polar bears could occur within the project areas. This includes habitat loss or alteration, disturbance or displacement of denning females and cubs, incidental harassment of polar bears transiting the project study area, intentional hazing near occupied work sites, or mortality due to collisions or defense of life kills.

The proposed drillsite pad location and most of the access road are located more than 5 miles from the coast of the Beaufort Sea where polar bears are more common. The banks of the Ublutuoch River where the access road would cross have slopes and banks that could be used for denning. No polar bear dens have been documented within 1 mile of the proposed project area. However, den locations are not static, and polar bears have been known to den as far south as the project study area. Female polar bears have fidelity to denning habitats, but not specific denning sites. Polar bears generally den in areas of topographic relief greater than 4.3 feet (e.g., along river and lake banks, coastal areas, and abandoned man-made gravel pads) where drifting snow accumulates early in the winter and provides adequate cover of snow throughout the denning season. Bears will generally select the leeward side of prevailing winds, and generally avoid human activity.

The applicant has prepared a Wildlife Avoidance and Interaction Plan that contains a Polar Bear Avoidance and Interaction Plan. The Polar Bear Avoidance and Interaction Plan details information on polar bear interaction procedures, potential polar bear denning habitat in the proposed project area, den survey techniques (including FLIR surveys), and work and transport stoppage procedures. The potential impacts to polar bears resulting is expected to be minor.

Bearded seals and ringed seals make up the common prey base for polar bears. Because of the extremely sporadic nature of bearded and ringed seal sightings in the inland waterways near the project area these species are unlikely to be adversely affected by the proposed project.

5.4.1.3 Biological opinion.

Consultation. Formal consultation under Endangered Species Act (ESA) with the USFWS has been completed. There are no listed species under the jurisdiction of the National Marine Fisheries Service (NMFS) in the project area. Section 7 consultation procedures were conducted concurrently with the BLM with the USACE as joint federal action agencies.

The applicant provided a draft and final biological assessment (BA) to USACE and BLM during the NEPA process as the ESA section 7 federal representative. The USFWS used the BA, USACE public notice, and FSEIS in their review and provided a biological opinion (BO) for the polar bear, spectacled eider, and Alaska-breeding Steller's eider on December 2, 2014, which tiered off of their BO for the BLM (Integrated Activity Plan (IAP)) BO of 2013, and amended on January 13, 2015.

The USFWS evaluated the alternatives in the FSEIS for the entire action area. The December 2, 2014 BO determined the proposed action(s) may affect polar bears, spectacled eiders, and Alaska-breeding Steller's eiders. It did not include an incidental take statement for polar bears as the BLM and USACE had not yet made permit decisions. The applicant has obtained a letter of authorization under the Marine Mammal Protection Act (MMPA) for the incidental take of polar bears for their various oil fields.

Biological opinion. On January 13, 2015, the USFWS provided an Amendment to the December 2, 2014 BO. The USFWS determined the proposed action was not likely to adversely affect the Alaska-breeding Steller's eider. They also determined the proposed action was not likely to jeopardize the continued existence of the spectacled eider and polar bear.

The USFWS January 13, 2015 BO Amendment included Reasonable and Prudent Measures (RPM), implementing Terms and Conditions (T&C), and Conservation Recommendations. Terms and conditions are non-discretionary requirements of the federal action agency.

RPM 1. Minimize ground-level activity (by vehicle or on foot) within 200 meters of occupied spectacled eider nests.

T&C 1a. Ground-level activity (by vehicle or on foot) within 200 meters of occupied spectacled eider nests, from June 1 through August 15, will be restricted to existing thoroughfares, such as pads and roads. Construction of permanent facilities, placement of fill, alteration of habitat, and introduction of high noise levels within 200 meters of occupied spectacled eider nests will be prohibited.

T&C 1b. In instances where summer (June 1 through August 15) support/construction activity must occur off existing thoroughfares, Service-approved nest surveys must be conducted during mid-June prior to the approval of the activity. Collected data will be used to evaluate whether the action could occur based on employment of a 200-meter buffer around nests or if the activity would be delayed until after mid-August once ducklings are mobile and have left the nest site. The BLM and USACE will also work with the Service to schedule oil spill response training in spectacled eider habitat to take place outside of nesting/brood-rearing periods or conduct nest surveys. The protocol and timing of nest surveys for spectacled eiders will be determined in cooperation with the Service, and must be approved by the Service. Surveys should be supervised by biologists who have previous experience with spectacled eider nest surveys.

RPM 2. Minimize the use of GMT1 facilities from as nesting, denning, or shelter sites for avian and nest predators.

T&C 2a. Areas of operation shall be left clean of all debris.

T&C 2b. CPAI shall prepare and implement a comprehensive waste management plan for all activities occurring within the GMT1 Action Area. The plan shall be submitted to the authorized officers for approval, in consultation with federal, State, and North Slope Borough regulatory and resource agencies, as appropriate (based on agency legal authority and jurisdictional responsibility), as part of a plan of operations or other similar permit application. Management decisions affecting waste generation shall be addressed in the following order of priority: (1) prevention and reduction, (2) recycling, (3) treatment, and (4) disposal. The plan shall consider and take into account the following requirements:

1. Methods to avoid attracting wildlife to food and garbage. The plan shall identify precautions that are to be taken to avoid attracting wildlife to food and garbage.

2. Disposal of putrescible waste. Requirements prohibit the burial of garbage. Lessees and permitted users shall have a written procedure to ensure that the handling and disposal of putrescible waste will be accomplished in a manner that prevents the attraction of wildlife. All putrescible waste shall be incinerated, backhauled, or composted in a manner approved by the authorized officer. All solid waste, including incinerator ash, shall be disposed of in an approved waste-disposal facility in accordance with Environmental Protection Agency and Alaska Department of Environmental Conservation regulations and procedures. The burial of human waste is prohibited except as authorized by the authorized officer.

T&C 2c. CPAI shall utilize best available technology to prevent facilities from providing nesting, denning, or shelter sites for ravens, raptors, and foxes. The lessee shall provide the authorized officer with an annual report on the use of oil and gas facilities by ravens, raptors, and foxes as nesting, denning, and shelter sites. Additionally, feeding of wildlife is prohibited and will be subject to non-compliance regulations.

RPM 3. Minimize the likelihood that collisions would occur as a result of GMT1 infrastructure.

T&C 3a. Illumination of all structures between August 1 and October 31 shall be designed to direct artificial exterior lighting inward and downward, rather than upward and outward, unless otherwise required by the Federal Aviation Administration.

T&C 3b. To reduce the possibility of spectacled eiders colliding with above-ground utility lines (power and communication), such lines shall either be buried in access roads or suspended on vertical support members except in rare cases which are to be few in number and limited in extent. Exceptions are limited to the following situations, and must be reported to the USFWS when exceptions are authorized:
1. Overhead power or communication lines may be allowed when located entirely within the boundaries of a facility pad;
2. Overhead power or communication lines may be allowed when engineering constraints at the specific and limited location make it infeasible to bury or connect the lines to a vertical support member; or
3. Overhead power or communication lines may be allowed in situations when human safety would be compromised by other methods.

T&C 3c. To reduce the likelihood of spectacled eiders colliding with communication towers, towers should be located, to the extent practicable, on existing pads and as close as possible to buildings or other structures, and on the east or west side of buildings or other structures if possible. Support wires associated with communication towers, radio antennas, and other similar facilities, should be avoided to the extent practicable. If support wires are necessary, they should be clearly marked along their entire length to improve visibility to low-flying birds. Such markings shall be developed through consultation with the Service.

The USFWS also included discretionary conservation recommendations (CR) as listed below.

CR 1. Develop an outreach program that aims to eliminate use of lead shot and accidental shootings of spectacled and Alaska-breeding Steller's eiders within the Action Area.

CR 2. Continue to monitor threatened eiders and BLM special status species in the Action Area. Results will allow the Service, BLM, and USACE to better evaluate abundance, distribution, and population trends of listed eiders and other special status species. These efforts will enhance the likelihood that future oil and gas development within NPR-A and the Colville River delta will not jeopardize listed eiders or lead to listing additional species.

CR 3. Work with the Service and other Federal and State agencies in implementing recovery actions identified in the Steller's and spectacled eider recovery plans. Research to determine important habitats, migration routes, and wintering areas of spectacled and Steller's eiders is an important step toward minimizing conflicts with current and future North Slope oil/gas activities.

USACE has included all terms and conditions of the USFWS amended BO, dated January 13, 2015 as special permit conditions on the DA permit. The terms and conditions were edited somewhat to ensure we remain within our jurisdicition and be reasonably enforeceable. (See section 6.1.48, Special Permit Conditions and Rationales).

Conservation recommendations. We have not included CRs 1 and 3 of the USFWS amended BO, dated January 13, 2015, in the DA permit authorization because they are not within our jurisdiction, under our regulatory authority, and not reasonably enforceable. CR 2 is related to an ESA requirement of federal action agencies to aid to the recovery of listed species through their individual authorities. Therefore, we have included a DA permit condition to require monitoring of the Steller's and spectacled eiders by the permittee under CR 2.

Coordination with the USFWS and NMFS and completion of the process and analyses contained within this ROD and signature by the authorizing official completes the USACE ESA responsibilities.

5.4.2 §230.31 Fish, crustaceans, mollusks, and other aquatic organisms in the fool web.

The discharge of dredged or fill material can variously affect populations of fish, crustaceans, mollusks, and other food web organisms by direct removal of habitats and release of contaminants.

Direct impacts to fish and fish habitat would not occur from the proposed action.

Indirect impacts would occur to fish and fish habitats adjacent to the proposed action.

The perennial Ublutuoch River, and seasonal Barely Creek, Crea Creek, and adjoining lakes and ponds provide seasonal fish habitat. The Ublutuoch River, which is classified as anadromous at the proposed crossing, is an important migratory corridor for Alaska blackfish; Arctic, Bering, and least cisco; Arctic grayling; Chinook and chum salmon; humpback and round whitefish; rainbow smelt; slimy sculpin; Dolly Varden; and ninespine stickleback. The well-connected stream and lake habitats associated with Crea Creek has the greatest documented fish use of the Ublutuoch River tributaries, especially for Arctic grayling and broad whitefish). Crea Creek is classified as an anadromous stream and provides habitat for Alaska blackfish, Arctic grayling, burbot, broad whitefish, humpback whitefish, least cisco, and slimy sculpin. Two lakes within the Crea Creek drainage provide fish habitat: Lake CC3 provides habitat for Arctic grayling and L9819 provides habitat for Arctic grayling and least cisco. Barely Creek provides habitat for three species of resident fish: Alaska blackfish, Arctic grayling, and ninespine stickleback. L9824, a small lake on Barely Creek adjacent to the Ublutuoch River, provides habitat for Arctic grayling. Almost all water bodies in the project area provide habitat for ninespine stickleback and habitat is not limiting for this species.

The proposed GMT1 access road would include 11.2 acres of fill within the Crea Creek drainage basin and 5.8 acres of fill within the Barely Creek drainage basin (Baker 2014). Based on aquatic site assessment (ASA) functional rankings, the proposed access road would impact 7.8 acres of wetland and water body types that may provide high value habitat for fish (PEM1F, PEM1H, L1UBH, PUBH, and/or R2UBH; ABR 2014a).

Potential direct and indirect impacts to freshwater and anadromous fish from the proposed project include Barriers to fish passage, erosion, siltation, equipment leaks associated Increased turbidity, road dust fallout, water withdrawal from lakes, ice roads, and possible point source pollution from oil spills and fuel leaks.

The proposed GMT1 access road would cross the Ublutuoch River with a 335-foot bridge opening. Bridge abutments would be above the river floodplain and the bridge deck would extend from bank to bank. Five sets of four 32-inch pilings would be positioned approximately 85 feet apart and would be placed outside of the main channel. The bridge would be 15 feet above the level of the anticipated 50-year flood. The Ublutuoch River Bridge would be designed to meet fish habitat and passage criteria required by ADF&G Title 16 Fish Habitat permit stipulations. The pipeline would be attached to the girders below the bridge deck.

Crea Creek would be crossed by a bridge with an opening for water flow of 25 feet wide. The Crea Creek Bridge would be designed to meet fish habitat and passage criteria. The pipeline would cross Crea Creek on VSMs that span the creek downstream of the bridge.

Barely Creek would be crossed by a culvert battery. The culvert battery would also be designed to meet fish habitat and passage criteria. The pipeline would cross Barely Creek on VSMs that span the creek downstream of the culvert battery.

Indirect effects of the road would include reduction of aquatic habitat caused by the drying of wetlands and shallow ponds. This could result in an additive effect on the potential direct and indirect impacts of the project including habitat loss from dust fallout, pollution, increases in turbidity resulting from erosion, and increased resource competition within the aquatic ecosystem.

With the inclusion of special conditions, the proposed project would comply with this factor of the 404(b)(1) guidelines.

5.4.3 §230.32 Other Wildlife.

The discharge of dredged or fill material can result in the loss or change of breeding and nesting areas, escape cover, travel corridors, and preferred food sources of resident and transient wildlife species associated with the aquatic ecosystem.

Wildlife associated with aquatic ecosystems includes resident and migratory mammals and birds.

Potential impacts from the proposed project are largely taxon or species-specific in intensity and duration. The following sections discuss potential impacts and proposed mitigation measures associated with those impacts.

The terrestrial mammal species most likely to be affected by the proposed GMT1 project include caribou (*Rangifer tarandus*), grizzly bear (*Ursus arctos*), arctic and red foxes (*Vulpes lagopus* and *V. vulpes*), and small mammal species such as arctic ground squirrels (*Urocitellus parryii*). While muskoxen (*Ovibos moschatus*) have been observed near the proposed project area, these sightings have been extremely sporadic.

Use of the proposed project area by caribou from the Teshekpuk herd and, to a lesser extent, the Central Arctic herd predominantly occurs during insect harassment season (late June to early August), fall migration, and winter season. However, small numbers of caribou are expected in

the project area throughout the year. Presence of caribou in the project area is important for subsistence harvest.

Potential impacts to caribou from the proposed GMT1 project would likely be long-term and of medium intensity. These potential impacts include:
1. The loss of 72.7 acres of primarily tussock tundra and moist sedge-shrub tundra resulting from fill placement. Both wetland assemblages are preferred caribou summer habitat.
2. Barriers to movement from the proposed pad, road, and pipeline.
3. Disturbance caused by noise, road traffic and human movements.
4. Disturbance from air traffic.

Predators including grizzly bears and arctic and red foxes are also likely to be found in the proposed project area. Reliable estimates of population sizes and distributions are not available for these species. Primary impacts of the proposed project to these species are associated with attraction to anthropogenic food and food waste. These impacts would be of low intensity, but long term. This attraction could result in increased conflicts between humans and wildlife and consequent injury to wildlife due to increased time spent in or around the project area. Potential increases in the local populations of predatory species, such as grizzly bears and foxes, resulting from attraction to anthropogenic foods, could have cascading negative effects on prey species.

The applicant's Wildlife Avoidance and Interaction Plan that contains strategies and protocols to properly contain and dispose of substances that are potentially attractive to wildlife. When properly implemented and enforced, this plan would effectively mitigate potentially adverse effects to wildlife from attraction to anthropogenic food and waste.

The project area also acts as a potential seasonal and permanent habitat for approximately 80 bird species. Bird species of concern to agencies (USFWS birds of conservation concern [BCC] and BLM special status species [SS]) that occur in the project area include the red-throated loon (BCC), yellow-billed loon (BCC, SS), golden eagle (SS), peregrine falcon (BCC), short-eared owl (SS), whimbrel (BCC), bar-tailed godwit (BCC), red knot (BCC, SS), dunlin (BCC), buff-breasted sandpiper (BCC), and arctic tern (BCC). Bird occupancy of the project area typically peaks in May, when migrant birds arrive to breed and nest. Migrants generally leave the area in mid to late August.

Impacts of the proposed project to bird species would be of low intensity and long term. The proposed GMT1 project would permanently remove 72.6 acres of nesting and breeding habitat due to construction of the gravel pads and road. Dust deposition from the gravel pads and road could potentially extend up to 300 feet from the edge of the gravel footprint, thus extending the area of habitat potentially altered to 582.3 acres.

Other potential impacts to birds from the proposed project would include potentially harmful attraction to sources of illumination (depending on lighting design); disturbance and displacement from noise, road traffic, and human movements associated with gravel placement; and increased nest depredation from predator populations attracted to human activities.

With the inclusion of special conditions, the proposed project would comply with this factor of the 404(b)(1) guidelines.

5.5 SUBPART E - Potential Impacts on Special Aquatic Sites.

5.5.1 §230.40 Sanctuaries and refuges.

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.

There are no sanctuaries or refuges located in the proposed project area.

5.5.2 §230.41 Wetlands.

Note: The order of wetland types and their characteristics listed below are by acreage size of impact which would occur with the proposed action (Alternative A). Some wetland functions and ecological services provided by the functions are described and related to some human values for the specific aquatic resource (wetland or water type). Some wildlife values per wetland or water type are also described, in recognition of the regional importance for wildlife production and subsistence harvesting. For additional information regarding water and wetland functional scoring, see Appendix B.

With the inclusion of special conditions the proposed project would comply with this factor of the 404(b)(1) guidelines.

5.5.2.1 PEM1/SS1B (Saturated Persistent Emergent and Broad-leave Deciduous Scrub Shrub Wetland.

These wetlands are among the highest and driest in the proposed project area and are known as moist tussock tundra wetlands. They occupy convex micro-relief and gently rolling slopes between drained lake basins. They display limited pattern ground features or high center polygons with less 5% aerial cover of inundated depressions. They are typically dominated by tall grass (*Eriophorum angustifolium*), sedges (*Carex bigelowii*), and shrubs like willows (*Salix pulchra*), dwarf birch (*Betula glandulosa*), and Cassiope (*Cassiope tetragona*).

These wetlands provide high functions for subsistence; moderate functions for wildlife habitat, flow regulation, sediment/toxicant removal, and organic matter export; and low function for uniqueness. These wetlands do not provide shoreline stabilization or fish habitat functions. Based on an overall functional score of 0.61, PEM1/SS1B is ranked as a Category II (moderate value) wetland.

This wetland type offers a high diversity of species when compared with inundated wetlands dominated by graminoids. Due to the abundance of this wetland type in a large no-fragmented landscape, it provides habitat for a variety of common wildlife species in conjunction with other similar wetland types in the area. It offers free range for large mammals and nesting habitat to several bird species, including passerine birds known to nest on the tundra ground. A limitation for some wildlife species may be a lower interspacing between surface water and drier vegetated grounds when compared to similar wetland types.

Most fill discharges would occur, under Alternatives A and B, to this wetland type, mainly for the access road and drill site construction. Alternative A would involve placement of fill in 43.4 acres, whereas Alternative B would involve fill in 42.3 acres.

5.5.2.2 PEM1/SS1E (Seasonally Flooded/Saturated Persistent Emergent and Broad-leave Deciduous Scrub Shrub Wetland).

Relief on this wetland type is dominated by high centered-low relief polygons, low centered polygons, and basin wetland complex. These wetlands provide a complex micro-topography supporting good surface water/ground interspersion.

These wetlands provide high functions for wildlife habitat, subsistence, flow regulation, and organic matter export; moderate functions for sediment/toxicant removal; and low functions for uniqueness. These wetlands do not provide functions for shoreline stabilization or fish habitat. Based on the overall functional score of 0.83, PEM1/SS1E is ranked as a Category I (high value) Wetland.

The micro-topography of these wetlands provide a high niche diversity for several bird and small mammal species.

The second most fill discharges would occur, under Alternatives A and B, to this wetland type, mainly for the access road construction. Additional PEM1/SS1E wetlands would be filled under Alternative B for the construction of the drill site pad, tie-in pad, and manual valve pads. Alternative A would involve placement of fill in 20.7 acres, whereas Alternative B would require placement of fill in 23.2 acres.

5.5.2.3 PEM1F (Semi-permanently Flooded Persistent Palustrine Emergent Wetland).

PEM1F wetlands provide a good mix of surface water and graminoid ground cover on non-patterned or low-centered polygon micro-relief areas. These wetlands are characterized by a dominance of tall cottongrass (*Eriophorum angustifolium*), water sedge (*Carex aquatilis*), and scattered willows (*Salix fuscescens*).

These wetlands provide high functions for flow regulation, organic matter export, wildlife habitat, fish habitat, and subsistence; moderate functions for sediment/toxicant removal and uniqueness. These wetlands do not provide for shoreline stabilization. Based on the overall functional score of 0.90, PEMF is ranked as Category I (high value) wetland.

Tall cotton grasses are extensively used by snow geese and other waterfowl; water sedge is considered excellent forage equal to clover in nutritional value and exceeds it in protein content. Water sedge provides cover to some bird species, waterfowl, and small mammals and as a semi-essential dietary item for caribou, providing nutrients not present in lichens. Based on plant composition and proximity to other wetland types, this wetland type provides habitat values to more than three species of voles, two species of lemmings, and one species of shrew present in the general project area. These wetlands are also preferred habitat for focal (Colville River Delta bird studies) avian species (yellow billed loon, tundra swans, Brant, and Spectacled Eider).

This third largest wetland acreage would be filled for the access road construction under Alternatives A and B. Alternative B would also fill an area for the tie-in pad. Alternative A would involve placement of fill into 6.9 acres, whereas Alternative B would place fill into 13.2 acres.

5.5.2.4 PEM1H (Permanently Flooded Palustrine Persistent Emergent Wetland).

These wetlands are associated with thaw ponds and a thaw basin along the west side of the road corridor. PEM1H is also found along the margins of two large lakes located south of the road corridor. Plant species composition is primarily arctic pendant grass (*Arctophila fulva*) and water sedge (*Carex aquatilis*).

These wetlands provide high functions for shoreline stabilization, wildlife habitat, fish habitat, and subsistence; moderate functions for flow regulation, sediment/toxicant removal, and organic matter export; and low functions for uniqueness. Based on the overall functional score of 0.79, PEM1H is ranked as a Category I (high value) wetland.

The plant species composition is both an excellent food source for water fowl and small mammals, among others.

PEM1H wetlands would incur 0.8-acre of fill impact under Alternative A and less than 0.1-acre under Alternative B.

5.5.2.5 PSS1C (Seasonally Flooded Broad-leave Deciduous Scrub Shrub Wetland).

PSS1C wetlands occur only along the banks of the Ublutuoch River on inactive buried peat/sandy riverine deposits, oxbows, and/or active riverine deposits and are seasonally flooded (generally

spring break-up). This wetland type is characterized by an abundance of willows (*Salix richardsonii*) creating an upper stratum of approximately 85% canopy cover and tall enough to clearly stand above the typical tundra grounds (3-5 feet). It also contains a variety of deciduous shrubs and forbs in the under canopy (*Petasites frigidus, Astragalus robbinsii,* and *Tephroseris atropurpurea*).

Due to abundant deciduous species (taller willows and small shrubs and forbs), PS11C produces an above average volume of organic matter which is seasonally exported by flooding. These wetlands provide high functions for shoreline stabilization, organic matter export, wildlife habitat, and subsistence; moderate functions for sediment/toxicant removal; and low functions for flow regulation, fish habitat, and uniqueness. Based on the overall functional score of 0.71, PSS1C is ranked as a Category II (moderate value) wetland.

Wetlands with two vegetation strata are regionally important in the Arctic Coastal Plain because they provide good shelter and nesting habitat for some species of passerine birds. Waterfowl use willow thicket edges for nesting, especially if they are in close proximity to open water. Willow ptarmigan may use these wetlands for nesting and/or brood-rearing.

PSS1C wetlands would incur 0.4-acre of fill under both Alternatives A and B.

5.5.2.6 R2EME (Seasonally Flooded/Saturated Lower Perennial Riverine System with Emergent Vegetation).

These wetlands abut small beaded streams like Crea Creek (anadromous stream) and Barley Creek (resident fish) or riparian corridors along the Ublutuoch River, which are exposed to seasonal flooding lasting beyond spring break-up. These wetlands are also found on thaw ponds, thaw basins (road corridor west end) and in the margins of two large lakes (road corridor south side). R2EME is known as a wet sedge meadow and dominated by sedges like water sedge (*Carex aquatilis*) and cotton grass (*Eriophorum angustifolium*).

These wetlands provide high functions for sediment/toxicant removal, shoreline stabilization, organic matter export, wildlife and fish habitat, and subsistence; and low function for uniqueness. Based on the overall functional score of 0.83, R2EME is ranked a Category I (high value) wetland.

The sedge vegetation of this wetland provides excellent forage for waterfowl. The white basal portions of sedge shoots are known for high carbohydrate and nitrogen contents. Water sedge reaches more than 8 inches tall in the summer, providing good rearing habitat, escapement, and cover for brood-reading waterfowl. When flooded, these wetlands provide feeding and rearing habitat for juvenile fish, either anadromous or resident species.

R2EME waters would incur 0.2-acre of fill under Alternative A and less than 0.1-acre under Alternative B.

5.5.2.7 PEM1T (Semi-permanently Flooded Tidal Palustrine Persistent Emergent Wetland).

PEM1T wetlands are located along inland main freshwater river channels but are influenced by seasonal brackish/saline inputs during Beaufort Sea tide/wind surges. These wetlands are connected to the Sakoonang Channel within the Colville River Delta. PEM1T supports a lush growth of sedges adapted to saline and/or brackish environments. Dominant vegetation include Hoppner's sedge (*Carex subspathacea*), fisher's tundra grass (*Dupontia fisheri*), and oval leaf willow (*Salix ovalifolia*), which are plant species typically found in wetlands associated to sand dunes, coastal estuaries, or lagoons flooded with salt or brackish waters for at least part of the year.

These wetlands provide high functions for flow regulation, sediment/toxicant removal, shoreline stabilization, organic matter export, and wildlife habitat; moderate functions for subsistence; and low function for fish habitat and uniqueness. Based on the overall functional score of 0.79, PEM1T is ranked as a Category I (high value) wetland.

These wetlands provide preferred habitat for nesting and brood-rearing tundra swans and fall staging habitats for tundra swans, brant and spectacled eiders, as well as other shorebird species.

PEM1T wetlands would incur less than 0.1-acre of fill under both alternatives. Direct impacts on this wetland type would be primarily from the installation of a limited number of VSMs. PEM1T wetlands occur beneath an existing pipeline and next to an active road where they could be impacted indirectly by dust, noise, vision, and potential hydrocarbon leaks.

5.5.2.8 PUSR (Seasonally Flooded Tidal Palustrine Unconsolidated Shore).

PUSR is found along the shoreline of the Sakoonang channel of the Colville River, a fresh water body with seasonal maritime influence during storm surges. These wetlands are also exposed to seasonal snowmelt floods and used by a relatively high number of avian species. The dominant substrate is mud or unconsolidated fine material with sparse salt-killed tundra vegetation.

Due to its proximity to an existing pipeline and active road, PUSR wetlands provide moderate functions for toxicant/sediment removal, subsistence, wildlife habitat, and fish habitat; and low functions for flow regulation, shoreline stabilization, organic matter export, and uniqueness. Based on the overall functional score of 0.50, PUSR is ranked as a Category III (low value) wetland.

Mudflats are considered valuable for their infaunal abundance that supports shorebird foraging, migration, and reproductive biology. Due to their high infaunal diversity, mudflats have the potential to function as bioremediation during recovery and cleanup of oil spill events. Young anadromous fish use shallow brackish waters for acclimation and osmoregulation while avoiding predation from larger fish.

PUSR waters would incur less than 0.1-acre of fill under both alternatives, primarily associated to the installation of VSMs. They occur beneath an existing pipeline and next to an active road where they could be impacted indirectly by dust, noise, vision, and potential hydrocarbon leaks.

5.5.2.9 L1UBH (Permanently Flooded Limnetic Lacustrine System with an Unconsolidated Bottom) – Lakes.

Under both alternatives, most effects would be the result of indirect impacts. The difference between lakes and ponds is that lakes are more than 20 acres, or less than 20 acres if deeper than 6 feet, whereas ponds are usually less than 20 acres and shallow. Lakes are found outside the south boundary of the 300-foot indirect impact zone. In the study area, lakes are associated to ice-rich sediments or abandoned river channels near the Ublutuoch River crossing. During spring break up (dominant flood event in the ACP), lakes receive waters from snowmelt regardless of the distance from over-flowing nearby streams or whether the lake has active inlets and outlets. Larger lakes, when deeper than 6 feet, do not freeze to the bottom and provide overwintering habitat for fish and invertebrates. Therefore, they not only provide overwintering habitat for fish and benthic macroinvertabrates, but also provide potable water for domestic use and fresh water to support oil development operations. Deep lakes without islands provide habitat to King eider, geese, tundra swan, and gulls, and are known preferred habitat for yellow-bill loon. Lakes provide high functions for fish habitat and subsistence; moderate functions for flow regulation, sediment/toxicant removal, wildlife habitat, and uniqueness. Based on the overall functional score of 0.72, L1UBH is ranked as Category II (Moderate).

L1UBH would incur no losses under Alternative A and less than 0.01-acre under Alternative B.

5.5.2.10 R2UBH (Permanently Flooded Lower Perennial Riverine System with an Unconsolidated Bottom-Streams).

R2UBH waters include the Ublutuoch River, classified as a lower perennial stream, and two of its tributaries, the Crea Creek and the Barely Creek.

They provide high functions for fish habitat and subsistence; moderate functions for wildlife habitat; and low functions for sediment/toxicant removal and uniqueness. They do not provide flow regulation, shoreline stabilization, or organic matter export functions. Based on the overall functional score of 0.67, R2UBH is ranked as a Category II (moderate value) wetland.

These R2UBH stream waters provide habitat for anadromous and resident fish and support benthic macroinvertebrates, microbial communities, organic carbon export, and connectivity between adjacent ponds and lakes. They also sustain the hydrology of several seasonally-permanently flooded wetlands.

R2UBH stream waters would incur a 0.2-acre loss under Alternative A and a 0.1-acre under Alternative B.

5.5.2.11 PUBH (Permanently Flooded Palustrine Unconsolidated Bottom-Ponds).

Shallow ponds and lakes generally begin to freeze in September, freeze to the bottom by mid-winter, and become ice-free between by mid-June to early-July, about a month earlier than deeper lakes. Although generally shallow, ponds do replenish during spring break up and store substantive volumes of water through the summer, decreasing peak flows in the lower sections of the watershed.

PUBH waters provide high functions for subsistence, wildlife, and fish habitat; moderate functions for flow regulation and sediment/toxicant removal; and low function for uniqueness. Based on the overall functional score of 0.77, PUBH is ranked as Category I (high value) water.

PUBH waters provide important summer rearing fish habitat when connected to a stream by a channel or intermittently flooded by nearby streams. They provide important habitat to emergent vegetation, invertebrates, and migratory birds due to the earlier availability of ice-fee areas. Spectacled eiders feed primarily by dabbling in shallow freshwater or brackish ponds, where they find insect larvae, benthic organisms, and aquatic plants or seeds; pre-nesting eiders prefer shallow ponds with islands, emergent grasses and sedges.

R2UBH would incur 0.2-acre loss under Alternative A and less than 0.1-acre under Alternative B, mainly due to road construction.

With the inclusion of special conditions, the proposed project would comply with this factor of the 404(b)(1) guidelines.

5.5.2.12 Effect on wetlands.
See section 3.5.6 above.

The direct effects of the proposed action would result in the loss of aquatic resources from the placement of fill to construct gravel pads, manual valves pads, roads, and the installation of VSMs as part of pipeline construction.

Indirect effects of the proposed action would result in reductions of aquatic resources functionality and include effect on the hydrologic regime (wetting or drying), gravel spray and dust generation, subsistence resources, erosion and siltation, noises effcts, visual effects, vegetation community

changes, thermokarsting, and/or changes in natural drainage patterns. Other indirect effects include displacement of wildlife from wetlands habitats, off-road tundra travel during the snow-free season, and potential oil spill impacts.

To minimize impacts on aquatic resources, the applicant would:
1. Minimize fill acreage of the gravel pads by project design and equipment layout.
2. Construct a bridges over the Ublutuoch River and Crea Creek.
3. Install a battery of culverts at Barely Creek.
4. Utilize ice roads and pads for construction access.
5. Water gravel roads and pads to control dust generation.
6. Slot ice roads at stream crossings to maintain natural drainage patterns during breakup.
7. Installing more or relocating culverts as needed after initial construction.
4. Provide compensatory mitigation for all unavoidable direct and indirect effects.

5.5.3 §230.42 Mudflats.

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 proposed project alignment would have less than 0.1-acre of direct impacts in mudflats, see more details on mudflats impacts in the wetland section under PUSR. Impacts are expected to be minor and mainly associated to the installation of a couple of VSMs.

With the inclusion of special conditions, the proposed project would comply with this factor of the 404(b)(1) guidelines.

5.5.4 §230.43 Vegetated shallows.

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. Permanently flooded emergent wetlands (PEM1H) may act as vegetated shallows and are usually associated to thaw ponds and a thaw basin at the west side of the road corridor. They are dominated by Arctic pendant grass (*Arctophila fulva*), a grass plant species known to develop aquatic leaves. The proposed project would impact 0.8-acre of vegetated shallows under the access road fill. Impacts to vegetated shallows are expected to be minor and associated to the construction of the access road.

5.5.5 §230.44 Coral reefs.

Coral reefs consist of the skeletal deposit, usually of calcareous or silicaceous materials, produced by the vital activities of anthozoan polyps or other invertebrate organisms present in growing portions of a reef.

There are no coral reefs located in the proposed project area.

5.5.6 §230.45 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 located in the proposed project area.

5.6 Subpart F - Potential Effects on Human Use Characteristics.

5.6.1 §230.50 Municipal and private water supplies.

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 and none would be impacted by the proposed action.

5.6.2 §230.51 Recreational and commercial fisheries.

Recreational and commercial fisheries consist of harvestable fish and other aquatic organisms used by man.

The discharge of dredged or fill material can affect the suitability of recreational and commercial fishing grounds as habitat for populations of consumable aquatic organisms.

There are no commercial fisheries currently operating within the proposed project area and no impact.

Recreational fishing within the project area predominately occurs opportunistically by people primarily in the area for other recreational purposes, such as big game hunting or float trips. As of 2012, there were no commercial sport fishing recreation permit requests or authorizations for the area and none of the outfitter guides operating in the NPR-listed sport fishing as a primary activity that they lead or promote. No specific use numbers for sport fishing are available for the project area. Fish species sought by visitors include the arctic char, arctic grayling, lake trout, northern pike, whitefish, and various species of salmon. The majority of recreational fishing takes place in the non-winter months.

The proposed project would have a negligible impact on recreational fishing during construction and operations. Most construction activities would occur during winter months, when no recreational fishing is likely to occur. Impacts to recreational fishing are anticipated to be negligible.

With the inclusion of special conditions, the proposed project would comply with this factor of the 404(b)(1) guidelines.

5.6.3 §230.52 Water-related recreation.

Water-related recreation encompasses activities undertaken for amusement and relaxation. The activities include consumptive and noncomsumptive uses.

Water-related recreation use within the project area is very low.

Public recreational use in the project area is low intensity and primarily represented by non-local visitors. The project study area offers opportunity for primitive unconfined recreation including backpacking and hiking, wildlife viewing, hunting, fishing, and boating. No federal, state, or NSB public recreation facilities exist in the project area and the lack of a developed public road system into or through the area limits recreational access almost exclusively to charter aircraft. In 2010, there were 10 authorized special recreational permit holders authorized to conduct backpacking, hiking, boating, and other recreational activities within the larger NPR-A area and approximately 150 recreational visitors annually.

Potential effects of the proposed project on water-related recreation include the loss of area available for recreational activities and the loss of opportunities to experience wilderness-like

values such as naturalness and solitude through changes in noise, visual aesthetics, dust, or odor. During winter construction for fill placement, the activity and noise would make the project more conspicuous for recreationists. Long-term effects of project operation are expected to be greatest within 1 mile of gravel roads and 2 miles of the production pad due to the presence of permanent facilities and associated noise.

Impacts to water-related recreation are anticipated to be negligible.

With the inclusion of special conditions, the proposed project would comply with this factor of the 404(b)(1) guidelines.

5.6.4 §230.53 Aesthetics.

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.

The discharge of dredged or fill material can mar the beauty of natural aquatic ecosystems by degrading or destroying vital elements that contribute to the compositional harmony or unity, visual distinctiveness, or diversity of an area, including property values.

Visual Resource Management (VRM) classes have been assigned to lands considered in the BLM GMT1 FSEIS 2014, with the exception of village owned lands. The majority of the project area falls within VRM Class IV, with approximately 10 acres at the southernmost point classified as VRM Class III. The VRM class objectives for these are as below:

VRM class	Visual resource objective	Change allowed (relative level)	Relationship to the casual observer
Class III	Partially retain the existing character of the landscape.	Moderate	Activities may attract attention but should not dominate the view.
Class IV	Provide for management activities which require major modification of the existing character of the landscape.	High	Activities may attract attention, may dominate the view, but are still mitigated.

The aesthetics impact of the fill material and associated structures would be permanent. During drilling, the presence of drill rigs during the summer season would create a moderate contrast against the surrounding landscape at a distance of 5 miles or less by introducing vertical lines. Once production facilities (well houses, misc. buildings) are in place they would provide a strong contrast with the natural landscape (including color). Most buildings would be less than three stories high. Communication towers would be much taller than buildings, at up to 200 feet high, introducing vertical lines into the landscape. Bridges would maintain the horizontal line of the landscape but would introduce contrasting colors. Color contrasts would also occur for emergency response containers placed along channels.

Construction and operations of the proposed project would result in moderate effects to visual resources. Summer activities would have a greater impact to visual resources than winter activities due to extended daylight hours.

Based on this analysis and with consideration for actions taken to minimize impacts, impacts to aesthetics are anticipated to be relatively minor to moderate and would comply with this factor of the 404(b)(1) guidelines.

5.6.5 §230.54 Parks, national and historical monuments, national seashores, wilderness areas, research sites, and similar preserves

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 discharge of dredged or fill material into such areas may modify these qualities thereby reducing or eliminating the uses for which such sites are set aside and managed.

The GMT1 project area would not be within any lands designated under federal or state laws or local ordinances. There are no designated or proposed Wild and Scenic Rivers located within the project area. The proposed action would not be located within or near any federally designated Wilderness areas, federal lands previously designated for Special Areas , or Land Use Emphasis.

No impacts to parks, national and historic monuments, national seashores, wilderness areas, research sites, and similar preserves would occur.

5.7 Subpart G – Evaluation and Testing.

5.7.1 §230.60 General evaluation of dredged or fill material.

The purpose of this section is to provide information to reach the determinations required by section § 230.11.

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

Physical characteristics of materials. The ASRC Mine Site is an existing commercial gravel source located adjacent on the east side of the East Channel approximately 500-feet from the Colville River. The site contains mineral alluvium ranging from gravelly sand to sandy gravel to with inter-bedded discontinuous layers of silt. The coarseness of the site's mineral material lends it to be less susceptible to retaining any chemical, biological or other pollutants as compared to organic and/or finer grained materials. Gravel fill material proposed for placement would be 'pit run' or in the raw form and not screened, crushed, or graded by material size particle. Gravel used for construction would be selected by visual and on-site testing and be clean material free of ice and snow concentrations, overburden, clay or silt seams, and organic matter. The desired silt/clay fraction in the gravel is 15 percent; however, actual pit run gravel would be used and it may vary from this specification.

Location. The applicant's proposed source for fill material is from the ASRC Colville River Mine Site about 6 miles southeast of Nuiqsut, Alaska. The mine site vicinity and watershed are not known to be contaminated with chemical or naturally occurring pollutants. The watershed is largely undeveloped and pristine in character and removed from sources of pollution to provide reasonable assurance the material is not a carrier of contaminants. Gravel for the GMT1 project would be mined from the Phase 3 area of the ASRC site, located directly south of Phase 2. Phase 3 area is currently unproven and additional geotechnical exploration work is necessary to delineate and assess sand and gravel resources within the proposed mine site expansion area.

Spill records for petroleum products or designated hazardous substances. There is no record of a petroleum product spill or other designated hazardous substance occurring in the vicinity of the proposed gravel source site. The ASRC Mine Site is located some distance from existing oil and gas infrastructure.

Federal, State, and Local records indicating significant introduction of pollutants. Inside the NPR-A, hazardous and solid waste locations, including landfills, reserve pits, formerly used defense sites, and privately-owned sites, have been identified and mapped. No hazardous and solid waste locations are located near the proposed fill sources. Other sites with potential for hazardous materials and solid waste inside and outside of the NPR-A (e.g., Nuiqsut community sources, winter travel routes, recreational trails, and oil and gas exploration sites) are described by BLM. One contaminated site was identified approximately 6 miles downstream of the ASRC mine site at the Nuiqsut Power Plant . Other potential sources of contamination include more recent oil industry exploration sites, three production pads (CD1, CD2, and CD4), and associated pipelines in the vicinity of the proposed pipeline alignment between CD4 and CD1/ACF. No unregulated hazardous or solid waste sites are known to exist in these areas. These sites are located a substantial distance downstream from the gravel mine source. The EPA Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) did not list any sites identified within the Alpine Field Development Area.

Based upon this information, there is no reason to believe the proposed fill material would contain contaminants, and the project would comply with this factor of the 404(b)(1) guidelines.

5.7.2 §230.61 Chemical, biological, and physical evaluation and testing.

The dredged or fill material has been excluded from the evaluation procedures of this section because it has been determined, on the basis of evaluation in § 230.60 General evaluation of dredged of fill material, that there is no reason to believe it would contain contaminants.

5.8 Subpart H - Actions to Minimize Adverse Effects.

5.8.1 §230.70 Actions concerning the location of the discharge.

The effects of the discharge can be minimized by: choosing disposal sites that minimize smothering of aquatic organisms; avoiding disruption of periodic water inundation patterns; minimizing or preventing the creation of standing water in areas of normally fluctuation water levels; and minimizing or preventing the drainage of areas subject to such fluctuations.

Description of Proposed Discharge Sites. The proposed discharge sites would be almost entirely permafrost-driven, flooded and saturated wetlands, ponds, lakes, and creeks of inter-related complexity on Alaska's Arctic Coastal Plain. The sites for placement of fill include the GMT1 drillsite pad, access road with vehicle pullout pads, east and west valve pads, and sand slurry mixture for VSM installations.

The aquatic resources of the proposed project area are characterized by extensive and complex arrangements of wetland and water body habitats. The total amount of fill discharged directly into waters of the U.S. would be 72.6 acres, with the largest amount consisting of saturated emergent-deciduous shrub meadow (PEM1/SS1B; 43.4 acres), followed by seasonally flooded/saturated emergent-deciduous shrub meadow (PEM/SS1E; 20.7 acres). Other wetland types impacted, listed in order of descending size include: semi-permanently flooded emergent meadow (PEM1F; 6.9 acres); permanently flooded emergent marsh (PEM1H; 0.8 acres); and small amounts (less than 0.5 acre) of other wetland and water body types including seasonally flooded deciduous shrub scrub (PEM1C), lower perennial emergent stream bank (R2EME), and lower perennial stream (R2UBH).

The disposal sites for construction of industrial infrastructure have been chosen by surveying the topography, water drainages, and surface waters to avoid and minimize the effects of the fill material which would minimize smothering of aquatic organisms. The route of the access road and location of drillsite pad, bridges, and culverts have been

designed to minimize creation of standing waters and drainage of areas subject to water fluctuation.

The proposed project would comply with this factor of the 404(b)(1) guidelines.

5.8.2 §230.71 Actions concerning the material to be discharged.

The effects of a discharge can be minimized limitating the type of material placed as well as the methods used to reduce the availability of pollutants.

The general characteristics of proposed fill material are described above in § 230.60, General evaluation of dredged of fill material. Approximately 628,050 cy of clean gravel fill from the ASRC Mine Site would be placed in 72.5 acres of waters and wetlands. An additional 4,200 cy of sand slurry mixture would fill 0.1 acres for VSM placement to support pipeline infrastructure.

Discharge of the sand and gravel fill material would occur during winter when the material is frozen, and the material would not be subject to movements until thaw season when it would dewater and settle. Some erosion protection would be necessary to prevent runoff and siltation of finer components, especially in or near lotic and lentic waters.

With the inclusion of special conditions, the proposed project would comply with this factor of the 404(b)(1) guidelines.

5.8.3 §230.72 Actions concerning the material after discharge.

The effects of the discharge of dredged or fill material may be controlled by selecting methods and sites where the potential for erosion, slumping, or leaching of material into the surrounding aquatic ecosystem would be reduced; maintaining and containing discharged materials; and timing the discharge to minimize impacts to aquatic resources.

The selection of the fill material discharge is addressed in § 230.70 Actions concerning the location of the discharge.

Fill would be placed during frozen winter conditions, using large side dump trucks accessed by seasonal ice roads. The authorized fill areas would be delineated and marked with stakes and flags following survey markers. Silt fences, coconut logs, or other biodegradable erosion protection would not be used with initial placement but would be required at environmentally important or sensitive site or erosion prone areas.

With the inclusion of special conditions, the proposed project would comply with this factor of the 404(b)(1) guidelines.

5.8.4 §230.73 Actions affecting the method of dispersion.

There are no proposed discharges of dredged or fill materials into open water bodies where materials would be dispersed into open water columns or migrate fine materials any substantial distance. All fill would be placed during winter frozen conditions. Discharges into ponds or flooded wetlands where the VSM piles would be placed would be solid frozen soils and ice. Excess dredged materials from auguring the VSM pipe holes would be removed and disposed of at an offsite upland location. With adherence to these measures, the proposed project would comply with this factor of the 404(b)(1) guidelines.

5.8.5 §230.74 Actions related to technology.

Discharges of dredged or fill material should be adapted to the needs of each site and sufficiently minimize adverse environmental impacts by use of appropriate equipment and machinery, maintenance, techniques, and designing roads and channel spanning structures and culverts, and by methods of transport of the material to be discharged.

The proposed action includes standard North Slope construction methods and machinery to transport, discharge, and spread the fill material in a manner that minimizes impacts to the aquatic environment. The design has been adapted to the needs of the fill sites to be minimized. Winter ice roads would be constructed parallel to an authorized surveyed road alignment and frozen material dumped and spread with machinery designed to not disturb tundra waters and wetlands. Bridges and culverts are designed to pass stream flow and overland cross drainage in appropriate locations. Culvert locations would more precisely be identified through field work, to better locate low drainage areas.

Design and techniques to avoid and minimize impacts include:
1. A 335-foot (bridge deck span) structure wide enough to span the 50-year floodplain with no piers placed in the active channel of the Ublutouch River, resulting in a span over this channel of 93 feet. The increase in bridge length would reduce the total road fill by more than 200 feet at the bridge approach and reduce potential flow restrictions and associated erosion and sediment accumulation. A 40-foot (bridge abutments span) structure over Crea Creek would also be constructed.
2. Use of a combination of armor rock and sheet pile abutments at the Ublutuoch River and Crea Creek bridge crossings to eliminate the need for placing fill within open waters.
3. Road, pipelines, and water crossings designed to maintain existing hydrology.
4. Gravel roads, culverts, and bridges designed with erosion control mechanisms following the Alpine Facilities Erosion Control Plan. This includes removing end-caps placed over culvert inlets and outlets (Fall season placed to prevent freeze-up of culverts) prior to spring snow-melt, clearing accumulated snow drifts from culvert inlets and outlets, clearing or thawing any culvert plugged by snow or ice, and regular inspection and documentation, and maintenance of culverts and physical armoring.
5. All roads designed, constructed, and culverted to provide adequate cross flow to prevent raising the water level on the upstream side of roads.

The proposed action uses best available technology, methods, maintenance, techniques, and timing to minimize adverse impacts caused to the aquatic environment. With inclusion of these measures and special conditions, the proposed project would comply with this factor of the 404(b)(1) guidelines.

5.8.6 §230.75 Actions affecting plant and animal populations.

Minimization of adverse effects of discharges on populations of plants and animals can be achieved by avoiding changes in water currents and circulation patterns; selecting and managing discharge sites; avoiding unique habitats; and timing discharges to avoid biologically critical time periods.

The proposed action includes measures to avoid or minimize impacts to aquatic flora and fauna by using existing infrastructure and reducing the size of fill areas and pipeline length. Wildlife surveys and habitat analyses, including aquatic site assessments, were used to identify and avoid sensitive fish and wildlife and unique habitats. Measures have been incorporated into the design and would be incorporated into construction elements to prevent or reduce erosion, slumping, runoff, and dust generation from fill areas.

With the inclusion of special conditions, the proposed project would comply with this factor of the 404(b)(1) guidelines.

5.8.6.1 Plants. Proposed fill areas were located to avoid open water areas containing submergent and emergent plant populations of importance for species and/or fish and wildlife habitat. Surveying and delineation work would be conducted to ahead of any construction to identify authorized fill boundaries, to prevent unnecessary vegetation disturbances. Fill material would be placed when the ground is frozen to limit disturbances to adjacent areas.

With inclusion of these measures and special conditions, the proposed project would comply with this factor of the 404(b)(1) guidelines

5.8.6.2 ESA listed species.

Actions to minimize impacts to spectacled eiders and polar bears caused by fill area construction and use are identified in the Biological Opinion for Effects of Greater Moose's Tooth 1 Oil and Gas Development in the National Petroleum Reserve-Alaska on the Polar Bear, Spectacled Eider, and the Alaska-breeding Steller's Eider, dated December 2, 2014 (BO). An Amendment to the BO was completed on January 13, 2015 which included Reasonable and Prudent Measures, Terms and Conditions, and Conservation Recommendations. USACE has accepted the findings of the BO and included the terms and conditions in our evaluation and permit conditions to protect listed species. With inclusion of these measures, the proposed project complies with this factor of the 404(b)(1) Guidelines.

5.8.6.3 Other wildlife and fish. Actions to minimize impacts to other wildlife and fish caused by fill area construction and use include:

1. Planning development with use of ecological mapping to assess wildlife habitat types prior to the design, placement, development of permanent facilities; minimizing the development footprint; and monitoring wildlife movements during and after construction.
2. Constructing roads and pipelines that do not impede caribou passage. Pipelines would be constructed on VSMs elevated a minimum of 7 feet above the ground surface and maintain a minimum distance of 500 feet between the pipeline and roads.
3. Implementing hydrological and biological studies at potential stream and river crossings to determine appropriate size and design of bridges and culverts.
4. Design and location of facilities to minimize the development footprint to minimize loss of aquatic habitats.
5. Prohibition of placement of permanent facilities within 500 feet of the ordinary high water mark of fish-bearing water bodies.

With inclusion of the measures and special conditions identified in section 5.8.6, the proposed project would comply with this factor of the 404(b)(1) guidelines.

5.8.7 §230.76 Actions affecting human use.

Minimization of adverse effects on human use potential may be achieved by preventing damage to aesthetically pleasing features of the aquatic views scapes; avoiding the more important aquatic areas; timing discharges to minimize adverse impacts to human use periods; and selecting sites to be compatible with human activities. Human use includes public water supplies, water recreation, and aesthetics associated with the aquatic ecosystem.

The proposed action would be constructed along several aesthetically pleasing aquatic areas, including ponds, lakes, creeks, a river, and highly complex water and wetland vegetated sites. The proposed action would minimize adverse impacts to impacts to human use, to the extent practicable, by locating fill areas away from open waters and crossing them when necessary at right angles. Preventive measures to not cause unnecessary ground disturbances and water pollution would protect the natural aesthetics. Lighting impacts would be reduced by using low intensity lighting and shading of externally facing building windows.

Mitigation measures to reduce impacts to recreational fishing and subsistence activities include measures to minimize impacts to fish and fish habitats and noise. Facilities have been designed to minimize development and reduce impacts to drainage patterns, higher value aquatic resources, and minimize disruption of caribou movement to protect recreational uses.

With inclusion of these measures and special conditions, the proposed project complies with this factor of the 404(b)(1) guidelines.

5.8.8 §230.77 Other actions.

This section includes controlling runoff of water from fill areas and other discharges from activities to be conducted on the fill.

The proposed action primarily involves linear impacts from construction of an access road where water runoff would be limited to each side of the narrow road fill. The largest fill area would be the drillsite where other pollutants would be used in construction, drilling, equipment and vehicle operations, and maintenance operations. The control of these activities and materials used are regulated by the State of Alaska for pollution prevention and control while drilling for hydrocarbons and production, pipeline maintenance, spill prevention, control, and clean-up, and not expected to pollute the fill or runoff to adjacent water and wetland areas.

With the inclusion of special conditions, the proposed project would comply with this factor of the 404(b)(1) guidelines.

5.9 Subpart J – Compensatory Mitigation for Losses of Aquatic Resources.

5.9.1 §230.93(a)(1) General considerations. The objective of compensatory mitigation is to offset environmental losses resulting from unavoidable impacts to waters of the US. Compensatory mitigation is determined by identifying aquatic resource functions that would be lost as a result of a permitted activity, and environmentally preferable measures capable of compensating for the the lost functions. Compensatory mitigation may be performed using the methods of restoration, enhancement, establishment, and in certain circumstance preservation, and may be on public or private lands.

5.9.2 §230.93(b) Type and location of compensatory mitigation. Compensatory mitigation should be located within the same watershed as the impact site, and should be located where it is most likely to successfully replace lost functions and services, and be compatible with adjacent land uses. Preference identified in the Mitigation Rule indicates that mitigation bank credits should be considered first, then in-lieu fee program credits, permittee-responsible mitigation under a watershed approach, permittee-responsible mitigation through on-site and in-kind mitigation, and lastly permittee-responsible mitigation through off-site and/or out-of-kind mitigation. Under certain circumstances, a combination of mitigation types or locations may be appropriate.

5.9.3 §230.93(b) Compensatory Mitigation Determination

The applicant has avoided and minimized to the extent practicable with inclusion of special permit conditions (see below section 6.1.48). For the unavoidable impacts to aquatic resources, compensatory mitigation is required to replace lost aquatic resource functions and services, as identified in Appendix B.

Is the impact in the service area of an approved mitigation bank?
☐ yes ☒ no There is a proposed bank, but not an approved bank on the North Slope.
Does the mitigation bank have the appropriate number and resource type of credits available?
☐ yes ☐ no ☒ n/a

Is the impact in the service area of an approved in-lieu fee program?
☒ yes ☐ no The project site is within The Conservation Fund's service area.
Does the in-lieu fee program have the appropriate number and resource type of credits available?
☐ yes ☒ no ☐
Check the selected compensatory mitigation option(s):
☐ mitigation bank credits
☐ in-lieu fee program credits
☒ permittee-responsible mitigation under a watershed approach
☐ permittee-responsible mitigation, on-site and in-kind
☒ permittee-responsible mitigation, off-site and out-of-kind

5.9.3.1 Mitigation Plan.

Compensatory mitigation is required for the unavoidable direct and indirect adverse impacts to waters of the US. The applicant's January 14, 2015, Mitigation Plan, proposed permittee responsible compensatory mitigation in the form of aquatic resource land preservation in the Fish Creek Delta. The USACE has determined that the mitigation plan is complete in accordance with section 33 CFR Part 332.4(c). The mitigation plan is the environmentally preferable form of compensatory mitigation because it is within the same Fish Creek watershed of the impact site; the proposed compensatory mitigation has a high likelihood for ecological success and sustainability; the aquatic resources are of high function and value; are relatively scarce estuarine waters and wetlands; are within an important subsistence harvest area; and the site would join an adjacent 127 acre preservation site for to create a much larger parcel of protected (conservation easement) area. This property has threat of development due to its general proximity to existing oil and gas industry development, including a lease held by the applicant for oil and gas development. Additionally, Kuukpik owns the property and has private private rights for surface development, and the ASRC owns the subsurface rights on this property and could mine for sand and gravel or other minerals.

This permittee-responsible compensatory mitigation plan is the only option available, as there is no mitigation bank nor ILF entity with available credits in this region. Therefore, this mitigation plan does not deviate from the order of the options presented in §332.3(b)(2)-(6) and is determined to be the environmentally preferable option because it is within the same watershed (Ublutouch River sub-drainage) of the proposed impact; consists of high functioning waters and wetlands, available and located where it is most likely to successfully replace lost functions and values; is compatible with surrounding adjacent land uses; and demonstrates the potential for threat from oil exploration and development given its proximity to industry infrastructure (including existing leases) and proximity to the community of Nuiqsut. Furthermore, the mitigation location occurs in a terrestrial/marine interface which, at the watershed level, is not as common as other aquatic resources.

The direct impacts for the loss of aquatic resources from conversion of water/wetlands to drylands would be compensated for at the ratios given in the table immediately below. The ratios were developed based on the applicant supplied aquatic site assessments and our revisions to the value (Category) judgements made by the applicant. Different types of wetlands were assigned different values of Category I, II, and III. All direct impacts would be compensated for with the preservation of aquatic resources at the Fish Creek Delta property as permittee responsible compensatory mitigation.

The applicant's Mitigation Plan includes compensation for the loss of 72.6 acres of wetlands. They have been calculated according to their value designation (Category). See table below.

The Mitigation Plan also included compensatory mitigation for the indirect impacts caused by the fill material within a 300-foot impact zone measured from all fill edges. The USACE has accepted this 300-foot indirect impact zone. We have used the USACE-determined aquatic resource Category (value) and ratio to calculate indirect impact debits. The indirect mitigation ratio was

based on the currently accepted USACE indirect impact rate of 10% of direct impacts. See table below.

Compensatory mitigation for the indirect impacts caused by the pipeline were not proposed. USACE recognizes the indirect impacts caused by pipelines to be much less than fill material discharges due to the activities occurring on them. Indirect impacts caused by oil pipelines include aesthetics, loss of subsistence harvest area, and a potential for land and water pollution in the case of a hydrocarbon leak or spill. Therefore, we have added compensatory mitigation debits for the pipeline based on its length, a 50-foot impact zone on each side, and a 0.05:1 preservation mitigation ratio for all water and wetland types within the indirect impact zone. See table below.

A. Debits - Proposed project (Alternative A).

1) Direct Impacts.

Functional Category	Wetland Types	Direct Impact Acreages	Preservation Ratio (X:1)	Mitigation Acreage
I	PEM1/SS1E, PEM1F, PEM1H, R2EME, PEM1T, PUBH	28.60	3:1	85.80
II	PEM1/SS1B, PSS1C, L1UBH, R2UBH	44.00	2.25:1	99.00
III	PUSR	<0.10	1.5:1	0.15
Total		**72.60**		**184.95**

2) Indirect Impacts.

Functional Category	Water/Wetland Types	Indirect Impact Acreages	Ratio (X:1)	Mitigation Acreage
I	PEM1/SS1E, PEM1F, PEM1H, R2EME, PEM1T, PUBH	290.60	0.30:1	87.18
II	PEM1/SS1B, PSS1C, L1UBH, R2UBH	291.30	0.225:1	65.54
III	PUSR	<0.10	0.15:1	0.02
	All pipeline waters/wetlands	93.33	0.05:1	4.67
Total		**582.00**		**157.41**

Indirect Impacts from pipeline area calculation.

7.7 miles pipeline X 5,280 feet/mile X 100 foot impact zone ÷ 43,560 square feet/acre X 0.05 indirect impact ration = 4.67 debits.

3) Total Debits.

Direct + indirect = 184.95 + 157.41 = **342.36 debits**

B. Credits - Proposed Fish Creek Delta preservation site.

NWI Code	Function Category	Multiplier	CE Acres	Preservation Mitigation Acreage
E2US3P	I	1.0		
E2EM1P	I	1.0		
E2EM1/USP	I	1.0		
Total			**Total**	**342.36**

Total Credits.

All 3 wetland types of the proposed permittee responsible Fish Creek Delta mitigation site have been determined to be Category I (high value) wetlands. Therefore, establishing a 342.36 acre land parcel would satisfy the debit amount calculated for the proposed action impact site above.

The applicant submitted their Greater Moose's Tooth 1, final Mitigation Plan, (Mitigation Plan) dated January 14, 2015 in accordance with the 2008 "Compensatory Mitigation for Losses of Aquatic Resources" (Mitigation Rule) regulation. The applicant proposed the following Mitigation Plan.

The creation of a 342.36-acre conservation easement for preservation of lands owned by the Kuukpik Corporation (Kuukpik). The proposed mitigation site is located between multiple small channels of the Fish Creek Delta (FCD) as it empties into the Beaufort Sea to form an estuary.

With the inclusion of this mitigation plan, the proposed project would comply with this factor of the 404(b)(1) guidelines.

5.9.4 §230.10(a) Determination of the less (least) environmentally damaging practicable alternative (LEDPA)/USACE environmentally preferred alternative.

See section 3.5 above.

5.9.5 §230.12(a) Findings of compliance or non-compliance with the restrictions on the discharge.

Compliance with the CWA Section 404(b)(1) Guidelines Determination.

The proposed project discharge is specified as complying with the requirements of the Guidelines with the inclusion of appropriate and practicable discharge conditions (see subparts H and J) to minimize pollution or adverse effects to the affected ecosystem. Alternative A is determined to be the less (least) environmentally damaging practicable alternative meeting the project purpose and need with the smallest loss of waters of the US and smallest overall adverse effects on the aquatic ecosystem.

In compliance with 40 CFR §230.10, based on the discussion in 3.5, Alternative A is the least environmentally damaging practicable alternative. "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

Alternative A would include all appropriate and practicable steps to minimize pollution or adverse effects to the affected ecosystem, and complies with the requirements of the Guidelines with the inclusion of appropriate and practicable discharge conditions. The discharge does not:

Violate state water quality standards;

Violate toxic effluent standards [under Section 307] of the Clean Water Act;

Jeopardize endangered or threatened species or their critical habitat;

Violate standards set by the Department of Commerce to protect marine sanctuaries;

Contribute to significant degradation of "waters of the U.S." through adverse impacts to: human health or welfare, through pollution of municipal water supplies, fish, shellfish, wildlife and/or special aquatic sites; life stages of aquatic life and/or wildlife; diversity, productivity, and stability of the aquatic life and other wildlife; or wildlife habitat or loss of the capacity of wetlands to assimilate nutrients, purify water or reduce wave energy; recreational, aesthetic, and/or economic values.

6.0 33 CFR Part 320 General Regulatory Policies.

The analysis of impacts on the physical, chemical, human, and biological environment is contained in the Final Supplemental Environmental Impact Statement for the Alpine Satellite Development Plan for the Proposed Greater Moose's Tooth One Development Project, October 2014, published by the U.S. Bureau of Land Management (FSEIS). The NEPA review of project impacts in the FSEIS also covered many public interest factors. Further discussion of public interest factors are included below, as noted.

6.1 §320.4(a)(1) Public Interest Review. Factors relevant to the national concern for both protection and utilization of important resources.

6.1.1 §320.4(a)(1)(i) Conservation.

Federal laws, executive orders, and agency regulations and policy guidance frequently address the need for conservation of natural resources. The USACE Regulatory Program, by authority, is focused on conservation of waters of the US, including wetlands. Our responsibilities and evaluations for DA permit evaluation must include direct and indirect impacts caused by projects we authorize. This can include many other natural resources. This proposed action would include impacts to waters and wetlands, fish and wildlife, vegetation, soils, air, land, minerals, subsistence plants and animals, and hydrocarbons.

As further described below, our evaluation disclosed conservation of natural resources would be accomplished by the proposed action, except for hydrocarbons, which would be exploited to the extent current technology would provide and be profitable.

6.1.2 §320.4(a)(1)(ii) Economics.

See section 6.1.45 below.

6.1.3 §320.4(a)(1)(iii) Aesthetics.

Direct, secondary and cumulative reasonably foreseeable future effects on aesthetics increases as development expands across the North Slope into undeveloped areas. Impacts are expected to be greatest within a 0.5-mile radius of each developed site given the presently undeveloped landscape. Proposed and reasonably foreseeable future projects would have an additive cumulative impact which would permanently alter existing

visual resources. Based upon the information in the FSEIS, and with consideration of actional taken to minimize impacts on aesthetics, impaxts are anticipated to be relatively minor to moderate.

6.1.4 §320.4(a)(1)(iv) General environmental concerns.

General environmental concerns include water, land, air, and human factors such as food or health issues. Subsistence, health, noise, air quality, and climate change were identified in the FSEIS as matters of general environmental concern which are not included in the standard public interest topics. These resources and concerns are addressed below.

6.1.5 §320.4(a)(1)(v) Wetlands.

The proposed project as identified under Alternative A, would result in the direct loss of 72.6 acres of waters of the U.S. See section 3.5.

6.1.6 §320.4(a)(1)(vi) Historic properties.

No historic properties would be affected by construction of the proposed action or any alternatives reviewed under the 2014 BLM GMT1 FSEIS. The State Historic Preservation Officer (SHPO) concurred with a finding of "No Historic Properties Affected" for a previous project area, as long as avoidance stipulations were implemented during project activities (Bittner to Rothwell, Conoco Phillips, 2008 NPR-A Cultural Reconnaissance survey for Alpine Satellite and Fiord West Development Projects, North Slope, Alaska, May 15, 2009). The finding of no historic properties affected and avoidance recommendations was based on cultural resource surveys conducted by Reanier and Associates in 2008. The current project scope does not expand into areas of any documented cultural resource locations. The proposed project would have no effect on sites listed, or eligible for listing, in the National Register of Historic Places.

The Alaska Heritage Resource Survey (AHRS) sites HAR-00057 and TLUI/HAR-087 are located less than 1 mile from the proposed action area. Following the SHPO and current NSB guidelines, development activities should implement avoidance measures to ensure protection of these sites during project activity by establishing a 500-foot avoidance buffer. The applicant would survey for historic properties and other cultural resources ahead of constructing ice roads, to avoid any identified resources.

No adverse impact to historic properties is expected.

6.1.7 §320.4(a)(1)(vii) Fish and wildlife values.

The proposed project as identified under Alternative A would have a direct and indirect impact on fish and wildlife values. See above section 3.5. Threatened and endangered species; section 5.4.2, Fish, crustaceans, mollusks, and other aquatic organisms in the food web; and section 5.4.3, Other wildlife.

6.1.8 §320.4(a)(1)(viii) Flood hazards.

There are no existing flood hazards within the proposed action area or any alternatives reviewed under the 2014 BLM GMT1 FSEIS. Authorized bridge and culvert structures and constructed roads and fill pads could become flood hazards if not constructed to accommodate expected high water events.

Spring breakup is normally the largest annual flooding event each year on the North Slope. The breakup cycle is a result of several factors including snow pack, sustained cold or warm temperatures, ice thickness, wind speed and direction, precipitation, and solar radiation.

The proposed action has been designed to accommodate predicted water flows with culvert and bridge structures to accommodate low and high water flows, fluctuating water levels, and maintain circulation. Constricting flows can result in increased stream velocities and higher potential for ice jams, scour, and stream bank erosion resulting in bank overflows and floodplain inundation. Road and pipeline crossing structures have been designed to protect their structural integrity and provide passage of all but the highest predicted flood events.

Bridges would be constructed where channelized flow occurs with a 50-year recurrence interval of 500 CFS or greater. A 335-foot opening bridge crossing the Ublutuoch River and a 40-foot opening bridge crossing Crea Creek would be constructed.

Cross drainage culverts would be placed in the road to maintain natural surface drainage patterns and not impound waters on the upstream road side by more than 6 inches compared to the down gradient side for more than one week after peak discharges. Culvert(s) would be installed at Barely Creek to maintain flow. An authorized road alignment would be field surveyed closely, one year in advance of construction, prior to and during spring break-up to identify low-lying areas where culverts are needed. The first spring break-up following road fill and culvert placement, another survey would be completed to install additional culverts or adjust culvert settings to provide for maximum retention of all natural drainage characteristics.

The proposed project area would not impact an area of occupancy and there would be no associated impact of floods on human safety. With the above actions taken to minimize adverse impacts, flood hazards would be minor.

6.1.9 §320.4(a)(1)(ix) Floodplain values.

There are floodplain values associated with the proposed action. Impacts would occur to the natural undisturbed floodplain values with the crossings of Ublutuoch River, Crea Creek, and Barely Creek floodplains. The land form and topography of these floodplains and watersheds is a coastal plain with very low reliefs. The floodplain of the Ublutuoch River drainage is the widest from the large size of the watershed and flows. Crea and Barely Creek floodplains, drainage areas, and flows are much smaller and remain frozen most of the year. The project area floodplain's most important value is for accommodating the passage of high water flows, early spring flooding and fish migrations, and rehydration of wetlands, ponds, and lakes to the extent they are able to withhold such waters during frozen soil periods and immediately thereafter.

Floodplain values would remain much the same and adverse impacts would be minor.

6.1.10 §320.4(a)(1)(x) Land Use

The current land use in the proposed action area is as natural lands in a remote arctic region without existing development. It is actively managed by separate owners as public land within a National Petroleum Reserve, State owned developable lands, and private corporate lands. The public lands are open to all for allowed use and private lands are subject to landowner permissions. Currently, all lands are generally open to local residential use for recreation and subsistence harvesting. The applicant does not own the land where the proposed action would be constructed. The linear project would transverse lands owned by 3 separate owners: The State of Alaska, US Bureau of Land Management, and Kuukpik Corporation, a Regional Native Corporation (ASRC). An additional land owner includes ASRC (as the administrator of some leases on Kuukpik Corporation land in NPR-A). ASRC owns the subsurface rights on ASRC owned lands. Check this on the permit application or FSEIS.

The Naval Petroleum Reserves Production Act (1976) provides for oil and gas leasing in the NPR-A while requiring protection of important surface resources and uses. The NSB would manage the rezoning process to evaluate the project area a Resource Development District via a Master Plan. Land owned by Kuukpik Corporation is designated for mixed use, including the oil

and gas production facilities associated with the Alpine Field. Each non-federal landowner has their own permitting processes to evaluate proposed resource and infrastructure development projects.

The proposed drillsite is located federal lands within the northeastern portion of the NPR-A and managed by the BLM for oil and gas production, with restrictions. See below/above section x.x. The proposed GMT1 drill site is located in the GMTU on federal lease AA-081798, issued by the BLM to CPAI and Anadarko E&P Onshore LLC (Anadarko), the other working interest owner in the GMTU.

The proposed road and pipeline corridors cross both public and private lands. The northern portion of the pipeline corridor between CD1 and CD4 North is on land owned by the State of Alaska and managed by the ADNR. Kuukpik Corporation owns land along the southern portion of the pipeline corridor between CD1 and CD4N and from CD4N to CD5. None of the proposed project facilities are located on or near Native Allotments.

The land use within the proposed project area would change from undeveloped natural appearing landscape to developed industrial appearing landscape with activities normally associated with North Slope oil and gas production. This would include a linear gravel roadway and gravel pad with some relatively low profile structures present and a high profile drill rig during hydrocarbon drilling activities in the early years. Provided the landowners give property access to the applicant for the intended purpose, conflicts with land use should be minimal. Some negative interference or positive access with subsistence activities could occur at times. See the below section x.x Subsistence.

Secondary impacts from development may extend onto lands not currently been reserved for oil and gas development. All future resource development land use would be subject to the permits and approvals process with Federal, State and Local authorities. The cumulative impact to land use by construction of GMT1 and the potential GMT2 is not expected to change the land uses in place.

Based on evaluated impacts, and with consideration for actions taken to minimize effects, the impacts to land use is expected to be compatible with current land use management.

6.1.11 §320.4(a)(1)(xi) Navigation.

There would be no adverse impacts to navigable waters. See section 6.1.43 below, Navigation.

6.1.12 §320.4(a)(1)(xii) Shore erosion and accretion.

Shore erosion and accretion (marine waters) do not occur in the project area and no direct impacts to the physical conditions or processes within the estuarine or nearshore environments are expected. The project area is located more than 4 miles inland from the Beaufort Sea. The only shoreline erosion and accretion would occur on shallow relatively small inland freshwater ponds and lake from windstorms. The proposed action would not impact these waters.

6.1.13 §320.4(a)(1)(xiii) Recreation.

Recreational activities occur within the proposed action areas on a very limited basis. The Federal and State owned public lands are open for recreational activities such as fishing, hunting, hiking, photography, etc. Privately held lands are generally open to local residents and others for recreation with permission. Some seasons of the year may be more sensitive for access and use due to potential noise caused by aircraft or other disturbances to local subsistence users. Recreation encompasses activities undertaken for amusement and relaxation. The activities include consumptive and noncomsumptive uses.

Public recreational use in the project area is low intensity and primarily represented by non-local visitors. No recreational facilities exist in the project area. The lack of a developed public road system into the area limits recreational access. Approximately 150 recreational users visit the entire NPR-A annually.

Effects of the proposed project on recreation include a reduction or loss of area because of the development and use by the lessee for industrial purposes. Local residents would still be allowed use of the access road and recreational activities likely coincide with subsistence harvesting activities. Construction of the road could therefore provide additional access and use for recreation to some users.

Secondary impacts to recreation include impacts from noise, visual distractions, and aesthetics and they could alter the recreational experience. These impacts are expected to be of low intensity but would last for the lifetime of the proposed project.
Cumulative impacts to recreation from drilling and operations from GMT1 and past, present, and reasonably foreseeable future (RFF) are expected to be negligible. Present and RFF development activities would have local, short-term impacts

6.1.14 §320.4(a)(1)(xiv) Water quality.

Water resources within the proposed action area are of high quality and uncontaminated. The proposed project area is largely pristine and unaffected by human use activities and developments. There are no known nearby pollution sources. The Fish Creek watershed and Ublutouch River watershed are undeveloped and not known to have sources of natural or anthropogenic pollution. Many project area water resources are productive during the growing season, composed of a diversity of aquatic flora and faunal use.

Water quality would decrease slightly from indirect impacts caused by road generated dust fallout, erosion and siltation of fill slopes, and gravel spray from vehicle use. Most discharges would occur in saturated or moist tundra wetland areas.

During the first seasonal thaw period following fill placement, the potential for erosion and siltation of waters would be increased due to fill material melt, settling, precipitation, and erosion. Siltation of waters adjacent to constructed fill areas could be reduced with careful fill placement, containment, and effective erosion control techniques and maintenance. The fill material would be placed during the winter when water bodies are ice covered (Ublutouch River) or frozen solid (shallow ponds and wetlands) and impacts to water quality from siltation would be minimized. The drillsite pad is located on moist wetland substrates, approximately 0.5 mile from the nearest drainage. Analyses of samples collected from lakes adjacent to existing gravel access roads and pads within the applicant's development complex at the Alpine Field suggest that construction of road and pads has no measurable effect on water quality. Additional data and information reviewed related to gravel pad and road construction impacts on alkalinity and pH have not yielded changes since 2004.

With restrictive conditions on fill discharges, containment, and indirect impacts caused by runoff siltation, dust, snow removal operations, and gravel spray from vehicle use, the aquatic resources high water quality would be maintained.

6.1.15 §320.4(a)(1) (xv) Energy needs.

The proposed action would require large amounts of fuels during the first 2 years to construct the gravel fill and pipeline placement infrastructure. Much of it would occur during the first 2 winter season to access the frozen tundra water and wetland areas. Construction would continue throughout the year at certain locations on authorized fill areas complete bridge and culvert installations and other structural or faculty work. Fuels would be needed to operate large trucks,

heavy equipment, smaller vehicles, aircraft, electrical generators, etc. Tasks would include construction of ice roads and pads; gravel mining; fill loading, hauling, and spreading; culvert placement, pipeline material transport and installation; and construction of various buildings and facility support at the drillsite.

Much less fuel would be used for drilling and operations. The drilling phase would require more fuels than the production phase where electrical energy would provide for the extraction and delivery of raw fluids. Electrical energy needs of the proposed GMT1 project would be powered via the existing Alpine electrical power system using power lines suspended from pipeline HSMs via messenger cable. The on-site drill rig would be powered by highline power. Stand-alone equipment (such as heaters or light plants) would be fueled via the Alpine diesel supply.

Small amounts of fuels would still be needed for personnel transportation for various operational and maintenance needs during the production phase that is expected to last approximately 30 years.

Energy resources are available within the Alpine development complex and throughout the North Slope developed oil and gas areas. Fuels need to be transported (consuming additional fuels) from distribution sites located within Alaska by truck via the Dalton Highway and to the ACF by ice road or air transport. There is no shortage of fuels and the amount consumed by the project is not expected to cause any shortages within the local or regional areas.

6.1.16 §320.4(a)(1) (xvi) Safety.

Industrial oil and gas construction, drilling, and operational activities in the arctic is inherently hazardous to humans due to extreme weather conditions (cold, wet, dark, windy, etc.), machinery operations, transportations, wildlife, etc. The applicant is expected to follow all safety precautions to provide for all employees, contractors, and visitors to the locations to ensure safe condition are provided. Construction and operational activities would follow standard North Slope safety practices, as outlined in the 2014 Alaska Safety Handbook and applicant internal policies. The applicant would provide employees with safety training and frequent safety meetings.

Providing safe conditions for facility users includes construction of an all-season access road connection between the drillsite and the emergency response facilities available at the ACF. Facilities at the ACF include medical emergency response equipment and personnel, fire and hazardous material response and personnel, and other hydrocarbon spill and emergency response equipment and personnel. Ground access would allow transport for lifesaving or medical evacuation of on-site personnel.

The access road would provide for pipeline or well control incidents to deploy personnel and equipment to the drillsite. The gravel access road near-parallel to the production pipeline would facilitate pipeline inspection, providing a more rapid detection of leaks or other problems that could cause a spill incident.

No unusual safety hazards or dangers for construction, drilling, or operations have been identified for this proposed action than do not normally exist within the North Slope oil and gas production areas. The applicant is very experienced in these type activities in the regional area and expected to provide safe conditions in all activities.

6.1.17 §320.4(a)(1) (xvii) Food and fiber production.

The arctic climate and conditions of the proposed action area are not conducive to food and fiber production due to frozen soils and short growing season under saturated soil conditions. There are no forests or agricultural lands.

Subsistence activities for harvesting of wild food are conducted but there is no human cultivation of food or fiber across the large regional area of the arctic coastal plain.

There would be no effect to food and fiber production.

6.1.18 §320.4(a)(1) (xviii) Mineral needs.

For the proposed action, large quantizes of sand and gravel mineral resources would be needed to construct the access road, associated pads, and pipeline VSM supports. The existing ASRC Mine Site, located adjacent to the east channel of the Colville River, has been identified as the probable material source. Approximately 628,050 cubic yards of gravel and 4,200 cubic yards of sand slurry/steel mixture for a total of 629,700 cy of mineral material would be needed. The ASRC is not known to be contaminated and this material source has been recently used for oil production infrastructure in the local area.

The arctic coastal plain is largely composed of sand and gravel alluvium mineral materials. However, high quality coarse gravel content fill material is rather scarce in large quantities or located in an economic location with respect to extraction and hauling costs. The use of the existing mine site for mineral resources would no impact the availability of gravel resources to future users.

The proposed action would not provide for mineral needs of others, only consume them for their fill area construction. The material could be retrieved some day and reused for similar purposes if and when the proposed project became obsolete and abandoned due to hydrocarbon depletion in the area reservoirs.

The proposed project has been minimized to construct the development footprint with the least amount of mineral resources as it reduces project costs and environmental impacts. ASRC maintains an existing USACE permit (independent of this proposed project) and is responsible for reclamation of the gravel extraction site based on their permit.

There would be no unacceptable impact to mineral needs caused by the proposed action.

6.1.19 §320.4(a)(1) (xix) Considerations of private property.

See the above section 6.1.10, Land Use and below section 6.1.34, Consideration of property ownership.

The proposed action would require permission from 3 different property owners to construct permanent structures and long term use of their lands. The State of Alaska, US Bureau of Land Management, and Kuukpik Corporation, a Regional Native Corporation own the surface lands. It is the applicant's responsibility to obtain all property access rights for any discharges of dredged of fill material into waters of the US associated with Department of the Army permits authorizing construction projects. Comments received from the 3 surface landowners were in favor of the applicant's plans to construct the project. The ASRC is an administrator of some leases on Kuukpik Corporation lands.

Very substantial review and examination has been performed on the applicant's intended use of the NPR-A public lands by the BLM in development of an EIS. Specific authorization is required by the BLM as land manager to approve their Right to Drill and Right-of-Way authorizations. The applicant will not be able to construct the project without these authorizations and permission of the other 2 land owners.

The FSEIS and comments from landowners indicate there would not be an objection to the proposed action. However, the BLM may direct modification to the design and/or locations

of the proposed permanent facilities and include several specific restrictions on their permits to use the public lands.

6.1.20 §320.4(a)(1) (xx) Needs and welfare of the people.

The proposed action would provide hydrocarbon resources (crude oil) in large quantities for approximately 30 years for general public for use including fuels for transportation, construction, heating, etc. and as a base resource for developing other derivative products. The proposed project would produce resources needed to help meet US domestic energy demand and help offset declines Alaska's oil production which provides benefits to local, state, and national economies. It would provide for additional temporary and full-time employment, created during construction and operations, tax revenues, revenue sharing, and royalties to the federal government and Alaska Native Claims Settlement Act (ANCSA) corporations. The production of raw hydrocarbon resources provides for direct (employment) and indirect benefits (fuels and other crude oil products) directly relates to the needs and welfare of the people. No public facilities or services would be provided by the proposed action.

The needs and welfare of the people would be served by the proposed action.

6.1.21 §320.4(a)(1) (xxi) Subsistence.

Primary impacts to subsistence and traditional use activities in the community of Nuiqsut include reducing the availability of subsistence resources, changing access to subsistence use areas (both positive and negative effects), hunter avoidance of industrial areas, and reducing overall community participation in subsistence activities.

These impacts could result in: increased investments in time, money, fuel, and equipment required to obtain subsistence resources; changes in hunting success; and changes in community cohesion. Access to subsistence harvest areas by road increases accessibility of some areas and may result in reduced these investment costs to obtain some subsistence resources. Negative effects could also occur as a result of an oil spill depending upon the size and location of the spill.

Nuiqsut residents would experience direct impacts to subsistence use areas, particularly areas used for harvesting caribou, geese, and furbearers. Project construction would result in the direct loss of subsistence use areas. The access road would be used by subsistence hunters and pullouts for safety and parking would be provided. The key area of project overlap with Nuiqsut community subsistence use areas are west of the community towards the Ublutuoch River and Fish Creek. The majority of impacts to subsistence activities would occur during the late fall caribou hunt, and winter wolf and wolverine hunts, and spring goose hunting. Some impacts to winter fishing activities may also occur. Subsistence harvesters often avoid areas of development due to concerns about contamination and discomfort with hunting near human or industrial activity. However, the proposed project would also provide beneficial effects by increased year-round access to these subsistence resource areas.

Subsistence harvest data show that 26 percent of total caribou harvested by Nuiqsut residents occurred in the overall proposed project area but only 12 percent were harvested within a 2.5-mile buffer it. The vast majority of caribou were taken along rivers.

Impacts on resource availability are related to noise, traffic, and infrastructure. Noise generated by helicopter and planes have the largest negative effect. Caribou, waterfowl, and furbearers are subject to displacement which would affect Nuiqsut subsistence harvesting.

Direct impacts of the proposed action would be localized by loss of subsistence use areas near the access road. Indirect effects for changes in cost, time, and effort) could extend beyond the local area and affect Nuiqsut subsistence activities beyond the access road and drillsite.

Subsistence activities play a very important role in the sociocultural environment of Nuiqsut. Adverse impacts to importance of specific subsistence resources would be important in context and a high concern to the local residents who rely on these resources for food supplies.

The FSEIS found construction and operation of the project would result in a major impact on subsistence.

Subsistence mitigation measures have been included in the design, construction, and operation of the proposed project to reduce impacts to subsistence resources and resource availability. This includes locating the proposed drillsite pad and much of the access road outside of the Fish Creek Buffer area. Impacts to subsistence activities and resources are mitigated also through by the BLM stipulations and BMPs. The applicant consulted with the local community on the locations of proposed roads and pipelines. The applicant has also developed processes to consult with subsistence users on daily planned oil and gas activities to avoid interference with subsistence activities.

Adverse impacts to subsistence resources and harvesters would be largest during the construction phase, particularly during the winter in within the liner projects areas. Summer construction activities at the bridge sites, culvert locations, and drillsite would also affect subsistence resources and harvesters. Disturbances to fish and wildlife resources and harvesters would then diminish with the operations when traffic, noise, and construction activities are less. Access to the Ublutouch River and Fish Creek areas by Nuiqsut residents would be much increased with all-season roads provided by Kuukpik via their Nuiqsut Spur Road, and the applicant's CD5 and GMT1 roads. Subsistence activities would be largely unaffected in other areas outside of the GMT1 project areas.

Cumulative effects of the past, present, and reasonably foreseeable future (RFF) from other projects could affect the availability and distribution of subsistence resources, increased road access, and disturbance to subsistence resources and users. Projects under construction or in the RFF include CD5, Nuiqsut Spur Road, Colville River Access Road, expansion of the ASRC Mine Site, and winter oil and gas exploration west of the community. Development of the Nuiqsut Spur Road and the Colville River Access Road would provide residents with improved access to subsistence use areas. The GMT1 and GMT2 projects may make development further west into the Bear Tooth Unit more feasible to develop providing additional subsistence access and the disturbance to subsistence resource that comes with all industrial roads and activities.

Data collected during The Nuiqsut Caribou Subsistence Monitoring Project has documented shifts in Nuiqsut subsistence activity away from Alpine-related development activities. Development of CD5, GMT1, and GMT2 projects would introduce the first permanent oil and gas infrastructure into subsistence use areas south and west of Nuiqsut, the two remaining directions residents can currently access without the presence of permanent oil and gas infrastructure.

6.1.22 §320.4(a)(1)(xxii) Climate change.

The regional area has a potential to change with global warming by degradation and thaw of permafrost. Melting of near-surface permafrost creates an irregular landscape referred to as patterned ground resulting from the action of thermokarst. Computer modeling completed for the NPR-A forecasts the mean annual thickness of the active layer of permafrost within the Arctic Coastal Plain would increase from 15 inches in the 1980s to 18 inches in the 2040s.

Climate change could make the growing season longer with warmer and drier soils with a potential to drive changes in plant communities. Climate warming could cause water resource changes to seasonal flow patterns, ice cover thickness and duration, and the frequency and severity of flood events. This could result in river channels migrating over the landscape and potential disruptions to infrastructure and habitat.

Global warming could also cause increase drying and water flows to decline. Freshwater lakes could reduce in size or increase due to thermokarst landscape development.

The relatively small amount of greenhouse gases exhausted from construction, drilling, and operation of the proposed action would not have a measureable effect to climate change. At this time, the long term effects of climate change in the project area from world greenhouse gases are unknown. The project purpose is to provide hydrocarbon resources for US domestic use which would not reduce emissions of green house gases to the air environment and reduce global warming trends. The adverse impacts caused by the project construction and operation due to greenhouse gases are expected to be negligible.

6.1.23 §320.4(a)(1)(xxiii) General health.

Effects to health include changes in the availability of subsistence resources, stress related to cultural changes due to modernization and loss of tradition, increased demand for health care services, and positive effects on health through increased employment and income. Cumulative effects to public health resulting from past and present oil and gas exploration and development have been both positive and negative for communities on the North Slope. Positive changes have included an increase in life expectancy, decrease in infant mortality, decreased infectious disease rates, improved health care services and public health programs, and improved municipal health infrastructure. Negative changes have included increase in chronic diseases such as cancer, cardiovascular diseases, metabolic disorders, increase in alcohol and substance misuse, suicide, violence, and other social dysfunction. The proposed project, current construction projects, and RFF projects may result in a continued change to village life and public health, some positive and some negative.

Direct and indirect impacts of oil and gas development on public health include potential changes in diet and nutrition from introduction of commercial food products, environmental exposures, infectious diseases due to influx of non-local workers, safety, acculturative stresses, economic impacts, and changes in the capacity of local health care services. Changing from a subsistence diet and toward commercial food is may be the cause of increased metabolic disorders such as obesity, heart disease and diabetes). Impacts to public health could occur from episodes of poor air quality associated with dust or fuel exhausts and pose a health hazard for at-risk populations. Because housing, food and other services for oil industry workers would be provided at the ACF, interaction between local residents and non-local oil industry workers would be minimal. The FSEIS concluded impacts associated with oil and gas development would be localized and temporary and there would be no measurable impact on public health at a population level.

6.1.24 § 320.4(a)(1)(xxiv) Air quality.

The proposed GMT1 project would require air permits from the state air quality agency the ADEC. The NPR-A is currently designated as unclassified under National Ambient Air Quality Standards (NAAQS) and Alaska Ambient Air Quality Standards (AAAQS), however the area is assumed to be in attainment including attainment of the particulate matter (PM) standards. Air quality is generally good, due to the few sources of both man-made and naturally occurring emissions and the dispersion by prevailing winds. West of the Colville River, existing emission sources include diesel fired generators, engines, heaters and vehicle traffic in Nuiqsut. The majority of housing in Nuiqsut is heated by natural gas and the primary power source is natural gas fired. Arctic haze, generated in Europe and Russia is periodically observed. The applicant has collected criteria pollutant ambient monitoring data in Nuiqsut since 1999. This data was reviewed as needed by ADEC to support Alpine-related permitting.

The GMT1 Air Quality Impact Analysis, which incorporates modeling of the proposed project components using the AERMOD and CALPUFF models, was completed per Memorandum of Understanding (Air Quality MOU) requirements including setting up a technical working group

made up of various Federal agencies and the State of Alaska to address compliance with NAAQS and air quality related values.

Construction emissions are expected to be transient and short-term, occurring over two construction seasons. Construction emissions would consist of fuel combustion related to heavy equipment used in site preparation and construction, smaller support equipment (such as heaters), and fugitive dust sources. Drilling emissions would run concurrently with a portion of the construction phase.

Operational emissions would be low as few permanent stationary source emission units are proposed for installation after the completion of construction. Ongoing emissions would include a heater, fugitive dust from vehicle travel to transport workers and materials to the site, and minor fugitive emission of field gas from equipment and pipeline components. Production activities would also include periodic well interventions and potential well infill drilling which would require fuel fired heaters, boilers, engines, temporary storage tanks for flow back fluids, and additional mobile sources.

Emissions from project-related equipment including mobile sources such as aircraft, non-road engines, and fugitive sources are quantified and included in the modeling. During and after construction, electric power would be provided to the site from existing, off-site generation which would limit total project site emissions.

The air impact analysis assessed near-field and far-field impacts on air quality. Near-field analysis assessed impacts in the project vicinity, while far-field analysis assessed impacts for Sensitive Class II areas within 185 miles of the project—the Arctic National Wildlife Refuge and Gates of the Arctic National Park. The near-field ambient air quality impacts analysis demonstrates that high air quality impacts will not result from the construction or operation of the proposed project and indicates compliance with all criteria pollutant NAAQS/AAAQS for all averaging periods. The far-field analysis of air quality impacts from NO_2, SO_2, PM_{10}, and $PM_{2.5}$ at the Arctic National Wildlife Refuge and Gates of the Arctic National Park indicates that total maximum ambient concentrations will be below the NAAQS/AAAQS for all pollutants examined. The far-field analysis also indicates that visibility impacts and deposition impacts are both predicted to be well below assessment thresholds for both areas.

Based on this analysis and actions taken to minimize impacts, overall impacts to air quality are expected to be low to moderate.

6.1.25 §320.4(a)(1)(xxv) Noise

Noise in the project area described in terms of potential effects as unwanted sound resulting from project related activities. The level of noise disturbance would result from two principal noise-generating sources: stationary and mobile activities.

Equipment operation for drilling, construction, and production as well as aircraft used for personnel transportation would all contribute to increased levels of noise in the project area. The proposed GMT1 project area is remote and sparsely populated with few anthropogenic-derived sources of noise. Proposed GMT1 project activities, in addition to construction at the CD5 project site and the Nuiqsut Spur Road, may all result in temporary, minor impacts to ambient noise levels in the project area.

Noise levels are anticipated to be consistent with other North Slope oil production facilities once production and development operations commence. Noise emissions from fixed-place facilities attenuate rapidly with distance from the facility.

Cumulative noise effects associated with the proposed project are unlikely to impact the community of Nuiqsut. Overall impacts to noise are anticipated to be minor.

6.1.26 §325.2(a)(6) Processing of applications.

Significant National Issues. If a district engineer makes a decision on a permit application which is contrary to state or local decisions, the district engineer will include in the ROD the significant national issues and explain how they are overriding in importance. This ROD results in a final decision that is not contrary to state or local decisions.

6.1.27 §320.4(a)(2)(i) The relative extent of the public and private need for the proposed structure or work: The relative extent of the public need for proposed action is nation-wide because the raw material being produced, exported, and distributed would be converted to fuels and other products of importance for daily use. The US has a great dependency on hydrocarbon resources. The proposed action would be primarily located on federal public lands established many years ago as a national petroleum reserve for future US domestic oil production and use which contributes to the large extent for the public need. The public need would be served by the applicant's proposal to construct infrastructure to access the identified hydrocarbon reservoir location. A public need would be served with receipt of royalties paid to the federal and state treasuries. The project would provide millions of barrels of crude oil per year for approximately 30-years.

The relative extent of the private need for the work is driven by the applicant to continue development and expand their Alpine Satellite industrial complex for additional crude oil production for corporate profitability. The applicant has invested in and received substantial land area leases within the NPR-A area that they want to develop for a return on investment. A private need would be served by creation of temporary construction jobs and full-time long-term operations and maintenance jobs. The extent of the employment would generally be local but important for local area residents in the NSB and State of Alaska.

The proposed action would have a positive effect and contribute to the relative extent of the public and private needs of the US population.

6.1.28 §320.4(a)(2)(ii) The practicability of using reasonable alternative locations and/or methods to accomplish the objective of the proposed structure or work:
☐ There are no unresolved conflicts as to resource use.
☐ There are unresolved conflicts as to resource use. One or more of the alternative locations and methods described above are reasonable or practicable to accomplish the objectives of the proposed structure or work but are not being accepted by the applicant.
☒ There are unresolved conflicts as to resource use; however, there are no practicable reasonable alternative locations and methods to accomplish the objective of the purposed work.

See the alternatives analysis above in sections 3 and 5.9.

6.1.29 §320.4(a)(2)(iii) The extent and permanence of the beneficial and/or detrimental effects that the proposed structures or work may have on the public and private uses to which the area is suited:

Beneficial effects. The area is suited for the applicant's proposed use because the public land is managed for petroleum production for US domestic use. The extent of the proposed action is linear and designed for access to undeveloped lands to reach a hydrocarbon reservoir on the applicant's leased area. The work to construct the access road, drillsite, and pipeline would be permanent. Eventual depletion of the GMT1 reservoir may not cause the use of the access road to become obsolete because of additional existing applicant leases for similar projects further west. If no further development occurred, the area would eventually return to near its original condition and used by the public for recreation and subsistence without oil field access restrictions. Most of the infrastructure would be on federal public lands established many years ago as a national petroleum reserve.

Detrimental effects. The area is suited for non-commercial use by the public for its natural undeveloped condition. The area is not widely frequented by the public largely because of its remote location and undeveloped public facilities to accommodate recreational visitation. The undeveloped project area is well suited for its plant, fish, and wildlife production and subsistence harvests by the local village populations. The extent and permanence of the proposed action would change the area from undeveloped natural lands used by the public and local residents to developed industrial lands with all the construction and maintenance activities necessary to produce crude oil. The area would be affected in a linear manner with a gravel access road, bridges, culverts, and an above-ground pipeline constructed generally parallel to the road. The federal land manager would authorize the applicant to construct project with restrictions to protect the natural environment and subsistence uses. The adverse effects of the work, such as loss of wetland habitat and other functions, noise and risk of oil spills, would last for the duration of the project.

The extent and permanence of the beneficial effects on the public and private uses for the proposed project area are consistent with the federal land management plan and USACE regulations and policies. A general and specific condition on a USACE authorization would require the fill materials and structure be removed and the affected areas returned to undeveloped natural conditions, to the extent practicable.

6.1.30 §320.4(a)(3)(b) Effect on wetlands.

See section 5.5.2.12 above.

6.1.31 §320.4(a)(3)(c) Fish and wildlife.

See above section 5.4.

6.1.32 §320.4(a)(3)(e) Historic, cultural, scenic, and recreational values.

There are no known historic or cultural resources within the direct impact areas of the proposed action for the discharge of fill material. Review of the Alaska Heritage Resources Survey (AHRS) and the NSB Traditional Land Use Inventory (TLUI) databases did not disclose any historic or cultural resources within the project areas.

There are identified cultural resource sites within a 0.25-mile buffer (indirect impact analysis area) and 5-mile buffer (visual and noise impact analysis area) of the proposed action fill areas. Three cultural resource sites listed in the AHRS and/or TLUI databases are located within the indirect impacts analysis area for Alternative A, and 12 listed cultural resource sites are within the 5-mile visual and noise impact analysis area. The FSEIS concluded all project components associated with Alternative A overlap the Nuiqsut Cultural Landscape.

To ensure the proposed project would not have any effect on any sites listed, or eligible for listing, in the National Register of Historic Places, or otherwise of national, state, or local significance, surveys would be conducted prior to construction of any ice roads to ensure the route avoids any previously unknown sites. Avoidance measures would also be implemented for sites HAR-00057 and TLUI/HAR-087.

There are no designated scenic areas in the vicinity of the proposed action.

There are recreational values on the public lands managed by the BLM in the project area. These values include recreational outdoor activities such as hiking, photography, fishing, hunting, small craft water trips on the larger creeks or rivers, and related activities. There is no access to these remote areas other than charter aircraft, no lodging, meals, or other facilities so there is

very little visitation and recreational activities. Construction industrial access roads into this project area would be restricted by the lease holder and not open to the public.

Based on the absence of resources, access, and use restrictions, impacts to Historic, cultural, scenic, and recreational values there would be little to no impacts caused by the proposed action.

6.1.33 §320.4(a)(3)(f) Effects on limits of the territorial sea.

The proposed action is not located within the territorial seas as it is several miles south of the Beaufort Sea on inland areas. There would be no impact to the territorial seas.

6.1.34 §320.4(a)(3)(g) Consideration of property ownership.

The proposed action would occur on 3 separate properties owned by Kuukpik, the State of Alaska, and federal public lands within the NPR-A managed by the BLM. This proposed project has been thoroughly reviewed by these property owners who have provided written comments either in favor of the construction and resource extraction or have no objections.

There would be no unresolved conflicts or objections to the proposed project. Property right-of-way permissions would be provided by all 3 landowners. There would be no issues remaining to consideration of property ownership.

6.1.35 §320.4(a)(3)(h) Activities of affected coastal zones.

The proposed action is not located on near the coast of the Arctic Ocean. There would be no impacts within a coastal zone.

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.

6.1.36 §320.4(a)(3)(i) Activities in marine sanctuaries.

There are no designated marine sanctuaries in the vicinity of the proposed action. The proposed project is not located within or near marine waters as it would be constructed several miles inland from the Beaufort Sea. There would no impacts to marine sanctuaries.

6.1.37 §320.4(a)(3)(j) Other Federal, state, or local requirements.

References: Other federal, state, or local requirements for the proposed GMT1 project are listed in FSEIS 2014 section §1.4.2 and Table 1.4-1.

6.1.38 Prime and unique farmland.

(7 CFR Part 658)

Federal agencies must consider consider adverse effects of their programs on the preservation of farmland and consider alternative actions, as appropriate, that could lessen such adverse effects. Based on information published by the Natural Resources Conservation Service, there are no designated prime and unique farmlands in the State of Alaska. The proposed project would have no adverse effects on prime and unique farmlands.

6.1.39 §320.4(a)(3)(k) Safety of impoundment structures.

There are no existing or proposed impoundments on any waters in the project vicinity or region.

6.1.40 §320.4(a)(3)(l) Floodplain management.

There are no developed floodplain areas within the proposed action area. There would be no associated impact of floods on human safety, health, or welfare. This proposed action would be the first road constructed from the applicant's CD5 drillsite across uninhabited pristine lands of the NPR-A public lands. There are no floodplain management plans for any of the drainages proposed to be crossed. Flooding within the floodplains of all drainages would be within natural developed areas and not cause any property damages or devalue property. Periodic flooding would retain the natural characteristics of the floodplains and aquatic ecology.

The largest floodplain crossed would be for the Ublutouch River where a 335-foot opening for water flows would be constructed between abutments. The bridge crossing would be more than adequate to provide for expected high flows in width and height. The proposed access road would also cross 2 minor tributaries with small floodplains at Crea and Barely Creeks. At Crea Creek, a 40-foot opening for water flows would be constructed between abutments. At Barely Creek a culvert battery would be installed. All crossing structures are expected to provide for expected high flows.

There would be little to no adverse effects to floodplain management or floodplains.

6.1.41 §320.4(a)(3)(m) Water Supply and Conservation.

Water supply for the proposed action would come from local surface waters source during construction, drilling, and production. Ice chips and freshwater for construction would come from local lakes as permitted by State of Alaska regulatory agencies, primarily within the NPR-A. Water for ice road and pad construction, drilling, and potable water would be withdrawn from lakes in the vicinity of the project area as authorized with Alaska Department of Natural Resource (ADNR) Temporary Water Use Permits and Alaska Department of Fish and Game (ADFG) Fish Habitat Permits. Large quantities of water for construction of ice roads and pads would be needed for the first 2 winters of construction. Drilling and operations would also require large quantities of freshwater.

The proposed action would require approximately 67.5 MG of water during Year 1 and 54 MG of water during Year 2 for ice road construction to haul and discharge gravel materials. Construction of ice pads would require approximately 32.5 MG of water during Year 1 and 13.8 MG of water during Year 2 for staging of materials and equipment. Drilling (including drilling needs, camp support, and miscellaneous requirements) would require approximately 23.7 MG per year, totaling 94.8 MG for 4 years.

Fresh water would be required for domestic use at remote construction camps as well as for construction and maintenance of ice roads and pads. Potable water requirements are based on a demand of 100 gallons per day (gpd) per person (estimated up to 100 people at a remote camp), totaling approximately 10,000 gpd during construction seasons. Freshwater may be used for hydrostatic testing.

The water use during the road and pipeline construction in years 1-2 and drilling in years 2-6 would put large demands on local freshwater sources. After completion of drilling, when operations move to full operations, the freshwater demand from local lakes will substantially reduce. When the pipeline is operational, produced water from the ACF would be delivered to the GMT1 drillsite for use. Water withdrawals are regulated by the State of Alaska, ADFG and ADNR and they limit the amount of water removed from each withdrawal location to not adversely impact the resource. Ice chips are used from lake surfaces and water pumped from below. With the regulatory controls in place, there would be low and acceptable impacts from water use. The withdrawal areas would be recharged each year at break-up flooding periods.

6.1.42 §320.4(a)(3)(n) Energy conservation and development.

Non-renewable crude oil from ancient geologic formations underground would be exploited by the proposed action for business profits for approximately 30-years to supply the US domestic raw hydrocarbon market. Crude oil energy resources would not be conserved but extracted by the latest technological methods to obtain all recoverable oil. No energy conservation of crude oil would occur. Substantial quantities of energy resources would be developed.

The project would produce raw liquids from the reservoir consisting of water, natural gas, and crude oil. This 3-phase liquid solution would be separated at the applicant's facility located several miles to the northeast. The crude oil would then be separated and sent to market. The natural gas would be used for energy at the industrial facility and/or conserved by injection into an underground storage reservoir. It could also be used pressurize a reservoir to enhance additional oil recoveries.

The sales quality crude would be transported through the Alpine Sales Oil Pipeline and Kuparuk Pipeline to the TransAlaska Pipeline System (TAPS) for oil tanker shipment to market in the lower 48 states. Development and production of hydrocarbons from GMT1 would produce resources needed to help meet US domestic energy demand. Development would also help offset declines in production from the Alaskan North Slope, as well as providing other economic benefits such as federal, state, and Native Corporation royalties and employment.

The project is located on public lands in a national petroleum reserve where the land management plans provide for access to extract hydrocarbon resources for our general use. The Naval Petroleum Reserves Production Act directs the US Department of the Interior to undertake "an expeditious program of competitive leasing of oil and gas" in the NPR-A. There is high demand for the crude oil resource and it can all be readily sold on the open market. The US consumes more energy from petroleum than from any other energy source. In 2010 the total US petroleum consumption was 19.2 million barrels per day, or 37 percent of all the energy consumed. Crude oil are used primarily for fuels and heating, but are also raw material to create many other products.

There would be no crude oil energy conserved by the proposed action. Limited quantities of natural gas could be conserved, depending upon the reservoir content and use in the Alpine complex. The proposed action would provide for substantial energy development.

6.1.43 §320.4(a)(3)(o) Navigation.

There are 2 navigable waters within the proposed project area subject to the USACE regulatory authority under Section 10 of the Rivers and Harbors Act of 1899 (RHA). These are the Nigliagvik and Nigliq channels of the Colville River where a new injection water pipeline would be installed on existing previously permitted bridge deck structures between the CD4N drillsite and the CD5 drillsite. Placing an additional pipe line at bridge deck height on an existing lateral extension over the navigable waterway would not affect the current coarse, location, and condition of the navigable water. Therefore, a permit is not being required for the water injection pipeline extension and it would not have an effect on navigation.

No work or construction of structures would occur in other areas of the Colville River or the Arctic Ocean. Construction of structures or work in any of the inland surface waters (lakes, rivers, creeks, ponds) which do not involve a discharge of dredged or fill material would not be regulated by the USACE. USACE does not regulate vessel traffic on navigable waters.

The Ublutuoch River is within the proposed project area but not listed on the Alaska District Navigable Waters List as it has not been determined by navigable waters study to support interstate or foreign commerce. The Ublutuoch River is not identified as known navigable waters

according to the ADNR. An elevated bridge structure would be constructed over the Ublutouch River at a single channel location and spanning far beyond its width to provide for navigation.

There would be no adverse impact to navigable waters. Therefore, no beneficial or detrimental effects to navigation are anticipated as a result of the proposed GMT1 project.

6.1.44 §320.4(a)(3)(p) Environmental benefits.

The proposed action would not provide any identifiable environmental benefits.

6.1.45 §320.4(a)(3)(q) Economics.

The proposed action would generate positive economic benefits to the village, borough, and state economies. The proposed project is expected to produce approximately 64.3 million barrels of oil between 2017 and 2050. Facility construction and drilling are expected to cost approximately $1.54 billion, and operation costs are expected to amount to over $1.9 billion. These expenditures would increase economic activity at a state, borough, and local level to varying degrees. The overall effect on the economies is expected to be relatively minor.

Development of the GMT1 facility would create temporary jobs during construction. The peak construction workforce for the proposed project is estimated at 300 jobs. Operation of the facility would create an estimate of 5.5, 12-hour positions (each position represents two people) over the life of the project.

The proposed project could have an indirect positive effect on local area employment through increased NSB and city tax revenues. It may also have a positive indirect effect through increased Kuukpik Corporation or ASRC dividends from increased revenues from project-related construction contracts, land use agreements, and royalties.

Taxes and royalties from oil sales, state corporate income taxes, property taxes, bed taxes, and other fees would benefit the City of Nuiqsut, NSB, the State of Alaska, and Native corporations. The City of Nuiqsut is projected to benefit from increased bed tax revenue resulting from higher hotel occupancy during construction and operation phases of the proposed project. The State of Alaska receives 50 percent of lease sale revenues, royalties, and other revenues from oil production in the NPR-A. Royalties from GMT1 are estimated at over $1.04 billion over the entire production period.

The State of Alaska and the NSB would receive property tax payments based on the assessed value of taxable oil infrastructure facilities estimated at approximately $275 million. Estimates the proposed project would generate approximately $279 million in total state corporate income taxes through 2050. BLM estimates that the proposed GMT1 project would generate approximately $455 million in total severance taxes net of credits through 2050, based on the State's current fiscal terms for petroleum activity (the More Alaska Production Act).

Economic and sociocultural effects of past and present oil and gas activities have been both positive and negative. Completion of the Nuiqsut Spur Road would allow residents of Nuiqsut to travel via road to employment opportunities at Alpine or GMT1 and provide residents with improved access to subsistence resources. Further development within the Alpine Field, GMT1, and GMT2 may increase revenues for Kuukpik as a result of land use agreements and would benefit ASRC through oil and gas royalties. Production of oil at the GMT2 may in the transfer of federal land and management of federal oil and gas leases in existing valid selections to Kuukpik and ASRC, respectively.

The proposed action would have positive effects on the village, borough, and state economies and employment opportunities.

6.1.46 §320.4(a)(3)(r) Mitigation.
See above section 5.9.

6.1.46.1 Avoidance and minimization.
See above section 5.9.

6.1.46.2 Compensatory mitigation.
See section 5.9 above.

6.1.48 Special Permit Conditions and Rationales.

The following special conditions will be included in the Department of the Army (DA) permit, if issued, to ensure the project is not contrary to the public interest [33 CFR 320.4(r)], and to ensure the project complies with the 404 (b)(1) Guidelines [40 CFR 230.10(d)], or at the permittee's request.

Pre-construction Meeting.

1. The permittee shall convene a pre-construction meeting, with their contractor representatives present, a minimum of 15-days prior to the discharge of fill material into waters of the US authorized under this DA permit. The permittee shall invite the USACE, and appropriate federal, state, and borough resource or regulatory agencies within 10-days of the meeting date. The permittee shall provide copies of this DA permit and all attachments to all contractor representatives who shall make the permit copies available in the field during construction activities.

Rationale: To ensure clarification of all permit requirements with the permittee and their contractors. 33 CFR 325

Compensatory Mitigation.

2. a. To compensate for the unavoidable losses of waters of the US authorized under this DA permit, the permittee shall provide compensatory mitigation in accordance with their January 14, 2015, Mitigation Plan (Mitigation Plan). Any deviation from the existing Fish Creek Delta mitigation site shall be submitted to USACE for evaluation and approval.

Rationale. Compensatory mitigation is required of DA permittees by federal regulation for unaviodable losses of waters of the US. 40 CFR 230, 33 CFr 325, and 33 CFR 332

b. The property must be used solely for the protection of its aquatic resources by the prohibitions set forth in the Mitigation Plan, section 3, Site Protection Instrument, site protective measures 1-9, with a legally sufficient Conservation Easement (CE). The CE must be approved by the USACE prior to recording, and recorded at the local recording district, prior to commencing the discharges of fill material authorized under this DA permit. A copy of the recorded CE shall be provided to the USACE within 30-days of recordation.

Rationale. Compensatory mitigation is required of DA permittees by federal regulation for unaviodable losses of waters of the US. 40 CFR 230, 33 CFr 325, and 33 CFR 332

c. Should this DA permit be transferred, a copy of the recorded CE shall be provided to the transferee. Proof of the permit transfer and CE delivery to the transferee shall be provided to the USACE at time of transfer.

Rationale. Proof of completion of the DA permit compensatory mitigation requirement is necessary for permit compliance. 40 CFR 230, 33 CFR 325, and 33 CFR 332

Fill Discharges.

3. a. All fill material authorized under this permit must consist of suitable material free from toxic pollutants in toxic amounts. Only clean earthen mineral material composed of coarse sands and gravels shall be used for fill.

Rationale. Discharges of pollutants, other than the clean mineral fill material, is not authorized and would cause additional adverse impacts to the aquatic environment. 40 CFR 230 and 33 CFR 325

b. All authorized fill area boundaries shall surveyed and be clearly delineated (staked, flagged, or posted) prior to the discharge. No fill material, supplies, or construction materials shall be stockpiled on wetlands outside of the authorized fill areas. Transportation vehicles and equipment shall not be operated outside of the authorized fill areas, except as authorized by the State of Alaska and/or North Slope Borough to construct and operate on winter ice pads and/or roads or for tundra travel with specially designed and approved low tundra impact vehicles. Excavation of wetland soils is not authorized.

Rationale. The discharge of fill materials and operation of heavy equipment or other activities causing a discharge of dredged or fill materials in unauthorized fill areas would violate federal law. Excavation or dredging of materials in waters of the US would cause unnecessary additional impact and/or change to the aquatic resource environment. 40 CFR 230, 33 CFR 323, 33 CFR 325

c. Snow and ice clearing operations necessary to discharge fill material within the fill areas authorized under this DA permit must prevent vegetation, soil, or debris from being discharged into waters of the US outside of all authorized fill areas.

Rationale. The discharge of fill materials or other activities causing a discharge of dredged or fill materials in unauthorized fill areas would violate federal law. The deposit of vegetative or other debris would cause unnecessary indirect impacts to waters of the US. 40 CFR 230, 33 CFR 323, 33 CFR 325

d. All authorized discharges, except those to place, adjust, or relocate culverts, shall be completed during frozen winter conditions during the State of Alaska and/or North Slope Borough approved winter tundra construction/travel season. Discharges necessary to install additional culverts, correct culvert positions, and adjust culvert settings may occur outside of the approved winter trundra construction/travel season.

Rationale. The discharge of fill materials and related construction activites during the winter season and on ice roads and pads greatly reduces the adverse impacts to the aquatic resources, fish and wildlife resources, and general environment. 40 CFR 230 and 33 CFR 325

e. All fill slopes shall be immediately stabilized to prevent erosional impacts to the aquatic envionment. Active sloughing of fill material, increased water turbidity, accumulation of sediment in waters and wetlands, and erosion on slopes or around culverts shall be indicators fill slope stabilization is not adequate.

Rationale. Erosion of fill materials into waters of the US is not an authorized discharge and causes additional pollution to the aquatic environment. 40 CFR 230 and 33 CFR 325

f. If placement of the access road fill material is not completed within any winter season, sufficient openings shall be provided in the roadbed to maintain river and creek flows and overland cross-drainage. Road opening widths shall be of sufficient size to prevent scour of the adjacent tundra wetlands.

Rationale. This condition is included to protect water quality and fish and wildlife habitats. 40 CFR 230, 33 CFR 320

g. Road and fill pad surfaces and slopes shall be maintained without discharging fill material off of the embankments into waters of the US.

Rationale. The discharge of fill materials into unauthorized fill areas would violate federal law. The regrading of roads and fill slopes needs to remain within the authorized fill footprint and not cause unnecessary impacts to the aquatic environment. 40 CFR 230, 33 CFR 323, 33 CFR 325

h. As-built surveys of all fill areas and pipeline VSMs shall be completed by a registered professional land surveyor following completion of construction. An as-built survey report shall be provided to the USACE within 120-days of construction completion showing the fill acreages for the access road, drillsite pad, and other smaller gravel fill areas authorized under this DA permit.

Fish and Wildlife.

4. a. To avoid disturbance of nesting birds, the authorized discharges into waters of the US shall not occur during the pre-nesting and nesting season (1 June - 31 July of each year). If fill discharges or ground disturbing activities must be conducted within waters of the US during the 1 June - 31 July time period, the permittee shall notify the USACE and USFWS, Fairbanks Field Office, to evaluate the potential effects of these activities on migratory birds. Fill discharges and ground disturbing activities outside the 1 June - 31 July time period shall not occur until authorized by the USACE.

Rationale. The discharge of fill material into wildlife (bird) habitats would cause unnecessary adverse impacts during the critical annual production period for sustaining populations. This condition is added at the request of the USFWS. CFR 230, 33 CFR 325, Endangered Species Act (ESA).

b. All utility lines (power and communication) to drill pads shall be suspended from the VSMs/HSMs at a minimum elevation of 7 feet above tundra elevation.

Rationale. Attaching above-ground wires to pipeline VSMs reduces the impact caused by installation of high rise power poles with bird collisions with aerial wires and potential electrocutions. Installing the wires at least 7-feet above the tundra ground surface allows large mammals such as caribou to migrate underneath without diverting around pipelines or causing injuries. This condition is added at the request of the USFWS. 40 CFR 230 and 33 CFR 325.

c. The permittee shall comply with their Lighting Plan for Greater Moose's Tooth Unit Facility Development, dated January 6, 2015. All lighting on structures shall be shielded (downcast) to lessen the potential for migratory bird collisions during periods of inclement weather. Permanent communications towers shall be located on facility pads, be less than 200 feet above ground level, and be constructed without support wires. Strobe lighting shall be used during the day and beacons shall be used at night. Temporary towers requiring support wires shall have bird diverters on the wires to minimize collisions.

Rationale. Shielding lighting fixtures placed on structures above-ground to prevent upward light projection prevents attraction of birds in flight and subsequent danger of collision during low light periods. This condition is added at the request of the USFWS. 40 CFR 230 and 33 CFR 325, and ESA.

d. The permittee shall update and comply with their Wildlife Avoidance and Interaction Plan (Wildlife Plan), dated April 2012, to include the GMT1 project. The Wildlife Plan shall include a predator management plan and demonstrate how the permittee will deter ravens, gulls, foxes, and bears from the GMT1 project areas. The permittee shall design and construct all structures

associated with the authorized development in a manner which discourages nesting of avian predators and fox denning. The permittee shall remove all bird nests from all structures annually prior to egg-laying to discourage avian predator nesting. The final Wildlife Plan shall be provided to the USACE and USFWS, Fairbanks Field Office, and approved by the USACE prior to commencing the discharges authorized under this DA permit.

Rationale. Managing against unwanted predators by not creating conditions for their success can protect important prey species such as migratory birds. A predatory management plan would outline structure designs and/or activities to not encourage predator use of the facilities and could also ensure safer conditions for workers. 40 CFR 230, 33 CFR 325, and ESA.

Threatened and Endangered Species.

Spectacled eider disturbance
5.a. Ground-level activities (by vehicles or on-foot) within 200 meters of occupied spectacled eider nests, from June 1 through August 15, shall be restricted to authorized fill areas. The construction of permanent facilities, placement of fill materials, alteration of habitat, and introduction of high noise levels within 200 meters of occupied spectacled eider nests shall not occur during the June 1 through August 15 time period.

In instances where summer (June 1 through August 15) support, maintenance, and construction activities must occur off authorized fill areas, USFWS approved nest surveys must be conducted during mid-June (same year of the activity) prior to the approval of the activity. Collected data will be used to evaluate whether the action could occur based on employment of a 200-meter buffer around nests or if the activity must be delayed until after August 15 once ducklings are mobile and have left the nest site. The permittee shall work with and notify the USFWS when scheduling oil spill response training in spectacled eider habitat to take place outside of nest/brood-rearing periods or conduct nest surveys. The protocol and timing of nest surveys for spectacled eiders shall be determined in cooperation with and approved by the USFWS. The surveys will be supervised by biologists who have previous experience with spectacled eider nest surveys.

Rationale. Protection of listed bird species is critical for their annual production during nesting and rearing periods to sustain or increase population levels. USACE must comply with the USFWS Terms and Conditions of the Final Biological Opinion, in accordance with our jurisdictional authorities as the action agency under the ESA. This condition is added at the request of the USFWS and based on the BLM's Best Management Plan (BMP) E-18.

Predation.
b. *Waste Management Plan.* The permittee shall prepare and implement a comprehensive waste management plan (Waste Plan) for all activities occurring within the authorized project areas. The Waste Plan shall be provided to the USACE for approval, in consultation with the USFWS, BLM, Alaska Department of Natural Resources (ADNR), the North Slope Borough (NSB), and other regulatory agencies, as appropriate (based on agency legal authority and jurisdictional responsibility), as part of a plan of operations or other similar permit application. Waste management decisions affecting waste generations shall be addressed in the following priority: (1) prevention and reduction, (2) recycling, (3) treatment, and (4) disposal. The Plan shall consider and take into account the following requirements:

1) Methods to avoid attracting wildlife to food and garbage. The Plan shall identify precautions and methods to avoid attracting wildlife to food and garbage.
2) Disposal of putrescible waste. There shall be no burial of garbage. The permittee shall have a written procedure to ensure the handling and disposal of putrescible waste shall be accomplished in a manner that prevents the attraction of wildlife. All putrescible waste shall be incinerated, backhauled, or composted in a manner approved by the landowners, and/or agency of jurisdictional authority. All solid waste, including incinerator ash, shall be disposed of in an approved waste-disposal facility in accordance with appropriate Environmental Protection Agency

(EPA) and/or Alaska Department of Environmental Conservation (ADEC) regulations and procedures. The Waste Plan shall prohibit the burial of human waste execept as authorized by the landowner and/or agency of jurisdictional authority.

Rationale. Protection of wildlife species from human food sources or contamination is critical sustaining populations. USACE must comply with the USFWS Terms and Conditions of the Final Biological Opinion, in accordance with our jurisdictional capabilities, as the action agency under the ESA. This condition is added at the request of the USFWS and based BLM's BMPs A-2a and A-2b.

c. P*redation.*
The permittee shall utilize best available technology to prevent facilities from providing nesting, denning, or shelter sites for ravens, raptors, and foxes. The permittee shall provide the USACE with an annual report on the use of oil and gas facilities by ravens, raptors, and foxes as nesting, denning, and shelter site. Additionally, feeding of wildlife is prohibited and will be subject to non-compliance regulations.

Rationale. USACE must comply with the USFWS Terms and Conditions of the Amended Final Biological Opinion, in accordance with our jurisdictional capabilities, as the action agency under the ESA. This condition is added at the request of the USFWS. and based BLM's BMPs A-2a and A-2b.

Collisions.
d. *Lighting.* Illumination of all structures between August 1 and October 31 of each year shall be designed to direct artificial exterior lighting inward and downward, rather than upward and outward, unless otherwise required by the Federal Aviation Administration.

Rationale. Shielding lighting fixtures placed on structures above-ground to prevent upward light projection prevents attraction of birds in flight and subsequent danger of collision during low light periods. This condition is added at the request of the USFWS and based on BLM's BMP E-10.

e. *Utility lines.* To reduce the possibility of spectacled eiders from colliding with above-ground utility lines (power and communication), such lines shall either be buried in the authorized fill areas or suspended on the pipeline vertical/horizontal support members (VSM/HSMs) except in rare cases which are to be few in number and limited in extent. Exceptions are limited to the following situations and must be reported to the USFWS when exceptions occur.

1) Overhead power or communication lines may be allowed when located entirely within the boundaries of a facility gravel pad;
2) Overhead power or communication lines may be allowed when engineering constraints at the specific and limited location make it infeasible to bury or connect the lines to a VSM/HSM.;
3) Overhead power or communication lines may be allowed in situations when human safety would be compromised by other methods.

Rationale. Attaching above-ground wires to pipeline VSMs reduces the impact caused by installation of high rise power poles with bird-wire collisions and electrocution. Installing the wires at least 7-feet above the tundra ground surface allow large mammals such as caribou to migrate underneath without diverting around pipelines or causing injuries. This condition is added at the request of the USFWS and would minimize the likelihood bird collisions would occur from infrastructure. This condition is added at the request of the USFWS and based on BLM's BMP E-11c

f. *Towers.* To reduce the likelihood of spectacled eiders colliding with communication towers, they shall be located, to the extent practicable, on authorized gravel pads as close as possible to buildings or other structures, and on the east or west side of buildings or other structures.

Support wires associated with communication towers, radio antennas, and other similar facilities, shall be avoided to the extent practicable. If support wires are necessary, they shall be clearly marked along their entire length to improve visibility to low-flying birds. Such markings shall be developed through consultation with the USFWS.

Rationale. Avoiding the use of support wires on towers or other tall structures minimizes impacts for birds in flight and helps reduce the likelihood of spectacled eiders colliding with towers. *This condition is added at the request of the USFWS and based on BLM's BMP E-11d.*

g. *Monitoring.* Record all positive sightings of spectacled eiders for the number, location, general habitat type, and gender (if practicable without disturbance) within the authorized project areas. Provide a summary report to the USFWS and USACE by December 1 of each year for the life of the project (use of the access road) or until the eiders become delisted.

Rationale. These efforts will help enhance the likelihood future oil and gas development within NPR-A and the Colville River delta will not jeopardize listed eiders or lead to listing additional species. This condition is added at the request of the USFWS under the ESA requirement to aid in the recovery of listed species.

Hydrology.

6. a. Existing (natural) drainage patterns shall be maintained throughout all construction and operation periods by the installation of culverts and bridges in all authorized fill areas in sufficient number and size to prevent ponding, dewatering, water diversion between watersheds, or concentrating runoff flows. Important field surveying, planning, and design work must ensure the placement of culverts and construction of bridges within the Ublutouch River; Barely, Crea, and Blackfish Creeks, and other unnamed watersheds along the access road are not effected by hydrologic changes due to project construction.

Rationale. This condition is included to protect important watersheds for water quality, vegetation and soils, and fish and wildlife habitats. 40 CFR 230, 33 CFR 320

b. A hydrologic field survey to accurately identify culvert drainages points and bridge abutment locations shall be completed for the entire GMT1 access road length and drillsite at spring break-up and/or shortly thereafter. The permittee shall submit a report of the field hydrology findings, proposed culvert locations and sizes, and proposed bridge locations and sizes to the USACE for approval prior to discharging fill material authorized under this DA permit.

Rationale. This condition is included to identify critical culvert locations to retain the existing hydrology in a relatively flat area with complex creek, lake, and pond resources supporting fish and wildlife resources. Retaining the hydrologic regime protects water quantity and quality, vegetation, and soils. 40 CFR 230, 33 CFR 320

c. The permittee shall prepare and submit a culvert monitoring report to the USACE, for the 3 summer seasons following fill placement authorized in this DA permit. The reports shall be submitted prior to July 30 of each year. The report shall include photographs of all road and pad areas to demonstrate the hydrologic conditions at spring break-up time and post break-up (summer conditions). The report shall include an evaluation of all areas where additional culverts are necessary to retain existing drainage patterns and where culvert maintenance, repair, upgrade, setting adjustments, or replacement are necessary. The culvert/drainage corrective work shall be completed by freeze-up within the same summer season the drainage problems are identified. Evidence of ponding, drying, erosion, or stream channel changes adjacent to authorized fill areas are indicators of necessary corrective action. Culverts shall be marked to facilitate snow removal operations to prevent excessive deposition of snow into creeks and drainage areas. Culverts shall be maintained to adequately convey surface waters throughout the life of the project (access road use).

Rationale. This condition is included to identify critical culvert locations to retain the existing hydrology in a relatively flat area with complex creek, lake, and pond resources supporting fish and wildlife resources. Retaining the hydrologic regime protects water quantity and quality, vegetation, soils. 40 CFR 230, 33 CFR 320

d. The Crea Creek bridge shall be constructed with a minimum 40-foot span between the sheet-pile abutments and ensure riparian buffers (creek banks and overbank flow areas) are provided on each side. The mid-point of the bridge deck shall be located over the center of the creek channel at the point of crossing. The Crea Creek banks and wetlands adjacent to the abutments shall not be disturbed or excessively thawed during bridge construction (sheetpile installations) to cause riparian areas to subside during construction or during the following summer season. Figures showing the Crea Creek bridge crossing design features shall be submitted to the USACE for approval prior to the discharge of fill material authorized under this DA permit.

Rationale. This condition is included to ensure water flow through the bridge is adequate for all flows at all times without causing erosional changes to the channel, including up and downstream reaches of the bridge; retain the creek substrate, banks, and vegetation; and provide for fish and wildlife habitat and travel corridor on each site of the channel. Retaining the hydrologic regime protects water quantity and quality, vegetation, soils, and fish and wildlife habitats. 40 CFR 230, 33 CFR 320

e. Design of the Barely Creek culverted road crossing shall be coordinated with the BLM, ADFG, and USACE. Final detailed design figures shall be provided to the USACE for approval prior to the discharge of fill material authorized under this DA permit.

Rationale. This condition is included to ensure water flow through the bridge is adequate for all flows at all times without causing erosional changes to the channel, including up and downstream reaches of the bridge; retain the creek substrate, banks, and vegetation; and provide for fish and wildlife habitat and travel corridor on each site of the channel. Retaining the hydrologic regime protects water quantity and quality, vegetation, soils, and fish and wildlife habitats. 40 CFR 230, 33 CFR 320

f. A minimum 6-inch layer of organic and/or fine grained plant growth material seeded with local native plant species shall be provided on each side of the roadbed for a distance of 50-feet along each side of the Ublutouch River, Crea, and Barely Creek crossings. Biodegradeable jute or matting shall be used to prevent erosion on the seeded slopes at installation. A figure showing the design features and a vegetation plan shall be submitted to the USACE for approval prior to the discharge of fill material authorized under this DA permit.

Rationale. This condition is included to ensure water flow through the bridge is adequate for all flows without causing erosional changes to the channel, including up and downstream of the bridge; retain the existing character of the creek substrates and banks; and provide for fish and wildlife habitats and migrations. Retaining the hydrologic regime protects water quantity and quality, vegetation, soils, and fish and wildlife habitats. 40 CFR 230, 33 CFR 320

g. Flow discharge measurements shall be collected throughout the first 3 thaw seasons following construction of the access road at the crossings of the Ublutouch River, Barely Creek, and Crea Creek. Continuous stage and discharge monitoring shall be collected until seasonal flows cease. Flow discharge measurements shall be collected using the US Geological Survey methods appropriate for use on the North Slope. A report shall be provided to the USACE and BLM by December 1 of the year following completion of the access road showing the highest and lowest data for water flows, stages, and velocities. Photographs showing all bridge abutments at the ground surface, creek culvert inlets and outlets, and channel and bank conditions for each crossing on each side of the access road shall be included.

Rationale. This condition is included to ensure water flow through the bridge is adequate for all flows without causing erosional changes to the channel, including up and downstream of the bridge; retain the existing character of the creek substrates and banks; and provide for fish and wildlife habitats and migrations. Retaining the hydrologic regime protects water quality, vegetation, soils, and fish and wildlife habitats. Collecting the hydrologic data will show whether water crossings are adequate to maintain hydrology. 40 CFR 230, 33 CFR 320

Gravel, Dust, and Snow.

7. a. The permittee shall comply with the Alpine Facilities Erosion Control Plan-Greater Mooses Tooth, Revised, dated November 2013.

b. The permittee shall ensure pollution to aquatic resources from road gravel spray and fine airborne fill particle dust discharges are minimized to the maximum extent practicable. Dust abatement practices, during dust prone weather and/or seasonal conditions, must be performed for the life of the project (use of the road). Priority shall be given to dust abatement practices and road maintenance within the Ublutouch, Barely, and Crea watersheds to ensure water pollution does not occur to fish habitat areas. Compliance with this condition shall be determined by visible dust and gravel presence on tudra wetland areas adjacent to the authorized fill areas.

Rationale. This condition is included to protect water quality and fish and wildlife habitats from secondary impacts. 40 CFR 230, 33 CFR 320.

c. Snow removal operations shall not cause a discharge of gravel or debris onto adjacent tundra wetlands. Any materials gravel or debris inadvertently discharged into wetland areas beyond the fill footprint shall be removed before seasonal snow melt is complete.

Rationale. This condition is included to protect vegetation, water quality, and fish and wildlife habitats from secondary impacts. 40 CFR 230, 33 CFR 320.

Cease to Maintain or Abandon.

8. Should the permittee decide to cease to maintain, use, or to abandon the authorized fill and pipeline VSMs authorized under this DA permit, the USACE shall be notified by written communication and in compliance with General Condition 2 of this DA permit. Cease to maintain, use, and abandon are defined as non-use of the facilities, or portions thereof, for a period of 5 consecutive years. To ensure any portions of fills and attendant structures authorized under this permit are not abandoned, a report shall be submitted to the USACE every five years, beginning after the completion of construction of facilities authorized by this permit, which detail the permittee's hydrocarbon production plans and use of the access road and pipelines. If any authorized fill areas or pipeline sections are determined to be unmaintained, used, or abandoned, a fill and/or structure removal and site rehabilitation plan (Rehab Plan) shall be submitted to the USACE within 120 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. The plan shall include an objective of restoring fish and wildlife habitat.

Rationale: This condition is necessary to make a determination following General Condition 2 and 4 on page 1 of this permit and as requested by the USFWS. 33 CFR 325 (Appendix A).

6.1.49 §320 Public Interest Determination.

Based on the public interest review herein, and inclusion of the above special conditions on the DA permit, the beneficial effects of the project outweigh the detrimental effects on the public interest.

7.0 33 CFR Part 320.3 Related Laws.

7.1 §320.3(a) Section 401 of the Clean Water Act (33 USC Section 1341).

Water Quality Certification
All conditions of Alaska Department of Environmental Conservation's Certification are incorporated as part of the DA permit.
Date Issued: June 13, 2014 ☒ Issued ☐ Waived ☐ Denied
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 site and conducted s 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 AC 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 1-800478-9300 after hours. Also, the applicant must contact by telephone the National Response Center at 1-800-424-8802.
3. During the work on the culverts and bridges, construction equipment shall not be operated below the ordinary high water mark if equipment is leaking fuel, oil. Hydraulic fluid, or any other hazardous material. 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 lead is repaired.
4. All work areas, material access routes, and surrounding wetlands involved in the construction project shall be clearly delineated and marked in such a way that equipment operators do not operate outside the marked areas.
5. Natural drainage patterns shall be maintained, to the extent practicable, without introducing ponding or drying.
6. Excavated or fill material, including overburden, shall be placed so than it is stable, meaning after placement the material does not show sighs of excessive erosion. Indicators of excess erosion include: gullying, head cutting, caving, block slippage, material sloughing, etc.
7. Fill material must be clean sand, gravel or rock, free from petroleum products and toxic contaminants in toxic amounts.
8. 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 of 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.
9. 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.
10..Any disturbed ground and exposed silt not covered with fill must be stabilized and re-vegetated 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.

Pursuant to 33 CFR 320.4(d), the certification of compliance with applicable effluent limitations and water quality standards required under the provisions of Section 401 of the Clean Water Act are considered conclusive with respect to water quality considerations unless the Regional Administrator, U.S. Environmental Protection Agency, advises of other water quality aspects to be taken into consideration.

7.2 §320.3(b) Section 307(c) of the Coastal Zone Management Act of 1973, as amended (16 USC 14456(c).

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.

7.3 §320.3(c) Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972, as amended (16 USC 1413).

Not applicable as the proposed action would not cause a transport of dredged material for disposal into marine waters.

7.4 §320.3(d) National Environmental Policy Act of 1969 (42 USC 4321 - 4347).

USACE is adopting and relying upon the FSEIS for preparation of this Record of Decision (ROD). USACE has independently reviewed and evaluated the information presented in the FSEIS. USACE finds FSEIS process has produced sufficient assessments of the resources, needs, concerns, and issues related to the proposed action and alternative actions and is appropriate for the public interest review required by 33 CFR Part 320.4 and Compliance with the Guidelines required at a 40 CFR Part 230.

Signature of this ROD by the authorizing official completes the USACE NEPA requirements and responsibilities.

7.5 §320.3(e) Fish and Wildlife Coordination Act (16 USC 661-666c-760g)

Coordination with the US Fish and Wildlife Service, National Marine Fisheries Service, and State of Alaska Department of Fish and Game, and completion of the process and analyses contained within this ROD and signature by the authorizing official completes the USACE Fish and Wildlife Coordination Act responsibilities.

7.6 §320.3(f) The Federal Power Act of 1920 16 USC 791, as amended.

Not applicable as the proposed action would not construct any physical structures of a hydro-power project.

7.7 §320.3(g) The National Historic Preservation Act of 1966 (16 USC 470 et seq.) National Historic Preservation Act of 1966 [16 U.S.C. 470 et seq.]
Completion of consultation with the Alaska Department of Natural Resources, Office of History and Archaeology, State Historic Preservation Officer, completes USACE's National Historic Preservation Act requirements.

7.8 §320.3(h) The Interstate Land Sales Full Disclosure Act (15 USC 1701).

Not applicable as the proposed action would not involve any selling or leasing of any lot in a subdivision.

7.9 §320.3(i) The Endangered Species Act of 1973 (16 USC 1531).
References: FSEIS
See above section 5.4.1, §230.30, Threatened and endangered species.

Actions to minimize impacts to spectacled eiders and polar bears caused by fill area construction and use are identified in the Biological Opinion for Effects of Greater Moose's Tooth 1 Oil and

Gas Development in the National Petroleum Reserve-Alaska on the Polar Bear, Spectacled Eider, and the Alaska-breeding Steller's Eider, dated December 2, 2014 (BO). An Amendment to the BO was completed on January 13, 2015 which included Reasonable and Prudent Measures, Terms and Conditions, and Conservation Recommendations. USACE has accepted the findings of the BO and included the terms and conditions in our evaluation and permit conditions to protect listed species. With inclusion of these measures, the proposed project complies with this factor of the 404(b)(1) Guidelines.

Formal consultation under Endangered Species Act (ESA) with the USFWS has been completed. There were no listed species under the jurisdiction of the National Marine Fisheries Service (NMFS) in the project area. Section 7 consultation procedures were conducted concurrently with the BLM with the USACE as joint federal action agencies.

7.10 §320.3(j) The Deepwater Port Act of 1974 (33 USC 1501).

Not applicable. The proposed action would not involve a deepwater port beyond the territorial seas.

7.11 §320.3(k) Marine Mammal Protection Act of 1972 (16 USC 1361).

Actions to minimize impacts to polar bears caused by fill area construction and use are identified in the Biological Opinion for Effects of Greater Moose's Tooth 1 Oil and Gas Development in the National Petroleum Reserve-Alaska on the Polar Bear, Spectacled Eider, and the Alaska-breeding Steller's Eider, dated December 2, 2014 (BO). An Amendment to the BO was completed on January 13, 2015 which included Reasonable and Prudent Measures, Terms and Conditions, and Conservation Recommendations. USACE has accepted the findings of the BO and included the terms and conditions in our evaluation and permit conditions to protect listed species.

The proposed action would not involve any construction or work in marine waters. However, the applicant is required to obtain a letter of authorization for the incidental take of Polar bears from the USFWS, Office of Marine Mammals. Under the ESA, the USFWS, Endangered Species Branch Office evaluated potential impacts to the Polar bear and found the proposed action may affect the species. This consultation also satisfies the requirements of the Marine Mammal Protection Act of 1972.

With inclusion of these terms and conditions, the proposed project complies with this factor of the 404(b)(1) Guidelines.

7.12 §320.3(l) Section 7(a) of the Wild and Scenic Rivers Act (16 USC 1278 et seq).

Not applicable as the proposed action would not involve any designated wild and scenic rivers.

7.13 §320.3(m) The Ocean Thermal Energy Conversion Act of 1980 (42 USC section 9101).

Not applicable as the proposed action would not involve an ocean thermal conversion facility.

7.14 §320.3(n) The National Fishing Enhancement Act of 1984 (Pub. L. 98-623)

Not applicable as the proposed action would not involve establishing of artificial reefs.

7.15 Clean Water Act (CWA) (33 USC 1251 et seq. Guidelines 40 CFR 230).
See the above sections 230. Subparts A-J.

Completion of the process and analysis contained within this ROD and signature by the authorizing official completes the USACE CWA Section 404(b)(1) Guideline requirements.

7.16 Clean Water Act (33 USC 1251 et seq.) Section 404 (33 USC 1344).

Completion of the process and analysis contained within this document and signature by the authorizing official completes the USACE CWA 404 requirements.

7.17 Rivers and Harbors Act of 1899 (33 USC 401).

There are 2 channels of the Colville River, a navigable water of the US, within the proposed project area. The proposed action involves an insignificant and de minimis action already authorized by previously issued DA permits. The project does not require further authorization under Section 10 of the Rivers and Harbors Act.

Completion of the process and analysis contained within this document and signature by the authorizing official completes USACE's RHA requirements.

7.18 Clean Air Act (42 U.S.C. 7401 - 7671 Section 176(c)).

The proposed project has been analyzed for conformity applicability pursuant to regulations implementing Section 176(c) of the Clean Air Act. Emissions from the implementation of the Selected Alternative are not expected to exceed State of Alaska ambient air quality Standards (18 AAC 50). The Alaska Department of Environmental Conservation (ADEC) has issued air permits that serve as a framework for the operation of the mine site. The Corps of Engineers finds the issuance of permits by ADEC conclusive with regards to air quality issues. Completion of the process and analysis contained within this ROD and signature by the authorizing official completes the Corps Clean Air Act requirements.

8.0 Executive Orders

8.1 Executive Order 13175 Consultation and Coordination with Indian Tribal Governments.

The BLM notified all regional area Federally Recognized Tribes and Alaska Native Settlement Act Native Corporations of the opportunity to consult in a letter. The USACE sent our public notice to all Alaska Federally Recognized Tribes on September 15, 2014. The USACE met with the Native Village of Nuiqsut officers and Council on July 9, 2014. One or two Tribal members also accompanied USACE during our site assessment to the proposed project and alternative sites on July 8, 2014. The USACE received one comment during the public notice period. No formal requests for consultation occurred. The USACE conducted tribal consultation by telephone, e-mail messages, and periodically with the BLM during their consultations and during weekly NEPA Cooperating Agency Meetings. The NVN was a cooperating agency.

Consultation with Federally recognized Tribes and completion of the process and analysis contained within this document and signature by the authorizing official completes USACE's Executive Order 13175 requirements.

8.2 Executive Order 12898 Environmental Justice.

Executive Order 12898 requires federal agencies identify and address "as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." The community of Nuiqsut has an American Indian/Alaska Native membership of 87.1 percent, well above the 50 percent threshold for minority population size specified in the EPA environmental justice guidelines.

The BLM and USACE consulted with the Native Village of Nuiqsut (NVN) and with their Alaska Native Claims Settlement Act Native Corporation, Kuukpik Corporation on government to

government and environmental justice issues and sought comments on the DSEIS and FSEIS from Nuiqsut and other North Slope Borough communities.

Direct and indirect impacts of the proposed project to the environmental justice population include the potential for impacts to subsistence activities and changes in employment or income. The primary impact of the proposed project would be the loss or avoidance of subsistence use areas and the possible displacement of harvest species. However, subsistence use data demonstrate rates of subsistence for the Nuiqsut community have remained relatively constant throughout the historical development of the Alpine Field and associated facilities. The potential loss and avoidance would be offset by the ability to use the proposed access road for access to subsistence resources. The community of Nuiqsut is expected to experience positive effects including reduced community isolation, increased employment opportunities, and increased income and economic benefits. Health impacts are anticipated to be low.

In the FSEIS the impacts to the minority community are expected to be long term and of high intensity; and that improved permanent access to subsistence use areas is expected to have a long-term, moderate beneficial effect for residents while substantially diminishing the traditional and subsistence value of the area due to loss of land, disturbance to and possible deflection of resources attributable to the stature of the road, road traffic, the presence of the pipeline, and increased local hunting pressure.

Residents may experience positive effects from the proposed project through increased income from Native corporation dividends and increased tax income for the NSB government resulting in increased community services. Economic and socio-cultural effects of past and present oil and gas activities have been both positive and negative. The FSEIS found the cumulative environmental justice impact is anticipated to be significant, but that the impact could be reduced through mitigation.

In accordance with Title III of the Civil Right Act of 1964 and Executive Order 12898, it has been determined that the project would not directly or through contractual or other arrangements, use criteria, methods, or practices that discriminate on the basis of race, color, or national origin nor would it have a disproportionate effect on minority or low-income communities.

Completion of the process and analysis contained within this ROD and signature by the authorizing official completes the Corps EO 12898 requirements.

8.3 Executive Order 11988 Flood Plain Management.

Executive Order 11988 requires federal agencies to avoid, to the extent possible, the long and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. In accomplishing this objective, "each agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by flood plains in carrying out its responsibilities."

The project area is not located within a mapped floodplain and would not impact an area of occupancy. The access road would cross a river and creek where bridges would be constructed. A culvert battery would be placed at another creek crossing. All flowing water channels would be adequate designed to manage expected high flows. The proposed access road would be protected from causing floodwater ponding by installation of many cross-drainage culverts throughout its length. There would be no associated impact of floods on human safety, health, or welfare.

The proposed action would not have an adverse effect floodplains and not create flood hazards in floodplains. All flowing waters, including seasonal creeks, will either be bridged or culverted with

very adequate design to pass all expected high flows and not impound waters or inundated any structures or developments. Completion of the process and analysis contained within this ROD and signature by the authorizing official completes USACE's Executive Order 11988 requirements.

8.4 Executive Order 13212 Expedite Energy-Related Projects, Energy Supply and Availability and Executive Order 13302 Amending Executive Order 13212, Actions to Expedite Energy-Related Projects.

☐ The project was not one that will increase the production, transmission, or conservation of energy, or strengthen pipeline safety.
☒ The review was expedited and/or other actions were taken to the extent permitted by law and regulation to accelerate completion of this energy-related (including pipeline safety) project while maintaining safety, public health, and environmental protections.

This proposed action was expedited even with an evaluation with an environmental impact assessment by the BLM as the Lead Federal Agency under NEPA as the land manager. Several agencies including federal, state, local, and tribal organizations participated as cooperating agencies (CA) over a period of approximately 2 years. The NEPA process was very extensive and included many public meetings, consultations, weekly CA meetings, a DSEIS and FSEIS. It was a major review and effort on all parts with substantial written documentation. This proposed action is the first construction project for permanent oil and gas production within the NPR-A, a very large area of natural undeveloped lands in the arctic region of Alaska.

8.5 Protecting America's Wetlands: A Fair, Flexible, and Effective Approach, White House Office on Environmental Policy, August 24, 1993 and Reaffirmation of the Presential Wetland Policy ,1995.

The decision below supports the Presidents Wetland Policy in regard to a fair, flexible and effective approach in permitting construction projects in wetlands.

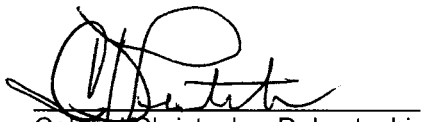
8.6 §320.4(j)(2) Other Federal, state, or local requirements.

Significant Issues of Overriding National Importance
Explain. No other required construction permit of rights of access have been denied for the proposed action.
☒ NA
☐ National Security
☐ National Energy Needs
☐ Navigation
☐ National Economic Development
☐ Water Quality
☐ Preservation of Special Aquatic Areas with Significant Interstate Importance
☐ Other

9.0 Department of the Army Permit Decision

I find that the issuance of the DA permit, as described by regulations published in 33 CFR Part 320 through 332, 40 CFR Part 230 is not contrary to the public interest with inclusion of the special conditions described in this ROD.

Approving Official:



Colonel Christopher D. Lestochi
District Commander

1/16/15
Date