DONLIN GOLD PROJECT

Joint Record of Decision and Permit Evaluation

U.S. Army Corps of Engineers

Bureau of Land Management

Crooked Creek, AK

August 13, 2018

Joint Record of Decision and Permit Evaluation for the Donlin Gold Project

LEAD FEDERAL AGENCY:	U.S. Army Corps of Engineers
COOPERATING FEDERAL AGENCY:	Bureau of Land Management
APPLICANT:	Donlin Gold LLC
APPLICATION REFERENCE NUMBERS:	POA-1995-120 BLM Case file (2890) AA 92403
WATERWAY:	Crooked Creek
RESPONSIBLE OFFICIALS:	Colonel Michael Brooks District Commander PO Box 6898 JBER, AK 99506-0898 Joseph Balash Assistant Secretary – Land and Minerals Management Department of Interior 1849 C St NW Washington, DC 20240
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ACRONYMS AND ABBREVIATIONS

AAC	Alaska Administrative Code
ABA	acid-base accounting
ACHP	Advisory Council on Historic Preservation
ADEC	Alaska Department of Environmental Conservation
ADF&G	Alaska Department of Fish and Game
ADNR	Alaska Department of Natural Resources
ADNR-Water	Alaska Department of Natural Resources Division of Water
ANCSA	Alaska Native Claims Settlement Act
ANILCA	Alaska National Interest Lands Conservation Act
APDES	Alaska Pollutant Discharge Elimination System
APE	Area of Potential Effects
ARD	acid rock drainage
ARMP	Aquatic Resources Monitoring Plan
AWQS	Alaska Water Quality Standards
BLM	Bureau of Land Management
BMPs	Best Management Practices
BTC	Birch Tree Crossing
Calista	Calista Corporation
CAR	Comment Analysis Report
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CGP	Construction General Permit
CIRI	Cook Inlet Region, Incorporated
CMP	compensatory mitigation plan
COA	core operating area
Corps	U.S. Army Corps of Engineers
CR	conservation recommendation
CWA	Clean Water Act
CWD	contact water dam
CZMA	Coastal Zone Management Act
DA	Department of the Army

DATROC	Donlin Advisory Technical Review and Oversight Committee
DOI	Department of the Interior
Donlin Gold	Donlin Gold LLC
Draft EIS	Draft Environmental Impact Statement
DST	dry stack tailings
EIS	Environmental Impact Statement
EFH	Essential Fish Habitat
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
Final EIS	Final Environmental Impact Statement
FLPMA	Federal Land Policy and Management Act
FMEA	Failure Modes and Effects Analysis
FOS	Factors of Safety
FRA	focused risk assessment
FWD	freshwater dam
FWDD	freshwater diversion dam
GHG	greenhouse gas
GLT	Great Land Trust
gpm	gallons per minute
HGM	hydrogeomorphic
HHRA	human health risk assessment
ISPMP	Invasive Species Prevention and Management Plan
JROD	Joint Record of Decision
HDD	horizontal directional drilling
HUC	Hydrologic Unit Code
INHT	Iditarod National Historic Trail
LEDPA	least environmentally damaging practicable alternative
LLDPE	linear low-density polyethylene
LNG	liquefied natural gas
LOM	life of mine
M	magnitude
mi2	square miles
MCE	maximum credible earthquake

MLA	Minerals Leasing Act
MMO	marine mammal monitor
MMT	million metric tons
MP	milepost
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MW	megawatts
MWMP	meteoric water mobility procedure
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NNIS	nonnative invasive species
NRHP	National Register of Historic Places
O&M	Operations and Maintenance
pga	peak ground acceleration
PHMSA	Pipeline and Hazardous Materials Safety Administration
PN	Public Notice
PRM	Permittee-Responsible Mitigation
Project	Donlin Gold Project
PSO	Protected Species Observer
RHA	Rivers and Harbors Act
ROW	right-of-way
RPM	revolutions per minute
SHPO	State Historic Preservation Office
SOC	Statement of Concern
SPN	Special Public Notice
SRS	seepage recovery system
SWPPP	Stormwater Pollution Prevention Plan
TKC	The Kuskokwim Corporation
tpy	tons per year
TSF	tailings storage facility
U.S.	United States
USC	United States Code
USFWS	U. S. Fish and Wildlife Service

WOUS	waters of the United States
WQS	water quality standards
WRF	waste rock facility
Y-K	Yukon-Kuskokwim

1 INTRODUCTION

This document constitutes the Joint Record of Decision (JROD) of the United States (U.S.) Department of the Army (DA) Corps of Engineers (Corps), and the Department of Interior, Bureau of Land Management (BLM), for the Donlin Gold Project (Project) proposed by Donlin Gold LLC (Donlin Gold, Applicant, or Permittee). The One Federal Decision policy mandated by Executive Order 13807 does not expressly apply to the Project, but the Corps and BLM are voluntarily issuing a JROD in the spirit of the Executive Order. This JROD outlines the Corps' and BLM's decision, under the National Environmental Policy Act (NEPA), to select Alternative 2 for the Donlin Gold Project, with incorporation of the North Route Pipeline option (herein referred to as the 'Alternative 2 North Option'); as detailed in the April 2018 Final Environmental Impact Statement [Final EIS] and subject to special conditions and the specified mitigation described below. The Corps authorities are specific to components of the Project proposed to be constructed within waters of the U.S. (WOUS). BLM's authorities are limited to the components of the Project that occur on BLM-managed federal lands.

The findings in the Final EIS are based on an open, collaborative, and robust process among the scientists, resource specialists, and regulatory staff of the Corps, BLM, all other cooperating agencies, the NEPA contractor, and the participating public. This process resulted in a Final EIS that—consistent with NEPA and Executive Order 13807—provides an adequately detailed analysis of the environmental impacts of the Applicant's proposal, and a reasonable range of alternatives, including the No Action alternative, to inform and support all federal reviews and authorizations of the Corps, BLM, and the other federal cooperating agencies, for the proposed Donlin Gold Project.

The U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), participated as a cooperating agency during development of the Environmental Impact Statement (EIS); and on June 5, 2018, issued a Special Permit to allow Strain-Based Design of the Pipeline. PHMSA issued its own decision document and is not participating in this JROD.

This JROD is prepared in accordance with NEPA; U.S. Environmental Protection Agency's (EPA) Section 404(b)(1) Guidelines (40 Code of Federal Regulations [CFR] 230); and the public interest review (33 CFR 320.4), under the authority delegated to the District Commander by 33 CFR 325.8, pursuant to Section 404 of the Clean Water Act (CWA); and Section 10 of the Rivers and Harbors Act (RHA) of 1899.

This JROD is also prepared in accordance with the BLM's authority under Section 28 of the Mineral Leasing Act, 30 United States Code [USC] 185, Section 302 and Section 304 of the Federal Land Policy and Management Act (FLPMA) (43 USC 1732 and 43 USC 1734), Sections 810 and 906 of the Alaska National Interest Lands Conservation Act (ANILCA), Section 106 of the National Historic Preservation Act (NHPA), and the National Trails Systems Act of 1968 (16 USC 1241-1251).

1.1 BACKGROUND

In July 2012, the Corps – Alaska District, received a DA permit application from Donlin Gold requesting authorization for the placement of fill material into WOUS, including wetlands, in connection with the development of an open-pit, hard-rock gold mine in western Alaska.

The Corps, as the lead federal agency under NEPA, determined that preparation of an EIS was necessary to inform the permit decision on the Project. A Notice of Intent to prepare the Donlin Gold Project EIS was published in the Federal Register on December 14, 2012. Four agencies, the State of Alaska, and six Alaska Native tribal councils with federally recognized tribal government status participated as cooperating agencies during development of the EIS. Those with cooperating agency status included the BLM, PHMSA, EPA, U.S. Fish and Wildlife Service (USFWS), State of Alaska, Village of Crooked Creek, Native Village of Chuathbaluk, Knik Tribal Council, Native Village of Napaimute, Native Village of Aniak, and Native Village of Akiak.

The scoping period extended from December 14, 2012 to March 29, 2013. Following scoping, the Corps and cooperating agencies began developing a Draft Environmental Impact Statement (Draft EIS). Donlin Gold submitted revised DA permit applications in December 2014 and August 2015. In November 2015, the Corps released the Draft EIS and published a Public Notice (PN) advertising the Draft's availability for public comment. The comment period for the Draft EIS ran initially from November 25, 2015 to April 30, 2016, and was extended until May 31, 2016.

In December 2017, Donlin Gold submitted an updated DA permit application that superseded all previous applications—with revisions and refinements to the Project design and footprint—resulting, in part, from the comments received during the Draft EIS review period. No changes to the Project were made that resulted in significant new circumstances or information related to environmental concerns, and after evaluation of the changes, the Corps determined a Supplemental Draft EIS was not warranted.

A Notice of Availability for the Final EIS was published in the Federal Register on April 27, 2018. A Special Public Notice (SPN) for the Final EIS and the Applicant's updated compensatory mitigation plan (CMP) (included as Appendices J and M in the Final EIS) was also published on April 27, 2018 (SPN-1995-120). The public review period for the Final EIS and the updated CMP ran from April 27, 2018 through May 29, 2018.

1.2 AUTHORITIES

The Corps, in coordination with cooperating agencies, has prepared a single EIS that includes an adequate level of detail and a reasonable range of alternatives sufficient to inform decisions by all agencies with review or authorization decision authorities.

The BLM hereby adopts the Final EIS for the Donlin Gold Project (available at http://www.donlingoldeis.com/).

Additional supporting documents pertinent to this JROD are included as Attachment A.

1.2.1 CORPS' AUTHORITY

The Applicant proposes to discharge fill material into WOUS, including wetlands, and to construct structures in and under navigable waters, which require authorization from the Corps (see Tables 1 and 2 below).

This permit action is being undertaken through authority delegated to the District Engineer by 33 CFR 325.8, pursuant to Section 10 of the RHA of 1899 (33 USC 403, and Section 404 of the CWA (33 USC 1344).

- The Corps has authority through Section 404 of the CWA to regulate the discharge of dredged or fill material into WOUS.
- The Corps has authority through Section 10 of the RHA of 1899 to regulate all work or structures in or affecting the course, condition, location, or capacity of navigable waters.

Pursuant to Council on Environmental Quality regulations for implementing NEPA (404 CFR Parts 1500-1508), the Corps has responsibility as the lead federal agency for the EIS. The Corps has reviewed and evaluated the information in the Donlin Gold Final EIS, including all supplemental data subsequently provided, in accordance with 40 CFR 1506.3 and 40 CFR Part 230, and has found them to be sufficient and accurate assessments, and therefore appropriate for the purposes of the public interest review and alternatives analysis required by 33 CFR 320.4(b)(4) and 40 CFR 230.10.

1.2.2 BLM'S AUTHORITY

The BLM is responsible for land use authorizations on certain federal lands. The authority for management of the land and resource development options presented in the EIS comes from several statutes, including NEPA, the FLPMA, the Minerals Leasing Act (MLA), Title VIII of the ANILCA, the Materials Act, the Independent Offices Appropriation Act of 1952 (31 USC 9701), the National Trails System Act, and the Alaska Native Claims Settlement Act (ANSCA). The BLM authorities to implement the actions identified in this record of decision are found under the following regulatory frameworks:

- NEPA – The Council on Environmental Quality regulations (40 CFR 1508.15) provide for the BLM to be a cooperating agency because the BLM has "jurisdiction by law" as a land manager in the proposed area of effect. In addition, BLM has "special expertise" regarding environmental issues, specifically in the matter of subsistence issues as they relate to the Donlin Gold proposal.
- Section 302 of the FLPMA (43 USC 1732) provides the general authority for BLM to manage the use, occupancy, and development of federal public lands[1] under the principles of multiple use and sustained yield, in accordance with the land use plans that BLM develops under FLPMA. Under FLPMA, the Secretary of the Interior has broad authority to regulate the use, occupancy, and development of public lands, and to take whatever action is required to prevent unnecessary or undue degradation of public lands, and manage under the principles of multiple use and sustained yield in accordance with the land use plans that BLM develops under the FLPMA. In accordance with the FLPMA, the BLM manages its Alaska lands and their uses to ensure healthy and productive ecosystems.
- Pursuant to 43 CFR 3601.3, BLM's authority to dispose of sand, gravel, and other mineral and vegetative materials that are not subject to mineral leasing or location under the mining laws is the Act of July 31, 1947, as amended (30 USC 601 et seq.), commonly referred to as the Materials Act. This authority applies to sale and free use of these materials.

[1] Public lands means any lands and interest in lands owned by the United States and administered by the Secretary of the Interior through BLM without regard to how the United States acquired ownership, except lands held for the benefit of Indians, Aleuts, and Eskimos.

- Section 304 of FLPMA (43 USC 1734) and the Independent Offices Appropriation Act of 1952 (31 USC 9701) authorize the U.S. Government to collect fees and to require reimbursement of its costs.
- Under Section 28 of the MLA (30 USC 185), and 43 CFR 2881.11, the BLM has the authority to issue grants for oil or gas pipelines or related facilities to cross federal lands under BLM jurisdiction. Donlin Gold would need to obtain a Right-of-Way Grant and Temporary Use Permits from the BLM for crossing public lands managed by the BLM. Donlin Gold has submitted a Standard Form 299, Application for Transportation and Utility Systems and Facilities on Federal Lands. Pursuant to a ROW grant, BLM would attach appropriate requirements for the construction, operation, maintenance, and reclamation of the proposed Pipeline across BLM lands.
- BLM has reviewed the proposed Public Easement Plan (Final EIS Appendix N) pursuant to the ANCSA 17(b) Easement Management Handbook (IM AK 2007-037). BLM has considered the proposed ANCSA 17(b) easement actions, including five terminations, one relocation by donation, and one corrected quadrangle map, to address public safety and access to public land in the vicinity of the mine core operating area (COA).
- Section 810 of the ANILCA contains procedures for federal agencies to evaluate impacts on subsistence uses and needs, and means to reduce or eliminate such impacts (16 USC 3120). Pursuant to ANILCA Section 810 and BLM Instruction Memorandum 2011-008, BLM evaluated impacts to subsistence uses and resources based on the information provided in the Final EIS (Final EIS Appendix N). BLM determined that the 810 Analysis would address the portion of the Project requiring a BLM authorization (i.e., Pipeline ROW), and all aspects of the Project that are dependent on that authorization and the associated Pipeline, to include mine construction and operations, and river and road transportation aspects of the Project, because those components of the Project would not go forward if not for the Pipeline, and the Pipeline would not go forward if not for those other components. This is consistent with NEPA requirements for evaluation of connected actions.
- Section 906 (l) of the ANILCA (48 USC note prec. 21) established interim provisions for federal agencies to grant ROWs on lands selected by, or granted, or conveyed to the State of Alaska under Section 6 of the Alaska Statehood Act (Public Law 85-508, 72 Stat. 340-43). Because there are lands in the proposed ROW corridor that have been selected by the State of Alaska but have not yet been conveyed, BLM responds to ROW applications under the BLM federal regulatory guidance as other BLM-managed lands.
- Pursuant to the requirements of the National Trails Systems Act of 1968 (16 USC 1241-1251), BLM is the federal administrator for the entire 2,500-mile Iditarod National Historic Trail (INHT) System, and is the lead federal agency charged with facilitating the implementation of the interagency Comprehensive Management Plan for the Trail. The Comprehensive Management Plan was developed in cooperation with the State in the 1980s, and implementation has been guided by a Memorandum of Agreement between the State and BLM since 1988. Implementation of the Comprehensive Management Plan is based on landowner cooperation and collaboration. The BLM does not make land management decisions for the Trail for non-BLM lands.

- Regulatory authority for BLM management of nonnative invasive species (NNIS) is derived from:
    - Executive Order 13112, Invasive Species 1999 directs BLM to "…prevent the introduction of invasive species and provide for their control and to minimize economic, ecological and human health impacts that invasive species cause".
    - Federal Land Policy and Management Act of 1976 (FLPMA) directs BLM to take any action necessary to prevent unnecessary and/or undue degradation of public lands and authorizes the BLM to enter into cooperative agreements.
    - Federal Noxious Weed Act of 1974, as amended by Sec. 15, Management of Undesirable Plants on Federal Lands, 1990 (Public Law 93-629) authorizes the BLM to "…cooperate with other Federal and State agencies, and others in carrying out operations or measures to eradicate, suppress, control or prevent or retard the spread of any noxious weed."

2 SUMMARY OF DECISION

2.1 CORPS' DECISION SUMMARY

A DA permit pursuant to Section 10 of the RHA of 1899 (33 USC 403), and pursuant to Section 404 of the CWA (33 USC 1344), is being issued to Donlin Gold for the discharge of fill material into WOUS, including wetlands, and the construction of structures in and under navigable waters. The DA permit authorizes the Applicant's proposed action (Alternative 2 North Option), as described in Section 3.0, Proposed Project, and Section 4.0, Alternatives. The impacts as a result of the discharge of fill into WOUS and the construction of structures in and under navigable waters are described in the JROD and Attachment B. This alternative incorporates all practicable avoidance and minimization measures.

The production of gold from the Project requires construction of mine facilities (e.g., open pit, Waste Rock Facility [WRF], and Tailing Storage Facility [TSF], transportation facilities [e.g., port, airstrip, roads], and a natural gas pipeline). The construction of these facilities will require temporary or permanent terrain modifications, and placement of fill. This permit authorizes Project work involving the discharge of dredge and/or fill material in WOUS, including wetlands, and the placement of structures in or work affecting navigable WOUS.

A detailed description of proposed activities involving the discharge of fill in WOUS is included in Block 18 (Nature of Activity) in the December 2017 DA permit application. Affected waterbodies are listed in Tables 13-2 through 13-7 of the DA permit application. These activities include cut-and-fill for construction of roads, airstrips, port facilities, laydown and work areas, Mine Site facilities, material sites, and installation of culverts and bridges at stream crossings, power poles, and the natural gas pipeline. Principal impacts to WOUS resulting from construction of the Project include the placement of 4,368,300 cubic yards of fill in up to 3,416 acres and 226,190 linear feet of WOUS.

The Kuskokwim and Susitna Rivers are listed by the Corps as traditional navigable waterways. The Project would include a port at Jungjuk Creek, abutting and within the Kuskokwim River waterway; two barge landings at the Kuskokwim River; and a Pipeline crossing of Kuskokwim River (using horizontal directional drilling [HDD] methods). Impacts to navigable waters include up to 3 acres and 2,472 linear feet of WOUS.

This authorization requires compensatory mitigation for the direct impacts to WOUS, including wetlands. This authorization also includes special conditions to avoid and minimize potential adverse impacts; to compensate for unavoidable adverse impacts to the aquatic ecosystem; and to ensure that the Project would not be contrary to the public interest. The Corps' mitigation determination is included in Section 6.2 of this JROD.

All work will be performed in accordance with the attached project plan (Attachment A1), which is composed of the following engineering drawings, dated December 22, 2017:

- Engineering Drawing G001 – General Notes and Sheet Index
- Engineering Drawing G002 – Plan View Overall Project Vicinity Map
- Engineering Drawings MA-200G through MA-214T – Mine Area Drawings
- Engineering Drawings TA-300G through TA-316T – Transportation Area Drawings

- Engineering Drawings PA-100G through PA-177T – Pipeline Area Drawings

The Corps' supporting analysis for this JROD is included as Attachment B.

2.2 BLM'S DECISION SUMMARY

After an independent review of the Final EIS, the BLM has determined that the Final EIS includes an adequate level of detail and a reasonable range of alternatives sufficient to inform the agency's decisions regarding the elements of the Project proposed to occur on or impact BLM-managed lands. In addition, the BLM finds that its comments, concerns, and suggestions have been adequately addressed in the Final EIS and in this JROD.

This JROD approves the development of the Donlin Gold's Alternative 2 North Option on BLM-managed lands; as described in the Final EIS (April 2018), and as detailed in the attached engineering drawings (Attachment A1; see Engineering Drawing G002 for the overall Project vicinity map). The location of the Donlin Gold Natural Gas Pipeline and associated fiber optic cable, temporary access roads, airstrips, ancillary facilities, and material sites are described in the Final EIS Chapter 2, Section 2.3.2.4, and associated Figures and Tables. Approximately 97 miles and 2,329 acres (1,768 acres in ROW corridor, 561 acres for ancillary facilities) of BLM-managed public land would be affected by the natural gas and fiber optic pipeline development.

Actions covered by this Decision include:

- Issuance of a 30-year ROW grant for the construction, operations, maintenance, and termination of a 14-inch buried natural gas pipeline and associated fiber optic cable on BLM-managed lands (Final EIS Sections 2.3 and 3.15).
- Approval of temporary access roads, airstrips, and ancillary facilities necessary for construction of the natural gas pipeline and fiber optic cable on BLM-managed lands (Final EIS Section 2.3).
- Approval of material sales (gravel, rock, and soil) and removal from BLM-managed lands necessary for Pipeline access, construction, operations, and termination (Final EIS Section 2.3).
- Approval of timber sales (merchantable valued) and removal from BLM-managed lands necessary for Pipeline access, construction, operations, and termination (Final EIS Section 3.10).
- Implementation of the Invasive Species Prevention and Management Plan (ISPMP) on BLM-managed lands during Pipeline construction, operations, maintenance, and termination (Final EIS Appendix U).
- Implementation of ANCSA 17(b) easement actions necessary to maintain public access to public lands adjacent to the mine COA to address public safety. This includes five easement terminations (20 miles total), one donation (2 miles) and one corrected easement location map (0.4 mile) (Final EIS Appendix Z).
- Implementation of the approved and executed NHPA Section 106 Programmatic Agreement (Attachment A2).

The BLM has reviewed the Donlin Gold Project proposal, as described in the April 2018 Final EIS, for the natural gas pipeline, associated fiber optic cable, and ancillary facility construction, operation, maintenance, monitoring, and termination where BLM-managed land and resources are involved. The BLM has determined that the Donlin Gold Project proposal is consistent with the MLA direction, and the direction in BLM Policy Manual 2884 – Applying for an MLA Grant or Temporary Use Permit, and is consistent with the BLM Alaska Statewide Land Health Standards. BLM will make a ROW Grant offer to Donlin Gold for the natural gas pipeline and associated fiber optic cable. Upon Donlin Gold's written acceptance of the ROW Grant terms and conditions, and submittal of rental payment, BLM will issue a decision to grant the ROW. Detailed plans for all aspects of the Pipeline activities will be reviewed by the Authorized Officer prior to issuing a Notice to Proceed according to terms, conditions, and stipulations outlined in an ROW Grant issued to Donlin Gold LLC. The ROW Grant will also specify requirements for Bonding and Liability, reporting, public safety and access, protection of environmental and cultural resources, and the sale of material (gravel, rock, etc.) and merchantable timber necessary for all Pipeline activities on BLM-managed land. Donlin Gold will be required to comply with all of the mitigating measures selected from Final EIS Chapter 5, and identified in this JROD (see Attachment C1), and which are further clarified and defined in the ROW Grant stipulations.

In addition to the ROW Corridor, ancillary facilities will affect approximately 561 acres of BLM lands, including one new airstrip, 22 material sites, two large (300-person) civilian camps, as well as temporary access roads and work spaces. These ancillary facilities necessary to support construction will be decommissioned and the land reclaimed to a natural condition on completion of the construction phase. There is an existing airstrip of approximately 140 acres, the Farewell Airstrip, which would be improved for use during Project Construction but would not be maintained, reclaimed or decommissioned after the Construction Phase. The Pipeline and fiber optic cable will involve 69 stream/river crossings on BLM-managed land: 62 will be open-cut trench, and 7 will be HDD.

On completion of the mining activities, the Pipeline, associated fiber optic cable, and related ancillary facilities would no longer be needed, and would be decommissioned. Aboveground facilities would be removed, and the ROW corridor reclaimed to a natural condition.

The BLM has reviewed and approves the proposed Public Easement Plan (Final EIS Appendix Z) pursuant to the ANCSA 17(b) Easement Management Handbook (IM AK 2007-037). BLM has considered the ANCSA 17(b) easement actions—including five terminations, one relocation by donation, and one corrected quadrangle map—to address public safety and access to public land in the vicinity of the mine COA. Five easement terminations inside the mine COA will prevent public easement user conflict or safety concerns with mining operations in the mine COA; one easement donation outside the mine COA will provide public easement connectivity to other established public easements due to the termination of an easement inside the southwestern corner of the mine COA; and one corrected easement quadrangle map will provide for an identified location of an easement that was otherwise not fully described in detail in the easement legal description, where the Mine Access Road and Angyaruaq (Jungjuk) Port will be developed near the junction with Kuskokwim River. The combination of BLM ANCSA 17(b) easements, along with the proposed easement actions by the State of ADNR, The Kuskokwim Corporation (TKC), and Calista Corporation (Calista), as proposed in the Public Easement Plan, provide for continued public access to public lands around the mine COA, while providing a safe operational area for Donlin Gold mine activities, and avoiding conflict

with public easements otherwise going through the mine COA. The Public Easement Plan, pursuant to ANCSA provisions, incorporates the legal requirements of the BLM and State of Alaska, as well as the needs of the Native Corporations involved. The approved ANCSA 17(b) easement actions to be implemented are described in detail in the Final EIS (Appendix Z, Public Easement Plan). The 17(b) easements involved with this project are 25- and 50-foot wide trail corridors. BLM will enter into a Memorandum of Agreement with TKC, Calista, and ADNR to implement the Public Easement Plan (Final EIS Appendix Z). Implementing the Public Easement Plan involves administrative actions as well as on-the-ground Certificate of Inspection and Possession (CIP Process) of the donated easement. Implementing the Public Easement Plan will provide for public safety and continued access to public lands across State and private Native Corporation lands outside of the mine COA.

The BLM has reviewed and approves the ISPMP as described in the Final EIS Appendix U, pursuant to the BLM Alaska Invasive Species Management Policy (IM AK-2010-001). The ISPMP is adaptive by design to accommodate new information, such as new NNIS identification, treatment, monitoring tools, technology, and policy. BLM participated in and supports the landscape-management approach across landowner boundaries for addressing NNIS prevention and management in the natural gas pipeline ROW, and associated activities. The outreach, education, and training for Donlin Gold staff and contractors, the use of Early Detection and Rapid Response, Best Management Practices (BMPs), and Hazard Analysis Critical Control Point protocol in the approved ISPMP are consistent with BLM Alaska requirements for preventing the introduction and spread of NNIS.

This JROD documents the Department of the Interior's (DOI) decision regarding the Donlin Gold Project proposed by Donlin Gold LLC. The decision will allow development of an open-pit, hard-rock gold mine about 10 miles north of the community of Crooked Creek, in southwestern Alaska. This decision adopts Alternative 2 North Option, described in the April 2018 Final EIS for the Donlin Gold Project. The Final EIS analyzed Donlin Gold's proposal to develop the gold mine, as well as transportation infrastructure and the Pipeline. The BLM decisions in this JROD are limited to federal lands, and only address authorizations under the jurisdiction of the BLM. Access to non-federal lands is subject to landowner approval, and other federal and state agencies will process applications for authorizations under their respective jurisdictions.

The decision made in this JROD emphasizes balanced and environmentally responsible development, and includes protections for physical, cultural, and biological resources. In accordance with the requirements of ANILCA Section 810, the decision also addresses local residents' concerns regarding protection of their subsistence way of life and the subsistence resources on which they depend, through inclusion of new mitigation measures developed specifically for the Donlin Gold Project (Final EIS Appendix N). At the same time, the decision enables Donlin Gold to reasonably develop the mineral resources from Alaska Native Corporation–owned lands, providing an economic benefit through a subsurface mineral lease with Calista, an Alaska Native regional corporation, a surface use agreement with TKC, an Alaska village corporation, as well as a surface use agreement with Cook Inlet Region, Incorporated (CIRI), for a small portion of the Pipeline on the Cook Inlet side of the Project, while helping to meet America's mineral development needs. The Donlin Gold Project will also lead to increased revenues to the State of Alaska, resulting from shared royalties, State and local taxes, and other fees. Local residents and communities will benefit indirectly from revenues associated with the development on federal land that would accrue to the State of Alaska.

Royalties received by Calista, TKC, and CIRI will also result in revenues to Alaska Native corporations from shared royalties.

This JROD adopts design features and BMPs analyzed and considered in Chapter 5 of the Final EIS. BLM has selected mitigating measures from Chapter 5 of the Final EIS which are discussed in more detail in Attachment C, Table C1, of this JROD. None of these mitigation measures are compensatory mitigation. Design features, BMPs, and mitigating measures not selected by BLM for inclusion are either out of the BLM's jurisdiction, or would go beyond what BLM considers reasonable, practicable, and appropriate to prevent undue and unnecessary degradation to public lands.

This JROD completes the required EIS process and NEPA requirements for subsequent issuance of a BLM ROW grant and other authorizations necessary for development of the natural gas pipeline and fiber optic cable on federal lands managed by the BLM, as well as the ANCSA 17(b) easement actions necessary in support of the Donlin Gold mine development.

BLM's supporting analysis and documentation for this JROD is included as Attachment C.

2.2.1 ANILCA SECTION 810 SUMMARY

Attachment C to this JROD, BLM Supporting Analysis and Documentation, describes in detail the mitigating measures Donlin Gold will undertake to avoid, minimize, and mitigate impacts to resources and subsistence.

The ANILCA Section 810 analysis concluded a positive finding for Alternative 2 North Option of a significant restriction to subsistence for the communities of Bethel, Tuntutuliak Napakiak, Napaskiak, Oscarville, Kwethluk, Akiachak, Akiak, Tuluksak, Upper and Lower Kalskag, Aniak, Chuathbaluk, Napaimute, and Crooked Creek due to a substantial reduction in the opportunity to continue uses of subsistence resources on the Kuskokwim River. Barging on the Kuskokwim River during construction and operation of the mine may cause extensive interference with access to the Kuskokwim River by subsistence users from villages along the river. It may cause a major redistribution of salmon, rainbow smelt, and whitefish, which are important subsistence resources for those villages. The analysis also concluded a positive finding for Alternative 2 North Option of a significant restriction to subsistence use for the communities of McGrath, Takotna, and Nikolai due to a substantial increase in competition for subsistence resources along the natural gas pipeline at the Farewell Airstrip due to increased activity and access that may increase disturbance to important subsistence resources by recreational sport hunters and commercial outfitters.

BLM has determined the significant restriction of subsistence use is necessary, consistent with sound management principles for the utilization of public lands. The proposed activity will involve the minimum amount of public lands necessary to accomplish the purposes of such use, occupancy or other disposition. Reasonable steps will be taken to minimize adverse impacts upon subsistence uses and resources resulting from such actions. Further discussion of the ANILCA 810 analysis findings is included in Attachment C2 of this JROD. The mitigating measures Donlin Gold has agreed to undertake to avoid and minimize impacts to subsistence are described in Table C2 of Attachment C2.

3 PROPOSED PROJECT

3.1 PROJECT DESCRIPTION

Donlin Gold proposes the development of an open-pit, hard-rock gold mine in the Kuskokwim River watershed, 277 miles west of Anchorage, 145 miles northeast of Bethel, and 10 miles north of the community of Crooked Creek. There is no existing overland year-round access to the site, or a utility service to supply the mine. Calista selected the mineral rights at the Donlin Gold site under the ANCSA because of the site's known gold potential. TKC owns the majority of the surface estate at the Donlin Gold site. Calista wishes to develop the mineral resources at Donlin Gold for the benefit of Calista's shareholders, and the shareholders of other Alaska Native corporations that benefit from natural resource development through ANCSA 7(i) and (j) revenue distribution requirements. Donlin Gold operates the Donlin Gold Project under a mineral lease with Calista and a surface use agreement with TKC.

The Project would have an average process throughput of 59,000 tons of ore per day, an estimated operational life of 27 years, and would produce approximately 30 million ounces of gold. Construction of the Project would take 3 to 4 years.

Major Project components include the proposed Mine Site, Transportation Corridor, and Pipeline. A brief summary of these Project components is provided in the sections below. See the Donlin Gold Final EIS Section 2.3.2, Alternative 2 – Donlin Gold's Proposed Action, for a detailed description of the Project.

Proposed Mine Site Facilities: The Mine Site would occupy a total area of approximately 14 square miles (9,000 acres). The primary Project subcomponents of the Mine Site include two open pits, a WRF, a TSF, water treatment plants, hydrologic control features (freshwater diversion dams, diversion trenches, settling ponds, contact water dams, and a freshwater reservoir), and other mining facilities. See Engineering Drawings MA-200G through MA-214T for plan views of the Mine Site area (Attachment A1).

Mine Site development in the COA would require the BLM to take actions relating to ANCSA 17(b)—public easements necessary to address public safety and maintain access to public land. These ANCSA 17(b) public easement actions include five terminations, one donation, and one corrected easement quadrangle map. The State of Alaska, in cooperation with Donlin Gold and the ANCSA Corporations, would provide for access to public lands west of the COA in lieu of the FAS (Federal-Aid Secondary) Route No. 231 prior to BLM terminating existing easements. The BLM would enter into a Memorandum of Agreement with Calista, TKC, and Alaska Department of Natural Resources (ADNR) to implement these actions to move existing public easements out of the COA, as well as defining the location of an easement at the proposed Angyaruaq (Jungjuk) Port, thereby avoiding coincidence with the port and mine access road.

Proposed Transportation Corridor Facilities: The proposed Transportation Corridor includes a port facility at Angyaruaq (Jungjuk), a 30-mile mine access road from the port, a 5,000 foot airstrip, and other transportation facilities to support movement of cargo to the mine. See Engineering Drawings TA-300G through TA-316T for plan views of the Transportation Corridor (Attachment A1).

Proposed Pipeline Facilities: Donlin Gold proposes to construct a 14-inch-diameter steel Pipeline to transport natural gas approximately 316 miles from an existing 20-inch gas pipeline

tie-in near Beluga, Alaska to the Mine Site power plant. Natural gas would be supplied to the Pipeline from existing Cook Inlet infrastructure. The Pipeline would require one compressor station at Milepost (MP) 0.4. See Engineering Drawings PA-100G through PA-177 for plan views of the Pipeline (Attachment A1). An associated fiber optic line has also been proposed in the ROW corridor parallel to the natural gas pipeline for operational needs and communications. At the Mine Site, natural gas would be used primarily as a fuel source for generating electricity and for space heating.

Based on comments on the Draft EIS from agencies and the public, one route option (Alternative 2 North Option) was included in the Pipeline component for the evaluation to address concerns due to Pipeline crossings of the INHT. The North Option realigns a segment of the natural gas pipeline crossing to the north of the INHT in the Happy River Valley. The North Option alignment is slightly shorter and reduces the number of INHT crossings and the length that the Pipeline would be physically collocated with the INHT historic route. Alternative 2 North Option was adopted by Donlin Gold as part of their proposed action, with submittal of their revised DA application in December 2017, and is incorporated into this Project description.

Summary of Impacts to WOUS: Construction of Project facilities would require temporary or permanent terrain modifications, and placement of fills in WOUS. Planned reclamation activities for temporary disturbance areas are fully described in the 2017 Plan of Operations Reclamation and Closure Plan: Volume 4 (SRK 2017B). For the purposes of this JROD, the duration of fill is defined using the terms below:

- **Temporary:** Project areas where fill is placed into wetlands for a brief period to facilitate construction activities, then removed concurrent with construction activities, or as soon as construction is complete. The fill may be in place for a matter of days; up to 3 years for the Pipeline; or up to 5 years for the Mine Site and Transportation Corridor construction period.
- **Permanent:** Project areas where fill is placed for the duration of the mine life (estimated to be between 27 and 30 years), and permanent fill to WOUS that remains after Project closure.

Direct impacts to WOUS from the discharge of dredged or fill material, along with fill volumes, are shown in the tables below. Table 1 presents impacts that fall under Section 10 jurisdiction. The impacts are broken down into major subcomponents of the Project; Table 2 presents impacts that fall under Section 404 jurisdiction.

Note: Information in the following tables is based on wetlands field survey data and calculations in the Preliminary Jurisdictional Determination (Michael Baker 2017a, 2017b, 2016). These data were used to develop impact summary tables in the Final EIS Section 3.11, Wetlands. Differences in numbers in the following tables compared to the Final EIS were due to:

- Reporting by Project phase in the Final EIS (Construction or Operations);
- Including non-fill–related impacts such as vegetation clearing in the Final EIS totals;
- Applying different duration (temporary or permanent) assessment criteria in the Final EIS; and
- Not separating Section 404 and Section 10 jurisdiction impacts in the Final EIS.

Table 1: Alternative 2 North Option – Proposed Structures and Fill in Section 10 Waters of the U.S.

Component	Navigable Waterbodies Impacted[1]				Type of Material
	Temporary		Permanent		
	Acres	Linear Feet	Acres	Linear Feet	
Transportation Corridor					
Angyaruaq (Jungjuk Port)[2]	0	0	3	1,109	Sheetpile, sand and gravel, shot rock and riprap
Pipeline					
HDD Crossing – South Fork Kuskokwim River[3]	0	0		1,363	Steel pipeline
Total for all Facilities	**0**	**0**	**3**	**2,472**	

Notes:

Numbers are rounded.

1. Includes direct impacts from fill and placement of structures in and under navigable WOUS.
2. Includes the amount of fill and linear feet of sheetrock placed below the ordinary high water mark of the Kuskokwim River.
3. Includes the linear feet of pipeline installed under the South Fork Kuskokwim River (within the bounds of ordinary high water mark of the river).

HDD = horizontal directional drilling

WOUS = waters of the U.S.

Source: Donlin Gold 2017e. Memorandum: Project Updates, Refinements, and Clarifications. March 31, 2017; Donlin Gold. 2017k. Proposed Modifications to the Donlin Gold Plan of Development for Proposed Natural Gas Pipeline Project. Letter Re: Supplemental Information for the Donlin Gold Natural Gas Pipeline State Pipeline Right-of-Way Lease Application (ADL 231908). Dan Graham, PE, Permit and Environmental Manager, Donlin Gold to Jason Walsh, State Pipeline Coordinator's Office. December 7, 2017; Michael Baker. 2017a. Wetland and Vegetation Maps, Donlin Gold Project, Southwest Alaska. Donlin_Wetland_Mapping_20170114.gdb, January 14, 2017, Prepared for Donlin Gold (as cited in the Donlin Gold Final EIS, April 2018).

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Table 2: Alternative 2 North Option – Proposed Fill for Waters of the U.S.

Component	Waters of the U.S. Impacted[1]						Fill Volume Cubic Yards	Type of Material
	Temporary		Permanent		Total			
	Acres	Linear Feet	Acres	Linear Feet	Acres	Linear Feet		
Mine Site								
Donlin-Jungjuk Road (East of Crooked Creek)	0	0	7	0	7	0	10,758	Shot rock, sand, and gravel
Laydown Areas	0	0	140	1,146	140	1,146	225,068	Shot rock or sand and gravel
Mine Internal Roads	0	0	119	4,444	119	4,444	192,100	Shot rock or sand and gravel
North Overburden Stockpile	0	0	209	3,876	209	3,876	337,657	Overburden
Open Pit	0	0	550	14,665	550	14,665	48,361	Waste rock, overburden for reclamation
Snow Gulch Freshwater Reservoir	0	0	42	6,363	42	6,363	8,571	Shot rock
South Overburden Stockpile	0	0	71	2,699	71	2,699	114,445	Overburden
Tailings Storage Facility	0	0	526	67,373	526	67,373	848,743	Shot rock
Treated Water Discharge Facility	0	0	2	0	2	0	3,604	Shot rock or sand and gravel
Material Sites & Stockpiles[2]	0	0	464	6,572	464	6,572	440,348	Overburden
Waste Rock Facility	0	0	442	63,862	442	63,862	713,350	Waste rock, overburden for reclamation
Total for Mine Site	**0**	**0**	**2,572**	**171,000**	**2,572**	**171,000**	**2,943,005**	
Transportation Corridor								
Airstrip	0	0	6	0	6	0	9,951	Shot rock, sand, and gravel
Airstrip Spur Road	0	0	<1	10	<1	10	482	Shot rock, sand, and gravel
Donlin-Jungjuk Road (West of Crooked Creek)	0	0	48	252	48	252	77,238	Shot rock, sand, and gravel
Angyaruaq (Jungjuk Port)[3]	0	0	11	0	11	0	21,774	Sand and gravel, shot rock and riprap
Material Sites[4]	0	0	40	1,582	40	1,582	46,835	Crushed road aggregate
Total for Transportation Corridor	**0**	**0**	**105**	**1,844**	**105**	**1,844**	**156,280**	

Table 2: Alternative 2 North Option – Proposed Fill for Waters of the U.S.

Component	Waters of the U.S. Impacted[1]						Fill Volume Cubic Yards	Type of Material
	Temporary		Permanent		Total			
	Acres	Linear Feet	Acres	Linear Feet	Acres	Linear Feet		
Pipeline								
Access Routes[5]	14	2,568	0	0	14	2,568	25,717	Shot rock or sand and gravel
Airstrips	12	2,065	0	0	12	2,065	18,561	Shot rock, sand, and gravel
Block Valves	0	0	<1	0	<1	0	27	Shot rock, sand, and gravel
Camps	<1	136	0	0	<1	136	441	Shot rock, sand, and gravel
HDD Workspace	4	898	0	0	4	898	6,459	Shot rock or sand and gravel
Material Sites	10	1,291	0	0	10	1,291	16,710	Shot rock or sand and gravel
Pipe Storage Yards	3	0	0	0	3	0	4,784	Shot rock or sand and gravel
Pipeline	494	46,326	200	0	694	46,326	1,194,894	Bedding material, Shot Rock, Sand and gravel, trench spoils. Rip rap at stream crossings.
Water Extraction Sites	1	62	0	0	1	62	1,370	Shot rock or sand and gravel
Work Pads	0	0	<1	0	<1	0	52	Shot rock or sand and gravel
Total for Pipeline	**538**	**53,346**	**200**	**0**	**738**	**53,346**	**1,269,015**	
Total for All Facilities	**538**	**53,346**	**2,877**	**172,844**	**3,415**	**226,190**	**4,368,300**	

Notes:

Numbers are rounded.

1. Includes direct impacts from cut/fill in WOUS. Impacts to wetlands are presented in acres. Impacts to streams/rivers are presented as linear feet.

2. Includes TSF Material Site-06/TSF Stockpile 2, TSF Material Site-07/TSF Stockpile 3, and TSF Stockpile 1.

3. Includes fill above the ordinary high water mark of Kuskokwim River.

4. Includes: MS-01, MS-05, MS-08, MS-10, MS-12, and MS-16. Discharge volume associated with MS-08, MS-10, and MS-16.

5. Includes: Cut/fill for construction access, shoofly access, and winter access routes.

HDD = horizontal directional drilling

WOUS = waters of the U.S.

Source: Donlin Gold 2017e. Memorandum: Project Updates, Refinements, and Clarifications. March 31, 2017; Donlin Gold. 2017k. Proposed Modifications to the Donlin Gold Plan of Development for Proposed Natural Gas Pipeline Project. Letter Re: Supplemental Information for the Donlin Gold Natural Gas Pipeline State Pipeline Right-of-Way Lease Application (ADL 231908). Dan Graham, PE, Permit and Environmental Manager, Donlin Gold to Jason Walsh, State Pipeline Coordinator's Office. December 7, 2017; Michael Baker. 2017a. Wetland and Vegetation Maps, Donlin Gold Project, Southwest Alaska. Donlin_Wetland_Mapping_20170114.gdb, January 14, 2017, Prepared for Donlin Gold (as cited in the Donlin Gold Final EIS, April 2018).

Summary of Impacts to BLM-Managed Lands: Of the 316-mile proposed Pipeline corridor, approximately 97 miles and 2,329 acres of largely remote and undisturbed BLM-managed public land are affected. The BLM would offer a ROW Grant to Donlin Gold LLC for the construction, operation, maintenance, and termination of the proposed 14-inch underground natural gas pipeline and associated fiber optic cable, and related ancillary facilities. There would be a 150 foot-wide temporary construction corridor, and a 51-foot-wide operational corridor for the Pipeline ROW. During the 3-year construction period, there would be ancillary facilities affecting approximately 561 acres, including one existing and one new airstrip, 22 material sites, two large (300-person) civilian camps, as well as temporary access roads and work spaces. These ancillary facilities, which are necessary to support construction, would be decommissioned (except for the existing Farewell Airstrip, which would be improved during Construction and not decommissioned); and the land reclaimed to a natural condition on completion of the construction phase. The Pipeline and fiber optic cable would involve 69 stream/river crossings on BLM-managed land: 62 would be open-cut trench, and 7 would be HDD. During the 27-year operations and maintenance period, the 51-foot-wide, 97-mile-long natural gas pipeline and fiber optic cable corridor would affect approximately 601 acres. During operations and maintenance, the Pipeline would be accessed via helicopter rather than via temporary construction-phase roads and airstrips. The ROW Grant term would be for 30 years. On completion of the mining activities, the Pipeline and associated fiber optic cable and related ancillary facilities would no longer be needed, and would be decommissioned. Aboveground facilities would be removed, and the ROW corridor reclaimed to a natural condition.

Table 3 presents the miles and acres of impacted BLM-managed lands for both the temporary construction and operational ROW. Acres shown vary from Table 2.3-14 of the Final EIS because those acreage figures represented a 300-foot-wide planning corridor instead of the 150-foot-wide construction corridor that will be part of the BLM ROW Grant. Post-construction, the operations corridor will be 51 feet wide on BLM-managed lands.

Table 3: Alternative 2 North Option – ROW and Ancillary Facilities on BLM-Managed Lands

	Construction Corridor and Ancillary Facilities (Acres)		Operations Corridor and Facilities (Acres)		Approximate Length (miles)
	Temporary 150-foot Construction ROW	Ancillary Facilities[1]	51-foot ROW	Ancillary Facilities	
Pipeline (Alternative 2 North Option)	1,768	561	601	0	97

Notes:

1. Includes access and shoofly roads, winter access routes, work pads, pipe storage yards, HDD workspace, water extraction sites, airstrips, material sites, and campsites. Includes entire footprint, including vegetation clearing areas on BLM-managed land. Estimated acres may be over-estimated due to overlapping components.

Source: Donlin Gold 2017g

3.2 PROJECT DESIGN REVISIONS

Changes since the Corps Public Notice: The 2017 permit application, which was updated after the Corps' PN (published in November 2015 with release of the Draft EIS), includes revisions and refinements to the Project design and footprint that resulted, in part, from the NEPA process review. Notable changes included in the updated application were:

- Modified natural gas pipeline alignment to include the "North Route" option through the Alaska Range, which was adopted as part of the Applicant's proposed Project to address concerns from agencies and the public regarding impacts to the INHT; resulting in:
    - Reduction of the overall construction impacts by about 65 acres; including about 6 acres less direct temporary impacts to wetlands and streams;
    - Reduction of the number of crossings (intersections) between the INHT historic route and the proposed Pipeline ROW(a reduction from 14 crossings to 5 crossings);
    - Reduction in the length that the Pipeline ROW would be collocated (within 100 feet) with the INHT historic route (from 2.5 miles to 0.2 miles);
    - Reduction in the length that the Pipeline ROW would be in proximity (within 1,000 feet) of the INHT historic route (from 14.3 miles to 5.3 miles);
    - Reduction in the overall length of shoofly roads (less than one mile difference);
    - Elimination of the HDD crossing of Happy River (note: while two unnamed tributaries of the Happy River would be crossed with HDD, the HDD crossing of Happy River itself would be eliminated);
- Updated calculations of the Project's impacts to WOUS using Corps' preliminary determined wetlands data; and
- Inclusion of an updated CMP.

In response to comments on the CMP, and through discussion with and feedback from the Corps, EPA, and USFWS regarding the CMP, Donlin Gold submitted a revised CMP in July 2018. See Section 6.0 of this JROD for a discussion of mitigation.

3.3 PROJECT PURPOSE AND NEED

Applicant's Stated Purpose and Need: Donlin Gold's stated purpose and need for the Project is (see Donlin Gold Final EIS Section 1.3.1) is to profitably produce gold from ore reserves owned by Calista, an ANCSA corporation, utilizing open-pit mining methods and proven ore processing methods suitable for application in remote western Alaska. The need for the proposed Project is to enable Calista and TKC to realize economic benefits for their shareholders and other ANCSA shareholders from lands with mineral potential selected and conveyed to them under ANCSA, by producing gold to meet worldwide demand. Gold is an established commodity with international markets.

The purpose of the Donlin Gold natural gas pipeline is to provide a long-term stable supply of natural gas to meet energy needs for the Project. The proposed Pipeline is designed as a

privately owned facility to support the proposed mine operation. Natural gas supplied by the Pipeline would be used to generate electricity for mine operations and heat for buildings. Donlin Gold has determined that the use of natural gas supplied via the proposed Pipeline is the most practicable, cost effective, and environmentally acceptable means of providing a reliable long-term energy source for the Project.

Donlin Gold's need for the Pipeline is driven by the remote location of the Mine Site. There are no existing or readily useable resources that can provide sufficient energy to power the development and operation of the mine within Donlin Gold's timeframe. The remote location does not have sufficient, naturally occurring gas resources, or other energy sources of the magnitude necessary to support mine development and operations. No existing transportation or utility infrastructure services are available to the proposed Mine Site or surrounding area. Access to the Mine Site is seasonal via the Kuskokwim River, or by aircraft, as weather conditions allow.

Corps' Determination of Basic Project Purpose: The Corps has determined that the basic Project purpose [40 CFR 230.10(a)(3)] is to extract and process gold. Extracting and processing gold is not a water-dependent activity. The Project is partially sited in a special aquatic site, jurisdictional wetlands; therefore, pursuant to 40 CFR 230.10(a)(3), practicable alternatives not involving special aquatic sites are presumed to be available, and are presumed to have less adverse impacts on the aquatic ecosystem, unless clearly demonstrated otherwise. Alternatives are discussed below in Section 4.0.

Corps' Determination of Overall Project Purpose: The overall Project purpose is used in the determination of practicable alternatives necessary to be evaluated under the CWA Section 404(b)(1) Guidelines. Practicable is defined as: "available and capable of being done after taking into consideration cost, existing technology, and logistics in light of the overall project purpose" [40 CFR 230.10(a)(2)]. Although the definition of overall project purpose is the Corps' responsibility, it must take into consideration the Applicant's stated need for the project and the type of project being proposed (July 1, 2009, Updated Standard Operating Procedures for the U.S. Army Corps of Engineers Regulatory Program, page 15). The overall project purpose should be specific enough to define the Applicant's needs, but not so restrictive as to constrain the range of alternatives that must be considered under the Guidelines.

The Corps has determined that the overall Project purpose is to produce gold from the Donlin deposit ore reserves using mining processes, infrastructure, logistics, and an energy supply(s) practicable for application in remote western Alaska.

BLM Purpose and Need for Action: The BLM actions under consideration is a 30-year ROW Grant for a natural gas pipeline and associated fiber optic cable, including related Temporary Use Permits, under the MLA, as amended (30 USC 185). The need to evaluate Donlin Gold's proposal is established by the BLM's responsibility under the MLA to respond to requests to transport oil or gas across public lands via pipeline. Consistent with 43 CFR 2881.2, the BLM's objective or purpose in considering this action is to provide legal access across public lands in a manner that protects the natural resources associated with federal and adjacent lands, whether private or administered by a government entity; prevents unnecessary and undue degradation to public lands; promotes the use of ROW in common (where applicable); and coordinates, to the fullest extent possible, with State and local governments, interested individuals, and appropriate quasi-public entities.

The BLM decision to be made is whether or not to authorize the requested 30-year ROW Grant and associated Temporary Use Permits; and if authorized, what terms and conditions would apply to the authorizations. BLM would decide whether or not to authorize material sales necessary to provide gravel resources necessary to support the construction of the Pipeline via the Materials Act; and if authorized, what terms and conditions would apply to the material sales.

The BLM's decision will also consider the proposed ANCSA 17(b) easement actions to address public safety concerns at the COA while providing public access to public lands in the vicinity of the mine COA (Final EIS Appendix Z).

Conformance with BLM Land Use Plans: In addition to the agency-specific guidance regarding purpose and need, the BLM has determined the Project is in conformance with two land use plans. The Ring of Fire Record of Decision and Approved Management Plan of March 2008, and the Southwest Planning Area, Management Framework Plan of November 1981 provide the overall long-term management direction for BLM-managed lands encompassed by the Donlin Gold Project.

3.4 SCOPE OF ANALYSIS

Scope of Analysis for Corps' Jurisdiction:

The Corps' federal involvement for a project proposed by a private actor is normally limited to a DA permit decision informed by an appropriate NEPA evaluation and public interest review, issued for activities and in areas over which the Corps has jurisdiction. However, the Corps is required to determine the scope of analysis for a NEPA document to address the impacts of both the specific activity over which the Corps has jurisdiction, and those portions of an entire project over which the Corps has sufficient control and responsibility to warrant federal review. In this instance, due to the configuration of streams and wetlands on the Project site, the regulated activities comprise a substantial portion of the Project so as to extend cumulative federal control and responsibility. Additional federal control and responsibility by the BLM and PHMSA extend to the Pipeline component. On these bases, the NEPA scope of analysis is the entire Project Area.

The substantive evaluation requirements of the CWA are outlined in guidelines developed by the Administrator of the EPA, in conjunction with the Secretary of the Army, and published in 40 CFR Part 230 (See Attachment B2). The fundamental precept of the Guidelines, which are binding regulations, is that discharges of dredged or fill material into WOUS, including wetlands, should not occur unless it can be demonstrated that such discharges, either individually or cumulatively, will not result in unacceptable adverse effects on the aquatic ecosystem. The Guidelines state that only the least environmentally damaging practicable alternative (LEDPA) can be permitted. Additional evaluation requirements are contained in the Corps' public interest review (33 CFR Part 320.4(a)).

The Corps' Section 404 jurisdiction for this Project is over the placement of fill into WOUS, including wetlands, for the proposed construction of the Mine Site components, Transportation Corridor components, and Pipeline components. The fill amount and surface area of impacts of each Project component are outlined in Tables 1 and 2 above.

Section 10 of the RHA of 1899 applies to the construction of any structure in, under, or over any navigable WOUS, the excavating from or depositing of material in such waters, or the accomplishment of any other work affecting the course, location, condition, or capacity of such waters. The substantive evaluation criteria for this authority is the Corps' public interest review (33 CFR Part 320.4(a)).

The Corps' Section 10 geographic jurisdiction for the Project is over all activities that occur in the Kuskokwim River. This work includes the sheet piles and fill associated with the Kuskokwim River Angyaruaq (Jungjuk) Port and the South Fork Kuskokwim River HDD Crossing.

Scope of Analysis for the BLM's Jurisdiction: The BLM scope of analysis describes which portions of the overall Project the BLM will evaluate, pursuant to NEPA, as the area under the BLM management control and responsibility.

The BLM's involvement for the Project involves three actions:

1) ANILCA 810 analysis

For any project requiring an authorization from BLM, pursuant to ANILCA Section 810, the BLM is responsible for conducting the ANILCA Section 810 analysis for the Project. Based on ANILCA Section 810 and BLM Instruction Memorandum 2011-008, BLM determined that the 810 Analysis will address the portion of the Project requiring a BLM authorization (i.e., Pipeline ROW and all aspects of the Project that are dependent on that authorization and the associated Pipeline, to include mine construction and operations and river and road transportation aspects of the Project, because those components of the Project would not go forward if not for the Pipeline; and the Pipeline would not go forward if not for those other components. This is consistent with NEPA requirements for evaluation of connected actions.

2) ROW Grant

The BLM is required to respond to the ROW Grant application from Donlin Gold, pursuant to Section 28 of the Mineral Leasing Act (30 USC 185), and 43 CFR 2881.11 for the natural gas pipelines and related fiber optic cable that would cross federal lands under BLM jurisdiction. The BLM jurisdiction for this Project is limited to BLM-managed lands in the proposed Pipeline ROW corridor and necessary ancillary facilities, involving 97 miles and 2,329 acres of BLM-managed lands.

The BLM has reviewed the proposed ROW action pursuant to NEPA and other applicable federal laws and regulations, including the Endangered Species Act (ESA) and the NHPA. The Pipeline ROW would not be necessary if the construction and development of the proposed open-pit gold mine were not to occur. Therefore, for the BLM, the Pipeline is an interdependent part of the proposed mine development—a larger action—and depends on that larger action for its justification. Therefore, the development of the proposed Mine Site and the requested Pipeline ROW are—by definition—connected actions; and therefore must be analyzed as such in the BLM's NEPA review and decision-making process (40 CFR 1508.25(a)(1).

3) ANCSA 17(b) public easements

ANCSA 17(b) public easements are rights reserved to the United States. They take the form of 60-food wide roads, 25- and 50-foot wide trails, and one-acre sites for short-term uses. These rights are reserved when the BLM conveys land to a Native corporation under the Alaska Native Claims Settlement Act (ANCSA).

BLM is responding to Donlin Gold's proposal (Final EIS Appendix Z) to relocate public access routes that currently go through the mine COA to access public land. Existing ANCSA 17(b) public easements inside the COA need to be moved and relocated outside the COA to avoid easement user conflict with mine development and operations. In addition, one easement quadrangle map needs to be corrected to clearly define a 17(b) easement route near the Jungjuk Port. This will avoid any potential public access conflicts with development of the mine access road leading from the Jungjuk Port area on the Kuskokwim River to the mine COA. These actions are pursuant to the ANCSA 17(b) Easement Management Handbook (IM AK 2007-037). BLM has reviewed the proposed ANCSA 17(b) easement actions, including five terminations, one relocation by donation, and one corrected quadrangle map, to address public safety and access to public land in the vicinity of the mine COA and the Angyaruaq (Jungjuk) Port. The ANCSA 17(b) actions are necessary because the mine development cannot move forward without the actions proposed in the Public Easement Plan.

Scope of Analysis for National Historic Preservation Act: Section 106 of the NHPA requires each federal agency, prior to any federal or federally assisted or funded undertaking, to take into account the effect of its proposed undertaking on any property included in or eligible for inclusion in the National Register of Historic Places (NRHP) (hereafter called historic properties).

The Corps, BLM, State Historic Preservation Officer (SHPO), and Advisory Council on Historic Preservation (ACHP) have determined that a Programmatic Agreement for the Project is appropriate, because the effects on historic properties cannot be fully identified and mitigated prior to agency permit decisions, and historic properties may be discovered during Project implementation; and to record the terms and conditions agreed on to resolve potential adverse effects of the Project on historic properties, pursuant to 36 CFR 800.14(b). The Programmatic Agreement is included as Attachment A2 of this JROD.

The Corps, as the lead federal agency for Section 106 obligations under the NHPA, and in consultation with the BLM, the SHPO, ADNR, the ACHP, and Donlin Gold, has established the undertaking's Area of Potential Effects (APE), as defined in 36 CFR 800.16(d), which encompasses direct and indirect effects on historic properties for alternatives carried forward for detailed analysis in the Final EIS. The APE applies to all lands, regardless of management status that may be affected by the Mine Site, Pipeline Corridor, transportation system, staging areas, access roads, borrow areas, or other related infrastructure to the Project undertaking. The APE is defined and documented in Appendix A of the Programmatic Agreement (see Attachment A2).

Section 106 consultation is further discussed in Attachment B3, Section B3.6 of this JROD.

Scope of Analysis for Endangered Species Act of 1973 (ESA): The ESA provides for conservation of fish, wildlife, and plant species considered to be at risk of extinction (threatened or endangered) in all or a substantial portion of their ranges, and to conserve ecosystems and habitats on which they depend. The USFWS and the National Marine Fisheries Service (NMFS) share regulatory authority for implementing ESA for the threatened and endangered species potentially affected by the Project.

Section 7 of the ESA requires all federal agencies to consult with the USFWS and/or NMFS when any action undertaken, funded, or permitted through the agency may affect an ESA-listed species or critical habitat. The determined scope for ESA is the Action Area, which means all

areas to be affected directly or indirectly by the federal action, and not merely the area that falls directly under the Corps' regulatory jurisdiction. The Action Area may be larger than the scope for NEPA, Section 404 and Section 10.

The Action Area established by the Corps in consultation with the USFWS and NMFS includes the following proposed Project components: Mine Site; natural gas pipeline; access road; Angyaruaq (Jungjuk) Port; river transportation route; and the marine barging routes in the Bering Sea and Cook Inlet. Only the marine barging routes are addressed, because they are the only Project component intersecting habitat used by species under the ESA. The Bering Sea marine barging routes extend from Unimak Pass to Bethel (supply), and Dutch Harbor to Bethel (fuel). The Cook Inlet marine barging route runs between Beluga and Anchorage, and/or Beluga and Nikiski.

Biological Assessments were developed and are included in Appendix O of the Final EIS. ESA Section 7 consultation conclusions are summarized in this JROD as Attachment B2, Section B2.3.1; and Attachment B4, Section B4.3.

Scope of Analysis for Magnuson-Stevens Fishery Conservation and Management Act: Section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) requires federal agencies to consult with the NMFS on any action authorized, funded, or undertaken that may adversely affect Essential Fish Habitat (EFH).

The Donlin Gold Project includes three primary components: 1) Mine Site; 2) natural gas pipeline; and 3) transportation infrastructure to include an access road, the Jungjuk Port, river transportation route, and marine barging routes in the Bering Sea and Cook Inlet. The Bering Sea marine barging routes extend from Unimak Pass to Bethel (supply), and Dutch Harbor to Bethel (fuel). The Cook Inlet marine barging route (supply) runs between Beluga and Anchorage, and/or Beluga and Nikiski. These three components define the Project Area, potentially affecting EFH.

The Mine Site facilities would be within Crooked Creek drainage, which flows into the Kuskokwim River at the village of Crooked Creek. Major Project components would be constructed in American Creek, Anaconda Creek, and Snow Gulch Basin.

An EFH Assessment was developed for the Project and is included in Appendix Q of the Final EIS. EFH consultation conclusions are discussed in Attachment B2, Section B2.3.4 of this JROD.

4 ALTERNATIVES

4.1 ALTERNATIVES CONSIDERED AND CARRIED FORWARD FOR DETAILED ANALYSIS

As described in Chapter 2 of the Final EIS, the Corps completed a rigorous and comprehensive process to identify and evaluate alternatives to the Project, as proposed by Donlin Gold. After careful study, seven alternatives were evaluated in the Final EIS (see Table 4 below). The action alternatives carried forward for analysis in the EIS vary from the proposed action in key engineering design, siting, and operational features, which address concerns raised in scoping, and provide a reasonable range of alternatives for comparison. For example, in one alternative, the Mine Site and the Pipeline components remain the same as in the proposed action, but two variants (Alternative 3A and Alternative 3B) are evaluated to reduce the amount of barging on the Kuskokwim River. The following sections provide a brief summary of alternatives.

Table 4: Donlin Gold Project Alternatives

Alternative 1 – No Action
Alternative 2 – Donlin Gold's Proposed Action Includes One Option: • North Option (Alternative 2 North Option)
Alternative 3A – Reduced Diesel Barging: Liquefied Natural Gas Powered Haul Trucks
Alternative 3B – Reduced Diesel Barging: Diesel Pipeline Includes Two Options: • Port MacKenzie Option • Collocated Natural Gas and Diesel Pipeline Option (Collocated Pipeline Option)
Alternative 4 – Birch Tree Crossing Port
Alternative 5A – Dry Stack Tailings Includes Two Options: • Unlined Option • Lined Option
Alternative 6A – Modified Natural Gas Pipeline Alignment: Dalzell Gorge Route

No Action Alternative: The No Action Alternative would result from the Corps not issuing required permits under Section 404 of the CWA and Section 10 of the RHA; and the BLM not granting the requested MLA ROW permits. There would be no Mine Site development, no new transportation facilities, and no Pipeline or fiber optic cable in areas over which the Corps or BLM exercise jurisdiction. The future of the existing camp, airstrip, and related facilities would be decided at the discretion of the land owners: Calista and TKC. The No Action Alternative represents a baseline for comparison of effects between the Proposed Action (Alternative 2) and the other action alternatives. Current ocean and river barging traffic would be expected to continue at similar levels. The No Action Alternative does not meet the purpose and need of the Project.

Alternative 2 – Applicant's Proposed Action: Donlin Gold's proposed action would establish an open-pit, hard-rock gold mine in southwestern Alaska on land leased from Calista. TKC has granted surface use rights to Donlin Gold. Donlin Gold also has legal control of approximately 13 acres in the Snow Gulch area, per a lease agreement with Lyman Resources in Alaska, Inc. The three main Project components include (see Section 3.1 above for additional information on the proposed Project):

- **Mine Site.** This component would include the pits, processing facility, WRF, TSF, and power plant.
- **Transportation Corridor.** This component would include a third party to transport fuel and other supplies to the Project site from Dutch Harbor or other locations outside Alaska; a dedicated new fleet of river barges and tugs; the Angyaruaq (Jungjuk) Port; a 30-mile access road; and a 5,000-foot dedicated airstrip.
- **Pipeline.** This component would include an approximately 316-mile-long, 14-inch-diameter, buried natural gas pipeline to support power generation at the Mine Site, built from Cook Inlet to the Mine Site. Based on comments on the Draft EIS from agencies and the public, one route option (Alternative 2 North Option) was included in the Pipeline component for evaluation to address concerns due to Pipeline crossings of the INHT. The North Option realigns a segment of the natural gas pipeline crossing to the north of the INHT in the Happy River Valley. The North Option alignment is slightly shorter, and reduces the number of INHT crossings and the length that the Pipeline would be physically located in the INHT ROW. Alternative 2 North Option was adopted by Donlin Gold as part of their proposed action, with submittal of their revised DA application in December 2017.

Alternative 3A – Reduced Diesel Barging: LNG-Powered Haul Trucks: Alternative 3A would use primarily liquefied natural gas (LNG) to fuel the large (300-plus-ton payload) trucks that would move waste rock and ore from the open pits. These large trucks would account for approximately 75 percent of the total annual diesel consumption under Alternative 2. Trucks hauling cargo and fuel on the mine access road from Angyaruaq (Jungjuk) Port would not be converted to LNG.

The primary differences between Alternative 3A and Alternative 2 would be the addition of a 220,000-gallon-per-day LNG plant and storage tanks near the processing plant; reduced consumption of diesel; reduced barge trips; reduced on-site diesel storage; and increased natural gas consumption. Currently, LNG-powered haul trucks are not in full commercial production. The technology to use natural gas products (such as LNG or compressed natural gas) in other industrial applications is proven, and equipment manufacturers are actively developing dual-fuel (diesel and natural gas) options for the mining industry.

Alternative 3B – Reduced Diesel Barging: Diesel Pipeline: Under Alternative 3B, an 18-inch-diameter diesel pipeline would be constructed from Cook Inlet to the Mine Site to virtually eliminate the need for Project-related diesel barging on the Kuskokwim River during Operations, and reduce the overall number of barge trips. The natural gas pipeline proposed for Alternative 2 would not be constructed, and natural gas would not be used. The power plant would be fueled only with diesel.

The diesel pipeline would traverse 334 miles, and would be buried in the same corridor proposed for the natural gas pipeline described under Alternative 2. This design would require

an additional segment between the Tyonek North Foreland Facility and the natural gas pipeline corridor start. This additional segment would cross the Beluga River using HDD. There would be improvements to the existing Tyonek North Foreland Barge Facility and transportation of diesel fuel in Cook Inlet. The Pipeline alignment crossing the Castle Mountain and Denali-Farewell faults would be constructed above grade, similar to the natural gas pipeline in Alternative 2.

Two options to Alternative 3B were added based on Draft EIS comments from agencies and the public:

- Port MacKenzie Option – This option would use the existing Port MacKenzie facility to receive and unload diesel tankers, instead of the Tyonek facility considered under Alternative 3B. A pumping station and tank farm of similar size to the Tyonek conceptual design would be provided at Port MacKenzie. A Pipeline would extend northwest from Port MacKenzie, route around the Susitna Flats State Game Refuge, cross the Little Susitna and Susitna Rivers, and connect with the Alternative 3B alignment at approximately MP 28.
- Collocated Natural Gas and Diesel Pipeline Option – This option (Collocated Pipeline Option) would add the 14-inch-diameter natural gas pipeline proposed under Alternative 2 to Alternative 3B. Under this option, the power plant would operate primarily on natural gas instead of diesel, as proposed under Alternative 3B. The diesel pipeline would deliver the diesel that would be supplied using river barges under Alternative 2; and because it would not be supplying the power plant, could be reduced to an 8-inch-diameter Pipeline. The two pipelines would be constructed in a single trench that would be a slightly wider trench, work space, and permanent ROW than proposed under either Alternative 2 or Alternative 3B. This option could be configured with either the Tyonek or Port MacKenzie dock options.

Alternative 4 – Birch Tree Crossing Port: Alternative 4 would move the port site to Birch Tree Crossing (BTC), about 75 river miles below the Angyaruaq (Jungjuk) Port site, and 124 river miles upstream from Bethel, reducing the barge distance for freight and diesel to the Mine Site. The same volume of cargo and diesel fuel would be transported by barge as in Alternative 2, and there would be no other substantive changes to other Project components.

The 65-acre BTC Port site would be situated on the Kuskokwim River, and would consist of an onshore pad with areas for general storage, fuel storage, a warehouse truck shop, and living accommodations; and a filled area on the riverbank to allow container barges to dock. An approximately 76-mile-long, 30-foot-wide, all-season gravel access road (46 miles longer than the mine access road in Alternative 2) would link the BTC Port to the Mine Site to transport fuel and cargo.

Alternative 5A – Dry Stack Tailings: Alternative 5A would use the dry stack tailings (DST) method instead of the subaqueous tailings method that would be used under Alternative 2. This alternative was developed to avoid the potential for accidental releases from the tailings dam, proposed under Alternative 2.

Under Alternative 5A, tailings would be dewatered in a filter plant using specialized equipment to produce a partially saturated, compactable filter cake. This material would be delivered to the TSF by truck, then spread and compacted in thin layers using bulldozers. Residual process water removed from the tailings would be transported to an operating pond via pipeline, and

reclaimed water from the pond would be pumped back to the processing plant for reuse. The main dam, upper dams, and operating pond would be fully lined with a 60-milliliter (1.5-millimeter) linear low-density polyethylene (LLDPE) liner.

This alternative includes two options:

- **Unlined Option –** The TSF would not be lined with an LLDPE liner. The area would be cleared and grubbed, and an underdrain system placed in the major tributaries under the TSF and operating pond to intercept groundwater base flows and infiltration through the DST, and convey it to a Seepage Recovery System. Water collecting in the Seepage Recovery System would be pumped to the operating pond, lower contact water dam, or directly to the processing plant for use in process.
- **Lined Option –** The DST would be underlain by a pumped overdrain layer throughout the footprint, with an impermeable LLDPE liner below. The rock underdrain and foundation preparation would be completed in the same manner as the Unlined Option.

Alternative 6A – Modified Natural Gas Pipeline Alignment: Dalzell Gorge Route: Alternative 6A was the Applicant's original proposed pipeline alignment through the Alaska Range. In December 2013, Donlin Gold revised their Plan of Development in favor of the currently proposed alignment, which avoids Dalzell Gorge. Alternative 6A would realign the natural gas pipeline west between MP 106.5 to MP 152.7, traversing Dalzell Gorge. The route would deviate from the Alternative 2 alignment at approximately MP 106.5, trend west, and parallel the Happy River for approximately 5 miles before trending northwest at Pass Creek and through Rainy Pass and Dalzell Gorge.

The terrain through the gorge is steep; the route through Rainy Pass starts at an elevation of 2,500 feet above mean sea level, and climbs to 3,327 feet mean sea level over about 6 miles. Approximately 34 miles of this route would be in the immediate vicinity of, or cross, the INHT.

4.2 ALTERNATIVES ELIMINATED DURING THE EIS PROCESS

Alternative options eliminated from further analysis are presented in the Final EIS in Section 2.4, Alternatives Considered but Eliminated from Detailed Analysis. Appendix C of the Final EIS includes tables that explain in detail why each option was considered, and provides rationale for their elimination. Over 300 alternative options were evaluated in Appendix C, including alternative mining methods, alternative water management and treatment, alternative infrastructure, and alternative locations for Project component facilities.

Overall, few options were eliminated because they did not meet the screening test for Purpose and Need. The technical and economic feasibility (including logistics in some cases) were evaluated carefully, and these factors were more often the basis for eliminating options. Environmental impacts were assessed at a screening level; some options were eliminated because they would not reduce environmental impacts when compared with the corresponding components of the Applicant's proposed action. Others were not carried forward as options because they were more properly characterized as potential mitigating measures.

Other Location Alternatives: The Corps has determined that the overall Project purpose is to produce gold from the Donlin deposit ore reserves using mining processes, infrastructure, logistics, and an energy supply(s) practicable for application in remote western Alaska. Other

locations would not meet the overall purpose to produce gold from the Donlin deposit, and are not practicable.

4.3 CORPS' DETERMINATION OF THE LEAST ENVIRONMENTALLY DAMAGING PRACTICABLE ALTERNATIVE (LEDPA)

The DA permit application evaluation requires compliance with the 404(b)(1) Guidelines. Under Subpart B of the 404(b)(1) Guidelines, the Corps' evaluation of the proposed Project is required to address four tests that the Project must meet to receive a Section 404 permit. One of these tests results is the identification of the LEDPA. See Attachment B2 – Evaluation of The Discharge of Dredge and Fill Material in Accordance with 404(b)(1) Guidelines.

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

With inclusion of the measures and special conditions discussed in Section 6.0, and based on the evaluation of the environmental impacts of the Applicant's proposed action (see Attachments B2 – B4), the Corps concludes that Alternative 2 North Option is the LEDPA. This alternative meets the overall Project purpose; is practicable in consideration of costs, logistics, and existing technology; and has the least total direct impacts (excavation, fill, and vegetation clearing) and potential indirect impacts (dust, dewatering) to WOUS of the practicable alternatives (see Final EIS Section 3.11, Wetlands). Table B2 in Attachment B2 summarizes the analysis for determining the LEDPA.

4.4 BLM'S RATIONALE FOR ADOPTING ALTERNATIVE 2 NORTH OPTION

Among the alternatives evaluated in the Final EIS, the Alternative 2 North Option will result in fewer overall environmental impacts than Action Alternatives 3A, 3B, 4, 5A and 6A, and therefore is considered by BLM to be the environmentally preferred alternative.

The Draft EIS included the Applicant's proposal, Alternative 2, to co-locate the natural gas pipeline with approximately 4 miles of the INHT, and involved 13 crossings, and was otherwise in 1,000-foot proximity of the INHT for 10.5 miles. The Final EIS (April 2018) includes a revised Applicant proposal, Alternative 2 North Option, to reduce the coincidence with the INHT to a total of just 4 crossings; and only 0.1 mile of Pipeline will be physically located in the 400-foot easement of the INHT. Overall construction impacts with Alternative 2 North Option will be about 65 acres less than construction of the originally proposed Alternative 2. The North Option segment of the Pipeline crosses only State lands along the INHT; no BLM-managed lands coincidental with the INHT will be impacted.

Alternative 2 North Option provides for less disturbance and less potential for environmental damage in the ROW corridor as compared to Alternative 3B co-located natural gas and diesel pipeline. Alternative 3B, co-located natural gas and diesel pipelines, would involve 19

additional miles in the length and 5 additional feet in the width of the ROW corridor to accommodate the diesel pipeline. This would increase the overall disturbance footprint on BLM-managed land. The diesel pipeline would increase potential for environmental damage in the case of a diesel pipeline rupture in the otherwise remote and undeveloped terrain. Alternative 3B would provide the need to retain new airstrips and gravel access roads during operations for diesel spill response capacity and would result in greater long-term ROW corridor and ancillary facilities footprint impacts to BLM-managed lands. The long-term need for the airstrips and gravel access roads in Alternative 3B would result in greater competition for subsistence resources due to increased access to the otherwise remote and undeveloped region. The increased helicopter surveillance of the diesel pipeline would also provide for greater disturbance to subsistence activities.

Alternative 2 North Option provides for less visual and direct physical disturbance to the INHT corridor as compared to Alternative 6A, Modified Natural Gas Pipeline Alignment: Dalzell Gorge Route. Alternative 6A involves the ROW corridor coincidence with the INHT in the Alaska Range through Rainy Pass and Dalzell Gorge, and the ROW corridor being closer to the BLM-managed Rohn Public Shelter Cabin. Alternative 2 involves the 'Jones alignment' which avoids the INHT in this area of the Alaska Range all together, as well as avoiding proximity to the Rohn Public Shelter Cabin.

5 PUBLIC INVOLVEMENT

Chapter 6 of the Final EIS describes consultation and coordination with agencies and public involvement opportunities for the EIS. A timeline and summary of milestones for the Project are included in the Section 1.1 (Background) of this document.

A public involvement plan was developed prior to scoping to provide the basis for the Corps and cooperating agencies to provide guidance for public outreach activities. The Project website (http://www.DonlinGoldEIS.com) was launched at the onset of the Project, and a Project newsletter was sent out that explained the NEPA/EIS process and how to participate. The Corps held numerous well-attended meetings, hearings, and public outreach presentations; and discussions with potentially affected tribal governments occurred throughout the NEPA process. Detailed information on public outreach activities, tribal coordination, and government-to-government consultation, including summary tables for meetings, are included in Chapter 6 of the Final EIS. The Corps' initiation of government-to-government consultation with federally recognized tribes is included in Appendix P of the Final EIS. Following public scoping, the Corps and cooperating agencies selected substantive impact issues identified during public and agency scoping for further analysis, and eliminated non-substantive issues from evaluation. Selected issues are listed in Table 2 of the Executive Summary of the Final EIS, and documented as Statements of Concern (SOCs) in the Scoping Report (Final EIS, Appendix B). SOCs are summary statements capturing a single substantive point that may have been expressed in a number of individual comments.

During the public comment period for the Draft EIS, the Corps received 529 unique submissions. Three form letters were received. Of these unique submissions, 17 were transcripts of the public meetings. Over 5,000 substantive comments were identified in submissions, which were then grouped into SOCs. A summary of the comment analysis process and tables addressing each SOC by resource area is included in the Comment Analysis Report (CAR), Appendix X of the Final EIS.

The Applicant's updated CMP (updated December 2017, included as Appendices J and M in the Final EIS) was open for public review and comment from April 27, 2018 through May 29, 2018 (SPN-1995-120). Comments on the Final EIS were received from the EPA, The Kuskokwim Corporation, Calista Corporation, Knik Tribal Council, Donlin Gold, the Center for Science in Public Participation (CSP2), and 13 members of the public. Many of the comments received were duplicative of comments previously received and addressed in the Final EIS, or Appendix X, the CAR. New substantive comments were received and responded to; see Attachment B1 for the Corps' analysis of these comments.

Additional BLM Public Involvement: The BLM considered public comment throughout the EIS process. BLM participated in public scoping and Draft EIS public meetings conducted by the Corps and Donlin Gold (listed in Chapter 6 of the Final EIS). The BLM also participated in agency scoping meetings that included Native Villages. It was through these public involvement opportunities that the BLM identified public issues of concern to incorporate into the EIS analysis and consequential outcome in the Final EIS.

Pursuant to ANILCA Section 810(a)(1) and (2), the BLM also conducted 12 hearings subsequent to many of the Draft EIS public meetings to hear and gather comments regarding potential impacts to subsistence use resulting from the alternatives considered in the Draft EIS. The ANILCA 810 hearings were conducted in the following communities: Aniak, Crooked Creek,

Anchorage, Bethel, Akiak, Quinhagak, McGrath, Nunapitchuk, Tyonek, Lower Kalskag, Holy Cross, and Chuathbaluk.

The BLM conducted a separate government-to-government inquiry regarding the Project. The BLM sent a letter of notification in August 2014 to the 66 tribes listed in Appendix P of the Final EIS, offering the tribes the opportunity to participate in formal government-to-government consultation with the BLM, apart from the Corps.

The BLM met with Calista and The Kuskokwim Corporation periodically throughout the development of the Donlin Gold Project EIS. The meetings involved consultation and updates on BLM involvement with the Project, and hearing issues or concerns regarding consequences of any potential BLM actions related to the proposal. Discussion topics included the various alternatives being considered, subsistence, the ANILCA 810 subsistence analysis, economics, ANCSA 17(b) public easements, NNIS, and public involvement, as well as our administrative protocol for necessary actions to implement the proposed Donlin Gold Project on BLM-managed lands.

6 MEANS TO MINIMIZE, AVOID, AND MITIGATE ADVERSE ENVIRONMENTAL IMPACT

6.1 APPLICANT'S PROPOSED MITIGATION (AVOIDANCE, MINIMIZATION, AND MITIGATION)

The Applicant provided a comprehensive statement of avoidance, minimization, and compensation in the CMP (revised Block 23, July 2018); included at Attachment B5 of this JROD. The Applicant has planned the proposed Project to avoid and minimize impacts to the WOUS during construction, operations, and closure phases of the Project. Due to the abundance of wetlands in the Project area, avoiding discharges into WOUS is not practicable. Donlin Gold has avoided or minimized fill impacts to wetlands and streams through facility design and optimization. A summary of the Applicant's measures to avoid and minimize impacts to WOUS is described below. The Applicant's proposed compensatory mitigation is discussed in Section 6.2.5.

6.1.1 AVOIDANCE AND MINIMIZATION

The following is a summary of the avoidance and minimization measures which are described fully in Block 23 of the final CMP:

6.1.1.1 MINE SITE

The 2017 PJD (Michael Baker 2016, 2017) for the Project shows that ridgetops and hillsides at higher elevations in watersheds are upland, while waters of the U.S. are more prevalent in valley bottoms and hillsides at lower elevations in watersheds. The Proposed Project infrastructure layout maximizes the use of uplands, while minimizing encroachment on WOUS to the extent practicable. Potential mine area impacts were reduced by placing facilities in fewer watersheds and WOUS. Facility placement and design are typically more efficient on flatter ground. However, to avoid WOUS, the facilities were placed on upland ridges as feasible.

The proposed locations of the WRF, TSF, mine facilities, Snow Gulch freshwater reservoir, material sites, and NOB and SOB stockpiles avoid anadromous fish habitat; however, while impacts to resident fish habitat (primarily Dolly Varden char) have been minimized, they could not be completely avoided. The location of the open pit is determined by the presence of ore and geotechnical constraints, which makes it immovable and irreplaceable in nature. Design criteria included access to the mineral resources; minimizing waste rock volumes; maintaining pit wall stability; and minimizing disturbance footprint. Studies were completed to determine the steepest practicable wall slopes to maintain stability, and consequently minimize the surface disturbance of the pit. The impacts to WOUS by the open pit would be unavoidable, and have been minimized to the extent practicable.

Potential locations for storage of waste rock considered placement of all waste rock in the American Creek valley, or splitting the waste rock storage between American Creek and Anaconda Creek or Snow Gulch. Siting the WRF within American Creek watershed provides the most practical option because of the proximity to the open pit to minimize transportation cost, and the ability to use the open pit to control runoff post mine closure. The WRF minimizes WOUS impacts with a compact footprint located in the upper watershed of American Creek.

General design criteria for the mine area facilities included sufficient space to accommodate mine facilities (e.g., crusher, processing facility, power plant, fuel storage, and laydown pads); proximity to the open pit, ore stockpile, and TSF to minimize ore and tailings transportation costs; geometrically designing pads with the lowest volumes of cut and fill; wetlands avoidance through strategic location of facilities; and factors such as hydrology, and soil stability. Locating the process facilities in the middle portion of the American ridge avoids all impacts to WOUS.

Material sites are necessary for the construction of mine facilities and roads. All material site locations were selected outside the floodplain of Crooked Creek to avoid impacts to anadromous fish. The sites identified provide high volume, high quality material, while minimizing access road distances. The amount of aggregate estimated to be required was minimized by designing facilities and roads that would need the least material to construct and maintain. The material site required to construct the Snow Gulch freshwater dam has been sited on a ridgetop where suitable material is present to avoid WOUS. In summary, although some material sites are located in WOUS, they were sited outside of the Crooked Creek floodplain and away from headwater streams.

6.1.1.2 TRANSPORTATION FACILITIES

Engineering design criteria for the mine access road specify a two-lane access road that minimized construction and maintenance costs; used the lowest volumes of fill; minimized drainage crossings and placed crossings perpendicular to flow; and located material sites close to the proposed road to reduce impacts of material site access roads.

Transportation facilities are located on upland ridgetops instead of wetter hillsides and valleys, as practicable, or sited away from WOUS. Examples of this are the Donlin-Jungjuk Road, camp, and airstrip. Transportation facilities require the development of 13 material sites, five of which would impact WOUS. Material site boundaries were adjusted to avoid and minimize impacts to WOUS, as practicable. The location of the transportation facilities limits the number of watersheds disturbed. The airstrip is sited on a ridgetop to minimize the amount of cut and fill in WOUS.

The port location selection criteria included distance to the mine to minimize road footprint and transportation costs; avoidance of WOUS.; adequate depth to dock and maneuver barges throughout the summer season without the need to dredge; avoidance of cultural resources; minimization of the amount of onshore grading; minimization of the probability of water or ice jams overtopping the wharf during the freshet; and sizing to fit 1,000 stackable containers. The DA permit application notes that the proposed Angyaruaq (Jungjuk) Port would impact 30.5 acres including 13.5 acres of unavoidable impacts to WOUS. The Angyaruaq (Jungjuk) Port footprint was reduced by planning to store cargo temporarily rather than permanently for transport to and from the mine; transporting cargo in stackable containers; and stacking loaded containers up to three high and empty containers up to six high. Following mine closure, the port will be reclaimed by removing the wharf fills, including sheet pile, and the area will be re-contoured leaving the access road and a "beach-type" landing in place.

Where practicable, facilities will share space or accommodate multiple uses to minimize the project ground disturbance footprint: the proposed camp facilities will be constructed within the disturbance footprint of Material Site-01; non-wetland material sites will be used for the temporary storage of construction equipment, refueling, and overburden storage during

construction; the airport is placed in the closest practicable location to the Donlin-Jungjuk Road and on a ridgeline in predominantly uplands. The Donlin-Jungjuk Road will be used to gain access to the airport with a short spur road. Transmission lines are designed parallel to roads to reduce access route footprints and the number of drainages disturbed.

The Donlin-Jungjuk Road is designed to minimize the number of stream and drainage crossings by following upland ridgelines to the extent practicable (Figure 4). Where stream crossings were unavoidable, the road approaches are designed to be perpendicular to the flow to minimize impacts to WOUS. Bridge structures and/or culverts will be installed at each stream and drainage crossing to facilitate vehicle passage and minimize impacts. Bridge structures will be installed at six major stream crossings where fish presence has been documented. Each bridge is designed to span the width of the creek, either as a steel span or steel span arch, and to account for high-water flow conditions. Riprap will be placed along the length of the arch or wall bases on both the upstream and downstream ends of the structure to protect the arch bases from erosion. Minor stream crossings and drainages will have appropriately sized culverts installed to ensure cross flow and maintain hydrologic connectivity.

6.1.1.3 NATURAL GAS PIPELINE FACILITIES

The proposed pipeline area facilities include a natural gas pipeline and fiber optic cable, compressor station, metering station, pig launcher/receiver site, check valves, and associated construction related support facilities such as construction camps and temporary airstrips, construction access roads, material sites, pipeline storage yards, shoofly roads, HDD workspaces, water extraction sites, work pads, and the pipeline construction ROW.

Design considerations for the proposed pipeline route include selection of the shortest pipeline length possible to minimize project footprint, while avoiding the following to the extent practicable: geotechnical hazards; hydrological hazards; known environmental and cultural sites; the INHT; and potential land use conflict areas. The pipeline route and ROW design also consider seasonal construction schedules; constructability; and avoidance and minimization of impacts to WOUS.

The pipeline has been designed to be installed primarily underground, eliminating the need for road access, which would create permanent roads and long-term impacts along the pipeline route.

All pipeline stream crossings were analyzed for flow, width, and characterization to determine crossing modes to avoid major diversions in rivers. HDD methods are proposed to install the pipeline underneath the Skwentna, Happy, Kuskokwim, George, East Fork George and the North Fork George rivers. Excavated cuttings from HDD sites will not be placed in waterbodies or in drainages. Without HDD crossings, the crossings would likely be aerial and require a larger disturbance footprint for gravel pads necessary for work areas, both of which would create additional potential impacts. Criteria for HDD stream crossing locations include 100-year flood recurrence interval, depth of cover, setbacks for pipe exposure, bank mitigation/restoration to prevent erosion, bank protection, fish habitat and recreation value, and adverse impacts to WOUS.

The pipeline area includes 69 material sites totaling 1,008-acres, of which six of the pipeline area material sites impact wetlands and WOUS (10.4 acres of wetland impacts). Donlin Gold developed a Transportation and Pipeline Area Wetland Impact Minimization Work Plan

detailing the restoration for these areas beyond the reclamation requirements established by the State of Alaska.

Work pads will be the minimum size necessary for equipment and construction activities and will be sited in uplands along the pipeline ROW. Temporary construction camps and airstrips are sited in uplands. Existing winter trails will be integrated into the winter ice routes for transportation of pipeline construction infrastructure. The timing of the construction and use of ice roads eliminates the need for permanent gravel access roads and construction pads. The pig launcher/receiver site is sited in uplands.

Many facilities along the pipeline will be multi-purpose to minimize the extent of the disturbance footprint. These co-located or progressively-located facilities include: material sites, laydown areas, equipment storage, staging areas, fueling areas, pipeline storage yards, material storage sites, camp units, and airstrips.

Erosion control and construction methods will be described in the SWPPP, and will comply with the State of Alaska 2016 Construction General Permit for Stormwater Discharges for Large and Small Construction Activities. BMPs for embankment stabilization, including contouring and seeding will be required project-wide to reduce embankment erosion and potential sediment runoff into WOUS. Construction methods in wetlands will minimize construction related effects on wetlands, including marking wetland boundaries and clearing limits, winter construction to the maximum extent practicable, confining activities to the construction zone to prevent disturbance of surrounding vegetation, maintaining slope stability, controlling erosion, using mats or other ground protection during non-winter months as practicable, maintaining existing wetland hydrology, and constraining permanent facilities to uplands.

Most areas underlain by permafrost will be crossed during winter to minimize disturbance from trenching. A seasonal construction timeline minimizes impacts to WOUS by timing construction activities in lowlands in the winter and in uplands during the summer. Approximately 60 percent of the total pipeline length will be constructed during frozen winter conditions to minimize wetland and soil disturbances from equipment. Snow and ice roads with frost packing will provide a stable surface for equipment to operate.

6.2 CORPS' MITIGATION DETERMINATION

6.2.1 COMPENSATORY MITIGATION REQUIRED

Is compensatory mitigation required? ☒ yes ☐ no

6.2.2 MITIGATION BANK

Is the impact in the service area of an approved mitigation bank? ☒ yes ☐ no

4.26 acres of wetland impacts would occur within the primary and secondary service area of an approved mitigation bank.

Does the mitigation bank have the appropriate number and resource type of credits available?

☒ yes ☐ no ☐ n/a

6.2.3 IN-LIEU FEE PROGRAM

Is the impact in the service area of an approved in-lieu fee program? ☒ yes ☐ no

4.91 acres of wetland impacts would occur within the service area of an approved in-lieu fee program. The 4.26 acres of wetland impacts identified above in Section 6.2.2 overlap with the 4.91-acre area of wetland impacts that would occur within the service area of an approved in-lieu fee program.

Does the in-lieu fee program have the appropriate number and resource type of credits available? ☒ yes ☐ no ☐ n/a

6.2.4 COMPENSATORY MITIGATION OPTIONS

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

6.2.5 PROPOSED COMPENSATORY MITIGATION

Donlin Gold submitted a Conceptual CMP in August 2015. A revised draft CMP was included in the December 2017 DA permit application (Block 23). In response to feedback from the Corps, EPA, and USFWS, Donlin Gold submitted a final CMP in July 2018 (Attachment B5 of this JROD).

The Corps is requiring compensatory mitigation for permanent loss of aquatic resources as a result of fill impacts from the proposed Project totaling 2,877 acres of wetlands, 3 acres of fill below the ordinary high water mark of the Kuskokwim River, and 175,316 linear feet of streams. Mine Site and Transportation Corridor components would permanently fill 2,677 wetland acres, 3 acres of fill below the ordinary high water mark of the Kuskokwim River, and 173,953 linear feet of streams, and the Pipeline would permanently fill 200 wetland acres and 1,363 linear feet of streams.

Pipeline facilities would temporarily impact 538 wetland acres and 53,346 linear feet of stream. These wetlands and steams would be restored prior to finalizing construction and are expected to return to their previous conditions shortly thereafter. Additionally, Pipeline construction would not impact more than 0.03 percent of any watershed it crosses. Therefore, the Corps is not requiring compensatory mitigation for the temporal loss of wetland and stream functions. Some project activities in wetland areas include vegetation clearing, winter roads, and work areas where no placement of fill would occur. For these activities, the Corps is not requiring compensatory mitigation.

All but 4.91 acres of the proposed Project impacts occur outside of the service areas of existing mitigation banks or In-Lieu fee service areas. Therefore, Donlin Gold researched permittee responsible options focusing first on the immediate watershed (HUC-10), and then systematically assessing larger hydrologic units for compensatory mitigation opportunities.

They evaluated six historical mining operations that remediation, restoration and preservation could feasibly be conducted. Donlin Gold considered the sites in terms of practicability including availability, feasibility and cost, land ownership and long term durability, and the potential for ecological enhancement to wetlands areas, streams and riparian areas. Efforts also considered out-of-kind and off-site reclamation and restoration of the Newtok village, community water and wastewater system improvements in the Yukon-Kuskokwim (Y-K) region, solid and hazardous waste management in the Y-K region, erosion control projects in the Kuskokwim River watershed, all-terrain vehicle trail hardening projects in the Y-K region and non-native species plant removal in the Crooked Creek watershed. Donlin Gold proposes two Permittee-Responsible Mitigation (PRM) projects. The proposed compensatory mitigation projects are summarized below.

6.2.5.1 CHUITNA PRM PLAN

The Chuitna PRM Plan would preserve 5,870 acres, of which 3,269 acres are wetlands and ponds, 418 acres of stream and river area (258,056 linear feet), and 2,183 acres of upland and riparian buffers in the Chuitna River watershed. The applicant proposes to protect this area long term through a deed restriction. See Tables 5 and 6 for a summary of acres and miles of proposed compensatory mitigation.

The Chuitna preservation area contains wetlands and aquatic resources that are unique to the area and provide valuable ecosystem functions at the watershed level. The preservation area includes headwater streams flowing through large bogs, connecting to intermediate streams with highly productive salmon and riparian habitat, into the Chuitna River, and to its outlet through an estuarine area into Cook Inlet.

Overall, 99 percent (5,852 acres) of the preservation area is located within the Chuitna River HUC-10 watershed, while less than 1 percent (18 acres), at the mouth of the Chuitna River, is located within the Old Tyonek Creek-Frontal Cook Inlet HUC-10 watershed. The most common wetland vegetation type in the two HUC-10 watersheds is freshwater forested/shrub followed by estuarine habitat, the majority of which is within the Old Tyonek Creek-Frontal Cook Inlet watershed. The most common wetland type in the preservation area is ericaceous shrub bog-string bog and low shrub bogs.

The wetland systems within the preservation area include large areas of slope hydrogeomorphic (HGM) wetlands including ericaceous shrub bog-string bog wetlands, riverine HGM riparian wetlands, estuarine fringe HGM wetlands, and a small number of depressional HGM wetlands.

- Slope HGM Wetlands – The largest HGM wetland type in the preservation area is slope HGM. This wetland type covers 2,661 acres, or about 45 percent of the area. Lone Creek, a tributary of the Chuitna River, flows through or near the majority of the slope HGM wetlands in the preservation area. These wetlands contribute to the stream base flow and nutrient outputs, which then flow to the Chuitna River.

  Ericaceous Shrub Bog-String Bog Wetlands – A type of slope HGM wetlands also known as patterned fens, these wetlands are a unique wetland type to the area, and only occur in a few very specific places worldwide. 802 acres of the slope HGM wetlands in the preservation area are ericaceous shrub bog-string bog wetlands.

- Riverine HGM Wetlands – Riverine HGM wetlands occur in floodplains and riparian areas. The dominant water sources are overbank flow from the channel or hyporheic flow between the stream and wetlands. The preservation area contains 500 acres of riverine wetlands.
- Estuarine Fringe HGM Wetlands – Estuarine fringe HGM wetlands occur along coastlines and are under the influence of sea water. The preservation area contains 29 acres of estuarine fringe HGM wetlands surrounding the outlet of the Chuitna River into Cook Inlet.
- Depressional HGM Wetlands – 79 acres of the preservation area as depressional HGM wetlands. These wetlands occur in topographic depressions.

The streams and rivers in the preservation area provide habitat for chinook, coho, chum, and pink salmon, as well as limited habitat for sockeye salmon, Dolly Varden, and rainbow trout. The mainstem of the Chuitna River includes Chinook, coho, chum, and pink salmon spawning habitat, and rearing habitat for all five Pacific salmon species. Tributaries to the Chuitna River within the Preservation Area also have documented use by all five Pacific salmon species. Chinook salmon was designated by the Alaska Department of Fish and Game (ADF&G) in 2010 as a stock of concern in the Chuitna River. Chinook salmon escapement in the Chuitna River had dropped to less than 600 fish. ADF&G manages the species to achieve an escapement goal range of 1200 to 2900 fish. In 2016, the escapement of Chinook salmon was documented by ADF&G at 1372 fish. The tributaries and main channel of the Chuitna River contain high-quality fish habitat including large woody debris, gravels, boulders, runs, riffles, and pools for adult salmon spawning and juvenile salmon foraging and resting. Acquisition of the Chuitna River drainage properties would preserve 148,632 linear feet (28.1 miles) of stream channel documented as Pacific salmon habitat including spawning, rearing, and migration habitats in five streams. An additional 47,660 linear feet of anadromous stream channel was identified by Donlin Gold consultants during the July 2018 field assessment of the preservation area. However, these field verified anadromous stream reaches have not been official documented in the ADF&G Anadromous Waters Catalog.

The preservation area includes 104,544 linear feet (19.80 miles) of the mainstem of the Chuitna River, within which, 49,262 linear feet (9.33 miles) of Chinook salmon spawning habitat, 69,115 linear feet (13.09 miles) of coho spawning habitat, 44,088 linear feet (8.35 miles) of chum spawning habitat, and 104,544 linear feet (19.80 miles) of pink spawning habitat are documented. The entire 104,544 linear feet (19.80 mile) reach contains documented rearing for Chinook and coho salmon juveniles. Some reaches of the mainstem are also documented as rearing habitats for other Pacific salmon, including 100,690 linear feet (19.07 miles) for sockeye, 12,514 linear feet (2.37 miles) for chum, and 13,253 linear feet (2.51 miles) for pink salmon.

In addition to the mainstem Chuitna River habitats, the preservation area includes important Pacific salmon habitats in Bass Creek, Middle Creek, Lone Creek and an unnamed anadromous stream (No. 247-20-10010-2020-3008).

While only 317 linear feet (0.06 miles) of Bass Creek fall within the preservation area, juvenile Chinook, sockeye, coho, and chum salmon use this reach for rearing.

The lower 1,426 linear feet (0.27 miles) of Middle Creek fall within the preservation area and are documented spawning habitat for Chinook, coho, and pink salmon, as well as rearing habitat for Chinook and coho. Unspecified pink salmon habitat is also documented in this reach.

Lone Creek has 26,928 linear feet (5.10 miles) and 15,418 linear feet (2.92 miles) of its downstream tributary stream within the preservation area. The entire 26,928 linear feet (5.10 mile) reach of Lone Creek is documented as important Chinook salmon spawning habitat and Chinook and coho rearing habitat. Sockeye, chum, and pink salmon are documented throughout the reach, but habitat uses have not been specified. The entire 15,418 linear feet (2.92 mile) reach of the Lone Creek tributary within the preservation area is documented as important coho salmon rearing habitat.

Salmon smolt populations were estimated for coho salmon in the Chuitna River watershed and specifically for Lone, Middle and Bass creeks in 2008 through 2011. Average Chuitna River populations ranged from 37,424 to 44,794 coho smolt, with Bass Creek accounting for 19 to 31 percent of production and Middle Creek accounting for 12 to 17 percent of total production.

The preservation area also protects buffers and riparian areas adjacent to wetlands and streams. These areas provide important ecosystem functions and values. Buffers and riparian areas can be important for groundwater recharge, sometimes exceeding adjacent wetlands due to more permeable soil. Areas directly adjacent to slope HGM wetlands support groundwater discharge functions, helping to maintain the downgradient wetlands. Upland buffers adjacent to wetlands also protect and maintain wetland function. They act to slow and stop sediment and pollutants entering wetlands, provide organic matter to wetlands, and maintain wildlife habitat and movement corridors.

Table 5: Compensatory Mitigation Proposed for Wetlands by HGM Class and Cowardin Group (Acres)

	Classification	Chuitna Preservation Area	Upper Crooked Creek Restoration	Upper Crooked Creek Preservation
Wetland HGM (Cowardin Classes)	Depressional (PAB, PEM, PFO, PSS, PUB)	79	0	1.6
	Estuarine Fringe (E2EM, E2US)	29	0	0
	Flat (PEM, PFO, PSS)	0	0	32.7
	Riverine Non-Anadromous (PEM, PFO, PSS, PUB)	76	92.95	0
	Riverine Anadromous (PEM, PFO, PSS, PUB)	424	0	17.9[1]
	Slope (PEM, PFO, PSS)	2,661	0	11.6
Group Totals	**Wetlands and Ponds**	3,269	92.95	63.8
	Stream and River Area	418	2.75	0.9
	Upland Riparian and Buffers	2,183	16.8	44.1
	Total of Parcel	**5,870**	**112.5**	**109**

Table 6: Compensatory Mitigation Proposed for Streams in Linear Feet (Miles)

HGM	Chuitna Preservation Area	Upper Crooked Creek Restoration	Upper Crooked Creek Preservation
Cataloged Anadromous Stream Channel	148,632 (28.1)	0	0
Field Reported Anadromous Stream Channel	47,660 (9.1)	0	0
Non-Anadromous Stream Channel	61,746 (11.7)	8,982 (1.7)[1]	4,036 (0.8)
Total	**258,056 (48.9)**	**8,982 (1.7)**	**4,036 (0.8)**

Notes:

1. The return of Anadromous salmon to restored streams cannot be accurately predicted. Post-restoration monitoring will verify presence or absence of anadromous fish.

Numbers are rounded.

6.2.5.2 UPPER CROOKED CREEK PRM PLAN

Donlin Gold proposes to restore historical gold placer mined areas in the upper Crooked Creek watershed. Placer tailings and overburden have been deposited in several locations within the various floodplains, causing adverse impacts to aquatic resources. Water diversion ditches were constructed, resulting in the channeling of surface and shallow groundwater flow from the original stream paths. An estimated 8,700 linear feet (1.64 miles) of stream channels have been mined and the abutting wetlands degraded.

The Upper Crooked Creek PRM plan would restore, enhance and preserve 92.95 acres of riverine wetlands and 2.75 acres of stream and river area (8,982 linear feet). This PRM plan would preserve an additional 63.8 acres of existing wetlands, 0.9 acre of existing stream and river area (4,036 linear feet), and 44.1 acres of upland riparian buffer. Combined this PRM plan would encompass a total area of 221.5 acres, which includes 156.8 acres of wetlands and 13,018 linear feet of streams. The applicant proposes to protect this area long term through deed restriction. This project would be initiated at the start of Mine Site construction.

Four distinct restoration projects are described within the 221.5-acre Upper Crooked Creek PRM Plan (Plan) boundary:

1. Restoration of lower Quartz Gulch: The proposed restoration activities include filling the diversion ditch features in Quartz Gulch and the Donlin Creek floodplain, directing the flows in the upper portion of Quartz Gulch to the secondary stream channel along the original stream path, and allowing the backwatered flows to return to Donlin Creek via the abandoned oxbow in the lower end of the system. Elimination of the mining ditch in the upper portion of the gulch will re-establish the historical channel along the valley floor. This movement of the main channel should return the stream to a more stable hydrologic regime and remove the hydraulically losing reach from the system. The removal of both ditch sections will result in expanded floodplain overbank flow function for the re-established stream sections in Quartz Gulch and Donlin Creek.

2. Restoration of lower Snow Gulch: To restore this stream system, a new channel will be constructed between the lower and middle ponds from the substrate materials that originally formed the historical channel. The new channel will exhibit scour and sediment transport properties consistent with the original sediments, geometry, gradients, and resultant flood flow velocities. The new channel will be designed to mimic the parameters of the pre-mining system based on calculations from undisturbed sections of Snow Gulch and from analysis of flood flow hydraulics. Portions of the regionally rare and productive habitat provided by the middle ponds will be retained.

In Snow Gulch, the upper and middle excavated ponds will be enhanced to create additional fish and quiescent water habitat. A portion of the northern end of the middle pond will be filled to gain additional length for the proposed re-constructed channel. Additional length is needed for the created channel to approach the gradient parameter of the original system in the sections that are now flat, open water ponds. A sinuous channel routing will be chosen to minimize cut and fill requirements, following a detailed survey of the area prior to construction. Stream channel substrate will be locally available fill materials with sufficient fines (greater than 20 percent) to sustain surface flows, and may be augmented with larger rock and woody debris features as needed to provide aquatic invertebrate substrate, hydraulic cover, low flow channelization for fish, and grade control to maintain channel stability.

A fish passage conveyance may be required on at least one access route linking the Lyman airstrip, which runs along the east side of Snow Gulch, with the facilities on the southwest side of the middle pond. If the structure is located in the backwater between the middle ponds, a simple, large diameter, round culvert will be sufficient. If this structure is located along the stream channel, the final design will contain provisions for a stream simulation designed conveyance with width equal to 120 percent of the stream bank full width.

The historical connection from Snow Gulch to Donlin Creek is currently blocked by a berm on the west side of the lower pond. To re-establish the connection with the Donlin Creek floodplain, the berm surrounding the west and north ends of the lowest pond will be removed and the current connection from the pond to Donlin Creek will be filled. Removal of the berm will funnel stream flow back into the historical channel west of the pond, and rewater off-channel habitat. The lower pond will be excavated and provide additional settlement area to improve downstream water quality.

3. Restoration of the wash plant tailings area along Crooked Creek, between Snow and Ruby Gulches: The Crooked Creek floodplain under the effluent discharge fan will be reshaped and re-contoured into a condition to restore wetlands back to the area. Materials will be removed down to the underlying organic layers that mark the original vertical extent of the floodplain. The berm along the settlement area will be left to maintain water levels in the restored areas. The coarse-grained tailings pile and other areas will be regraded and re-contoured for stability (minimum 2:1 slopes), and augmented with finer materials to promote vegetation growth. Disturbed areas will be revegetated.

4. Restoration of lower Ruby and Queen Gulches: Restoration activities for Ruby and Queen gulches will include restoring portions of the Ruby Gulch stream channel, removing overburden stockpiles in the Crooked Creek floodplain, filling the drainage ditch in upper Queen Gulch to reroute the stream to the valley floor, reshaping the ponds to provide increased shallow water and deep water habitats, removing constricted areas where beaver activity can easily block fish passage, restoring a floodplain elevation outlet from the ponded area through

abandoned oxbows into Crooked Creek, and filling in the long drainage ditch currently connecting the ponded area to Crooked Creek. Disturbed areas will be re-contoured into shallow slopes running down to the ponds, allowing re-establishment of the floodplain and diverse aquatic habitats. Disturbed areas will be revegetated.

Restoration of Ruby Gulch will be similar to that of Snow Gulch except on a smaller scale. Re-establishing the historical floodplain gradient will involve refilling the area with appropriate substrate, shaping an appropriately sized channel, adding habitat features and grade control, and revegetating disturbed areas. Fish passage structures may be required where Ruby and Queen Gulches are crossed by the existing mining access road.

Reconnection of Ruby and Queen Gulches to the Crooked Creek floodplain is more complex than at Snow Gulch. The pond system fed by the gulches is separated from the Crooked Creek floodplain by a steep-sided berm constructed from the overburden materials removed from placer mining operations. North of the dogleg at the north end of the berm is a large deposit of overburden tailings that will be left substantially intact to prevent the main Crooked Creek channel from shortcutting through the ponds. At the dogleg, additional water is added to the system from a shallow, surface water basin and the tailings deposit is reduced to a simple berm separating the ponds from the floodplain. This berm would be substantially removed south of the dogleg so the pond features would be joined hydraulically with the existing natural oxbows along Crooked Creek. The average elevation of these oxbows (382 feet) appears consistent with the proposed water level in the ponds.

Restoration of Queen Gulch has been developed while considering the predicted drawdown effects from the proposed open pit. Rerouting of flow in Queen Gulch will be similar to Quartz Gulch with available side cast used to refill the ditch, rerouting the flows to the old stream channel location and revegetation of disturbed areas. Expansion of two small ponded areas in the lower reach will enhance resident fisheries habitats. The flows from Queen Gulch will be re-directed into the square pond. A fish passage conveyance or low water ford will be provided at the road crossing. Berms around the south and west sides of the square pond will be removed to re-connect this pond with the floodplain and the pond margins will be regraded similar to the more northern ponds. An outfall will be established to an existing oxbow in the northwest corner of the square pond.

Finally, the ditches connecting the northern ponds to the square pond and the diversion ditch, which connects the pond system to Crooked Creek, will be refilled with the side-cast materials and revegetated.

These four restoration projects would increase the function and sustainability of the watershed and its fisheries because they:

- Re-establish and rehabilitate historical stream and wetland functions present prior to placer mining;
- Re-establish historical and establish new stream, pond, and off-channel anadromous and resident fish habitat; and
- Have a high likelihood of success to restore naturally occurring, self-sustaining systems within the Crooked Creek watershed because they are based on a stream functional framework.

All four restoration projects are located in the same 10-digit HUC watershed as the majority of the permanent aquatic resources impacts from the Project.

6.2.5.3 IN-LIEU FEE MITIGATION PLAN

A portion of the pipeline component of the Project would impact 4.91 acres of wetlands within the service area of the Great Land Trust (GLT) in-lieu fee program. Specifically, the project would impact 1.78 acres of riverine type wetlands and 2.76 acres of slope and depression type wetlands within the GLT service area. The applicant has proposed to offset these impacts at a 2:1 ratio by purchasing 9.8 credits from the GLT in-lieu fee program. The GLT does have the appropriate type and amount of released wetland credits for purchase. The applicant proposes to purchase these credits prior to construction.

6.2.6 MITIGATION SUMMARY

The Applicant has avoided and minimized to the maximum extent practicable; however, there would be unavoidable impacts to WOUS as a result of the Project, including:

- Permanent fill impacts to 2,877 acres of wetlands;
- Permanent fill impacts to 3 acres of the Kuskokwim River;
- Permanent fill impacts to 175,316 linear feet of streams; and
- Temporary impacts to 538 acres of wetlands; and
- Temporary fill impacts to 53,346 linear feet of streams.

In accordance with 2008 Mitigation Rule, compensatory mitigation is required to offset unavoidable Project impacts to WOUS. Compensatory mitigation is therefore required for the unavoidable permanent fill impacts listed above. The Corps has worked with Donlin Gold in the development of an appropriate CMP for compensation of unavoidable permanent impacts to WOUS.

Wetland minimization activities, discussed above, include restoring wetlands following placement of fill by removing the fill at the end of pipeline construction and at the end of the mine life, and returning the areas to functioning wetlands similar to pre-pipeline construction and pre-mining conditions. Additionally, no compensatory mitigation is being proposed for vegetation clearing, winter roads, and work areas where no placement of fill would occur in WOUS.

Donlin Gold has evaluated all available and practicable options to assure compliance with the provisions of the 2008 Mitigation Rule and the 1994 Alaska Wetland Initiative (EPA et al. 1994).

Donlin Gold evaluated both the Su-Knik Mitigation Bank and the GLT in-lieu fee program. The Pipeline component has higher impacts to wetlands within the GLT service area. In addition, the GLT has the appropriate types of released credits available for purchase. It is appropriate for Donlin Gold to purchase 9.8 released credits from the GLT in-lieu fee provider to offset 4.91 acres of impact as proposed.

As discussed above, the majority of the proposed project impacts occur outside of the service areas of existing mitigation banks and in-lieu fee service areas. Donlin Gold researched PRM alternatives, focusing first on the immediate watershed (HUC-10), and then systematically

assessing larger hydrologic units (e.g., HUC-08, HUC-06, HUC-04) for compensatory mitigation opportunities.

Donlin Gold identified the Upper Crooked Creek PRM Restoration project located in the same watershed of the proposed impact. Implementation is proposed to yield substantive, near-term benefits to aquatic resources resulting in restoration of 92.95 acres of wetland, 8,982 linear feet of stream, 16.8 acres of riparian buffer and would preserve an additional 63.8 acres of existing wetlands, 4,036 linear feet of stream, and 44.1 acres of riparian buffer.

The Chuitna PRM Preservation Plan was determined to yield the optimal ecological increase in functions and services resulting in the preservation of 5,870 acres, of which 3,269 acres are wetland and ponds, 258,056 linear feet of stream and 2,183 acres of riparian buffers.

Overall, the compensatory mitigation described herein would purchase 9.8 released credits from GLT In-Lieu fee provider, restore 92.95 acres of wetlands, 8,982 linear feet of streams, 16.8 acres of riparian buffer and preserve a total of 3,425.75 acres of wetlands and 271,074 linear feet of streams and 2,243.9 acres of riparian buffer. The proposed compensatory mitigation 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. Based on the information contained above and evaluated throughout this JROD, the Corps concludes that the Applicant's proposed mitigation plan adequately compensates for the Projects' impacts on WOUS and the mitigation described above would be required as outlined in Section 6.2.8 below.

6.2.7 OTHER MITIGATIVE ACTIONS

Mitigation and monitoring measures listed in Sections 5.5 and 5.7 of the Final EIS were developed for consideration by the Corps, BLM, and cooperating agencies to further minimize Project impacts, as reasonable and practicable. However, as noted in Section 5.5 of the Final EIS, mitigation identified in the EIS does not necessarily have to be required by the federal agencies in their RODs. For example, Council on Environmental Quality (CEQ) guidance uses terms such as "reasonable, practicable, and appropriate" when considering potential mitigation and permit conditions. In addition, there may be potential mitigation measures identified in the EIS that are not within the federal agencies' authority to require as a condition to a permit or are otherwise not reasonably enforceable.

The Corps has reviewed the measures identified in the Final EIS (Table 5.5-1A and 5.7-1A) that were assessed as both effective and reasonable/practicable and that are within the Corps' authority to require. The Corps has determined that the special conditions identified in Section 6.2.8 below and the compensatory mitigation specified in Section 6.2.5 above are sufficient to avoid and minimize potential adverse impacts and to compensate for unavoidable adverse impacts to the aquatic ecosystem, and to ensure that the Project would not be contrary to the public interest. The intent of the mitigation measures, ascribed to the Corps, identified in Table 5.5-1A and 5.7-1A have been addressed through the Applicant's proposed CMP, including avoidance and minimization measures, by special conditions outlined below in Section 6.2.8, or adopted as conditions of other state and federal permitting requirements.

6.2.8 SPECIAL CONDITIONS OF THE CORPS PERMIT

In addition, in order to comply with the 404(b)(1) guidelines, and to ensure the Project is not contrary to the public interest, the following special conditions will be carried on in the DA permit:

1. The permittee agrees to provide all contractors associated with construction of the authorized activity a copy of the permit and drawings. A copy of the permit will be available at the construction site at all times.

Rationale: *This special condition is required to ensure compliance with the permit, and to minimize impacts to adjacent wetlands and other WOUS as a result of the permitted project (33 CFR 320.4(b) and 40 CFR 230.41).*

2. The permittee shall ensure that the project minimizes alterations to water circulation patterns to the extent practicable. If it is determined by the Corps that the project negatively impacts the hydrology within the wetland, the Permittee may be required to take additional measures (i.e. install additional depressed road beds, culvert(s), or a similar water conduit) beneath the road to re-establish the hydrology of the area to that of pre-construction conditions.

Rationale: *This condition is required to minimize impacts to adjacent wetlands and other WOUS as a result of the permitted project (33 CFR 320.4(b) and (l) and 40 CFR 230.41).*

3. Prior to commencement of construction activities within WOUS, the Permittee shall clearly identify the permitted limits of disturbance at the project site with highly visible markers (e.g., construction fencing, flagging, silt barriers). The permittee shall properly maintain such identification until construction is complete and the soils have been stabilized. The permittee is prohibited from conducting any unauthorized Corps-regulated activity outside of the permitted limits of disturbance (as shown on the permit drawings).

Rationale: *This condition is required to minimize impacts to adjacent wetlands and other WOUS as a result of the permitted project (33 CFR 320.4(b) and (l) and 40 CFR 230.41).*

4. The permittee shall submit a signed compliance certification to the Corps within 60 days following completion of the authorized work and any required mitigation. The certification will include: 1) A copy of this permit; 2) A statement that authorized work was done in accordance with the Corps authorization, including any general or specific conditions; 3) A statement that any required mitigation was completed in accordance with the permit conditions; 4) The signature of the Permittee certifying the completion of the work and mitigation.

Rationale: *This special condition is required to ensure compliance with the permit and special conditions and required mitigation is being accomplished.*

5. The permittee understands and agrees that the DA permit has been issued based upon the Permittee's intended purpose to produce gold from the Donlin deposit ore reserves using mining processes, infrastructure, logistics, and an energy supply(s) practicable for application in remote western Alaska in accordance with the permitted plans. The permittee recognizes that its commitment to construct and operate the mine pursuant to the Project details described in the DA permit application.

Rationale: *This special condition is required to ensure applicant understands the Corps permit decision was based on the information supplied by the Applicant for the Corps to evaluate.*

6. Prior to the initiation of any work authorized by this permit, the Permittee shall install erosion control measures along the perimeter of all work areas to prevent the displacement of fill material outside the authorized work areas into WOUS. Immediately after completion of the final grading of the land surface, all slopes, land surfaces, and filled areas shall be stabilized using sod, degradable mats, barriers, or a combination of similar stabilizing materials to prevent erosion. The erosion control measures shall remain in place and be maintained until all authorized work is completed and the work areas are stabilized.

Rationale: *This condition is required to prevent adverse impacts to wetlands and other WOUS outside of the permitted project area (33 CFR 320.4(b) and (d), 40 CFR 230.21(b), and 40 CFR 230.73(c)).*

7. No fill material, equipment or construction materials shall be stockpiled or stored on wetlands that do not have DA authorization for those activities, as shown on the project plans.

Rationale: *This condition is required to prevent the placement of fill, or anything that may have the effect of fill, outside the permitted area; thereby, minimizing the impacts to wetlands and preventing sedimentation outside of the permitted area [40 CFR PART 230.70 and 40 CFR PART 230.77(a)].*

8. The Permittee shall comply with the federal ESA, the Permittee must implement all of the mitigating measures identified in the enclosed USFWS letter of concurrence (FWS 2017-I-0343, dated November 2, 2017) and NMFS letter of concurrence (POA-1995-120, NMFS #AKR-2018-9745, dated March 29, 2018), including those ascribed to the Corps therein. If the Permittee is unable to implement any of these measures, the Permittee must immediately notify the Corps, the USFWS Office, and the NMFS so we may consult as appropriate, prior to initiating the work, in accordance with federal law.

Rationale: *This condition is required to reduce the likelihood of adverse impacts to species protected under the Endangered Species Act and to comply with the Act (Section 7 of the ESA and 40 CFR 230.30).*

9. The Permittee shall implement the attached Programmatic Agreement, entitled "Programmatic Agreement by and among the U.S. Army Corps of Engineers, U.S. Bureau of Land Management, Advisory Council on Historic Preservation, Alaska State Historic Preservation Officer, Alaska Department of Natural Resources, and Donlin Gold, LLC Regarding the Donlin Gold Project", dated June 28, 2018, in its entirety (see Attachment A2). The Corps has been designated the lead federal agency responsible for implementing and enforcing the Programmatic Agreement as signed. If the Permittee fails to comply with the implementation and associated enforcement of the Programmatic Agreement the Corps may determine that the Permittee is out of compliance with the conditions of the Department of the Army permit and suspend the permit. Suspension may result in modification or revocation of the authorized work.

Rationale: *This condition is required to avoid impacts to historic properties/cultural resources and comply with Section 106 of the National Historic Preservation Act. (Section 106 of NHPA, 33 CFR 320.4(e), and 33 CFR 325 Appendix C).*

10. Should any other agency require and/or approve changes to the work authorized or obligated by this permit, the Permittee is advised a modification to this permit may be required prior to initiation of those changes. It is the Permittee's responsibility to request a modification of this permit. The Corps reserves the right to fully evaluate, amend, and approve or deny the request for modification of this permit.

Rationale: *This special condition is required to ensure compliance with the permit, and to minimize impacts to adjacent wetlands and other WOUS as a result of the permitted project (33 CFR 320.4(b) and 40 CFR 230.41).*

Compensatory Mitigation

11. Mitigation Plan. Prior to initiation of construction activities within WOUS, Donlin Gold shall implement the mitigation plan "Compensatory Mitigation Plan", dated July 2018, a subpart of Block 23 of the DA application, proposed by Donlin Gold and which is incorporated herein by reference (also included as Attachment B5 of this JROD). The permittee must implement the mitigation in accordance with the plan and any permit conditions. If conflicts occur between this mitigation plan and any permit conditions, the permit conditions shall prevail.

Rationale: *This condition is required to compensate for resource losses important to the human and aquatic environment (33 CFR 320.4(r)(1), 33 CFR 332.1, 33 CFR 332.3(a)(1) and (b)(3), and 40 CFR 230.41).*

12. Performance Standards. Prior to initiation of construction activities within WOUS, the permittee shall submit for Corps review and approval a draft of the final performance standard parameters and values for restoration and preservation. The performance standards shall be in substantial compliance with 33 CFR 332.5 and the mitigation plan. Corps review and approval must be obtained prior to initiation of construction activities within WOUS.

Rationale: *This condition is required to ensure final performance standards are approved by the Corps (33 CFR 332.3(a)(1), 33 CFR 332.4(c)(9), and 33 CFR 332.5).*

13. In-Lieu Fee Program. Prior to initiation of construction activities within WOUS, the permittee shall purchase 3.6 Riverine released credits and 6.2 Slope wetland released credits from Great Land Trust In-Lieu Fee Program for the loss of 1.78 acres of Riverine and 2.76 acres of Slope wetlands. You must email the signed credit transaction form to mitigationmanager@usace.army.mil and to the Project Manager via Regulatory Pagemaster at: regpagemaster@usace.army.mil upon completion of credit transaction (see form attached). If the permittee is unable to complete this transaction, the permittee is required to obtain a permit modification prior to commencing the work authorized by this permit for approval of an alternate mitigation method.

Rationale: *This condition is required to compensate for resource losses important to the human and aquatic environment (33 CFR 320.4(r)(1), 33 CFR 332.1, 33 CFR 332.3(a)(1) and (b)(3), and 40 CFR 230.41).*

14. Site Protection. Prior to initiation of construction activities within WOUS, the permittee shall ensure all compensatory mitigation parcels are provided long-term protection through a restrictive covenant (deed restriction). This site protection instrument must be approved by the Corps prior to the recording of the restrictive covenant. To obtain this approval, the permittee shall submit a draft of the restrictive covenant, including all supporting documentation necessary for the review of the restrictive covenant, e.g. title reports, title insurance, any liens or other encumbrances/interests, surveys and legal descriptions, etc. The restrictive covenant shall be in substantial compliance with 33 CFR 332.7(a). After Corps review and approval, the permittee shall take actions required to record the deed restrictions with the Registrar of Deeds or other appropriate official charged with the responsibility for maintaining records of title to or interest in real property. The permittee shall provide a copy of the recorded document to the

Corps clearly showing a stamp from the appropriate official indicating the book, page and date prior to initiation of construction activities within WOUS.

Rationale*: This condition is required to compensate for resource losses important to the human and aquatic environment. (33 CFR 320.4(b), 33 CFR 320.4(r), and 40 CFR 230.41)*

15. Financial Assurances. Prior to initiation of construction activities within WOUS, the permittee shall ensure financial assurances are in place. The permittee shall:

(a) Prior to the establishment of the required financial assurances, the permittee shall submit for Corps review and approval detailed cost estimates that include, but are not limited to the cost of providing replacement mitigation, including costs for land acquisition, planning and engineering, legal fees, mobilization, construction, monitoring, and contingencies. These estimates shall be to a sufficient level of detail and take into account the replacement mitigation being conducted by a competent third-party.

(b) Submit for Corps review and approval a draft of the proposed financial assurance. The assurances shall be compliant with 33 CFR 332.3(n) and must be in a form that ensures that the District Engineer will receive notification at least 120 days in advance of any termination or revocation. For third-party assurance providers, this may take the form of a contractual requirement for the assurance provider to notify the district engineer at least 120 days before the assurance is revoked or terminated.

(c) Provide a plan for phasing out required financial assurances once the compensatory mitigation project has been determined by the district engineer to be successful in accordance with its performance standards. The permittee shall submit for Corps review and approval draft performance standards that shall clearly identify the conditions under which the financial assurances are to be released.

Rationale: *This condition is required to ensure a high level of confidence that the mitigation project will be successfully completed (33 CFR 332.3(a) and 332.7(c)).*

16. Long-Term Management Plan. Prior to initiation of construction activities within WOUS, the permittee shall ensure long-term management plans for all compensatory mitigation parcels are established. The permittee shall submit for Corps review and approval a draft of the proposed long-term management plans. These long-term management plans must describe how the compensatory mitigation project will be managed after performance standards have been achieved to ensure the long-term sustainability of the resource, including long-term financing mechanisms and the party responsible for long-term management. The long-term management plans shall be in substantial compliance with 33 CFR 332.7(d). The permittee may transfer the long-term management responsibilities of the compensatory mitigation project sites to a land stewardship entity, such as a public agency, non-governmental organization, or private land manager, after review and approval by the Corps.

Rationale: *This condition is required to ensure long term sustainability of the mitigation plan (33 CFR 332.3(a) and 33 CFR 332.7(d)).*

Section 10 Only

17. Your use of the permitted activity must not interfere with the public's right to free navigation on all navigable WOUS.

Rationale: *Protection of navigation and the general public's right of navigation on the water surface is a primary concern of the federal government. This condition is required by regulation (33 CFR 320.4(o)(3)).*

18. You must install and maintain, at the Permittee's expense, any safety lights and signals prescribed by the U.S. Coast Guard (USCG), through regulations or otherwise, on the Permittee's authorized facilities. The USCG may be reached at the following address and telephone number: Commander (oan), 17th Coast Guard District, P.O. Box 25517, Juneau, Alaska 99802, (907) 463-2272.

Rationale: *The facility must be lighted to prevent navigation hazards and this condition is required by regulation (33 CFR 320.4(o)(3)).*

19. The permittee understands and agrees that, if future operations by the U.S. require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the Permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the U.S. No claim shall be made against the U.S. on account of any such removal or alteration.

Rationale: *This condition is required by regulation to protect free navigation and the interests of the United States in existing or future federal projects (33 CFR 320.4(o)(3) and HQ memorandum).*

6.3 BLM'S MITIGATION DETERMINATION

Donlin Gold's proposed design features are listed in the Final EIS; Chapter 5, Section 5.2, Design Features Proposed by Donlin Gold. The BLM views these elements as part of the Project, and considers Donlin Gold's proposed design measures as inherent to the Donlin Gold proposed action. Additionally, Donlin Gold will follow BMPs and industry standards required to comply with regulations and standard permit requirements that are designed to reduce impacts to the environment (SRK 2016a, 2013b – as cited in Chapter 5 of the Final EIS). Section 5.3 of the Final EIS describes the robust permitting process and regulatory standards for large mine projects in Alaska, and summarizes some of the more prominent BMPs and standard permit conditions that would likely be required for the Donlin Gold Project.

As part of the decision to adopt Alternative 2 North Option in this JROD, the BLM is adopting Donlin Gold's proposed avoidance, design features, and BMPs from Chapter 5 of the Final EIS. BLM has also selected 41 of the 97 mitigation measures considered in Chapter 5, Table 5.5, and are included as Attachment C1 to this JROD. These mitigating measures avoid, minimize, or reduce impacts identified in the environmental analysis associated with Alternative 2 North Option. Mitigating measures not selected from Chapter 5 of the Final EIS are either not within BLM jurisdiction, not applicable to the Pipeline ROW, are not feasible, or are not practicable. The selected mitigation measures included in Attachment C1 will apply only to lands under BLM jurisdiction and authority (BLM-managed lands). Specific stipulations reflecting these measures will be included and further defined in the BLM ROW Grant Offer to Donlin Gold.

In developing this mitigation package, the BLM considered guidance in the 1981 Southwest Planning Area Management Framework Plan, Alaska Statewide Land Health Standards, BLM

standard ROW Grant stipulations, ANILCA 810 analysis (Final EIS Appendix N) and mitigations incorporated via Project design for Alternative 2 North Option.

In addition to reducing impacts to the Project area as a whole, the Project Design Features in Alternative 2 North Option will serve to avoid impacts to natural and cultural resources, subsistence uses, and resources to the maximum extent practicable. Impacts to historic and cultural resources are addressed in the NHPA Section 106 Programmatic Agreement executed on June 28, 2018 (Attachment A2). For administrative consistency across the mixed-land jurisdictions, the BLM has aligned the natural gas and fiber optic cable ROW Grant stipulations with the State of Alaska ROW Lease requirements along the 316-mile mixed-land jurisdiction Pipeline corridor.

6.4 MITIGATION MEASURES REQUIRED BY STATE AGENCIES

Many of the permits required for Project approval are under the jurisdiction of the State of Alaska. State agencies have clear compliance standards and requirements for monitoring of environmental conditions; future risks associated with unexpected conditions may also be addressed in specific permitting authorizations. Many of the State permits will not be issued until after this JROD is complete; however, it is anticipated that they would contain measures specific to their permit authorities to mitigate unavoidable impacts; and as appropriate, incorporate elements of adaptive management if monitoring results indicate a basis for changes. A list of State permits that have been issued for the Project at the time of this JROD is included in Attachment B4 (Section B4.18) of this JROD. The State water quality agency, Alaska Department of Environmental Conservation, issued their conditioned 401 Water Quality Certification titled "State of Alaska Certificate of Reasonable Assurance for the Donlin Gold Project," for the placement of the fill material for the Applicant's proposed Project (see Attachment B6).

Donlin Gold has engaged the appropriate State agencies to work within the State permit process to address concerns regarding predicted flow losses in Crooked Creek. The Alaska Department of Natural Resources Division of Water (ADNR-Water) is responsible for managing water in the State, and has the authority to render a decision on whether establishment of a minimum instream flow is necessary to comply with the Anadromous Fish Act (AS 16.05.871-.901) and the Fish Passage Act (AS 16.05.841). The ADF&G, under Alaska's fish protection statutes specified above, is responsible for protecting freshwater habitat for salmon and other anadromous fish, and for ensuring free passage for all fish in rivers, lakes, and streams throughout the State.

Donlin Gold has committed to specific programs to minimize impacts from the Project (see Final EIS Chapter 5, Section 5.2). Particular programs of note that minimize impacts to aquatic resources are summarized below. These programs were considered in the decision-making process for the JROD, and are expected to be further developed as part of the State permitting process.

Rainbow Smelt Monitoring Program – As specified in the Final EIS Section 5.2 (Design Feature T17), this program would establish additional baseline data for a better understanding of the species' occurrence, and the character, use, and distribution of spawning habitat along the Kuskokwim River. Survey methodology would likely include documenting sex ratio and age structure of the population; and if possible, fecundity of females. Initially, surveys would be conducted annually to document the age structure of the rainbow smelt population, and further

document spawning patterns. Once an adequate baseline is established, regular sampling would be used to monitor for changes to existing patterns. The frequency of surveys over the long-term would depend on previous results, and whether the data indicate a potential shift.

If rainbow smelt population changes are observed over a defined time period, additional work would need to be undertaken to investigate the reason for those changes. If observed changes were attributed to Project-related activities, Donlin Gold would implement an assessment of measures available to address or mitigate those activities (Donlin Gold 2018a – as cited in Chapter 5 of the Final EIS).

Aquatic Resources Monitoring Plan (ARMP) for Crooked Creek – To be developed under the provisions of Title 16 fish habitat permits administered by the ADF&G and water use permits administered by the ADNR. As specified in the Final EIS Section 5.2 (Design Feature A33), the objectives of the ARMP are to: 1) monitor for major changes to aquatic communities; 2) monitor for smaller-scale and incremental changes to aquatic communities; and 3) guide results-based refinement to the monitoring program. The plan would build on the existing baseline dataset, and include both biological and flow components, including fish presence/abundance, invertebrate and periphyton sampling, and fish metals analysis; flow monitoring and winter surface water sampling to characterize fish habitat/passage and freezedown patterns; sediment sampling; and collection of additional geology and hydrology data to refine understanding of dewatering and groundwater/surface water flow dynamics (Donlin Gold 2018a,b; Owl Ridge 2017c – as cited in Chapter 5 of the Final EIS).

The ongoing data collection would be used in an adaptive management approach to refine the understanding of the dynamics surrounding Crooked Creek flow in winter, as well as the open water seasons; and to identify the most effective measures that can be used to ensure that minimum flows in Crooked Creek are maintained. If the Project results in minimal losses to Crooked Creek flows, adaptive management measures may be unnecessary. If flow losses warrant a response, a range of measures could be considered that include, but would not be limited to, lining or relocating portions of the stream channel; augmenting flows from the Snow Gulch Reservoir; pumping water from the Kuskokwim River, or grouting areas of bedrock demonstrating high flow rates (Donlin Gold 2018a – as cited in Chapter 5 of the Final EIS).

In July 2018, the Applicant prepared a draft ARMP framework document as part of the Plan of Operations – Volume VIIC[2]. Donlin Gold is using this framework document as a basis for discussions with the State of Alaska (ADF&G and ADNR) to ensure that the ARMP addresses all aspects of monitoring to support fish habitat permits and water withdrawal authorizations. The plan briefly describes the extensive aquatic resources baseline sampling program conducted to date, including an inventory of sites previously sampled, the frequency and duration for which they were sampled historically, and their relevance in supporting future monitoring efforts in advancing the ARMP. Specific methodologies, sample locations, frequencies, analytical methods, and comparative methodologies will be determined in coordination with the ADF&G and ADNR subject matter experts.

The objectives of the draft ARMP framework adds to those specified in Design Feature A33 above; to:

[2] Donlin Gold. 2018. Aquatic Resources Monitoring Plan. Draft Framework. Plan of Operations – Volume VIIC. Prepared with support by Owl Ridge Natural Resources Consultants, Inc. July.

- Extend portions of the aquatic life and habitat monitoring initiated during baseline studies to subsequent phases of the Project.
- Collect data suitable for detecting changes to aquatic communities and habitat.
- Identify a range of conditions against which future monitoring results will be evaluated for shifts in species composition, populations, and habitat quality and function.
- Collect information to allow differentiating between naturally occurring changes and Project-related changes.

As stated in the draft ARMP framework document, the ARMP will implement adaptive management as an iterative multi-step process that allows for additional investigation, in response to observed changes from baseline conditions.

7 FINAL AGENCY DECISIONS

7.1 CORPS' DECISION

I find that the issuance of the Corps permit, as described by regulations published in 33 CFR Parts 320 through 332, with the scope of work as described in this document, is based on a thorough analysis and evaluation of all issues set forth in this JROD. There are no less-environmentally damaging, practicable alternatives available to Donlin Gold LLC to construct the Donlin Gold Project, Alternative 2 North Option. The issuance of this permit is consistent with National Policy, statutes, and administrative directives; and on balance, issuance of a Corps' permit to construct the Donlin Gold Project is not contrary to the public interest. As explained above, all practicable means to avoid and/or minimize environmental harm from the selected, permitted alternative have been adopted and required by terms and conditions of this permit.

Approving Official:

13AUG2018

Colonel Michael Brooks
District Commander

Date

7.2 BLM'S DECISION

7.2.1 ACTING ALASKA STATE DIRECTOR'S RECOMMENDATION

I recommend approval of this Record of Decision to authorize a 14-inch, underground natural gas pipeline and associated fiber optic cable Right-of-Way grant and associated Temporary Use Permits subject to terms, conditions, stipulations, and environmental protection measures developed by the U.S. Department of the Interior, and identified in this Record of Decision, including attachments, and the Plan of Development by Donlin Gold LLC.

Karen Mouritsen 8-13-18

Karen Mouritsen
Acting State Director, Bureau of Land Management, Alaska

Date

7.2.2 APPROVAL BY THE ASSISTANT SECRETARY

I hereby approve this Record of Decision to authorize a 14-inch, underground natural gas pipeline and associated fiber optic cable Right-of-Way grant and associated Temporary Use Permits subject to terms, conditions, stipulations, and environmental protection measures developed by the U.S. Department of the Interior, and identified in this Record of Decision, including attachments, and the Plan of Development by Donlin Gold LLC.

My approval of this decision constitutes the final decision of the Department of the Interior.

Joseph Balash
Assistant Secretary – Land and Minerals Management

8/13/18
Date

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ATTACHMENTS

The following attachments are included:

- Attachment A (A1 through A2)
- Attachment B (B1 through B6)
- Attachment C (C1 through C2)

ATTACHMENT A SUPPORTING DOCUMENTS PERTINENT TO THE JOINT DECISION

Attachment A includes the following sections:

- Attachment A1 – Project Plan
- Attachment A2 – NHPA Section 106 Programmatic Agreement

ATTACHMENT A1 PROJECT PLAN

Attachment A1 includes the following documents:

- Engineering Drawing G001 – General Notes and Sheet Index
- Engineering Drawing G002 – Plan View Overall Project Vicinity Map
- Engineering Drawings MA-200G through MA-214T – Mine Area Drawings
- Engineering Drawings TA-300G through TA-316T – Transportation Area Drawings
- Engineering Drawings PA-100G through PA-177T – Pipeline Area Drawings

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ATTACHMENT A2 NHPA SECTION 106 PROGRAMMATIC AGREEMENT

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ATTACHMENT B CORPS' SUPPORTING ANALYSIS AND DOCUMENTATION

Attachment B includes the following sections:

- Attachment B1 – Response to Comments on Special Public Notice (SPN-1995-120)
- Attachment B2 – Evaluation of the Discharge of Dredge and Fill Material in Accordance with 404(b)(1) Guidelines (40 CFR Section 230, Subparts B through H)
- Attachment B3 – General Policies for Evaluating Section 10 RHA and 404 CWA Permit Decisions [33 CFR 320.4]
- Attachment B4 – Compliance with Environmental Requirements (33 CFR 320.3 Related Laws)
- Attachment B5 – Applicant's Compensatory Mitigation Plan
- Attachment B6 – State of Alaska Certificate of Reasonable Assurance for the Donlin Gold Project

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ATTACHMENT B1 RESPONSE TO COMMENTS ON SPECIAL PUBLIC NOTICE (SPN-1995-120)

New substantive comments on the Final Environmental Impact Statement (Final EIS) were grouped into like Statements of Concern (SOCs) and summarized below. The Corps has added a response to the comment statements.

B1-1: A preferred alternative was not identified in the Final EIS, as required under National Environmental Policy Act (NEPA).

- Response: The Corps is neither a proponent for nor an opponent of the proposed Project and does not have an agency preferred alternative. Under the regulatory process, the decision to issue or deny the permit is made after the 30 day review period for the Final EIS and documented in the Record of Decision (ROD).

B1-2: Because ANCSA calls for maximum participation by Alaska Natives in decisions affecting their rights and property, input from relevant Alaska Native corporations should be central to the public interest economic analysis.

- Response: Economic impacts to Alaska Native corporations was considered and addressed in the public interest review.

B1-3: A freshwater pipeline from the Kuskokwim River to the Mine Site could support plant operations and potentially be used to augment flows to Crooked Creek.

- Response: Use of a pipeline to transport Kuskokwim River water to the Crooked Creek watershed to supplement flows was considered in the Final EIS, Chapter 5. Constructing a pipeline at Project startup based on modeled flow losses from Crooked Creek is not considered a practicable measure; however, if unexpected flow losses were to occur, constructing a pipeline is one action that would be considered. Kuskokwim River water is not needed for plant operations.

B1-4: Construction of a cutoff wall and water pipeline from the Kuskokwim River should not be deferred as future adaptive management, but instead evaluated as part of the Section 404(b)(1) Guidelines analysis and disclosed in the Record of Decision.

- Response: Donlin Gold has developed an Aquatic Resources Monitoring Plan (ARMP) Draft Framework in anticipation of producing a final ARMP under the provisions of its Title 16 fish habitat permits administered by the Alaska Department of Fish and Game (ADF&G). The ARMP will include aquatic resource monitoring throughout Crooked Creek and its tributaries upstream and downstream from the Mine Site, to include fish surveys, habitat, sediment, fish tissue, and flow monitoring. Flow monitoring will address both summer and winter flow conditions. The ARMP will provide for reporting to ADF&G and will require specific action by Donlin Gold if the data show variability from the predicted results on aquatic resources (to include flow). The actions that could be taken to reduce unexpected flow loss include but would not be limited to lining or relocating portions of the stream channel, augmenting flows from the Snow Gulch Reservoir or the Kuskokwim River, or a cutoff wall/grouting areas of bedrock demonstrating high flow rates (Final EIS, Chapter 5).

B1-5: Projects of this size deserve more effort in engagement. Public meetings and poster displays are a good step forward. But many of the residents of the area still did not understand the scope, nor did the Corps do a very good job of speaking clearly about the balance of development and risks. An Environmental Impact Statement (EIS) is intended to disclose what impacts are anticipated, not necessarily prevent them. So, it is possible that people's expectations may not have been met. Many folks incorrectly believed that the EIS would "ensure" that there would be no impacts to the environment.

- Response: The Corps held 14 public scoping meetings and 17 public meetings for the Draft Environmental Impact Statement (Draft EIS). The Draft EIS public meetings had an open house component to allow the public to talk with members of the EIS team and ask questions. Additionally, as described in the Final EIS Section 6.3.5, the Corps provided:
    - 20 EIS overview and update presentations to stakeholder groups,
    - Monthly visits between August 2014 and October 2015 to the Yukon-Kuskokwim Y-K) region to provide updates of the EIS process and discuss specific concerns and answer questions about the Project and EIS process,
    - Seven newsletters to inform the public and let them know of opportunities for public participation,
    - Translation of a Draft EIS summary into Yup'ik, and
    - Scoping, Draft EIS, and Final EIS notifications in local newspapers and on KYUK.

B1-6: Agency and resident comments that were not in line with mine development were only incorporated if it did not require much change to Donlin Gold's general plan.

- Response: All comments on the Draft EIS were weighed equally and responded to in Appendix X, the Comment Analysis Report (CAR), of the Final EIS. Additionally, between the Draft and Final EIS documents, changes were made to the Proposed Action, alternatives considered, and recommended mitigation measures based on agency and public comments on the Draft EIS.

B1-7: The fact that the Akiak Native Community and The Kuskokwim River Watershed Council are mentioned as cooperating agencies in the Public Notice is something that I believe is indicative of a flawed public involvement process. Likewise, there are other villages listed as cooperating agencies. Listing six villages on the cover of the documents is somewhat misleading.

- Response: The six tribes on the cover formally agreed to be cooperating agencies in the EIS process. All Tribes and State and Federal agencies that agreed to join the process as cooperating agencies were invited to participate at each stage. Some entities were very active and others were not.

B1-8: When doing monitoring on smelt, attributing impacts to the project related activities would be difficult and contentious. Until a relatively accurate population estimate can be determined, it would be impossible to determine if, and when, the smelt are being affected by barge traffic before it was too late.

- Response: Donlin Gold would develop and implement a rainbow smelt monitoring program to establish additional baseline data for a better understanding of the species'

occurrence and the character, use, and distribution of spawning habitat along the Kuskokwim River. Survey methodology would likely include documenting sex ratio and age structure of the population and if possible, fecundity of females. Initially, surveys would be conducted annually to document the age structure of the rainbow smelt population and further document spawning patterns. Once an adequate baseline is established, regular sampling would be used to monitor for changes to existing patterns. The frequency of surveys over the long-term would depend on previous results and whether the data indicate a potential shift (Table 5.2-1 in the Final EIS, design feature T17). If rainbow smelt population changes are observed over a defined time period, additional work would need to be undertaken to investigate the reason for those changes. If observed changes were attributed to project-related activities, Donlin Gold would implement an assessment of measures available to address or mitigate those activities. Such activities would be coordinated with the Donlin Advisory and Technical Review and Oversight Committee (DATROC) Subsistence Subcommittee.

B1-9: No matter what technology is used, it's not possible to ensure vessel passages are conducted through the deeper portions of the channel; if that were the case, there would be far fewer barge strandings than currently occur in the Kuskokwim River.

- Response: Donlin Gold has committed to employing professional barge captains using state of the art navigation and communication equipment. Donlin Gold's barge plan includes an initial pre-barging survey of the active channel and periodic re-surveys to develop the route that would be followed. Additionally, Donlin Gold has committed to cease barging at a river flow below 39,000 cubic feet per second. The Final EIS concludes that these measures make barge stranding an unlikely event. The Final EIS Appendix W contains Donlin Gold's Barge Communication and Grounding and Response Plans.

B1-10: There is no assessment of indirect emissions for different components. Therefore we have no idea if indirect emissions are important. Do Table 3.26-8 and Table 3.26-9 include indirect emissions? Or are they only direct emissions? While Ocean Barging emissions are quantified, air traffic emissions are not. It is not clear why Ocean Barging and Air Traffic are not considered "Direct" emissions (Final EIS page 3.26-29). They are regional, not local, in impact – but all greenhouse gas emissions are considered a global, not local, impact.

- Response: Assessment of indirect emissions is provided for each Project component and Project phase, as applicable. Sources of indirect emissions are also identified for each Project component and phases, as applicable. See Page 3.26-1: "Where possible, indirect emissions are assessed or qualitatively described." See also page 3.26-27: "There are currently no defined methodologies for estimating indirect emissions from oil and gas production and refining, which is highly dependent on the design, operation, and product composition…" Both tables clearly only present direct emissions. See page 3.26-28 where the paragraph referring to Table 3.26-8 discusses only direct impacts; indirect impacts are in a separate following paragraph. For Table 3.26-9, see page 3.26-30; this table is clearly described as presenting only direct greenhouse as (GHG) emissions in the paragraph preceding the table: "Direct GHG emissions at the Transportation Corridor would be within immediate Project Area (Table 3.26-9)." Direct versus indirect emissions are defined by the Clean Air Act (discussed in regulations sections, Page 3.26-6). Further discussion of emissions is discussed in and cross referenced to Section 3.8,

Air Quality. See CLIM 9 in the CAR, Appendix X, Page 123, for an explanation of what elements were analyzed in this EIS.

B1-11: The text not only fails to adequately compare alternatives, it downplays the impact by separating phases of the Project (emissions during construction would be less than 1 percent of annual GHG for the State of Alaska, during operations would be 3.7 percent of annual GHG for Alaska). A table of the emissions annually and over the life of mine should be provided. This would show in what sectors mitigation would have the most affect. It would also provide a framework for how to indicate the difference in GHG emissions between alternatives.

- Response: The intent of the percent of annual GHG for Alaska was not to downplay the impact of the Project, but to show context for the impact as required by Council on Environmental Quality (CEQ) guidelines, and temporal differences between Project phases. We concur with the usefulness of the example summary table and graphs provided in the comment and an expanded version of the table is provided below. (Note that the table in the comment appears to contain a conversion error in the Operations-Transport category, which inflated the annual million metric tons (MMT) amount and LOM (MMT) values for this phase/component.)

  The numbers in Table B1 are consistent with the Final EIS, in that they show the largest contribution of GHG emissions occurring during Operations at the Mine Site component. Mitigations that target other Project components would have far less effect. The alternatives summary data are also consistent with the discussion in the Final EIS, and show that Alternative 3A would have slightly lower overall GHG emissions than Alternatives 2 and 6A; Alternatives 4 and 5A would have slightly more GHG emissions overall than Alternative 2; and Alternative 3B would have the largest total GHG emissions. We concur that Donlin Gold Mine would be a large source of GHGs: slightly more overall for the life of mine (48 MMT) than one year for all sources in Alaska combined (43 MMT). However, total GHGs over the life of mine would still be about 4 percent of total Alaska GHGs over the same time period.

Table B7: GHG Summary for Life of Mine

Project Phase	Project Component	GHG Emissions			Time Period (years)
		Annual (tpy)	Annual (MMT/yr)	LOM (MMT)[b]	
Alternative 2 – North Option and Alternative 6A – Dalzell Gorge					
Construction [a]	Mine Site	58,100	0.0527	0.18	3.5
	Transportation Corridor	208,200	0.189	0.28	1.5
	Pipeline	86,600	0.0785	0.24	3.0
Operations	Mine Site	1,761,000	1.60	44	27.5
	Transportation Corridor	73,000	0.0662	1.8	27.5
	Pipeline	18,800	0.0171	0.47	27.5
Closure	Mine Site	194,300	0.176	0.88	5.0
	Transportation Corridor	20	0.00	0.00	5.0
	Pipeline	20	0.00	0.00	5.0

Table B7: GHG Summary for Life of Mine

Project Phase	Project Component	GHG Emissions			Time Period (years)
		Annual (tpy)	Annual (MMT/yr)	LOM (MMT)[b]	
LOM Total for Alternative 2 or 6A				**48**	
Alternative 3A – LNG Haul Trucks					
Construction [a]	Mine Site	58,100	0.0527	0.18	3.5
	Transportation Corridor	208,200	0.189	0.28	1.5
	Pipeline	86,600	0.0785	0.24	3.0
Operations	Mine Site [c]	1,696,900	1.54	42	27.5
	Transportation Corridor	73,000	0.0662	1.8	27.5
	Pipeline	18,800	0.0171	0.47	27.5
Closure	Mine Site	194,300	0.176	0.88	5.0
	Transportation Corridor	20	0.00	0.00	5.0
	Pipeline	20	0.00	0.00	5.0
LOM Total for Alternative 3A				**46**	
Alternative 3B – Diesel Pipeline					
Construction [a]	Mine Site	58,100	0.0527	0.18	3.5
	Transportation Corridor	208,200	0.189	0.28	1.5
	Pipeline	173,100	0.157	0.47	3.0
Operations	Mine Site [d]	2,048,000	1.86	51	27.5
	Transportation Corridor	73,000	0.0662	1.8	27.5
	Pipeline	18,800	0.0171	0.47	27.5
Closure	Mine Site	194,300	0.176	0.88	5.0
	Transportation Corridor	20	0.00	0.00	5.0
	Pipeline	20	0.00	0.00	5.0
LOM Total for Alternative 3B				**55**	
Alternative 4 – BTC Road/Port					
Construction [a]	Mine Site	58,100	0.0527	0.18	3.5
	Transportation Corridor [e]	500,100	0.454	0.68	1.5
	Pipeline	86,600	0.0785	0.24	3.0
Operations	Mine Site	1,761,000	1.60	44	27.5
	Transportation Corridor [e]	122,800	0.111	3.1	27.5
	Pipeline	18,800	0.0171	0.47	27.5
Closure	Mine Site	194,300	0.176	0.88	5.0
	Transportation Corridor [e]	40	0.00	0.00	5.0

Table B7: GHG Summary for Life of Mine

Project Phase	Project Component	GHG Emissions			Time Period (years)
		Annual (tpy)	Annual (MMT/yr)	LOM (MMT)[b]	
	Pipeline	20	0.00	0.00	5.0
LOM Total for Alternative 4				**49**	
Alternative 5A – Dry Stack					
Construction [a]	Mine Site	58,100	0.0527	0.18	3.5
	Transportation Corridor	208,200	0.189	0.28	1.5
	Pipeline	86,600	0.0785	0.24	3.0
Operations	Mine Site [f]	1,796,000	1.63	45	27.5
	Transportation Corridor [g]	73,900	0.0670	1.8	27.5
	Pipeline	18,800	0.0171	0.47	27.5
Closure	Mine Site[f]	198,200	0.180	0.90	5.0
	Transportation Corridor	20	0.00	0.00	5.0
	Pipeline	20	0.00	0.00	5.0
LOM Total for Alternative 5A				**49**	
Total for state of Alaska [h]			**43**	**1,200**	**27.5**

Notes:

a. Construction totals for whole phase (in Final EIS Sections 3.8 and 3.26) converted to tons per year (tpy) based on time period shown.
b. Life of mine (LOM) values rounded to 2 significant digits.
c. Reflects reduction in annual GHGs by 64,100 tpy to account for liquefied natural gas (LNG) haul trucks in lieu of diesel trucks, and reduction in river barging and fuel tanks (AECOM 2017a).
d. Reflects increase in stationary emissions in Final EIS Table 3.8-19 of 28% for use of diesel instead of natural gas at power plant (Section 3.26.4.4.1).
e. Reflects increase in land-based mobile transportation emissions, and reduction in river-based mobile emissions (Tables 3.8-27 through 3.8-31), by amounts proportionate to increase in BTC road length and decrease in river mile length, respectively.
f. Reflects roughly 2% increase in mine mobile and stationary emissions over Alt 2.
g. Reflects 6% increase in river mobile emissions over Alternative 2 North Option (Section 3.26.4.6.1).
h. Total for 2010 (ADEC 2015).

B1-12: If the Dry Stack Tailings is rated as "low likelihood of implementation" in the Final EIS, why has it been followed through as a viable alternative? Why was it not eliminated from the Final EIS, if the high cost difference has been known for 2-3 years? If it were eliminated, would that have allowed room for other viable options (paste tails, cement tails, or other types of mining alternatives)?

- Response: The EIS considered other mining alternatives such as paste tails as part of the process of identifying potential alternatives and determining which ones would be carried forward for evaluation in the EIS (see Final EIS Appendix C). The dry stack tailings (DST) method was suggested as an alternative during scoping and evaluated in the EIS as a reasonable alternative to determine if the alternative could reduce impacts to waters of the U.S. (WOUS). The technology wasn't proven at that time for operations with the throughput planned for Donlin Gold and remains unproven now at the conclusion of the NEPA process. Alternatives were not eliminated based on lack of "room" in the EIS and if other alternatives had been reasonable/feasible, they would have been evaluated.

B1-13: Removing captured liquid and solid mercury from the Mine Site by air was deemed to have a "low likelihood of implementation" because barging was safe (Final EIS Table 5.5-1B). Please provide a cost and safety analysis of the full transport route via barge (including truck and rail, if necessary) to the final intended repository with a cost and safety analysis of transport by plane. Include a potential option to build a Resource Conservation and Recovery Act facility for mercury storage in Alaska or other sites.

- Response: Donlin Gold is proposing to transport mercury recovered during the milling/refining process to long-term storage in the Continental U.S., using trucks to Angyaruaq (Jungjuk) Port site, river barges to Bethel, and ocean barges to certified handling and disposal facilities in the Pacific Northwest. Elemental mercury would be contained in 76 pound flasks or one metric tonne steel containers constructed and used specifically for this purpose. Additional shipments of mercury-loaded spent carbon in steel drums would also occur. All mercury containers would be further contained in steel shipping containers and secured to barges during transport. Crowley and Alaska Marine Lines, major shippers of containerized freight in Alaska and the Pacific Northwest, were queried and have not had any incidents in Alaska in at least the last decade with similar sized shipping containers being lost overboard (Walt Tague conversation, 2016, Mike Stuart conversation, 2016). In the meantime, there have been instances of cargo plane crashes in rural Alaska. The Corps finds that Donlin Gold's proposed mercury shipments are lawful, meet standard industry transport practices, and are reasonable and we have no reason or authority to require air shipment. Additionally, there are no planned or existing facilities in Alaska permitted for mercury storage and the Corps has no reason or authority to require one.

B1-14: Under Alternative 4, how many locations with a potential for slides or rockfall are above fish-bearing water bodies?

- Response: The proposed sidehill cut and fill construction would reduce the risk of moderate to steep slopes experiencing slides or rockfall along most of the BTC road. However, as indicated in Final EIS Section 3.3.2.2.2, the one area of the road with increased potential for slope movement is along the northwest side of Juninggulra Mountain. This three mile long section lies at the headwaters of Montana Creek, which

is not known to be an anadromous fish stream (Final EIS Section 3.13.2.2.1). Most of this road segment is coincident with the Mine Access Road under Alternative 2 North Option. Although the anadromous Owhat River and lower reaches of its tributaries along the western portion of the BTC road are classified as Essential Fish Habitat (EFH) under the Magnuson–Stevens Fishery Conservation and Management Act (MSA), the risk of slides or rockfall is lower in this area of more moderate slopes.

B1-15: Would the piezometers and embankment settlement monuments continue to remain in place at the dam, and would they be part of the annual monitoring?

- Response: Alaska Dam Safety Program regulations and guidelines require that details necessary for dam closure be provided in an application for a Certificate of Approval to Modify or Abandon a Dam. Application requirements include hydraulic and stability evaluations of the final dam configuration; Operations and Maintenance (O&M) details; and financial assurance adequate to pay for post-closure O&M, monitoring, and inspections. The details requested in this comment would be included in this application. While it would be cost-effective to continue use of existing piezometers and embankment settlement monuments, new ones may be required as the downstream face would be flattened to a lower slope angle (Final EIS Section 3.3.3.2.2). The O&M details would specify when inspections would occur. Typically, extraordinary inspections would be conducted following heavy or extended precipitation, just as they would after earthquakes, in accordance with Alaska Dam Safety Program guidelines.

  Though the Donlin Gold tailings storage facility (TSF) closure monitoring details are not available at this time, several points of comparison can be made between Bingham Canyon situation and the Donlin Gold TSF. The Bingham Canyon pit walls are steeper than the Donlin Gold TSF would be in post-closure: overall pit slope angles of 45 degrees are common in open pits, while the Donlin Gold TSF downstream face in post-closure would be 27 degrees (2H:1V). The Bingham Canyon pit walls are cut into bedrock, while the Donlin Gold TSF would be composed of rockfill. As such, the system used at Bingham Canyon to detect steep bedrock slope instabilities, such as extensometers, may or may not be applicable to the Donlin Gold TSF. The Bingham Canyon slide may have been caused by pre-existing bedrock weaknesses (such as a fault or sedimentary structure) that would not exist within the TSF rockfill dam, and current stability analyses of the TSF dam account for bedrock weaknesses in the dam buttresses (BGC 2011a).

B1-16: For the sentence "Impacts associated with climate change (for Alternative 3B) would be the same as discussed for Alternative 2" (Final EIS Section 3.18.2.4.4, page 3.8-63), are the increases during construction offset by decreases in operations? If so, that should be shown on a chart comparing GHG emissions between alternatives.

- Response: The sentence cited in the comment refers to socioeconomic impacts. As discussed in Section 3.26.4.4.1, lower GHG emissions under Alternative 3B due to reduced barging would be more than offset by higher GHGs from combustion of diesel at the Mine Site, as shown in Table B1.

B1-17: Why is the Tailings Storage Facility proposed to be designed to withstand a less severe event than the Waste Rock Facility? The tailings dam would be built to withstand a peak

ground acceleration (pga) of 0.36g (page 3.3-11), but the waste rock would be built to withstand a much higher pga of 0.4g.

- Response: The pga of 0.4g used in the numerical seismic deformation analysis of the WRF (BGC 2011b) was based on a recommendation in BGC (2011l) for a pga of 0.36g representing a maximum credible earthquake (MCE) of magnitude (M) 7.8. A smaller more frequent earthquake with a pga of 0.26g (for a 2,500-yr event) was also applied to the WRF in a pseudostatic analysis (BGC 2011b). The recommended MCE of M7.8 with a pga of 0.36g is the same as that used in the TSF analysis (BGC 2011a, 2011l). The higher MCE pga value used in the WRF analysis (0.4g vs 0.36g) appears to be due to rounding, or increased specificity and optimization applied to the analysis of the TSF dam. The TSF only considered the MCE in two types of seismic analyses; whereas the WRF analyses considered both a lower event (0.26g) and the MCE.

  A less stable dam design was not chosen for the TSF as indicated in the comment. Rather, as described in Final EIS Section 3.3.3.2.1 (under "Seismic Deformation Analysis"), the same design was subjected to both the 5,000- and 10,000-year events, with the results showing minimal (up to 1.4 feet) settlement and displacement in both cases.

B1-18: Why do suggested Mitigation measures suggest further analysis of a higher level seismic event and revised seismic stability analysis for the pit and the WRF but not the TSF? (Final EIS, page 3.3-73).

- Response: As described in Section 3.3.3.2.1 (p. 3.3-42 under Waste Rock Facility (WRF), and p. 3.3-49 under Open Pit), these measures were based on specific concerns identified during review of feasibility level design reports (BGC 2011b, 2014j) regarding the presence of ice-rich soils at the WRF, and the use of a moderate level earthquake (250-year event) in the seismic analysis of pit slope stability. These specific concerns do not exist at the TSF, where all ice-rich overburden would be removed prior to construction, and where higher level earthquakes were used in the seismic analyses, as described above.

B1-19: It would be very helpful to have maps of the potential tailings flow after the draindown period (for the TSF), and for the Dry Stack Tailings Facility after the operating pond is reclaimed.

- Response: As described in Final EIS Section 3.24.3.5.2, tailings release scenarios selected for analysis in the EIS were based on a consensus of geotechnical expert opinion as to the most likely way a significant (low probability, high consequence) tailings spill could occur that is not considered "worst-case" (SRK 2015a, AECOM 2015c). In accordance with CEQ guidelines, not all variants of spill scenarios must be analyzed in detail. Many could fall within the probability and consequences of the selected scenario, and have smaller effects that are accounted for within the scope of the analyzed scenario (AECOM 2015c).

  The tailings release scenarios selected for analysis in the EIS, from either a piping breach or sinkhole to the underdrain, would occur during late Operations when the TSF is at its ultimate size; and the fluid released could range from water only, to a slurry with 20 to 50 percent solids content (BGC 2015n). If the same scenarios were applied to the Closure situations described in the comment, the distance of travel would be the same or less

than those shown on Figures 3.24-2 and 3.24-3 (Section 3.24.5.9). There would be no water-only release from either the TSF or Dry Stack Operating Pond, as the free water in both cases would be removed during Closure. The terminal density of the consolidated tails in the TSF after the draindown period would be the same as upper end of the slurry solids content (50 percent) considered in the inundation study for the selected scenarios (BGC 2015n) and could travel a similar distance. However, the likelihood of a TSF release occurring in post-closure may be less than that considered in the selected spill scenarios, due to flattening and covering of the TSF downstream face at Closure (BGC 2011a).

The dry stack material would be buttressed by the upper Operating Pond dam that would remain after Closure, and would have a lower moisture content than the TSF tails, due to filtering and compaction during placement (Section 3.3.3.6.1). As such, the material is unlikely to flow under the selected tailings spill scenarios. In the event that saturated dry stack material near the bottom of the pile is released under the selected spill scenarios, the distance it would travel would be less than that shown in Figures 3.24-2 and 3.24-3. Thus, a potential tailings flow from either of the situations described in the comment would be both less likely to occur, and have the same or less impact, than the scenarios analyzed in the EIS.

B1-20: Donlin Gold will emit seven times more than all the mines in Alaska combined. Another way to look at it would be that not building the Donlin Gold Mine would be the equivalent of Alaska producing no greenhouse gas emissions at all for 1.5 years. This type of information would provide us a good basis for comparing alternatives and also for discussion of climate mitigation, including carbon offsets.

- Response: The mining category in Final EIS Table 3.26-2 does not include mines which draw power from the grid, such as Fort Knox and Pogo, whose GHG emissions are attributed to the physical stationary source where the electricity is generated; i.e., GHG emissions for these mines are included in the power plant category. As such, the comparison between Donlin Gold mine and all mines in Alaska together in the comment is not an equivalent correlation.

  As shown in Table B1 and noted above, the Project would emit slightly more GHG emissions for overall life of mine (48 MMT) as one year for all sources in Alaska combined (43 MMT). As such, we concur that not building the Donlin Gold Mine would be the equivalent of Alaska producing no greenhouse gas emissions at all for more than a year. On an average annual basis over the life of mine (48 MMT over LOM/27.5 years), Donlin Gold would emit roughly 1.75 MMT/yr GHGs, similar to other large single sources in Alaska such as on the North Slope, or several railbelt utilities combined (EPA 2014h). Average annual GHGs for other alternatives range from 1.67 to 2.00 MMT/yr. (Note that the 3 MMT/year figure for Donlin Gold cited in the comment adds up multi-year construction emissions, not annual emissions.)

B1-21: Was an assessment done to determine if pit walls would collapse under intensified precipitation conditions? A slope failure was predicted at Bingham Canyon and in preparation they set up nine layers of protection including slope stability radar, micro-seismic arrays, extensometers, GPS monitoring. Will similar layers of protection be placed in pit walls at Donlin? Describe what will be in place.

- Response: Assessment of pit wall stability in Project design documents (BGC 2007b, 2011k) was conducted based on both dewatered and fully saturated (unmitigated) conditions. The effect of intensified precipitation on pit walls, however, would primarily be to increase runoff to the in-pit surface water collection system, not necessarily increase groundwater levels and pit wall instability. As indicated in Final EIS, Appendix X (see GRD 17 in the CAR), most precipitation would quickly runoff the steeply sloping rock walls; any groundwater recharge into the pit walls/benches that did occur, even under intensified precipitation conditions, is anticipated to be inconsequential to the groundwater modeling and slope stability results. The dewatering pumping system was designed for a peak capacity (8,300 gallons per minute [gpm]) roughly three to five times higher than the range of average pumping rates expected (1,700 to 2,600 gpm). In addition, runoff from areas upslope from the pit would be diverted away from the pit by an interceptor ditch constructed around the perimeter (BGC 2011h), and is not expected to affect wall stability under intensified precipitation conditions.

  Slope stability analyses conducted on the pit walls indicate that certain locations could have Factors of Safety (FOS) less than the target of 1.2 under saturated conditions (BGC 2007b, 2011k). At these slopes, the mine plan calls for more aggressive dewatering, which would entail increased pumping and/or closer spaced dewatering wells and horizontal drains. As noted in Final EIS Section 3.3.3.2.2, experience would be gained throughout Operations as to the performance and deformation behavior of the slopes, and the design and/or operations would be adjusted accordingly. For example, the number, length, and spacing of horizontal drains needed to generate adequate depressurization would largely be determined as mining progresses, through monitoring of pit wall pore pressures and seepage rates, and would target specific depressurization needs identified by the slope instrumentation and monitoring program (BGC 2011k, 2014c). Thus, it is unlikely that intensified precipitation would result in higher groundwater levels and increased slope instability that are not maintained through pumping.

  The main difference between Bingham Canyon and Donlin Gold situations is that the slope failure was predicted at Bingham Canyon based on the instrumentation, and was not mitigated by changed design or operations; no such prediction has been made for the Donlin Gold pit under planned operating conditions. The "layers of protection" at Bingham Canyon were not intended protect the slope from failing, but to predict that it would, and to remove people and equipment in time. Similar protections such as slope instrumentation and monitoring are planned at Donlin, as well as optimization and adaptive management of slope design during both final design and operations, as described above.

B1-22: An Area of Critical Environmental Concern designation should be made in the Upper-Kuskokwim River region in the BSWI RMP *[Bering Sea Western Interior Resource Management Plan]* to conserve sheefish habitat and conservation of fish and game populations through monitoring in adaptive management models should be addressed.

- Response: The Corps does not have the authority to designate Areas of Critical Environmental Concern. The Applicant is proposing monitoring and adaptive management through the DATROC Barging and Subsistence Subcommittees and the proposed rainbow smelt monitoring program.

B1-23: Relocate the proposed pipeline corridor into the lower terrain of the north Alaska Range.

- Response: The Corps considered an alternative option that would relocate the pipeline into the lower terrain. It is addressed in Appendix C of the Final EIS as Option PL-30. The CAR also responded to requests to analyze this alternative in detail; see PAA 24 in Appendix X of the Final EIS.

B1-24: The Corps should require formation of an Upper Kuskokwim subcommittee under DATROC (commenter used the term "larger project citizens advisory group" which we interpret to be DATROC).

- Response: The Corps does not have authority to require the applicant to form and support an additional subcommittee under DATROC. The applicant has voluntarily committed to the Barging and Subsistence Subcommittees.

B1-25: A negotiated Controlled-Use Area designation should be made for the pipeline corridor to control/minimize use by non-local Alaska residents.

- Response: The Corps does not have authority to designate Controlled-Use Areas.

B1-26: The ROD should include a stipulation that local residents be included in an adaptive management scheme to participate in discussions, but also be involved in the fieldwork to assess inadvertent consequences and unforeseeable adverse effects to the upper resources of the Kuskokwim River.

- Response: The Corps does not have authority to require the applicant to develop an adaptive management program that designates local residents be involved in ecological monitoring.

B1-27: The Corps should consider a recommendation in the ROD for installation of thermosyphons to provide a thermal barrier in unstable soils with permafrost and in transition areas of the pipeline.

- Response: Thermosyphons are more typically used in areas of Alaska with ice-rich, discontinuous-to-continuous permafrost (such as the North Slope, Interior, and western Alaska coastal plains), than in areas crossed by the Donlin Gold pipeline, described as having sporadic-to-discontinuous permafrost (10-90%), localized thaw unstable areas, and no extensive areas of massive ground ice. As noted in FEIS Sections 3.2 (Soils) and 3.25 (Pipeline Reliability and Safety), mitigations such as strain demand monitoring, special wall thickness, and insulation may be employed to minimize differential settlement based on the results of additional geotechnical work in final design. In localized areas, thermosyphons could be considered as one such tool in final design or as a result of monitoring. It is the applicants' responsibility to design, construct, and maintain the pipeline to prevent subsidence in ice rich soils.

ATTACHMENT B2 EVALUATION OF THE DISCHARGE OF DREDGE AND FILL MATERIAL IN ACCORDANCE WITH 404(B)(1) GUIDELINES (40 CFR SECTION 230, SUBPARTS B THROUGH H)

The Department of the Army (DA) permit application evaluation requires compliance with the U.S. Environmental Protection Agency's (EPA) Section 404(b)(1) Guidelines (40 CFR 230; Guidelines). The Final EIS contains appropriate analysis of all factors within the Guidelines, except as supplemented here-in as specifically needed to comply with the Guidelines.

B2.1 SUBPART B – COMPLIANCE WITH THE GUIDELINES

B2.1.1 RESTRICTIONS ON DISCHARGE (SECTION 230.10)

The following sections summarize the evaluation of anticipated impacts from the proposed Donlin Gold Project (Project) with the specific regulatory criteria on restriction of discharge as listed in 40 CFR 230.10.

B2.1.1.1 FINDING OF PRACTICABLE ALTERNATIVES (SECTION 230.10[A])

Overall, the U.S. Army Corps of Engineers (Corps) finds that the basic purpose of the Project is not water dependent but that practicable alternatives that do not impact WOUS and/or special aquatic sites do not exist as a result of geographical and technological constraints of Project siting.

As described in Chapter 2 of the Final EIS, the Corps completed a rigorous and comprehensive process to identify and evaluate alternatives to the Project. After careful study, seven alternatives (including Alternative 1 – No Action) were evaluated and described in detail in Chapter 2 of the Final EIS (see Section 4.0 of this Joint Record of Decision [JROD]). The Corps determined that the six action alternatives meet the Project's Purpose and Need; which is outlined in Section 3.0 of this JROD. Over 300 alternative options were evaluated and those eliminated from further analysis are presented in Chapter 2 of the Final EIS Section 2.4, Alternatives Considered but Eliminated from Detailed Analysis. Appendix C of the Final EIS includes tables that explain in detail why options were considered and provides rationale for the elimination of each option.

Of the six action alternatives analyzed in the Final EIS, Alternative 3A and Alternative 5A are determined to be not practicable due to existing technology. Alternative 3A was considered in detail in the EIS because equipment manufacturers had announced plans to produce liquefied natural gas (LNG) powered haul trucks; however, at the time of the JROD, trucks of the planned payload capacity are not proven or commercially available. Alternative 5A was considered in detail to examine potential for reducing impacts to WOUS but the technology is not proven for mining operations at the planned throughput rate.

Environmental Analysis of Practicable Alternatives

This environmental analysis focuses on the alternatives that the Corps determined to be practicable, and compares the relative extent and nature of impacts for the practicable alternatives to Alternative 2 North Option (described in Section 2.1 of the JROD). The alternatives are assessed in terms of impacts to the aquatic ecosystem to determine whether they would have less adverse impacts than the Proposed Action. If a practicable alternative is

determined to have greater adverse impacts to the aquatic ecosystem as compared to the Proposed Action, then that alternative is not considered to be the Least Environmentally Damaging Practicable Alternative (LEDPA).

Alternative 3B – Diesel Pipeline

Alternative 3B (includes Port MacKenzie and Collocated Natural Gas and Diesel Pipeline options) was developed as an alternative to reduce barging activity on the Kuskokwim River. Alternative 3B would provide an alternate method of transporting diesel to the Mine Site to power the large mining trucks and other equipment (the power plant would run on natural gas). The Proposed Action would require approximately 58 barge trips of diesel per year on the Kuskokwim River. Alternative 3B would construct an 18-inch, 334-mile diesel pipeline from Cook Inlet to the Mine Site, instead of the natural gas pipeline, to eliminate the 58 annual barge trips of diesel. The alternative was developed to respond to concern about barging impacts on the river such as spill risk, impacts to fish, propeller scour of the river bottom, barge wakes, wave induced erosion, and interference with subsistence fishing activities. The alternative increases direct impacts to WOUS by between approximately 150 to 240 acres depending on the option.

How Alternative 3B Changes Spill Risk – The Alternative 3B pipeline would originate at Tyonek, operate all year, and require improvements to the existing Tyonek barge facility. There are two options; the Port MacKenzie Option would originate at the existing Port MacKenzie and the Co-located Option would construct the 14-inch natural gas pipeline and a small diameter 8-inch diesel pipeline in the same corridor. The alternative and either option would require diesel deliveries and vessel transit in critical habitat for Cook Inlet beluga whales. It would also pose the risk of diesel pipeline leaks and the Final EIS Section 2.3.4.3 describes spill response equipment and construction infrastructure (roads and airstrips) that would need to be left in place for spill readiness. At least 25 additional surveillance flights per year would be required of the Pipeline corridor to look for diesel leaks.

Section 3.24.5.5 of the Final EIS describes two scenarios for diesel pipeline leaks associated with Alternative 3B; pinhole leaks and a complete rupture. The pinhole leak scenarios evaluated in the Final EIS range in probability from very high for low volume (less than 99.9 gallons) spills to medium to low probability for spills ranging up to 100,000 gallons. (Pinhole leaks can continue for some time because leak detection systems can have difficulty detecting the loss.) The pipeline rupture scenario evaluated in the Final EIS evaluated a very low probability (probability approaches zero) spill of 422,000 gallons or more. These spills could occur any time of the year and could travel downstream under ice in the winter complicating response and recovery efforts. Evaporation would be reduced in the winter allowing migration of the diesel over longer distances. Response efforts would be complicated by the remote location relative to response facilities.

In comparison, under the Proposed Action, Donlin Gold would transport diesel to the Mine Site during the ice-free season using specially constructed river barges. The diesel river barges would be double hulled and have ten separate water-tight compartments. These design features would reduce the potential for spills and also reduce the volume that could be released if there was an accident. Section 3.24.5.2 of the Final EIS describes a river barge spill scenario under Alternative 2 with a very low probability (probability approaches zero) that releases 37,817 gallons of diesel to the Kuskokwim River during the ice-free season. The tug crew would respond initially and other responders would be mobilized. The Final EIS describes that

between recovery from responders, evaporation, and dispersion, within three days there would be no or very little visible sheen remaining. Final EIS Section 3.24.6.7 – Water Quality notes that the impacts could extend downstream over distances of up to several miles beyond which natural processes would attenuate the impacts. The perception of water quality impacts for salmon fishers and other resources users could extend beyond the area of actual effects.

How Alternative 3B Changes Impacts to Aquatic Resources of the Kuskokwim River – Section 3.13.3.2.2 of the Final EIS finds that potential impacts from barge traffic on migrating adult salmon are expected to be unnoticeable. Also, the Final EIS concludes that the Proposed Action is unlikely to cause noticeable changes in fish behavior and that no noticeable incidents of injury or mortality to individual fish would likely occur. The Final EIS reports that impacts from prop wash scour on anadromous or resident fish and aquatic life would be limited to mainstem channel areas (Section 3.13.3.2.2). Scouring could displace, injure, or cause mortalities to eggs of rainbow smelt. As a result of reduced barging under Alternative 3B, the potential effects of prop wash scour from barge traffic on migrating and rearing fish in confined and shallow sections of the navigation channel would be reduced from the Proposed Action. The Final EIS concludes that under Alternative 3B, impacts would be similar to that described for Alternative 2, but less likely to occur due to the reduced number of barge trips.

Barge actions under Alternative 2 are not expected to have perceptible impacts on surface water quality (Final EIS Section 3.7.3.2.2). The Final EIS also concludes that potential barge wake induced erosion could occur but would not be distinguishable from natural bank erosion on the Kuskokwim River (Final EIS Section 3.11.4.2.2). The reduced barging under Alternative 3B would have little effect on surface water quality or bank erosion.

How Alternative 3B Changes Impacts to Subsistence – As noted earlier, Alternative 3B will require readiness to respond to spills from the diesel pipeline and will require maintenance of roads and airstrips that would have been reclaimed after construction and made unusable under Alternative 2. As a result, Alternative 3B is expected to result in increased access by out of region hunters and trappers using airplanes. This will result in increased competition for subsistence users along the Pipeline right of way. The 25 additional surveillance flights per year would also cause disturbance of subsistence resources and users.

In comparison, barging under Alternative 2 would potentially interfere with subsistence fishing, primarily in several narrow reaches of the river. In response to concerns by local residents and subsistence users of the river, Donlin Gold will implement a communication program to keep local communities informed of the barge schedules and current status of barge traffic as well as minimize displacement of subsistence fishing by barges (see Final EIS, Appendix W, for Donlin Gold's Barge Communication Plan). Donlin Gold has also committed to two subcommittees, the Barge Subcommittee and the Subsistence Subcommittee, managed under the purview of the DATROC.

The Barge Communication Plan and the subcommittees under DATROC would reduce impacts under Alternative 2. Alternative 3B would reduce Project related barging by eliminating the diesel barges, thereby reducing the impact from Alternative 2.

Summary of LEDPA Analysis for Alternative 3B – Alternative 3B increases direct impacts to WOUS by between approximately 150 to 240 acres. Other environmental impacts represent tradeoffs:

- Alternative 3B eliminates the risk of barge related diesel spills on the Kuskokwim River during operations but adds the risk of larger pipeline spills to 334 miles of land and streams along the route;
- Alternative 3B increases the amount of ship traffic and diesel transfer in critical habitat for Cook Inlet beluga whales;
- Alternative 3B reduces barge related impacts to resources of the Kuskokwim River such as fish, water quality, bank erosion, and propeller scour;
- Alternative 3B reduces impacts to subsistence fishing on the Kuskokwim River but introduces new competition for subsistence resources along the Pipeline route through the roads and airstrips that would need to be maintained for spill response readiness; and
- Alternative 3B requires 25 additional surveillance flights per year that would disturb wildlife and subsistence users.

The Corps finds that Alternative 3B increases impacts to WOUS. While other environmental impacts such as potential impacts to rainbow smelt may be reduced by Alternative 3B, it represents an increased risk from oil spills, increased competition for subsistence resources, and increased vessel activity in critical habitat for Cook Inlet beluga whales. The Corps has determined Alternative 3B is not the LEDPA.

Alternative 4 – Birch Tree Crossing Port

Alternative 4 was a concept the Applicant considered prior to initiation of permitting and would have a longer road but a shorter barging distance. Alternative 4 would construct the upriver port at Birch Tree Crossing. Under Alternative 4, river barges would not ply the 75 river miles between Birch Tree Crossing and Jungjuk and not pass the communities of Aniak, Chuathbaluk, and Napaimute. A 76-mile road to the Mine Site would be required and would be about 46 miles longer than the road for Alternative 2. The alternative increases direct impacts to WOUS by approximately 345 acres and increases indirect impacts by approximately 1,380 acres. There would be 11 fewer water body crossings (2 more bridges, 13 fewer culverts).

How Alternative 4 Changes Impacts to Aquatic Resources of the Kuskokwim River – Section 3.13.3.2.2 of the Final EIS finds that potential impacts from barge traffic on migrating adult salmon are expected to be unnoticeable. Also, the Final EIS concludes that the Proposed Project is unlikely to cause noticeable changes in fish behavior and that no noticeable incidents of injury or mortality to individual fish would likely occur. The Final EIS reports that impacts from prop wash scour on anadromous or resident fish and aquatic life would be limited to mainstem channel areas (Section 3.13.3.2.2). Scouring could displace, injure, or cause mortalities to eggs of rainbow smelt. Alternative 4 would have the same impacts as Alternative 2 up to Birch Tree Crossing but would eliminate all barging related impacts upstream except for a small number of barges during construction.

Barge actions under Alternative 2 are not expected to have perceptible impacts on surface water quality (Final EIS Section 3.7.3.2.2). The Final EIS also concludes that potential barge wake induced erosion would not be distinguishable from natural bank erosion on the Kuskokwim River (Final EIS Section 3.11.4.2.2).

How Alternative 4 Changes Impacts to Subsistence – Alternative 4 would eliminate barging related impacts upstream of Birch Tree Crossing except for a small number of barges during construction. However, the longer access road under Alternative 4 (additional 46 miles) would cross through moose, black bear, waterfowl, and berry picking subsistence areas for Aniak and Chuathbaluk residents.

Barging under Alternative 2 would potentially interfere with subsistence fishing in several narrow reaches of the river. As mentioned above, Donlin Gold's Barge Communication Plan and the subcommittees under DATROC would reduce these impacts.

Summary of LEDPA Analysis for Alternative 4 – Alternative 4 increases direct impacts to WOUS by approximately 345 acres and increases indirect impacts by approximately 1,380 acres. Other environmental impacts represent tradeoffs:

- Alternative 4 nearly eliminates barge related impacts between Birch Tree Crossing and Jungjuk to resources of the Kuskokwim River such as fish, water quality, bank erosion, and propeller scour;
- Alternative 4 nearly eliminates impacts to subsistence fishing between Birch Tree Crossing and Jungjuk but has no change downstream of Birch Tree Crossing;
- Alternative 4 would cross through moose, black bear, waterfowl, and berry picking subsistence areas for Aniak and Chuathbaluk residents.

The Corps finds that Alternative 4 increases impacts to WOUS. While other environmental impacts such as potential impacts to rainbow smelt and interference with subsistence fishing may be reduced by Alternative 4, the road would cross through important subsistence areas. The Corps has determined Alternative 4 is not the LEDPA.

Alternative 6A – Dalzell Gorge Pipeline Route

Alternative 6A was the Applicant's original proposed pipeline alignment through the Alaska Range. In December 2013, Donlin Gold revised their Plan of Development in favor of the currently proposed alignment which avoids Dalzell Gorge. Alternative 6A increases direct and indirect impacts to WOUS by approximately 105 acres. It would also increase impacts to the Iditarod National Historic Trail to include 20 additional crossing, 15 more miles of pipeline in close proximity for a greater length, and 12 more miles of co-located sections. There would be 3 fewer total pipeline miles and 3 fewer new airstrips required but one more existing airstrip used. The route would also pose greater geotechnical hazard from unstable slopes than corresponding Alternative 2 segment.

Alternative 6A would increase impacts to WOUS, the Iditarod National Historic Trail, and not provide any substantial benefits. The Corps has determined Alternative 6A is not the LEDPA.

LEDPA Determination

Based on the evaluation above, the Corps concludes that Alternative 2 North Option is the LEDPA. This alternative meets the overall Project purpose, is practicable in consideration of costs, logistics, and exiting technology, and has the least total direct impacts (excavation, fill, vegetation clearing) and potential indirect impacts (dust, dewatering) to WOUS of the practicable alternatives (see Final EIS Section 3.11). Table B2 summarizes the analysis for determining the LEDPA.

Table B8: Summary of LEDPA Analysis

Alternative	Practicability Analysis	Comparison of Environmental Impacts to Alternative 2 North Option	Conclusion
Alternative 1 – No Action	Not practicable - does not meet the overall Project purpose	Not applicable – alternative does not meet overall Project purpose.	Not LEDPA
Alternative 2 – North Option	Practicable	5,545 acres of direct and indirect impacts to WOUS. Of these, 4,285 are direct impact acres, and 1,260 are indirect impact acres. 58 diesel barge trips and 58 cargo barge trips per year on the Kuskokwim River during operations during open water. Nine new airstrips for pipeline construction that would be reclaimed and made unusable Limited shipping (only during pipeline construction) in Cook Inlet Beluga critical habitat.	LEDPA
Alternative 3A – Reduced Diesel Barging: Liquefied Natural Gas Powered Haul Trucks	Not practicable - as of the time of the Final EIS and this JROD, trucks of the planned payload capacity are not proven or commercially available.	Not applicable – alternative is not practicable due to existing technology.	Not LEPDA
Alternative 3B – Reduced Diesel Barging: Diesel Pipeline (includes Port MacKenzie Option and Collocated Diesel and Natural Gas Pipelines Option)	Practicable	Increases direct impacts to WOUS by 160 acres. Port MacKenzie Option increases direct impacts to WOUS by 150 acres. Collocated Option increases direct impacts to WOUS by 200 acres. The Collocated Option configured with Port MacKenzie increases direct impacts to WOUS by 240 acres. Eliminates Project-related diesel barging on the Kuskokwim River during operations. There would be less on-site diesel storage required Requires maintenance of the nine new airstrips used for pipeline construction for oil spill response readiness. These airstrips would cause increased competition for subsistence resources. There would be at least 25 more surveillance overflights per year. Diesel spills from the pipeline could be difficult to detect and occur under ice and snow in the winter. There would be about 20 more pipeline miles. Shoofly roads would need to be left in place along the pipeline for oil spill response. Increased ship activity in Cook Inlet Beluga critical habitat (12 fuel barge round trips per year during operations).	Not LEPDA

Table B8: Summary of LEDPA Analysis

Alternative	Practicability Analysis	Comparison of Environmental Impacts to Alternative 2 North Option	Conclusion
Alternative 4 – Birch Tree Crossing Port	Practicable	Increases direct and indirect impacts to WOUS by 1,725 acres (345 more direct impact acres, and 1380 more indirect impact acres). There would be 15 fewer water body crossings (2 more bridges, 17 fewer culverts). Port size would be about 45 acres greater. Barges would not ply the 75 river miles between Birch Tree Crossing and Jungjuk and not pass the communities of Aniak, Chuathbaluk, and Napaimute. The longer access road (additional 46 miles) would cross through moose, black bear, waterfowl, and berry picking subsistence areas for Aniak and Chuathbaluk residents. There would be an additional 47 material sites required.	Not LEPDA
Alternative 5A – Dry Stack Tailings	Not practicable - technology is not proven for mining operations at the planned throughput rate.	Not applicable – alternative is not practicable due to existing technology	Not LEPDA
Alternative 6A – Modified Natural Gas Pipeline Alignment: Dalzell Gorge Route	Practicable	Increases direct impacts to WOUS by about 105 acres (no change in indirect impact acres). Increases impacts to the Iditarod National Historic Trail to include 20 additional crossing, 15 more miles of pipeline in close proximity for a greater length, and 12 more miles of co-located sections. There would be 3 fewer total pipeline miles. There would be 3 fewer new airstrips required but one more existing airstrip used. Greater geotechnical hazard from unstable slopes than corresponding Alternative 2 segment.	Not LEPDA

B2.1.1.2 THE PROPOSED DISCHARGE OF DREDGED OR FILL MATERIAL WOULD NOT (SECTION 230.10[B])

(1) Violate any applicable State water quality standard. The State water quality agency, Alaska Department of Environmental Conservation (ADEC), issued their conditioned 401 Water Quality Certification titled, "State of Alaska Certificate of Reasonable Assurance for the Donlin Gold Project," for the placement of the fill material for the Applicant's proposed Project described in our Public Notice (see Attachment B6).

(2) Violate toxic effluent standards or prohibitions under section 307 of the Clean Water Act (CWA). The fill material would come from local sources known to be free of human or natural contamination.

(3) Jeopardize the continued existence of any species listed as endangered or threatened species under the Endangered Species Act of 1973 (ESA) or their critical habitat. The Proposed Action, as well as the alternative actions, have been coordinated with the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) through informal consultation resulting in a determination of "may affect, not likely to adversely affect" for all listed species in the Project Area.

(4) Violate any requirement imposed by the Department of Commerce to protect marine sanctuaries under Title III of the Marine Protection, Research, and Sanctuaries Act of 1972. This is not applicable as there are no marine sanctuaries in the Project area.

This determination is based on the conclusions of factual determinations and technical evaluation factors of this analysis and takes into account the detailed analysis of impacts on specific physical, chemical, biological and human characteristics of the aquatic ecosystem conducted as part of the Final EIS. Additionally, Subpart H of the Guidelines (see Section B2.7 of this attachment) summarizes key measures that relate to the discharge of fill material into WOUS to minimize adverse effects.

B2.1.1.3 EXCEPT AS PROVIDED UNDER SECTION 404(B)(2), NO DISCHARGE OF DREDGED OR FILL MATERIAL SHALL BE PERMITTED WHICH WILL CAUSE OR CONTRIBUTE TO SIGNIFICANT DEGRADATION OF WATERS OF THE U.S. [SECTION 230.10(C)]

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 B2.5.1 – B2.5.4 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 B2.1.2.5, B2.1.2.8, and B2.3.1 – B2.3.3 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 B2.2.1 – B2.2.5 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 B2.5.1 – B2.5.4 below.

In letters dated May 31, 2016 and June 27, 2016, the EPA provided information that significant degradation could occur to the Kuskokwim River from barging and to Crooked Creek because of permanent modifications in the watershed. The modifications to Crooked Creek include loss of flows from discharge of fill material into Snow Gulch for the reservoir, American Creek for the waste rock facility, and Anaconda Creek for the tailings storage facility. (Based on hydrologic models, there could also be loss of flows from the groundwater pumping that would occur to dewater the pit; however these flow losses would not be the result of the discharge of fill and are outside the scope of the Corps' authority.) Tables B3 and B4 quantify the average losses of flow and Tables B5 and B6 quantify the winter losses of flow attributed to the discharge of dredged or fill material (direct impact) and from pit dewatering (indirect impact) into Crooked Creek from Snow Gulch, American Creek, and Anaconda Creek. The indirect impacts assume base-case conductivity (K) bedrock condition. Changes in this condition would only affect the indirect impacts. The effects of the discharge of dredged or fill material would be independent of the bedrock conditions. The direct effect of the discharge of dredged or fill material would cause no more than an approximate 10 percent loss of flow to Crooked Creek.

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Table B9: Average Annual Flow Loss – Crooked Creek Tributaries

Snow Gulch				American Creek								Anaconda Creek			
Baseline (cfs)[3]	Direct[1] Impacts			Baseline (cfs)	Direct + Indirect[2] Impacts			Direct Only		Indirect Only		Baseline (cfs)	Direct Impacts		
	Flow Loss[4]		Resulting flow (cfs)[3]		Flow Loss		Resulting Flow (cfs)	Flow Loss		Flow Loss[6]			Flow Loss[7]		Resulting Flow (cfs)
	%[5]	cfs			%	cfs		%	cfs	%	cfs		%	cfs	
4.3	0	0	4.3	6.9	0	0	6.9	0	0	0	0	6.7	0	0	6.7
4.3	-14	-0.6	3.7	6.9	-100	-6.9	0	-55	-3.8	-45	-3.1	6.7	-67	-4.5	2.2
4.3	0	0	4.3	6.9	-23	-1.6	5.3	-3[9]	-0.2	-20	-1.4	6.7	-67	-4.5	2.2

Table B10: Average Annual Flow Loss – Crooked Creek

Project Phase	Crooked Creek[10]							
	Baseline (cfs)	Direct + Indirect Impacts			Direct Only		Indirect Only	
		Flow Loss		Resulting Flow (cfs)	Flow Loss		Flow Loss	
		%	cfs		%	cfs	%	cfs
Existing	100.2	0	0	100.2	0	0	0	0
Operations	100.2	-12[11]	-12.0	88.2	-9	-8.9	-3	-3.1
Closure[8]	100.2	-4	-4.0	96.2	-3	-2.6	-1	-1.4

Notes:

1. Direct = flow loss as a result of blockage of runoff from fill placement for dams, diversion structures, stockpile berms, WRF, TSF impoundment, and seepage recovery system (SRS).
2. Indirect = flow loss as a result of groundwater pumping for pit dewatering in Operations, and maintenance of pit lake level and groundwater flow direction in Closure.
3. Based on median (50th percentile) flow condition and water balance model for average precipitation.
4. All flow loss is from dam and diversion to process plant; no indirect flow loss from pit dewatering.
5. Percent (%) reduction from baseline.
6. Based on base-case hydraulic conductivity (K) bedrock condition for pit dewatering.
7. All flow loss is from TSF blockage and reduced recharge; no indirect flow loss from pit dewatering.
8. Represents flow loss after pit lake fills to managed capacity (Closure Year 52 on).
9. Represents contribution to pit lake pumping and treating from WRF fill seepage and runoff.
10. Below Crevice Creek: represents impacts downstream of all mine structures and fill.
11. Based on average of Mining Years 10 and 20.

cfs = cubic feet per second
WRF = Waste Rock facility
TSF = Tailings Storage Facility
Source: Final EIS Section 3.5 and Appendix G; BGC (2015h); SRK (2017e)

Table B11: Winter Flow Loss – Crooked Creek Tributaries

Project Phase	Snow Gulch				American Creek								Anaconda Creek			
	Baseline (cfs)[3]	Direct[1] Impacts			Baseline (cfs)	Direct + Indirect[2] Impacts			Direct Only		Indirect Only		Baseline (cfs)	Direct Impacts		
		Flow Loss[4]		Resulting flow (cfs)		Flow Loss		Resulting Flow (cfs)	Flow Loss		Flow Loss[6]			Flow Loss[7]		Resulting Flow (cfs)
		%[5]	cfs			%	cfs		%	cfs	%	cfs		%	cfs	
Existing	0.9[8]	0	0	0.9	2.6	0	0	2.6	0	0	0	0	3.2	0	0	3.2
Operations	0.9	-66	-0.6[10]	0.3	2.6	-100	-2.6	0	0	0[11]	-100	-2.6[11]	3.2	-71[3]	-2.3	0.9
Closure[9]	0.9	0	0	0.9	2.6	-100[3]	-2.6	0	-13[12]	-0.3	-87[13]	-2.3	3.2	-71[3]	-2.3	0.9

Table B6: Winter Flow Loss – Crooked Creek

Project Phase	Crooked Creek[14]							
	Baseline (cfs)	Direct + Indirect Impacts			Direct Only		Indirect Only	
		Flow Loss		Resulting Flow (cfs)	Flow Loss		Flow Loss	
		%	cfs		%	cfs	%	cfs
Existing	45.4	0	0	45.4	0	0	0	0
Operations	45.4	-16[15]	-7.3	38.1	-10	-4.7	-6	-2.6
Closure[9]	45.4	-14[3]	-6.4	39.0	-9	-4.1	-5	-2.3

Notes:

1. Direct = Flow loss as a result of blockage of runoff from fill placement for dams, diversion structures, WRF, stockpile berms, TSF impoundment, and SRS.
2. Indirect = Flow loss as a result of groundwater pumping for pit dewatering in Operations, and maintenance of pit lake level and groundwater flow direction in Closure.
3. Based on average of monthly flow rates from November to March under median (50th percentile) flow conditions (Final EIS Appendix G).
4. All flow loss is from dam and diversion to process plant; no flow loss from pit dewatering.
5. Percent (%) reduction from baseline.
6. Based on base-case hydraulic conductivity (K) bedrock condition for pit dewatering.
7. All flow loss is from TSF blockage and reduced recharge; no indirect flow loss from pit dewatering.
8. Average of 25 periodic winter (November to March) measurements (BGC 2012a; Donlin Gold 2017c).
9. Represents flow loss after pit lake fills to managed capacity (Closure Year 52 on).
10. Assumes all demand for process water from Snow Gulch Reservoir would occur in January through March (SRK 2017e).
11. Assumes all water extraction from American creek watershed in winter is from year-round pit dewatering; i.e., there would be no runoff in winter to be blocked by fill.
12. Based on proportion of flow to pit lake that comes from WRF fill seepage and runoff.
13. While no pit lake pumping would occur in winter (SRK 2017e), groundwater would continue to flow towards pit lake in winter due to lowered lake levels, drawing flow from American Creek.
14. Below Crevice Creek: represents impacts downstream of all mine structures and fill.
15. Based on average of Mining Years 10 and 20.

cfs = cubic feet per second
WRF = Waste Rock facility
TSF = Tailings Storage Facility
Sources: Final EIS Section 3.5 and Appendix G; BGC (2012a, 2015h); Donlin Gold (2017c); SRK (2017e)

The District's authority is limited to regulating the discharge of dredged or fill material into WOUS. The Alaska Department of Natural Resources Division of Water (ADNR-Water) is responsible for managing water in the State and has the authority to render a decision on whether establishment of a minimum instream flow is necessary to comply with the Anadromous Fish Act (AS 16.05.871-.901) and the Fish Passage Act (AS 16.05.841). Donlin Gold has stated they recognize the concerns regarding predicted flow losses in Crooked Creek and they have engaged the appropriate State agencies to work within the State permit process to address this issue. Since stream flow changes will occur slowly over an extended period of time and unknowns exist, the ADF&G has recommended Donlin Gold incorporate the establishment of a field monitoring program into their ADF&G application with provisions for making adaptive changes as needed to ensure the proper protection of aquatic resources in Crooked Creek (See Final EIS Section 5.2, Table 5.2-1, Design Feature A33, Crooked Creek Substrate Freezing Monitoring and Subsequent Mitigation Plan).

The primary measures to be implemented to avoid significant degradation of the Kuskokwim River and Crooked Creek include:

- Donlin Gold would develop and implement a rainbow smelt monitoring program to establish additional baseline data for a better understanding of the species' occurrence and the character, use, and distribution of spawning habitat along the Kuskokwim River. Additionally, Donlin Gold will implement a communication program to keep local communities informed of the barge schedules and current status of barge traffic as well as minimize displacement of subsistence fishing by barges (see Final EIS, Appendix W, for Donlin Gold's Barge Communication Plan). Donlin Gold has also committed to two subcommittees, the Barge Subcommittee and the Subsistence Subcommittee, managed under the purview of the DATROC. The Corps has concluded that while there would be impacts to the Kuskokwim River, with implementation of the rainbow smelt monitoring program, the communication program, and the subcommittees under DATROC, there would be no significant degradation of Kuskokwim River WOUS.
- Donlin Gold states they have applied for water rights authorization from the State and will comply with the monitoring requirements under that certificate as well, which is typically based on consultation with ADF&G. Donlin Gold has developed an Aquatic Resources Monitoring Plan Draft Framework in anticipation of producing a final ARMP for Crooked Creek under the provisions of its Title 16 fish habitat permits administered by the ADF&G. The ARMP will include aquatic resource monitoring throughout Crooked Creek and its tributaries upstream and downstream from the Mine Site, to include fish surveys, habitat, sediment, fish tissue, and flow monitoring. Flow monitoring will address both summer and winter flow conditions. The ARMP will provide for reporting to ADF&G and will require specific action by Donlin Gold if the data show variability from the predicted results on aquatic resources (to include flow). The actions that could be taken to reduce unexpected flow loss include but would not be limited to lining or relocating portions of the stream channel, augmenting flows from the Snow Gulch Reservoir or the Kuskokwim River, or grouting areas of bedrock demonstrating high flow rates (Final EIS Chapter 5). The Corps has concluded that while there would be impacts to Crooked Creek, with stipulation of permit conditions established by the State of Alaska, implementation of the ARMP, and the availability of actions than can be taken reduce unexpected flow loss, there would be no significant degradation of Crooked Creek WOUS.

The Corps finds that with the inclusion of the mitigation measures identified by the Applicant as part of the proposed Project, compensatory mitigation for unavoidable losses of WOUS, and additional mitigation measures in the form of special conditions, applied by the Corps (Section 6.0 of this JROD), the proposed Project would not cause or contribute to significant degradation of the WOUS. This determination is based on the conclusions of factual determinations and technical evaluation factors of this analysis and takes into account the detailed analysis of impacts on specific physical, chemical, biological and human characteristics of the aquatic ecosystem conducted as part of the Final EIS. Additionally, Subpart H of the Guidelines (see Section B2.7 of this attachment) summarizes key measures that relate to the discharge of fill material into WOUS to minimize adverse effects.

B2.1.1.4 MINIMIZATION OF POTENTIAL ADVERSE IMPACTS (SECTION 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. B2.7 Subpart H (below) identifies such possible steps.

B2.1.2 FACTUAL DETERMINATIONS (SECTION 230.11)

The determinations of potential short or long-term effects of proposed discharges of dredged or fill material on the physical, chemical and biological components of the aquatic environment are discussed below. These "factual determinations" are used to evaluate compliance with the second Guidelines compliance test (Restrictions on Discharges – see Section B2.1.1 above). The analysis of these determinations is based on finding s of technical evaluation factors (Guidelines Subparts C through F – see Sections B2.2 through B2.5).

Measures identified to minimize impacts to each of the determinations outlined below can be found in the 2017 Plan of Operations Reclamation and Closure Plan: Volume 4; Final EIS, Chapter 5, Section 5.2, Design Features Proposed by Donlin Gold, and Standard Permit Conditions and BMPs discussed in Section 5.3; and Block 23 of the June 2018 updated Compensatory Mitigation Plan.

B2.1.2.1 PHYSICAL SUBSTRATE DETERMINATIONS (SECTION 230.11[A], 230.20)

References: Final EIS in Sections 3.1 (Geology), 3.2 (Soils), 3.5 (Surface Water Hydrology), and 3.11; Preliminary Jurisdictional Determination reports (Michael Baker 2016, 2017a, 2017 as cited in the Final EIS)

Ultimately the Project would result in a permanent loss of 2,877 acres of wetland substrates and 172,844 linear feet of stream substrates and the temporary loss (primarily those occurring along the Pipeline corridor) of 538 acres of wetland substrates and 53.346 linear feet of stream substrates. Indirect impacts would disturb a total of about 1,260 acres of wetlands substrates from dust and dewatering, of which 635 acres are dust impacts in the Mine Site; about 430 acres are overlapping dewatering impacts in the Mine Site, and about 630 acres are dust impacts in the Transportation Corridor. Indirect impacts would disturb of total of about 65,470 linear feet of streams due to dust and dewatering (including an overlapping 34,850 linear feet due to dewatering in the Mine Site).

The Applicant has incorporated measures to avoid and minimize impacts of the proposed Project to the physical substrate. The intensity of Project effects to physical substrate would be

reduced through effective design, reclamation, and use of BMPs. Additionally, Subpart H of the Guidelines (see Section B2.7 of this attachment) summarizes key measures that relate to the discharge of fill material into WOUS to minimize adverse effects.

Key measures applicable to physical substrate include:

- A Fugitive Dust Control Plan and air quality permit requirements will be followed that describe Best Available Control Technologies and source testing for particulate matter emissions, best management practices (BMPs) for controlling dust from site activities (including roads) and wind erosion, and training and performance assessment procedures (ADEC 2017i). These actions are required for an Applicant to meet ADEC, Division of Air Quality, requirements per 18 Alaska Administrative Code (AAC) 50.010, Ambient Air Quality Standards. Construction practices would meet requirements for air quality protection permits outlined in 18 AAC 50.502 (b). Donlin Gold LLC was issued an ADEC Air Quality Control Construction Permit on June 30, 2017 (Permit AQ0934CPT01).
- Erosion control and construction methods will be described in the Donlin Gold Stormwater Pollution Prevention Plan (SWPPP). The SWPPP is required by ADEC Division of Water for an Applicant to acquire a Construction General Permit (CGP) for Storm Water Discharges for Large and Small Construction Activities (2016 CGP, AKR100000). The goal of the 2016 CGP is to minimize erosion and reduce or eliminate the discharge of pollutants, such as sediment carried in storm water runoff from construction sites, through implementation of appropriate control measures for embankment stabilization, including contouring and seeding will be employed Project-wide to reduce embankment erosion and potential sediment runoff into WOUS.
- Most areas underlain by permafrost will be crossed during winter to minimize disturbance from trenching for the Pipeline (CMP, Block 23, July 2018). A seasonal construction timeline minimizes impacts to WOUS, by timing construction activities in lowlands in the winter and in uplands during the summer. Approximately 60-percent of the total Pipeline length would be constructed during frozen winter conditions to minimize wetland and soil disturbances from equipment (delineated in the Pipeline Construction Execution Plan of December 2016). Snow and ice roads with frost packing will provide a stable surface for equipment to operate.
- Monitoring of bank erosion immediately upstream and downstream of Angyaruaq (Jungjuk) port will continue, with measures applied, as warranted, for streambank protection as part of adaptive management (as a Standard Operating Procedure). If warranted, this may include installation of geotextile matting, riprap armoring or methods from the ADF&G Streambank Revegetation and Protection Manual (Walter et al. 2005), such as willow staking, to reduce the effects of eddy formation, scour, and bank erosion during flood events (BGC 2014e).

With Applicant design features and inclusion of special conditions, the proposed Project would comply with this factor of the Guidelines.

B2.1.2.2 WATER CIRCULATION, FLUCTUATION AND SALINITY DETERMINATIONS (SECTION 230.11[B], 230.22 – 230.25)

References: Final EIS in Sections 3.5 (Surface Water Hydrology), 3.6 (Groundwater Hydrology), 3.7 (Water Quality), and 3.13 (Fish and Aquatic Resources); Water Resources Management Plan (SRK 2017a); Aquatic Resources Monitoring Plan.

The proposed Project will adversely impact water quality and chemistry as a result of geochemical alteration of mined rock and its interaction with air and water, mercury deposition from stacks and fugitive dust, and potentially sedimentation and turbidity from construction of Project component facilities and barging in shallow areas along the Kuskokwim River. Discharges at the Mine Site to Crooked Creek and its tributaries would be subject to Alaska Pollutant Discharge Elimination System (APDES) permit conditions which include effluent quality limitations that are protective of existing uses. Impacts from barging and during Pipeline construction would be temporary and intermittent.

Most effects from the Project on water circulation, patterns, and fluctuations would occur within the Mine Site. Surface water resources would be affected in a local area of approximately 20 square miles encompassing the pit, WRF, and TSF. Watershed disturbances from construction of Mine Site facilities combined with indirect impacts from dewatering of the pit area would affect streamflow by altering the amount of runoff that reaches streams and the amount of water that percolates to the groundwater that may contribute to streamflow in Crooked Creek. Development of Mine Site facilities would result in permanent changes to flow patterns of Crooked Creek, a complete loss of flows in American Creek, and the loss of substantial flows from Anaconda Creek. Surface flows would be rerouted around some of the constructed facilities and reintroduced downstream where the flow patterns in undisturbed areas below the fills would be reestablished. The highest intensity surface water impacts (dewatering losses and tributary diversions) would occur throughout Operations and the early closure period. After the pit lake achieves its maximum managed stage the magnitude of the effects would be reduced so that changes in water quantity are likely to be within the limits of historic seasonal variation.

Construction of the Pipeline and access road could result in localized short-term impacts to streamflows. Construction of the Angyaruaq (Jungjuk) Port would have minimal effects on circulation and fluctuation.

Impacts to salinity gradients, where salt water from the ocean meets and mixes with freshwater from land are not expected to result from Project activities.

The Applicant has incorporated measures to avoid and minimize impacts of the proposed Project to water quality, circulation, and water fluctuation. The intensity of Project effects to water quality, circulation, and fluctuation would be reduced through effective design, water management, use of BMPs, and compliance with State-issued APDES and waste management permits. Additionally, Subpart H of the Guidelines (see Section B2.7 of this attachment) summarizes key measures that relate to the discharge of fill material into WOUS to minimize adverse effects.

Key measures applicable to water quality, circulation, and fluctuation include:

- Donlin Gold has developed an Aquatic Resources Monitoring Plan Draft Framework in anticipation of producing a final ARMP under the provisions of its Title 16 fish habitat permits administered by the ADF&G. The ARMP will include aquatic resource monitoring throughout Crooked Creek and its tributaries upstream and downstream from the Mine Site, to include fish surveys, habitat, sediment, fish tissue, and flow

monitoring. Flow monitoring will address both summer and winter flow conditions. The ARMP will provide for reporting to ADF&G and will require specific action by Donlin Gold if the data show variability from the predicted results on aquatic resources (to include flow). The actions that could be taken to reduce unexpected flow loss include but would not be limited to lining or relocating portions of the stream channel, augmenting flows from the Snow Gulch Reservoir or the Kuskokwim River, or grouting areas of bedrock demonstrating high flow rates (Final EIS Chapter 5).

- The APDES 5-year permit would be reevaluated, as required, including water flow models and/or pit lake modeling as appropriate. The adequacy of post-Closure Water Treatment Plant technology would also be reevaluated as pit lake water monitoring is conducted; and treatment technologies would be adjusted, as necessary, as a result of this evaluation;
- Post-closure sediment controls would include site grading and capping of erodible material, revegetation, and re-routing of surface runoff to reestablish natural conditions;
- The Project design at the Mine Site includes water management strategies that would maintain flow and storage within the design capacity of structures, provide flexibility for extra storage in high precipitation years, and sufficient water supplies for processing in low precipitation years, and minimize storage if not needed through water treatment and discharge;
- The Project design includes streamflow monitoring and dam inspections (SRK 2016h) to continually provide data for water management and dam safety purposes;
- Donlin Gold would implement barge guidelines for operating at certain river flow rates, and conduct ongoing surveys of the Kuskokwim River navigation channel to identify locations that should be avoided to minimize effects on bed scour and the potential for barge groundings. As part of the proposed operation, equipment will be available to free or unload/lighter barges in the event of groundings. The equipment will be available as part of ongoing operations, it will not all be dedicated standby equipment.

With Applicant design features, the proposed Project would comply with this factor of the Guidelines.

B2.1.2.3 SUSPENDED PARTICULATE/TURBIDITY DETERMINATIONS (SECTION 230.11[C], 230.21)

References: Final EIS Sections 3.5 (Surface Water Hydrology), 3.7 (Water Quality), and Section 3.13 (Fish and Aquatic Resources); Final EIS Appendix F (Supplemental Soil Information); Water Resources Management Plan (SRK 2017a); Aquatic Resources Monitoring Plan.

Increases in suspended particulates and turbidity are expected at the Mine Site during in-stream construction. Erosion of cleared stream banks in the American Creek and Anaconda Creek watersheds are also expected during construction. Placement of fill during construction of the Angyaruaq (Jungjuk) Port would have the potential to cause localized erosion and resuspension of fine-grained sediments in the Kuskokwim River. Additionally, increases in suspended particulates and turbidity may occur at various stream crossings during Pipeline construction.

In order to minimize impacts to water quality from erosion, runoff and sedimentation, an important part of Donlin Gold's water management strategy for construction involves diversion

structures that would direct surface water and runoff from precipitation around and away from the exposed areas (see Final EIS Section 3.2, Soils). By minimizing the rates of flow over the cleared areas, impacts from erosion and sedimentation would be controlled so that surface water quality would be expected to comply with all AWQC during the construction phase. Energy dissipating and erosion control features would be installed or modified as required to meet APDES discharge requirements.

Stormwater runoff would be managed for all construction-related activities and during operation of the mine through BMPs and erosion and sediment control (ESC measures), which will be detailed in Donlin Gold's SWPPPs. Donlin Gold's Draft Transportation and Mine Facility Erosion and Sediment Control Plan (Donlin Gold 2018) discusses the applicability of stormwater management (e.g., construction general permit or multi-sector general permit) across the various Project components and phases. ESC measures will be implemented prior to any ground-disturbing activities. Additionally, Subpart H of the Guidelines (see Section B2.7 of this attachment) summarizes key measures that relate to the discharge of fill material into WOUS to minimize adverse effects.

With Applicant design features and inclusion of special conditions, the proposed Project would comply with this factor of the Guidelines.

B2.1.2.4 CONTAMINANT DETERMINATIONS (SECTION 230.11[D])

References: Final EIS Sections 3.5 (Surface Water Hydrology), 3.6 (Groundwater Hydrology), and 3.7 (Water Quality), and Section 3.13 (Fish and Aquatic Resources); Final EIS Appendix F Supplemental Soil Information.

The following information has been considered in evaluating the biological availability of possible contaminants in dredged or fill material for all alternatives:

- Results from previous testing of the material or similar material in the vicinity of the Project. (See Final EIS Section 3.2.3.2.4 and Appendix F)
- Spill records for petroleum products or designated (Section 311 of CWA) hazardous substances. (See Final EIS Section 3.2.3.2.4 and Appendix F)
- Other public records of significant introduction of contaminants from industry, municipalities or other sources. (See Final EIS Section 3.2.3.2.4 and Appendix F)
- Known existence of substantial material deposits of substances which could be released in harmful quantities to the aquatic environment by man-induced discharge activities (See Final EIS Section 3.2.3.2.4 and Appendix F)

Dredge or fill material associated with the Mine Site, Transportation Corridor, and Pipeline will consist of native soils and parent material of native soils from borrow areas and other excavations in the Project area. Some of these materials will be stockpiled and reused for reclamation, and this would not be expected to introduce, relocate, or increase contaminants with implementation of erosion and sediment control measures. Non-acid generating rock, including waste rock and material form borrow sites, would be used for construction at the Mine Site. Material sites at the Mine Site, mine access road, and Pipeline would be evaluated prior to use for metals leaching and acid rock drainage (ARD) potential in final design using bulk geochemistry analysis, meteoric water mobility procedure (MWMP), and acid-base

accounting (ABA) methods. Alternative sites would be selected if results indicate the potential for impacts to downgradient water resources.

As discussed in the Final EIS Section 3.2.3.2.4, Soil Quality/Contaminated Sites, a review of public-record documents available from local, state, and federal agencies was conducted to identify possible impacts to the Project and from Project activities due to the presence of contaminated sites. No contaminated sites are present within the Mine Site Project boundaries. Contaminated sites were identified within the Project vicinity for the Transportation Corridor and Pipeline components. However, most of these sites are unlikely to have an effect on Project activities because they are outside areas that would be disturbed by construction activities. As stated in Section 5.2 of the Final EIS (Design Feature A11 in Table 5.2-1), Donlin Gold's Project design includes evaluating material sites at the Mine Site, mine access road, and Pipeline (prior to use) for metals leaching and ARD potential in final design using bulk geochemistry analysis, MWMP, and ABA methods. Alternative sites would be selected if results indicate the potential for impacts to downgradient water resources. Because of the remote undeveloped nature the material sources, these sites are not expected to contain contaminants such as pesticides or petrochemicals from previous activities which would trigger additional testing.

Based on an evaluation of the information above, there is no reason to believe the material to be discharged in the WOUS would contain contaminants. With the inclusion of special conditions, the proposed Project would comply with this factor of the Guidelines.

B2.1.2.5 AQUATIC ECOSYSTEM AND ORGANISM DETERMINATIONS (SECTION 230.11[E])

References: Final EIS Sections 3.11 (Wetlands) and 3.13 (Fish and Aquatic Resources); Final EIS Appendix Q (Essential Fish Habitat Assessment); Water Resources Management Plan (SRK 2017a); Aquatic Resources Monitoring Plan.

Impacts to the aquatic ecosystem and organisms are discussed in more detail under Subpart D (Section B2.3.2). The Project would result in direct habitat removal, wetland removal, streamflow and temperature changes, and sedimentation. These effects would impact migration, spawning, or rearing life stages of Pacific salmon and other anadromous or resident fish species and aquatic habitat in the Crooked Creek drainage near the Mine Site. Just less than 8 miles of streambed (in American and Anaconda creeks and portions of Snow and Lewis gulches) would be eliminated to construct various Mine Site facilities. Of this, less than one mile is classified as anadromous waters and regulated as Essential Fish Habitat (EFH). Along the Transportation Corridor, depending on water conditions, Project-related barge/tug propeller forces along the Kuskokwim River travel route may create riverbed scour, particularly in narrow and shallow segments of the river. In combination with existing boat traffic, this could degrade habitat and disturb or destroy fish eggs, larvae, or juveniles. Impacts to aquatic ecosystems from construction of the transportation and Pipeline facilities would generally be limited to the construction period primarily at stream crossings.

The Applicant has incorporated measures to avoid and minimize impacts of the proposed Project to the aquatic ecosystem. Subpart H of the Guidelines (see Section B2.7 of this attachment) summarizes key measures that relate to the discharge of fill material into WOUS to minimize adverse effects.

Key measures specifically applicable to the aquatic ecosystem and organisms include:

- Donlin Gold has developed an Aquatic Resources Monitoring Plan Draft Framework in anticipation of producing a final ARMP. The ARMP would be developed in conjunction with ADF&G and ADNR through habitat and water rights permitting processes. The objectives of the plan are to: 1) monitor for major changes to aquatic communities, 2) monitor for smaller scale and incremental changes to aquatic communities, and 3) guide results-based refinement to the monitoring program. The plan would build on the existing baseline dataset and include both biological and flow components, including: fish presence/abundance, invertebrate and periphyton sampling, and fish metals analysis; flow monitoring and winter surface water sampling to characterize fish habitat/passage and freezedown patterns; sediment sampling; and collection of additional geology and hydrology data to refine understanding of dewatering and groundwater/surface water flow dynamics (Donlin Gold 2018a,b; Owl Ridge 2017c). The ongoing data collection would be used in an adaptive management approach to refine the understanding of the dynamics surrounding Crooked Creek flow in winter as well as the open water seasons and to identify the most effective measures that can be used to ensure that minimum flows in Crooked Creek are maintained. If the Project results in minimal losses to Crooked Creek flows, adaptive management measures may be unnecessary. If flow losses warrant a response, a range of measures could be considered that include but would not limited to: lining or relocating portions of the stream channel; augmenting flows from the Snow Gulch Reservoir; pumping water from the Kuskokwim River, or grouting areas of bedrock demonstrating high flow rates. (Donlin Gold 2018a);
- Donlin Gold would develop and implement a rainbow smelt monitoring program to establish additional baseline data for a better understanding of the species' occurrence and the character, use, and distribution of spawning habitat along the Kuskokwim River. Survey methodology would likely include documenting sex ratio and age structure of the population and if possible, fecundity of females. Initially, surveys would be conducted annually to document the age structure of the rainbow smelt population and further document spawning patterns. Once an adequate baseline is established, regular sampling would be used to monitor for changes to existing patterns. The frequency of surveys over the long-term would depend on previous results and whether the data indicate a potential shift. If rainbow smelt population changes are observed over a defined time period, additional work would need to be undertaken to investigate the reason for those changes. If observed changes were attributed to Project-related activities, Donlin Gold would implement an assessment of measures available to address or mitigate those activities. Such activities would be coordinated with the DATROC Subsistence Subcommittee (Donlin Gold 2018a);
- Donlin Gold would implement barge guidelines for operating at certain river flow rates, and conduct ongoing surveys of the Kuskokwim River navigation channel to identify locations that should be avoided to minimize effects on bed scour and the potential for barge groundings. As part of the proposed operation, equipment will be available to free or unload/lighter barges in the event of groundings. The equipment will be available as part of ongoing operations, it will not all be dedicated standby equipment; and
- Culverts and bridges on transportation routes would be designed for fish passage.

With Applicant design features, the proposed Project would comply with this factor of the Guidelines.

B2.1.2.6 PROPOSED DISPOSAL SITE DETERMINATION (SECTION 230.11[F])

The Project does not involve open water disposal of material; therefore, this factual determination does not apply.

B2.1.2.7 DETERMINATION OF CUMULATIVE EFFECTS OF THE AQUATIC ECOSYSTEM (40 CFR 230.11[G])

References: Final EIS Chapter 4 (Cumulative Effects)

An assessment of cumulative effects takes into consideration the consequences of 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 Final EIS and find it to be a sufficient and accurate assessment.

The cumulative impacts expected from the proposed Project are permanent impacts to 2,877 acres of WOUS. Reasonably foreseeable future actions include mineral exploration activities at the Donlin Gold Mine development that the Applicant has been conducting in recent years.

The intensity of cumulative impacts attributable to the Project would vary in the Mine Site vicinity. The addition of mercury deposition from Project sources to global sources could result in water and sediment quality that is likely to be within regulatory limits or natural variation on average, but could exceed water quality criteria for total mercury in some areas. Impacts at the Mine Site would result in neither increases nor decreases to the cumulative effects on sediment quality associated with rates of mercury methylation in the Project Area. There would be additive incremental cumulative impacts to surface water and sediment quality along the Transportation Corridor and Pipeline components.

Cumulative effects on surface water hydrology would include Project-related localized noticeable changes in resource character during the life of the Project, and relatively small geographical area of effects on surface water. Cumulative effects on groundwater hydrology would include Project-related acute or obvious changes in the vicinity of the pit during the life of the Project because they are limited to a relatively small area and would be reduced in post-Closure.

The effects of predicted climate change on wetlands may increase in later years of the Project due to warming temperatures and altered precipitation patterns, resulting in permafrost loss, vegetation type changes, a general drying trend, and changed fire regime. The cumulative effects on wetlands, vegetation and fish and aquatic resources are expected to be measureable, but geographically limited.

The placement of fill material due to the reasonably foreseeable future action listed above would directly impact the physical substrate, water, and 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, would not result in significant adverse cumulative impacts to aquatic resources with the area of cumulative effect.

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.

Any proposed future projects requiring DA authorization would be evaluated as separate permit actions and the appropriate environmental analysis would be required, including a cumulative effect analysis. Permitting of these projects would be subject to Section 404 of the CWA, 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 CWA could not be authorized.

With Applicant design features and inclusion of special conditions, the proposed Project would comply with this factor of the Guidelines.

B2.1.2.8 DETERMINATION OF SECONDARY EFFECTS ON THE AQUATIC ECOSYSTEM (40 CFR 230.11[H])

References: Final EIS Chapter 2 (Table 2.3-55) and Chapter 3

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 B2.7 Subpart H below.

Secondary effects are effects on an aquatic ecosystem associated with a discharge of fill materials, but that do 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, impoundments; disturbance of wildlife populations as a result of noise or human activity; and a change in wildlife survival or productivity. Secondary effects may also include potential increases in resource competition among aquatic species due to habitat loss resulting from water withdrawals, increases in turbidity associated with erosion or discharge, or barriers to movement. These impacts are also discussed in Sections B2.2, B2.3, and B2.4, below.

Surface water hydrology would have secondary impacts from a decreased runoff contribution from American Creek and Anaconda Creek to Crooked Creek and would result in substantial flow diversions and changes in flow systems that are likely to affect nearby uses or environments. There is the potential for drainage changes and increased sedimentation associated with construction of access roads, the Angyaruaq (Jungjuk) Port, and the Pipeline; changes to surface water resources would be within the limits of historic seasonal variation.

Secondary impacts to water quality could result from erosion, runoff and sedimentation to surface water during construction of the Transportation Corridor and the Pipeline. Erosion and sediment controls would mitigate effects so the receiving waters would comply with ADEC water quality criteria. Mining activities would result in additional inputs of mercury to surface water from both atmospheric and aqueous sources. These inputs are likely to be within

regulatory limits on average, but could be sufficient to exceed AWQC and baseline ranges in some cases, depending on season, watershed location, and existing baseline concentrations.

Wetlands would experience secondary effects to about 1,260 acres of wetlands from fugitive dust deposition and dewatering at the Mine Site, and 630 acres of wetlands from fugitive dust deposition generated by traffic on gravel roads. There could also be impacts from potential thermal effects from the Pipeline in portions of the permanent ROW.

Unless effectively controlled, sediment generated from several sources at the Mine Site could be released to tributaries and the mainstem channel of Crooked Creek in the vicinity of the Mine Site. Habitat alterations from streamflow changes and sedimentation could cause secondary local effects to fish populations and aquatic habitat in Crooked Creek and its tributaries. Impacts would result from flow diversions and other water management activities at the Mine Site, pit dewatering, and clearing, earth movement, and grading along certain Crooked Creek tributaries. Habitat alterations from wetland and riparian removal would result in noticeable changes in the character and quantity of aquatic habitat. Habitat alterations from the Transportation Corridor resulting in changes in the character or quantity of aquatic habitat from erosion, turbidity, and water temperature may not be measurable or noticeable. Along the Pipeline, potential secondary impacts related to habitat degradation could result from stormwater runoff, suspended solids, and altered flows caused by disturbed soils; water withdrawals for ice-road construction and Pipeline hydrotesting; construction of stream crossings using open-trench methods; and water releases from Pipeline hydrotesting.

Secondary impacts are discussed in more detail in the technical evaluation discussions under Subparts C through F of this analysis.

With Applicant design features and inclusion of special conditions, the proposed Project would comply with this factor of the Guidelines.

B2.1.3 FINDINGS OF COMPLIANCE OR NON-COMPLIANCE WITH THE RESTRICTIONS ON DISCHARGE (40 CFR 230.12)

On the basis of these Guidelines (Subparts C through G after consideration of Subparts B through H), the proposed disposal site for the discharge of dredged or fill material complies with the Section 404(b)(1) Guidelines with the inclusion of the appropriate and practicable discharge conditions to minimize pollution or adverse effects to the affected aquatic ecosystem. See Section 6.2.7 of the JROD for a list of special conditions.

B2.2 SUBPART C – POTENTIAL IMPACTS ON PHYSICAL AND CHEMICAL CHARACTERISTICS OF THE AQUATIC ECOSYSTEM (40 CFR SECTION 230 SUBPART C)

The effects described in this subpart were considered in making the factual determinations and the findings of compliance or non-compliance in Subpart B (see Section B2.1).

B2.2.1 SUBSTRATE (SECTION 230.20, REQUIRED UNDER SECTION 230.11[A])

References: Final EIS in Sections 3.1 (Geology), 3.2 (Soils), 3.5 (Surface Water Hydrology), and 3.11 (Wetlands)

The proposed Project would adversely impact the physical substrate through activities such as stream diversion, removal of wetland vegetation and substrates, gravel fill placement for roads,

work pads, airstrips, laydown areas; resource extraction for development of the Mine Site and material sites; trenching and HDD for Pipeline installation, etc. Fills associated the Project would consist of native soils stockpiled for use in reclamation and material from material borrow sites identified in the Final EIS. Estimated direct impacts to WOUS (and underlying substrate) due to cut and fills to construct the Project as well as the duration of fill (temporary vs. permanent) are outlined in Section 3.1 of this JROD. Ultimately the Project would result in a permanent loss of 2,877 acres of wetland substrates and 172,844 linear feet of stream substrates and the temporary loss (primarily those occurring along the Pipeline corridor) of 538 acres of wetland substrates and 53,346 linear feet of stream substrates.

The process for developing the Mine Site, Transportation Corridor, and Pipeline are discussed in the Final EIS, Chapter 2, Section 2.3.2. The process of developing facilities at the Mine Site involves capturing surface flows, diversion of streams, and removal of wetland vegetation and substrates underlying facilities to be located in the American Creek and Anaconda Creek watersheds. Substrates would be stockpiled for use in closure and reclamation or placed in the WRF, following construction. Substrates underlying the port and access road would also be stripped and stockpiled for the life of the facilities. Pipeline construction would involve conventional open cut methods with substrates used for backfilling and reclaiming the Pipeline trench following placement of the Pipeline.

Direct impacts on the substrate of the aquatic ecosystem from construction activities, ground disturbance, and placement of fill would include altered topography, compaction of soil, and potential exposure of unconsolidated materials to erosion. Soil types are described in the Final EIS, Chapter 3, Section 3.2 Soils. Discontinuous permafrost exists in areas of the Mine Site and along portions of the Pipeline corridor. Permafrost removal is a requirement for the Project, given that existing permafrost could potentially result in adverse impacts on the stability of important structures if not mitigated. For the Pipeline component, most areas underlain by permafrost will be crossed during winter to minimize disturbance from trenching. Permafrost degradation could cause drainage and drying wetlands and subsidence that converts wetlands to waters.

Indirect effects to physical substrate could result from fugitive dust deposition, changes in water circulation, depth, pattern, and fluctuation from discharges which alter substrate elevation or contours, and from pit dewatering. Pit dewatering would lower the groundwater table, resulting in adverse impacts to wetland soils that presently rely on un-perched shallow groundwater processes. Wetland substrates most susceptible to dewatering activities are primarily located at low elevations in Mine Site drainages, as discussed in the Final EIS Section 3.11, Wetlands. Soil disturbances and permafrost degradation would also result in the release of greenhouse gas (GHG) emissions. Estimates of GHG emissions from soils and other sources influenced by Project activities are presented in Final EIS Section 3.8, Air Quality.

With Applicant design features and inclusion of special conditions, the proposed Project would comply with this factor of the Guidelines.

B2.2.2 SUSPENDED PARTICULATES/TURBIDITY (SECTION 230.21, REQUIRED UNDER SECTION 230.11[C])

References: Final EIS Sections 3.5 (Surface Water Hydrology), 3.7 (Water Quality), and Section 3.13 (Fish and Aquatic Resources); Final EIS Appendix F (Supplemental Soil Information)

Potential Project impacts include increased turbidity at the Mine Site during construction resulting from suspension of sediment due to in-stream construction and erosion of cleared stream banks in the American Creek and Anaconda Creek watersheds. In-stream construction could cause dislodging and transport of channel bed sediment and the alteration of stream bottom contours, resulting in increased suspended sediment concentrations in surface water. Changes in the bottom contours could alter stream dynamics and increase downstream erosion or deposition. Surface discharges to the local drainages during construction would potentially result in increased erosion and sedimentation, which could adversely affect surface water quality by increasing suspended particulates and turbidity.

Other construction activities across all Project components would consist of vegetation clearing, grading, and excavation work, which would expose areas to erosion, potentially increasing sediment concentrations in adjacent streams and water bodies. Use of heavy construction equipment would cause disturbance of near-surface soils that could locally result in increased runoff and subsequent increased sedimentation at downstream locations. Surface water quality could be temporarily and locally affected during Pipeline construction at stream crossings, but would be mitigated by HDD crossings of selected waterways and winter trenching at other crossings.

During operation of the Mine Site, non-contact freshwater (water that is never touched by the mining process), including surface water flows and stormwater runoff, would be intercepted to control erosion, avoid contact with stockpiles and other mining infrastructure, and minimize potential water quality impacts to aquatic biota (see detailed figures in the Final EIS, Chapter 2, Alternatives). Collected non-contact freshwater would be conveyed to stormwater/sedimentation control and storage facilities before being returned directly to other tributaries downstream or Crooked Creek.

With Applicant design features and inclusion of special conditions, the proposed Project would comply with this factor of the Guidelines.

B2.2.3WATER (SECTION 230.22, REQUIRED UNDER SECTION 230.11[B])

References: Final EIS in Sections 3.5 (Surface Water Hydrology), 3.6 (Groundwater Hydrology), 3.7 (Water Quality), and 3.13 (Fish and Aquatic Resources)

Prior to discharge to Crooked Creek, all mine contact water would be treated and would meet water quality standards (WQS); Mine Site waters outside the immediate mine area would also meet WQS. In the event of seepage recovery system (SRS) pump failure and overflow after Closure, the possibility exists that waters discharged to Anaconda and Crooked Creeks (WOUS) could exceed regulatory limits in WQS. There is also a possibility of contaminated groundwater migration from the South Overburden Stockpile towards Crooked Creek. Mitigation measures are described that would help reduce this potential impact. The Applicant has incorporated measures to avoid and minimize impacts of the proposed Project to water quality, circulation, and water fluctuation, as discussed in Section B2.1.2.2 and Subpart H.

Impacts to surface water quality resulting from atmospheric deposition of mercury would vary in intensity. Effects are likely to be within regulatory limits on average, but could vary above baseline conditions and EPA chronic criteria in certain tributary watersheds along Crooked Creek. Impacts to sediment quality in Crooked Creek, and increases in mercury and methylmercury concentrations in sediments, would be within the range of natural variation, and would be expected to decline in post-Closure. A Human Health Risk Assessment was

conducted to evaluate the risk from Project related concentrations of mercury, arsenic, and antimony and the findings are summarized in Section 3.22 of the Final EIS. The human health risk assessment (HHRA) concluded that the small increases in constituent concentrations are unlikely to result in unacceptable risks to human populations who would have the highest exposure (e.g., subsistence populations). Impacts to sediment quality from surface disturbances would be limited to discrete portions of the Project area by containment from BMPs.

Surface water quality could be temporarily and locally affected during Pipeline Construction at stream crossings, but would be mitigated by BMPs, HDD crossings of selected waterways, and winter trenching at other crossings.

Overall, impacts to water quality and chemistry are not expected to exceed regulatory limits. Discharges at the Mine Site to Crooked Creek and its tributaries would be subject to the APDES permit which was issued on May 24, 2018 and it contains effluent quality limitations that are protective of existing uses. Impacts during Pipeline construction would be temporary. The ADEC issued a conditioned 401 Water Quality Certification for the placement of the fill material for the Applicant's proposed Project described in our Public Notice (see Attachment B6 - State of Alaska Certificate of Reasonable Assurance for the Donlin Gold Project).

With Applicant design features and inclusion of special conditions, the proposed Project would comply with this factor of the Guidelines.

B2.2.4 CURRENT PATTERNS AND WATER CIRCULATION (SECTION 230.23, REQUIRED UNDER SECTION 230.11[B]) AND NORMAL WATER FLUCTUATION (SECTION 230.24, REQUIRED UNDER SECTION 230.11[B])

References: Final EIS in Sections 3.5 (Surface Water Hydrology), 3.6 (Groundwater Hydrology), 3.7 (Water Quality), and 3.13 (Fish and Aquatic Resources)

Most effects from the Project on water circulation, patterns, and fluctuations would occur within the Mine Site. Development of Mine Site facilities involves construction of freshwater reservoirs and diversion structures to manage the surface water flows in Anaconda and American Creek drainages as mine facilities are developed and operated. Placement of fill material to construct these facilities would result in changes in topography, soil permeability, vegetative cover, runoff and infiltration, and routing and storage of water in the Project area that would affect streamflow.

Surface water amount and flow would be altered during every Project phase in Snow Gulch, Lewis Gulch, American Creek, Omega Creek, Unnamed Creek SE1, and Anaconda Creek (see Final EIS Figure 3.5 1) through damming, pit dewatering, and other diversions. Additionally, water will be discharged into the Crevice Creek tributary of Crooked Creek after the post-reclamation phase. Affected drainages account for about 8 percent of the Crooked Creek watershed.

Surface water resources would be affected in a local area of approximately 20 square miles encompassing the pit, WRF, and TSF. Crooked Creek would have a decrease in streamflow that could extend for several miles downstream of the mine, but would have an imperceptible impact on the Kuskokwim River. As such, the extent or scope of impacts would range from discrete portions of the Project Area (Crooked Creek) to imperceptible impacts extending beyond the Project Area (Kuskokwim River). While surface water is an abundant resource in

the area, it is a shared resource and its use, diversion, and discharge are governed by State laws and regulations.

Effects on water circulation, patterns, and fluctuations from Transportation Corridor facilities would be primarily associated with potential drainage changes from construction of access roads and associated drainage structures. Bridges and culverts would be installed using standard construction practices and sized to pass design flows. Potential impacts to surface water from clearing and grading within the Pipeline construction ROW at stream crossings includes increased runoff, erosion, and sedimentation due to removal of vegetation and soil compaction from equipment. Pipeline construction would not result in long-term alterations to streamflow, stream profile, or structural components of streams and other water bodies crossed by the Pipeline (see Section 3.11, Wetlands, for description of wetlands crossing). For most stream crossings, temporary disturbances to water bodies would be limited to the Construction Phase. Stream beds, banks, and riparian areas would be restored to pre-project contours and configurations to the maximum extent possible. Channel banks and riparian areas would be revegetated to prevent erosion and to maintain bank stability. Design and implementation of erosion control procedures and BMPs at each water body crossing, for both the Transportation Corridor and Pipeline, would minimize potential impacts to surface water flow. Additionally, potential impacts to surface water are reduced by installing the Pipeline across most water bodies during winter months and low streamflow conditions. Therefore, the intensity of the impact of construction of Transportation Corridor and Pipeline facilities on surface water flow at stream crossings is such that changes are likely to be within the limits of historical seasonal variation.

With Applicant design features, the proposed Project would comply with this factor of the Guidelines.

B2.2.5 SALINITY GRADIENTS (SECTION 230.25, REQUIRED UNDER SECTION 230.11[B])

References: Final EIS in Sections 3.5 (Surface Water Hydrology), 3.6 (Groundwater Hydrology), 3.7 (Water Quality), and 3.13 (Fish and Aquatic Resources)

Discussion of impacts: The Kuskokwim River experiences tidal influence from the mouth upstream to approximately Akiachak located approximately 150 river miles downstream of the Jungjuk (Angyaruaq) port site. Therefore, the mine and transportation components of the Project are located well upstream of tidal influence on the Kuskokwim River. Impacts from construction and operation of transportation and mine facilities to surface flow and quality in the Crooked Creek drainage and the Kuskokwim River downstream would not affect salinity gradients.

Pipeline construction would involve dredging and the placement of fill materials for the Pipeline itself and the use of a winter trail to transport materials across the Susitna River watershed, which drains to Cook Inlet. These activities are well inland and would not affect salinity gradients downstream.

With Applicant design features and inclusion of special conditions, the proposed Project would comply with this factor of the Guidelines.

B2.3 SUBPART D – POTENTIAL IMPACTS ON BIOLOGICAL CHARACTERISTICS OF THE AQUATIC ECOSYSTEM (40 CFR SECTION 230 SUBPART D)

The technical evaluation factors discussed in this section address potential impacts on the biological characteristics of the aquatic ecosystem (Guidelines Subpart D). The effects described in this subpart were considered in making the factual determinations and the findings of compliance or non-compliance in Subpart B (see Section B2.1).

B2.3.1 THREATENED AND ENDANGERED SPECIES (SECTION 230.30)

References: Final EIS, Section 3.14 (Threatened and Endangered Species); Final EIS Appendix O (USFWS Biological Assessment, NOAA-NMFS Biological Assessment USFWS Letter of Concurrence; NOAA-NMFS Letter of Concurrence)

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. A candidate species is one under consideration for listing under the ESA. 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. Coordination with the USFWS and NMFS, completion of the process and analyses contained in the Final EIS and this JROD, and signature by the authorizing official, completes the Corps ESA responsibilities.

Biological Assessments

There are no threatened or endangered plant species in the action area. Threatened, endangered, or candidate species in the action area are listed below in Table B7.

USFWS Consultation: The Corps delivered a BA and requested initiation of informal consultation to the USFWS on August 18, 2017 to discuss impacts to northern sea otter, Pacific walrus, short-tailed albatross, spectacled eider, and Steller's eider (see Table B7 below). Consultation also included consideration of critical habitat for northern sea otter. A final BA was submitted dated September 2017. The USFWS concurred with the Corps' overall ESA effects determination of "may affect, not likely to adversely affect" listed species or their critical habitat. On November 2, 2017, the USFWS gave a Letter of Concurrence (LOC) to the Corps, agreeing to the Corps' determination that the action may affect, but is not likely to adversely affect listed species or their critical habitat. The Applicant is obligated to incorporate the mitigation measures described in the LOC. The BA and LOC are available in the Final EIS, Appendix O. ESA Section 7 Consultation conclusions are described fully in the BAs (Final EIS Appendix O).

NFMS Consultation: The Corps initially met with NMFS in September 2016 to discuss the proposed Project and possible mitigation measures. NMFS then sent the Corps standard mitigation measures and research papers. The Corps requested consultation on August 23, 2017. NMFS requested information about the proposed Project in October, 2017, and in November, 2017, the Corps provided NMFS with a BA. NMFS requested additional information regarding mitigation measures proposed, and then met with the Corps on January 24, 2018 to discuss the proposed Project. ESA Section 7 consultation was initiated on February 26, 2018 to discuss impacts to North Pacific right whales, fin whales, humpback whales, gray whales (western North Pacific stock), beluga whales (Cook Inlet stock), Steller sea lion (western distinct

population segment), ringed seal, and bearded seal (see Table B7 below). Consultation also included consideration of critical habitat for Steller sea lion, North Pacific right whale, and beluga whale Cook Inlet stock. On March 29, 2018, the NMFS gave an LOC to the Corps, agreeing to the Corps' determination that the action may affect, but is not likely to adversely affect listed species or their critical habitat. The Applicant is obligated to incorporate the mitigation measures described in the LOCs. The BA and LOC are available in the Final EIS, Appendix O. ESA Section 7 Consultation conclusions are described fully in the BAs (Final EIS Appendix O).

Impacts and Mitigation: The potential effects of the Proposed Action on listed species and critical habitat are listed below, along with mitigation as specified in the LOCs.

Auditory or visual disturbance: Underwater noise from barges may temporarily disturb or mask communication of marine mammals and alter behavior. An animal is disturbed when human activities alter an animal's natural behavior. A listed species could react to Project activities by either investigating or being startled by barges or tugs. Disturbance from vessels could temporarily increase stress levels or displace an animal from its habitat. The primary underwater noise associated with the proposed barging operations is the continuous noise produced from propellers and other on-board equipment. Underwater noise from barges may temporarily disturb or mask communication of marine mammals.

- Mitigation: The implementation of mitigation measures related to barge operations are expected to further reduce the number of times marine mammals react to transiting vessels. Consequently, barge traffic is not expected to significantly disrupt normal marine mammal behavioral patterns (breeding, feeding, sheltering, resting, migrating, etc.), making acoustic harassment of listed marine mammals very unlikely. Barge plans are included in the Final EIS, Appendix W.

Vessel strike or collision: Aircraft, barges and tugs transiting the marine environment have the potential to collide with, or strike, birds or marine mammals. Collisions could cause injury or mortality. Effects may occur, but other than direct collision, they may not be detectable. Mitigation measures include:

- Shipping is proposed to be conducted in existing shipping corridors and at existing harbors.
- All aircraft will transit at an altitude of 1,500 feet or higher, to the extent practicable and excluding takeoffs and landing, while transiting over Cook Inlet and while maintaining Federal Aviation Administration flight rules (e.g., avoidance of cloud ceiling, etc.). If flights must occur at altitudes less than 1,500 feet due to environmental conditions, aircraft will make course adjustments, as needed, to maintain at least 1,500 foot separation from all observed marine mammals. Helicopters will not hover or circle above marine mammals.
- Specific to the North Pacific right whale: Barges will either: a) avoid transiting through designated North Pacific right whale critical habitat (73 FR 19000) or b) implement mitigation measures while traveling within North Pacific right whale critical habitat. Operators will maintain a ship log indicating the time and geographic coordinates at which vessels enter and exit North Pacific right whale critical habitat. Vessels will travel at speeds of 10 knots (or less while traveling within the boundaries of designated North Pacific right whale critical habitat. A minimum of two Protected Species Observers

(PSOs) or trained crew members will alternate shifts during travel through North Pacific right whale critical habitat. PSOs or trained crew members will maintain a constant watch for all marine mammals from the bridge or other similar vantage points. At least one dedicated observer will vigilantly scan for whales at all times. Scanning will involve the use of 10-power binoculars or greater. PSOs or trained crew members will maintain direct contact with the vessel pilot, advising the pilot/operator of the position of all observed marine mammals as soon as they are observed.

  - If a North Pacific right whale is observed at a distance greater than 800 meters from the vessel's intended course line, or other marine mammal is observed within 91 meters of the vessel's intended course line, monitoring of the marine mammal(s) location will continue, and for whales, the direction of the vessel will be altered to maintain these minimum distances from the observed whale(s). Course alterations made to avoid cetacean disturbance will be made in a manner that avoids sudden changes in revolutions per minute (RPM) and cutting in front of their direction of travel.
  - If a North Pacific right whale is observed within 800 meters of the vessel's intended course line, or other whale species is observed within 274 meters of the vessel's intended course line, vessel speeds will be reduced to no greater than 5 knots, sea conditions permitting, to minimize the risk of injurious collision. While avoiding collisions with marine mammals may necessitate sudden changes in vessel RPM and heading, course alterations made to avoid marine mammal disturbance will be made in a manner that avoids sudden changes in RPM and cutting in front of their direction of travel. Vessel speed may resume to normal operating speed when North Pacific right whales are greater than 800 meters and other whale species are greater than 274 meters from the vessel and its intended course.
  - The vessel operator will avoid: i) direct approach of whales; ii) separating members of any group of whales from other members of that group; iii) causing a whale of any species to make multiple changes in direction.
  - If the vessel is taken out of gear, vessel crew will ensure that no whales are within 50 meters of the vessel when propellers are re-engaged, thus minimizing risk of marine mammal injury.

- Marine mammal monitors (MMOs) will either be PSOs or crew members who have received standard PSO training from experienced trainers. MMOs must be able to accurately identify and distinguish between species of cetaceans under field conditions.
- MMOs will work in shifts lasting no longer than 4 hours with at least a 1-hour break from marine mammal monitoring duties between shifts. MMOs will not perform MMO duties for more than 12 hours in a 24-hour period (to reduce fatigue).
- While functioning as an MMO, that individual will have no other duty which could distract them from keeping careful watch for marine mammals near the vessel and along its intended course. At least one MMO will be actively engaged in scanning the surrounding waters at all times while transiting through North Pacific right whale critical habitat.

- Prior to each transportation season, MMOs will attend a 1-day PSO training course (taught by an experienced trainer following a course syllabus approved by NMFS).Training may be delivered by video using the same syllabus. This course will: a) provide ecological information on Bering Sea marine mammals and specifics on the ecology and management concerns of North Pacific right whales; b) teach proper equipment use and methodologies in marine mammal observation and recording; and c) provide clarification of obligations including log keeping and seasonal reporting.
- MMOs will record all marine mammals observed within North Pacific right whale critical habitat using NMFS-approved observation forms. Sightings of North Pacific right whales will be transmitted to NMFS within 24 hours. These sighting reports will include the following information:
    - Date, time, and geographic coordinates of the sighting(s). b. Species observed, number of animals observed per sighting event; and number of adults/juveniles/calves per sighting event (if determinable). c. Because sightings of North Pacific right whales are uncommon, and photographs that allow for identification of individual whales from markings are extremely valuable, photographs will be taken if feasible, but in a way that does not involve disturbing the animal (e.g., if vessel speed and course changes are not otherwise warranted, they will not take place for the purpose of positioning a photographer to take better photos. Any photographs taken of North Pacific right whales will be submitted to NMFS.
- Donlin Gold LLC will designate an individual who is familiar with NMFS reporting procedures to collect, organize, and report on vessel travel within North Pacific right whale critical habitat and marine mammal observations that occur within that critical habitat. These reports will be submitted to NMFS by the end of each calendar year. The end-of-year report will outline the following information:
    - Ship logs (time and location for when a vessel entered and exited North Pacific right whale critical habitat). b. Species, date, and time for each sighting event. c. Number of animals per sighting event; and number of adults/juveniles/calves per sighting event (if determinable). d. Geographic coordinates for the observed animals, with the position recorded by using the most precise coordinates practicable (coordinates must be recorded in decimal degrees, or similar standard (and defined) coordinate system). e. Environmental conditions as they existed during each sighting event, including sea conditions, weather conditions, visibility (km/mi), lighting conditions, and percent ice cover. f. Any photographs taken.
- NMFS Contact Info: Reports, observation forms, ship logs, and North Pacific right whale sightings will be transmitted to: National Marine Fisheries Service, Protected Resources Division at greg.balogh@noaa.gov, verena.gill@noaa.gov, and alicia.bishop@noaa.gov (individual North Pacific Right Whale sightings may also be called in to (907) 271-3023) or 907-271-1937. In the event that this contact information becomes obsolete, call 907-271-5006 for updated contact information.

- Though take is not authorized, if a listed marine mammal is struck by a vessel, it must be reported to NMFS within 24 hours. The following will be included when reporting take of a listed species:
    - a. All the information that would otherwise be listed in the PSO report. b. Number of listed animals taken. c. The date, time, and location of the take. d. The cause of the take (e.g., vessel strike). e. The time the animal(s) was first observed and last seen. f. Mitigation measures implemented prior to and after the animal was taken. g. Contact information for MMO on duty at the time of the collision, ship's Pilot at the time of the collision, or ship's captain.

Exposure to harmful materials: Some species could be exposed to harmful materials, fuel, oil, or chemicals through incidental and accidental spills during barging activities. Harmful materials may also cause habitat degradation. Fuel spills and associated response actions could increase risk to listed species, prey, and habitat. ESA listed species could be exposed to harmful materials, fuel, oil, or chemicals through incidental and accidental spills during barging activities. Incidental spills associated with Donlin Gold's barging program are most likely to occur in port (Dutch Harbor, Bethel, Anchorage, Nikiski, or Beluga) during fuel and supply transfer, with the greatest risk during fuel barge filling operations at Dutch Harbor and offloading at Bethel. Accidental spills are large spills involving the rupture of a vessel or transported fuel tank, usually as a result of a collision, sinking, fire, or running aground. The Corps conducted spill risk and spill fate analyses and determined the probability of a spill was so low that effects on listed species would be discountable because a spill would be extremely unlikely to occur. Mitigation measures include:

- Avoiding operation of watercraft in fall and winter in the presence of sea ice to the extent practicable.
- Using double-hull tanks for fuel transport (from Dutch Harbor to Bethel) to reduce tank rupture risk.
- Using fully operational vessel navigation systems composed of radar, chart plotter, sonar, marine communication systems, and satellite navigation receivers, as well as Automatic Identification System (AIS) for vessel tracking.
- All Project barges operating in Cook Inlet will maintain a distance of 1.5 miles from the mean lower low water (MLLW) line of the Susitna Delta (MLLW line between the Little Susitna River and Beluga River).

Table B12: ESA Threatened, Listed, or Candidate Species Assessed for the Project

Species	ESA Status[1]	Locations[2]	Agency
northern sea otter	Threatened	Bering Sea barging route; occurs within the Action Area near Dutch Harbor.	USFWS
Pacific walrus	Candidate	Bering Sea barging route; haulout sites and foraging areas have been identified in Kuskokwim Bay within the Transportation Corridor of the Project Area.	USFWS
short-tailed albatross	Endangered	Bering Sea barging route; possibility of occurrence within the Action Area near	USFWS

Table B12: ESA Threatened, Listed, or Candidate Species Assessed for the Project

Species	ESA Status[1]	Locations[2]	Agency
		Dutch Harbor.	
spectacled eider	Threatened	Bering Sea barging route; the South Yukon-Kuskokwim Delta critical habitat breeding area is north of Kuskokwim Bay in the Transportation Corridor of the Project Area.	USFWS
Steller's eider	Threatened	Bering Sea barging route; Kuskokwim Bay, the Kuskokwim River, and in upper Cook Inlet within the Transportation Corridor of the Project Area. Some overwinter in the Action Area near Dutch Harbor. Spring staging and fall molting occur in Kuskokwim Shoals critical habitat, near the Transportation Corridor of the Project Area.	USFWS
North Pacific right whale	Endangered	Bering Sea barging route; intersects Bering Sea right whale critical habitat area.	NMFS
fin whale	Endangered	Bering Sea barging route; the area around Dutch Harbor is used.	NMFS
humpback whale	Endangered	Bering Sea barging route; the area around Dutch Harbor is used.	NMFS
gray whale Western North Pacific stock	Endangered	Bering Sea barging route; occasional use of Alaskan waters near Dutch Harbor is presumed.	NMFS
beluga whale Cook Inlet stock	Endangered	Cook Inlet barging route; the Cook Inlet construction barging route would designate critical habitat area 1.	NMFS
Steller sea lion western distinct population segment (DPS)	Endangered	Bering Sea barging route; Kuskokwim Bay, the Kuskokwim River, and in upper Cook Inlet within the Transportation Corridor and Pipeline components of the Project Area.	NMFS
ringed seal bearded seal (referred to collectively as ice seals)[3]	Threatened	Bering Sea barging route; winter distribution overlaps with a portion of the proposed barging route, so there is no temporal overlap in use.	NMFS

Notes:
1. At the time of publication of the Final EIS, April 2018
2. Action Area is defined in the BAs per ESA Section 7 and is larger than the Project Area; not all species occur with the areas listed in the Action Area or Project Area at all times of the year.
3. Both species are assessed collectively in the BA, but are not included in the LOC.

With inclusion of special conditions, the proposed Project would comply with this factor of the Guidelines.

B2.3.2 FISH, CRUSTACEANS, MOLLUSKS, AND OTHER AQUATIC ORGANISMS IN THE FOOD WEB (SECTION 230.31)

References: Final EIS, Section 3.13 (Fish and Aquatic Resources)

The Project features and facilities presenting potential risks to aquatic ecosystems and biota primarily involve those that ultimately could directly or indirectly alter or degrade surface or groundwater and aquatic habitats. This includes construction of mine infrastructure, access roads, and related facilities; mining and earth moving activities; pumping/dewatering and other management practices involving groundwater, surface water, and stormwater; wastewater or contact water conveyance, treatment, and disposal; storage and handling of fuel, process chemicals/byproducts, and hazardous waste; and other site management practices near and upslope, or otherwise hydraulically connected to surface waters that might be a source of contamination.

Mine Site – Effects at the Mine Site component on aquatic resources and organisms include direct habitat removal, wetland removal, streamflow and temperature changes, and sedimentation, impacting migration, spawning, or rearing life stages of Pacific salmon and other anadromous or resident fish species and aquatic habitat.

Streams in the Crooked Creek drainage near the mine support Chinook, Coho, chum, pink, and sockeye salmon. Just less than 8 miles of streambed, (in American and Anaconda creeks and portions of Snow and Lewis gulches) would be eliminated to construct various Mine Site facilities. These, and smaller tributary drainages that would be affected, represent about 8 percent of the Crooked Creek watershed. Most of the segments that would be filled in these tributaries do not support salmon, but in some years, habitat in American Creek supports up to 200 age 0 and age 1 juvenile Coho salmon, which would be lost.

Streamflow changes would be seasonal, with greatest reductions during winter months, affecting resident fish and overwintering Coho salmon. The greatest effects of flow reductions and temperature increase in Crooked Creek would occur upstream of Crevice Creek. Below this, tributary inflows/runoff from unaffected watersheds (e.g., Bell and Getmuna creeks) would restore flow reductions during construction and operations phases. Water management practices permitted by the State of Alaska for the Mine Site component would help avoid and mitigate effects on downstream aquatic resources, including EFH.

Transportation Corridor and Pipeline – There would be no direct fill impacts to these resources in these two components.

In summary, noticeable impacts that may cause acute or obvious changes could result from streamflow reduction and sedimentation that cause local effects to fish populations and aquatic habitat in Crooked Creek and its tributaries in the vicinity of the Mine Site area.

With Applicant design features, the proposed Project would comply with this factor of the Guidelines.

B2.3.3 OTHER WILDLIFE (SECTION 230.32)

References: Final EIS, Section 3.12 (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 ecosystem includes resident and migratory mammals and birds.

For terrestrial wildlife, during all three phases, expected effects include habitat alteration or fragmentation from vegetation removal and modification (in some places permanent) or from potential accidental fire; behavioral disturbance from noise, vehicles and human presence including organic waste attraction; barriers to movement from Project activities; potential NNIS introduction; behavioral disturbance from increased barge, vessel, and vehicle traffic; and spread; and potential injury and mortality from vehicle collisions or environmental contamination. During closure, areas of permanent habitat alteration could remain and potential increased hunter and trapper access and pressure could exist.

For birds, effects during construction and operations phases include habitat alteration or fragmentation from vegetation removal and modification (in some places permanent) including nest site loss (loss of habitat suitable for birds to nest) or disturbance, or from potential accidental fire; behavioral disturbance from noise, vehicles and human presence including organic waste attraction; barriers to movement from Project activities; potential NNIS introduction and spread; potential injury and mortality from vehicle collisions or powerline collisions, or environmental contamination including pit lake attraction. During closure, areas of permanent habitat alteration could remain.

For marine mammals (non-ESA listed), effects during construction and operations phases of the Transportation Corridor include behavioral disturbance or displacement from in-water port site construction, fuel and cargo barge traffic; and potential injury and mortality from vessel collisions or environmental contamination. During closure, there would be reduced impacts as there would be less ocean barge traffic.

In some locations, changes in behavior due to Project activity may not be noticeable; animals would be expected to remain in the vicinity, although specific movement patterns may change in response to passing barges or construction noise. In other locations within the Project footprint or adjacent to Project activity, there may be noticeable changes in behavior that may affect reproduction or survival of individuals. Behavior would be expected to be altered for several years during construction and operations phases and would be expected to return to pre-Project activity levels after actions causing impacts were to cease. Some impacts would be seasonal or intermittent (noise, barge traffic). Impacts would occur within the Project Area, mainly around areas of Project activity within the Project footprint, but behavior patterns could cause changes in movement within the Project Area. Behavior patterns could cause changes in movement within the EIS Analysis Area for marine mammals. Impacted species are expected to be those common to the region, with some species such as moose being important game species, and some species such as small mammals being important furbearing species for trapping. Any impacted marine mammal species are protected under the MMPA. For birds, impacted species would be common to the region, except for species considered to be species of special concern or conservation need. Bald and golden eagles have protections under the Bald and Gold Eagle Protection Act. Migratory birds have protections under the Migratory Birds Treaty Act.

While injury or mortality may occur, population level effects are not expected to be detectable. There is unlikely to be a noticeable change in animal population character or quantity. In some locations, injury or mortality risk would be expected to be higher for several years and would return to pre-activity levels in the long-term after actions causing impacts were to cease. Some impacts would be seasonal or intermittent (vehicle use of roads, barging traffic). In some

locations, risk would be permanent such as the pit lake and would need to be addressed by appropriate mitigation and design. Impacts are expected to be limited to vicinity of the Project footprint, but it is possible that individuals may be impacted throughout the Project Area due in the case of environmental contamination to a species that is mobile.

With Applicant design features, the proposed Project would comply with this factor of the Guidelines.

B2.3.4 ESSENTIAL FISH HABITAT

References: Final EIS, Section 3.13 (Fish and Aquatic Resources); Final EIS Appendix Q (NMFS conservation recommendation letter, November 2017; NOAA-NMFS Essential Fish Habitat Assessment)

Section 305(b)(2) of the MSA requires federal agencies to consult with NMFS on any action authorized, funded, or undertaken which may adversely affect EFH. The EFH consultation process begins with a determination of adverse effect by the action agency. If an action may adversely affect EFH, an EFH Assessment is required per 50 CFR 600.920(e).

An EFH Assessment was submitted to NMFS dated September 26, 2017, from the Corps (see Appendix Q of the Final EIS). The submission of this EFH Assessment asserts that the Corps permitted actions may have adverse effects on EFH. The Corps determined that the overall Project will have short term and long term effects; overall activities are unlikely to have adverse effects on EFH, and any adverse effects on EFH will be minimal. Further, mine facilities and the port at Jungjuk Point will not have any adverse effects on EFH. NFMS provided a conservation recommendation letter to the Corps on November 2, 2017.

The EFH Assessment reports that the proposed Project would affect aquatic habitats that support different species and life stages of salmon, summarized per component:

Mine Site – Streams near the proposed Mine Site support spawning by Chinook, Coho, and chum salmon and rearing by juvenile Chinook and Coho salmon. Adult pink salmon and sockeye salmon can be present in low numbers. Site-specific Project effects to EFH and EFH species from mine facilities are judged to range from low to moderate, with an overall low level of effect to EFH and EFH species in the drainage. Impacts are expected to range from negligible to low in Crooked Creek mainstem habitats. EFH upstream from the proposed Mine Site (primarily in Donlin Creek) and downstream from the proposed Mine Site (in two major salmon tributaries downstream), would be unaffected. Crooked Creek mainstem habitats adjacent to the Mine Site and downstream would be adversely affected, primarily by reduced flow and associated increased sedimentation. A low level overall effect to EFH is anticipated in this reach of Crooked Creek, with most reductions in habitat occurring adjacent to the Mine Site. Localized moderate impacts are associated with loss of Chinook and Coho rearing habitat through direct loss of two creeks and the effects of reduced flow in Crooked Creek. Rearing stages of these two species are present in low densities in streams that will be affected by Project activities. Coho spawning habitat will likely be reduced in Crooked Creek adjacent to the mine area because of the estimated stream flow reductions; however, spawning in this reach is low.

Transportation Corridor – Transportation infrastructure will include a port on the Kuskokwim River and a road connecting the port to the mine facilities. Transportation operations will include increased barge activity along the Kuskokwim River, barge-handling activities at the Port, and truck traffic from the Port to the mine facilities. The mine access road will cross six

streams used by Chinook, Coho and/or chum salmon, although crossings of Jungjuk Creek occur at least 1.6 miles (2.6 kilometers) upstream from documented EFH. Five streams will be crossed with full span steel arch bridge structures while Crooked Creek will be crossed with a clear span bridge, resulting in low effect. Activities associated with port construction, port operation, and barge navigation between the port and Bethel, are judged to result in a low effect to EFH and EFH species. Potential impacts at the port would primarily result from pile driving and propeller strikes. Barging between approximately May and September, may result in an increased potential for stranding juvenile salmon during the end of the smolt outmigration, primarily for chum salmon. However, such impacts should be low based on results of analysis of the temporal and spatial distribution and habitat use by outmigrating salmon and predicted barge-induced wave heights.

Pipeline – The Pipeline route will cross numerous streams containing habitat used by the five species of Pacific salmon (Chinook, chum, Coho, pink, and sockeye). Potential effects of the natural gas pipeline on EFH species are judged to be low, because most construction will be conducted during winter when salmon are not present. The few streams requiring summer construction will employ BMPs that reduce and mitigate disturbance to streambeds; or will be crossed using horizontal directional drilling (HDD) under the stream channel.

The NMFS reviewed the EFH Assessment and provided EFH conservation recommendations (CRs) for the Project, pursuant to Section 305(b)(4)(A) of the MSA (see the NMFS CR letter dated November 2, 2017, included in Appendix Q of the Final EIS). The NMFS's CRs have been fully considered by the Corps during evaluation of the permit application for the Project. In accordance with 50 CFR 600.920(k), the Corps transmitted a response to the NMFS's CRs on July 13, 2018. The following are the Corps' responses to the NMFS' CRs:

CR #1: The Corps and project proponents should address inadequacies and deficiencies identified by the cooperating agencies in the current ground water (hydrological) models (2015 Public Comments).

Response: The District concurs with this recommendation. Groundwater and hydrological model inadequacies and deficiencies identified by the cooperating agencies in the 2015 Draft Environmental Impact Statement (Draft EIS) have been addressed in the 2018 Final EIS.

CR #2: Implement measures to predict, regulate, and provide adequate instream flows of Crooked Creek to allow adequate water conditions to support migratory corridors, maintain fish passage, and provide salmon survival at all freshwater life stages in the upper reaches of Crooked Creek and Donlin Creek. The Corps should continue to work with the State of Alaska, U.S. Fish and Wildlife Service, and Donlin Gold to establish these flow levels.

CR #3: Design and install structures to supplement or reduce the loss of water flow underneath the reaches of Crooked Creek that are susceptible to dewatering, such as to employ technologies to limit loss of instream flows and surface waters to the influence of groundwater draw down.

Response: CRs 2 and 3 both relate to instream flows of Crooked Creek and can be addressed simultaneously. They are only partially consistent with the District's authority to regulate the discharge of dredged or fill material into WOUS. Neither the pit dewatering nor the groundwater drawdown requires a DA permit. Therefore, it is beyond the District's scope of authority to require Donlin Gold to take actions to avoid or mitigate for the loss of flows to Crooked Creek due to groundwater drawdown. The District concurs with this recommendation as it relates to the impacts, as a result of the discharge of dredged or fill material.

Tables are provided in the Corps response letter that quantify the losses of flow attributed to the discharge of dredged or fill material (direct impact) and from pit dewatering (indirect impact) into Crooked Creek from Snow Gulch, American Creek, and Anaconda Creek (see Tables B3 – B6 in Section B2.1.1.3 above). The indirect impacts assume base-case conductivity (K) bedrock condition. Changes in this condition would only affect the indirect impacts. The effects of the discharge of dredged or fill material would be independent of the bedrock conditions. The direct effect of the discharge of dredged or fill material is not expected to cause more than 10 percent loss of flow to Crooked Creek, as compared to baseline.

The State of Alaska has the authority to render a decision on whether establishment of a minimum instream flow is necessary to comply with the Anadromous Fish Act (AS 16.05.871-.901), and the Fish Passage Act (AS 16.05.841). Donlin Gold has stated they recognize the concerns regarding predicted flow losses in Crooked Creek, and they have engaged the appropriate State agencies to work within the State permit process to address this issue. Because stream flow changes will occur slowly over an extended period of time and unknowns exist, the ADF&G has recommended Donlin Gold incorporate the establishment of a field monitoring program into their ADF&G application, with provisions for making adaptive changes as needed to ensure the proper protection of aquatic resources in Crooked Creek (see Final EIS Section 5.2, Table 5.2-1, Design Feature A33, Crooked Creek Substrate Freezing Monitoring and Subsequent Mitigation Plan).

Donlin Gold has committed to developing and implementing a comprehensive Aquatic Resources Monitoring Plan (ARMP) for Crooked Creek under the provisions of its Title 16 fish habitat permits administered by the ADF&G. The ARMP will include aquatic resource monitoring throughout Crooked Creek and its tributaries upstream and downstream from the Mine Site; to include fish surveys, habitat, sediment, fish tissue, and flow monitoring. Flow monitoring will address both summer and winter flow conditions. Monitoring data collected during the initial years of mine development and operations will establish baseline data to determine the need for potential mitigation and mechanisms that may be most effective in minimizing any actual flow loss. The ARMP will require reporting to ADF&G, and will require specific action by Donlin Gold if the data show variability from the predicted results on aquatic resources (to include flow). The actions that could be taken to reduce unexpected flow loss include, but would not be limited to, lining or relocating portions of the stream channel, augmenting flows from the Snow Gulch Reservoir or the Kuskokwim River, or grouting areas of bedrock demonstrating high flow rates (Final EIS Chapter 5).

Additionally, the ADNR-Water is responsible for managing water in the State. Donlin Gold states they have applied for water rights authorization from the State and will comply with the monitoring requirements under that certificate. Any water rights authorized by ADNR-Water would be developed in coordination with ADF&G.

The District agrees there would be impacts to Crooked Creek. The permits that would be required by the State of Alaska; specifically, the implementation of the ARMP, addresses this CR.

CR #4: Monitor the project, post-closure mine pit, tailings impoundments, waste rock facilities, and associated ground and surface waters in perpetuity.

Response: This CR is outside of the District's authority. This CR is addressed by the State of Alaska mining reclamation requirements. Therefore, the District would not incorporate this CR

into a DA permit, if issued. However, Donlin Gold mine facilities (e.g., tailings impoundment, waste rock facility, post-closure mine pit) and associated surface water and groundwater, water in Crooked Creek, and discharge water from water treatment plants, will be monitored during mine operations, closure, reclamation, and post-closure; as outlined in the Reclamation Plan.

The Corps finds that the Project would have moderate adverse effects on EFH which are not contrary to the public interest. With Applicant design features, the proposed Project would comply with this factor of the Guidelines.

B2.4 SUBPART E – POTENTIAL IMPACTS ON SPECIAL AQUATIC SITES (40 CFR SECTION 230 SUBPART E)

The technical evaluation factors discussed in this section address potential impacts on the special aquatic sites (Guidelines Subpart E). The effects described in this subpart were considered in making the factual determinations and the findings of compliance or non-compliance in Subpart B (see Section B2.1).

B2.4.1 SANCTUARIES AND REFUGES (40 CFR SECTION 230.40)

References: Final EIS, Section 3.15 (Land Ownership, Management, and Use)

There would be no direct or indirect effects from construction, operations, and closure of the proposed Transportation Corridor and Mine Site on the management of any legislatively designated area. However, a portion of the Applicant's proposed Pipeline would cross the Susitna Flats State Game Refuge, designated by the Alaska State government for special management. The ADF&G manages the Susitna Flats State Game Refuge, in accordance with the purposes for which it was established, and under the guidance of the Susitna Flats State Game Refuge Management Plan; to ensure the protection of fish and wildlife populations and habitat, and to provide for public opportunities for wildlife viewing, photography, recreation, and the use of fish and wildlife and their habitats (ADF&G 1988 as cited in the Final EIS Section 3.15.3.2.2). The management plan states that new utilities may be allowed to cross the refuge where no feasible off-refuge alternative exists, consistent with the plan's goals and objectives. The first 5 miles of the Pipeline, including the compressor station, would be located in the Susitna Flats State Game Refuge.

The Pipeline would be in the Pretty Creek public road easement through most of its route through the refuge, and the electric transmission line would follow the Chugach Electric Association high-voltage transmission line corridor to the connection with the Beluga pipeline and then would be within the ROW to the compressor station at MP 5. Therefore, the project would be consistent with the goals of the plan, and no direct or indirect effects would occur to the State's land use management within the Susitna Flats State Game Refuge.

Construction activities would be timed to avoid disruption of breeding, spawning, or migratory movements of fish and wildlife. Under the terms of the management plan, any use, lease, or disposal of resources of State land in the Susitna Flats State Game Refuge, such as location of proposed facilities within the refuge, would require authorization from ADF&G and ADNR.

With Applicant design features, the proposed Project would comply with this factor of the Guidelines.

B2.4.2 WETLANDS (40 CFR SECTION 230.41)

References: Final EIS Section 3.11 (Wetlands), Final EIS Appendix K, and Preliminary Jurisdictional Determination reports (Michael Baker 2016, 2017a, 2017 as cited in the Final EIS)

Wetlands occur throughout the Project Area. Detailed information on wetlands types and percentages can be found in the Final EIS Section 3.11, Wetlands.

Direct wetlands impacts, as assessed in this JROD, would include placement of fill in wetlands. Indirect wetlands impacts include dust emissions and dewatering areas. Permanent impacts would occur in those areas where fill is placed for the duration of mine life (estimated to be between 27 and 30 years), and permanent fill to WOUS that would remain after Project Closure. Temporary impacts would occur in those areas where fill is placed in wetlands for a brief period to facilitate construction activities, then removed concurrent with construction activities, or as soon as construction is complete. Indirect impacts, as assessed in this JROD, would include acres impacted by dust emissions or water drawdown (see also Table B2 for a Project summary of direct and indirect impacts to WOUS by direct and indirect acres, for the LEDPA analysis).

Indirect impacts in the Final EIS were also assessed for clearing and removal of wetland vegetation (quantified by vegetation cut acres), compaction, rutting, and mixing of wetland soils (qualitatively discussed using available quantified information), permafrost degradation creating subsidence that converts wetlands to waters (quantified by acres of vegetation cut/fill or vegetation cut on permafrost acres), and disruption of wetland hydrology through events such blocking surface water flow or diverting water flow that may dry wetlands (qualitatively discussed using available quantified information).

Mine Site – Construction of Mine Site facilities would cause direct impacts to wetlands. Excavation of the open pit and filling within the WRF and TSF would occur throughout the active life of the mine. Some wetland reclamation would begin shortly after the start of the Construction Phase and would continue throughout Operations and Closure. Impacts would be considered permanent, however, as they would occur through the life of the mine.

Permanent, direct fill impacts to wetlands include 2,877 acres. See also Table 2 in this document for details of proposed fill by facility for wetlands.

Indirect impacts (as assessed in the Final EIS, and included in calculations to inform Table B2) include 630 acres from dust emissions and 430 acres from potential dewatering (drawdown areas).

In the Final EIS, other wetland disturbance activities were assessed as direct impacts but are not considered direct fill impacts for the purposes of this JROD. An additional 815 acres are affected by vegetation clearing only, and an additional 98 acres are impacted by vegetation clearing in permafrost areas. This type of impact was assessed as being temporary rather than permanent; these areas may be suitable for reclamation to wetland conditions at or before the Closure Phase. Note that the totals shown in the LEDPA analysis (Table B2) include direct impact acres as defined in the Final EIS.

Transportation Corridor – Construction of the port site, mine access road, and ancillary facilities would cause direct impacts to wetlands. Transportation Corridor impacts would be permanent because the mine access road and other features would not be reclaimed.

Permanent, direct fill impacts include 105 acres of wetlands. See also Table 2 in this document for details of proposed fill for WOUS.

Direct impacts as defined in the Final EIS also include 119 acres of vegetation clearing or permafrost removal. Note that the totals shown in the LEDPA analysis (Table B2) include direct impact acres as defined in the Final EIS.

Indirect impacts (as assessed in the Final EIS, and included in calculations to inform Table B2) include 630 acres from dust emissions.

Pipeline – Construction of the pipeline would require trenching activities. Winter construction techniques, temporary rerouting of surface flows, and sediment control BMPs are measures that would be used to limit the extent of wetland habitat impacted. Construction of airstrips, ancillary facilities, and various other workspaces would be considered temporary impacts. Some sections of the pipeline and related ancillary facilities would be considered permanent as defined for this JROD, as they will not be reclaimed until after Closure. Indirect effects (as defined in the Final EIS) specific to the Pipeline component would generally occur within the permanent right-of-way (ROW) and would include changes in soil temperature, blockage of subsurface shallow groundwater flow, and potential aufeis formation.

Temporary, direct impacts include 538 acres of temporary impacts to wetlands. Permanent, direct impacts include 200 acres. Total direct impacts are therefore 738 acres.

Direct impacts as defined in the Final EIS also include 1,089 acres of vegetation clearing and permafrost clearing. Note that the totals shown in the LEDPA analysis (Table B2) include direct impact acres as defined in the Final EIS.

There would be no indirect impacts (as defined in the Final EIS) in this component.

Total Project – The total direct, temporary impacts to wetlands are 538 acres. The total direct, permanent impacts to wetlands are 2,877 acres. The total direct impact acres are 3,416. See also Table 2 in this document for a summary for all facilities. The total indirect acres (dust emissions and water drawdown is 1,260. Note that the calculated indirect impact as reported here and in Table B2 is not additive as many of the Mine Site drawdown indirect impact areas overlap with areas affected by dust.

Minimization and avoidance activities as described in the CMP (Block 23, June 2018) are described in Section 6.3.5. Compensatory mitigation would be required for the unavoidable impacts to wetlands as described in Attachment B5.

With Applicant design features and inclusion of special conditions, the proposed Project would comply with this factor of the Guidelines.

B2.4.3 MUD FLATS (40 CFR SECTION 230.42)

Mudflats are not located in the Project area.

B2.4.4 VEGETATED SHALLOWS (40 CFR SECTION 230.43)

Vegetated shallows are not located within the Project area.

B2.4.5 CORAL REEFS (40 CFR SECTION 230.44)

Coral reefs are not present in the Project area.

B2.4.6 RIFFLE AND POOL COMPLEXES (40 CFR SECTION 230.45)

References: Final EIS, Section 3.13 (Fish and Aquatic Resources)

Discussion of impacts:

A series of Title 16 fish habitat permits, issued by ADF&G would be required to protect in-water habitat, minimize impacts during construction, and assure long-term fish passage throughout post-closure phase monitoring. Compliance with the BMPs and stipulations identified in the Title 16 fish habitat permits for the various project phases would be intended to minimize impacts to aquatic habitat and fish passage, including potential impacts to riffle and pool complexes in located in the streams adjacent to the Mine Site, and along the mine access road and pipeline.

Mine Site – Just under 8 miles of streambed (in American and Anaconda creeks and portions of Snow and Lewis gulches) would be filled to construct various Mine Site facilities. Fill would occur in the Crooked Creek watershed including Snow Gulch, American Creek, and Anaconda Creek. The details of these activities and potential impacts are discussed in detail in Sections B2.1.2.2 and B2.1.2.5. These activities would alter flow patterns and eliminate segments of riffle and pool complexes in those drainages. Riffle, pool, and run habitat types occur throughout the Crooked Creek watershed. A total of 33 linear miles of Crooked Creek and its tributaries were surveyed as reported in the 2012 Aquatic Biomonitoring Report by Ottertail Environmental Inc. Riffle habitat made up 12 percent of the wetted habitat within the Crooked Creek drainage (112.7 square miles). 71 percent of this riffle habitat was classified as poor quality, with 27 percent classified as fair quality. Pool habitat accounted for 8 percent of the habitat area (70.6 square miles) with 70 percent of that habitat classified as good quality and 25 percent as fair quality. Gravel and cobble substrates dominate the riffle areas and freezing in winter months can reach the stream bottom resulting in variable flows.

Riffle and pool complexes would be permanently lost in the American Creek and Anaconda Creek drainages. The American Creek drainage is the proposed location of the mine pit and WRF. American Creek drains an area of 6.9 square miles, comprising 2 percent of the entire Crooked Creek drainage. Beaver activity is prevalent throughout the drainage; but in reaches unaffected by beavers the stream is a narrow, incised channel with gravel substrates dominating riffle areas. Flowing water is present year-round in upstream portions of American Creek, while the lower reaches may freeze to the bottom in winter resulting in discontinuous surface flow. The small watersheds of Lewis Gulch (0.8 square miles) and Omega Gulch (1.0 square miles) have limited aquatic habitat, lack overwintering habitat, and are unlikely to support fish. Anaconda Creek is the proposed location of the TSF. Silt and sand are the dominant substrates in this creek, which drains an area of 7.9 square miles. Aquatic habitat is classified as poor quality due to the lack of gravel and cobble substrate, a highly incised channel, and highly variable water quality caused by flooding, major stream erosion, turbidity, and silt deposits.

Scouring/deposition patterns downstream in Crooked Creek would be managed using energy dissipaters at all discharge points to the extent possible.

Transportation Corridor – There would be no impacts to riffle or pool habitats as a result of fill in the Transportation Corridor.

Pipeline – Construction of the Pipeline could affect riffle and pool complexes during trenching activities. Winter construction techniques, temporary rerouting of surface flows, and sediment control BMPs are measures that would be used to limit the extent of wetted habitat directly affected and would reduce the volume of sediment potentially released downstream. The relatively narrow width of the trench where it crossed the stream would limit the disturbance footprint and the extent of subsequent effects within riffle and pool habitats.

For the Mine Site and Transportation Corridor, habitat loss would be avoided or minimized to the extent possible or practicable, as addressed in the CMP (Attachment B5). Other potential effects would be minimized through compliance with the Title 16 fish habitat permit from ADF&G.

With Applicant design features, the proposed Project would comply with this factor of the Guidelines.

B2.5 SUBPART F – POTENTIAL EFFECTS ON HUMAN USE CHARACTERISTICS (40 CFR SECTION 230, SUBPART F)

The technical evaluation factors discussed in this section address potential impacts on human use characteristics of the aquatic ecosystem (Guidelines Subpart F. The effects described in this subpart were considered in making the factual determinations and the findings of compliance or non-compliance in Subpart B (see Section B2.1).

B2.5.1 MUNICIPAL AND PRIVATE WATER SUPPLIES (40 CFR SECTION 230.50)

References: Final EIS, Section 3.6 (Groundwater Hydrology), Section 3.7 (Water Quality), Section 3.24 (Spill Risk)

Mine Site – Section 3.6.1.5 of the Final EIS discusses groundwater use for each Project component. Two wells are reported to serve the existing Donlin Gold Camp as a domestic water supply; a main well; and a backup well, located at the southeastern end of the current airstrip (see Figure 3.6-2 in Section 3.6, Groundwater Hydrology, of the Final EIS). A community water supply well is located in the village of Crooked Creek about 10 miles downstream of the Mine Site and ½-mile southwest of the confluence with the Kuskokwim River. Subsurface water rights are held here by Crooked Creek Traditional Council. The well and associated treatment, storage, and distribution system is listed as active as of 1993 by ADEC. The drinking water source protection area identified by ADEC for the well extends northwest and upslope of the hill west of the airstrip (see Figure 3.6-6 in Section 3.6, Groundwater Hydrology, of the Final EIS) and is 10 miles away from any potential source of contamination from the mine. A flood in Crooked Creek from the partial dam release considered in the Final EIS (predicted 1 foot increase near the village) would not impact the aquifer used by village drinking water supply well, as it is sited about 60 feet above Crooked Creek and Kuskokwim River." Donlin Gold's existing exploration camp wells would be decommissioned in early construction in accordance with State requirements and replaced with eight water wells that would be drilled between Omega Creek and an unnamed creek to the south (see Figure 2.3-7 in Chapter 2 of the Final EIS). These new wells would supply freshwater for the construction camp and ancillary water uses such as dust control, truck washing, and fire protection. The wells would lie outside of the pit/TSF cone of depression (See Final EIS Figure 3.6-8), and would be upgradient or cross-gradient from any shallow groundwater contamination that may develop in drainages beneath the WRF and TSF."

Transportation Corridor – Nine villages (Kwethluk, Akiachak, Akiak, Tuluksak, Lower Kalskag, Upper Kalskag, Aniak, Chuathbaluk, and Napaimute) are located between Bethel and Crooked Creek along the Kuskokwim River and adjacent sloughs. Each village except Napaimute has records of one or more wells drilled for water supply. While most well records are for public water systems, there are also some records of privately owned wells. Bethel has the most numerous wells, with approximately 17 known public water systems served by wells, although a few are inactive. Wells have been in use in Bethel for several decades, so there is also the possibility that there are some formerly-used wells that are not part of current public water systems. There are records of a few other wells in Bethel that may be privately owned and used for residential or other purposes.

All other existing municipal and private water wells in the vicinity of the Project are outside the influence of the groundwater that may be affected by the Project and no water extraction sites would be developed in the vicinity of an existing public or private water supply. Thus the discharge of dredged or fill material related to the Mine Site, Transportation Corridor, or Pipeline would not adversely affect the quality or quality of municipal or private water supplies.

With Applicant design features, the proposed Project would comply with this factor of the Guidelines.

B2.5.2 RECREATIONAL AND COMMERCIAL FISHERIES (SECTION 230.51)

References: Final EIS, Sections 3.16 (Recreation), Section 3.18 (Socioeconomics), Section 3.21 (Subsistence)

Mine Site – Dredge and fill activities for mine development and transportation facilities would generally occur well away from subsistence fishing grounds. The discharge of treated water to Crooked Creek would also occur well away from recreational and commercial fishing activities; the discharge would meet all applicable Alaska Water Quality Standards (AWQS) and is not expected to result in adverse effects to aquatic resources. Potential impacts to aquatic habitat and fish resources in the Crooked Creek drainage are primarily in the middle reaches of the drainage, from Anaconda Creek to Snow Gulch, alongside the Mine Site, while the lower portion of the drainage, below Crevice Creek, would see limited effects.

Subsistence fishing use area maps for Crooked Creek residents show salmon and non-salmon fishing extending to Bell Creek in the lower reaches of the drainage. As a result, effects on salmon and non-salmon species subsistence fishing are unlikely.

Increased competition due to employment at the Mine Site would be reduced by policies prohibiting employees from hunting and fishing while at the Mine Site and by the enclave development strategy with housing at the Mine Site and transportation provided for employees commuting between their communities and the Mine Site.

Transportation Corridor – Dredge and fill activities for mine development and transportation facilities would generally occur well away from subsistence fishing grounds. The primary form of recreational and commercial fishing in the Project area is subsistence fishing, which is practiced by the local residents living along the Kuskokwim River. Construction of the facilities at the Angyaruaq (Jungjuk) Port could produce suspended sediments but any effects would be local and short-lived; impacts to habitats of key subsistence species would be minor. Spawning of key subsistence species typically occurs in tributaries that would be unaffected. The majority

of stream crossings required by Pipeline construction would be conducted during the winter and outside of typical timeframe for recreational or commercial fishing. No Project activities are expected to contribute sediments or other pollutants that would be disruptive to migration or adversely affect spawning areas for species important for subsistence or commercial fishing or the prey species upon which they depend.

Pipeline - Recreational and commercial fisheries also occur in Cook Inlet and rivers crossed by the natural gas pipeline route east of the Alaska Range, including the Susitna River. There would be no impact to recreational and commercial fisheries as a result of the Project.

With Applicant design features and inclusion of special conditions, the proposed Project would comply with this factor of the Guidelines.

B2.5.3 WATER-RELATED RECREATION (SECTION 230.52)

References: Final EIS, Section 3.16 (Recreation)

Mine Site – Construction and operation of mine-related facilities would not affect water-related recreation as they are located away from areas where such activities would occur.

Transportation Corridor and Pipeline – Recreational activities in the Kuskokwim River basin occur at moderate to low levels. Water-related recreation includes sport fishing and hunting and recreational boating; these activities would be minimal to non-existent in the Project Area during winter due to freezing conditions and ice.

The use of winter construction techniques and HDD to build the Pipeline would minimize the addition of sediments or other water quality constituents that could adversely affect water-related recreation along the Pipeline corridor; non consumptive water-related recreation on the east side of the Alaska Range would not be expected in the winter.

Similar to Mine Site construction, summer Pipeline construction activities would not occur in areas regularly used for consumptive or non-consumptive water-related recreation. The construction of the Angyaruaq (Jungjuk) Port would require the placement of clean rock fill and sheet pilings. At this location, the extent of fill placement is not expected to be of a level that would create a measurable loss of consumptive or non-consumptive recreational values although there could be some displacement of recreational users from the immediate vicinity during construction.

With Applicant design features and inclusion of special conditions, the proposed Project would comply with this factor of the Guidelines.

B2.5.4 AESTHETICS (SECTION 230.53)

References: Final EIS, Section 3.17 (Visual Resources), Section 3.9 (Noise and Vibration)

Dredge and fill activities associated with all three components would alter the visual aesthetics of aquatic ecosystems within their respective areas. Due to the remote location of the majority of proposed construction and operations activities, the effects of the proposed Project on the aesthetics of the potentially affected aquatic ecosystems are expected to very limited.

Mine Site – Mining activities would produce a strong visual contrast with the natural appearance of the surrounding landscape as the pit is excavated and the TSF, WRF, and stockpiles are built and enlarged. As the Mine Site is remote and not readily accessible and because public access would be restricted during construction and operations for safety reasons,

the general public would not have terrestrial access to the area. The only members of the general public that may experience the aesthetic changes caused by the Project would be passengers overflying the Project site in aircraft.

Viewer exposure would be restricted by the rugged topography and transient in nature when viewed from the air. Due to topography, the visibility of changes in the Mine Site area from ground-based viewer locations would generally be limited to a three to five mile range due to the area's rugged terrain. Following closure, the WRF and TSF would be regraded and revegetated resulting in an area that blends with the surrounding topography. The pit lake would remain and could create a visual attraction due to its contrast with the surrounding landscape. Mining activities including blasting and heavy equipment operation could adversely affect noise related aesthetics but the remote location would limit the number of human noise receptors who might experience the anthropogenic sounds.

Some alterations to landforms would persist beyond the estimated life of the Project and after closure. In terms of context, no sensitive viewers (such as a community for whom a particular view is culturally or spiritually important) were identified in the viewshed of the proposed Mine Site.

Transportation Corridor – Construction and operation of the Angyaruaq (Jungjuk) Port would result in new facilities that would affect the aesthetics in the area. The industrial activity would present a strong visual contrast compared to the adjacent natural settings. The area around Jungjuk burned in 2015 which also adversely affects the aesthetic appearance when compared to adjacent, unburned forest.

Construction and operations would cause changes in landscape character along the Kuskokwim River, from barge traffic and from the Angyaruaq (Jungjuk) Port site that would extend through the life of the Project. The Port would be demobilized at closure, but a basic barge landing facility and access road would remain at this site in perpetuity. Views of the proposed airstrip, which would also remain in perpetuity, would be mostly limited to ridgetops west of the Mine Site. Villages located along the Kuskokwim River and the river channel would potentially have potentially high visual impact.

Pipeline – Visual effects from the Pipeline would be greatest in the following instances and locations: during intensive but temporary construction activities, especially in high activity areas such as locations where HDD would be used for river under-crossings; in forested areas due to strong visual contrast of the cleared ROW against the existing forest; and, where the ROW parallels, or crosses the Iditarod National Historic Trail (INHT). Apart from the INHT, the affected area is not recognized in an existing land management plan for its scenic value.

The dredge and fill aspects of Pipeline construction are unlikely to present any long-term effect on aesthetics since the trench and ROW would be returned to original grade following installation of the Pipeline. Maintenance of the ROW would result in changes to the appearance of vegetation in shrubby or forested areas, due to period and regular brushing. The width of the ROW would be small compared to the surrounding landscape and would be most apparent to a viewer in an aircraft following in a direction that paralleled the Pipeline.

With Applicant design features, the proposed Project would comply with this factor of the Guidelines.

B2.5.5 PARKS, NATIONAL AND HISTORICAL MONUMENTS, NATIONAL SEASHORES, WILDERNESS AREAS, RESEARCH SITES, AND SIMILAR PRESERVES (SECTION 230.54)

References: Final EIS, Section 3.15 (Lands), Section 3. 17 (Visual Resources), Programmatic Agreement (Final EIS, Appendix Y), Cultural Resource Management Plan (Final EIS, Appendix A of Appendix Y).

Mine Site and Transportation Corridor – The Mine Site and Transportation Corridor are not located proximate to any parks, national or historic monuments, national seashores, wilderness areas, research sites, or similar preserves. As a result, the placement of fill associated with these Project components would not affect areas designated under federal or state laws or local ordinances for special management.

Pipeline – As discussed in Appendix D, Cultural Resources Management Plan, of the Section 106 of the National Historic Preservation Act Programmatic Agreement for the Project, 47 miles of the INHT would be present within the Area of Potential Effects, and the Pipeline ROW would cross the INHT 4 times. Potential effects to the INHT include alteration of character-defining features and integrity (e.g., location, design, setting, feeling, and association); and changes in scenic quality.

The Corps, in consultation with the Alaska State Historic Preservation Officer, BLM, Advisory Council on Historic Preservation, ADNR, Donlin Gold and other consulting parties, including local villages and tribal organizations, the Corps developed a Programmatic Agreement under Section 106 of the National Historic Preservation Act. The Programmatic Agreement requires specific mitigation actions to offset adverse impacts to the INHT. In addition, in response to comments on the Draft EIS, Donlin Gold modified the route of the Pipeline that crossed or paralleled the INHT to a location that reduces the number of INHT crossings to four and eliminates the co-location with the INHT. The North Route is now part of Donlin Gold's Proposed Project, and is discussed in the Final EIS as the North Option. The aesthetic values of the trail would be affected by the construction and maintenance of the Pipeline ROW, which would require control of woody vegetation by brushing on a regular basis resulting in a linear feature that would visually contrast with the adjacent landscape.

With Applicant design features, the proposed Project would comply with this factor of the Guidelines.

B2.6 SUBPART G – EVALUATION AND TESTING (40 CFR SECTION 230, SUBPART G)

References: Final EIS Sections 3.1 (Geology) and 3.2 (Soils)

The dredged and fill material to be placed in wetlands and WOUS would primarily consist of shotrock, sand, and gravel. As described in Section 3.1.2 of the Final EIS, two sources of borrow material would be used, bedrock and gravels. As stated in Section 5.2 of the Final EIS (Design Feature A11 in Table 5.2-1), Donlin Gold's Project design includes evaluating material sites at the Mine Site, mine access road, and Pipeline (prior to use) for metals leaching and ARD potential in final design using bulk geochemistry analysis, MWMP, and ABA methods. Alternative sites would be selected if results indicate the potential for impacts to downgradient water resources. Because of the remote undeveloped nature the material sources, these sites are not expected to contain contaminants such as pesticides or petrochemicals from previous

activities which would trigger additional testing. This is discussed in more detail in Section B2.1.2 Contaminant determinations above.

With Applicant design features and inclusion of special conditions, the proposed Project would comply with this factor of the Guidelines.

B2.7 SUBPART H – ACTIONS TO MINIMIZE ADVERSE EFFECTS (40 CFR SECTION 230, SUBPART H)

The Applicant has identified numerous measures to minimize adverse impacts. These measures are outlined in the Chapter 5 of the Final EIS (Section 5.2) as well as in Block 23 of the DA permit application, which was updated in June 2018. Additionally, Donlin Gold has developed a Compensatory Mitigation Plan (Attachment B5) that identifies proposed compensatory mitigation for unavoidable wetland and stream impacts.

Minimization measures described below are the key measures that relate to the discharge of fill material. Additional minimization and mitigation measures are described in the Donlin Gold Project Plan of Operations and Chapter 5 of the Final EIS. These measures are incorporated into Factual Determinations and Technical Evaluation Factors of the Corps' analysis (see Sections B2.1.2 and B2.2) on which the finding of no significant degradation is based.

The Corps has reviewed the minimization measures proposed by the Applicant and considers them to be a reasonable starting point for developing the list of all appropriate and practicable steps which can be taken to minimize the potential adverse impacts of the proposed Project. In addition to the Applicant's proposed mitigation measures, and BMPs, the Corps would require additional conditions and stipulations to further minimize impacts. These conditions are described in Section 6.2.7 of the JROD.

B2.7.1 ACTIONS CONCERNING THE LOCATION OF THE DISCHARGE (SECTION 230.70)

The Project includes the following avoidance and minimization actions related to the location of the discharge:

- Facilities (camps, roads, material sites, Pipeline layout, and mine components) have been designed and located to avoid WOUS to the maximum extent practicable. Donlin Gold evaluated multiple alternatives for the location and design of Project components with the intent to avoid and minimize impacts, while allowing development of a feasible Project.
- Facilities have been sited in previously disturbed areas where possible to minimize impacts. For example, the Mine Site components would be built in existing disturbed areas associated with exploration activities and the camp; the Pipeline would be located along an existing corridor in the Susitna Flats State Game Refuge; existing airstrips, roads, and camps would be used during Pipeline construction to the extent practicable.
- Donlin Gold has minimized the Mine Site footprint and concentrated land disturbances to create a compact footprint. The location of the ore reserves and therefore the open pit mine is fixed. Other Mine Site components (overburden storage areas, WRF, TSF, water management features, processing facilities) were located as close together as possible to

concentrate land disturbance and to limit effects to the American Creek and Anaconda Creek drainages, and, more broadly, the Crooked Creek watershed.

- The mine access road was designed to avoid wetlands and minimize stream crossings to the extent practicable, while maintaining grade, safe sight distance at stream crossings, and allowing for streamflow.
- The transmission line to the camp would be routed in proximity to the mine access road, where possible, to minimize impacts.
- The Mine Site airstrip location was selected to avoid wetlands to the extent possible and designed to minimize the amount of cut and fill required for runway construction.
- The Angyaruaq (Jungjuk) Port location was selected to reduce the length of mine access road while still allowing safe barge access. The port is sited on uplands to the extent practicable.
- The barge route and the Angyaruaq (Jungjuk) Port location and port design were developed to avoid the need for dredging.
- The Pipeline route was selected to minimize its length, minimize wetland and stream crossings, avoid geotechnical and hydrologic hazards, and minimize visual and recreational impacts. The Pipeline route follows uplands where available and avoids wetlands and waterbodies where practicable.
- Material sites for all Project components were designed to avoid wetlands to the extent practicable.
- Wetland mapping was used to guide placement of culverts to maintain natural drainage to the extent possible to maintain existing wetland hydrology.

With the inclusion of special conditions, the proposed Project would comply with this factor of the Guidelines.

B2.7.2 ACTIONS CONCERNING THE MATERIAL TO BE DISCHARGED (SECTION 230.71)

The Project includes the following avoidance and minimization actions related to the material that would be discharged.

- Waste rock and overburden has been characterized for the potential to be acid generating and metal leaching. Most of the waste rock is non-acid generating (NAG). NAG waste rock would be used for construction of the TSF as fill, filter media, riprap, and underdrain material. Use of NAG waste rock minimizes the amount of fill needed from material sites.
- The open pit mine has been engineered to optimize recovery of the ore reserve and minimize the amount of overburden and waste rock removed so as to minimize associated land disturbance for storage of these materials.
- Waste rock would be backfilled into the ACMA pit after it is mined to reduce the need for surface storage of waste rock and resulting land disturbance.

- Material sites at the Mine Site, mine access road, and Pipeline would be pre-sampled for metals leaching and ARD potential in final design, and alternative sites would be selected if results indicate the potential for impacts to down gradient water resources.

With the inclusion of special conditions, the proposed Project would comply with this factor of the Guidelines.

B2.7.3 ACTIONS CONTROLLING THE MATERIAL AFTER DISCHARGE (SECTION 230.72)

The Project includes the following minimization actions related to control of the material after it is placed.

- The design of the TSF impoundment dam complies with industry standards and State of Alaska Dam Safety Program requirements for stability and safety.
- Diversion channels would be constructed around all Mine Site stockpiles and facilities to minimize runoff and erosion.
- Facility slopes would be designed to minimize erosion to the extent practicable.
- The WRF would be designed to maximize concurrent reclamation, minimize the effects of PAG materials, minimize infiltration and erosion, and promote controlled surface runoff and revegetation.
- Concurrent reclamation would occur during mine operations where possible in areas no longer required for active mining (e.g., Pipeline ROW revegetation, reclamation of areas within the WRF and overburden stockpiles).
- BMPs would be used to minimize erosion and sedimentation to wetlands and WOUS for all Project components from construction through closure. BMPs are actions that both control the material after discharge and relate to the method of dispersion. Typical BMPs would include silt fences, sediment retention basins, cross bars and ditches, runoff interception and diversion, mulching and revegetating surfaces and stockpiles. Additional BMPs are listed below. The Final EIS describes how these BMPs would be required under various Project permits and approvals, including:
    - A SWPPP that describes BMPs related to storm water management would be required by ADEC.
    - A sediment and erosion control plan would be required by the State of Alaska Pipeline Office for the Pipeline.
    - Fish habitat permits issued by ADF&G would require implementation of BMPs.
- Road cuts would be stabilized and seeded as soon as possible as necessary to reduce sediment runoff.
- BMPs would be installed at all stream crossings to minimize impacts to fish, other aquatic biota, and their related habitats. Monitoring of BMPs would ensure their effectiveness
- Temporary roads and water crossings are needed for Pipeline construction. These roads and water crossings would be removed as soon as practicable following construction of a Pipeline section.

- Select material sites would be evaluated for the potential to be reclaimed as ponds or wetlands.
- The Mine Site access road and airstrip would be maintained as permanent structures. The Mine Site facilities would be reclaimed following the Reclamation and Closure Plan (SRK 2017b). The Reclamation and Closure Plan would be approved by ADNR and ADEC to meet State reclamation and closure objectives that result in biological, chemical, and physical stability of the site. Post-mining drainage design would account for pre-mining channel characteristics and provide erosional stability, geotechnical stability, and compliance with AWQS.
- Financial assurance would be established and approved by the State of Alaska prior to construction and operations to cover the costs of reclamation and closure.
- Pipeline support infrastructure (temporary airstrips, camps, and construction roads) would be reclaimed. Fill would be removed as practicable and the ground scarified to reduce compaction. The surface would be re-contoured and the on-site growth media would be re-spread. Surface drainage would provide for storm flow capacity, erosional stability, Pipeline stability, and long-term surface permanence. All culverts and temporary bridges would be removed from channels and active floodplains. The Natural Gas Pipeline Plan of Development (SRK 2013b) describes Pipeline reclamation and requirements for a stabilization, rehabilitation and reclamation plan and detailed Pipeline abandonment plan. Final reclamation and abandonment of the Pipeline is under the jurisdiction of the BLM and Sate of Alaska Pipeline Coordinators Office who will review these plans.
- The Project design includes restoring flat-to-gently sloping wetlands by removal of fill at Project closure where feasible.
- Post-closure sediment controls would include site grading and capping of erodible material, revegetation, and re-routing of surface runoff to re-establish natural conditions.

With the inclusion of special conditions, the proposed Project would comply with this factor of the Guidelines.

B2.7.4 ACTIONS AFFECTING THE METHOD OF DISPERSION (SECTION 230.72)

In addition to the actions listed above, the Project includes the following minimization actions related to the methods of fill placement.

- The Project design includes installation of Project components (roads and pipelines) at most water bodies and wetlands primarily in the winter months when frozen ground and snow are present, flows are lowest, and disturbance of the river, stream banks, and local groundwater would be minimized, or by using HDD technology to avoid flow impacts at major Pipeline river crossings.
- The Project design includes (when possible) crossing drainages at right angles to reduce riparian impacts, and use of bridges.
- Construction effects on fish and fish habitat areas would be minimized by selecting stream crossing techniques that provide the appropriate level of protection for the specific habitat sensitivity. In-water work windows would be used to minimize effects

on fishery resources during sensitive life-cycle stages. Appropriate stream bank rehabilitation and reclamation techniques and BMPs would be used.

- For summer construction in wetlands without permafrost, workpads could be temporary. They would be made from imported fill and/or trench spoil (if suitable) or timber mats. A layer of geotextile or mats would be used to separate fill from vegetation.
- Permitted disturbance boundaries would be clearly delineated prior to construction work to confine activities to the construction zone or permitted footprint to prevent disturbance of surrounding vegetation.
- The roads would be constructed via the use of pioneer segments in the winter to minimize disturbance to wetlands and the vegetation mat underlying the road. As necessary a geosynthetic fabric would be installed over permafrost or wetland areas to minimize thawing and degradation of the gravel road bed. As soon as possible after construction is completed, road cuts would be stabilized and seeded.
- Winter construction is planned for a majority of the Pipeline route. In winter, wetlands that are underlain by permafrost would be crossed using an ice or snow pad. Wetlands without permafrost would be frost packed to freeze them down to more competent soils or deep enough to support the pipe and construction equipment.
- The Pipeline construction plan avoids the need for permanent gravel access roads. This reduces the need for permanent culverts, bridges, and structures in numerous streams.
- Buffers were established around streams to minimize impacts.

With the inclusion of special conditions, the proposed Project would comply with this factor of the Guidelines.

B2.7.5 ACTIONS RELATED TO TECHNOLOGY (SECTION 230.74)

The following technology-related actions would be taken to minimize impacts.

- HDD would be used to avoid direct impacts at six major stream crossings along the Pipeline route.
- The TSF and water dams were designed using rockfill, bedrock foundations, multiple filter zones, impermeable liners, and downstream construction methods to resist seismic hazards, static stability, and seepage concerns. The dams would be designed, constructed, and operated to meet or exceed State of Alaska Dam Safety Program engineering standards and requirements for environmental protection, stability, and safety. Certificates of approval to construct, operate, maintain, and abandoned the dams would be obtained by the ADNR Dam Safety Program.
- The Project design at the Mine Site includes water management strategies that would maintain flow and storage within the design capacity of structures, provide flexibility for extra storage in high precipitation years, and sufficient water supplies for processing in low precipitation years.
- The natural gas pipeline would be strain-based design to minimize impacts to permafrost.

- The Project would use bridges rather than culverts to cross fish-bearing streams along the mine access road to avoid impacts to streamflow, water circulation patterns, aquatic habitat, and fish migration.
- Runoff and seepage from Mine Site facilities would be generally collected and reused or treated to meet AWQS. The proposed treatment includes the use of high-rate classifiers, green sand filters, and reverse osmosis technology. Treated water would discharge to Crooked Creek as authorized by an APDES permit issued by ADEC.

With the inclusion of special conditions, the proposed Project would comply with this factor of the Guidelines.

B2.7.6 ACTIONS AFFECTING PLANT AND ANIMAL POPULATIONS (SECTION 230.75)

Many of the measures discussed above will minimize adverse effects on plant and animal populations. Following are additional actions that would be taken.

- Pre-construction surveys of vegetation to be disturbed would be conducted to determine the presence or absence of any rare and sensitive plant species. If any individuals or populations are found, the appropriate agencies would be consulted to determine potential mitigation such as avoidance or transplant.
- Raptor nest surveys would be conducted during the spring prior to start of construction. If occupied nests are found close to areas of proposed activity, the activity would be scheduled to occur outside the nesting season if feasible.
- Donlin Gold would develop a wildlife avoidance and human encounter/interaction plan to minimize the risk of adverse wildlife interactions with workers and avoid impact to subsistence species.
- Surface water quality sampling and aquatic life monitoring will regularly be conducted.
- ADEC's Draft Waste Management Permit includes a provision to minimize the potential that any area containing contaminated water becomes attractive to birds and wildlife.
- Pursuant to the Reclamation and Closure Plan, disturbed areas will be reclaimed to a stable condition that can support wildlife habitat.

With Applicant design features, the proposed Project would comply with this factor of the Guidelines.

B2.7.7 ACTIONS AFFECTING HUMAN USE (SECTION 230.76)

Many of the measures discussed above will minimize adverse effects on human use. Following are additional actions that would be taken.

- Whenever reasonably possible, construction and maintenance schedules would recognize peak periods and locations of subsistence hunting and fishing, with the understanding that some construction activities must also take advantage of seasonal and environmental conditions.
- The Pipeline construction schedule would try to avoid peak periods of recreation and tourism activities.

- Donlin Gold would regularly communicate with local tourism and recreation businesses to avoid impacts during construction and operations.

With Applicant design features, the proposed Project would comply with this factor of the Guidelines.

B2.7.8 OTHER ACTIONS (SECTION 230.77)

No impact reducing measures that would be classified as Other Actions are proposed.

ATTACHMENT B3 GENERAL POLICIES FOR EVALUATING SECTION 10 RHA AND 404 CWA PERMIT DECISIONS (33 CFR 320.4)

B3.1 PUBLIC INTEREST REVIEW (33 CFR 320.4[A])

The decision whether to issue a permit will be based on an evaluation of the probable impacts, including cumulative impacts, of the proposed activity and its intended use on the public interest.

The Corps has determined, after evaluation of the following general criteria (i – iii below) and the factors listed in Section B3.2 through B3.18, that the proposed Donlin Gold Project will not be contrary to the public interest, as long as all measures identified in Section 6.0 of the JROD, including permit special conditions listed in Section 6.2.7, are implemented.

i. The relative extent of the public and private need for the proposed work:

Donlin Gold's stated need for the proposed Project is to enable Calista and The Kuskokwim Corporation (TKC) to maximize economic benefits for their shareholders, from lands with mineral potential selected and conveyed to them under ANCSA, by producing gold to meet worldwide demand. Gold is an established commodity with international markets. Donlin Gold's need for the Pipeline is driven by the remote location of the Mine Site. There are no existing or readily useable resources that can provide sufficient energy needed for development and operation of the mine within Donlin Gold's timeframe. The remote location does not have sufficient, naturally occurring gas resources, or other energy sources of the magnitude necessary to support mine development and operations. No existing transportation or utility infrastructure services are available to the proposed Mine Site or surrounding area. Access to the Mine Site is seasonal via the Kuskokwim River or by aircraft, as weather conditions allow.

Gold is an important precious metal used worldwide. The Project represents a needed exploitation and use of these metals, with stable prices allowing for profitable operations. The Corps has found that a demonstrable demand for gold exists and that the Applicant's stated need is not unduly speculative. The Project will develop gold resources, representing an expanded source of gold in the United States and a contribution to worldwide gold supplies.

The Proposed Action would generate positive economic benefits to communities in the Y-K region, ANCSA corporations (Calista, TKC, and Cook Inlet Region Incorporated [CIRI]) and their shareholders, and the State and local governments.

The Donlin Gold Project would generate positive economic benefits from employment, income, sales (i.e., purchases of equipment and supplies) and tax revenues. Given the high unemployment in the Y-K region, beneficial employment effects would be particularly important within that region. The villages of the Y-K region are small, remote communities with subsistence-based economies and few opportunities for year-round employment. Commercial fishing, which is seasonal and subject to fluctuating stocks, is the mainstay of the private economy but has faced recent conservation and economic challenges. These communities have among the lowest rates in the State for per capita income, and among the highest for unemployment. Many people are leaving these small communities for economic opportunities in urban areas.

Under agreements with the landowners, Calista and TKC, Donlin Gold has a hiring preference for shareholders and descendants and residents of local communities. Many workers with the skills needed for Project construction are available within the region, and an estimated 1,600 to 1,900 from Y-K communities would be employed during this phase (14 to 17 percent of 2015 Y-K region employment). During Operations, an estimated 500 to 600 regional residents would be employed (4 to 5 percent of 2015 Y-K employment). Employment income could help to offset the current trend of decreasing income from fishing. Additionally, for each year the Project is operational, an estimated 650 jobs and $40 million in wages would be generated statewide through multiplier effects, while sales within the State would increase by $150 million per year. As landowners at the Mine Site, Calista and TKC would receive substantial income through lease, surface use agreement, and royalty payments. For the Pipeline, landowners will receive right-of-way (ROW) lease payments, while State and local governments would receive tax revenue. ANCSA corporations (Calista, TKC, and CIRI) would directly benefit from lease payments and ROW payments and all ANCSA corporations would benefit due to revenue sharing.

The duration of beneficial socioeconomic impacts would extend through the life of the mine. During Mine Site closure, seasonal workers would be employed only for monitoring and operations of the water treatment plant, which is planned to take function in perpetuity from the time when the pit lake fills (estimated at 50 years after Closure). While employment opportunities would significantly decrease at the Donlin Gold site after Closure, the ability to use the skills developed at the Donlin Gold site would persist and could result in continued employment at another location.

The Corps concludes that gold mined from the Project would help meet the public and private need for gold in both the short and long term and provide short and long term beneficial socioeconomic effects to a region of the State that is economically depressed.

ii. The practicability of using reasonable alternative locations and/or methods to accomplish the objective of the proposed structure or work:

Overall, the Corps finds that practicable alternatives that do not impact WOUS and/or special aquatic sites do not exist as a result of geographical and technological constraints of Project siting. An analysis of practicable alternatives and the Corps' LEDPA determination is presented in Subpart B of this analysis (Attachment B2.1, Section B2.1.1.1).

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 which the area is suited:

The Final EIS addresses the range of potential adverse and beneficial impacts related to the current and potential future public and private uses for which the area is suited. The Project would affect lands from the west side of Cook Inlet, through the Alaska Range, onto the Mine Site 10 miles north of Crooked Creek, and through the Kuskokwim River valley to the Bering Sea. These are generally very remote lands, used primarily by local communities for dispersed subsistence activities, with low levels of use by others. Additional important land uses include: ongoing metals exploration and small mining operations in the vicinity of the Mine Site and the Transportation Corridor; and dispersed recreation (sport hunting, fishing, rafting, and hiking) along with the seasonally intensive use of the INHT for the winter races in the vicinity of a portion of the Project Pipeline.

The proposed Mine Site area is privately owned by Calista for the subsurface and TKC for the surface. The proposed Transportation Corridor would affect land owned or managed by Calista, TKC, the State of Alaska, the City of Bethel, and private landowners. Lands affected by the proposed Pipeline are owned or managed by the State of Alaska, the BLM, Calista, and CIRI.

The Mine Site would primarily occupy private land, owned and managed by Calista and TKC, consistent with their land policies. The Transportation Corridor would occupy private lands managed by Calista and TKC, and public lands managed by the State of Alaska. The proposed transportation facilities would be consistent with the authorities and policies of the respective landowners. The Pipeline would occupy State lands for approximately 207 miles or 66 percent of the length, under the provisions of the Susitna Matanuska Area Plan, the Susitna Flats State Game Refuge Management Plan and the Kuskokwim Area Plan. Supply routes for Pipeline construction would also cross lands within the Southeast Susitna Area Plan boundaries. The INHT passes through State-owned lands near and within the Pipeline corridor, and is jointly managed under the Iditarod National Historic Trail Comprehensive Management Plan. Approximately 97 miles, or 31 percent, of the Pipeline ROW would occupy federal lands, which is currently managed under the Southwest Management Framework Plan of the Bureau of Land Management (BLM).

The proposed Project would require 3 to 4 years to construct. Active mining would occur for approximately 27 years, with concurrent restoration as the mine progresses. Many areas will not be reclaimed until 1 to 27 years after mining starts and some areas will require up to 33 years or longer before they will be fully reclaimed and closed. However, many effects that occur during active mining would be considerably reduced or reversed with time, and many habitat values and potential uses would improve, although not entirely to pre-mining conditions.

Detrimental impacts include the loss of WOUS, impacts on fish and aquatic resources, disturbance to subsistence resources, and effects on surface water and water quality. These impacts range in intensity. Many of these effects will be temporary and will be alleviated after the mine is closed and reclaimed. A number of these impacts will be minimized through measures to be implemented by the Permittee, through compliance with required state and federal regulations, and by specific permit conditions imposed by the respective permits.

In terms of beneficial effects, the area is economically depressed and the Project would create a considerable number of jobs in the area. This will benefit the community. The fiscal benefits of the Project may increase access and affordability of healthcare and would support subsistence activities.

The Corps has determined that the CMP proposed by Donlin Gold adequately compensates for the aquatic resources functions that would be lost as a result of the proposed Project. Furthermore, the Corps concludes the Project would not have detrimental effects on the public and private uses which the area is suited.

B3.2 FOOD AND FIBER PRODUCTION (33 CFR 320.4[A])

References: Final EIS Sections 3.21 (Subsistence), 3.22 (Human Health), and Appendix AB (Focused Risk Assessment [FRA]); ERM 2017b – Human Health Risk Assessment

During the scoping meetings for the Donlin Gold Project, Alaska Native residents in the Project area emphasized their desire to protect their cultural traditions and subsistence way of life. The

proposed Project has the potential for creating adverse and beneficial effects on subsistence resources and practices in the Project area. Potential impacts to subsistence include reductions in subsistence resource abundance and availability, restrictions on access to traditional use areas, increased competition for subsistence resources (from within and outside the region), and sociocultural changes due to employment, out-migration, and shift work. In regard to sociocultural impacts, new employment and income would be beneficial, increasing the ability of households to meet the high costs of subsistence equipment and fuel. The nature, intensity and duration of potential impacts vary by Project component, Project phase and geographic subregion. Potential mitigation measures, including specific Project design and construction/operations/closure procedures proposed by the Applicant, standard state and federal permit conditions, and best management practices were taken into consideration in analyzing potential impacts.

Generally, the habitat areas adversely affected by the Project and the proportion of traditional uses affected are small, and subsistence users may redirect effort to alternative use areas at little cost and effort, with little overall reduction in subsistence harvest levels. The intensity of displacement would be greater for Crooked Creek residents in relation to the Mine Site (with a small displacement of Aniak resident uses), greater for subsistence fishing in narrow and shallow segments of the river, near Aniak and the Oskawalik River, and a small increase in competition for McGrath and Nikolai due to competition deriving from greater use of Farewell Airstrip. Employment and income generated by the Project may be used to support subsistence.

Additionally, comments on the Draft EIS expressed concerns about the potential risk to human health associated with potential exposures to Project-related hazardous chemicals. Most of the concerns expressed were associated with consumption of chemicals in food (fish, wildlife, vegetation) and inhalation of chemicals in air. These and other comments were discussed with cooperating agencies during a technical review workshop. As a result of the discussions, a FRA was conducted as part of finalizing the EIS to evaluate the potential risks and hazards of exposure to Project-related hazardous chemicals and is included in Appendix AB of the Final EIS. A quantitative human health risk assessment (HHRA) was conducted by Environmental Resources Management, Inc. (ERM 2017b) with input from the Corps and AECOM, and is cited in the FRA. The results of the FRA as they apply to potential impacts to subsistence and consumption of subsistence resources are included in the Final EIS Section 3.21.

The FRA and HHRA evaluated the potential exposure of residents in the vicinity of the mine operations to baseline and mining generated levels of mercury, arsenic, and antimony as the result of consumption of representative subsistence resources. Overall, the findings of the quantitative HHRA indicated that the small increases in constituent concentrations estimated to occur outside of the Mine Site due to Project-related activities are unlikely to result in unacceptable risks to human populations who would have the highest exposure (i.e., subsistence users). Based on these findings, other human populations, such as other residents in the region, would not be expected to be exposed to unacceptable risk due to exposure to Project-related concentrations of mercury, arsenic, or antimony.

The Corps has determined that the proposed Project would have negligible effects on food and fiber production and it is not contrary to the public interest.

B3.3 EFFECTS ON WETLANDS (33 CFR 320.4[B])

Reference: Final EIS, Sections 3.11 (Wetlands)

The Applicant's proposed Project would result in permanent loss of wetlands and vegetation, including those wetlands that may be involved with shallow groundwater recharge (320.4(b)(2)(i)) and wetlands that may be involved with wave action, erosion, or storm damage (320.4(b)(2)(iv)), through development of the Mine Site, placement of fill for transportation component facilities, and discharges from installation of the natural gas Pipeline. Indirect effects would be incurred from dust deposition and potential dewatering. Impacts to wetlands, including a summary of direct and indirect impact acreages, are discussed in Subpart E (Attachment B2.4, Section B2.4.2). Cumulative effects are discussed in Subpart B (Attachment B2, Section B2.1.2.7). 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.

Compensatory mitigation would be required for unavoidable impacts to wetlands, as described in Section 6.2 of the JROD and Attachment B5. With implementation of the CMP, the Corps finds that the adverse effects on wetlands and the aquatic resource functions that would be lost as a result of the proposed Project would be adequately compensated. The proposed CMP will preserve wetlands and riparian areas in the Chuitna watershed, restore and enhance floodplain habitat in the upper Crooked Creek watershed. The Crooked Creek Permittee-Responsible Mitigation Project is located in the same watershed (on-site) of the proposed impact. Off-site options were extensively evaluated by Donlin Gold and the Project in Chuitna was determined to yield the optimal ecological increase in functions and services, while meeting land owner, land use, practicability and economic considerations. Implementation of the CMP would yield substantive, near-term benefits to aquatic resources which perform functions important to the public interest.

The Corps has determined that the proposed Project would have moderate adverse effects on wetlands and it is not contrary to the public interest.

B3.4 FISH AND WILDLIFE (33 CFR 320.4[C])

Reference: Final EIS, Sections 3.12 (Wildlife) and 3.13 (Fish and Aquatic Resources)

The Applicant's proposed Project would result in a permanent loss of fish and wildlife habitat, fragmentation, and degradation from development of the Mine Site, placement of fill for transportation component facilities, and installation of the natural gas pipeline. 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. Indirect effects vary in type and intensity for the different Project components and for the various fish and wildlife potentially affected by the Project. Overall, the cumulative effects on wildlife are expected to be geographically or temporality limited within a large area. While the individual impact of the Project is measurable, the cumulative effect is still considered to be limited, given the limited area of disturbance over the region. The cumulative effects on fish and aquatic resources are expected to increase over the life of the Project. Impacts to Fish and Wildlife are further discussed in Subpart B (Attachment B2, Section B2.1.2.5) and Subpart D (Attachment B2.3, Sections B2.3.1 – B2.3.3

The Corps finds that overall the proposed Project would have a minor adverse effect on wildlife. There is unlikely to be a noticeable change in animal population character or quantity as a result of the Project.

An EFH Assessment was submitted to NMFS dated September 26, 2017, from the Corps (see Appendix Q of the Final EIS). The submission of this EFH Assessment asserts that the Corps permitted actions may have adverse effects on EFH. The Corps determined that the overall Project will have short term and long term effects; overall activities are unlikely to have adverse effects on EFH, and any adverse effects on EFH will be minimal. Further, mine facilities and the port at Jungjuk Point will not have any adverse effects on EFH. EFH consultation is discussed in Section B2.3.4.

The Corps has determined that the proposed Project would have minor adverse effects on fish and wildlife and it is not contrary to the public interest.

B3.5 WATER QUALITY (33 CFR 320.4[D])

References: Final EIS in Sections 3.5 (Surface Water Hydrology), 3.6 (Groundwater Hydrology), 3.7 (Water Quality), and 3.13 (Fish and Aquatic Resources); Water Resources Management Plan (SRK 2017a); Aquatic Resources Monitoring Plan.

The proposed Project would result in adverse direct and indirect impacts to water quality and chemistry as a result of geochemical alteration of mined rock and its interaction with air and water, mercury deposition from stacks and fugitive dust, and potentially sedimentation and turbidity from construction of Project component facilities and barging in shallow areas along the Kuskokwim River. Impacts to water quality are further discussed in Subpart B (Section B2.1.2.2) and Subpart C (Sections B2.2.3 – B2.2.5). As discussed in Subpart F (Attachment B2.5, Section B2.5.1), the discharge of dredged or fill material related to the Mine Site, Transportation Corridor, or Pipeline would not adversely affect the quality or quantity of municipal or private water supplies.

Overall, impacts to water quality and chemistry are not expected to exceed regulatory limits. Discharges at the Mine Site to Crooked Creek and its tributaries would be subject to the APDES permit which was issued on May 24, 2018 which contains effluent quality limitations that are protective of existing uses. Impacts to water quality during construction of the Transportation Corridor and Pipeline components would be temporary. The ADEC issued a conditioned Section 401 Water Quality Certification for the placement of the fill material for the Applicant's proposed Project described in our Public Notice (see Attachment B6 - State of Alaska Certificate of Reasonable Assurance for the Donlin Gold Project).

Considering that the Project would be required to maintain effluent water quality limitations administered by the APDES permit and adhere to the Section 401 Water Quality Certification the Corps has determined that the proposed Project would have minor adverse effects on water quality and it is not contrary to the public interest.

B3.6 HISTORICAL, CULTURAL, SCENIC, AND RECREATIONAL VALUES (33 CFR 320.4[E])

References: Final EIS, Sections 3.16 (Recreation), 3.17 (Visual), 3.20 (Cultural Resources), 3.21 (Subsistence), and Appendix Y (Programmatic Agreement).

Known historic properties (i.e., cultural resources determined eligible for nomination to the NRHP) would be adversely affected by the Project and additional resources may be identified where impacts cannot be avoided and or effects minimized. Donlin Gold has prepared a

Cultural Resources Management Plan (attached as Appendix D of the Programmatic Agreement), to guide mitigation or treatment in consultation with the Corps, BLM, ADNR, SHPO, Tribes, and other affected parties. Unavoidable impacts would create a permanent loss of integrity with resources eligible for the NRHP. However, data recovery and other mitigation could be implemented through the Programmatic Agreement to adequately resolve adverse effects. As outlined in the Programmatic Agreement, mitigation of adverse effects will be required for a minimum of seven historic properties, including two historic cabins (IDT-00260 and TYO-25 00215), the INHT, and four prehistoric occupation sites or lithic scatters (SLT-00094, IDT-00288, MCG-00071, and TYO-00277). Additional historic properties may be located during additional inventory efforts or construction activities. Measures to be implemented for the purposes of mitigating adverse effects to historic properties are detailed in the Programmatic Agreement.

Recreational use of the proposed Mine Site and areas affected by the proposed Transportation Corridor is currently low. The opportunities for recreation in these areas, such as sport (general or non-subsistence) hunting or snowmachining, are widely available elsewhere in the region. Since current recreation use is low, impacts involving changes in recreation access, setting, activities, or use levels that may not be measurable or apparent. The Mine Site is not recognized for its scenic value. The Transportation Corridor affected area may be recognized for its scenic quality and landscape character, though scenic resources are not protected by existing legislation.

Over much of the proposed natural gas pipeline route, recreational use of the corridor is low, and the resources would affect recreation in settings designated by legislation but not designated Wilderness. Guided hunting occurs in two Game Management Units, which are crossed by the Pipeline. As a principal recreational resource of the area, and one of historic significance to Alaska and the nation, the INHT is of special note with regard to the proposed Pipeline. Recreational effects of the Pipeline component would come from disturbance during construction and clearing of shrubs from the Pipeline ROW during construction and maintenance of the Pipeline. The duration of effects vary seasonally and geographically along the Pipeline due to differing levels and contexts of recreation use. The Pipeline corridor would overlap with the INHT for 2.5 miles, and would be within 1,000 feet of the route for 14.3 miles. Impacts to Recreation are further discussed under Subpart F (Attachment B2.5, Sections B2.5.2 and B2.5.3). Impacts to the INHT are further discussed under Subpart F (Attachment B2.5, Section B2.5.5 Parks, National and Historical Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves).

Impacts to scenic values (visual resources) are discussed in Subpart F (Attachment B2.5, Sections B2.5.4 and B2.5.5).

The Applicant has incorporated design features to reduce impacts to cultural, recreational, and visual resources include. Design feature that minimize Project impacts are listed in Chapter 5 of the Final EIS.

Considering that the Applicant would be required, through the special conditions (see Section 6.2.7 of the JROD), to adhere to the National Historic Preservation Act Section 106 Programmatic Agreement, that includes mitigation to address adverse effects to historic properties, the Corps has determined that the proposed Project would have minor adverse effects on historic, cultural, scenic and recreational values and it is not contrary to the public interest.

B3.7 EFFECTS ON LIMITS OF THE TERRITORIAL SEA (33 CFR 320.4[F])

There are no limitations of the territorial sea anticipated from the construction of this Project.

B3.8 CONSIDERATION OF PROPERTY OWNERSHIP (33 CFR 320.4[G])

References: Final EIS Section 3.15 (Land Ownership, Management, and Use)

The proposed Mine Site area is privately owned by Calista for the subsurface and TKC for the surface. The proposed Transportation Corridor would affect land owned or managed by Calista, TKC, the State of Alaska, the City of Bethel, and private landowners. Lands affected by the proposed Pipeline are owned or managed by the State of Alaska, the BLM, Calista, and CIRI.

For all components under the proposed Project, land ownership would experience no impacts to no apparent impacts, and management would not be affected, because current managers would continue to hold authority and the Proposed Action is consistent with current management plans and policies. Lease agreements and ROWs from land owners would be obtained by Donlin Gold for the purposes of construction, operation and maintenance, and closure of the mine, Transportation Corridor, and Pipeline facilities.

Changes in land use at the Mine Site would be from partially disturbed land to intense industrial development. These changes, consistent with the goals of the landowners (Calista and TKC), would predominantly result in obvious changes in land use given the large shift in land use, which would be beneficial to the landowner. The duration of direct and indirect effects would vary. Changes in land use at the Mine Site would revert after closure to nearly pre-mining levels, except for the pit lake and residual transportation infrastructure, and easements. The adjustments to access easements would persist over the life of the Project and may persist after Project Closure even if the actions that caused the impacts were to cease. Access rights on easements crossing the Mine Site, including 17(b) easements, would be administratively adjusted through agreements between affected land managers, and comparable access would be provided.

Land ownership, management, and use changes for transportation facilities would persist after Project Closure and extend beyond a local area, and result in obvious changes and affect resources throughout the EIS Analysis Area for the proposed airstrip, port improvements and mine access road. Adverse effects that may not be measurable or apparent would occur to easements at the port site, and to intermittent users of the State lands affected by the Transportation Corridor footprint.

For the proposed Pipeline, the period of intense disturbance would persist only during the 3 to 4 years of construction. Disturbance from brushing each decade may not be measurable or apparent. During the period of operations and maintenance, changes in ownership, management, or land use may reasonably be expected to convert (or revert) to another use frequently, over the life of the Project. The INHT is considered as having special or rare characteristics with regard to the Pipeline component. Impacts to the INHT are discussed under Subpart F (Attachment B2.5, Section B2.5.5 Parks, National and Historical Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves).

There are no unresolved issues with respect to property ownership. Therefore, the Corps has determined that the proposed Project would have negligible effects on property ownership and it is not contrary to the public interest.

B3.9 ACTIVITIES AFFECTING COASTAL ZONES (33 CFR 320.4[H])

By operation of Alaska State law, the federally approved Alaska Coastal Management Program expired on July 1, 2011, resulting in a withdrawal from participation in the Coastal Zone Management Act's (CZMA) National Coastal Management Program. The CZMA federal consistency provision, section 307, no longer applies in Alaska. Federal Register Notice published July 7, 2011, Volume 76, No. 130, page 39857.

B3.10 ACTIVITIES IN MARINE SANCTUARIES (33 CFR 320.4

There are no marine sanctuaries in the Project area.

B3.11 OTHER FEDERAL, STATE, AND LOCAL REQUIREMENTS (33 CFR 320.4[J])

See Attachment B4 (Section B4.18) for State and Local authorizations obtained.

B3.12 SAFETY OF IMPOUNDMENT STRUCTURES (33 CFR 320.4[K])

References: Final EIS Sections 3.3 (Geohazards), 3.5 (Surface Water Hydrology), 3.2 (Soils), and 3.24 (Spill Risk); Final EIS Chapter 5 (Mitigation); Final EIS Appendix A (Financial Assurance) and AA (Additional Regulatory Information); ADNR (2005, 2017); BGC (2011a, c, f, l); SRK (2015a)

Dam safety in the State of Alaska is regulated by the ADNR primarily under Alaska Statute (AS) 46.17 "Supervision of Safety of Dams and Reservoirs" and 11 AAC 93 "Dam Safety." Enforcement powers granted to ADNR under Dam Safety regulations include requirements for approval to construct, enlarge, repair, alter, remove, maintain, operate, or abandon a dam or reservoir; requirements governing different phases of the Project life, such as construction plans, quality assurance/quality control, operations, maintenance, repairs, monitoring and inspections, emergency action planning, and closure; authority for ADNR dam inspection, ordering the owner to take action to protect life and property, and supervisory control of the dam in emergency situations; and financial assurance requirements associated with dam safety (11 AAC 93.171 and 172) to pay for costs of reclamation and post-Closure monitoring and maintenance, or for breaching a dam and restoring the stream channel and land to natural conditions (see Final EIS Appendix A, Financial Assurance, and Appendix AA, Additional Regulatory Framework Information).

ADNR (2005, 2017) has published Guidelines for Cooperation with the Alaska Dam Safety Program, which is administered by ADNR in accordance with dam safety regulations. ADNR uses three classifications for dams based on the potential impacts of failure or improper operation of a dam. Those pertinent to dams at the Donlin Gold Mine Site include:

- Class I (high). Probable loss of one or more lives if failure were to occur.
- Class II (significant). No loss of life expected, although a significant danger to public health may exist; probable loss of or significant damage to structures or property; or

probable loss of or significant damage to waters identified under 11 AAC 195.010(a) as important for anadromous fish.

The planned dams at the Donlin Gold Mine Site consist of the following:

- The Tailings Storage Facility Dam (TSF) – Class I;
- Fresh Water Dam (FWD) (Snow Gulch FWD) – Class I;
- The Fresh Water Diversion Dams (FWDD) (American FWDD and North and South FWDDs) – Class II; and
- Upper and Lower Contact Water Dams (CWDs) – Class II.

The ADNR (2005, 2017) guidelines contain design requirements for hydrology (inflow flood, precipitation, snowpack); hydraulics (flood routing, spillway, freeboard); stability under a variety of loading conditions; design earthquake levels; seepage analysis; and cold regions factors such as permafrost foundation issues, ice loading, and other cold temperature effects on construction materials and operations. The input parameters and design elements of the proposed dams at the Donlin Gold Mine that meet these criteria are presented in BGC (2011a, c, f, and l) and are discussed in Final EIS Sections 3.3.3.2.1 (Earthquakes), 3.3.3.2.2 (Slope Stability), 3.3.3.2.3 (Other Geohazards [Dam Seepage]), 3.2.3.2.2 (Permafrost), 3.5.2.1.3 (Meteorological Inputs to Water Balance Modeling), and 3.5.3.2.1 (Surface Water Hydrology-Mine Site).

The results of static and seismic stability analyses of the TSF dam indicate that it is a robust design. Its downstream construction is inherently the most stable type of tailings dam, and proposed slopes and rock zones are considered safe and meet industry standard factors of safety. Valley siting, dam foundation preparation, water control structures, rockfill body, filter zones, liner materials, and downstream raises all contribute to dam stability in the event of an earthquake. Seismic parameters incorporated into the design, as well as performance examples for similar dams worldwide, indicate that the TSF dam would be extremely unlikely to fail during the largest earthquake that is considered probable in the area, and would very likely remain functional and easily reparable. The intensity of geohazards effects on the dam are expected to range from immeasurable to noticeable changes (e.g., up to 1.4-foot crest settlement and 0.5-foot horizontal displacement in the case of the maximum earthquake). These analyses and results apply to both operations and closure/post-closure phases of the TSF dam (the other Donlin Gold Project dams would be removed at closure).

The impacts of various geohazards on the two Class I dams at the Donlin Gold mine area were subject to review by a panel of geotechnical experts in an Early Stage Failure Modes and Effects Analysis (FMEA) workshop, during which various potential dam failure scenarios were evaluated for probability and consequences (SRK 2015a). Based on further screening analysis of the Early Stage FMEA results (AECOM 2015c), two failure scenarios that represent unlikely but not worst-case situations were selected for analysis of environmental impacts from a partial dam breach for the purposes of the EIS. The parameters for this analysis (failure mode selection, size of the release) and inundation maps from this modeled spill scenario are provided in the Final EIS Section 3.24, Spill Risk (Sections 3.24.3.5.2 and 3.24.5.9).

The ADNR (2005, 2017) dam safety guidelines also contain specific requirements under 11 AAC 93.164(b) for dam failure analysis and detailed inundation maps to be provided in emergency action plans, which estimate the extent of downstream flooding in the event of a complete dam breach regardless of failure mode. These analyses would be completed during final design and

State permitting which are ongoing. Donlin Gold has committed to meeting or exceeding State of Alaska engineering standards and requirements under the ADNR Dam Safety Program (Donlin Gold 2018). Other commitments related to dam safety included in Final EIS Chapter 5, Mitigation include the various construction elements described above, dam inspections and monitoring, excavation of permafrost to bedrock beneath abutments, and water management strategies to maintain flow and storage within the design capacity of all dams and minimize water storage in the TSF in particular.

The impoundment structures at the Donlin Gold mine would serve the public interest identified under B3.1 Public Interest Review (economic benefits) by functioning as necessary and integral parts of mine construction and operations. Based on review of feasibility level designs in the Final EIS that were prepared by qualified persons (e.g., BGC 2011a, c; SRK 2015a), commitments by Donlin Gold for meeting or exceeding State dam safety requirements in final design, and independent reviews of final design and emergency action plans by ADNR qualified persons, impoundment structures are expected to have negligible adverse effects on public safety and are not contrary to the public interest.

B3.13 FLOODPLAIN MANAGEMENT (33 CFR 320.4[L]; EXECUTIVE ORDER [EO] 11988)

References: Final EIS Section 3.5 (Surface Water Hydrology)

As stated in the referenced regulations, floodplains possess significant natural values and carry out numerous functions in the public interest including: flood attenuation, water quality maintenance, groundwater recharge, living resource values, and cultural resource values. A particular alteration of the floodplain may constitute a minor change; however, the cumulative impact of such changes may result in a significant degradation of floodplain values and functions and in increased potential for harm to upstream and downstream activities.

At the Mine Site, overall direct and indirect impacts to floodplains would result from surface water diversion and storage in the American and Anaconda Creeks, and interception of surface water and groundwater by the mine pit and dewatering wells in the American Creek watershed. These impacts would range in intensity; effects may or may not be within historic seasonal variation depending on season, watershed, and mine phase. The highest intensity of surface water impacts that would affect floodplains (dewatering losses and tributary diversions) would occur throughout Operations and the early closure period. Impacts to floodplains would also result from placement of fill that would eliminate wetlands where flood waters may be stored.

Surface water crossings associated with the Transportation Corridor have the potential to affect floodplain values if drainage structures are missing, undersized, or improperly constructed. Culverts would be installed using construction practices designed to prevent damage from heavy loads, pass the design discharge, and to prevent erosion at the outlets. Bridge and steel arch structures would be constructed to prevent impacts to streams during normal and flood conditions.

The Angyaruaq (Jungjuk) Port design includes a sheet pile wall that extends an average of 150 feet into the Kuskokwim River (BGC 2014e). The sheet pile wall and fill are necessary to provide a level dock adjacent to the moored barges for the lift-trucks loading and unloading shipping containers. A flood-peak frequency analysis (BGC 2014e), a hydraulic model of the 100-year

flood, and ice jam surveys (RECON 2014b) were used to design the fixed structure to be above the 100-year flood and known ice jam elevations. Hydraulic analysis conducted at the Angyaruaq (Jungjuk) Port location concluded that as designed, the sheet pile wall would not majorly impact Kuskokwim River channel morphology during average annual peak flow and 100-year flood conditions.

The majority of rivers and streams along the Pipeline route would be crossed by an open-cut method during winter months when flows are lowest and disturbance of the channel and streambank can be minimized. Final Pipeline design for burial depths and lengths at open-cut stream crossings will include surveying the stream reach to determine the main channel thalweg elevation and floodplain or fan width. These crossings would be designed in cooperation with the ADF&G for protection of habitat and fish, as well as with state and federal regulatory agencies to ensure compliance with applicable water quality regulations. Six Pipeline river crossings are proposed as HDD crossings. The HDD technique minimizes disturbance to the ground surface between the entry and exit points at a given crossing. Additionally, HDD eliminates the need to excavate and backfill within the stream channel.

Impacts to the physical characteristics of the aquatic ecosystem are also disused under Subpart B (Attachment B2.1, Section B2.1.2.1) and Subpart C (Attachment B2.2, Sections B2.2.3 and B2.2.4).

Overall, the Corps finds that the Project would have minor adverse effects on floodplains and it is not be contrary to the public interest.

B3.14 WATER SUPPLY AND CONSERVATION (33 CFR 320.4[M])

During construction, freshwater would be required for construction camps, extraction sites for construction of the Pipeline, and ancillary water uses such as dust control, truck washing, and fire protection.

At the Mine Site, the existing exploration camp wells would be decommissioned in early construction in accordance with ADEC (2017e) guidance, and replaced with eight water wells that would be drilled between Omega Creek and an unnamed creek to the south (See Final EIS Figure 2.3-7). Water rights for this proposed use of water have been applied for in the amount of 201 acre-feet per year (125 gpm on a continuous basis). The potable water wells remaining in use at the plant site during Operations would be decommissioned at Closure in accordance with ADEC (2017e guidance). The permanent camp and associated potable water wells would remain during Closure to support continuing reclamation and water treatment activities, although flow rates would be reduced in proportion to staffing reductions.

Construction of a potable water well would be required at the Angyaruaq (Jungjuk) Port. Water rights have been applied for from a well in the amount of 0.55 acre-feet/year (0.34 gpm on a continuous basis) and all conditions would be complied with. The potable supply well would be operated at the Angyaruaq (Jungjuk) Port for the duration of Project operations. The quantity of water used would make up a small portion of the capacity of local or regional aquifers. At Project closure, the potable water well at the Angyaruaq (Jungjuk) Port would be abandoned according to ADEC regulations. Any impacts on local and regional aquifers would be restored to pre-development conditions.

Water extraction sites from surface water sources would be necessary for Pipeline construction and water supply wells would be used to support remote construction camps. Peak numbers of

construction personnel is estimated to be 650 people. At 55 gallons per day (gpd)/person, this is 35,750 gpd or 25 gallons per minute, spread across several camp locations. The quantity of water use would likely be small compared to the quantity of groundwater resource readily available.

Water withdrawals are regulated by the State of Alaska, ADF&G and ADNR and they limit the amount of water removed from each withdrawal location to not adversely impact the resource. Overall, conservation of ground water is not of concern for the Project and the Corps finds that the Project would have no adverse effects on water supply and conservation and it is not contrary to the public interest.

Municipal and private water supply related impacts are discussed under Subpart F (Attachment B2.5, Section B2.5.1).

B3.15 ENERGY CONSERVATION AND DEVELOPMENT (33 CFR 320.4[N])

References: Final EIS, Section 3.18.2.2.3 Local Public Infrastructure and Services; Donlin Gold 2011

The Project is not an energy production facility. Rather, the Project would create new base load electric demand for ore extraction and processing. Electrical power for the Project would be generated on site from a dual-fueled reciprocating engine power plant with a steam turbine using waste heat recovery from the engines. Natural gas would be the primary fuel, with ultra-low sulfur diesel as backup. The power plant would have a total installed capacity of 227 megawatts (MW), an average running load of 153 MW, and a peak load of 184 MW. Natural gas would be transported to the Donlin Gold Mine Site via a 316-mile, 14-inch-diameter buried steel pipeline originating from an existing 20-inch natural gas pipeline near Beluga, Alaska.

Alaska's electrical energy infrastructure differs from that in the rest of the U.S. in that there is no extensive infrastructure of transmission interties that span the state. The electrical needs of some communities in the EIS Analysis Area are currently served by public utilities connected to a regional transmission line owned by the Alaska Energy Authority. However, in the smaller, more isolated communities, such as those in the Yukon-Kuskokwim (Y-K) region, electricity is generated by isolated diesel generators that are not tied into regional grids. Residents of the Y-K region have the highest energy costs in the nation, at $7 to $12 per gallon for diesel heating fuel; diesel-generated electricity is delivered at a cost ranging from $0.58 to $1.05 per kilowatt hour.

The operation of the Project would have a potential indirect effect on local public utility costs in some Y-K region communities. Although the Project would not be a natural gas distributor, other entities could use any excess capacity that may become available in the natural gas pipeline to help Y-K region communities meet their energy needs (Donlin Gold 2011; as cited in the Final EIS). As stated in the natural gas pipeline plan of development (SRK 2013b; as cited in the Final EIS), providing a means for a reliable natural gas fuel source to the Project may create opportunities for further development of natural gas use beyond that of the Project. For example, the construction of off-take points from the natural gas pipeline would make it possible to provide natural gas to communities that are not currently served by natural gas utilities. This gas could be used for commercial and residential heating needs, as well as for electricity generation capacity.

It is difficult to determine the likelihood that the Project would result in the provision of an alternative energy source for communities in the Y-K region. The biggest challenge lies in the

lack of economies of scale. The fixed costs associated with constructing a regional natural gas pipeline distribution system are large, and the customer base is small. It is unlikely that development of a distribution system would be economically viable unless it was subsidized by an outside entity. However, if this were to happen, the Project would result in a beneficial impact to Y-K region communities.

The Corps has determined that the proposed Project would have beneficial effects over the long term on energy conservation and development, and it is not contrary to the public interest.

B3.16 MINERAL NEEDS (33 CFR 320.4[A][[1])

References: Final EIS Section 3.1 (Geology), Final EIS Section 3.23 (Transportation)

For the proposed action, about 50 million tons of overburden would be moved and reused for reclamation across about 9,000 acres at the Mine Site; 4.6 million cubic yards of gravel resources would be extracted from material sites; alteration of surficial deposits would occur along 340 miles of roads and Pipeline ROW; and there would be about 2,800 acres of material sites and Pipeline infrastructure areas. Quantities of sand and gravel mineral resources would be needed to construct access roads, road pads, building facility pads, and other mine- and Pipeline-related infrastructure. The proposed action would not provide for the mineral needs of others; only consume them for the fill area construction. Most rock and gravel aggregate resources impacted are usual or ordinary resources that are not considered depleted, although the ore-containing bedrock at the mine is a rare economic resource.

The Corps has determined that the proposed Project would have no adverse effects on mineral needs and is not contrary to the Public Interest.

B3.17 NAVIGATION (33 CFR 320.4[O])

References: Final EIS Section 3.23 (Transportation)

Water transportation is important throughout the Project area during the open-water period of the summer. The Port of Anchorage is a year-round major cargo hub for the state, especially the rail belt; while the Port of Bethel operates only during the ice-free season and is the principal cargo hub for the Y-K Delta. Existing barge traffic on the Kuskokwim River supplies communities with fuel and goods, while small boat river travel supports the critical subsistence activities of fishing, hunting, gathering, and sharing, as well as inter-community family and social travel.

During the winter, the frozen Kuskokwim River serves as a Transportation Corridor for snowmachines, off-highway vehicles, dogsleds, and light-duty passenger vehicles (cars and pickup trucks). There are approximately 28 miles of ice road on and along the Kuskokwim River in winter that support heavy equipment and large trucks (up to 25,000 pounds [not including cargo]) for an average of 1 month each winter when ice thickness is sufficient. During the shoulder seasons of freeze-up and breakup, there typically are no motorized vehicles or boats on the river. Using the Kuskokwim River for winter travel by snowmachines (or less frequently, dog teams) between Aniak and Crooked Creek is common. An extensive system of marked winter trails runs between villages, which allows for local travel by snowmachine (or less frequently, dogsleds).

On the lower river, closer to the city of Bethel, hovercrafts provide summer and winter postal, freight, and passenger service to eight nearby communities, operating over open water, marshy land, and river ice. Hovercrafts are used year-round in the area between Napaskiak and Akiak on the lower Kuskokwim River, with the exception of short times during freeze-up and breakup periods.

The greatest effects to navigation from the Project would be associated with barging on the Kuskokwim River. The Project would increase commercial vessel traffic on the Kuskokwim River during all phases of the Project as cargo and fuel are transported to the Angyaruaq (Jungjuk) Port (estimates of river barge round trips per season are proved in Table 3.23-11 of the Final EIS). Existing transportation systems would remain intact; however, the volume of additional barge traffic on the Kuskokwim River over the life of the Project would have a noticeable disturbance or displacement of transportation access, mode, or traffic levels. This would cause potential for disturbance and limited displacement of the commercial and non-commercial vessel traffic, approximately 395 average annual commercial vessel trips, and 1,600 average annual non-commercial vessel trips on the Kuskokwim River. The contribution of the Donlin Gold Project barges carrying Pipeline support material in Cook Inlet would be minimal.

Navigation impacts would be minimized by implementation of design features detailed in Table 5.2-1 of the Final EIS. The Corps has determined that the proposed Project would have minor adverse effects on navigation, and it is not contrary to the public interest.

B3.18 ENVIRONMENTAL BENEFITS (33 CFR 320.4[P])

The Proposed Action would not provide any identifiable environmental benefits.

B3.19 ECONOMICS (33 CFR 320.4[Q])

References: Final EIS Section 3.18 (Socioeconomics)

The Proposed Action would generate positive economic benefits to communities in the Y-K region, ANCSA corporations (Calista, TKC, and Cook Inlet Region Incorporated [CIRI]) and their shareholders, and the State and local governments.

Project impacts would include beneficial effects from employment, income, sales (i.e., purchases of equipment and supplies) and tax revenues. Given the high unemployment in the Y-K region, beneficial employment effects would be particularly important within that region. Under agreements with the landowners, Calista and TKC, Donlin Gold has a hiring preference for shareholders and descendants and residents of local communities. Many workers with the skills needed for Project construction are available within the region, and an estimated 1,600 to 1,900 from Y-K communities would be employed during this phase (14 to 17 percent of 2015 Y-K region employment). During Operations, an estimated 500 to 600 regional residents would be employed (4 to 5 percent of 2015 Y-K employment). Employment income could help to offset the current trend of decreasing income from fishing. Additionally, for each year the Project is operational, an estimated 650 jobs and $40 million in wages would be generated statewide through multiplier effects, while sales within the State would increase by $150 million per year. As landowners at the Mine Site, Calista and TKC would receive substantial income through lease, surface use agreement, and royalty payments. For the Pipeline, landowners will receive ROW lease payments, while State and local governments would receive tax revenue. ANCSA corporations (Calista, TKC, and CIRI) would directly benefit from lease payments and ROW

payments, and all ANCSA corporations would benefit due to revenue sharing. Commercial fishing is also important to the economy of several local communities. If the project had impacts to fish, commercial fishing would also be impacted, but determining the extent of those impacts is difficult and would depend on potential impacts to the fisheries (see also Section B3.4).

Overall, the duration of socioeconomic impacts during the Construction Phase would be temporary, lasting the 4 years in which Project construction occurs. For impacts due to mine operations, the duration would extend through the 27-year estimated life of the mine. Impacts during the Closure Phase would return to pre-activity levels when actions causing impacts cease, because seasonal workers would be employed only for monitoring and operations of the water treatment plant, which is planned to function in perpetuity from the time when the pit lake fills (estimated at 50 years after Closure). However, while employment opportunities would significantly decrease at the Donlin Gold site after Closure, the ability to use the skills developed at the Donlin Gold site would persist, and could result in continued employment at another location.

It is assumed that appropriate economic evaluations have been completed by the Applicant, the proposal is economically viable, and is needed in the market place (33 CFR 320.4(q)).

The Corps has determined that the proposed Project would have moderate, long-term beneficial effects on economics in the Yukon Kuskokwim Region, and it is not contrary to the public interest.

B3.20 CONSERVATION (33 CFR 320.4[M])

References: Final EIS Chapter 1, Final EIS Chapter 3

Federal laws, executive orders, and agency regulations and policy guidance frequently address the need for conservation of natural resources. The Corps Regulatory Program, by authority, is focused on conservation of WOUS, including wetlands. The proposed action would include impacts to waters and wetlands, fish and wildlife, vegetation, soils, air, land, minerals, and subsistence plants and animals. As described throughout the other subsections in Section B3, this evaluation discloses that conservation of natural resources would be accomplished by the proposed action, aside from extracted gold ore.

The Corps has determined that the proposed Project would have no adverse effects on Conservation and would not be contrary to the Public Interest.

B3.21 GENERAL ENVIRONMENTAL CONCERNS (33 CFR 320.4[A])

References: Final EIS Section 3.9 (Noise), Final EIS Section 3.24 (Spills), Final EIS Section 3.26 (Climate Change).

General environmental concerns include noise, spill risk, and climate change, which were identified in the Final EIS as matters of general environmental concern, and which are not included in the standard public interest topics.

Equipment operation for drilling, construction, and production, as well as vessels and aircraft used for transportation, would contribute to increased levels of noise in the Project area. Noise levels are expected to be consistent with other mine 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 local communities. Overall impacts to noise are anticipated to be minor.

Risks are associated with potential spills of five substances proposed for use in the Donlin Gold Project: ultra-low sulfur diesel fuel (diesel) transported in barges, trucks, and pipelines, and stored in tanks; liquefied natural gas (LNG) releases; mercury or cyanide release to the environment during transport; and tailings behind the tailings dam. The substances would be regulated by a variety of federal, state, and international standards. The impacts described are not part of the Project design, but represent upset or system failure.

The relatively small amount of greenhouse gases (GHGs) exhausted from construction, drilling, and operation of the proposed action would not have a measurable effect to climate change. At this time, the long-term effects of climate change in the Project area are unknown. The adverse impacts caused by the Project construction and operation due to GHGs are expected to be negligible.

Overall, the Corps finds that the Project would have moderate adverse effects on environmental concerns and it is not be contrary to the public interest.

B3.22 MITIGATION (33 CFR 320.4 [R])

Mitigation is discussed in Subpart H (Attachment B2.7) and in Section 6.0 of the JROD.

ATTACHMENT B4 COMPLIANCE WITH ENVIRONMENTAL REQUIREMENTS (33 CFR 330.3 RELATED LAWS)

B4.1 CLEAN WATER ACT (33 USC SECTION 1341) SECTION 401 CERTIFICATE OF REASONABLE ASSURANCE (33 CFR 320.4[D])

The ADEC issued a conditioned 401 Water Quality Certification for the placement of the fill material for the Applicant's proposed Project described in our Public Notice (see Attachment B6 - State of Alaska Certificate of Reasonable Assurance for the Donlin Gold Project).

B4.2 COASTAL ZONE MANAGEMENT CONSISTENCY DETERMINATION (33 CFR 320.4[H])

By operation of Alaska State law, the federally approved Alaska Coastal Management Program expired on July 1, 2011, resulting in a withdrawal from participation in the Coastal Zone Management Act's (CZMA) National Coastal Management Program. The CZMA federal consistency provision, section 307, no longer applies in Alaska. Federal Register Notice published July 7, 2011, Volume 76, No. 130, page 39857.

B4.3 ENDANGERED SPECIES ACT OF 1973 (16 USC 1531)

References: Final EIS, Section 3.14 (Threatened and Endangered Species)

Impacts to endangered species and the outcome of consultation with the USFWS and NMFS are discussed under Subpart D (Attachment B2.1, Section B2.3.1).

Coordination under Endangered Species Act (ESA) with the USFWS and NMFS has been completed. Letters of Concurrence (LOCs) agreeing with the Corps' determination that the action "may affect, but is not likely to adversely affect listed species or their critical habitat" were provided by the USFWS and NMFS. The Applicant would be obligated to incorporate the mitigation measures described in the LOCs into the Project operations. The Corps would incorporate the NMFS and USFWS LOCs as a special condition of any permit we may authorize (see Section 6.2.7 of the JROD). ESA compliance has been met.

B4.4 FISH AND WILDLIFE COORDINATION ACT (16 USC 661)

Coordination with the USFWS, NMFS, and ADF&G, and completion of the process and analyses contained within the JROD and signature by the authorizing official completes the Corps' Fish and Wildlife Coordination Act responsibilities.

B4.5 MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

Consultation under the Magnuson-Stevens Fishery Conservation and Management Act with the NMFS has been completed and is summarized in Section B2.3.4. Signature of this JROD by the authorizing official completes the Corps' responsibilities under this act.

B4.6 NATIONAL ENVIRONMENTAL POLICY ACT OF 1969 (42 USC 4321 – 4347)

Signature of this JROD by the authorizing official completes the Corps NEPA requirements and responsibilities.

B4.7 NATIONAL HISTORIC PRESERVATION ACT OF 1966 (16 USC 470 ET SEQ.)

Completion of consultation with the Alaska Office of History and Archaeology and signature of the Programmatic Agreement completes the Corps' NHPA requirements.

B4.8 CLEAN WATER ACT (33 USC 1251 ET SEQ. 404[B][1] GUIDELINES 40 CFR 230 SUBPART B)

Completion of the process and analysis contained within the JROD (Attachment B2) completes the Corps 404(b)(1) requirements.

B4.9 CLEAN WATER ACT (33 USC 1251 ET SEQ.) SECTION 404 (33 USC 1344)

Completion of the process and analysis contained within the JROD and signature by the authorizing official completes the Corps CWA 404 requirements.

B4.10 RIVERS AND HARBORS APPROPRIATION ACT OF 1899 (33 USC 401, 403, 407)

Completion of the process and analysis contained within the JROD and signature by the authorizing official completes the Corps RHA requirements.

B4.11 MARINE MAMMAL PROTECTION ACT OF 1972 (16 USC 1361 ET SEQ., 1401-1407, 1538, 4107)

The Proposed Action does not involve the transport of dredged material for disposal or any construction in marine waters. Under ESA coordination, the Corps, USFWS, and NMFS evaluated impacts from barging on listed marine mammals and their critical habitat. See Section B4.3 above. This consultation also satisfies the requirements of the Marine Mammal Protection Act of 1972.

B4.12 EXECUTIVE ORDER 13175 CONSULTATION AND COORDINATION WITH INDIAN TRIBAL GOVERNMENTS

This EO was designed to establish regular and meaningful consultation and collaboration with tribal officials in the development of federal policies that have tribal implications and to strengthen the U.S. government-to-government relationships with Indian tribes.

The Corps identified 66 federally recognized tribes potentially affected by the Project (see Final EIS Section 6.2 and Appendix P). On September 24, 2012 the Corps sent a letter of notification and inquiry to the 66 tribes offering the opportunity to participate in formal government-to-government consultation, to participate as a cooperating agency, or to simply receive information about the Project. The letters also included a Tribal Coordination Plan for the development of the EIS. The Corps requested information from the tribes on the following

topics: subsistence, archaeological sites, and traditional cultural properties as well as special expertise regarding any environmental, social and/or economic impacts. Six tribes elected to serve as cooperating agencies during development of the EIS (see Section 1.1 of the JROD for a complete list of cooperating agencies). Discussions with potentially affected tribal governments continued throughout the course of the Project. A summary of consultation efforts by the Corps is included in the Final EIS Section 6.2 (Tribal Coordination and Government-to Government Consultation).

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

B4.13 CLEAN AIR ACT (42 USC 7401 – 7671 SECTION 176[C])

The ADEC has issued an air quality control permit that serve as a framework for the operation of the Mine Site. The Corps of Engineers finds the issuance of the permit by ADEC is conclusive with regards to air quality issues. Completion of the process and analysis contained within this JROD and signature by the authorizing official completes the Corps Clean Air Act requirements.

B4.14 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."

Most communities in the Project area are low-income and minority communities, as defined under the Council on Environmental Quality (CEQ) guidelines (see Final EIS Figure 3.18-1). This includes the Yukon-Kuskokwim (Y-K) region and the Native Village of Tyonek. Communication and outreach with these communities occurred throughout the scoping process, the public meetings on the Draft EIS, and in government-to-government consultation with Tribes. Final EIS Sections 6.2 and 6.3 of Chapter 6, Consultation and Coordination, discuss these outreach and consultation efforts. This outreach effort identified many concerns, which are catalogued in the Scoping Report and the Comment Analysis Report. Many of the issues selected for further analysis in Chapter 6, Consultation and Coordination, reflect concerns raised by communities included in the environmental justice analysis.

As discussed in the Final EIS Section 3.19 (Environmental Justice), the proposed Project would result in a variety of direct and indirect impacts to socioeconomics, subsistence, and human health as they relate to environmental justice. Table 3.19-7 in the Final EIS provides a summary of impacts. These impacts are also addressed Attachment B3 (Sections B3.19 [economics] and B3.2 [food and fiber production]) above.

The proposed Project would provide employment and income to the Y-K region, an area with notably low per capita incomes, high unemployment, and high poverty rates. In terms of intensity, employment impacts in the Y-K region during Construction would be beneficial and result in changes to socioeconomic indicators that are well outside normal variation and trends or greater than a 10 percent increase. During Operations, the beneficial increase in employment would be from 4 to 5 percent. Payments to ANCSA landowners would be outside of normal

variation and trends, exceeding a 10 percent increase, while tax revenues would represent large sums of income to borough and state governments.

Adverse impacts to subsistence would include disruption to subsistence resources and displacement of access to subsistence use areas of different communities depending on the project component. The duration of socioeconomic impacts would be for the Construction and Operations Phase. However, while employment opportunities would significantly decrease at the Donlin Gold Mine after Closure, the ability to use the skills developed at Donlin Gold would persist and could result in continued employment at another location. For subsistence effects, most impacts would occur for the duration of the Construction and Operations phases. However, for the pipeline component, the disturbance to subsistence resources and displacement of subsistence access would be greater during the Construction phase, and would decrease considerably during Operations when the pipeline would be buried in nearly all of its length, with limited monitoring activity and brushing of the corridor every ten years.

An increase in employment and incomes could support subsistence activities, improve food security, and contribute to improving health. Adverse human health impacts could include increases in substance abuse, potential accidents and injuries, exposure to hazardous constituents, and infectious diseases. Balancing the beneficial and potential adverse impacts of the proposed Project on minority and low-income populations, it is not expected to raise an environmental justice concern. Donlin Gold will implement a communication program to keep local communities informed of the barge schedules and current status of barge traffic as well as minimize displacement of subsistence fishing by barges (see Final EIS Section 3.19.3.2.6 and Appendix W, for Donlin Gold's Barge Communication Plan). Donlin Gold has also committed to two subcommittees, the Barge Subcommittee and the Subsistence Subcommittee, managed under the purview of the DATROC.

In accordance with Title 111 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 JROD and signature by the authorizing official completes the Corps Executive Order 12898 requirements.

B4.15 EXECUTIVE ORDER 11988 (FLOOD PLAIN MANAGEMENT)

See Attachment B3, Section B3.13. The Proposed Action would not be constructed in designated floodplains and would not create flood hazards in floodplains. Completion of the process and analysis contained within this JROD and signature by the authorizing official completes the Corps Executive Order 11988 requirements.

B4.16 EXECUTIVE ORDER 13112, INVASIVE SPECIES

Through the Applicant's compensatory mitigation plan, required as a special condition (see 6.3.7 in the JROD), the Permittee will be required to control the introduction and spread of exotic species.

B4.17 EXECUTIVE ORDERS 13212 AND 13302, ENERGY SUPPLY AND AVAILABILITY

The Project was not one that will increase the production, transmission, or conservation of energy, or strengthen Pipeline safety.

B4.18 OTHER FEDERAL, STATE AND/OR LOCAL AUTHORIZATIONS (IF ISSUED)

ADEC – Alaska Pollutant Discharge Elimination System Permits (AK0055867)

Date Issued: 5/24/2018

Conditions for issuance: ☒ Yes ☐ No

ADEC – Air Quality Control Construction Permit (AQ0934CPT01)

Date Issued: 6/30/2017

Conditions for issuance: ☒ Yes ☐ No

ADEC – Certificate of Reasonable Assurance (POA-1995-120)

Date Issued: 8/10/2018

Conditions for issuance: ☒ Yes ☐ No

U.S. Department of Transportation – Special Permit (PHMSA-2016-0149)

Date Issued: 6/5/2018

Conditions for issuance: ☒ Yes ☐ No

B4.19 SIGNIFICANT NATIONAL ISSUES (33 CFR 325.2[A][6])

The regulations state that if a district engineer makes a decision on a permit application that is contrary to State or local decisions, the district engineer will include in the decision document the significant national issues, and explain how they are overriding in importance.

This decision document and final decision are not contrary to State or local decisions, and there are no significant issues of overriding national importance.

ATTACHMENT B5 APPLICANT'S COMPENSATORY MITIGATION PLAN

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ATTACHMENT B6 STATE OF ALASKA CERTIFICATE OF REASONABLE ASSURANCE FOR THE DONLIN GOLD PROJECT

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ATTACHMENT C BLM'S SUPPORTING ANALYSIS AND DOCUMENTATION

Attachment C includes the following section:

- Attachment C1 – BLM Selected Mitigation from Chapter 5 of the Final EIS
- Attachment C2 – ANILCA Section 810 Summary

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ATTACHMENT C1 BLM SELECTED MITIGATION FROM CHAPTER 5 OF THE FINAL EIS

As required by the Corps, any impacted WOUS on BLM-managed lands in the ROW corridor is factored into the overall CMP. The ROW development involves impacts to wetlands. The Corps' special conditions listed in Section 6.2.8 of the JROD include mitigation to off-set unavoidable impacts to WOUS. BLM is not requiring any compensatory mitigation from Donlin Gold LLC.

In addition to the Design Features described in the Final EIS Chapter 5, Table 5.2-1, Best Management Practices and Permit Requirements described in Section 5.3, the BLM has selected mitigating measures from the Final EIS Chapter 5 to avoid, minimize, or reduce impacts identified in the environmental analysis. These selected mitigations from Final EIS Chapter 5, Tables 5.5 and 5.7, will apply only to lands under BLM jurisdiction and authority (BLM-managed lands). While some of these mitigating measures provide general guidance and expectations for the Donlin Gold Project as a whole, they will be further defined and clarified in the ROW Grant offer to Donlin Gold as they apply specifically to BLM-managed lands. The ROW Grant stipulations are additional terms and conditions that must be complied with for all activities involved with the natural gas pipeline and associated fiber optic cable construction, operation, maintenance, and termination on BLM-managed lands, within the parameters of the Final EIS.[3]

Table C1: BLM Selected Mitigation Measures from Final EIS Chapter 5

1	Train site construction managers to oversee work of specialists in wetland recognition, permit stipulations, and BMPs.
2	Prior to pipeline construction, the specific location of potentially contaminated soils should be mapped compared to final grading plans at the Farewell airstrip (all action alternatives), North Foreland barge landing, Tyonek-Beluga pipeline trench segment, and Puntilla airstrip (Alternative 3B). Disturbance of these soils can then be avoided if possible, and the impacts reduced. Clear documentation of the current, contaminated sites would also reduce liability for the developer.
3	Develop Plans and Procedures for notification, documentation, sampling, and curation in the event that scientifically important paleontological resources (e. g., dinosaur fossils) are found during ground disturbing activities.
4	Schedule Pipeline component Closure Phase activities to occur during the winter season (similar to how Construction Phase activities are scheduled) to minimize surface disturbances to soil and erosion potential.
5	Where practicable, leave riparian bank vegetation material intact or, where needed and practicable, store for replacement on the disturbed banks to stabilize and restore the crossing. Monitoring of crossing sites to identify sites that need additional restoration to prevent bank erosion should be implemented after construction. At stream bank crossings, placement of riparian mats or root masses would be placed to facilitate rapid vegetation regrowth to prevent bank erosion.
6	Mark wetland boundaries and vegetation clearing limits with flagging or other markers to prevent crews from damaging more vegetation than needed during construction.

[3] Some mitigating measures from the Final EIS Chapter 5 were assessed by the Corps as "Not Likely to be Required" based on likelihood of implementation, effectiveness, and reasonable/practicable. Despite this assessment, BLM feels many are effective, reasonable and practicable, and has selected many of the mitigating measures for inclusion in the JROD as they will apply to BLM-managed land. These mitigating measures will be further defined and clarified in ROW Grant stipulations.

Table C1: BLM Selected Mitigation Measures from Final EIS Chapter 5

7	Where practicable, for winter pipeline construction access roads, frost pack muskegs and wetlands (the combination of covering with snow and driving on it causes freezing at depth and provides a slightly elevated running surface) to minimize impacts to vegetative ground cover and wetlands.
8	Where practicable, promote salvaging and re-spreading topsoil over the overburden piles and allowing native vegetation and native seed planting vegetation growth to keep topsoil viable until it is needed during final reclamation. In pipeline reclamation practices, segregate windrowed organic soils as cover material (where present).
9	Install signs that clearly distinguish trails from the pipeline ROW at points where the pipeline crosses trails to guide trail users to stay on the trail and off of the pipeline ROW where the two are not collocated. As practicable, revegetate, or otherwise block access to, a narrow strip of the pipeline ROW where it crosses the trail to help steer and keep trail users on the trail and reduce the visual effect of the pipeline ROW crossing.
10	Where practicable, when clearing brush and shrubs as required to maintain the operations ROW, introduce variation in the edges of clearing (i.e., avoid extended straight lines) to minimize effects to visual resources.
11	Include measures to mitigate visual impacts to known sensitive cultural resource areas, such as clearing a narrower construction ROW, using HDD drilling under a sensitive site, minor realignment of the construction ROW, or other appropriate measures to avoid known sensitive areas.
12	Apply measures to reduce substantial grading of hillsides for the pipeline ROW, on a site-specific basis.
13	Apply measures to reduce the initial clearing requirements for the ROW, on a site -specific basis. Avoid vegetation clearing during the bird nesting season.
14	Evaluate use of slope breakers and trench breakers at wetlands boundaries to prevent trenches from draining wetlands.
15	During final design locate any potential vegetation buffers to reduce visual impacts.
16	To the extent practicable, avoid wetlands in the positioning of temporary construction facilities, including camps.
17	Where appropriate, employ seasonal timing restrictions on blasting, as stipulated by resource agencies, to reduce noise related effects of blasting during sensitive subsistence hunting activities (e.g., fall moose hunting).
18	Develop a sampling and analysis plan to ensure PAG rock and other sources of contaminants are not used for construction at the mine or for road surfacing (i.e., where such construction could lead to surface water quality impacts).
19	Frost pack the pipeline trench cover in bogs and fens, cut the trench cover in blocks, set the blocks aside during construction and replace them over the trench fill afterwards.
20	Segregate wetlands soil for use in wetland mitigation to the maximum amount practicable.
21	During construction of the pipeline, avoid wetlands impacts by placing above ground appurtenances away from floating bogs and fens.
22	Restore flat-to-gently sloping wetlands by removal of fill at Project closure where practicable. Removed fill would be transported to approved upland areas for disposition.
23	Restore riparian areas at stream crossings along the pipeline.

Table C1: BLM Selected Mitigation Measures from Final EIS Chapter 5

24	Specific plans for borrow site reclamation would be completed in a later phase of the Project. In addition to standard BMPs for contouring, drainage, and erosion controls (Section 3.2, Soils), reclamation should create ponds and/or stream connections for fish and wildlife habitat at borrow sites in low lying areas (e.g., at Getmuna Creek) in accordance with ADEC and ADF&G guidance (McClean 1993; Shannon & Wilson 2012; Owl Ridge 2017c).
25	Include additional erosion and sediment control measures such as settling ponds, silt fences, or sediment barriers to minimize the amount of sedimentation from snowmelt.
26	Where needed and practicable, use mats or other appropriate types of ground protection to minimize disturbance to ground vegetative cover during non-winter construction.
27	Where practicable, salvage and replace the native vegetation mat in wetlands, and/or re-establish wetland vegetation that is typical of the general area.
28	Where practicable and in compliance with FAA and safety requirements, establish appropriate minimum flight altitudes to minimize impacts to wildlife when animals are present in the vicinity of the work (both >1,000 feet and > 1,500 have been specified for other projects in Alaska).
29	Review the success and practicability of measures that were taken to prevent or minimize adverse effects on visual resources on other linear projects, including the Trans-Alaska Pipeline System (TAPS), the Dalton Highway, the Elliott and Parks Highways, and the Anchorage-to-Fairbanks Intertie, and incorporate successful measures into the design and location of the pipeline where reasonable and appropriate.
30	Work with communities to make equipment and parts available at Closure, and remaining material should be shipped off site for recycling or disposal.
31	Agencies should coordinate to refine clearing practices that both meet PHMSA regulations and protect ecological values.
32	Develop a Fugitive Dust Control Plan for the Pipeline component.
33	Reduce the total number of material sites by increasing their size and maximizing haul distance between them.
34	Use raincoatings to cover stockpiles or other areas expected to produce runoff to reduce potential seepage of contaminants.
35	Establish scientifically based thresholds or quantitative indicators for construction operations (e.g., number of days below freezing, depth of ground frost penetration, minimum thickness of surface water freeze-up) to promote accomplishment of minimum impact winter construction techniques, above which construction activities would be postponed until these conditions are met. Such practices have already been established and successfully implemented in cases such as the permitting and development of ice roads on the North Slope of Alaska where these practices have been assessed to be feasible and practicable.
36	Place valve stations to avoid visual impacts to local businesses, the INHT, hunting/guiding camps and cabins, as necessary on a site-specific basis.
37	Construct temporary access roads using geotextile, “Chip Seal,” “High Float,” paving, or similar design feature and controls to reduce erosion, sedimentation and dust impacts.
38	Inert solid wastes that are proposed to be permanently disposed of onsite after the Project is completed should be transported offsite to a licensed landfill facility, if feasible.
39	Apply restoration practices to vegetation in wetland areas in trenches along the pipeline route to prevent permanent water filled trenches with no vegetative cover as seen at the Beluga to Anchorage Pipeline.

Table C1: BLM Selected Mitigation Measures from Final EIS Chapter 5

40	Apply measures to further restrict public access to the ROW to reduce indirect effects, such as closing the pipeline ROW to Off Highway Vehicle (OHV) and snowmachine use, where appropriate based on landowner approval.
41	Add training for staff or construction managers in identification of NNIS for the full Project area (especially along the pipeline route, all Project and local roads, and the mine area.)

ATTACHMENT C2 ANILCA SECTION 810 SUMMARY

The Alaska National Interest Lands Conservation Act (ANILCA) Section 810(a) requires that an evaluation of subsistence uses and needs should be completed for any federal determination to "withdraw, reserve, lease, or otherwise permit the use, occupancy or disposition of public lands." As such, an evaluation of potential impacts to subsistence under ANILCA Section 810(a) must be completed for the Final EIS because the project requires a BLM ROW grant for the natural gas pipeline's proposed crossing of federally managed lands. BLM conducted the required ANILCA Section 810 analysis for the Final EIS. ANILCA requires that this evaluation include findings on three specific issues:

1) The effect of use, occupancy, or disposition on subsistence uses and needs;
2) The availability of other lands for the purposes sought to be achieved; and,
3) Other alternatives that would reduce or eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes (16 USC Section 3120(a)).

C2.1 NOTICE AND HEARINGS

A finding that the proposed action may significantly restrict subsistence uses imposes additional requirements, including provisions for notices to the State of Alaska and appropriate regional and local subsistence committees, as well as a hearing in the vicinity of the area involved.

ANILCA Section 810(a) provides that no "withdrawal, reservation, lease, permit, or other use, occupancy or disposition of the public lands which would significantly restrict subsistence uses shall be effected" until the federal agency gives the required notice and holds a hearing in accordance with ANILCA Section 810(a)(1) and (2), and makes the three determinations required by ANILCA Section 810(a)(3)(A), (B), and (C). The three determinations that must be made are: 1) That such a significant restriction of subsistence use is necessary, consistent with sound management principles for the utilization of the public lands; 2) That the proposed activity will involve the minimal amount of public lands necessary to accomplish the purposes of such use, occupancy, or other such disposition; and 3) That reasonable steps will be taken to minimize adverse impacts to subsistence uses and resources resulting from such actions [16 USC Section 3120(a)(3)(A), (B), and (C)].

Through feedback provided during the scoping meetings, the BLM, as part of the Draft EIS, made a preliminary determination that Alternatives 2, 3A, 3B, 4, 5A and 6A may significantly restrict subsistence uses for the communities of Tyonek, Skwentna, McGrath, Nikolai and Takotna, Bethel, Tuntutuliak, Napakiak, Napaskiak, Oscarville, Kwethluk, Akiachak, Akiak, Tuluksak, Upper and Lower Kalskag, Aniak, Chuathbaluk, Napaimute Red Devil, Sleetmute, Stony River, and Crooked Creek.

The BLM also made a preliminary determination that the cumulative case may significantly restrict subsistence uses for the communities of Bethel, Tuntutuliak, Napakiak, Napaskiak, Oscarville, Kwethluk, Akiachak, Akiak, Tuluksak, Upper and Lower Kalskag, Aniak, Chuathbaluk, Napaimute and Crooked Creek.

Therefore, the BLM undertook the notice and hearing procedures required by ANILCA Section 810 (a)(1) and (2) in conjunction with release of the Donlin Gold Project Draft EIS in order to

solicit public comment from the potentially affected communities of Aniak, Crooked Creek, Bethel, Quinhagak, Akiak, Nunapitchuk, Tyonek, McGrath, Lower Kalskag, Holy Cross, and Chuathbaluk, as well as from all subsistence users. A public meeting and 810 hearing was also held in Anchorage. The following discussion summarizes the ANILCA Section 810 evaluation for the decision to select Alternative 2 North Option in this JROD. The summary is based on the detailed ANILCA Section 810 analysis in Appendix N of the Donlin Gold Project Final EIS.

C2.2 ALTERNATIVE 2 NORTH OPTION – SUMMARY OF FINDINGS

The positive finding for Alternative 2 North Option of a significant restriction to subsistence for the communities of Bethel, Tuntutuliak Napakiak, Napaskiak, Oscarville, Kwethluk, Akiachak, Akiak, Tuluksak, Upper and Lower Kalskag, Aniak, Chuathbaluk, Napaimute, and Crooked Creek would be due to a substantial reduction in the opportunity to continue uses of subsistence resources on the Kuskokwim River. Barging on the Kuskokwim River during construction and operation of the mine may cause extensive interference with access to the Kuskokwim River by subsistence users from villages along the river. It may cause a major redistribution of salmon, rainbow smelt, and whitefish, which are important subsistence resources for those villages.

The positive finding for Alternative 2 North Option of a significant restriction to subsistence use for the communities of McGrath, Takotna and Nikolai would be due to a substantial increase in competition for subsistence resources along the natural gas pipeline at the Farewell Airstrip. Increased activity and access at the Farewell Airstrip and along the nearby gas pipeline right-of way may cause major increases in the disturbance and use of moose, caribou, black bear and furbearer subsistence resources by recreational sport hunters and commercial outfitters. These are important subsistence resources for the villages of McGrath, Takotna, and Nikolai.

C2.3 CUMULATIVE CASE - FINDINGS

With the implementation of Alternative 2 North Option, there would be direct and indirect impacts to subsistence practices and a contribution to cumulative effects on subsistence resources and practices. Overall, the impact on subsistence resources from the proposed project and past, present, and reasonably foreseeable future actions could result in some harvest decrease and slightly increase competition for resources, although there would be minimal impact to access.

The cumulative case for the proposed Donlin Gold Project may result in significant restriction to subsistence uses for the communities of Bethel, Tuntutuliak, Napakiak, Napaskiak, Oscarville, Kwethluk, Akiachak, Akiak, Tuluksak, Upper and Lower Kalskag, Aniak, Chuathbaluk, Napaimute, and Crooked Creek on the Kuskokwim River due to large reductions in the abundance of Chinook salmon and a major redistribution of salmon resources on the Kuskokwim River.

C2.4 SIGNIFICANT RESTRICTION OF SUBSISTENCE USE IS NECESSARY, CONSISTENT WITH SOUND MANAGEMENT PRINCIPLES FOR THE UTILIZATION OF PUBLIC LANDS

The BLM authorizes ROWs to fulfill its responsibilities under the authority of Section 28 of the Mineral Leasing Act of 1920, as amended. Donlin Gold filed a ROW application with the BLM

for the proposed project across federal lands. The BLM is responsible for providing a ROW across federal lands for the proposed natural gas pipeline, while providing protections for specific habitat, resources and uses. Therefore, the BLM finds that issuance of a ROW for this action would be necessary and consistent with sound principles for the utilization of public lands. Authorization of this project by BLM is also necessary to effectuate the purposes of ANCSA (i.e., to allow the Native Corporations a reasonable opportunity to economically develop their lands).

C2.5 THE PROPOSED ACTIVITY WILL INVOLVE THE MINIMUM AMOUNT OF PUBLIC LANDS NECESSARY TO ACCOMPLISH THE PURPOSES OF SUCH USE, OCCUPANCY OR OTHER DISPOSITION

The BLM has determined that Alternative 2 North Option involves the minimum amount of public lands necessary to accomplish the purpose of the proposed activity, which is to grant a ROW for a natural gas pipeline for the project. The pipeline would be necessary to supply energy to operate the proposed Donlin Gold Mine. An alternative that varied the pipeline route (Dalzell Gorge route, Alternative 6A), and the no action alternative were also analyzed. All other action alternatives (3A-LNG trucks, 3B-Diesel pipeline, 4-Birch Tree Crossing Port, 5A-Dry Stacking of Tailings) would not change the proposed pipeline route, nor the need for a ROW across federal public lands.

Alternatives that would reduce or eliminate the use of public lands needed for subsistence purposes include Alternative 1 (No Action). Section 2.4 in the Final EIS, Alternatives Considered but Eliminated from Detailed Analysis, discusses other alternatives that were considered that involve less federal public lands, but were eliminated from analysis due to economic or technological disadvantages, lack of feasibility, or because they did not meet the purpose of the proposed action to produce the gold resource discovered on Calista and TKC lands at the Donlin Gold site.

C2.6 REASONABLE STEPS WILL BE TAKEN TO MINIMIZE ADVERSE IMPACTS UPON SUBSISTENCE USES AND RESOURCES RESULTING FROM SUCH ACTIONS

The design features, best management practices, agency mitigation, monitoring, and adaptive management opportunities are discussed in Chapter 5 of the Final EIS. These proposed measures are designed to protect various subsistence resources and their habitat and to reduce negative impacts from the proposed Donlin Gold mine.

Attachment B to this JROD, Corps' Supporting Analysis and Documentation, describes in detail the mitigating measures Donlin Gold will undertake to avoid, minimize, and mitigate impacts to subsistence. Donlin Gold has committed to certain mitigation measures they intend to undertake even though language within the Final EIS and Appendix N (ANILCA 810 analysis) of the Final EIS indicates that they are merely being "considered" or "may" happen. The language in Attachment B provides clarification for those measures that Donlin Gold will implement despite the Final EIS listing them as not "effective" and/or not "reasonable/practicable."

Table C2 lists the mitigation measures referenced in Chapter 5 of the Final EIS that Donlin Gold has committed to, to avoid and minimize impacts to subsistence.

Table C2: Donlin Gold Mitigation Measures Relevant to Subsistence Uses and Resources

Number	Mitigation Measure	References	Clarification
1	Agreements with Alaska Native landowners create contractual commitments to shareholder hire and revenue flows for Alaska Native shareholders.	1) Final EIS Table 5.2-1: Design Features (A-3)	Comments from the public during scoping and Draft EIS indicate that employment income is important to support subsistence activities.
2	The project design includes consultation with the public and tourism and recreation businesses to minimize impacts to current uses and operations	1) Final EIS Table 5.2-1: Design Features (A-7)	Current uses include subsistence activities.
3	Where practicable, construction and maintenance schedules would seek to minimize impacts on subsistence hunting and fishing, with the understanding that some construction activities must also take advantage of seasonal and environmental conditions.	1) Final EIS Appx. N (ANILCA 810) 2) Final EIS Table 5.2-1: Design Features (A-12)	
4	Donlin Gold would implement a “no hunting/fishing policy” for employees at work sites to minimize competition from employees for local resources.	1) Final Appx. N (ANILCA 810) 2) Final EIS Table 5.2-1: Design Features (A-13)	
5	The project design includes the development and implementation of a Construction Communications Plan to inform the public and commercial operators of construction activities.	1) Final EIS Appx. N (ANILCA 810) 2) Final EIS Table 5.2-1: Design Features (A-14)	
6	Shareholder preference in hiring maximizes economic benefit to local communities (minority and low income); along with enclave work place, this minimizes risk of influx of non-local workers into nearby communities.	1) Final EIS Table 5.2-1: Design Features (A-18)	Reducing the potential for influx of non-local workers into local communities also reduces the potential for an influx of non-local subsistence users.
7	The project design includes shift work schedules to maximize opportunities for employees to remain active in subsistence harvest efforts during Construction and Operations Phases.	1) Final EIS Appx. N (ANILCA 810) 2) Final EIS Table 5.2-1: Design Features (A-19)	
8	Surfaces would be progressively reclaimed throughout operation. Sediment controls would include site grading and capping of erodible material, revegetation, and re-routing of surface runoff to reestablish natural conditions.	1) Final EIS Appx. N (ANILCA 810) 2) Final EIS Table 5.2-1: Design Features (A-23)	
9	Donlin Gold’s surface use agreements with Calista and TKC include the DATROC, which is active and meets quarterly. Appropriate project communications would be managed under the purview of the DATROC, ultimately in the form of advisory subcommittees. Donlin Gold has committed to two subcommittees, the Barge Subcommittee and	1) Final EIS Table 5.2-1: Design Features (A-31)	Donlin Gold has initiated planning with the DATROC partners (TKC and Calista) to establish the format, structure, membership and process to be followed by the barge and subsistence subcommittees.

Table C2: Donlin Gold Mitigation Measures Relevant to Subsistence Uses and Resources

Number	Mitigation Measure	References	Clarification
	Subsistence Subcommittee, which would act in parallel to engage and inform local communities. The primary function of these committees is to engage the local communities to identify locations and times when subsistence activities occur, and opportunities to avoid, eliminate, or reduce conflicts that serve to restrict access to subsistence resources during construction, operations and post-closure. The Subsistence Subcommittee would also contribute to the identification of practical and effective monitoring measures to address concerns of subsistence users that subsistence resources may be adversely affected by project-related activities and would support development of an information-sharing framework to efficiently and effectively share results of monitoring (and other project-related technical information), at a practical level, with local subsistence users. The long duration of the project, the wide range of resources involved, and the varied interests among participants may require that the form and function of the subcommittees and the processes they oversee, evolve with time. The subcommittees would be encouraged to work through the DATROC to identify and/or recommend adaptive management needs. (Donlin Gold 2018a).		
10	Numerous locations and combinations of locations were analyzed for TSF and WRF layouts during the alternatives development process. These are summarized in Appendix C. The layout of major mine facilities was designed to minimize wetland impacts and limit effects on water quality to the American and Anaconda Creek watersheds. The 404(b)(1) analysis will document the steps taken to minimize wetlands impacts.	1) Final EIS Appx. N (ANILCA 810) 2) Final EIS Table 5.2-1: Design Features (M-11)	
11	Water management planning at the mine site would assist in controlling the flow of groundwater at the pit and other major facilities (WRF, TSF), as well as controlling the potential effects of groundwater flow on water quality downgradient of the mine. This would be accomplished through design	1) Final EIS Appx. N (ANILCA 810) 2) Final EIS Table 5.2-1: Design Features (M-13)	

Table C2: Donlin Gold Mitigation Measures Relevant to Subsistence Uses and Resources

Number	Mitigation Measure	References	Clarification
	elements such as dewatering wells, collection of groundwater infiltration through and around the TSF at the SRS pond, and lake level maintenance following closure. A variety of groundwater monitoring activities would also be planned. M13 broadly covers design features of the water management plan, with details available in Chapter 2, Alternatives. Chapter 3 sections provide design and impact analysis pertaining to individual resources.		
12	During the Operations Phase, concurrent reclamation activities (e.g., certain tiers and areas within the WRF) would be conducted immediately after construction and stabilization and whenever practicable in disturbed areas no longer required for active mining.	1) Final EIS Appx. N (ANILCA 810) 2) Final EIS Table 5.2-1: Design Features (M-14)	
13	The mine plan incorporates the concept of design for closure. This incorporates methods for safe and efficient closure of the mine as an integral part of the planned mine design and operations. Implementing design for closure can have the effect of minimizing disturbance and the re-handling of materials.	1) Final EIS Appx. N (ANILCA 810) 2) Final EIS Table 5.2-1: Design Features (M-21)	
14	Ocean and river fuel barges would be double-hulled and have multiple isolated compartments for transporting fuel to reduce the risk of a spill.	1) Final EIS Appx. N (ANILCA 810) 2) Final EIS Table 5.2-1: Design Features (T-1)	
15	The barge operations system was designed to avoid the need for dredging the navigation channel in the river.	1) Final EIS Appx. N (ANILCA 810) 2) Final EIS Table 5.2-1: Design Features (T-3)	
16	Donlin Gold would implement barge guidelines for operating at certain river flow rates, and conduct ongoing surveys of the Kuskokwim River navigation channel to identify locations that should be avoided to minimize effects on bed scour and the potential for barge groundings. As part of the proposed operation, equipment will be available to free or unload/lighten barges in the event of groundings. The equipment will be available as part of ongoing operations; it will not all be dedicated standby equipment.	1) Final EIS Appx. N (ANILCA 810) 2) Final EIS Table 5.2-1: Design Features (T-6)	
17	To reduce impacts on existing river traffic and potential for groundings and accidents, Donlin Gold would	1) Final EIS Appx. N (ANILCA 810) 2) Final EIS Table 5.2-1:	

Table C2: Donlin Gold Mitigation Measures Relevant to Subsistence Uses and Resources

Number	Mitigation Measure	References	Clarification
	establish navigational aids and develop procedures for queuing in narrow channels. Donlin Gold vessels would use state-of-the-art navigation and communication equipment.	Design Features (T-10)	
18	River pilots would be used for all tug and barge traffic between the mouth of the Kuskokwim River and Bethel (see Appendix W for Donlin Gold's Barge Communication Plan).	1) Final EIS Appx. N (ANILCA 810) 2) Final EIS Table 5.2-1: Design Features (T-14)	
19	The project design includes a natural gas pipeline to decrease the amount of barging needed to transport diesel fuel. The design decision to use a natural gas pipeline instead of barging 110 Mgal of diesel per year was developed in response to community concern about barge traffic levels.	1) Final EIS Appx. N (ANILCA 810) 2) Final EIS Table 5.2-1: Design Features (P-3)	
20	Appropriate notices, warning signs, and flagging would be used to promote public safety. Barricades may also be used around dangerous areas such as open trenches during construction.	1) Final EIS Appx. N (ANILCA 810) 2) Final EIS Table 5.2-1: Design Features (P-7)	
21	The project design includes routing of the pipeline and siting of the related compressor station along an existing corridor in Susitna Flats State Game Refuge to minimize impacts.	1) Final EIS Appx. N (ANILCA 810) 2) Final EIS Table 5.2-1: Design Features (P-12)	
22	Donlin Gold will coordinate with and help educate people who want to travel in the area during the pipeline construction period through its Public Outreach Plan to either allow controlled access through or within construction zones or provide alternate access.	1) Final EIS Appx. N (ANILCA 810) 2) Final EIS Table 5.2-1: Design Features (P-16)	
23	At the TSF dry beach, the project design includes installing silt fences, removing snow from active placement areas only, and using polymer suppressant to minimize dust. In addition, an air blast evaporation system or sprinklers would be used to minimize fugitive dust emissions from TSF beaches during dry conditions.	1) Final EIS Appx. N (ANILCA 810) 2) Final EIS Table 5.2-1: Design Features (M-2)	
24	The project design includes a communication program to keep local communities informed of the schedules and current status of barge traffic, as well as to minimize displacement of subsistence fishing by barges (see Appendix W for Donlin Gold's Barge Communication Plan). Donlin Gold would consult with	1) Final EIS Appx. N (ANILCA 810) 2) Final EIS Table 5.2-1: Design Features (T-9)	Donlin Gold has initiated planning with the DATROC partners (TKC and Calista) to establish the format, structure, membership and process to be followed by the barge subcommittee. The subcommittee is both a communication link as well as a

Table C2: Donlin Gold Mitigation Measures Relevant to Subsistence Uses and Resources

Number	Mitigation Measure	References	Clarification
	people experienced with navigation on the Kuskokwim River to incorporate local knowledge as the company designs its barging operations and guidelines. In addition, as contained in the communication plan, potential conflict would be avoided through the following steps: • Community Meeting Plan – annual community meetings before and after every barge season to outline the needs and expectations going into a season and debrief how things went after each season; • Additional Barging Status updates – in-season communications via community meetings, newsletters, website, social media; • Barge Location Information System – system to view the current location and movement of project barges available to users of the river; • Stakeholder Communication with Barges – published VHF channels and vessel cellular phone numbers to contact the barges directly; and • Barge Communication with Stakeholders – deployment of pilot boat in congested and high use areas ahead of the barge arrival to coordinate safe passage of the barge. In the event of any barging-related conflict or concern, Donlin Gold is committed to resolving issues with stakeholders through an established conflict or concern resolution process (outlined in Section 6.0 of Donlin Gold's Barge Communication Plan).		key part of the dispute resolution process. The planning for the subcommittee's under DATROC is ongoing.
25	Implement a two-way communications strategy to keep local communities informed of the schedules and current status of barge traffic, and keep Donlin Gold informed of the location and timing of commercial and subsistence fishing activities. The communication plan should include Bethel, due to the volume of traffic moving through Bethel Port. (Donlin Gold's Barge	1) Final EIS Appx. N (ANILCA 810) 2) Final EIS Table 5.2-1: Design Features (T-9)	Donlin Gold has initiated planning with the DATROC partners (TKC and Calista) to establish the format, structure, membership and process to be followed by the barge subcommittee. The subcommittee is both a communication link as well as a key part of the dispute resolution process. The

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Number	Mitigation Measure	References	Clarification
	Communication Plan is available in Appendix W). In addition, the project design includes a communication program, managed under purview of the DATROC Barge Subcommittee (see Design Feature A31), to keep local communities informed of the schedules and current status of barge traffic as well as minimize displacement of subsistence fishing by barges (see Appendix W for Donlin Gold's Barge Communication Plan). Donlin Gold would consult with people experienced with navigation on Kuskokwim River to incorporate local knowledge as they are designing their barging operations and guidelines.		planning for the subcommittee's under DATROC is ongoing.
26	Designing and installing culverts and bridges on transportation routes for fish passage.	1) Final EIS Appx. N (ANILCA 810) 2) Final EIS 5.3.2 Best Management Practices	
27	Implementation of Stormwater Pollution Prevention Plans (SWPPPs) and/or Erosion and Sediment Control Plans (ESCPs), and use of industry standard Best Management Practices (BMPs) for sediment and erosion control.	1) Final EIS Appx. N (ANILCA 810) 2) Final EIS 5.3.2 Best Management Practices	
28	Development and maintenance of Oil Discharge Prevention and Contingency Plans, Spill Prevention, Control and Countermeasure Plans, and Facility Response Plans.	1) Final EIS Appx. N (ANILCA 810) 2) Final EIS 5.3.2 Best Management Practices	
29	Use of BMPs, such as watering and use of dust suppressants, to control fugitive dust.	1) Final EIS Appx. N (ANILCA 810) 2) Final EIS 5.3.2 Best Management Practices	
30	Compliance with ADNR Dam Safety requirements through certificates of approval to construct and operate dams to include preparation of Emergency Action Plans and completion of a FMEA.	1) Final EIS Appx. N (ANILCA 810) 2) Final EIS 5.3.2 Best Management Practices	
31	Appropriate bonding/financial assurance required by ADNR and BLM.	1) Final EIS Appx. N (ANILCA 810) 2) Final EIS 5.3.2 Best Management Practices	
32	Compliance with ADNR Temporary Water Use Authorization conditions for water withdrawal, such as screening requirements to avoid fish entrainment or injury, establishing water withdrawal rates and volumes,	1) Final EIS Appx. N (ANILCA 810) 2) Final EIS 5.3.2 Best Management Practices	

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Number	Mitigation Measure	References	Clarification
	and as appropriate timing of water withdrawal to avoid fish migration, spawning, and incubating eggs;		
33	Monitoring of water withdrawals to ensure permitted limits are not exceeded.	1) Final EIS Appx. N (ANILCA 810) 2) Final EIS 5.3.2 Best Management Practices	
34	Preparation of a Wildlife Avoidance and Human Encounter/Interaction Plan.	1) Final EIS Appx. N (ANILCA 810) 2) Final EIS 5.3.2 Best Management Practices	A Wildlife Avoidance and Human Encounter Interaction Plan is required as part of the construction planning documents prior to receiving a Notice to Proceed
35	Verification that project vessels are equipped with proper emergency towing equipment in accordance with 18 AAC 75.027(f).	1) Final EIS Appx. N (ANILCA 810) 2) Final EIS 5.3.2 Best Management Practices	
36	Development of Blasting Plans.	1) Final EIS Appx. N (ANILCA 810) 2) Final EIS 5.3.2 Best Management Practices	
37	Development of ISPMPs and application of industry-standard BMPs relating to NNIS prevention and management.	1) Final EIS Appx. N (ANILCA 810) 2) Final EIS 5.3.2 Best Management Practices	
38	Compliance with Section 106 Programmatic Agreement and Cultural Resources Management Plan, including adequate survey prior to ground-breaking activities and protocol for inadvertent discovery of cultural resources.	1) Final EIS Appx. N (ANILCA 810) 2) Final EIS 5.3.2 Best Management Practices	
39	Verifying pipeline integrity with visual and other non-destructive inspections of welds, hydrostatic testing, use of in-line inspection tools, and aerial inspections.	1) Final EIS Appx. N (ANILCA 810) 2) Final EIS 5.3.2 Best Management Practices	
40	Use of cathodic protection (specific method to be determined in final design) for corrosion protection of the steel pipeline.	1) Final EIS Appx. N (ANILCA 810) 2) Final EIS 5.3.2 Best Management Practices	
41	Preparation and implementation of a Stabilization, Rehabilitation, and Reclamation Plan. Preparation and implementation of a Reclamation and Closure Plan.	1) Final EIS Appx. N (ANILCA 810) 2) Final EIS 5.3.2 Best Management Practices	
42	Install signs that clearly distinguish trails from the pipeline Right of Way (ROW) at points where the pipeline crosses trails to guide trail users to stay on the trail and off the pipeline ROW where the two are not co-located. As practicable, revegetate, or otherwise block access to, a narrow strip of the pipeline ROW where it	1) Final EIS Appx. N (ANILCA 810) 2) Final EIS Table 5.5-1A: Mitigation Measures Being Considered	Donlin Gold will work will landowners to implement.

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Number	Mitigation Measure	References	Clarification
	crosses the trail to help steer and keep trail users on the trail, and to reduce the visual effect of the pipeline ROW crossing.		
43	Where appropriate, employ seasonal timing restrictions on blasting, as stipulated by resource agencies, to reduce noise related effects of blasting during sensitive subsistence hunting activities (e.g., fall moose hunting).	1) Final EIS Appx. N (ANILCA 810) 2) Final EIS Table 5.5-1A: Mitigation Measures Being Considered	Donlin Gold will work will BLM to implement.
44	Develop adaptive management plan(s) in conjunction with local communities. Involve residents when determining parameters and performance standards, as appropriate.	1) Final EIS Appx. N (ANILCA 810) 2) Final EIS Table 5.7-1A: Monitoring and Adaptive Management being Considered	Donlin Gold will incorporate adaptive management principles into many aspects of planned mitigation. For example, Donlin Gold's Aquatic Resources Management Plan, Wetlands Compensatory Mitigation Plan, and Barge Communication Plan all incorporate adaptive management principles.
45	Apply measures to further restrict public access to the ROW to reduce indirect effects. Close the pipeline ROW to OHV and snowmachine use, where appropriate and based on land ownership, to minimize increased recreational access.	1) Final EIS Appx. N (ANILCA 810) 2) Final EIS Table 5.5-1B Mitigation Measures Assessed as Not Likely to be Required	Although Donlin Gold cannot restrict access to land it does not own or control, Donlin Gold has committed to taking the following steps to limit use of the ROW: (1) make provisions for suitable permanent and clearly delineated crossings for the public where the ROW or access roads cross existing roads, foot trails, winter trails, easements or other rights-of-way, unless otherwise authorized by the Authorized Officer during all Pipeline Activities. (2) where the ROW crosses authorized trails, a screen of material or vegetation native to the specific setting shall be maintained, or established over disturbed areas to minimize recreational use of the ROW.
46	Maintain communication throughout all project phases with subsistence users concerning perception of ecological risk or potential exposure of waterfowl or fish to contamination. A communication method is important to address concerns and perceptions about contamination. DATROC may serve to facilitate communication, as	1) Final EIS Appx. N (ANILCA 810)	Donlin Gold is committed to working with DATROC to determine the most effective modes of communication to address perceptions of ecological risk and exposure.

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Number	Mitigation Measure	References	Clarification
	appropriate.		
47	Donlin Gold should consult with the Alaska Department of Fish and Game and local subsistence users for current information and traditional knowledge to identify locations and times when subsistence activities occur, and to the extent practicable, minimize impacts to these activities. The DATROC may serve to facilitate consultation, as appropriate.	1) Final EIS Appx. N (ANILCA 810)	Donlin Gold is currently in the process of forming DATROC subcommittees on barging and subsistence to engage the local communities to identify locations and times when subsistence activities occur, and opportunities to avoid, eliminate, or reduce conflicts that serve to restrict access to subsistence resources. (See Donlin Gold Technical Memorandum: Additional Final EIS Design Features, January 15, 2018)
48	Smelt monitoring program: Donlin Gold would develop and implement a rainbow smelt monitoring program to establish additional baseline data for a better understanding of the species' occurrence and the character, use, and distribution of spawning habitat along the Kuskokwim River. Survey methodology would likely include documenting sex ratio and age structure of the population and if possible, fecundity of females. Initially, surveys would be conducted annually to document the age structure of the rainbow smelt population and further document spawning patterns. Once an adequate baseline is established, regular sampling would be used to monitor for changes to existing patterns. The frequency of surveys over the long-term would depend on previous results and whether the data indicate a potential shift. If rainbow smelt population changes are observed over a defined time period, additional work would need to be undertaken to investigate the reason for those changes. If observed changes were attributed to project-related activities, Donlin Gold would implement an assessment of measures available to address or mitigate those activities. Such activities would be coordinated with the DATROC Subsistence Subcommittee.	1) Final EIS Table 5.2-1: Design Features	Donlin Gold initiated the first round of data collection in May 2018. The data is being compiled and analyzed and the first report from the project should be available this fall documenting the results. Donlin Gold will focus future rainbow smelt monitoring activities by working with local fishers to sample harvested rainbow smelt to establish age distribution patterns within the spawning population. Donlin Gold's goal with the program will be to document age distributions prior to initiating barge traffic that will be associated with project construction. Survey methodology will likely include documenting sex ratio and age structure of the population and if possible, fecundity of females. Initially, surveys would be conducted annually to document the age structure of the rainbow smelt population and further document spawning patterns. Once an adequate baseline is established, regular sampling will be used to monitor for changes to existing patterns. The frequency of surveys over the long-term will depend on previous results and whether the data indicate a potential shift. (See Donlin Gold Technical Memorandum: Additional Final EIS Design

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Number	Mitigation Measure	References	Clarification
			Features, January 15, 2018).
49	A Crooked Creek ARMP would be developed in conjunction with Alaska Department of Fish and Game (ADF&G) and ADNR through habitat and water rights permitting processes. The objectives of the plan are to: 1) monitor for major changes to aquatic communities, 2) monitor for smaller scale and incremental changes to aquatic communities, and 3) guide results-based refinement to the monitoring program. The plan would build on the existing baseline dataset and include both biological and flow components, including: fish presence/abundance, invertebrate and periphyton sampling, and fish metals analysis; flow monitoring and winter surface water sampling to characterize fish habitat/passage and freezedown patterns; sediment sampling; and collection of additional geology and hydrology data to refine understanding of dewatering and groundwater/surface water flow dynamics (Donlin Gold 2018a,b; Owl Ridge 2017c). The ongoing data collection would be used in an adaptive management approach to refine the understanding of the dynamics surrounding Crooked Creek flow in winter as well as the open water seasons and to identify the most effective measures that can be used to ensure that minimum flows in Crooked Creek are maintained. If the project results in minimal losses to Crooked Creek flows, adaptive management measures may be unnecessary. If flow losses warrant a response, a range of measures could be considered that include but would not be limited to: lining or relocating portions of the stream channel; augmenting flows from the Snow Gulch Reservoir; pumping water from the Kuskokwim River, or grouting areas of bedrock demonstrating high flow rates.	1) Final EIS Table 5.2-1: Design Features 2) Donlin Gold. 2018a. Letter to Richard Darden, US Army Corps of Engineers, RE: Donlin Gold's Comments to the November 2, 2017 National Marine Fisheries Service (NMFS) Essential Fish Habitat (EFH) Recommendations. Daniel Graham, PE. January 4, 2018. 3) Donlin Gold. 2018b. Technical Memorandum: Additional Final EIS Design Features. Gene Weglinski, Senior Permitting Coordinator to Richard Darden, US Army Corps of Engineers. January 15, 2018. 4) Owl Ridge. 2017c. Essential Fish Habitat Assessment. Draft Version 2.4. June 2017. Prepared for Donlin Gold, Anchorage, AK by Owl Ridge Natural Resource Consultants, Inc., Anchorage, AK. 75 pp.	Donlin Gold has submitted a framework for this plan to the State of Alaska agencies for their review and input. Comments are expected back soon and will be used to further advance the ARMP as part of the Project's monitoring commitments.

The agreements Donlin Gold has made for mitigation not only provide direct financial compensation to the native corporations, but also include terms that allow the corporations to be involved in the project to ensure responsible and sustainable development for the benefit of

their shareholders. The establishment of the DATROC with Barge and Subsistence Subcommittees to address barging impacts to aquatic resources demonstrates Donlin Gold's commitment to avoid and minimize impacts to subsistence. Both Calista and TKC have strongly advocated for the project to realize ANCSA's vision of Alaska Native economic development and self-sufficiency. This is an instance where a ROW across public lands is necessary to achieve the fundamental purposes of a related statutory scheme, namely, to allow for development of ANCSA-selected lands and mineral resources by and for the benefit of Alaska Native communities.

Given these steps, the BLM has determined that the proposed action includes all reasonable steps to minimize adverse impacts on subsistence uses and resources.