US Army Corps of Engineers

Donlin Gold Project

Comment Analysis Report

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Village of Crooked Creek

Native Village of Napaimute

Native Village of Chuathbaluk

Native Village of Aniak

Knik Tribal Council

Akiak Native Community

DONLIN GOLD PROJECT
ENVIRONMENTAL IMPACT STATEMENT

COMMENT ANALYSIS REPORT

Prepared for:

U.S. Army Corps of Engineers

CEPOA-RD

P.O. Box 6898

JBER, Alaska 99506-0898

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1.0 INTRODUCTION

On November 25, 2015, the Alaska District, U.S. Army Corps of Engineers (Corps) published a Special Public Notice regarding the comment period for the Draft Environmental Impact Statement (EIS) for the proposed Donlin Gold Mine. This notice featured a 157-day comment period, ending April 30, 2016. Given the receipt of multiple requests to extend the comment period on the Department of the Army (DA) Permit Application and/or the Draft EIS, the Corps extended the public comment period to May 31, 2016.

Public comments regarding the Draft EIS were received as oral and written testimony at the public meetings, and as written comments received through postal mail, fax, and email. Comments were submitted by individual citizens as well as groups, including federal agencies, tribal governments, state agencies, local governments, businesses, special interest groups, and non-governmental organizations. Section 2.0, Statements of Concern (SOCs), summarizes the issues identified in the Draft EIS comments, comments made during the Bureau of Land Management (BLM) Alaska National Interest Lands Conservation Act (ANILCA) 810 hearings, and comments on the ANILCA 810 Analysis.

The Statement of Concern category termed "ANIL" refers to comments made during meetings, hearings, and in written submissions on the ANILCA Section 810 analysis. These SOCs will be used by the Corps and the third party contractor in ensuring that all comments on subsistence, whether in the context of the Draft EIS or the 810 Analysis, will be considered in revisions to the EIS. Only the BLM will respond to comment in the revision of the Section 810 Analysis.

Process

The comment analysis process used in the Donlin Gold Project Draft EIS relied on the concept of identifying individual submissions from commenters, identifying individual substantive comments within each submission, assigning each comment to an issue code category established during the EIS scoping process, and developing statements of concern that group and summarize similar comments. This process has been used by many federal agencies over the last two decades to meet National Environmental Policy Act (NEPA) requirements that require the lead agency to identify and respond to substantive comments submitted on a Draft EIS. Comments are analyzed, coded, and entered into a database (the Comment Analysis System) that allows the EIS team to identify and respond to substantive comments, then track responses to submissions and substantive comments made on a Draft EIS.

Terminology

There were a total of 529 unique submissions received by the Corps during the Draft EIS comment period. The term submission refers to the entirety of oral testimony at a public meeting, an entire letter, or an email message. Most submissions included many comments, a term which refers to each of the discrete concepts conveyed in a submission. The Draft EIS comment period generated over 5,000 coded comments.

The EIS team read and analyzed all submissions for substantive comments, assigning each discrete comment to a content-based Issue Code in the Comment Analysis System database. Issue categories were then more finely assigned into specific Issue Code Categories corresponding to common issue or concern. For example, a comment expressing concern about how streams were classified in the Draft EIS would be coded to Issue Code Hydrology (HYD)

because it related broadly to hydrology. The comment would then be assigned, with similar comments, to Issue Code Category HYD 2 – Stream Classification, as it specifically expressed concern over stream classification.

Issue categories and corresponding issue codes, presented by broad issue groups, are listed in Table 1.

Statement of Concern (SOC) Structure

The concern or issue expressed in each issue code was summarized into a Statement of Concern (SOC) and are included in Section 2.0, Statements of Concern. A SOC was developed for each issue code. SOCs are presented by issue category in table format following the order listed in Table 1. The Corps will use the SOCs to prepare the Final EIS.

SOCs consist of a concise statement summarizing the issue or concern. Some contain bullet points that illustrate the nature of the SOC. Bullet points consist of individual quotations and paraphrased statements taken from comments. Some of the comment submissions used a matrix format recommended by the Corps; matrix headings including references to document sections, pages, tables, and text were preserved in example comments (e.g., [Section 3.5.3.2.1, page 3.5-62] [Original Language]). In some cases, capitalization was used for emphasis if the original comment was retained. The goal in all SOCs was to preserve the original intent of the commenter within the issue or concern.

SOC Comment Index

To identify how each submission was coded within a Statement of Concern, a Comment Index (Section 4.0) was created. Appendix A, Volumes 1 to 5 (Submissions with Denoted Comments) contains the original submission and then the comments were bracketed to denote which SOC they were coded to. To aid viewers each coded comment is bracketed using a solid blackline or a dashed line and the SOC code is noted in the margin. All comments received became part of the public record.

Table 1: Donlin Gold Draft EIS Issue Categories and Codes

Issue Group	Issue Code Name	Issue Code	Example Comment Subjects
Process: NEPA, Permits, this EIS, Consultation, and Coordination	Legislative and Regulatory Process	LEG	Compliance with other statutes, laws, or regulations that should be considered; coordinating with Federal, state, local agencies or organizations; permitting requirements.
	Public Involvement	PUB	Insufficient information presented to public and issues concerning outreach process to communities.
	Government-to-Government	G2G	Consultation and coordination with tribal governments and Alaska Native Claims Settlement Act (ANCSA) corporations.
	NEPA Process	NEP	Compliance with NEPA. Specific to the adequacy of Purpose and Need, scoping, technical analysis, and NEPA milestones. Includes requests for comment period extensions.
	Endangered Species Act Compliance	ESA	Compliance with the Endangered Species Act (ESA).
	NHPA Section 106 Compliance	NHPA	Compliance with the National Historic Preservation Act, specifically Section 106 which is in regards to historic properties, and consultation with the Alaska State Historic Preservation Office (SHPO) and tribes.
	Clean Water Act Compliance	CWA	Compliance with the Clean Water Act (CWA), specifically Section 404 that regulates the placement of fill into wetlands.
	ANILCA Section 810(a) Analysis	ANIL	Comments on the ANILCA Section 810(a) analysis, conducted by the BLM.
Proposed Action, Alternatives, Mitigation Measures, and Monitoring	Proposed Action and Alternatives	PAA	Proposed alternative, additional alternatives that should be considered, comments associated with other action alternatives and the no action alternative, issues associated with proposed mine components, and phases.
	Mitigation Measures	MIT	Comments related to suggestions for or implementation of mitigation measures in general terms. Specific mitigation related to specific resource issues will be addressed under that resource issue.
	Bonding, Escrow, Restoration and Reclamation	BER	Comments related to reclamation activities, bonding, and setting up escrow fund for restoration. Mechanisms for in-perpetuity post-closure (i.e., plan for permanent water treatment, the entity, which would pay post-closure – secure financing in perpetuity).
	Monitoring and Adaptive Management Plans	MON	Requests for long-term monitoring plans, and/or adaptive management plans.

Table 1: Donlin Gold Draft EIS Issue Categories and Codes

Issue Group	Issue Code Name	Issue Code	Example Comment Subjects
Affected Environment: Comments about each resource, and **Environmental Consequences**: Potential direct, indirect and cumulative impacts	PHYSICAL		
	Air Quality	AIQ	Comments and concerns regarding impacts to air quality from construction, fugitive dust emissions, vehicle equipment emissions, and mining activities (mercury dust). Does not include concern for impacts to climate change.
	Barge Issues	BARG	Comments related to concerns for increased barge traffic on communities from project components and phases. Erosion to riverbanks from barge traffic. Example: not enough water in river systems to allow for increased levels of barge traffic as a result of the project.
	Climate Change	CLIM	Comments and concerns related to increased glacial discharges, less snow pack, reduced water levels in the river systems, and impacts to region. Includes air quality issues and climate change.
	Fuel Spill Risks/Release	FSR	Concerns about potential for fuel and oil spills or accidental releases, ability to clean up spills in various conditions, and potential impacts to resources or environment from spills or release. This is fuel spill risk not hazardous materials or tailings dam.
	Geology / Seismic Activity	GEO	Seismic risks, soils stability, permafrost, fault lines, and earthquakes.
	Groundwater Impacts	GRD	Impacts to groundwater systems and aquifers from tailings, waste rock, mine pits, and other sources (transportation of groundwater – how it moves underground).
	Hazardous Materials	HZM	Concerns about the potential for hazardous material storage, spills, and impacts to resources or the environment. Chemicals associated with mine process and storage of materials (cyanide, mercury, arsenic, acids).
	Hydrology (surface water)	HYD	Impacts to streams, local waterbodies, disruption in local water patterns. Riverine systems, wave impacts to shore banks and surface waters. Lower surface water levels.
	Water Quality and Quantity	WAQ	Comments and concerns regarding impacts to water quality and quantity from construction and operation (rock, river). Pit water and tailings dam management. Water budget available for the mine during operation. Erosion, turbidity, temperature changes, and barge traffic concerns causing changes in turbidity.
	Noise	NOI	Noise impacts from mine, along river systems, and in pipeline corridor from project construction and operation.

Table 1: Donlin Gold Draft EIS Issue Categories and Codes

Issue Group	Issue Code Name	Issue Code	Example Comment Subjects
Affected Environment (cont'd): Comments about each resource, and **Environmental Consequences:** Potential direct, indirect and cumulative impacts	Soils	SOL	Comments and concerns regarding impacts to soils.
	Tailings Dam	DAM	Comments regarding concern of the stability of the tailings dam, potential for tailings dam failure, and impacts of a failure.
	BIOLOGICAL		
	Birds – Impacts	BIRD	Comments related to potential impacts to migratory birds and waterfowl populations, abundance, diversity, migratory patterns, and potential for displacement from project components. Attraction of birds to tailings ponds. Potential for impacts to ESA-listed birds.
	Fish – Impacts	FISH	Comments related to potential impacts to fish (salmon, sheefish) populations, abundance, diversity, migratory patterns, and potential for displacement from project components. Impacts to fish from barging activities.
	Habitat	HAB	Comments associated with terrestrial habitat requirements, or potential habitat impacts from project components and operations. Comment focus is habitat impacts, rather than specific resource topics such as wildlife or fish.
	Vegetation	VEG	Comments related to concerns about vegetation and potential for disturbance from project components.
	Wetlands and Aquatic Communities	WET	Filling of wetlands and alterations of wetlands habitat. Fragmentation and loss of wetland habitat as a result of project components.
	Wildlife – Impacts	WILD	General comments related to potential impacts to wildlife (mammals), unrelated to subsistence resource concepts. Potential for impacts to ESA-listed mammals.
	Nonnative Invasive Species	INV	Comments related to nonnative invasive species.
	SOCIAL		
	Cultural Resources	CUL	Impacts to archaeological and cultural resources as a result of mine and related mine infrastructure facilities, construction, and operation.
	Iditarod National Historic Trail	IDIT	Impacts to the Iditarod National Historic Trail (INHT), including cultural significance, recreation, and regarding user groups.
	Environmental Justice	EJ	Impacts to low income and minorities as a result of the proposed project.

Table 1: Donlin Gold Draft EIS Issue Categories and Codes

Issue Group	Issue Code Name	Issue Code	Example Comment Subjects
Affected Environment (cont'd): Comments about each resource, and **Environmental Consequences:** Potential direct, indirect and cumulative impacts	Land Ownership, Management and Use	LAND	Public and private land use, ownership, and management objectives. Loss/degradation of wilderness values – not traditional land use. Land status and ownership.
	Natural Gas Supply	GAS	Lower costs of fuel in rural Alaska as a result of potential new gas supply and spur/distribution systems. Impacts to gas supply in Cook Inlet.
	Public Health	PHL	Impacts to local communities' public health and infrastructure as a result of the project (disease, contaminants, lifestyle changes, behavioral health, and physical health). Health Impact Assessment. Industrial hygiene.
	Recreation	REC	Impacts on recreation and tourism, recreational hunting and recreation patterns, usage near mine, along river systems, and in pipeline corridor during construction and operation. Disruption of recreational experiences of INHT.
	Socioeconomic Impacts	SER	Comments on economic impacts to local communities, regional economy, and national economy, can include changes in the social or economic environments. Influx of construction and operational workers, employment, jobs, and housing. Potential for out migration from communities. Boom and bust cycle.
	Subsistence	SUB	Comments related to potential impacts to subsistence resource (harvest, sharing, and traditional use areas). Comments on need to protect subsistence resources and potential impacts to these resources. Perceived contamination and/or avoidance of subsistence resources.
	Traditional Culture and Way of Life	TWL	Comments related to potential cultural impacts (and values) or desire to maintain traditional practices. Languages, traditional land use areas (cultural continuity).
	Transportation	TRAN	Impacts to transportation systems – airports, roads, rivers – as a result of the project. Impacts to existing barge traffic.
	Visual Resources	VIS	Impacts to visual resources from mine, along river systems, and in pipeline corridor from project components and phases.
	Socioeconomics vs. Environment	SVE	Comments weighing the tradeoffs and benefits between economic development and environmental impact.

Table 1: Donlin Gold Draft EIS Issue Categories and Codes

Issue Group	Issue Code Name	Issue Code	Example Comment Subjects
General	Data and Available Information	DATA	Comments about the inadequacy of data and requests to incorporate specific studies into the analysis in general terms. When related to a specific resource, it will be included in that resource.
	Non-Substantive Comment	NSB	Submissions without substantive comments.
	Research, Monitoring, and Evaluation Needs	RME	Comments on baseline research, monitoring, and evaluation needs, and data gaps in general terms. When related to a specific resource, it will be included in that resource.
	Clarification and Document Inconsistencies	CLA	Comments that illustrate inconsistencies in the document or the document message. Requests for clarification or more detailed information in general terms. When related to a specific resource, it will be included in that resource.
	Editorial	EDIT	Comments that are strictly editorial.

2.0 STATEMENTS OF CONCERN

2.1 LEGISLATIVE AND REGULATORY PROCESS

Compliance with other statues, laws, or regulations that should be considered; coordinating with federal, state, local agencies or organizations; permitting requirements.

Category Code	Statement of Concern	Response
LEG 1	The Corps should consider that the permitting processes, including identification of appropriate issuing authority, and waterway jurisdiction are complex and should be followed carefully. All permitting agencies should establish the appropriate levels of protections, and enforce compliance.	The Corps understands the complexity of the project, and recognizes that the various regulatory authorities involved increase the complexity. The Corps has been working closely with cooperating agencies so that the document meets their needs. Clear lines of authority and jurisdiction are known. It is the responsibility of each permitting agency to establish permit stipulations and ensure compliance. The proposed Donlin Gold Project will require over 100 permits from federal, state, and local governments. For a summary listing of the permits, the issuing agencies, and the underlying authorities, see Appendix AA, Additional Regulatory Framework Information.
LEG 2	The Corps should comply with the statutory requirement that federal agencies consult with Alaska Native Corporations (ANCs), on the same level as Indian tribes (on a government-to-government basis), and should allow full public review and comment before moving on to the next step in the environmental review process.	See response to G2G 1.
LEG 3	The Presidential Memorandum "Mitigating Impacts on Natural Resources from Development and Encouraging	This Presidential Memorandum was rescinded by the March 28, 2017 Executive Order (EO) 13783 "Promoting Energy

Category Code	Statement of Concern	Response
	Related Private Investment" was issued on November 3, 2015 and should be included in the EIS to address the "net benefit goal" for mitigating impacts from natural resource use.	Independence and Economic Growth."
LEG 4	Further explanation or clarifying language for specific legislative or regulatory process references should be included to address relevancy and avoid confusion.	The document has been edited for clarification as applicable. A regulatory framework section is included for resource sections in Chapter 3.
LEG 5	The Corps is required to submit an Essential Fish Habitat (EFH) report to the National Marine Fisheries Service (NMFS) for review and consultation, and there is no record of that occurring in Chapter 6 (Consolation and Coordination of the Draft EIS). The oversight agency's (NMFS) views on the assessment would be invaluable at determining the validity of the EFH assessment, and their comments should have been included in the Draft EIS.	Information was added to Section 3.13, Fish and Aquatic Resources to include consultation with National Oceanic and Atmospheric Administration (NOAA)-NMFS regarding the EFH, and the assessment of impacts to EFH per project component. The EFH Assessment is included as Appendix Q. The EFH consultation process with NOAA-NMFS is separate from and concurrent with the NEPA process. The results of the EFH consultation will be included in the Record of Decision (ROD).

2.2 PUBLIC INVOLVEMENT

Insufficient information presented to public and issues concerning outreach process to communities.

Category Code	Statement of Concern	Response
PUB 1	Sustained outreach has been identified as an essential component of the project that the Corps should continue to take place to solicit meaningful public and stakeholder collaboration and facilitate community empowerment. • Expanded outreach: Some villages expressed concern about being left out of outreach efforts. Additional communities in surrounding regions (such as Bristol Bay or Dutch Harbor or Southeast Alaska) should also be included in outreach efforts. More outreach should take place prior to meetings about time and location. Regional Advisory Committees (Alaska Department of Fish and Game [ADF&G]) should be included in discussions. • Stronger collaboration: Residents would like to continue to work with the Corps to understand implications of the project through permitting and beyond. All affected parties should be invited to communicate, collaborate, and cooperate proactively. • Inclusion: Some residents expressed frustration over not feeling that their comments were being heard and incorporated, that their past comments were ignored, or that their comments were restricted (as expressed by one commenter regarding how Iditarod participants could not comment due to new regulations for the Iditarod sled dog race participants by that organization). Community empowerment: A balance of needs can best be met with direct and	In accordance with 40 CFR 1506.6, the Corps has made multiple efforts to keep stakeholders informed of the NEPA process and schedule. Public and stakeholder involvement programs were designed in accord with applicable NEPA requirements to maximize opportunities for public input. Hard copies and CDs/DVDs of the Draft EIS were sent to an extensive list of Alaska Native organizations, Tribal and local governments, and libraries in the potentially affected communities, as well as to private citizens who requested copies. Public review of the Draft EIS afforded an opportunity to provide input on the need for, and expected effectiveness of mitigation measures, as well as on the potential effects to be mitigated. Communities in Bristol Bay and Dutch Harbor were determined not to be in the project area (as they are outside the analysis area for resources or not part of the proposed action and considered connected actions) and therefore outreach was not conducted in these communities. Draft EIS comments received from stakeholders in the communities were reviewed and incorporated into the Final EIS as appropriate including suggestions for monitoring and mitigation (Chapter 5; Tables 5.7-1A and 5.7-1B) and Section 2.10 and Section 2.12 of this Comment Analysis Report. Supplemental outreach efforts that were conducted by the Corps were listed on the project website and included presentations and project updates at stakeholder gatherings

Category Code	Statement of Concern	Response
	substantive involvement of the local communities and tribal governments. Involve communities in designing and implementing mitigation measures, strategies, and plans. Communities should also be involved with monitoring of the mitigation. There is also a need to ensure that communities have the capacity to participate in making decisions regarding mitigation.	which included conferences and regional subsistence advisory council meetings. See Chapter 6, Section 6.3.5, Table 6.3-3 in the Final EIS for a listing of supplemental outreach activities.
PUB 2	Effective prior outreach efforts and methods by the Corps and Donlin Gold were recognized and should continue in the following ways: • The hub community outreach approach by the Corps afforded opportunity for remote residents and hub residents to participate. • The comment period was thought to be adequate with the one month extension to meet community and cultural needs, combined with the extensive scoping period to identify issues of greatest interest. • The Corps should continue to convey to residents that concerns have been heard and considered, and to present the results in terms that can be clearly understood by the general public and, specifically, to residents in the region. • The Corps should continue to look specifically at identified concerns in comments to address them directly with information in the Draft EIS. • The Corps should be specific as to where information	Public meeting and outreach were conducted with communities as specified by NEPA. The Corps also has a dedicated Tribal and Community Liaison who is in touch with communities and available to discuss concerns and ideas about how to improve the public processes and outreach efforts. Information including background documents, EIS documents, newsletters, presentations and information on how to contact the Corps have been posted to the project website and been available throughout the NEPA process.

Category Code	Statement of Concern	Response
	can be found on the website.	
PUB 3	The Corps should have held another meeting in Anchorage to allow more time for people to review the Draft EIS.	The comment period for the Draft EIS was extended an additional month (i.e., November 27, 2015 to May 31, 2016) for a total of six months to allow the public to review the document. Another Anchorage meeting was not held as the Corps had already met obligations under NEPA with meetings previously held in Anchorage on the Draft EIS.
PUB 4	Concerns were expressed that access to information and materials was not adequate or too expensive; that provided materials were too long, complex and technical; and that not enough time was provided to review materials thoroughly. • Continued access to project materials, including presentations and notes from public meetings, should be available on the Donlin Gold EIS website. • Materials should be provided to all interested communities and provided in more adequate formats (residents may not have access to technology to review the Draft EIS CDs or to download materials from the Donlin Gold EIS website). • Residents should not be expected to understand and process the amount and depth of information given to them late in the process of deciding on alternatives; greater consultation, collaboration, and cooperation should take place with greater attention to timing. • The Executive Summary and Draft EIS should be shorter and less technical. A third party reviewer	Notification of Availability of the Draft EIS was published in the Federal Register on November 27, 2015. The Draft EIS meetings were not held until January in order to give the public time to review the document before commenting. Public hearings on the Draft EIS were held from January through April 2016 in communities with public meeting dates coordinated with the Alaska Native communities to avoid conflict with community activities. The meeting dates were advertised in local media, though flyers, the project website, the Federal Register and by contacting stakeholders in the communities. The meeting format included a presentation on the Draft EIS, with resource specialists available to answer questions during an open house period prior to comments being taken. Transcripts of the public meetings and posters presented at the meetings were made available on the project website at donlingoldeis.com for the public to view. Newsletters and posters were also available at meetings as handouts. Supplemental outreach efforts were conducted prior to publication of the Draft EIS in 2015 to prepare communities to participate in the Draft EIS comment process by explaining how the document would be organized and how to review and effectively comment on

Category Code	Statement of Concern	Response
	should be available to interpret project materials for residents. • The comment period should be extended to allow all residents and villages that may have had restricted access time to review all materials.	the document. The Draft EIS was available from the project website, as a CD / DVD and hardcopy documents were available and mailed when requested. The comment period was extended one month to May 31, 2016 to allow stakeholders additional time to review and to comment on the Draft EIS. .
PUB 5	Efforts by the Corps to include Yup'ik translations should continue, through a combination of providing translators at meetings, by playing Yup'ik translations podcast CDs at meetings, by providing videos and the podcast on the Donlin Gold EIS website, and by sending podcast CDs to villages. • The Corps should be recognized as having fulfilled its obligations under NEPA to meet the needs of the region by providing Yup'ik translations. • A translation of a summary of the Final EIS and ROD should be provided to residents. • The entire Draft EIS should be translated into Yup'ik and Dena'ina so people can understand how impacts affect them. • Concern was also expressed that elders would not be able to understand impacts unless Yup'ik translation was available; Yup'ik explanations should be available in all communities.	Translation of the entire EIS into Yup'ik was not feasible. As noted in the comments, a Yup'ik translator was available at each public comment meeting. In addition, a Yup'ik language translation that served as an introduction and overview to some of the concepts and the terminology in the EIS was recorded and broadcast on the radio station KYUK in five segments that were approximately 25 to 30 minutes each in an effort to engage Yup'ik language stakeholders. The Yup'ik Language Podcast included: an Introduction to the Draft EIS and the project Purpose and Need; a description of the process used to identify and select project alternatives to be fully evaluated in the EIS; a description of the existing conditions and analysis of potential impacts from the proposed project and alternatives on 26 resource topics including direct, indirect, and cumulative impacts: and a description of mitigation measures that may reduce impacts from the proposed project and alternatives. This was an important supplemental public outreach tool for a region with many elders who are most comfortable in Yup'ik. These audio recordings and podcasts were also posted to the Corps project website donlingoldeis.com and available upon requests as CDs.
PUB 6	Incorporation of project changes based on feedback and	Public outreach efforts by Donlin Gold (then Donlin Creek)

Category Code	Statement of Concern	Response
	communication is an outreach process that the Corps should continue. • The project should be recognized as being environmentally responsible and consistent with values of the region. • Donlin Gold should be recognized for being proactive with State agencies, and for making tangible, substantive design changes to respond and adapt to stakeholder concerns to develop a project that balances the needs of all stakeholders and resources. • Proposed actions should be acknowledged as being based on Donlin Gold's extensive baseline research and continued attention and response to concerns voiced by residents.	began well before the EIS process and resulted in important design changes. The EIS process provided public comment opportunities during scoping and the Draft EIS review period, in accord with applicable NEPA requirements to maximize opportunities for public input. This included opportunities to explore and adopt changes in the proposed project design, pipeline alignment and mine site operations to meet public and regulator concerns that were voiced during scoping. Supplemental outreach was conducted in various communities upon request, meetings and conferences to keep the public updated on the process and status of the EIS occurred between scoping and the release of the Draft EIS. These presentations were made available to stakeholders thought the project website.

2.3 GOVERNMENT-TO-GOVERNMENT CONSULTATION

Consultation and coordination with tribal governments and ANCSA corporations.

Category Code	Statement of Concern	Response
G2G 1	The Corps should be more inclusive in consultation with area communities. The Corps should engage Bethel Native Corporation (BNC) on a government-to-government basis prior to a decision being made on the project, particularly in regards to Kuskokwim River barging and the Bethel Port. The Corps should advance consultations with Upper Kuskokwim River communities to include their concerns.	Chapter 6 describes the Corps' and BLM's government-to-government consultation efforts. The Corps recognizes its obligation to consult with ANCs and would do so prior to making a decision.
G2G 2	Federally recognized tribes should be included in the process by the Corps and their involvement should be prioritized as primary local governments impacted in terms of helping mitigate adverse impacts, and organizing assistance, health, and welfare to tribal members.	The Corps has developed the EIS in compliance with EO 13175 and other agency guidance concerning consultation with federally recognized tribes. Tribal governments and associations (such as Yukon-Kuskokwim Health Corporation [YKHC] and Association of Village Council Presidents [AVCP]) are recognized as important institutions for mitigating impacts of the proposed project.

2.4 NEPA PROCESS

Compliance with NEPA, with specific suggestions as to the adequacy of Purpose and Need, scoping, technical analysis and NEPA milestones. Includes requests for Draft EIS public comment period extensions.

Category Code	Statement of Concern	Response
NEP 1	The Corps should have extended the comment period beyond the granted 30-day extension to allow for meaningful public comment as part of the NEPA process. Commenters stated that the document is long and complex and technical problems on the publication website prevented some people from ready access to technical materials.	NEPA guidelines require a minimum review period of 45 days. The original published review period was set for five months. The Corps granted a 30-day extension for a total review period of 180 days. The Corps did not receive notification of technical problems with the Donlin Gold EIS website (http://www.donlingoldeis.com). Additionally, the Corps mailed 37 hardcopies and 210 DVDs of the Draft EIS to local communities and libraries. The Draft EIS was provided to the public, tribes, Alaska Native Corporations, and local governments. All requests for hard copies or DVDs were accommodated.
NEP 2	The one month extension of the comment period to May 31, 2016 extension was appreciated.	Comment acknowledged.
NEP 3	Clarifications should be considered in the Purpose and Need section regarding how the Corps addresses maximizing economic benefits. The document should state that Alternative 1 does not meet the Purpose and Need. Additional clarifications on the Purpose and Need are requested.	Clarifications were made to descriptions of the Alternatives in Chapter 2. In addition, edits to the Purpose and Need have been made to clarify the unique land status of the project, and the role of subsistence policy. The project Purpose and Need statement is included in Chapter 1, Section 1.3, Project Purpose and Need. Inclusion of ANCSA Corporation's right to develop mineral resources is a part of the Purpose and Need statement at Section 1.3.1.

Category Code	Statement of Concern	Response
NEP 4	The Corps should note in the EIS that the NEPA process should be acknowledged as having been followed adequately.	Comment acknowledged.
NEP 5	The NEPA process should continue to be followed by the Corps, in terms of permitting or information to include in documents.	Comment acknowledged.
NEP 6	Analysis and information should be revised, expanded, edited, or supplemented to meet NEPA requirements as the current analysis is insufficient. The Corps needs to consider preparation of a Supplemental EIS (SEIS) if changes are substantive, to allow public comment on the SEIS, and fully disclose the environmental consequences of all reasonable alternatives in a Final EIS. Specific concerns regarding legal deficiencies include: • Pit Lake: The Corps must fully and accurately disclose the ecological risks posed by the pit lake, the changes in mine site hydrology that result from it, and the details of Donlin Gold's financial assurances for perpetual water treatment. • Mine Site Water Treatment: The Corps should explain how the proposed action comports with New Source Performance Standards for mining waste discharges into streams and wetlands under the Clean Water Act. • Tailings Dam: The Corps must completely analyze the risk of a tailings dam failure and account for the findings of an expert panel on the recent, catastrophic tailings dam breach at the Mount Polley mine in British Columbia,	This SOC is intended to address comments requesting the Corps to consider preparation of a Supplemental EIS. Separate SOCs have been prepared that cover specific aspects of the general concerns regarding stated deficiencies of the Draft EIS. Where there is one or two particular SOCs that capture the main topic of the general concern listed in NEP 6, these SOCs have been cross-referenced in the response below. Please see separate SOCs (referenced below) for a discussion of specific concerns regarding stated deficiencies of the Draft EIS. Additional information and analysis and modified alternatives have been added to the Final EIS in accordance with 40 CFR 1503.4. The Corps reviewed the need for a Supplemental Draft EIS following the requirements of 40 CFR 1502.9(c)(1) and determined that there were no substantial changes to the proposed action or any significant new circumstances or information relevant to environmental concerns. • See GRD 6 and WILD 5 for a discussion of main Pit Lake concerns. • See WAQ 10 for a discussion of Mine Site water treatment

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	Canada.
	• Subsistence and ANILCA Section 810(a) Findings:
	  • The Corps should objectively describe potential impacts to subsistence and address the apparent discrepancy between its own conclusions and the findings of BLM under Section 810(a) of ANILCA.
	  • Final ANILCA §810 findings not released until the Final EIS stage of the process. In order for the public to fully understand the scope of the project and its effects on subsistence uses, the Corps and BLM should republish the Draft EIS with these findings.
	• Wetlands: The Corps must present a more definite picture of the effects of the proposed action—as well as other alternatives—on wetlands and explain how those impacts would comport with regulations established under the Clean Water Act.
	• Iditarod National Historic Trail (INHT): The Corps should canvass the entire range of the pipeline's impacts on the INHT, thoroughly study alternatives that would avoid impacts to the Trail, explain how granting a right-of-way would be consistent with the State of Alaska's agreements with the federal government and the state's land-management plans, and complete the process prescribed by Section 106 of the National Historic Preservation Act (NHPA) before rendering a permitting decision.
	• Bethel Port Facilities Scope: The Corps must thoroughly address the potential effects of the construction of a cargo
		concerns.
		• See MIT 29 for a discussion of the implementation of Mount Polley Independent Technical Review Panel recommendations, including tailings dam analysis concerns.
		• See SUB 21 for a discussion of concerns regarding the EIS subsistence analysis and BLM's ANILCA Section 810(a) findings.
		• See CWA 4 and CWA 5 for a discussion of concerns regarding wetlands analysis and compliance with the Clean Water Act.
		• 'IDIT' SOCs capture concerns specific to the Iditarod National Historic Trail (INHT).
		• See BARG 10 and PAA 49 for a discussion of concerns with the Bethel Port facilities scope and analysis.
		• See CLIM 1 for a discussion of the alternatives' contributions to climate change and an explanation for how climate change could alter the project's environmental impacts.
		• See CLA 4 for a discussion regarding an analysis of potential mine site expansion.
		• See WAQ 20 and GRD 7 for a discussion of plans for seepage and fate and transport modeling of contaminants. CEQ regulations direct federal agencies to "use the NEPA process to identify and assess the reasonable alternatives to proposed actions that will avoid or minimize adverse

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	terminal in Bethel. • Segmented analysis of transportation facilities at Bethel as an action that may possibly occur rather than a definitive component of the project. • Minimal level of environmental analysis relating to the proposed expanded Bethel Port facilities, new fuel tank farm in Bethel, and the increase in ocean-going and river barges staging within the City of Bethel and traversing the Kuskokwim River from the Donlin Gold Bethel Port to Crooked Creek and an additional segment from Bethel to the Bearing Sea. Descriptions of direct and cumulative impacts do not fully disclose the impacts of such a major facility. • Treatment of Bethel Port Facility and Tank Farm as indirect effects of the Project rather than integral components of the project. • Climate Change: The Corps should fully and fairly discuss all of the alternatives' contributions to climate change and explain how climate change could alter the project's environmental impacts. • Mine Site Expansion: The Corps must thoroughly address the potential effects of the possible future expansion of the mine. The cumulative effects of a possible future expansion of the mine should be discussed as a "reasonably foreseeable" action that would have cumulative effects on the region. • Disclosure of plans for seepage and complete fate and transport modeling of contaminants: Mitigation measures	effects of these actions" 40 CFR 1500.2(e). The NEPA document was based on Plans of Operations and other engineering information submitted by the applicant in support of Federal and State permit applications, and fully addresses the range of potential effects, design features proposed by the applicant, best management practices and standard operating procedures required by permitting agencies, and suggested mitigation measures from agencies and the general public. Issuing the Draft EIS for public and agency review is a key step in the NEPA process to identify impact minimization measures (mitigation), and mitigation measures presented for discussion in the Draft EIS are refined as part of the normal NEPA process involving review of public comments on the Draft EIS, agency review of the Preliminary Final EIS and additional mitigation proposed by the applicant in response to their review of the Draft EIS. It also follows that mitigation identified during the NEPA process would be refined and adopted after NEPA is completed. For the Donlin Gold project, this may be most appropriate during the State of Alaska permitting process that follows NEPA; the State has the primary permitting authority that addresses detailed design and engineering features, which are often refined between the permit application and issuance of State permits. Some studies have been proposed during NEPA as mitigation and if determined necessary by permitting agencies would occur later.

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	in the Draft EIS, such as liners, hydraulic containment and further studies as part of final design, such as fate and transport groundwater modeling, indicate the Draft EIS was issued prematurely since planning for the mine has not progressed far enough to even have completed all necessary studies or planned adequate mitigation.	
NEP 7	The Corps should consider that the summary impact determinations and impact level criteria should be removed from the document because current levels do not allow sufficient comparison or evaluation under NEPA.	Overall summary impact determinations have been removed. The impact methodology framework to assess direct or indirect impacts to all resources based on four factors of magnitude or intensity, duration, extent or scope, and context is based on 40 CFR 1508.27, described in Section 3.0-Approach and Methodology. Originally, a level was assigned to each type of effect that a resource may experience for each of the four factors. This specific approach has been applied in past NEPA documents as an accepted metric to compare and evaluate impacts. At this time, all levels assigned to each of the four factors have been removed from the document, to meet concerns that the assignment of levels did not allow sufficient comparison of impacts or evaluation of impacts for this document. Impact methodology assessment criteria are now described in a table for each resource section (Chapter 4, Chapter 3-Sections 3.1 to 3.24 and 3.26). Rather than applying levels, assessment criteria is provided as a descriptive narrative for each of the four factors for each of the types of effects that the resource may experience, in order to allow comparison and evaluation of impacts within the analysis framework. Overall summary impact levels were originally included for each resource, assigned by considering the levels assigned to

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		each of the four factors for each of the types of effects to the resource. The summary impact levels have also been removed to meet concerns that summary impact levels were not sufficient to compare or evaluate impacts under NEPA.
NEP 8	A Supplemental EIS should not be necessary. The Corps should use the Draft EIS, public comments, State comments and the cooperating agencies to develop a defensible Final EIS that covers any concerns or gaps that these agencies may have, rather than adding unnecessary steps to the process. Draft EISs by their nature are the established process through which to work out any concerns or perceived deficiencies by working through those issues and developing a Final EIS that thoroughly identifies and discloses impacts from the project. The Corps is not required to go out to a Supplemental Draft EIS and should use the agreed-upon EIS process to develop a defendable Final EIS that better aligns federal agency's positions and concerns.	Comment acknowledged.
NEP 9	The Department of Homeland Security (DHS) should comment on any and all emergency management plans for safety or evacuation of residents along the Kuskokwim River and the entire project natural gas pipeline route.	The Federal Department of Homeland Security and the Alaska Division of Homeland Security and Emergency Management are listed as entities that would issue permits, approvals, or consultations for the proposed project. No comments were received from these agencies.
NEP 10	The Corps should consider the source of natural gas as part of the project scope.	Donlin Gold proposes to buy natural gas on the open market from an existing pipeline and there is currently excess gas in the region. If Donlin Gold proposed to import LNG or perhaps if natural gas was in short supply in Southcentral Alaska (ConocoPhillips in 2016 received approval to export 40 billion cubic feet of natural gas from its Nikiski LNG

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		facility) the source of natural gas would need to be evaluated; however, at this time it appears speculative and out of scope to evaluate in the EIS.
NEP 11	EIS resource sections should be revised to include analysis of interrelated and additive effects on environmental resources from project-related actions (for example, the effects of hydrologic modifications on wetland habitat or subsistence users).	Section 3.0-Approach and Methodology contains a discussion of the interrelated nature of environmental resources. Chapter 3 (Sections 3.1 to 3.24 and 3.26) contain discussions per resource area on interrelated and additive effects from project-related activities as applicable within the document's analysis framework.

2.5 ENDANGERED SPECIES ACT COMPLIANCE

Compliance with the Endangered Species Act (ESA).

Category Code	Statement of Concern	Response
ESA 1	Ultimate fate and potential environmental effects of an accidental spill of a tanktainer of cyanide or a cargo load of mercury should be analyzed by the Corps in the EIS for the geographic area of the Kuskokwim River and Kuskokwim Shoals coastal and marine areas. Contaminant persistence and impact in terms of likelihood and possible effects on federally listed Endangered Species Act (ESA) species should be described. Differences in Alternatives 3A and 3B from Alternative 2 should be disclosed, and environmentally sensitive areas should be identified.	Contaminant impacts to resources, including ESA-listed species, are discussed in Section 3.24-Spills. Donlin Gold has developed Oil Discharge Prevention and Contingency Plans (ODPCPs) to meet State of Alaska response planning requirements and inform the NEPA process (see Appendix R). The ODPCPs consider similar scenarios and have information related to fate and transport and the amount and placement of cleanup equipment. There are two ODPCPs; one for vessel operations and the other for the terminal and tank farm. These plans would be revised post-NEPA and prior to construction. Additional spill fate modeling was not conducted, per the Technical Memorandum from AECOM to the Corps dated August 8th, 2016 (Donlin Gold Project EIS – Response to: Enclosure 1. The U.S. Fish and Wildlife Service Request for Spill Fate Analysis on the Kuskokwim River and Kuskokwim Bay). Text has been clarified to disclose differences in Alternatives 3A and 3B from Alternative 2 as appropriate for ESA-listed species in Section 3.14-Threatened and Endangered Species. Protection of environmentally sensitive areas per [18 AAC 75.425(e)(3)(J)] is addressed in the ODPCPs in Appendix R.
ESA 2	The Corps should consider that the NEPA and ESA requirements include a heightened analysis of likely effects to sensitive species listed under ESA including Steller's eider,	Effects to Steller's eider and spectacled eider were analyzed in Section 3.14-Threatened and Endangered Species for

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	spectacled eider, and Cook Inlet beluga whale. The EIS should include adequate analysis of effects caused by increased use and development of the Kuskokwim River, habitat loss, climate change, and increased risk of environmental contamination. Mitigation measures specifically designed to preserve eiders should be included, such as mandated barge speed limits, mandated barge operating hours, and barge number restrictions. Impacts to Cook Inlet beluga whales should be at the "hard look" analysis level required by NEPA, and should include disclosure of probabilities and likely effects to population dynamics from barge strikes. The EIS should include enforceable, effective mitigation measures designed to minimize barge strikes to beluga whales. Analysis should include additional scientific information and research unique to this area.	potential direct and indirect effects in Alternative 2. Analysis in Section 3.14 in the Final EIS is consistent with the ESA effects determination of May Affect, Not Likely to Adversely Affect for both Steller's eiders and spectacled eiders in the USFWS and NOAA-NMFS Biological Assessments (included in Appendix O). These determinations take into account impact-reducing design features (see Table 5.2-1 in Chapter 5) proposed by Donlin Gold and also the Standard Permit Conditions and BMPs (Section 5.3) that would be implemented. Additional ESA species avoidance practices are addressed in the Biological Assessments. Scientific information on potential barge traffic impacts to Cook Inlet belugas is included in Section 3.14 to support impact analysis. Tables referring to the summary impact levels have been removed (see NEP 7).

2.6 NHPA SECTION 106 COMPLIANCE

Compliance with the National Historic Preservation Act, specifically Section 106 which requires Federal agencies to take into account the effects of their undertakings on historic properties, and consultation with the Alaska State Historic Preservation Office (SHPO) and tribes.

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NHPA 1	The National Historic Preservation Act (NHPA) Section 106 Programmatic Agreement (PA) should be finalized and signed prior to Record of Decision (ROD) signing, likely taking up to 1.5 years to complete in coordination with the Draft EIS development. The PA framework should outline proponent actions necessary for compliance with Section 106. Agencies must disclose efforts to identify, evaluate, and mitigate effects to cultural resources, both known and unknown, to inform the public of required procedures. Active involvement for consulting parties will include approximately 24 federally recognized tribes, Native corporations, and other cooperators and stakeholders.	The PA addresses the points made in these comments. The goal is completion and signing of the PA in approximately the same timeframe as the ROD. The Draft PA is included as Appendix Y to the EIS.
NHPA 2	Corps conclusions including assessment of alternatives that would reduce harm to the Iditarod National Historic Trail (INHT) and other historic resources should be documented under Section 106 of the NHPA and included in the Final EIS prior to signing the ROD. The INHT and specific sites along the Trail qualify as historic properties eligible for inclusion in the National Register of Historic Places (NRHP). Agencies must assess resource, and develop and evaluate alternatives or modifications that could	The EIS includes an assessment of impacts to the INHT and other historic resources in Section 3.20, Cultural Resources. The Final EIS includes the North Option in Alternative 2 which would avoid the segments of heaviest impact to the INHT. Alternative 2 is also compared with Alternative 6A, which would have more impacts to the INHT. The Corps, the BLM, and the State of Alaska conducted a thorough NHPA Section 106 analysis in consultation with Tribes and INHT user groups, releasing a draft of the PA for public review in May

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	avoid, minimize, or mitigate adverse effects on historic properties in consultation with state and tribal historic preservation officers. Agencies must provide the public an opportunity to express views on resolving adverse effects.	2017. The PA is scheduled for signature in approximately the same timeframe as the ROD. The Draft PA is included as Appendix Y to the EIS.

2.7 CLEAN WATER ACT COMPLIANCE

Compliance with the Clean Water Act (CWA), specifically Section 404 that regulates the placement of fill into wetlands.

Category Code	Statement of Concern	Response
CWA 1	Concerns were expressed that the Section 404 permit application was incomplete and missing sections or information at the time of publication of the Draft EIS. The Corps should have allowed opportunity for public review of a complete Section 404 permit application. The Corps should include a complete Section 404 permit application in the Final EIS as an Appendix. The Final EIS should include information on the status of the Section 404 permit application.	The purpose of the EIS is to describe the Donlin Gold Mine Project and the environmental impacts from construction and operation of the project for public review. The CWA Section 404 compensatory mitigation process and 404(b)(1) analysis are separate from the NEPA process. A complete CWA Section 404/10 RHA Permit application are not required by the Corps to complete the NEPA process, but versions of whatever status these documents are in will be included as an Appendix when the Final EIS is published.
CWA 2	Socioeconomics and public interest aspects of CWA Section 404 permitting should be acknowledged in the EIS as a critical piece of NEPA analysis.	Project impacts on socioeconomics are addressed in Section 3.18, Socioeconomics. A description of requirements for public interest findings is included Section 3.11, Wetlands, under the subheading Regulatory Framework. The Corps ROD would incorporate EIS findings on socioeconomics, as well as public interest findings as required by the CWA.
CWA 3	Concerns were expressed that there was not sufficient disclosure of how the proposed project would comply with CWA. The Corps should consider the pit lake, the TSF, and the contact water dams to be Waters of the US under CWA. The Corps should disclose how water quality standards will not be met in these locations, and how new source performance standards will be met.	Section 404 of the Clean Water Act (CWA) establishes a program to regulate the discharge of dredged or fill material into waters of the United States, including wetlands. Proposed activities are regulated through a permit review process. An individual permit is required for potentially significant impacts. Individual permits are reviewed by the U.S. Army Corps of Engineers (Corps), which evaluates applications under a public interest review, as well as the environmental criteria set forth in the CWA Section 404(b)(1)

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		Guidelines, regulations promulgated by EPA. The Final EIS discusses how waters discharged from the mine site would be treated and must meet water quality standards before they can be discharged to Waters of the U.S. (WOUS). The pit lake, TSF, and contact water impoundments were designed to prevent contaminated water from entering WOUS, and as such these artificial waters would not be required to meet water quality standards. Industrial facilities and WOUS converted to uplands due to placement of fill are not considered WOUS. Also, the TSF is not a waste treatment system. Compliance with CWA, water quality, treatment, and monitoring from the seepage water collection system and in the pit lake are discussed in Section 3.7, Water Quality Discharges and drainage from the proposed mine would be regulated by an APDES permit. The State of Alaska would issue the permit and is the permitting authority responsible for compliance with any New Source Performance Standards as specified in 40 CFR 122.2 or 122.29. CWA Section 306 applies to federal facilities.
CWA 4	Concerns were expressed that project impacts on wetlands may not be consistent with guidelines established under the CWA including: detailed analysis of practicable alternatives; definition of and selection of the Least Environmentally Damaging Practicable Alternative (LEDPA); explanation of no significant degradation of the aquatic ecosystem; and inclusion of all appropriate and practicable measures to minimize potential harm to aquatic ecosystems. Wetland analysis should demonstrate that the proposed filling would	Section 404 of the Clean Water Act (CWA) establishes a program to regulate the discharge of dredged or fill material into waters of the United States, including wetlands. Proposed activities are regulated through a permit review process. An individual permit is required for potentially significant impacts. Individual permits are reviewed by the U.S. Army Corps of Engineers (Corps), which evaluates applications under a public interest review, as well as the environmental criteria set forth in the CWA Section 404(b)(1)

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	comply with Section 404 permit application guidelines. Specific concerns include: • The Draft EIS does not explain how the proposed filling of wetlands would be consistent with guidelines established under the CWA. In applying 404(b)(1) guidelines the Corps must "…make factual determinations as to the potential environmental effects of the proposed filing, and it must indicate whether the project complies with the 404(b)(1) guidelines in the record of decision based on the Final EIS." • The Draft EIS does not indicate whether or how the proposed action is the least environmentally damaging practicable alternative (LEDPA). "Given the scale of the project, the Corps must conduct a more thorough analysis of alternative that may quality as the LEDPA." • The Draft EIS does not describe how the project's impacts on wetlands would not significantly degrade those ecosystems. "… inadequacies in plans for minimization or compensation may invalidate the decision to allow discharge."	Guidelines, regulations promulgated by EPA. • The purpose of the EIS is to describe the Donlin Gold Mine Project and the environmental impacts from construction and operation of the project for public review and to inform the Corps decision process under Section 404(b)(1) Guidelines. Section 3.11, Wetlands, discloses impacts to wetlands and evaluates multiple alternatives in detail. • NEPA may have a broader range of reasonable alternatives than the 404(b)(1) process. They are separate processes. NEPA does not have to demonstrate a LEDPA. • See above responses. The purpose of the EIS is to inform the Corps decision under CWA Section 404(b)(1) Guidelines. The NEPA process does not include decisions reached in the CWA Section 404(b)(1) process on how proposed filling of wetlands would be consistent with CWA guidelines, or the degree of significance of degradation per Corps regulations.
CWA 5	Concerns were expressed that wetland analysis was insufficient to comply with requirements of the CWA. A revised Preliminary Jurisdictional Determination (PJD) should be approved with factual determinations of wetland acres impacted during the Corps permitting process to	Section 404 of the Clean Water Act (CWA) establishes a program to regulate the discharge of dredged or fill material into waters of the United States, including wetlands. Proposed activities are regulated through a permit review process. An individual permit is required for potentially

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	eliminate potential jurisdictional inconsistencies, and to determine adjusted areas of jurisdictional wetland impacts following recent jurisdictional guidelines. Jurisdictional inconsistencies should be addressed, and the revised estimates of the wetland acreage impacts should be included, as accurate information regarding the acreage of direct and indirect wetland impacts associated with the alternatives would be necessary to adequately compare alternatives. Specific concerns include: • There is no basis for the assertion that water within the mine facilities is not Waters of the U.S. (WOUS). Nothing in the statute, regulations, or any agency policy exempts mines. The only exception that could be applicable to some mine components is one for "waste treatment systems." While, for example, the Corps and EPA might make a determination that a properly designed tailings storage facility would qualify as a "waste treatment system" under the rule defining WOUS," the entire mine plainly would not. Before deeming any portion of the project to be an exempt "waste treatment system," EPA and the Corps should undertake the rulemaking promised in 1980, adopting clear guidelines specifying the appropriate criteria for a waste treatment system. They should further document exactly how any portion of the Donlin project would qualify as a waste treatment system under those guidelines and how the rest of the project would comply with New Source Performance Standards, water quality standards, and other requirements of the CWA. All of	significant impacts. Individual permits are reviewed by the Corps, which evaluates applications under a public interest review, as well as the environmental criteria set forth in the CWA Section 404(b)(1) Guidelines, regulations promulgated by EPA. See CWA 4 for a discussion of NEPA versus CWA Section 404(b)(1) Guidelines. • See CWA 3; Corps regulations are clear about what defines a water of the U.S. • A PJD for the project area and a PJD for the route along the North Option were completed in 2016 and 2017 by Michael Baker along with a compilation of GIS data (together, the "PJD"; Michael Baker 2016, 2017a, 2017b). The Corps approved the PJD on February 27, 2017 (Donlin Gold PJD Study Area) and on October 12, 2017 (Donlin Gold North Route Addendum). The PJD eliminates jurisdictional inconsistencies with respect to mosaic classes and is consistent with the Alaska Regional Supplement to the Corps' wetland delineation manual. The PJD does not require approval from the Corps, but has been used in preparing the Final EIS assessment of wetlands impacts, and was used for the permit application and to develop compensatory mitigation requirements during the CWA Section 404(b)(1) permitting process. Wetland types described in the PJD are analyzed in Section 3.11-Wetlands data tables, and in Section 3.10-Vegetation and Nonnative Invasive Species data tables. Indirect impacts, including those from groundwater drawdown, are quantified per alternative in Section 3.11. A

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	this should be disclosed in a Supplemental EIS subject to public comment. • The Draft EIS does not adequately discuss the project's impacts on wetlands because : 1) it relies on Donlin Gold's assessment of wetlands functions, putting off its own assessment until the Final EIS; 2) it defers the functional assessment for Alternative 4 until the Final EIS if that alternative is carried forward; 3) it lacks data for Alternatives 3B, 5A, and 6A; and 4) for all alternatives it omits the long-term effects on wetlands of a lower equilibrium groundwater level at the mine site post-closure due to a lack of detail in the model.	functional assessment will not be prepared for this EIS; note that wetland functional assessment data are not required to compare alternatives, although a discussion on wetland function is included in Section 3.11. • The TSF is not a waste treatment facility; the waste treatment system exclusion does not apply to the project. See also CWA 3. Donlin Gold proposes to convert wetlands to uplands through the removal of material from the footprint of the tailings storage facility and then the placement of fill to support the liner. Tailings would then be placed on the liner in "uplands," an approach accepted by EPA and Corps regulations.

2.8 ANILCA SECTION 810(A) ANALYSIS

Comments on the Alaska National Interest Lands Conservation Act (ANILCA) Section 810(a) analysis, conducted by the BLM.

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ANIL 1	The BLM should provide clarification of the criteria used to define thresholds in determining significant restriction in order to support Section 810 Analysis conclusions.	The BLM determines the appropriate revisions for the Section 810 Analysis.
ANIL 2	The Corps should consider authority and jurisdiction along the proposed natural gas pipeline, as BLM authority under Section 810 is limited to federal public lands under its management, which would apply to a relatively minor portion (less than one-third) of a right-of-way application for the proposed natural gas pipeline.	Comment acknowledged. The BLM determines the appropriate revisions for the Section 810 Analysis.
ANIL 3	Concern was expressed that the BLM Section 810 Analysis conclusions were not accurate or did not include information that was included in the Draft EIS. The BLM should have incorporated more local knowledge and input into the process of developing the analysis.	The BLM determines the appropriate revisions for the Section 810 Analysis, and determines response to analytic details raised in comments.
ANIL 4	Clarifying edits should be made to the Section 810 Analysis text.	The BLM determines the appropriate revisions for the Section 810 Analysis.
ANIL 5	The Section 810 Analysis should discuss socioeconomic effects including positive subsistence effects.	The BLM determines the appropriate revisions for the Section 810 Analysis. See also SUB 11 on project effects on in- and out-migration, and SUB 18 regarding beneficial economic impacts in the Final EIS.
ANIL 6	The Section 810 Analysis should formally consider the fact that part of the reason for development of the Donlin Gold	The BLM determines the appropriate revisions for the Section 810 Analysis.

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	Project is to fulfill the economic benefits to Alaska Natives intended through ANCSA in exchange for settling aboriginal claims to the land. Concern was expressed that the mine was not proposed to be built on state or federal lands but rather ANCSA corporation lands for the specific reason of realizing the obligation of ANCSA.	
ANIL 7	Concern was expressed that the BLM Section 810 Analysis conclusions regarding impacts to fish discharged waters and run-off were inaccurate and did not consider Alaska Pollutant Discharge Elimination System (APDES) permitting and compliance or project in design.	The BLM determines the appropriate revisions for the Section 810 Analysis.
ANIL 8	Concern was expressed that barging data included in the Section 810 Analysis did not include enough information to effectively support any conclusions in terms of subsistence impacts.	The BLM determines the appropriate revisions for the Section 810 Analysis. See also SUB 16 regarding underestimates of impacts from project transportation activities in the Final EIS.
ANIL 9	Support was expressed for the BLM Section 810 Analysis conclusions.	Comment acknowledged. The BLM determines the appropriate revisions for the Section 810 Analysis. See also SUB 21.
ANIL 10	The BLM should consider impacts in the context of the variety of existing activities and uses along the proposed pipeline right of way in the Section 810 Analysis and in the next step of Section 810 determinations.	The BLM determines the appropriate revisions for the Section 810 Analysis. See also SUB 8 concerning underestimates of impacts from the pipeline corridor in the Final EIS.
ANIL 11	Concern was expressed that the BLM Section 810 Analysis conclusions concerning spill scenarios were inaccurate, and should be revised.	The BLM determines the appropriate revisions for the Section 810 Analysis. See also SUB 15 concerning underestimates of spill impacts in the Final EIS.
ANIL 12	Mitigation measures were suggested to include in the Section	The BLM determines the appropriate revisions for the

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	810 Analysis.	Section 810 Analysis.
ANIL 13	The Corps and the BLM should concur on barging impact conclusions between the EIS and the BLM Section 810 Analysis.	The BLM determines the appropriate revisions for the Section 810 Analysis. See also SUB 21 requesting that the Corps explicitly assess in the EIS the discrepancies between the two documents.
ANIL 14	The BLM has overestimated impacts at the mine site.	The BLM determines the appropriate revisions for the Section 810 Analysis. See also SUB 24 concerning underestimates of mine site impacts in the Final EIS.
ANIL 15	The BLM is legally required to consult with ANCSA Corporations on the 810 Analysis.	The BLM determines the appropriate revisions for the Section 810 Analysis.
ANIL 16	Comments on the Section 810 subsistence impact analysis should also be considered in the Draft EIS.	The Corps and the BLM agreed that all comments on the subsistence impact analyses in the Final EIS and the Section 810 analysis were considered in the revisions of both documents.

2.9 PROPOSED ACTION AND ALTERNATIVES

Proposed alternative, additional alternatives that should be considered, comments associated with other action alternatives and the no action alternative, issues associated with proposed mine components and phases.

Category Code	Statement of Concern	Response
PAA 1	Alternative 1 should be selected by the Corps because of high impacts to many resources from the proposed project, and because at this time technology does not support a project of this magnitude.	Comment acknowledged.
PAA 2	Alternative 1 should not be selected by the Corps as it would be detrimental to the region both economically and culturally.	Comment acknowledged.
PAA 3	Options should be explored to cost effectively transport natural gas in the proposed pipeline to create lower cost energy for the region.	Comment acknowledged.
PAA 4	Alternative 3A should be selected by the Corps instead of Alternative 3B, as a diesel pipeline has greater environmental risk. Natural gas should be selected as it is cleaner, cheaper, and safer with a smaller footprint than diesel.	Comment acknowledged.
PAA 5	Alternative 3A should not be selected by the Corps at this time as current technology for LNG trucks is not thought to be adequate for the mining fleet given uncertainties in the technology; in the future, the project may be able to accommodate LNG technology.	Comment acknowledged.
PAA 6	Alternative 3B should be selected by the Corps because the diesel pipeline has potential positive impacts on Kuskokwim Region communities in terms of providing lower-cost heating	Comment acknowledged.

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	fuel and energy options through creating a supply opportunity. Donlin Gold could partner with a local carrier to earn back some costs of construction and operation. A diesel pipeline should be selected as the alternative as it would be a better method to deliver fuel rather than barging or flying in this fuel.	
PAA 7	Alternative 3B should be rejected by the Corps. The diesel pipeline should be eliminated from consideration because of higher greenhouse gas emissions, and the preclusion of potentially developing or using more LNG technology. Furthermore, the diesel pipeline should not be considered as it would be higher cost with higher wetland mitigation costs, have a more substantial permanent footprint that requires more access points and maintenance needs for the operational life of the pipeline and would increase the risk for diesel shipment in Cook Inlet particularly in winter and, would result in more activity along the proposed route including spill staging and preparedness.	Comment acknowledged.
PAA 8	Alternative 4 should be selected by the Corps because of numerous reduced impacts from barging upriver. These include the ease for barges to navigate downstream from Birch Tree, a reduction of barge induced salmon impacts, barge erosion to riverbanks, less air pollution from tug engine emissions and possible fuel spills, and the potential for reliable ice road trucking. Concern has been expressed about the feasibility of increased barging further upriver compared to Alternative 4 at Birch Tree and the likelihood of barge groundings. Overall, the access road under Alternative 4 provides less impact to the environment than a longer	Comment acknowledged.

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	barging route upriver. Alternative 4 should also be selected because it provides a more clear benefit to the local economy by opening up other mineralized areas for development and the access road would remain after the project closure.	
PAA 9	Alternative 5A – Dry Stack Tailings requires additional analysis/clarification: • The Corps should consider alternatives that reduce saturation in tailings, like another "dry "alternative that will work. Additional water treatment could be required which could require more water treatment but would be much safer in the long run. • As long as the pumping system is in place, there is a risk of water contamination. The dry stacking alternative will help this perceived risk. The best alternative from the perspective of avoiding contamination from the tailings facility is to use dry stack tailings with both a liner beneath them and then an impervious cover as part of reclamation. • Describing the subaqueous tailings storage as conventional implies that dry stack is unconventional. • The EIS should clarify why some tailings would not be filtered due to the specified moisture content. • The biogeochemical mechanism whereby metals released into the environment would return to background ranges once they are released should be described. • The EIS should explain why the operating pond will be constructed below the TSF.	• Additional details regarding Alternative 5A have been added to Chapter 2 as appropriate and relevant, including a better description of the operating pond (Section 2.3.6.1). • Comment acknowledged. Alternative 5A would have an impervious (LLDPE) cover. The EIS evaluates both unlined and lined options. • The word "conventional" to describe the tailings method has been discontinued in Chapter 2. • Clarification of off-spec tailings was added. • This is beyond the scope of the EIS. • Additional explanation of the operating pond location was added to Chapter 2.

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PAA 10	The Corps should address additional alternatives to barging, including one that considers constructing both a diesel and a natural gas pipeline in one corridor, an alternative that considers constructing a diesel pipeline parallel to the proposed natural gas pipeline, and an alternative for a road between the Yukon and the Kuskokwim River.	The Final EIS evaluates a collocated diesel and natural gas pipeline as an Option of Alternative 3B (the Collocated Natural Gas and Diesel Pipeline Option). Appendix C discusses the alternatives development process, including numerous alternatives considered but eliminated from further evaluation. An alternative for a road between the Yukon and the Kuskokwim River would still require barging; but on both rivers. This alternative is evaluated in Appendix C as TI-34.
PAA 11	Suggestions were given for winter access routes for construction of the east end of the natural gas pipeline. Instead of the proposed overland winter access routes, the Corps should consider a river ice road beginning from the existing ramp at Deshka Landing, down the Susitna River, up the Yentna River and then up the Skwentna River. Discuss the alternatives if Donlin Gold intends to construct the pipeline during low-snow years.	The alternate river route is unreliable and potentially unsafe due to late freeze up, early thawing overflow, and holes in the river ice. The suggested river ice road would add approximately 10 miles of travel, and therefore increase potential impacts to the environment from noise, wildlife interactions, and fuel spill risk. During low-snow years Donlin Gold would likely seek other alternatives in coordination with ADNR or the applicable land manager(s); measures may include the use of ice chips or other means to ensure safe and functional use of winter access routes. Additional text has been added in Section 2.3.2.3.5 Wetland Crossings to further discuss the options for access during low-snow years.
PAA 12	Smaller-scale mining alternatives should be reconsidered or be supported by further explanation as to why they were not carried forward. Pairing alternative energy sources with smaller-scale mine output would allow smaller energy production of those sources to match the smaller energy needs of lower production volumes.	As described in Table C-7 in Appendix C, options for lower throughputs were evaluated and dismissed as not feasible.

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PAA 13	Alternatives with more options for overland transport of fuel should be considered over those with longer water routes or more water route transport traffic. Overland travel should be considered because of the reduced risk to fuel or other spills in water in the river or the delta that would impact fish and other resources.	Alternatives to reduce or eliminate barging were considered during the Alternatives Development Process. Overland transportation of fuel was considered but is not feasible, see options TI-22 through TI-32a, Table C-3, Appendix C.
PAA 14	Concerns were expressed about liners and underdrains beneath the WRF and TSF: • To minimize migration of contaminants into groundwater, it is recommended that a liner be incorporated into the design of the WRF, the south overburden stockpile (SOB), and all areas that use waste rock from the proposed mine. • The WRF should have an underdrain to pass streamflow beneath it, and a channel around the pit,	• As described in Section 2.3.2.2.9, groundwater beneath the WRF would be captured by the Lower CWD and dewatering wells during operations, and by the pit lake during closure, such that a liner beneath the WRF would be unnecessary to prevent contaminated groundwater from migrating offsite. Related concerns regarding possible perched aquifer flowpaths around the pit and long-term hydraulic containment by the pit were explored during the December 2016 Mine-Water Workshop and further addressed in RFAIs #98, 101, and 102 (BGC 2017b, e, f) (see GRD 6 and 11). A liner beneath the SOB is included in Chapter 5 as a potential mitigation measure being considered by appropriate resource agencies. Materials placed in the NOB are not considered to pose an acid-rock drainage (ARD) or metal leaching (ML) risk (see Appendix H). Various monitoring efforts regarding the WRF are described in Table 5.7-1A in Chapter 5. • Water captured by the CWDs is needed as process

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	without the water being captured in the Upper CWD. • A 100-mil liner should be used under the TSF rather than a 60-mil liner to make leaks less likely and reduce the amount of seepage captured in the underdrain and recirculated, to allow the TSF to be decommissioned faster. For example, the Stillwater Mine in Montana will shift from a 60-mil to a 100-mil liner due to the failure of the thinner liner. Furthermore, the waste water from these facilities must be treated before being released into the environment and monitored.	water in the plant. Without it, there would not be enough water supply to operate the mine. In addition, a drain or channel that directs water around the pit to Crooked Creek would be difficult to seal off from perched or other contact groundwater, potentially increasing the risk of contaminated flow reaching the creek. • 60-mil liners are industry standard for lined systems. A system that is properly designed, specifically, that provides a good cushion for the geomembrane, will function. Failures in liners typically occur because they were not properly protected during installation or were damaged during operations. Regardless of the liner thickness, rock, substrate, or material in contact may damage the liner. Any wastewater that leaks through the TSF liner would be captured by the SRS and sent to the WTP for treatment prior to release to the environment.
PAA 15	Concerns were expressed that the Draft EIS analyzed an unreasonably narrow range of alternatives and should provide a wider range of alternatives to minimize environmental and social effects. Furthermore, Appendix C does not disclose or discuss the specific reasons why some of the options were dismissed from further evaluation. The Corps should have considered these options further or at least explained more thoroughly why the rejected alternatives were not practicable. A pipeline ROW route to avoid federally managed land should have been analyzed.	Over 300 hundred alternative options were evaluated and are documented in the EIS. Appendix C provides a thorough analysis of alternatives dismissed from further consideration, including PL-7a, a pipeline route to avoid federal land. Alternatives were eliminated from consideration if they were infeasible or found to not reduce impacts. For each alternative dismissed, a rationale for elimination is provided in Tables C-5 through C-23.

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PAA 16	Additional information / edits are needed to better compare Alternative 2 and 5A with regards to: • Closure of the tailings storage facility • Percent solids in the tailings facility • Cost comparison in feasibility analysis • Information presented in Table 3.7-42 • Virtual elimination of dam failure risk under Alternative 5A • Stream impacts • PM2.5 and PM10 emissions for both Alternatives	The Comparison of Impacts by Alternative tables at the end of each section provides a concise method to compare the impacts to each resource of concern. Suggested edits have been made where appropriate and relevant to more comparably evaluate Alternative 2 and 5A.
PAA 17	Suggestions were given for an environmentally preferred alternative that incorporates components of Alternative 3A, 3B, and 5A into 2 to avoid and minimize impacts to the Kuskokwim River. From Alternative 3A, the environmentally preferable alternative would use LNG or natural gas, rather than diesel, to power all trucks, vehicles, and certain facilities at the mine site. The environmentally preferable alternative would include both a natural gas pipeline (Alternative 2) and diesel fuel pipeline (Alternative 3B) within the same right-of-way, and identify the sources of natural gas and diesel fuel so that the direct, indirect, and cumulative environmental impacts could be adequately evaluated for the necessary transportation, handling, and storage facilities. The environmentally preferable alternative would manage and store mine waste tailings using both a subaqueous disposal and dry stack tailings method (Alternative 5A). Dry stack	Comment acknowledged. The Corps can select combinations of various alternatives and document the decision in the ROD prepared after the Final EIS is published. Specific suggestions to combine both types of mine tailings disposal methods are addressed in PAA 58.

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	tailings could be implemented during the summer months, and the subaqueous disposal method in the colder winter season.	
PAA 18	It is a mischaracterization of the NEPA process and the no action alternative to state that the No Action Alternative would also result if Donlin Gold chooses not to pursue the project. The no action alternative is a requirement of NEPA and therefore of the federal agencies. An agency could select a no action alternative as part of the NEPA process; however, if the proponent determines not to pursue a project, the NEPA process would simply end.	Text was edited in Section 2.3.1 as suggested to clarify the No Action Alternative in the Final EIS.
PAA 19	The Corps should provide clarifying edits to text and figures in Chapter 2 to improve the description of Alternative 2 as it relates to environmental resources.	Suggested edits to text and figures were incorporated as appropriate and relevant. Information presented in Chapter 2 is intended as a summary of Donlin Gold's Project Description and Pipeline Plan of Development, and a discussion of specific issues related to each environmental resource are further detailed in their respective Sections within Chapter 3.
PAA 20	According to the Draft EIS, LNG-powered haul trucks may not be commercially available at this time, but the technology to use natural gas is proven and companies are developing the technology. Alternative 3A should evaluate the use of LNG and/or natural gas for all trucks, including the trucks hauling cargo and fuel on the mine access road from the Jungjuk Port. The EIS should also evaluate the opportunity for other aboveground facilities at the mine site to be powered by LNG and/or natural gas.	Section 2.3.3 adequately addresses how LNG could be used to power this equipment, trucks and facilities. Additional clarifying wording has been added to this section. At this time, it is too early in the application of this technology to know if the technology and assumed fuel mix will prove out for the haul trucks. Other trucks and perhaps other above ground facilities could use LNG if Alternative 3A proves commercially viable.
PAA 21	The Corps should evaluate options for diesel fuel delivery	Additional text has been added to Section 2.3.4.2 to explain

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	that would eliminate impacts to the Native Village of Tyonek, and modifications to the North Foreland Dock Facility (TNF) under Alternative 3B. It was suggested that instead of extending the existing dock 1,500-ft, navigational dredging could be done to meet the desired water depth to accommodate vessels. Furthermore, Alternative 3B should identity the water depth and draft requirements at the TNF facility to accommodate vessels in excess of 30,000 gross tons. Additional recommendations included an evaluation of a subsea pipeline in Cook Inlet from Nikiski to Beluga or use of the existing Port MacKenzie dock	that tankships in excess of 30,000 gross tons would be approximately 600 feet long, 105 feet wide, with drafts approaching 40 feet. Water depth at the face of the current TNF is about 20 feet MLLW. Water depth at the face of the extended dock would be about 45 feet MLLW to allow for the vessel draft and design clearance to the floor of Cook Inlet at low tide levels. Dredging is not practical because the currents in the area would redistribute sediment causing the need for frequent maintenance dredging. The undersea pipeline from Nikiski poses feasibility concerns related to: 1) the cost of constructing the undersea pipeline; 2) it would constrain Donlin Gold to purchasing diesel only from the existing refinery; and 3) it would increase construction activities in endangered Cook Inlet beluga whale habitat. The Port MacKenzie Option of Alternative 3B (added to Section 2.3.4.3.1) and the original concept appear more reasonable than the undersea pipeline from Nikiski. Under Alternative 3B – Port MacKenzie Option, the Final EIS also evaluates using the existing Port MacKenzie dock for diesel delivery.
PAA 22	Suggestions were given for Alternative 4. • The EIS should include estimates of the water needs, location and quantities of water sources for the temporary ice road to construct the BTC road • The description of Alternative 4 does not mention how many river miles are traversed on the route from	Section 2.3.5 of the EIS reports that from Bethel to Birch Tree Crossing is 124 river miles. If Alternative 4 is chosen, Donlin Gold would then identify water sources and acquire necessary permits for water withdrawal for ice road construction; the locations and quantities are currently unknown. Section 3.13.2.1.3 describes EFH in the Project Area. As

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	Bethel to Birch Tree Crossing. Provide road and river mile lengths and descriptions of pertinent sections (stream crossings, narrow river reaches, Essential Fish Habitat, [EFH] etc.) in the descriptions of each Alternative. • For Alternative 4, describe the number of barrow sites needed, the fish species and abundance in the 40 streams that would need to be crossed, the vegetative communities and wetlands that could be impacted, and the wildlife movement through the area.	described in Section 3.13.2.2.1, the road between the BTC Port site and the mine would cross 40 streams or drainages requiring 8 bridges and 32 culverts. This section also explains that many of these drainages are used by anadromous and resident fishes for rearing and spawning and are classified as EFH. Section 3.13.2.2.1 reports that 52 borrow sites would be used to provide materials to construct the gravel road between the BTC and the mine. The vegetative communities that would be affected by Alternative 4 are described in Section 3.10, Vegetation and Nonnative Invasive Species and Section 3.11, Wetlands. Wildlife impacts are described in Section 3.12, Wildlife.
PAA 23	Alternative 5A should be selected by the Corps because it is an environmentally preferable Alternative compared to Alternative 2. Outside experts available to Corps should review this Alternative.	Comment acknowledged. Alternative 5A has been reviewed by the Corps and the third party NEPA contractor.

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PAA 24	The Corps should reconsider the footprint of the proposed pipeline as it pertains to the Upper Kuskokwim Region between the proposed pipeline mile markers 150 through 220 to avoid transitional habitat and various wintering grounds for caribou, moose, and other game species. The Corps should analyze in detail dismissed alternative PL-30.	As described in Appendix C, in Table C-21, alternative pipeline route PL-30 would route the pipeline through black spruce habitat. Geotechnical analyses in similar settings for the project area indicate black spruce forests soils contain higher levels of moisture and ice, making them less stable and more prone to melting and thaw settlement. Thaw settlement could impact pipe integrity and require increased maintenance, entailing summer and fall access, equipment use, and camps and aircraft use. The proposed route runs through transitional habitat which is drier and less likely to experience thaw settlement. While the pipeline could be installed in the wetter black spruce zone, it would require greater excavation to competent material, additional backfill, and additional maintenance and brush / tree cutting. The alternative route would also cause more of a visual impact. Minor alignment adjustments will be considered during the permitting process while coordinating with land owners or resource managers, which may include the avoidance of wintering grounds for game species. As such, avoiding transitional habitat would be one of several factors considered in localized siting determinations as engineering advances, and adjustments are made during construction. Comments on the Draft EIS did not provide new information to cause the Corps to consider the option in detail.

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PAA 25	Alternatives to burying equipment should be considered. Comments recommended salvaging all carbon-based material to reduce the overall carbon foot print and reduce the impact and burial of waste on private lands. Alternatively, communities may be able to utilize excess equipment or it could be taken back for recycling.	As practical, working equipment would be offered to local entities for reuse or repurposing. At this time it is not possible to predict if the used equipment would desired by these communities. However, mobile equipment that cannot be reused or repurposed would be buried in the WRF as stated in Section 2.3.2.1.12. Current regulations require that ADEC approve or deny burial of the equipment under an Integrated Waste Disposal Permit. Should the permit requirement remain in place at the time of closure, this permit would cover several other activities which overlap with ADNR and ADF&G authority. In addition, landowners would also need to agree to burial on any privately owned lands. Text has been added to Section 2.3.2.1.12 to further discuss this issue.
PAA 26	The EIS should include a dredging plan for the Bethel Port and discuss what is being proposed (e.g., dredging volumes and disposal areas).	Donlin Gold addressed dredging plans at port sites in RFAI #96 dated Nov. 3, 2016. The Bethel Yard Dock expansion (POA 2014-64) is being proposed by Knik Construction Company. Information regarding the potential effects of the Bethel Yard Dock provided in RFAI #96 reflects communications between Knik Construction and the Corps. Information provided to Donlin Gold from Knik Construction indicates that no maintenance dredging would be necessary for the Bethel Yard Dock. This has been incorporated into Section 2.3.2.2.3. Note that any actions that would occur at the Port of Bethel at the Bethel Yard Dock are not part of the proposed action, and are considered connected actions pursuant to NEPA (40 CFR 1508.25). At this time, it is not known that connected actions would occur. However, connected actions are analyzed for

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		some resources in or near the Bethel Yard Dock in the context of resource impacts in Chapter 3, Affected Environment and Environmental Consequences. See Chapter 1, Section 1.2.1, Connected Actions.
PAA 27	The Draft EIS should include a setback (buffer) alternative which requires the pit excavation not intersect the Crooked Creek alluvium. There should be a minimum setback from the creek of several hundred feet to protect stream flows and decrease the amount of water potentially drawn from the Creek.	Comment acknowledged. The mine was designed to avoid as practicable contact with Crooked Creek. There is potential for the western tip of the ultimate pit crest to intersect a small portion of the Crooked Creek floodplain deposits. There are several mitigation measures (e.g., slurry wall or grout curtain) that would be considered if an unacceptable loss of Crooked Creek flow is realized as mining progresses. ADNR would be the permitting authority for water losses from the creek.
PAA 28	Concern was expressed that the proposed pipeline construction airstrips at Happy River and Threemile would have a detrimental impact to the area and wildlife. It was suggested the Whiskey Bravo and/or Puntilla airstrip could be upgraded to accommodate the needs of the project.	Donlin Gold has proposed reclaiming and closing the proposed Happy River and Three Mile Valley airstrips assuming the concurrence of the landowner (State of Alaska). Donlin Gold points to the decommissioned Hayes River Airstrip as an example of a previously used airstrip that was successfully closed. Utilizing the Whiskey Bravo strip would require approximately 13 miles of all season gravel road, and Puntilla about 10 miles. Both airstrips would need to be upgraded and this would allow the use of larger public aircraft more capable of transporting all-terrain vehicles to the project area. It is likely that because Whiskey Bravo and Puntilla are existing strips with a history of use by the public, there

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		would be opposition to efforts to reclaim or remove the improvements. This alternative could increase impact to the area and wildlife by increasing the placement of gravel fill and facilitating increased access for sport hunting.
PAA 29	Concern was expressed that discussion of an unlined option for dry-stacked tailings only serves to distract the reader from a clear comparative analysis of Alternatives 2 and 5A. The Corps should also eliminate Option 1 for an unlined dry stack from further consideration. Dry stack tailings with a liner would mean less risk for tailings breach.	Different base liner options were considered in AECOM (2015e), and the Unlined Option retained due to advantages of practicability and cost, as well as eventual similarities in SRS water quality over the long-term, compared to the Lined Option. This issue was further explored in the December 2016 Mine-Water Workshop. Generally, a facility without a liner is better for stability and can be managed passively. Placement of a drainage layer over the liner risks damage to the liner. The dry stack at Pogo Mine, for example, has no liner. At Greens Creek Mine, lining was not deemed necessary for contaminant migration, but was added later to prevent groundwater flowing into the tailings and mounding.
PAA 30	The Corps should further evaluate and consider Option MS-71 to build a secondary dam downstream of the TSF as a means of capturing spilled material. It is not clear whether the topography would be amenable to building a secondary dam or what the exact cost would be for such an alternative. Although the TSF dam is to be built with a good design, there is always the potential for human error in the future, or the need for cost cutting measures that would result in later dam lifts being less robust than planned. A secondary dam would provide some measure of environmental security against future cost cutting measures.	An option to install a secondary dam downstream from the TSF to capture material escaping through spills or cracks was considered as MS-71 in Appendix C. This option was eliminated from further evaluation due to a greater overall environmental impact and larger footprint, as detailed in Table C-10. ADNR Dam Safety and Construction Unit issues certificates to construct and operate dams in Alaska. Any dam construction or modification, including subsequent dam lifts / raises, would require review and authorization by ADNR.

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PAA 31	The Final EIS should include an expanded definition of Alternative 1. As written, the description of the No Action alternative is simply presented in terms of the effects of the Proposed Action not occurring. The Corps should revise the description of the No Action alternative for key resources, to characterize baseline considerations in terms of the mine site, transportation facilities, and natural gas pipeline components as is done for the Proposed Action and other alternatives.	As per NEPA standard of practice, baseline conditions for all resources are described in the affected environment sections of Chapter 3 (Sections 3.1 to 3.24 and 3.26). A sentence has been added to Section 2.3.1 to direct readers to Chapter 3 for characterizations of baseline conditions.
PAA 32	The Draft EIS understates the pipeline impacts on the INHT and fails to consider a reasonable range of alternative pipeline routes. The Corps should consider an alternate routing for the pipeline and access roads further away from the INHT corridor to reduce impacts. The pipeline could be routed through the upper Skwentna and Happy River drainages or routing away from the INHT from MP 96 to 106. This would reduce excessive trail crossings. Commenters also stated that the Kichatna River Valley route should be carried forward in the EIS because it reduces impacts to the INHT.	Alternative pipeline routes were considered to reduce impacts to the INHT. Appendix C describes the screening process for the proposed Kichatna River Valley route (PL-26) which considered two alignment options. While the Kichatna route would reduce impacts to the INHT, it was dismissed from detailed consideration due to feasibility issues and increased impacts to other resources (see Appendix C for more detail). Additionally, Donlin Gold revised their proposed action during the NEPA process to avoid the INHT impacts from routing through Dalzell Gorge; their original proposed alignment. Donlin Gold's original proposed action through Dalzell Gorge is evaluated in the EIS as Alternative 6A. After considering the Draft EIS comment to reroute from MP 96 to 106, a route option from MP 84.8 to 110 has been developed and is evaluated in the Final EIS. This option is presented in the Final EIS as Alternative 2 – North Option, which would realign this segment to limit intersections with the INHT to "occasional tangential crossings". Using details from RFAI #90 dated January 26, 2017, this route Option is described in Section 2.3.2.3.8.

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PAA 33	The EIS should evaluate the types of facilities that would be needed to handle and / or store the natural gas prior to transportation to the mine site and the associated direct, indirect, and cumulative environmental impacts. The environmental impacts associated with these facilities should be evaluated in the EIS.	As stated in Section 1.9.3, the project will purchase natural gas on the open market from an existing pipeline. Natural gas is a commodity that is not in short supply in Cook Inlet. Additional text has been added to Section 2.3.2.3 to clarify that storage and treatment facilities, as necessary, would be accomplished using existing Cook Inlet infrastructure.
PAA 34	Concern was expressed that an aboveground pipeline would be more environmentally suitable and allows monitoring of leaks.	An option for constructing an above-ground natural gas pipeline is addressed as PL-56 in Appendix C. This option was removed from detailed consideration because it would add extraordinary costs and not significantly reduce environmental impacts. However, above ground construction could be applied as a design feature in specific situations that may be driven by geotechnical or other environmental considerations.
PAA 35	The Corps should also consider co-locating the pipeline with TAPS instead of making a new corridor and rerouting gas into Port Valdez instead of Cook Inlet.	The suggestion is not in the project area and is therefore not feasible.
PAA 36	Concern was expressed that Alternative 6A is far more environmentally harmful than the proposed route in Alternative 2. Providing an alternative with such severe environmental risks as 6A demonstrates that the Corps did not consider it to be a realistic alternative. Furthermore, since the Dalzell segment is not being considered in the POD it should be removed from the Draft EIS.	Alternative 6A was Donlin Gold's original proposed route in the Plan of Development (POD) in July 2012 and is a viable and feasible route. Following the 2012 POD, Donlin Gold proposed a new route primarily to reduce impacts to INHT which is now presented as Alternative 2. Retaining Alternative 6A allows a comparison of impacts to wetlands, the INHT, recreation, and other related resources in the area; analysis of feasible alternatives is required under NEPA and the 404 permitting process.
PAA 37	The Corps should realign the pipeline as proposed under	The analysis of the proposed pipeline alignment does take

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	Alternative 2, as the area is already experiencing noticeable climate change that is affecting tundra uplands.	into account impacts from climate change, as detailed in Section 3.5 and 3.26. Additional text has been added to Section 3.26 to discuss the glacier retreat rings lying in the proximity of the major drainages to the north of the proposed pipeline alignment between MP 140 and MP 200.
PAA 38	The construction of a natural gas pipeline to the Donlin Gold project could be extended to add critical energy infrastructure to the region. Other options may be available for infrastructure such as roads and airstrips to remain in place after the project to support local villages.	As discussed in Section 2.3.2.3.6, The pipeline would have common carrier status and could ship gas for other owners. However, there are no proposals by other entities to ship gas in the pipeline so such an activity would be speculative. During preparation of the Closure Social Impact Assessment (Section 2.3.2.1.12) desired infrastructure by local villages/communities would be identified. Specifically, the power plant could remain if desired by the local landowner. Also, the airstrip and the 30-mile road connecting the mine site to the Angyaruaq (Jungjuk) Port would remain to be used in monitoring during mine reclamation into the foreseeable future (Section 2.3.2.1.12).
PAA 39	The Corps should consider additional or alternative power systems, like a pump storage hydroelectric system, or use of wind power. Power options should be considered in less invasive locations, such as sending power by wire, to be dismantled after mining ends.	Several alternative energy systems are discussed in Appendix C, Alternatives Development Process. Wind and hydro power were eliminated from detailed consideration due to their economic and technical infeasibility, as described on Page C-67 and C-68 for options TI-71, TI-73, and TI-74. Option TI-80 evaluated generating power offsite and delivering by transmission line but was determined to be infeasible.
PAA 40	To control dust, the dry stack tailings should be reclaimed incrementally rather than wait until closure. Incremental reclamation provides an opportunity to place an	Progressive reclamation would reduce infiltration on some slopes, but others would remain open for continued stacking throughout operations. While the BGC (2015d) seepage

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	impermeable cover on sections of the Dry Stack Tailings Facility (DSTF), which would stop meteoric water from entering those sections and allow those sections to begin to drain down. By the time the mine begins closure, there may only be a small section that has not been covered. Therefore, the volume of water entrained in tails in a traditional TSF could be much higher than that entrained in a DSTF at the end of mine life, resulting in a difference in the amount of time needed to achieve a low rate of seepage.	model assumes zero-flux through the cover at closure, rather than a slowly decreasing flux throughout operations, the latter is not expected to produce materially different results over the time-scale of the model (200 years). See also GRD 7.
PAA 41	Concern was expressed that the current comparison between Alternative 2 and 5A for tailings dam failure is inadequate and requires further modeling.	The amount of tailings generated would be the same under either Alternative 2 or 5A because the same amount of ore would be processed; this has been clarified in Section 3.24.3.5.3. The contaminant loads for materials that could be released are presented in Sections 3.24.6.2 and 3.24.6.7 for each alternative. For the purposes of this EIS, it is assumed that a release from the Alternative 5A operating pond would be similar to the water-only release modelled for the TSF dam for Alternative 2. It would likely be permitted as a high-hazard Class I dam by ADNR, like the TSF. The dry stack facility is a stable land form, and a failure is not a viable scenario for analysis. Text has been clarified to disclose differences in alternatives as appropriate.
PAA 42	The Corps should consider local exploration for oil and gas to eliminate the need for a natural gas pipeline from Cook Inlet.	There are currently no active applications or programs to explore oil or natural gas in the area of the proposed mine site. A discussion of this option for oil and gas exploration will be added to Appendix C.
PAA 43	The Corps should consider the use of railroad for hauling	A railroad from Bethel to the mine site for cargo and fuel

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	fuel, between Bethel and the Donlin Gold Mine. This alternative eliminates the need for tugs and barges on Crooked Creek.	transportation was considered as TI-22, but eliminated from further evaluation due to unfavorable ground conditions and large impacts to wetlands and other Waters of the U.S.
PAA 44	The Corps should consider including Emmonak in developing a port as part of barging providing income to the community.	Use of the Emmonak port would require barging on the Yukon River to a new upriver port. Two primary reasons that Yukon River barging was eliminated include: 1) building a road from the Yukon River to the mine site was determined not as practicable as building a road from the Kuskokwim; and 2) even though the Association of Village Counsel Presidents (AVCP) is proposing to build a road from the Yukon River to the Kuskokwim River, it is unlikely to be available during the initial phases of mine Construction and Operations. The proposed road project (funded through State of Alaska general fund appropriation) is still in the initial planning phase. The project has no appropriation for construction, and is not currently on the 2016-2019 Alaska Department of Transportation and Public Facilities' Statewide Transportation Improvement Program for construction funding or identified in the Alaska Statewide Long Range Transportation Plan. The proposed road would still be unlikely to be available during the initial phases of mine construction and operation. See Appendix C options TI-34 to TI-39.
PAA 45	The Corps should evaluate alternatives allowing more transportation in winter on ice roads.	An alternative to build an ice road to the mine site for transportation of cargo and fuel was considered as option TI-30 in Appendix C but was dismissed as infeasible. The alternatives presented in the EIS provide a reasonable range

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		of options. These alternatives are based on careful consideration of all the options presented in Appendix C and based on the feasibility of each option and its impacts to the environment.
PAA 46	The Corps should reject Alternative 5A due to technological infeasibility. Concerns were expressed about the potentially high cost and technical challenges involved as dry stacking has been more commonly applied to smaller projects in less severe operating environments and not the sub-Arctic.	Comment acknowledged. The EIS discusses the feasibility concerns expressed in the comments as applicable within the analysis framework of the document.
PAA 47	Concern was expressed that although using LNG powered trucks does reduced the diesel barging up the Kuskokwim River, it increases the flow through the pipeline, which increases the likelihood of leaks. The Corps should prepare a statement that compares barging to pipeline risks.	Section 2.3.3.3 describes that the pipeline has an engineered capacity to accommodate 26 BSCF per year with additional compression. The additional pressure is within the engineered capacity so risk of leaks would not be increased. Text to clarify has been added to Section 2.3.3.3.
PAA 48	The Corps should consider alternative options to address risks and cost in transporting fuel and other materials such as air transport of mercury.	Air transport of mercury will be assessed as a potential mitigation measure in Chapter 5 of the Final EIS. There have not been any incidents in Alaska in at least the last decade with shipping containers being lost overboard (Tague 2016; Stuart 2016).
PAA 49	The Corps failed to look at less harmful alternatives in Bethel. Other land in Bethel that is suitable for the Project's needs could be economically developed as a port. The expansion of the current facilities in Bethel will concentrate activity and push out existing users.	Other alternatives to Bethel were considered, but eliminated from further evaluation as described in Table C-15 in Appendix C. Ultimately, there would be less impact to the environment by making use of existing infrastructure at the Bethel Port rather than creating a port in an undeveloped area. Additional rationale has been added to Appendix C. Currently when barges use the existing infrastructure they push against the beach and block a large amount of the navigation channel. The proposed expansion of the Bethel

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		Yard Dock would reduce blockage of the channel because barges would moor alongside the dock instead of the existing practice of pushing against the beach perpendicular to the river (see Final EIS Section 3.5.3.2.2). It appears the additional barge activity could be accommodated without forcing out existing users (see Final EIS Section 3.23.2.2.2). Note that any actions that would occur at the Port of Bethel at the Bethel Yard Dock are not part of the proposed action, and are considered connected actions pursuant to NEPA (40 CFR 1508.25). At this time, it is not known that connected actions would occur. However, connected actions are analyzed for some resources in or near the Bethel Yard Dock in the context of resource impacts in Chapter 3, Affected Environment and Environmental Consequences. See Chapter 1, Section 1.2.1, Connected Actions.
PAA 50	The Draft EIS should have given thorough consideration to alternative leaching methods to cyanide.	Alternative gold recovery methods, including thiosulfate, thiourea, bromine, and a combination of cyanide and other extracting chemicals were considered but eliminated from detailed analysis in Table C-6 in Appendix C.
PAA 51	The Corps should consider an alternative to excavate additional bedrock to a deeper basin design relative in area to match required construction of the proposed TSF dam to half its height at completion.	The suggested alternative would require excavation a large amount of material at great expense of manpower, equipment, and fuel. The excavated material would need to be disposed; an action that would create additional impacts. The benefit of this suggestion is not apparent considering the state Dam Safety permitting process will include a Failure Modes Effects Analysis and final engineering to address identified failure modes.
PAA 52	The Corps should include an impact summary of exchanging	Exchanging the site of the WRF and TSF provides no clear

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	the site of the WRF and TSF as an alternative.	environmental benefits and would likely unnecessarily complicate water management practices. In addition, because waste rock is delivered by truck and tailings by pipeline, moving waste rock a greater distance would result in more fuel consumption, more fuel-related emissions, more fugitive dust from increased hauling, and could increase the number of barge trips required to supply the increased fuel demand.
PAA 53	The Draft EIS does not explain how the Corps reached the conclusion that decommissioning the open pit would be economically infeasible, or what standards the agency was using for feasible.	Table C-12 in Appendix C provides rationale for the infeasibility of option MS-90 to decommission the open pit; additional text has been added to support this rationale where appropriate.
PAA 54	Some options in Appendix C were reviewed and approved by the cooperating agencies to be carried forward for further analysis in the EIS but were subsequently eliminated in Step 4 without sufficient justification and without cooperating agency agreement. Furthermore, Appendix C provided a list of alternatives the Corps considered and rejected prior to the Draft EIS but does not disclose or discuss the specific reasons why some of these reasonable alternatives were dismissed from further evaluation.	Initial meetings held with cooperating agencies screened the options presented in Appendix C for feasibility and benefit. A list of these options eliminated from the final set of project alternatives has been previously provided to cooperating agencies as requested. Over 300 hundred alternative options were evaluated and are documented in the EIS. Appendix C provides a thorough analysis of alternatives dismissed from further consideration. For each alternative dismissed, a rationale for elimination is provided in Tables C-5 through C-23.
PAA 55	The Corps should include geochemical characterization of potential new and existing gravel material source sites for Alternative 2.	As detailed in Section 5.2 (Impact Avoidance, Minimization, and Mitigation), Table 5.2-1, 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

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		selected if results indicate the potential for impacts to downgradient water resources.
PAA 56	Concern was expressed that the alternatives other than the proposed action are not only technologically impossible, but do not consider the financial implications for each alternative.	Alternatives were screened as detailed in Appendix C, and alternatives that were deemed financially impractical or infeasible were dismissed.
PAA 57	Additional information should be included to better compare Alternative 2 and 5A. Include a comparison of the "footprint" after the operating pond is drained during reclamation. At this point, the dry stack could be approximately half the size of the slurried TSF. The dry stack Alternative could greatly reduce risk of the dam to catastrophically fail and flood Crooked Creek and the Kuskokwim River. Compare the total volume of filtered tailings with the total volume of the slurried TSF so these numbers can be compared without referring to the prior section.	Section 2.3.6.1 text has been edited as suggested to include a comparison of the dry stack tailings pile footprint after the operating pond is drained during reclamation. Additional text has been added to compare the total volume of filtered tailings with total volume of slurried TSF.
PAA 58	The EIS should also evaluate options of incorporating both types of mine tailings disposal methods: dry stack tailings and subaqueous tailings (Alternative 2) in order to remove the majority of water from entering the tailings storage facility, and to minimize the potential contamination from an accidental breach.	The suggested option would require management of additional water than is currently proposed because less water would be trapped in the tailings, contradicting the objective for the alternative. It would also increase the complexity of the process and add costs and duplication of equipment. These duplications are compounded by the severe climate and desire to confine the operations footprint. For these reasons, the alternative is determined to not be feasible.
PAA 59	It was suggested that photos of "before and after" facilities development should be used to better display the alternatives	Figures 2.3-1 to 2.3-44 provide the best overall visual approach to understand the differences among alternatives.

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	instead of the included figures.	
PAA 60	Alternative 3A should include the use of LNG for all vehicles and trucks.	The Corps agrees that other trucks and perhaps other above ground facilities could use LNG if Alternative 3A proves commercially viable. Section 2.3.3 adequately addresses how LNG could be used to power equipment, trucks and facilities. Some clarifying wording has been added to this section.
PAA 61	The EIS should provide detailed information on the location of ancillary facilities for the proposed pipeline under Alternative 2. Include more information on material borrow sites, shoofly roads, pipe laydown areas, truck turnaround areas, HDD footprint, road footprints, and fly-in camps.	Details on the locations of ancillary facilities for the proposed pipeline, including water sources, are found in Appendix D: Pipeline Engineering Strip Maps. References to the details provided in Appendix D have been added to Chapter 2 where applicable.
PAA 62	The Corps should evaluate alternative dust suppression methods for the gravel access road, such as an impermeable, inert cap, or chip seal.	Other operational measures to control erosion and minimize dust were considered as PL-102 in Appendix C but eliminated from further evaluation in the EIS as explained in Appendix C.
PAA 63	The Draft EIS does not adequately analyze how all the proposed alternatives differ from one another in terms of potential direct and indirect impacts, and opportunities to avoid, minimize, and mitigate impacts. An in-depth analysis of alternatives that identifies the amount and types of resource loss and their interactions in the ecosystem is needed to guide the development of effective avoidance, minimization, and compensatory mitigation. This would allow reviewers to evaluate the alternatives on their comparative merits.	The Corps agrees in part. The Comparison of Impacts by Alternative tables at the end of each section provides a concise method to compare the impacts to each resource of concern. Where appropriate, additional details have been included in these tables to further highlight the differences between alternatives in terms of potential project impacts and opportunities for mitigation. Descriptions of direct and indirect effects have been described quantitatively instead of qualitatively, where appropriate and relevant.

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PAA 64	More detail is needed on the fiber optic cable installation, such as whether or not the fiber optic cable would be installed within proposed construction and operations ROW, or an additional separate ROW would be needed.	As discussed in Section 2.3.2.3.2, from the metering station, the fiber optic cable would be installed either in the trench with the pipeline or immediately adjacent to the pipeline cut to the compressor station and then, except at the two fault crossings where the pipeline and cable would be above-ground, on to the mine site (within the proposed construction and operations ROW). Additional details regarding installation of the fiber optic cable would be completed during final design.
PAA 65	Suggestions/clarifications were given for Alternative 3B: • Add location of aboveground facilities, borrow and water sources, HDD crossings, and discharge locations for Figure 2.3-40 • Describe how manual block valves would be closed in remote locations.	The appurtenances and construction techniques would be essentially the same as Alternative 2 except for the dock and fuel storage area near Tyonek already described. A description of how manual block valves would be closed in remote locations has been added to Section 2.3.4.3.

2.10 MITIGATION MEASURES

Comments related to suggestions for or implementation of mitigation measures in general terms. Specific mitigation related to specific resource issues will be addressed under that resource issue.

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MIT 1	The Corps should clarify how mitigation measures will be specified, carried out, and enforced once permitting and construction begins for each alternative. There should be a mitigation design feature reporting plan which documents whether or not such measures were carried out and if not why.	Following publication of the Final EIS, the Corps will prepare a ROD which will be the formal Corps decision on whether to issue the requested permit as proposed, a modified permit, or no permit. If the Corps determines it will issue the permit, the ROD will also identify the conditions, including mitigation. The ROD will include appropriate Donlin Gold-proposed design features, and any additional mitigation measures considered by the Corps and other agencies with permitting authority, and agreed to by the Corps. The final measures included in the ROD will then be considered part of the project by the Corps during its permitting process. If the Corps decides to issue a permit, measures for monitoring and enforcement specific to resources under the Corps' jurisdiction would be included in the Section 404/10 permit issued by the Corps. See also CWA 1. Specific recommendations for additional mitigation, monitoring, and adaptive management measures (that are not already covered by existing design features or measures in Chapter 5 or otherwise previously evaluated in Appendix C alternatives development process) have been added to Chapter 5 for consideration by the Corps and appropriate resource agencies, as reasonable and practicable.
MIT 2	Actions specified in other sections of the Draft EIS that	Specific recommendations for additional mitigation,

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	should be considered in Chapter 5 as mitigation or BMP opportunities include: • Mitigation measures that reduce fear of contamination in subsistence foods, confront disparities in hiring and workforce management, and increase the successful integration of local residents into mine operations and auxiliary activities; • Mon 18 (secondary containment of SRS) – edits to include maintenance plans; and suggestion that it fits better as a mitigation measure than monitoring and adaptive management, as it spells out a process for change rather than prescribing a specific solution; • The area around the barge landing sheet pile wall and the port site to be recontoured and revegetated; • Mitigation listed in Section 3.11, Wetlands; • Fuel dispensed to the contractors' fuel trucks on the ROW or at camp; • Wetlands are not the only resources requiring mitigation. Reference where and if stream mitigation is discussed in other Sections of the mitigation outside of Appendix M; and • Consider restoration of all mine and Jungjuk port facilities (such as the Lower CWD, ore stockpile berm / sump, SOB, and barge landing area) as possible wetlands mitigation sites, rather than just reclaiming them.	monitoring, and adaptive management measures (that are not already covered by existing design features or measures in Chapter 5 or otherwise previously evaluated in Appendix C alternatives development process) have been added to Chapter 5 for consideration by the Corps and appropriate resource agencies, as reasonable and practicable. The Corps will consider the input that was received from public comment and during the mitigation workshops to prepare the mitigation and monitoring measures assessed in the Final EIS. Mitigation suggestions for wetlands and streams are included as appropriate in Chapter 5. Important design features, Standard Permit Conditions, BMPs, and mitigation measures are also discussed in Section 3.11-Wetlands and Section 3.13-Fish and Aquatic Resources. Secondary containment of SRS was included as a potential monitoring / adaptive management measure for assessment in Chapter 5 based on updates in the revised Plan of Operations (SRK 2016a, 2016b, 2016c, 2017b) indicating two rows of sentinel / collection wells downstream of SRS pond. The need for additional mitigation would be based on performance of this system.
MIT 3	The Corps should evaluate specific comments on Table 5.2-1.	Comments acknowledged. Edits to Table 5.2-1 were made to

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	• A3. Clarify what comparison was made to determine that Alaska Native shareholders are a minority population. • A27. Work with communities to recycle and take advantage of the increased scale of materials. • A28. Biological monitoring should include fish tissue, feathers, and hair to detect any changes in contaminant concentrations. Mass stability monitoring should occur at the waste rock facility and the tailings dam in order to detect potential movement. • M1. Detail how design feature implementation will be monitored and tracked by the applicant. • M11. Cite where the 404(b)(1) analysis is located in the Draft EIS. • M22. The TSF should have an impermeable cover, not a permeable engineered soil cover. • M24. The freeboard but poses a risk to wildlife. Fencing should be considered to keep wildlife from falling into the pit. • T3. Explain how the barge operations system was designed to avoid the need for river dredging, considering the shallow river areas. • T6, T9. Barge guidelines should also include speed limits and periods of barging suspension to protect smelt and important subsistence fish and fishermen.	address specific comments or provide clarification as appropriate. Specific recommendations for additional mitigation, monitoring, and adaptive management measures (that are not already covered by existing design features or measures in Chapter 5 or otherwise previously evaluated in Appendix C alternatives development process) have been added to Chapter 5 for consideration by the Corps and appropriate resource agencies, as reasonable and practicable.

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	• T8. Air transport of the containers would eliminate risk to subsistence aquatic resources.	
MIT 4	The Corps should evaluate specific comments on Table 5.5-1. • Under feasibility / likelihood of effective implementation it would be more informative if information was provided on the potential success of the mitigation or the level of environmental lift an activity might provide. • Possible additional thought should be applied to the potential for pike, having a cultural anthropologist on staff during construction, and not using straw bales erosion control. • Those that are effective and feasible with practicability / cost considerations that should certainly move forward include using a higher level seismic event to determine stability, and using vegetative mats or root masses to facilitate revegetation • The State will work with the EIS team to identify any known requirements that would be needed, but in general many of these decisions would not be made until after the release of the Final EIS and subsequent RODs and may be pre-decisional to identify in the EIS. • Mit 24. Delete item in Final EIS. Glyceria striata can contain cyanogenetic compounds and the plant has been associated with cyanide poisoning of livestock	Comments acknowledged. Mitigation measures listed in the specified Chapter 5 table were developed for consideration by the Corps and cooperating agencies to further minimize project impacts, as practicable. The measures were developed based on analysis of project impacts and through input from federal, state and Tribal cooperating agencies, as well as the public through comment on the Draft EIS. Assessment of these measures was updated for the Final EIS to include the likelihood of implementation, effectiveness, and practicability of each measure. The agencies with potential jurisdiction for the specific measures was also updated where appropriate. Specific recommendations for additional mitigation, monitoring, and adaptive management measures (that are not already covered by existing design features or measures in Chapter 5 or otherwise previously evaluated in Appendix C alternatives development process) have been added to Chapter 5 for consideration by the Corps and appropriate resource agencies, as practicable. Edits to tables in Chapter 5 were made to address specific comments or provide clarification as appropriate.

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	in the continental US. • Mit 28. Trail users will find a way to travel the pipeline corridor regardless of signage and barriers. Signs will become a firearms target, and berms will easily be overcome. • To control dust, the dry stack tailings should be reclaimed incrementally rather than wait until closure. • 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. • Describe HAPs by their individual constituents so that mitigation strategies for pollutants may be developed.	
MIT 5	The Corps should address concerns that mitigation measures in the Draft EIS do not address worst case scenarios; mitigation measures should be designed using the strictest criteria.	NEPA requires the evaluation of reasonably foreseeable adverse effects. The basis for "reasonably foreseeable" spills scenarios evaluated in the EIS is presented for each spill scenario in Section 3.24-Spill Risk. Mitigation measures have been developed, as appropriate, based on analysis of reasonably foreseeable project impacts and through input from federal, state and Tribal cooperating agencies, as well as the public through comment on the Draft EIS. Although worst-case spill scenarios are outside of the scope of NEPA, some permitting agencies may require worst case scenario modeling and mitigation; for example, the ODPCP (Appendix R) will require Donlin Gold to be prepared for a realistic maximum oil discharge and the Alaska Dam Safety process will require analysis of a complete dam breach and

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		downstream inundation mapping.
MIT 6	The Corps should clarify the authority of the Corps and the BLM in requiring compensatory mitigation.	The Corps' and BLM's authority in requiring compensatory mitigation has been clarified in Chapter 5 and throughout the Final EIS.
MIT 7	The Corps should reevaluate and reconsider the Conceptual Compensatory Mitigation Plan included as Appendix M of the Draft EIS. Specific concerns include: • Donlin Gold's proposed Compensatory Mitigation Plan is problematic for a number of reasons, and the Corps should require more-rigorous compensatory mitigation before issuing a permit. • Compensatory mitigation information, including the development of the Compensatory Mitigation Plan, should include additional analysis, clarification, information, and ideas. • The EIS should disclose how the Corps plans to evaluate the requirements of the mitigation rule and the compensatory mitigation for the Donlin Gold Project. • The Corps should require more-rigorous compensatory mitigation before issuing a permit. • The CMP should contain a discussion on temporal impacts, the anticipated temporal loss from the proposed projects and how the applicant will address temporal loss outside of the use of mitigation banks and detail the extent of temporal loss the mitigation banks might provide.	Section 404 of the Clean Water Act (CWA) establishes a program to regulate the discharge of dredged or fill material into waters of the United States, including wetlands. Proposed activities are regulated through a permit review process. An individual permit is required for potentially significant impacts. Individual permits are reviewed by the U.S. Army Corps of Engineers (Corps), which evaluates applications under a public interest review, as well as the environmental criteria set forth in the CWA Section 404(b)(1) Guidelines, regulations promulgated by EPA. For unavoidable impacts, compensatory mitigation is required to replace the loss of wetland, stream, and/or other aquatic resource functions and area. The Corps (or approved state authority) is responsible for determining the appropriate form and amount of compensatory mitigation required. All comments on the Compensatory Mitigation Plan are acknowledged. At this time, Donlin Gold is preparing a Compensatory Mitigation Plan. See CWA 1 and CWA 4 for additional discussion of NEPA versus the CWA Section 404 compensatory mitigation process and 404(b)(1) analysis. See WET 3 for consideration of wetland functions as part of the Corps' 404(b)(1) evaluation. Section 3.11-Wetlands contains information on important design features, Standard Permit Conditions, BMPs, and

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	• The areas where long term effects or permanent effects would remain should be identified for compensatory mitigation. • At this time, the compensatory mitigation and functional assessment have not been analyzed. Discuss how Permittee Responsible Mitigation would be monitored to ensure project success in meeting standards. • Clarify if listed mitigation measures under resource sections of the EIS would be implemented as part of the compensatory mitigation plan. • Mitigation bank credits can only be used when permitted impacts are within the service area of an approved bank. Although the pipeline would traverse the service areas of two approved mitigation banks—the Su-Knik Mitigation Bank and the Pioneer Reserve LLC Mitigation Bank—the validity of credits issued by the former has been called into question. The only mitigation bank that contains the mine site within its service area, the Chuilnuk Bank, has apparently not yet been approved. Donlin Gold cannot reliably use credits from the Su-Knik and Chuilnuk Banks to offset wetlands impacts. • The CMP also identifies an in-lieu fee program, sponsored by the Conservation Fund, which offers credits in some regions of the state. In-lieu fee programs can only provide credits for impacts located within their service areas. The program's service area contains the mine site, but it is not	mitigation measures appropriate to minimizing disturbance during project activities. Language in this section has been edited, where appropriate, to clarify that these practices are not specifically indicated as compensatory mitigation.

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	selling credits while it is undergoing an audit. Obviously, the Corps cannot include credits from this program in a permit until the audit is complete. • Permittee-responsible mitigation (PRM): Because the quality of the water in the pit lake is a problem in its own right, and because the habitat created would be insubstantial, the Corps should not treat it as a substitute for degraded or destroyed wetlands. • Out-of-kind PRM projects included in the CMP (educating local communities, developing a manual on TSF restoration, etc.) should only be considered as a last resort and should not be allowed to constitute such a substantial portion of the mitigation plan.	
MIT 8	The Corps should add a commitment to the EIS for development of a mitigation implementation plan for the proposed design features, mitigation measures, and BMPs during project construction, operations and maintenance, and closure. The Corps should also consider opportunities for empowering communities in designing and implementing mitigation measures, strategies, and plans and actively engaging local communities in conducting the monitoring activities.	Specific recommendations for additional mitigation, monitoring, and adaptive management measures (that are not already covered by existing design features or measures in Chapter 5 or otherwise previously evaluated in Appendix C alternatives development process) have been added to Chapter 5 for consideration by the Corps and appropriate resource agencies, as reasonable and practicable.
MIT 9	The Corps should evaluate the use of Best Management Practices (BMPs). • Authorization under the Pipeline GP for the discharge of hydrostatic test water assumes summer discharges and no chemical additives (e.g., no antifreeze or biocides). In addition, Best Management	Suggested BMPs and comments regarding support for the Project's use of BMPs noted. As discussed in Chapter 5, the BMPs and industry standards required to comply with regulations and standard permit requirements were taken into consideration when assessing the impacts of the project. A summary of BMPs considered to assess impacts of the

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	Practices for sediment and erosion control at the point of discharge would be required. • Listing BMPs relating to preventing introduction and spread of nonnative invasive species is within the scope of this EIS. • The proposal to use the synthetic liner under the tailings impoundment is a prime example of a best practice of an environmentally responsible mine project. • Examples of best practices proposed to allow for safe management of water quality include minimization of the overall mine footprint, use of a synthetic liner underneath the tailings impoundment, and dry closure of the tailings storage facility.	project on resources are discussed under each resource in Chapter 3. A partial list of more prominent BMPs and standard permit conditions that would likely be required for the Donlin Gold Project is included in Chapter 5. Chapter 2 describes measures Donlin Gold is proposing to protect streams and other water bodies from chemical and physical pollutants (e.g., sediment). Additional information can be found in Sections 3.5 Surface Water Hydrology and 3.7 Water Quality. Information on important design features, Standard Permit Conditions, BMPs, and mitigation measures have been included as appropriate in Section 3.10-Vegetation and Nonnative Invasive Species (NNIS) for preventing introduction and spread of NNIS. Chapter 5, Section 5.3 was edited to include application of industry-standard BMPs relating to NNIS introduction, prevention, and management.

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MIT 10	Concern was expressed that analysis did not support impact level assessments. Lack of specificity and quantitative conclusions were thought to make it challenging to identify unavoidable impacts warranting mitigation.	NEPA regulations require that potential environmental impacts be discussed in proportion to their significance (40 CFR §1502.2). Impacts of potential significance are to be fully assessed in the EIS, while impacts assessed as having a lesser impact require less analysis. The terminology that was used in the Draft EIS for intensity / magnitude of impacts and the overall impact ratings are commonly used as a guideline for assessing impacts. However, in response to public comments regarding the methodology used in the Draft EIS, the Corps decided to remove the overall impact conclusions (minor, moderate, major, negligible, none) from the Final EIS. Analyses, both qualitative and quantitative (where possible), are discussed in the four context categories with appropriate, commonly used, NEPA-specific levels (intensity / magnitude, extent, context, duration). In determining which mitigation measures are practicable and appropriate for inclusion in the Section 404(b)(1) analysis and Record of Decision (ROD), the Corps will incorporate as appropriate, consideration of the potential mitigation measures presented in Chapter 5 (Sections 5.5 and 5.7) and additional public and agency comments received during review of the Draft EIS.
MIT 11	The Corps should include comparison of mitigation measures in action alternatives to impacts of the no action alternative. Without the comparison of the No Action Alternative, there is no measurable way to discuss the resulting environmental, social, economic impacts of the various Action Alternatives.	Impact analyses for the action alternatives accounted for the avoidance and minimization measures proposed by the applicant. Impacts for all alternatives, including the No Action Alternative, are compared in the EIS.

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MIT 12	The Corps should revise Table 5.2-1 to reduce unnecessary length. All design features should have been introduced in Chapter 2. Chapter 5 should instead focus on measures that are additional to those that have been incorporated into the project design.	Comment acknowledged. Chapter 5 describes the process of identifying mitigation during the NEPA, Section 404, and the BLM permitting processes, and identifies committed and suggested measures intended to avoid or minimize impacts. Design features by Donlin Gold intended to avoid or minimize impacts are included as part of this process per Chapter 5 objectives.
MIT 13	The Corps should revise the entire mitigation chapter and release for public review.	Chapter 5 provides a complete listing of design features for evaluation in the EIS as well as mitigation and monitoring measures developed for consideration by the Corps and cooperating agencies to further minimize project impacts, as reasonable and practicable. The measures were developed based on analysis of project impacts and through input from federal, state and Tribal cooperating agencies, as well as the public through comment on the Draft EIS. Major revisions to the layout of Chapter 5 is not warranted.
MIT 14	The Corps should consider installing more monitoring and shut down valves as a method to insure against a large volume spill include mitigation measures as part of the proposed pipeline design.	The recommended mitigation measure for installing more monitoring and shut down valves has been added to Chapter 5 for consideration by the Corps and appropriate resource agencies, as reasonable and practicable.
MIT 15	Additional measures should be considered for barging: • The project should provide up to date, valid bathymetry data to prevent groundings and minimize impacts. • Local knowledge should be used in transportation planning for the project. • Additional mitigation measures should be developed	As described in Chapter 5 (Impact Avoidance, Minimization, and Mitigation, Table 5.2-1), 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

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	to avoid, reduce, or otherwise mitigate impacts on aquatic resources in identified environmentally sensitive areas. • A memorandum of understanding (MOU) should be drafted to formalize an agreement (with adaptive management and potential compensatory mitigation options) between Donlin Gold and Native villages to manage use of river to avoid, reduce, or compensate for impacts on subsistence users, similar to the existing Alaska Eskimo Whaling Commission Conflict Avoidance Agreement (AEWC CAA) on the North Slope. It is important to analyze effects, both with and without this mitigation measure, in the revised EIS. • There should be a commitment from the project proponent, or a requirement from the Corps, to restrict project-related shipping to use of double-hulled vessels. Otherwise, analysis of spill risk without use of double-hulled barges should be included in the revised EIS.	in the event of groundings. The equipment will be available as part of ongoing operations, it will not all be dedicated standby equipment. Additionally, to reduce impacts on existing river traffic and potential for groundings and accidents, Donlin Gold would establish navigational aids and develop procedures for queuing in narrow channels. Donlin Gold vessels would use state-of-the-art navigation and communication equipment. The Applicant is also proposing collection of annual bathymetric data and the use of double-hull barges for both ocean and river diesel shipping. They also plan to use local knowledge by employing experienced river pilots and barge captains. The project design includes a communication program, managed under purview of the Donlin Advisory and Technical Review Oversight Committee (DATROC), 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. Ocean and river fuel barges would be double hulled and have multiple isolated compartments for transporting fuel to reduce the risk of a spill. The analysis of spill risk in the EIS is based on these design features. At this point the recommendation for an MOU similar to the AEWC CAA has not been added to Chapter 5 but there are other measures for coordination to reduce subsistence

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		impacts.
MIT 16	Mitigation measures for rehabilitation of areas and soils affected by the proposed project were suggested. • If fine-grained peat/loess mixtures in the NOB stockpile considered wetland soils, they should be segregated and re-used as growth media during wetland mitigation. • Remove road wastes to a licensed solid waste landfill and the site waste should not remain after the project is completed. All solid waste should be removed to ensure the least possible impacts from the project. • If topsoil is salvaged and re-spread, it could eliminate the need for fertilizer. • To increase the availability of soil for reclamation, composting could be instituted adjacent to the cafeteria (in a fenced or enclosed area to prevent it from becoming an attractant). Similarly, sewage sludge and wood waste can be turned into viable soil for reclamation. Using food waste and human waste in this manner would also reduce the costs of disposal. • Solid waste should be taken off site, not placed in the WRF.	Specific recommendations for additional mitigation, monitoring, and adaptive management measures (that are not already covered by existing design features or measures in Chapter 5 or otherwise previously evaluated in Appendix C alternatives development process) have been added to Chapter 5 for consideration by the Corps and appropriate resource agencies, as reasonable and practicable.
MIT 17	Any activity that could disturb/impact a contaminated site must be reviewed and generally approved by ADEC's contaminated sites program. Given this requirement and ADEC's program knowledge and experience, this type of	The assessment of mitigation measures has been reviewed and updated as appropriate for the Final EIS, including the potential jurisdiction for measures listed in Chapter 5. The Corps recognizes that the various regulatory authorities

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	mitigation should be the State's responsibility not the Corps.	involved increase the complexity of the EIS, and has been working closely with cooperating agencies to ensure that the document meets their needs. It would be the responsibility of each permitting agency to establish permit stipulations and ensure compliance. Text has also been added to Section 3.2-Soils to indicate ADEC's jurisdiction for this type of activity.
MIT 18	The EIS should further identify and describe measures for reducing and mitigating GHG emissions and climate change effects such as evaluating enhanced energy efficiency, lower GHG technology, and renewable energy. The EIS should disclose GHG reductions associated with such measures. The Record of Decision should commit to implementation of reasonable mitigation measures that would reduce project-related GHG emissions.	The proposed combined cycle, heat recovery, and cogeneration aspects of the proposed power plant contribute to GHG reduction especially compared to coal or diesel fired power plants. Carbon capture has been added as a potential mitigation measure in Chapter 5. Renewable energy was evaluated in the alternatives development process and no alternative energy sources were practical. Best management practices (BMPs) will be employed during mine operations that will contribute to GHG emission reductions. BMPs will include regular scheduled maintenance of equipment (packing replacement in compressors, etc.), use of dry vs. wet seals in compressors, use of degassing capture systems, use of leak detection systems to identify fugitive emissions, isolation of compressors from pressurized systems prior to maintenance, and implementation of procedures to reduce pipeline pressures before venting to perform maintenance.
MIT 19	Additional measures to prevent the use of PAG rock with metal leaching potential as road construction material should be implemented. • Clarify how materials that could act as sources of contamination will be verified during construction,	Donlin Gold has committed to testing material sources and not using unsuitable material for road construction (see Table 5.2-1 in Chapter 5, Impact Avoidance, Minimization, and Mitigation). Alternative sites would be selected if results indicate the potential for impacts to downgradient water resources.

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	and if there is a sampling and analysis plan for the construction materials. It is recommended that the EIS include geochemical characterization of potential new and existing gravel material source sites that would be used to construct the mine access road. • The waste rock will remain exposed to the elements in perpetuity, which is the timeframe Donlin Gold should be considering when designing waste rock facilities. Even with the designed cap being considered, in the long time frame the cover will be breached by wildlife and vegetation leading to exposure to the elements and acid drainage. • The waste rock also needs to be covered immediately to stop the formation of dust.	Specific recommendations for additional mitigation, monitoring, and adaptive management measures (that are not already covered by existing design features or measures in Chapter 5 or otherwise previously evaluated in Appendix C alternatives development process) have been added to Chapter 5 for consideration by the Corps and appropriate resource agencies, as reasonable and practicable.
MIT 20	Commenters expressed support for mitigation associated with erosion control and suggested timing and coordination of these actions as well as recommendations for additional erosion control measures should be included in project plans. • The proposed mitigation measures to develop and maintain a native species seed bank for reclamation and restoration practices and develop and implement test vegetation plots to determine potential revegetation success with native and local plant material and seeds should be put into place immediately. This could and should involve local elders and local youth, possibly in conjunction with a local college course as part of educational outreach and training. A seed bank could be nurtured through	Suggested mitigation measures and support for mitigation included in the EIS are noted. Specific recommendations for additional mitigation, monitoring, and adaptive management measures (that are not already covered by existing design features or measures in Chapter 5 or otherwise previously evaluated in Appendix C alternatives development process) have been added to Chapter 5 for consideration by the Corps and appropriate resource agencies, as reasonable and practicable.

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	a local nursery as part of promoting small business in the region. • Stream crossings, barge landing, and other areas that are disturbed could stake willows as one way to reduce erosion and simultaneously provide habitat.	
MIT 21	Additional discussion of minimization of effects and mitigation should be added for wetlands. Specific concerns include: • The 404(b)(1) guidelines prohibit issuance of a permit unless appropriate and practicable steps have been taken which will minimize potential adverse impacts of the discharge on the aquatic ecosystem. The Corps has largely deferred any action to minimize impacts on wetlands at this point, noting that minimization is part of a separate mitigation process that is "commonly not completed at the time of release of the Draft EIS for public review." 404(b)(1) guidelines additionally require minimization of the effects of unavoidable filling. When the Corps undertakes a complete analysis under Section 404(b)(1), it will be important to provide an additional opportunity for comment on substantial changes to the project necessary to minimize impacts on wetlands. • There should be efforts to identify best management practices during winter construction in wetland areas to preserve the vegetative cover over the pipeline trenches such as frost packing the trench cover in bogs and fens, cutting the trench cover in blocks, setting the blocks aside during construction and	See CWA 4 for a discussion on the role of NEPA and CWA pertinent to this project. Comments on this subject are acknowledged. Section 404 of the CWA establishes a program to regulate the discharge of dredged or fill material into waters of the United States, including wetlands. Proposed activities are regulated through a permit review process. An individual permit is required for potentially significant impacts. Individual permits are reviewed by the U.S. Army Corps of Engineers (Corps), which evaluates applications under a public interest review, as well as the environmental criteria set forth in the CWA Section 404(b)(1) Guidelines, regulations promulgated by EPA. For unavoidable impacts, compensatory mitigation is required to replace the loss of wetland, stream, and/or other aquatic resource functions and area. The Corps (or approved state authority) is responsible for determining the appropriate form and amount of compensatory mitigation required. Chapter 5 provides comprehensive lists of proposed design features and mitigation and monitoring measures developed for consideration by the Corps and cooperating agencies to further minimize project impacts, as reasonable and practicable. Summaries of the BMPs considered to assess impacts of the project on resources are discussed under each

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	replacing them over the trench fill afterwards. • Alternative 2 does not include all appropriate and practicable measures to minimize potential impacts to wetlands. Subpart H of the 404(b)(1) guidelines provides examples of actions the Corps might take to minimize adverse effects. They include limiting the solid or liquid components of material to be discharged, using lined containment areas to reduce leaching of chemicals, and capping contaminated material in place with clean material, among other things. • When the Corps undertakes a complete analysis under Section 404(b)(1), it will be important to provide an additional opportunity for comment on substantial changes to the project necessary to minimize impacts on wetlands. • Donlin Gold should be required to actively mitigate wetland vegetation communities, and use adaptive management in case any of these factors are not restored to pre-construction condition. • A mitigation bank is a viable option to provide compensatory mitigation to offset impacts to wetlands and aquatic resources. The project proponent should develop its own mitigation bank for the Donlin Gold Project. • The dam footprint and Snow Gulch should be mitigated rather than just reclaimed. • When equilibrium does occur, Donlin Gold should	resource in Chapter 3. The assessment of measures listed in Sections 5.5 and 5.7 has been reviewed and updated for the Final EIS. Specific recommendations for additional mitigation, monitoring, and adaptive management measures (that are not already covered by existing design features or measures in Chapter 5 or otherwise previously evaluated in Appendix C alternatives development process) have been added for consideration. Bog and fen wetlands are defined in the Final EIS Section 3.11; however, note that these particular descriptions of wetlands are not specifically quantified as wetland types for the project in the quantified acre tables. Note that a mitigation measures for pipeline construction in bogs and fens is identified in Chapter 5 tables for consideration.

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	be required to map the wetlands to determine final mitigation requirements. • Please describe how a pit lake replaces the functions from the loss of 878 acres of HGM flat (organic and mineral) wetlands; especially given the fact that the lake will never meet Alaska Water Quality Standards. • Clarify whether or not terminal density would be prudent to try to establish wetlands on the site at the end of operations or until 52 years after closure. • Regulating flows back to Crooked Creek should be considered in the design to adequately protect nearby habitats and environments for the expected range of conditions.	
MIT 22	The public raised concerns regarding the potential exposure of birds and wildlife to contaminants from the TSF and the pit lake and recommended that a Wildlife Management Plan be developed and implemented. Specific wildlife protection measures suggested include: • incorporating an enclosed perimeter fence, netting or other non-intrusive barriers • a cover so that birds cannot land on it • wildlife management control techniques such as hazing.	Donlin Gold proses as a design feature, development of a Mine Site wildlife protection plan (which may include elements typical to such plans as Avian Protection Plans) to identify measures to prevent birds or wildlife from accessing the TSF, the pit lake, or other mine waters. Specific recommendations for additional mitigation, monitoring, and adaptive management measures (that are not already covered by existing design features or measures in Chapter 5 or otherwise previously evaluated in Appendix C alternatives development process) have been added to Chapter 5 for consideration by the Corps and appropriate resource agencies, as reasonable and practicable.
MIT 23	In the event that monitoring of SRS wells indicates groundwater contamination, it should be mitigated and	This measure has been added to Chapter 5 for consideration by the Corps and appropriate resource agencies, as

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	steps taken to prevent further contamination.	reasonable and practicable.
MIT 24	Additional measures to reduce potential fish impacts should be required. • Barges should stop going up river when the smelt are spawning (May), until the spawn is over to reduce impacts on smelt. • There is a limited period during the summer to fish for salmon. Consider ceasing barge traffic when ADF&G provides the opening. • Apply dust palliative as additional requirement to help minimize dust on all access roads. • Describe measures, such as screening, that would be implemented to minimize impacts to fish. Including the following additional mitigation measures: establishing water withdrawal rates, timing of water withdrawal to avoid fish migration, spawning, and incubating eggs. • Typical work window for protecting anadromous fish is May 15 to July 15. This is the period typically after eggs have hatched and before new eggs are deposited. The majority of construction is planned for the winter which would be outside of this work window. The EIS should either clarify or explore other methods to minimize adverse effects. • Place the discharge points higher in the drainage such as at Queen Gulch, Lewis Gulch, or American Creek. Analysis should be conducted to determine	Specific recommendations for additional mitigation, monitoring, and adaptive management measures (that are not already covered by existing design features or measures in Chapter 5 or otherwise previously evaluated in Appendix C alternatives development process) have been added to Chapter 5 for consideration by the Corps and appropriate resource agencies, as reasonable and practicable. Specific mitigation measures related to flow loss in Crook Creek are described in Section 5.5 and Section 5.7 tables.

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	whether impacts on aquatic species could be reduced due by additional discharge of water into Crooked Creek. • Design and install culverts and bridges for fish passage on transportation routes. • Mitigation Planned in the case of greater reductions in stream base flows.	
MIT 25	As a mitigation measure, identify and resolve ownership of pending Alaska Native allotments that were applied for within any of the proposed projects and erroneously conveyed to the State of Alaska.	Recommendation for mitigation noted. Identification and resolution of pending Alaska native allotments that may have been erroneously conveyed to the State of Alaska and are on lands potentially affected by the Proposed Project should be resolved between the State and BLM prior to final permitting actions by both parties.
MIT 26	Buried transmission lines may be considered to reduce visual impacts and preserve the viewshed of the natural landscape.	This measure has been added to Chapter 5 for consideration by the Corps and appropriate resource agencies, as reasonable and practicable.
MIT 27	Concerns were expressed regarding regional hazardous materials spill and emergency response capacity as well as the development of hazardous spill response plans. The EIS should include a commitment for the project proponent to work with the local communities to develop regional response capabilities and response plans for accidental releases and spills of LNG, cyanide, mercury, and mine tailings. Spill response planning should include training local responders, engaging in community response exercises, prevention, and monitoring. The City of Bethel lacks capacity to respond spills and does not have the necessary	Spill response plans, including training, are required by the State of Alaska and will be finalized after the NEPA process. Donlin Gold has developed draft response plans that are appended to the EIS. They include measures and commitments to prevent spills, preposition equipment and train personnel to be ready for spills should they occur, and response measures that would be implemented. Additionally, Cyanide and mercury spill response planning would be components of Donlin Gold's hazardous materials management and spill plans. The applicable training, inspection, reporting, preparedness, spill prevention,

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	infrastructure to respond to emergencies like a road for crews to get to the port facility and no water pressure in proposed dock yard.	contingency planning, and emergency procedures required by RCRA and ADEC Division of Spill Prevention and Response would be implemented. Emergency response information would be provided and maintained according to Title 49 CFR 172.
MIT 28	The Corps should consider the following measures regarding mercury: • Donlin Gold should develop a detailed Mercury Management Plan to be included as part of the proposed action, recognizing the potential for human error, and the limited information on effectiveness of mitigation measures. The plan should detail the amount and disposal of the materials. • If more mercury could methylate over time, consider reducing the amount of sulfate released from the WTP.	Donlin Gold has committed to preparation and implementation of a mercury management plan (see Table 5.2-1 Design Features). Specific recommendations for additional mitigation, monitoring, and adaptive management measures (that are not already covered by existing design features or measures in Chapter 5 or otherwise previously evaluated in Appendix C alternatives development process) have been added to Chapter 5 for consideration by the Corps and appropriate resource agencies, as reasonable and practicable.
MIT 29	The Corps should consider implementing review panel recommendations and other practices as potential mitigations for avoidance of tailings dam failures. The Corps should include the FMEA and an adaptive management plan resulting from the FMEA process in the EIS to address contingencies relative to not only tailings dam stability concerns, but other environmental concerns. The Final EIS also needs to evaluate the impacts caused by any tailings dam failure to adhere to the Mount Polley expert recommendations.	Implementing pertinent Best Applicable Practice (BAP) recommendations from the Mount Polley review panel have been added to Chapter 5 for consideration by the Corps and appropriate resource agencies, as reasonable and practicable. In some cases, Mount Polley review panel recommendations are captured in current project design elements, in other cases, panel recommendations are captured in mitigation measures to be considered. Completion of a Failure Modes Effects Analysis (FMEA) is required by the State of Alaska Dam Safety Regulations and will be conducted after the NEPA process.

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MIT 30	Develop new technologies for mitigating the tailings storage facility in perpetuity to safeguard against accidents and failures. Construct the dam in a way that is impermeable and be able to withstand a millennium of natural forces and human activity.	Comment acknowledged. Specific recommendations for additional mitigation, monitoring, and adaptive management measures (that are not already covered by existing design features or measures in Chapter 5 or otherwise previously evaluated in Appendix C alternatives development process) have been added to Chapter 5 for consideration by the Corps and appropriate resource agencies, as reasonable and practicable.
MIT 31	More adequate and additional mitigation measures should be included to address Hydrology concerns. • If streams are too large for isolation methods, HDD should be used for pipeline crossing. If HDD cannot be used because of a technical reason, then the EIS should describe the effects and mitigation if a large stream is open cut. • The Corps should work with the State, USFWS, and Donlin Gold to establish minimum flows in Crooked Creek. • Describe the mitigation options for a high conductivity scenario. • Given the uncertainty with regards to the streamflow reduction in the middle reach of Crooked Creek, the EIS should discuss potential mitigation measures specific to changes in stream flow whether they be positive or negative. The EIS should implement a plan to discharge treated waste water in locations that would mitigate flow losses.	Specific recommendations for additional mitigation, monitoring, and adaptive management measures (that are not already covered by existing design features or measures in Chapter 5 or otherwise previously evaluated in Appendix C alternatives development process) have been added to Chapter 5 for consideration by the Corps and appropriate resource agencies, as reasonable and practicable. • HDD is proposed for large streams. In the event that alternative methods would be required, State permits would maintain protective restrictions for mitigating any water quality or habitat impacts. • Establishment if minimum flows are included in Chapter 5 as mitigation to be considered by the Corps and State agencies during permitting. • Effects on Crooked Creek flow are discussed in detail in Section 3.5, and potential mitigation and adaptive management measures to maintain flow are described in Chapter 5. • Relocation of the treated water discharge point is addressed in Chapter 5 as a potential mitigation

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	• To avoid water reduction in Crooked Creek between Snow Gulch and Anaconda Creek, the discharge point for treated water should be relocated higher in the watershed above the mine. • If the water treatment plant cannot be used to regulate flows back to Crooked Creek during winter, consider the feasibility of creating a flow regulation reservoirs, or use Snow Creek for this purpose. • Describe how flow mitigation will be done during the winter months.	measure to be considered by the Corps and State permitting agencies. • Seasonal effects on flow in Crooked Creek are discussed in Section 3.5, and potential mitigation and adaptive management measures for maintaining flow are included in Chapter 5 for consideration.
MIT 32	The Corps should include mitigation measures specifically designed to protect eiders and Cook Inlet beluga whales.	Chapter 5, Impact Avoidance, Minimization, and Mitigation, (Table 5.2-1) currently includes measures designed to protect eiders and Cook Inlet beluga whales, such as: ocean and river fuel barges would be double hulled and have multiple isolated compartments for transporting fuel to reduce the risk of a spill. Specific recommendations for additional mitigation, monitoring, and adaptive management measures (that are not already covered by existing design features or measures in Chapter 5 or otherwise previously evaluated in Appendix C alternatives development process) have been added to Chapter 5 for consideration by the Corps and appropriate resource agencies, as reasonable and practicable.
MIT 33	The Corps should consider the use of raincoats to cover stockpiles and reduce potential seepage of contaminants.	The use of raincoats for covering stockpiles or other areas expected to produce runoff to reduce potential seepage of contaminants has been added to Chapter 5 for consideration by the Corps and appropriate resource agencies, as reasonable and practicable.

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MIT 34	A spill response plan should be developed to include environmentally sensitive areas for wildlife protection. These areas should be mapped along with spill fate models to identify where spills would likely go and where environmentally sensitive areas overlap so that emergency response equipment and responders are prepared and ready to arrive on the scene. This would include Kuskokwim Bay and the Kuskokwim Shoals.	Spill response plans are required by the State of Alaska and will be finalized after the NEPA process. Donlin Gold has developed draft response plans that are appended to the EIS. They include measures and commitments to prevent spills, preposition equipment and train personnel to be ready for spills should they occur, and response measures that would be implemented. Environmentally sensitive areas are outlined in subarea contingency plans available on ADEC's prevention preparedness and response website (see the Western Alaska Subarea Contingency Plan (February 2013) available at http: / / dec.alaska.gov / spar / PPR / plan.htm).
MIT 35	The Corps should include mitigation measures specifically designed to minimize impacts to subsistence resources and users and a commitment by the project proponent to work actively and engage the local communities on opportunities to improve access to subsistence resources during the active life of the mine. For example, a local subsistence board could serve to advise the project proponent of potential conflicts with access to subsistence uses and recommend improvements to mine operations that would avoid and minimize subsistence conflicts.	Donlin Gold's surface use agreements with Calista and TKC include the Donlin Advisory and Technical Review Oversight Committee (DATROC). Donlin Gold will establish a subsistence subcommittee under the DATROC to provide an additional communication pathway between subsistence users in the YK Region and Donlin Gold. The full scope and responsibilities of this subsistence subcommittee will be developed in time but will include: • Working in conjunction with the DATROC Barging Subcommittee 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; • Encouraging the inclusion of traditional ecological knowledge into the function and activities of the

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		subcommittee; • Contributing 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; • Supporting development of an information-sharing framework to efficiently and effectively share results of monitoring data with local subsistence users; and Supporting development of a mechanism to share other project-related technical information at a practical level for local subsistence users (e.g., discussing the science of contaminant exposure). Specific recommendations for additional mitigation, monitoring, and adaptive management measures (that are not already covered by existing design features or measures in Chapter 5 or otherwise previously evaluated in Appendix C alternatives development process) have been added to Chapter 5 for consideration by the Corps and appropriate resource agencies, as feasible and practicable.

2.11 BONDING, ESCROW, RESTORATION, AND RECLAMATION

Comments related to reclamation activities, bonding, and setting up escrow funds for restoration. Mechanisms for in-perpetuity post-closure actions (i.e., plan for permanent water treatment, the responsible entity, or who would pay for post-closure secure financing in perpetuity).

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BER 1	The Corps should clarify the State's role in the project bonding and financial assurances to protect the area. The Corps should not issue a permit if the State cannot prove that it can develop, implement, and monitor activities as planned.	Mine site financial assurance plan would be required by the State of Alaska prior to beginning construction. Financial Assurance information is located in Appendix A - Financial Assurance, and Appendix AA - Additional Regulatory Information.
BER 2	The Corps should provide more detailed analysis of the financial assurances. Three major permits depend on the analysis of the financial assurance, but this analysis is not included in the EIS process and should be.	The Corps acknowledges the concern that the final financial assurance amounts are not determined at the time of a NEPA analysis. The information will be refined as the EIS is finalized and as the agencies responsible for approving the financial assurance amount review the costs and make their final permit and approval decisions. In addition, a NEPA review must analyze effects under the assumption that permitting requirements are complied with. Financial Assurance information is located in Appendix A - Financial Assurance, and Appendix AA - Additional Regulatory Information.
BER 3	The Corps should reexamine Donlin Gold's ability to develop, operate, and maintain the mine, including their financial responsibility for long-term monitoring or to correct a major environmental problem such as a dam breach. The discussion should include the possibility of gold falling below the break-even point for the company and the ability to pay for a disaster in that instance, and the potential	When a permit application is filed, the Corps considers it viable and makes a determination based on the proposed action. The agencies with authority to require financial assurances (the State of Alaska and the BLM) will determine the amount of such assurances after the release of the Final EIS.

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	of investor withdrawal.	
BER 4	The Corps should clarify the issue of reclamation and closure of the mine. Having the information spread through various resources makes it difficult to review the closure components and impacts. It is recommended to include an appendix with the Reclamation and Closure Plan to alleviate this difficulty.	At the time the Final EIS is issued, the Reclamation and Closure Plan would be in draft form, and therefore not included as an appendix. The draft Plan of Operations: Reclamation and Closure Plan (June 2015) is available on the project website, www.DonlinGoldEIS.com. A final Plan will be approved by the agencies prior to project commencement.
BER 5	The Corps should clarify the legal responsibilities of reclamation and possible cleanup if Donlin Gold does not meet their responsibilities (e.g., operators, taxpayers, land owners, the State).	Refer to Section 2.3.2 and Appendix A for information on the role of the State of Alaska and BLM regarding financial assurances. The bond and trust fund amounts and mechanisms proposed by Donlin Gold would need to be reviewed and approved by these agencies that have final authority. A NEPA review analyzes effects under the assumption that permitting requirements are complied with.
BER 6	The Corps should clarify who would cover the costs of long-term monitoring and treatment through bonding after the mine closes. Discuss other mines that have treatment in perpetuity and disclose that this is Alaska's first mine to do so.	Regulations require that the financial assurance established for post-closure activities must be adequate to cover the costs of performing reclamation and post-closure monitoring and maintenance. Refer to Section 2.3.2 for information on the role of the State of Alaska and BLM regarding financial assurances. A NEPA review analyzes effects under the assumption that permitting requirements are met and held. Advanced water treatment technologies, and water management protocols, were considered in the EIS analysis for suitability, constraints, and precedents at operating mines. Other mines in Alaska (e.g., Red Dog), have post-closure

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		long term monitoring activities planned, as well as some activities that would happen indefinitely. Section 3.7.3.2.2 was edited to acknowledge the use of this technology in Alaska.
BER 7	The Corps should describe the methodology for calculating the final funding amounts for perpetual water treatment and long term post-closure reclamation and maintenance of the mine and pipeline. The amounts presented in a memo from Donlin Gold may underestimate the costs of water treatment and do not appear to extend distant enough in time (i.e., should be into perpetuity) and should build in buffers to account for unknowns. The Draft EIS should present this information, so the public can evaluate and comment on potential long-term impacts of the proposed action before the Corps renders its decision.	As stated in Section 2.3.2 and Appendix A, development of the mine site financial assurance cost estimate is an iterative process that occurs post-NEPA during permitting by ADNR and ADEC. At the EIS stage it is possible to have a range of preliminary cost estimates available for the proposed action, which is included in Appendix A, but it is not possible to present the entirety of the information that is requested. The estimated financial assurance amount associated with the Integrated Waste Management Plan and Reclamation and Closure Plan will be subject to a public review period during the State of Alaska permitting process. That is the opportunity for the public to comment on the detailed information that would be part of the calculation of the trust fund.
BER 8	The Corps should clarify the status of financial assurances for closure and reclamation and should evaluate the environmental and social impacts associated with a low probability, high consequence event of a premature mine closure.	Refer to Section 2.3.2 for information on the role of the State of Alaska and BLM regarding financial assurances. A NEPA review analyzes effects under the assumption that permitting requirements are met and held. Donlin Gold would also update and complete a Closure Social Impact Assessment three years prior to closure of any operation. In Appendix A, Donlin Gold estimates that a trust fund of $73 million would be required to create a self-sustaining fund to cover long-term post closure costs for 200 years. The

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		fund would be created from an annual contribution of $2.3 million throughout the life of the mine, so that at the time of planned closure, the trust fund would be fully endowed. The requirements for financial assurance are intended to provide sufficient financial assurance for any early closure of the mine for these specified purposes.
BER 9	The Corps should clarify the legal accountability and consequences of failure to follow permit standards.	A NEPA review analyzes effects under the assumption that permitting requirements are complied with. Potential consequences would differ for each permitting agency and depend on a variety of circumstances.
BER 10	The Corps should make clarifying edits to and about Appendix A (Financial Assurance).	Edits requested to Appendix A cannot be accommodated by the Corps, as the document presented is a memorandum written by Donlin Gold to provide preliminary estimates that will be defined in the later permitting processes. Edits requested about Appendix A were incorporated as appropriate.
BER 11	The Corps should clarify language in Chapter 1, Section 1.10.4.1 Financial Assurance.	The former Section 1.10.4.1 has been moved to Appendix AA. Text has been edited in Appendix AA as suggested to clarify the financial assurance language.
BER 12	The Corps should require that the project provide financial assurance in the event that the Compensatory Mitigation Plan (CMP) is determined to be not acceptable, as given the authority by Regulatory Guidance Letter 05-1.	This discussion would take place in the permitting phase (likely after the release of the Final EIS) and the Corps would determine at that time if financial assurance is required for any aspects of the CMP. The financial assurances would be part of 404 permitting.
BER 13	Both Barrick Gold Corporation and NovaGold Resources are Canadian corporations with a record of environmental and	The financial assurance process required by the State of Alaska and BLM will require bonding and a trust fund

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	regulation violations. The companies will leave after mining without spending the money it takes to properly close and reclaim the land. It makes more sense to have an American Company mine the gold.	adequate to close and reclaim the land. See Section 2.3.2 and Appendix A. Also, while the parent companies are Canadian corporations, NovaGold Resources Alaska Inc. and Barrick Gold US Inc., the entities that own Donlin Gold LLC, are incorporated in the United States, as is Donlin Gold LLC.

2.12 MONITORING AND ADAPTIVE MANAGEMENT PLAN

Requests for long-term monitoring plans, and / or adaptive management plans.

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MON 1	The Corps should address concerns about effects of shoreline erosion from barge traffic and how this will be monitored. • Clarify the frequency of river operations, and monitoring of river conditions for navigability. • Include information about the understanding of dynamics and changes in river bed morphology associated with discharge rates. • Include monitoring of barge speed and additional watercraft / traffic along the river.	Donlin Gold has committed to surveying critical river sections and using state of the art navigation equipment that will be capable of displaying hazards. Text edited in the tables in Chapter 5 to clarify that other agencies do not have authority to require barge traffic monitoring. Specific recommendations for additional mitigation, monitoring, and adaptive management measures (that are not already covered by existing design features or measures in Chapter 5 or otherwise previously evaluated in Appendix C alternatives development process) have been added to Chapter 5 for consideration by the Corps and appropriate resource agencies, as reasonable and practicable.
MON 2	The Corps should implement additional or more rigorous long-term wetlands monitoring over the visual and one-time hydrologic assessments made during wetland delineation.	The comment refers to the Conceptual Compensatory Mitigation Plan (for wetlands) developed by Donlin Gold (dated August 2015) and included in the EIS as Appendix M. Donlin Gold Compensatory Mitigation Plan and a complete CWA Section 404 / 10 RHA Permit application are not required by the Corps to complete the NEPA process, but versions of whatever status these documents are in will be included as an appendix when the Final EIS is published. The specifics of long term wetlands monitoring would be determined during the final CWA Section 404 permitting process. However, comments received during the Draft EIS public comment period are available to the Corps and applicant to consider during preparation of the

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		Compensatory Mitigation Plan. Specific recommendations for additional mitigation, monitoring, and adaptive management measures (that are not already covered by existing design features or measures in Chapter 5 or otherwise previously evaluated in Appendix C alternatives development process) have been added to Chapter 5 for consideration by the Corps and appropriate resource agencies, as reasonable and practicable.
MON 3	The Corps should develop a Pit Lake Groundwater Sampling and Monitoring Plan to focus on long-term, real-time water quality monitoring, sampling, and testing of the groundwater around the pit. The Seepage Recovery System should be similarly monitored. The monitoring technology should be the best available and should be revisited periodically through perpetuity. • Monitor the streambank downstream of the outfall in order to ensure erosion or other affects are identified and corrected as soon as possible. • Since the dry stack option 1 would be unlined, groundwater monitoring should be included in the requirements. • Procedures for minimization of ground water impacts should be reviewed and monitored for accidental releases. • Develop a Mine Pit Dewatering Monitoring Plan to ensure that flow reductions to Crooked Creek are being monitored in real-time as the pit is being	The development of a Pit Lake Groundwater Sampling and Monitoring Plan, and the development of a Mine Pit Dewatering Monitoring Plan have been added to Table 5.7-1A, Monitoring and Adaptive Management being Considered, for consideration by the Corps and appropriate resource agencies, as reasonable and practicable. Specific recommendations for additional mitigation, monitoring, and adaptive management measures (that are not already covered by existing design features or measures in Chapter 5 or otherwise previously evaluated in Appendix C alternatives development process) have been added to Chapter 5 for consideration by the Corps and appropriate resource agencies, as reasonable and practicable.

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	developed.	
MON 4	The Corps should clarify that monitoring would remain in place long-term.	Text has been edited where appropriate to clarify that the monitoring would occur long-term, according to the Alaska Department of Environmental Conservation (ADEC) or other appropriate permits. Monitoring is being considered by the Corps and appropriate resource agencies as reasonable and practicable.
MON 5	The Corps should specify how it will monitor the revegetation progress during the first five years after closure. Monitoring revegetation progress should include Early Detection and Rapid Response (EDRR) practices for nonnative invasive species, and described so the reader can conduct environmental impact and effects analysis for each Alternative.	Section 3.10-Vegetation and Nonnative Invasive Species discusses important design features, Standard Permit Conditions, BMPs, and suggested mitigation measures regarding vegetation removal impacts. The Donlin Gold Reclamation and Closure Plan (SRK 2017f) provides details on reclamation practices. Seeding, among other measures, is intended to initiate successional processes through which natural plant communities can become reestablished. EDRR principles are outlined in the Donlin Gold Invasive Species Prevention and Management Plan (ISPMP) in Appendix U, and discussed as appropriate in Section 3.10. Specific recommendations for additional mitigation, monitoring, and adaptive management measures regarding revegetation have been added to Chapter 5 for consideration by the Corps and appropriate resource agencies, as practicable.
MON 6	There should be some long term monitoring and maintenance to address the fact that beaver activity will resume long-term.	The comment refers to the Conceptual Compensatory Mitigation Plan developed by Donlin Gold (dated August 2015) and included in the EIS as Appendix M. The CWA Section 404 compensatory mitigation process and 404(b)(1) analysis are separate from the NEPA process. A complete Compensatory Mitigation Plan (CMP) and CWA Section

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		404/10 RHA Permit application is not required by the Corps to complete the NEPA process, but versions of whatever status these documents are in will be included as Appendices when the Final EIS is published. Specific recommendations for additional mitigation, monitoring, and adaptive management measures for wildlife (that are not already covered by existing design features or measures in Chapter 5 or otherwise previously evaluated in Appendix C alternatives development process) have been added to Chapter 5 for consideration by the Corps and appropriate resource agencies, as reasonable and practicable.
MON 7	The Corps should clarify details of the Waste Rock Facility (WRF). Specifically, whether the landfill trench within the WRF will be lined to meet ADEC landfill permit requirements, and if the entire WRF will eventually be covered with a low permeability cover. Describe monitoring for leachates and the cover integrity.	Because materials disposed of within the landfill trenches are inert, the potential for leachate is minimal. The State of Alaska would determine if lining the landfill trench within the WRF would be required when permitting the landfill. Section 3.7.3.2.3 was edited to clarify that the WRF cover would be constructed from a layer of non-acid generating rock and growth medium. It should be noted, however, that all runoff and seepage from the WRF would flow into the pit lake, and the water would be treated before discharge. Donlin Gold has developed an Integrated Waste Management Monitoring Plan (SRK 2016h) that outlines further monitoring activities of the WRF.
MON 8	The Corps should develop a Subsistence Plan and Report which would include best management practices for the mine operations to improve subsistence activities and avoid potential conflicts. The plan should also include monitoring	The suggestion measure has been added to Chapter 5 for consideration by the Corps and appropriate resource agencies, as reasonable and practicable.

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	of mine activities to ensure that subsistence resources are adequately protected throughout the active mine life and post-closure. It should be developed with input from the local subsistence users, and should include an adaptive management framework where certain monitoring activities may no longer be needed, but additional monitoring may be required based on the results of previous years' activities.	
MON 9	The Corps should clarify requirements for long-term monitoring of human health, including food consumption and exposure to methylmercury throughout the active mine life and during post-closure. Develop the monitoring plan in partnership with the ADHSS and involvement with the local native communities.	Specific recommendations for additional monitoring activities for human health have been added to Chapter 5, Section 5.7 (Monitoring and Adaptive Management), for consideration by the Corps and appropriate resource agencies, as reasonable and practicable.
MON 10	The Corps should revise the discussion on the frequency of monitoring, specific monitoring requirements, and adaptive management. A monitoring and enforcement program should be adopted and summarized where applicable. Thresholds and objectives should be clearly defined for resources, and regulating authorities defined for each measure identified in Table 5.7-1. Measures without clear thresholds or that lack specificity should be deleted from the Final EIS. Certain measures were noted as being unwarranted and unjustified based on the effects analysis in the EIS.	As part of issuing permits, the Corps or other agencies may require Donlin Gold to prepare mitigation monitoring plans, which may include elements of adaptive management, to monitor success of mitigation efforts. Plans may detail the process for making changes to or adding mitigation and monitoring as needed. A specific measure has been added to Section 5.7 (Monitoring and Adaptive Management) for consideration by the Corps and appropriate resource agencies, as reasonable and practicable, to address this concern. Chapter 5 is intended to provide a comprehensive list of all design features, mitigation measures, and monitoring developed based on analysis of project impacts and through input from federal, state and Tribal cooperating agencies, as well as the public through comment on the Draft EIS. Specific recommendations for additional mitigation, monitoring, and

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		adaptive management measures (that are not already covered by existing design features or measures in Chapter 5 or otherwise previously evaluated in Appendix C alternatives development process) have been added to Chapter 5 for consideration by the Corps and appropriate resource agencies, as reasonable and practicable. Edits to Chapter 5 tables were also made to address specific comments or provide clarification as appropriate. The criteria for assessing measures in Sections 5.5 and 5.7 has been updated and clearly defined in the Final EIS. The assessment includes the likelihood of implementation, effectiveness, and practicability of each measure, as well as potential agency jurisdiction.
MON 11	The Corps should address concerns about adaptive management policy and implementation. • Develop an adaptive management policy that would keep local people involved over the course of the project. • Clearly state adaptive management actions which would have specific triggers and parameters that put the actions into place.	As part of issuing permits, the Corps or other agencies may require Donlin Gold to prepare mitigation monitoring plans, which may include elements of adaptive management, to monitor success of mitigation efforts. Plans may detail the process for making changes to or adding mitigation and monitoring as needed. It would be the responsibility of each permitting agency to establish permit stipulations and ensure compliance. The suggestion to involve local communities in the adaptive management and monitoring process has been added to Section 5.7 (Monitoring and Adaptive Management) for consideration by the Corps and appropriate resource agencies, as reasonable and practicable.
MON 12	The Corps should clarify the term “perpetuity” in the EIS, and describe how monitoring and maintenance of the pumps	The term “perpetuity” is taken as the literal definition, “indefinite”. Regulations require that the financial assurance

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	and systems for long term would occur, and by whom.	established for post-closure activities must be adequate to cover the costs of performing reclamation and post-closure monitoring and maintenance. Refer to Appendix AA - Additional Regulatory Information - for information on the role of the State of Alaska and BLM regarding financial assurances.
MON 13	The Corps should clarify how the monitoring of the tailings dam facility and inspections would occur. Monitoring tailings dam with remote sensing devices should be identified as part of the monitoring program.	As part of issuing permits, the Corps or other agencies may require Donlin Gold to prepare mitigation monitoring plans, which may include elements of adaptive management, to monitor success of mitigation efforts. Plans may detail the process for making changes to or adding mitigation and monitoring as needed. For example, the Alaska Department of Environmental Conservation (ADEC) may require monitoring to determine compliance with effluent limits established in the Alaska Pollutant Discharge Elimination System (APDES) permit for wastewater discharges from the Donlin Gold Project. Monitoring may also be required to gather effluent and receiving water data to determine if additional effluent limits are required and/or to monitor effluent impact on the receiving waterbody quality. Opportunity for public comment on monitoring measures specific to the State of Alaska permits will be available during their formal public review periods. Monitoring activities considered as part of Donlin Gold's Proposed Action are discussed in Chapter 2. Measures listed in Section 5.7 (Monitoring and Adaptive Management) represent a comprehensive list of the monitoring and adaptive management measures identified for consideration by the Corps and appropriate resource agencies to further minimize project impacts, as reasonable

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		and practicable. The measures were developed based on analysis of project impacts and through input from federal, state and Tribal cooperating agencies, as well as the public through comment on the Draft EIS. It includes monitoring measures specific to mine facilities, including the suggested measure for monitoring the tailings dam with remote sensing devices. However, as noted Section 5.7, specific measures identified in the EIS may not be required by the federal agencies in their RODs. These measures may continue to be refined during the each agencies' individual permitting processes and the final measures would be outlined in the appropriate permit decision documents.

2.13 AIR QUALITY

Comments and concerns regarding impacts to air quality from construction, fugitive dust emissions, vehicle equipment emissions and mining activities (mercury dust). Does not include concern for impacts to climate change.

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AIQ 1	Concern was expressed that there could be negative impacts from air emissions, including Hg and other hazardous air pollutants on downwind communities or elsewhere.	A synopsis is provided at the beginning of Final EIS Section 3.8 Air Quality that encapsulates 3.8.1 Affected Environment and 3.8.3 Environment Consequences associated with various project components, including Mine Site, Transportation and Pipeline. Furthermore, these sections describe effects associated with various alternatives to the Proposed Action (Alternative 2). This analysis included a review of the direct and cumulative impacts of criteria and hazardous air pollutants in the near-field of the facility and regionally. Any project-related air emissions would be governed by a permit issued by ADEC under the Clean Air Act (CAA). The CAA is intended to establish emissions standards that are protective of human health.
AIQ 2	A Fugitive Dust Control Plan (FDCP) to include design features, mitigation measures, and monitoring of fugitive dust emissions and exposure during the active mine life and post closure should be developed and included in the EIS.	The FDCP has been added to the EIS in Appendix I, Air Quality. This document was prepared by Donlin Gold and provided as Appendix E to their air quality permit application. The air quality permit review period began on April 12, 2017 and ran through May 12, 2017, Comments on the FDCP are anticipated from that review
AIQ 3	The fugitive dust emission inventory has gaps or inappropriate control factors: • The 90% control efficiency used to estimate how much fugitive dust could be generated from	• A combination of water and chemical suppression, limiting vehicle speed, and other measures detailed are Donlin Gold's FDCP; these were researched in prior dust suppression studies (Air Science 2015d; SACI 2015) and shown to achieve target control

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	unpaved roads (haul roads and access roads), material handling (ore and waste), and maintenance equipment (dozers, graders, water trucks) and 80% control efficiency to estimate how much dust could be generated by flat surfaces exposed to wind erosion, as part of its estimate of land and air transportation construction phase emissions are overly optimistic and thereby lead to underestimation of the impacts of the project. • The wind climatology of the region was not accounted for in the fugitive dust emissions. • Emissions from the tailings pile were not included.	efficiencies. In addition, a review of EPA's BACT/LAER Clearing house (2015) for PSD BACT requirements indicate that chemical suppressants and other measures proposed by Donlin Gold can reasonably achieve the target control efficiencies. Compliance with dust control measures have been subject to permitting reviews. Visual observations will be used to assess control effectiveness (Donlin Gold 2015i). A summary of dust suppression studies, proposed dust control measures, and how compliance with the dust management plan will be monitored has been added to Section 3.8. • The assumptions in the fugitive dust estimates were compared to the Donlin Gold FDCP and wind climatology for the project site; the assumptions and estimated impacts were further revised to align with the indicated control strategies and wind climatology. • Fugitive wind erosion and mobile source hauling emissions associated with the tailings beach are included in operational emissions summarized in Table 3.8-19: Annual Mine Site Operations Phase Emissions. Increased emissions associated with the dry stack tailings, including hauling and placement/compaction, are provided in Air Sciences Inc. (2015c). The percentage increases and discussion under Section 3.8.3.7, Alternative 5A – Dry Stack Tailings, have been modified to reflect that the stated increases are above facility totals, not above emissions from the tailings beach operation under

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	• Fugitive dust emissions from the construction and operation of the pipeline should be added to the EIS.	Alternative 2. The discussion under Section 3.2.3.6 Alternative 5A – Dry Stack Tailings (of respective Soil section) also focuses on the potential for fugitive dust. • Project natural gas pipeline construction and operational emissions are included in particulate matter (PM) estimates summarized in Table 3.8-33: Annual Pipeline Construction Phase Emissions and Table 3.8-34: Annual Pipeline Operations Phase Emissions, respectively. Discussion of these emissions is provided in respective subsections of 3.8.3.3.3 Natural Gas Pipeline. Text has been added to clarify the types of activities included (dozing, grading, etc.). (See also SOL 7).
AIQ 4	Concern was expressed that the dry stack tailing option would be a poor fit for the environment.	As discussed in the response to AIQ 3, discussions under both 3.2.3.6 and 3.8.3.7, Alternative 5A – Dry Stack Tailings (same name for both, in respective Soil and Air Quality sections) describe the anticipated effects (i.e., fugitive dust) associated with this option. In addition, the fourth bullet under Mine Site Operation and Maintenance sub-section of 3.2.3.6.3 Erosion includes a variety of measures that would be implemented to mitigate erosional effects. Additional information comparing and contrasting application of the dry stack tailing option at the project site as compared with other sites in North America, esp. climatological conditions (e.g., winds / meteorology) has been added to Section 3.8.
AIQ 5	Concern was expressed about the estimated impacts from upset conditions:	• While the Corps agrees that speculative worst-case spill scenarios are outside the scope of a NEPA review, mercury spill scenarios in Section 3.24-Spill

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	• The discussion of impacts from speculative mercury spills should be removed from the discussion of foreseeable effects given that they have a low probability of happening. • Further analysis was suggested for assessing the impacts from a mercury container rupture.	Risk are estimated to range from very low to low probability, the latter of which warrant discussion. • Information has been added to Section 3.24.6.8 (Spill Scenario Impacts – Air Quality) to describe possible mercury volatilization quantities in the event of a spill.
AIQ 6	Concern was expressed that the mercury deposition modeling requires third party review.	Subject matter experts on the Corps EIS team conducted independent reviews of Donlin Gold technical source documents as part of the impact analysis, submitted questions on the models in several RFAIs (#61, 65, 73), conducted additional reviews to develop agenda issues for the December 2016 mercury workshop (AECOM 2016a, c), and participated in workshop discussions of mercury model issues with Donlin Gold modeling representatives. The mercury depositions (dry and wet) were estimated through a sequence of air quality models (Environ 2014a, 2014b, 2015) performed to simulate atmospheric transport and fate of mercury, establish baseline mercury concentration levels, and assess project impacts during construction and operations. Based on Corps SME reviews, the reports use appropriate state-of-art and EPA-regulatory proven air quality models (GEOS-Chem, CMAQ and CALPUFF) with reasonable inputs and selected settings to predict annual average mercury air concentrations and total deposition in the project area. In areas of uncertainty, conservative assumptions were typically made such that source contributions are more likely to be over-estimated than under-estimated. Additional text summarizing the approach and findings of the models has been incorporated into the

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		EIS Section 3.8.
AIQ 7	The EIS should better identify specific data sources and models, organize text, tables and/or figures for easier access to information, and reword sentences for clarity in the Air Quality Section.	The specific sections noted by commenters have been reviewed and revised as necessary to improve readability and clarify content.
AIQ 8	Potential impacts from hazardous air pollutants (HAPs) should be more thoroughly addressed in the EIS: • Additional quantified analysis of HAPs of concern other than mercury (e.g., arsenic, cyanide) should be included for all mine phases under Alternatives 2 and 5A, and the data reorganized to a style similar to the Water Quality Section that lists individual constituents. • Maps should be provided showing total deposition of individual HAPs at the end of mine life.	• Section 3.8-Air Quality primarily presents and discusses HAPs in total, rather than by individual compounds that make up the total value, in order to reduce document length. In some cases, constituents of concern such as mercury (Hg) or lead (Pb) are presented alongside the total HAPs results. HAPs emissions at the mine include 11 metals in fugitive dust and 40-60 organic and inorganic compounds in other sources. While it would be very cumbersome to report each of these HAPs in the main EIS document, additional HAPs of concern, such as arsenic and cyanide, have been added to the tables and discussion in Section 3.8. All HAPs are included in the totals and in the emissions calculation spreadsheets by Cardno (2015a) provided in the Administrative Record. • The analysis of HAPs concentrations in air is presented in Section 3.8 (Air Quality), and the analysis of HAPs deposition and concentrations on the ground is presented in Section 3.2 (Soils). Cross-references have been added to Section 3.8 to direct the reader to the deposition analysis. Predictions for end-of-mine life soil concentrations were made for selected HAPs of concern on a site-wide basis based

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		on data in the Environ (2015) deposition model for the mine, and an Air Sciences Inc. (2015a) model for the mine access road. Maps depicting total dust deposition in the top inch of soil at the end of mine life, and the predicted percent increase in the selected HAPs in watershed areas of maximum impact, are depicted in Figures 3.2-10 and 3.2-13, respectively. Implications for human health are discussed in Section 3.22, Human Health, and an analysis of HAPs metals impacts to ecological receptors is presented in Section 3.12, Wildlife and 3.13, Fish.
AIQ 9	Concerns were expressed that impact levels require clarification, or lack an analysis of quantifiable effects or combinations of effects.	The Corps has directed that summary impact levels be removed from the EIS, and that extent definitions be revisited. Summary statements have been updated accordingly following revisions to the air quality analysis.
AIQ 10	Concerns were expressed that air quality trends are not discussed in the EIS Affected Environment section as called for in federal guidance.	Tabulated data and discussion of existing air quality in the project vicinity contained in various sub-sections of 3.8.2 Affected Environment have been supplemented to include readily available information on air quality trends.
AIQ 11	Specific concerns were expressed regarding the mercury air model: • The mercury model should account for fugitive emissions from the pit lake.	• Calculations of pit lake mercury emissions flux (AECOM 2016b, Vijayaraghavan 2016) were discussed in the December 2016 mercury workshop. These are estimated to be in the range of 2 to 6 g/year. They represent less than 0.01 to 0.02 % of the TSF pond emissions during operations, and an even smaller fraction of total Hg emissions, and are considered to be negligible. • Including additional high solar radiation data and

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	• The model should be adjusted to account for the percent of time with high solar radiation, to provide a better estimate of mercury emissions from the TSF. • The model does not consider the impact of climate change and melting permafrost in the prediction of future baseline mercury deposition; this could cause increased inputs of mercury to northern rivers in the arctic and subarctic, which is likely to become progressively worse over time as the arctic becomes progressively warmer.	calculations in the mercury air model would not result in a better Hg flux estimation than that in the current model (Environ 2015) for the following reasons: 1) The daily Hg flux estimation in Environ (2015) is based on daily mean (average) solar radiation data. The daily mean solar radiation in Donlin Gold project area is predominantly in low to middle solar ranges. Thus, there is no need to assess high solar conditions. 2) Very few data are available from any existing gold-mine studies that can be reliably applied to assess Hg flux in high solar conditions. 3) Donlin Gold's estimates of Hg flux in low / middle solar ranges can be overly conservative when comparing to Eckley's studies using similar logarithmic regression equation analysis. This further reduces the need to adjust the emissions to account for high solar conditions (AECOM 2017c). • Mercury emissions from melting permafrost are considered "legacy" emissions (re-emissions of previously deposited mercury) in the global model (GEOS-Chem) and were indeed treated in the modeling to establish baseline concentrations, which were evaluated against actual observations. Legacy emissions, however, can be highly uncertain, and their impacts due to climate change even more so. The Donlin Gold region only has intermittent permafrost, so additional climate change effects are not likely to change Hg loading in the rivers in this region. The upper Kuskokwim does have continuous permafrost, and climate change could introduce

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	• Wind modeling for mercury volatilization is needed in village area.	additional bound-up Hg in frozen soils into rivers. Most would be transported downstream with suspended sediment, settling in the mainstem river temporarily and ultimately in the marine environment, where it would be unlikely to contribute a significant amount of Hg to the atmosphere through volatilization. Some could be deposited locally on riverbanks and terraces during floods, which may add a minor amount to baseline that would likely be very small compared to global and other legacy sources. • Wind and other meteorological information is included in both the regional-scale CMAQ (~20 mi x 20 mi) and CALPUFF (~300 mi x 300 mi) modeling domains in the Environ (2015) mercury air model, which cover the Crooked Creek village area. Baseline mercury and depositional data from the Crooked Creek village area are also included in the CMAQ model. Meteorological information and baseline mercury for more distant villages from the mine site are included in CALPUFF as well as the global-scale GEOS-Chem model in Environ (2015).

2.14 BARGE ISSUES

Comments related to concerns for increased barge traffic on communities from project components and phases. Erosion to riverbanks from barge traffic.

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BARG 1	Concerns were expressed about the increased levels of barge traffic that would occur under the proposed project. The Corps should consider the impacts of bigger engines and bigger props that would result in greater damage to the river. The Corps should evaluate changes to the character of the river environment and to the activities of the peoples who rely on the river, including potentially increased interference with daily lives. Barging will affect the Kuskokwim River ecosystem and the lifestyle of local residents.	The proposed tugs and barges are carefully described and the physical impacts that are anticipated from their use are carefully modeled. Model results were analyzed in Section 3.5.3.2.2, Surface Water Hydrology-Transportation Facilities. The Bethel Yard Dock expansion was also discussed in this section. Anticipated impacts as a result of barge traffic are described throughout the Final EIS in relevant sections. Note that any actions that would occur at the Port of Bethel at the Bethel Yard Dock are not part of the proposed action, and are considered connected actions pursuant to NEPA (40 CFR 1508.25). At this time, it is not known that connected actions would occur. However, connected actions are analyzed for some resources in or near the Bethel Yard Dock in the context of resource impacts in Chapter 3, Affected Environment and Environmental Consequences. See Chapter 1, Section 1.2.1, Connected Actions.
BARG 2	Environmentally sensitive areas along the barge transportation route should be identified, and additional analysis of these areas should be included in the revised EIS.	Environmentally sensitive areas along the Transportation Corridor are identified in the Final EIS such as nearshore areas at the Bethel and Angyaruaq (Jungjuk) Ports, and narrow reaches of the Kuskokwim River. Additional areas were mentioned through public comments. These areas include resident fish camp locations from Kalskag to Napaimute, fishing for salmon and non-salmon species near the Bethel Port and Oscarville Slough, and more recent

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		rainbow smelt spawning locations. Where appropriate, these areas have been added to the Final EIS in their respective sections. Note that any actions that would occur at the Port of Bethel at the Bethel Yard Dock are not part of the proposed action, and are considered connected actions pursuant to NEPA (40 CFR 1508.25). At this time, it is not known that connected actions would occur. However, connected actions are analyzed for some resources in or near the Bethel Yard Dock in the context of resource impacts in Chapter 3, Affected Environment and Environmental Consequences. See Chapter 1, Section 1.2.1, Connected Actions.
BARG 3	The barge operators should use river pilots and incorporate local knowledge about navigational hazards and changes to the river channels along the proposed barge route.	Donlin Gold would employ river captains experienced with navigating the Kuskokwim River. Furthermore, Donlin Gold has committed to surveying critical river sections and using state of the art navigation equipment that will be capable of displaying hazards. See Section 2.3.2.2.1 for information on the barge plan and the project barge plans (Appendix W).
BARG 4	Concern was expressed that analysis did not support impact level assessments.	Overall impact conclusions (minor, moderate, major, negligible, none) have been removed from the document. The analysis in all relevant sections has been evaluated and revised as appropriate.
BARG 5	The portrayal of the proposed increase in barge traffic was thought to be exaggerated in the Draft EIS. The additional barge traffic would be easily accommodated with little adverse impact. Currently, barges and other boat traffic have been safely working among each other for decades. Additionally, the Corps should not use a percentage of	Comment acknowledged. More context was added to Section 3.23-Transportation, and percentage increases were removed.

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	increase without more context to other existing traffic.	
BARG 6	The Corps should improve the description of barging activities within the EIS and more carefully describe Donlin Gold's barging plan.	The document has been edited to more clearly describe the proposed barging activities. Requested edits were made as appropriate.
BARG 7	The Corps should re-examine the relationship between barging disturbance impacts and subsistence practices in Alternative 3B.	Levels of disturbance from barges and subsistence fishing harvests are separate topics. The reduction in barge activity and disturbance between Alternative 2 and Alternative 3B is analyzed accurately in the Final EIS. As subsistence fishing effort is adaptive and would be redirected to avoid disturbances, quantitative changes in subsistence harvest levels cannot be readily extrapolated from the amount of disturbance.
BARG 8	Erosion impacts from proposed barge traffic should be more adequately described: • General concerns were expressed regarding the effects of increased barging on erosion. The Corps should direct commenters to appropriate information to address impacts of concern not readily found in the Draft EIS. • Effects of re-sedimentation and possible creation of shoals from barge-induced erosion should be described. • Provide additional justification for the duration of bank erosion effects, and More details on the long-term effects of bank erosion on river geomorphology.	• The effects of increased barging on riverbank erosion are described in Section 3.5.3.2.2, Surface Water Hydrology-Transportation Facilities. Additional text has been provided to address specific concerns as described below. • Section 3.5.3.2.2 describes the potential effects mine-related barge traffic would have on riverbed erosion and barge-induced bank erosion. Text added to include a discussion of re-sedimentation and possible creation of shoals. • The results of barge wave energy calculations indicate that barge waves would add at most 3% to the overall natural erosive forces of the river. Thus, it was concluded that barge-induced waves would not

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	• Explain whether erosion rates can be higher at higher water levels. • Baseline erosion, plus erosion from wakes and scour, should be described as additive. • Explain if downstream erosive effects can cause changes in upstream effects. The barge effects analysis focuses on the lower Kuskokwim instead of the entire watershed.	majorly impact Kuskokwim River bank erosion rates, and there would be no long-term effects that would alter river geomorphology. Text in Section 3.5.3.2.2 has been updated to include additional analyses completed since the Draft EIS (BGC 2016a, 2017g (RFAI #97); Styles and Gailani 2016). The analysis concluded that barge-induced waves would not majorly impact Kuskokwim River bank erosion rates, therefore, resedimentation and creation of shoals is not expected to occur related to increased barge traffic. • Edits were made as appropriate to address these comments. • Edits were made as appropriate to address these comments. • Erosion associated with barge-induced waves, which is considered to be minimal in the lower Kuskokwim River, would not affect Kuskokwim River bank upstream of the barge route.
BARG 9	Existing natural and anthropogenic effects on the Kuskokwim River should be discussed in greater detail to put potential effects of the project into context. • Provide additional information on baseline bank erosion conditions and more clear maps of historically eroded areas.	• Edits were made as appropriate to address these comments, and map scales improved. • As described in Section 3.5, Surface Water Hydrology, bank erosion rates were based on comparison of aerial photos from 1950s and 2001, and were estimated to be between 10 to 15 feet per

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	• Add local knowledge of baseline bank erosion at Akiak, Bethel, Kalskag, Oscarville, and Kuskokuak Slough. • Add more description of ice breakup and flood erosion, and existing vessel-related erosion, including small boats close to shore. • Revisit applicability of streambank erosion definition in introduction to this topic. • The description of Alternative 1 effects should acknowledge naturally high turbidity, sediment load, and erosive conditions of the Kuskokwim River.	year. Local knowledge of bank erosion has been added to Section 3.5.2.2.3, Surface Water Hydrology – Kuskokwim River and Ports. • Additional text was added to clarify erosion caused by breakup, flood events, and existing boat traffic. • Edits were made to clarify the primary cause of streambank erosion along the Kuskokwim River. It is applicable to describe this mechanism of streambank erosion when evaluating potential bank erosion from increased barge traffic. • Baseline conditions of the Kuskokwim River are described in Section 3.5.2.2.3 (Surface Water) and in Section 3.7.2.1.2 (Water Quality). Text has been added to Sections 3.5.3.1 (Surface Water Hydrology, Alternative 1) and 3.13.3.1 (Aquatic Resources, Alternative 1) to summarize that these effects are expected to occur in the absence of the Project.
BARG 10	Hydrological and navigational effects resulting from the proposed Bethel dock expansion should be more fully addressed. • There are existing conditions that already make this area of the river narrow and navigationally challenging (e.g., sandbar accretion on the inside of the river bend, and reinforced seawalls upstream of the proposed dock that exacerbate natural erosion processes). • Describe the effects of shoreline alteration associated with dock expansion on changes in river velocity,	• Additional information and figures have been added to Section 3.5, Hydrology (Affected Environment) regarding existing conditions near Bethel Yard Dock. Note that any actions that would occur at the Port of Bethel at the Bethel Yard Dock are not part of the proposed action, and are considered connected actions pursuant to NEPA (40 CFR 1508.25). At this time, it is not known that connected actions would occur. However, connected actions are analyzed for some resources in or near the Bethel Yard Dock in the context of resource impacts in Chapter 3, Affected Environment and Environmental Consequences. See

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	navigability, and upstream and downstream erosion and deposition patterns. • Describe channel effects from propeller wash during loading and unloading of barges. • Request for analysis by a reliable third party on the impacts the sheet pile dock and resulting altered river flow has on sediment deposition in the vicinity of the dock.	Chapter 1, Section 1.2.1, Connected Actions. • Additional discussion has been added to EIS Sections 3.5, Hydrology and 3.23, Transportation regarding effects of dock expansion on river velocity, river morphology, erosion and deposition, and navigability. • A description of effects while barges are held stationary is included in Final EIS Section 3.5.3.2.2, in the analysis of "Propeller Wash and Scour." • AECOM is the third party NEPA contractor preparing the EIS at the direction of the Corps. AECOM has conducted a review of the proposed design and associated impacts and the results are described in the EIS.
BARG 11	The modeling analysis of barge wake, bank erosion, and propeller wash should be revised: • A thorough analysis by a hydrologist who specializes in large river systems should be considered. • Descriptions of predicted bank erosion should be updated based on revised analysis in BGC (2015m, 2016). Descriptions of wave height and bank erosion are inconsistent in different sections of the Draft EIS. • Concerns were expressed that predictions of wave height and erosion are not realistic and that actual	• Modeling of wakes and propeller wash was completed using accepted engineering practice and subject to review by the Corps' EIS team experts and hydrologists at the Corps' Engineer Research and Development Center (ERDC) (Styles and Gailani 2016). • Bank erosion estimates in Section 3.5, Surface Water Hydrology have been updated based on various reports (BGC 2017g, Styles and Gailani 2016). Similar comments on other resource sections are addressed under FISH, TRAN, WET, and LAND issue codes. • A comparison between experimental and observational data in the literature formed the basis of model selection for the EIS. A summary of this

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	observations are higher than those predicted in the Draft EIS. • Explain the difference in prop scour between existing and proposed tugs more clearly. • Add more discussion of effects where barges turn and operate close to banks. The wave and bank erosion predictions were based on the navigation channel being in the center of the river. Provide a more accurate analysis of areas where the navigation channel could come closer to the bank. • Provide a more accurate analysis of downstream empty barge estimates for wave height and bank erosion, given that wastes and other cargo would be backhauled.	information has been added to EIS Section 3.5, Surface Water Hydrology. • The description of baseline vs. projected-related prop scour has been revised for clarity. • A description of prop wash effects where barges turn and operate close to banks is included in Section 3.5, Surface Water Hydrology under "Propeller Wash and Scour." This section has been revised to incorporate information received in RFAI #97 following the December 2016 Barge Technical Workshop. • Based on discussions at the December 2016 workshop, the amount of backhaul would not appreciably change the results of the wave height analysis. Wave height calculations in BGC (2007c, 2015m, 2016) provide a range of results based on two different methods and two different barge trip conditions (upriver loaded trips and downriver unloaded trips), with the downriver trips resulting in the highest wave estimates primarily due to higher vessel speed. A change from an empty downriver barge to a lightly loaded backhaul would affect the vessel speed and draft (displacement volume) input parameters in the calculations; downriver barges lightly loaded for backhaul would result in a larger displacement volume, but would be operated at a slower speed. The method with the lowest results (Weggel and Sorensen 1986) uses both of these parameters, while the method with higher wave results (PIANC 1987) incorporates vessel speed but

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	• Collection of additional field data or use of existing cross-section diagrams is recommended to more accurately estimate wave heights, especially along sensitive areas of the river; cross-sections should identify potential shipping routes with river depths and distance to shoreline to calculate wave heights.	not displacement volume, accounting for vessel shape in the water using dimensionless coefficients from the literature. Because the PIANC method produces the higher results of the two methods, would provide smaller wave estimates given a slower backhaul speed, and would not change due to vessel draft, the results for a downriver backhaul barge are expected to be within the current range of estimates. • Wave height estimates were calculated for representative communities along the river that were delineated for channel mapping (BGC 2007c; Terrasond Ltd. 2007, 2010). However, because river depths and bottom configurations are constantly changing, average depths in predictive wave height calculations are based on discharge-depth relationships using average discharge data over a 53-year USGS gauge record (BGC 2007c, 2015m, 2016). Subsequent to the December 2016 Barge Workshop, wave height results based on mid-river shipping route assumptions were re-evaluated based on actual shipping routes in RFAI #97, and related text updated in EIS Section 3.5.3.2.2 (Surface Water Hydrology, Transportation Facilities). • As described in EIS Section 3.5.2.2.3 and Table 3.5-21, cross-sectional data from river surveys were used to evaluate channel widths corresponding to minimum operational water levels along several critical sections of the river (AMEC 2014). River depth concerns would also be addressed through barge

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	• Field-verified data should replace assumptions used to determine if the river is deep enough for necessary under-keel clearance, without dredging.	operational rules based on minimum flow restrictions, and by using survey data collected during barging (see Chapter 5, Table 5.2-1).
BARG 12	The navigation channel in the Kuskokwim River changes frequently and may be too shallow at times to pass the proposed barges. The Corps should better describe the plans for barging in low water conditions especially for the known narrow and shallow areas. Dredging of the river may be needed to accommodate the river barges.	The Corps and its consultants have reviewed Donlin Gold's barging plan and determined it to be reasonable without a need to dredge the navigational channel. Potential changes in river flow due to climate change were also considered. Additional clarification of Donlin Gold's plans to resupply the mine during low water conditions and potentially relaying barges through shallow and narrow areas has been added to the document. See Section 2.3.2.2.1 for information on the barge plan, and Appendix W.
BARG 13	The fish section should note the design decision to include a natural gas pipeline to reduce barge traffic.	Section 3.13.3.2.5 in Section 3.13-Fish and Aquatic Resources has been edited to include the natural gas pipeline as a design feature included to reduce impacts to fish.
BARG 14	Under keel clearance was thought to be an important factor that may influence the risk of barge grounding.	Donlin Gold's barge fleet design factors in under keel clearance for safety and will be a factor in load planning.
BARG 15	The Corps should develop a more detailed analysis of the impact of bed scouring and as it relates to on fish spawning areas in greater detail in the EIS.	The impacts of substrate scouring along the Transportation Corridor are detailed in Section 3.13.3.2.2, and include fish injury / mortality and disturbances to incubating eggs. Additional analysis has been added to this section regarding the effects of scouring on shallow-water refugia for rearing and migrating fish near the Bethel and Angyaruaq (Jungjuk) Port Sites.

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		Information regarding mine resupply during low-flow years has been added to Section 2.3.2.2.1. In addition, Donlin Gold's Barge Grounding Response Plan has been added as an appendix to the EIS (Appendix W). The suggested mitigation measures for reducing shoreline erosion are included in Tables in Section 5.7. Note that any actions that would occur at the Port of Bethel at the Bethel Yard Dock are not part of the proposed action, and are considered connected actions pursuant to NEPA (40 CFR 1508.25). At this time, it is not known that connected actions would occur. However, connected actions are analyzed for some resources in or near the Bethel Yard Dock in the context of resource impacts in Chapter 3, Affected Environment and Environmental Consequences. See Chapter 1, Section 1.2.1, Connected Actions.
BARG 16	The EIS should state that the US Coast Guard should be notified if a barge grounds. A Barge Grounding and Response Plan should be included in the EIS.	The Final EIS lists the first step as notification of the U.S. Coast Guard in the event of a barge grounding. Donlin Gold has developed a Barge Grounding and Response Plan and it has been included as an appendix to the Final EIS (Appendix W).
BARG 17	The Corps should clarify the comparative analysis of barge impacts between alternatives in relation to the baseline, particularly the decrease of barge traffic in Alternatives 3A and 3B.	Text was edited to more clearly describe the differences in proposed barging activities.
BARG 18	Concern was expressed about the impact of proposed barge activities on subsistence resources, subsistence activities, and the subsistence lifestyle of communities along the river.	The Corps has confirmed that the underlying analysis of propeller-generated wave forces from barging was sound, per Corps' Engineer Research and Development Center (ERDC) documentation (Styles and Gailani 2016). The

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		analysis of wave impacts in Section 3.13-Fish and Aquatic Resources was revisited, and resulted in the same conclusions regarding subsistence fish resources. Additional language regarding interference with subsistence harvest activities and subsistence user travel has been added. Adaptive management measures are including in Tables in Section 5.7 regarding barging and salmon spawning.

2.15 CLIMATE CHANGE

Comments and concerns related to increased glacial discharges, less snow pack, reduced water levels in the river systems, and impacts to region. Includes air quality issues and climate change.

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CLIM 1	Concern was expressed that analysis on the impacts of climate change on the project, region, and resources was not adequate. Specific concerns include: • The Draft EIS does not explain how climate change would alter the project's impacts. • The Draft EIS disregards or downplays climate-related hazards. • The Corps should address the following potential climate related impacts in the Final EIS: ➢ How abnormally high levels of precipitation and ensuing flooding could destroy waste dumps, seepage capture systems, and mine access roads; cause impoundments to overflow and dams to be breached; and push water treatment costs over-budget or cause releases of untreated water. ➢ Possible effects of climate change on the magnitude of inflow the dams and other facilities will likely need to withstand. ➢ Assess the likelihood that bridges and culverts will collapse and that the pipeline will be exposed at	• This SOC addresses how climate change may impact resources or the project; for discussion of concerns about how the proposed project may impact climate change, please see SOC CLIM 12. Climate change analysis in this document in Section 3.26-Climate considers the effects of GHG and climate change in accordance with NEPA. At this time, the final 2016 CEQ guidelines have been rescinded. The regulatory framework may be revised. This document currently follows draft 2014 CEQ guidelines, analyzing: the potential effects of a proposed action on climate change as indicated by GHG emissions; and the implications of climate change for the environmental effects of a proposed action. The draft 2014 CEQ guidance is meant to provide greater clarity and more consistency in how agencies address climate change in the environmental impact assessment process. Agencies have discretion in how they tailor their individual NEPA reviews to accommodate the approach outlined in this guidance, consistent with the CEQ regulations and their respective implementing procedures and policies (CEQ 2014). • Disagree that the document disregards or downplays climate-related hazards. The Final EIS discloses climate-related impacts to resources in accordance

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	stream crossings under reasonable climate scenarios, and it should describe the extent of the resultant environmental impacts if structures fail during a major precipitation event. ➢ Capacity of the pit lake and the water treatment facility to sustain larger inflows from storm events and long-term climate cycles. ➢ Analyze whether warming over the life of the mine and post-closure could cause the waste rock facility to collapse [as frozen soils melt and lose cohesion]. ➢ Effects of climate change on thaw-settlement of ice rich soils lowering the western rim of the open pit and increasing the likelihood that Crooked Creek would overtop the wall during flooding. ➢ Possible ground settlement under the pipeline based on realistic climate predictions and potential for wildfires to exacerbate permafrost thaw and ground settlement. • The Draft EIS does not adequately discuss how climate change could render the environment more susceptible to the project's impacts. Climate change will alter all aspects of the affected environment, and any discussion of the project's impacts that does not recognize this altered baseline is incomplete. Examples: ➢ The Final EIS should account for the near-term vulnerability of ecosystems potentially affected by the project when assessing its impacts on biological	with CEQ 2014 guidance in Section 3.26-Climate. Supporting analysis is provided in various sections including Section 3.4-Climate and Meteorology (weather patterns and climate analysis); Section 3.8-Air Quality (GHG emissions, ambient air quality), and Section 3.2-Soils (permafrost). Water balance modeling contributing to understand hydrological systems to develop a project water management plan is discussed in Section 3.5-Surface Water Hydrology. • While climate change may cause a variety of impacts on the project, analysis is presented in accordance with CEQ 2014 guidance. Section 3.26-Climate has been organized to present Affected Environment (describes affected environment for atmosphere, water resources, permafrost, biological resources, and subsistence in the context of climate change) and Environmental Consequences (addresses the potential effects of the proposed action on climate change, indicated by the Donlin Gold Project's GHG emissions [atmosphere]; this section also addresses the implications of climate change for the environmental effects of the proposed action (water resources, permafrost, and biological resources and subsistence). It is recognized that impact analysis requires consideration of the future conditions in which the proposed facilities will operate and be maintained. Direct and indirect impacts for all three project phases, where applicable, are discussed. Other action alternatives are discussed briefly where there

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	resources. ➢ Disregards interactive or indirect effects of climate change on ecosystems (see letter for examples). ➢ Lack of adequate attention on climate-related impacts on ecosystems (see letter for examples). • Ignores cumulative impacts that could worsen the project's impacts.	are differences from the proposed action. The proposed action is analyzed quantitatively, where possible, in accordance with CEQ 2014 guidelines. • SNAP data has been applied. Impacts are discussed in the context of model limitations and assumptions. Characterization of future precipitation remains within modeled predictions with impacts analyzed accordingly • See above response. • Reasonable climate scenarios were applied. Such assessment is outside the scope of analysis as wholesale failure of structures is not predicted. • Pit lake capacity and water balance is analyzed in Sections 3.6-3.7, and discussed as appropriate under CEQ 2014 guidance in Section 3.26. • Specific scenario model would require input parameters with unacceptable levels of uncertainty. Section 3.26 provides analysis as appropriate under CEQ 2014 guidance. • See above responses on realistic climate predictions, information included in the Final EIS, and uncertainty in models. • See above responses. Models with interrelated resource-impacting perturbations increase uncertainty. • See above responses regarding both how CEQ 2014 is followed in Section 3.26, and the organization of

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		Section 3.26 (Affected Environment and Environmental Consequences). • Examples noted. Where possible, information has been clarified in Section 3.26. Where appropriate, text has been clarified in Chapter 4, Cumulative Effects, regarding potential impacts from climate change. However, only limited guidance is given in CEQ 2014 Guidance regarding how to address cumulative effects from climate change on projects.
CLIM 2	The Corps should provide clarifying edits or reorganize results and information in the Climate Change Section.	Clarifying edits have been made where appropriate. Reference to the Alaska State Greenhouse Gas Emissions Inventory 1990-2010 document has been included.
CLIM 3	Concern was expressed about analysis of emissions. The Corps should revise the approach to how emissions were addressed. Minimizing emissions should be a goal of the project. Specific concerns include: • The Draft EIS fails to disclose the emissions of the alternatives and explore options that would decrease emissions: • One type of alternative an agency should consider to reduce greenhouse gas emissions is using renewable energy. If an agency ignores an alternative that is reasonably related to the project's purpose, its NEPA analysis may be held invalid. • The Draft EIS does not compare the alternatives' Greenhouse gas emissions sufficiently to inform the Corps and the public. The Final EIS should present	• GHG analysis discussion has been clarified as appropriate in Section 3.8-Air Quality, including discussion by alternative. The document already includes GHG emissions for mobile, fugitive and stationary sources for each phase of the project, as well as biogenic emissions associated with wetlands and permafrost directly impacted by the project. The discussion of GHG emissions from alternatives has been clarified but remains qualitative. The emissions from ocean barging have been added. See CLIM 1 for discussion of CEQ climate change NEPA guidance. • Comment acknowledged. There is no record of development of and no analysis that suggests that a reasonable alternative that considered renewable energy was ignored. Alternative development

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	greenhouse gas emissions under all the alternatives, and it should clearly identify the source of that information. • By disregarding options and design features that would reduce the project's greenhouse gas emissions, the Corps violates NEPA's command to consider reasonable alternatives. See examples on page 53.	information is available in Appendix C. • Disagree. Analysis on GHGs presented in Section 3.26 is in accordance with CEQ 2104 Guidance. At this time, 2016 Final CEQ guidance was rescinded. • Disagree. There is no regulatory framework requiring NEPA consideration of reasonable alternatives in the context of GHG reduction. Options and design features have been analyzed and incorporated where appropriate. Alternative development information is available in Appendix C.
CLIM 4	The Corps should include additional analysis on project components concerning potential hydrological changes, including changes to permafrost, due to climate change.	Specific sections in Section 3.2, Soils, and Section 3.5, Surface Water Hydrology have been clarified as appropriate. Final design of project components will take place during the permitting phase. Creation of additional specific designs for project components based on modeled potential climate impacts to various resources such as permafrost or hydrology, would require assuming a level of uncertainty that is outside of standard design practice, and beyond the scope of NEPA analysis. See CLIM 1 for discussion of CEQ climate change NEPA guidance.
CLIM 5	General concern was expressed about impacts of climate change in the region.	Climate change has been acknowledged and considered in the region. Within the document, analysis of climate change impacts on various resources has been included. Analysis of the project's impacts on climate change has also been included.
CLIM 6	The Corps should revise the scale of impact assessments associated with GHG emissions.	Impact conclusion level assessments have been removed from the document. Quantitative analysis has been included

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		at appropriate scales.
CLIM 7	Support was expressed for including mitigation measures relating to impacts that may occur from climate change or to impacts from predicted climate change scenarios.	Suggested mitigation measures are noted. During the permitting phase of the project mitigation measures will be incorporated in the final design as practicable.
CLIM 8	The Corps should include more comprehensive analysis of the interaction of climate change and impacts of project water-containment features of tailings-management alternatives. Specific concerns include: • There are uncertainties not considered in the Draft EIS that could cause the pit lake to fill and overwhelm the pump and treat system. Climate change could increase precipitation by up to 25% on average but there would also be more frequent very large events, which is not considered in the Draft EIS. This pump and treat system would be required forever so all possible combinations of weather will eventually occur. • The modeling does not include climate change. The design water balance is based on a deterministic data set of precipitation running from 1940 to 2010. It is critical to consider the potential inflow to the pit lake with not just an increased average flow but with a much increased variance to account for large inflow events occurring during a wet period. • Pit lake water balance simulations should include stochastically simulated precipitation events to account for the increased frequency of what are currently low frequency events.	• Analysis of climate change impact on specific project water-containment features was analyzed in Section 3.5, Surface Water Hydrology, which acknowledges the uncertainty of climate prediction models concerning future climate and weather patterns. Text has been revised to explain uncertainty of predictions and the basis for the analysis. It is not possible or necessary to analyze all possible combinations of weather eventually occurring. A reasonable presentation of likely scenarios has been analyzed. • Comment acknowledged. See above response. • Comment acknowledged. Pit lake modeling exhibits a reasonable range of data inputs. Limitations and assumptions are discussed in Section 3.5. • See above response. • The Final EIS discusses the operating season for the water treatment plant in Section 3.5.3.2.1. The plant would operate seasonally, approximately 6 months per year. • See CLIM 10 responses regarding ADPES permitting in the context of monitoring and climate change.

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	• Pit lake simulations with climate change should also include simulations with higher groundwater inflow that could result from higher bedrock K or high-K faults and fractures. • The Draft EIS should disclose whether the closure treatment plant would be able to operate up to 12 months a year in all kinds of weather. • The Draft EIS should plan for treatment on future conditions with climate change rather than being just based on the current climate statistics.	
CLIM 9	The Corps should include analysis of project-related air travel and supply chain dynamics on GHG increases, including impacts to human health from fumes from air travel and overall contributions to climate change.	Quantified analysis of project impacts to GHG is included in Section 3.8, Air Quality. Specific calculation of aspects of GHG emissions is broken down as appropriate to meet CEQ 2014 draft guidelines for addressing climate change in NEPA (Final 2016 Guidelines have been rescinded, so at this time, the document is referencing the 2014 draft CEQ guidelines; see CLIM 1 for discussion of CEQ climate change NEPA guidance.). Discussion of air travel fumes on human health is beyond scope of current guidance.
CLIM 10	The Corps should revise or expand analysis of impacts of changing weather (e.g., increased precipitation, increased flooding, higher erosion rates, and changing hydrological patterns). Specific concerns include: • The Corps indicates that climate change should be considered in future modeling (Draft EIS, p 3.6-45, Draft EIS Table 5.7-1 #3). Long-term climatic	SNAP data have been included in predictive climate models. Analysis is presented in Section 3.26, and in Section 3.5, Surface Water Hydrology. Section 3.4, Climate and Meteorology, includes discussion of water balance modeling contributing to understand hydrological systems. Erosion impacts are discussed in Section 3.2, Soils, and in the context of various other resources including potential impacts to wetlands and impacts to transportation. As SNAP data are

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	observations at the site should be compared with climate model predictions to assess the accuracy of the predictions with respect to Donlin. • Climate change effects on the project should be included with each model update and use the most current precipitation forecasts from global climate models. If the simulations predict substantially different potential future conditions, the Corps should complete supplementary NEPA analysis to disclose to the public the potential changes and to allow the public to provide additional comment.	downscaled from global circulation models, additional predictive models applying different scenarios would not contribute greater understanding to predicted weather patterns, or potential impacts to the region or the project. Models become increasingly uncertain with each future decadal prediction; therefore additional modeling is outside the scope of NEPA as uncertainty is too great under the CEQ 2014 guidance. • A measure specifying reexamination of the applicability of key portions of the water balance model, including climate change precipitation predictions, is included in Tables in 5.7 for consideration by the Corps and cooperating agencies. • Supplementary EIS is not warranted as current analysis does not suggest substantially different potential future conditions. Information is analyzed in accordance with CEQ 2014 Guidance in Section 3.26. See CLIM 1 for discussion of CEQ climate change NEPA guidance.
CLIM 11	The Corps should provide additional analysis on the contribution to GHG emissions from any potential low probability, high consequence, spills including an ocean barge rupture at sea, river barge release, tank farm release, tanker truck release, diesel pipeline release, LNG release, cyanide release, mercury release, and a partial tailings dam failure.	Additional spill fate modeling will not be included in the document, per the Technical Memorandum from AECOM to the Corps dated August 8th, 2016 (Donlin Gold Project EIS – Response to: Enclosure 1. The U.S. Fish and Wildlife Service Request for Spill Fate Analysis on the Kuskokwim River and Kuskokwim Bay). Analysis of GHG emissions has been included in the document in accordance with the 2014 CEQ draft climate

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		change guidance. See CLIM 1 for discussion of CEQ climate change NEPA guidance. GHG analysis discussion has been clarified as appropriate in Section 3.8, Air Quality. Additional analysis on GHG emission contribution from potential low probability, high consequences spills is considered to be speculative and therefore outside the scope of NEPA analysis.
CLIM 12	Concern was expressed that analysis of the project's effects on climate change was not adequate. Specific concerns include: • The Draft EIS does not adequately address the project's contribution to climate change. • Project Emissions: • The high impact rating (more than 10% of statewide greenhouse gas emissions on 2005) is misleading because it minimizes the project's impacts by comparing them to statewide emissions more than ten years ago (when emissions were at an all-time high) and because statewide emissions do not provide a meaningful comparator for an individual project's contributions to cumulative climate effects. • The Final EIS should compare impacts to a more recent point of reference. • Given that expected damages from each ton of carbon dioxide emitted are available in the form of the social cost of carbon, and that the mine site alone could emit nearly two million tons of carbon-dioxide equivalent annually, the Final EIS should monetize the project's	• See CLIM 1 for discussion of CEQ climate change NEPA guidance. • GHG emissions as calculated and included in the document were handled in a manner very typical of NEPA reviews during the time of document development. The document adheres to CEQ 2014 Guidance; at this time, there are no approved GHG emissions reductions or climate adaption plans or policies applicable to the project. Given this absence, an applicable relevant emission inventory is included as the best frame of references. • The qualitative discussion of each alternative's GHG emissions in Section 3.8, Air Quality, clarifies relative impacts. Indirect emissions from fuel (natural gas and diesel) production has been added to Section 3.8. Sufficient information to quantify emissions from activities such as the production and refinement of fuels used to power mine operations is not available, and is not necessary to reach a reasoned decision among alternatives. A discussion of indirect emissions from electrical power used to power the compressor stations has been added.

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	potential climate-related harms. • The Final EIS must discuss the quantity of greenhouse gases that could be emitted from permafrost due to the project, as well as cumulative effects of permafrost degradation throughout the region. It refers the reader to the section on air quality for estimates of greenhouse gas emissions resulting from permafrost degradation in the project area, but that section contains no such information. • Related Emissions: • In addition to estimating a proposed action's direct contributions to climate change, agencies must analyze its indirect effects. These effects include "emissions from activities that have a reasonably close causal relationship to the [proposed] action, such as those that may occur as a predicate for the agency action (often referred to as upstream emissions) and as a consequence of the agency action (often referred to as downstream emissions)." For example, an EIS for an open-pit mine might need to analyze the downstream effects of using the resource, as well as various upstream effects. Agencies must also assess the emissions of connected actions. • The Draft EIS falls short in describing related emissions. It should fully discuss these following foreseeable emissions: 1) emissions from the Bethel Port facility, 2) emissions that could result from continuing to operate the natural gas power plant if the electrical power facilities are left intact for	• Comment acknowledged. No specific points of references were suggested. • There are no regulations or guidance on analysis on monetizing climate-related impacts. • A social carbon cost is an option that was suggested for inclusion, which has been described under CEQ guidance but is not currently a requirement of NEPA analysis; inclusions is per agency judgement as to the appropriateness of this type of analysis. At this time, social carbon cost is not considered appropriate to this project, under current 2014 draft CEQ guidance for analyzing GHG emissions and climate change in accordance with NEPA (the final 2016 CEQ guidance has been rescinded, so at this time, the document is following the 2014 guidance). Generally, such a calculation is produced separately and appended rather than included directly in a NEPA analysis. • Permafrost loss is quantified in Section 3.2, Soils, and discussed in terms of wetland indirect impacts in Section 3.11, Wetlands. Quantification of GHG emissions from permafrost degradation is given in Section 3.8, Air Quality. • Comment acknowledged; however, there is no regulation requiring agencies to analyze indirect contributions of a proposed action to climate change. • Quantification of emissions is presented in accordance with current regulations in Section 3.8, Air Quality. Additional quantification of emissions

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	maintaining the pipeline after the mine closes, 3) upstream emissions, such as those caused by generating the electricity used at the pipeline compressor station and by extracting natural gas. • The Draft EIS disregards potential emissions from a pipeline rupture or leak, even though recent experience shows that natural-gas releases are not uncommon and can have major climate impacts.	contributing to GHGs is provided in Section 3.26based on comments received on the Draft EIS, such as emissions from ocean barging. • Comment acknowledged. There is no regulatory framework for analyzing potential emissions from ruptures or leaks.
CLIM 13	Concern was expressed that potential changes in precipitation caused by climate change may alter fill rates for mine site features. Additional analysis or clarification was suggested to compare alternatives.	Climate change impacts on specific project water-containment features is analyzed in Section 3.5, Surface Water Quality, which acknowledges the uncertainty of climate prediction models concerning future climate and weather patterns. Text has been revised as appropriate to clarify uncertainty of predictions and the basis for the analysis. Additional comparative analysis on potential scenarios is not warranted given the level of uncertainty in current climate change models.

2.16 FUEL SPILL RISKS / RELEASE

Concerns about potential for fuel and oil spills or accidental releases, ability to clean up spills in various conditions, and potential impacts to resources or environment from spills or release. This category includes fuel spill risks, not hazardous materials or tailings dam.

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FSR 1	Concerns were expressed about impacts of pipeline leaks of diesel fuel and natural gas affecting the environment, land, water, salmon and other sensitive resources.	Suggested edits and clarifications added as appropriate. It is important to note that Donlin Gold's proposed pipeline in Alternative 2 would carry natural gas, which if released would have fewer adverse impacts to land, water, fish, and animals than diesel, which would be transported via pipeline under Alternative 3B. The impacts to resources in the environment as a result of a diesel pipeline are discussed in Section 3.24.6. Comments were taken into consideration when analyzing impacts. Natural gas pipeline safety, leak detection, and strain-based-design are discussed in Section 3.25, Pipeline Safety and Reliability. Spill response plans will be developed to satisfy regulatory requirements after the NEPA process.
FSR 2	Concern was expressed about risk of spills from the transport of diesel fuel and other materials to the river. Spill prevention measures should be used.	Suggested edits and clarifications added as appropriate. The impacts of potential spills are discussed in Section 3.24. Donlin Gold has proposed a variety of prevention and response measures to reduce the potential for and the impacts of spills, including the use of double hulled barges with multiple (10 per river barge) water tight compartments. Comments were considered when editing the EIS.
FSR 3	The Corps should include additional analysis of impacts from potential fuel spills from storage. Concerns were expressed that pollution could harm wildlife and habitat, by	Suggested edits and clarifications added as appropriate. The impacts to resources in the environment as a result of a diesel pipeline are discussed in Section 3.24.6. Comments

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	releasing toxic chemicals into the soil and water, with impacts occurring even after the spill has been cleaned up.	were taken into consideration when analyzing impacts. Spill response plans will be developed to satisfy regulatory requirements after the NEPA process. Donlin Gold has developed draft response plans (Terminal and Tank Farm ODPCP, and Vessel Operations ODPCP) that are included in the EIS in Appendix R. They include measures and commitments to prevent spills, preposition equipment and train personnel to be ready for spills should they occur, and response measures that would be implemented.
FSR 4	Scenario 6, for an LNG spill, should consider the facility layout of the proposed project, and where a large amount of LNG would be in proximity to a significant water body. Fuel tanks on the haul trucks are relatively small, and a release of LNG from the large storage tanks to a water body is very unlikely. Please note that an LNG fueling spill would occur on a hard surface within secondary containment.	Edits were made to Scenario 6 to describe the location of the LNG plant/storage tanks in relation to waterbodies and to clarify secondary containment.
FSR 5	Concerns were expressed regarding the regulatory standards and agencies responsible for implementing response. The Corps should include more detailed spill response plans and spill response training for local responders. Local communities are concerned that if there were to be a fuel spill, they do not have the capacity for response. A robust emergency management plan should be implemented, included definite plans for local response training.	Suggested edits were made as appropriate. Spill response plans, including training, are required by the State of Alaska and will be finalized after the NEPA process. Donlin Gold has developed draft response plans that are appended to the EIS. They include measures and commitments to prevent spills, preposition equipment and train personnel to be ready for spills should they occur, and response measures that would be implemented.
FSR 6	The Corps should adjust the spill analysis framework and impact ratings to more fully assess potential spill impacts, taking into account potential resource effects and by presenting spill risk in a way that is meaningful to the	The likelihood of a spill is a qualitative assessment based on the rate or frequency of occurrence. The rate of occurrence is a function of several factors, including operating procedures, personnel training and awareness, maintenance, and human

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	general public.	error. The methodology is used in other Corps EISs as the means for assessing the potential impacts of "reasonably foreseeable" spills as part of NEPA review.
FSR 7	Concern was expressed that a number of spill scenarios evaluated in the Draft EIS should be considered worse-case conditions, and are therefore outside the scope of NEPA.	Suggested edits were made as appropriate, and language added to clarify that some scenarios are extremely unlikely.
FSR 8	The Corps should exclude discussions of spills with either no or extremely limited environmental effects. The Spill Risk Section should be revised to explain that scenarios 3, 6, 7, and 8 are not considered in detail, and then reorganized so that the Final EIS considers only the effects of the reasonably foreseeable spill scenarios. This analysis should be limited to those resources that may be affected by the spill scenario (i.e., there may be no need to discuss visual resources, noise and vibration, socioeconomics, or environmental justice).	Suggested edits were made as appropriate; however, the section was not reorganized. Language added to clarify that some scenarios are extremely unlikely.
FSR 9	The Corps should examine a spill scenario where more than one diesel barge spills into the Kuskokwim River; concern was expressed that the Draft EIS presented the best-case scenarios for spill risks and failed to consider likely scenarios that take a hard look at the risk and consequences of a diesel spill on the Kuskokwim River.	A scenario in which more than one diesel barge spills into the Kuskokwim River would require a combination of multiple extremely unlikely events. This would not represent a reasonably foreseeable scenario. The basis for the "reasonably foreseeable" spills scenarios evaluated in the EIS is presented for each spill scenario in Section 3.24, Spill Risks.
FSR 10	The Corps should more fully analyze fuel tanker truck spill concerns. Clarify how diesel spilled on the road would remain on the roadbed.	Suggested edits were made as appropriate. The tanker truck collision under Scenario 4 was modified to clarify how diesel could remain on the roadbed. Spill response plans are required by the State of Alaska and will be finalized after the NEPA process. Donlin Gold has

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		developed draft response plans that are appended to the EIS. They include measures and commitments to prevent spills, preposition equipment and train personnel to be ready for spills should they occur, and response measures that would be implemented.
FSR 11	The Corps should include additional information and clarification on double-hulled barges and the likelihood of a spill from barge grounding.	Donlin Gold is proposing to use only double hulled barges for transport of diesel. Suggested edits were made as appropriate. Reference added to Section 3.24.3.1.2 regarding double-hulled barges. Spill response plans are required by the State of Alaska and will be finalized after the NEPA process. Donlin Gold has developed draft response plans that are appended to the EIS. They include measures and commitments to prevent spills, preposition equipment and train personnel to be ready for spills should they occur, and response measures that would be implemented
FSR 12	The Corps should include additional fate and transport modeling and analysis for diesel spills from river and ocean barging, including the areal extent and persistence under river flow conditions.	Suggested edits and clarifications were made as appropriate. Donlin Gold has developed Oil Discharge Prevention and Contingency Plans (ODPCPs) to meet State of Alaska response planning requirements and inform the NEPA process. The ODPCPs consider similar scenarios and have information related to fate and transport and the amount and placement of cleanup equipment. There are two ODPCPs; one for vessel operations and the other for the terminal and tank farm. These plans would be updated post-NEPA and prior to construction. Impact determinations using quantitative fate and transport models would not differ substantially from the impacts

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		determined using the qualitative approaches applied and would also not facilitate a better comparison of alternatives.
FSR 13	The Corps should provide further clarification of diesel spill modeling that was performed, and perform additional modeling and analysis to fully assess the impacts of potential diesel fuel spills on the Kuskokwim River.	The State of Alaska will require preparation of Oil Discharge Prevention and Contingency Plans (ODPCPs) to meet response planning requirements. Donlin Gold has prepared ODPCPs to inform the NEPA process and they consider similar scenarios to those in the EIS and have information related to fate and transport and the amount and placement of cleanup equipment. There are two ODPCPs; one for vessel operations and the other for the terminal and tank farm. These plans would be updated post-NEPA and prior to construction. Impact determinations and the ability to compare among alternatives using the qualitative methods in the EIS would not be expected to differ substantially if probabilistic modeling approaches were applied.
FSR 14	The section on spill risk is inadequate for a comparison of alternatives. • The reduction of risk from barging needs to be described more completely between alternatives. • The reduction of risk from a tailings dam failure needs to be described more completely between alternatives. • Devote substantial treatment to each alternative considered in detail for all resources. • The Corps should revise the Spills Section to address	Section 3.24 has been edited as appropriate based on comments received on the Draft EIS, and more information was added to adequately compare risk among alternatives without structural change to the document. There will not be a public review period before the Final EIS is released.

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	major issues, and then make this available for public review for at least 90 days.	
FSR 15	The Corps should provide clarifying edits concerning fuel spill risks and releases. The section on spill risk is confusing to the reader and should be reorganized.	Suggested edits and clarifications were made as appropriate. More detail on spill risks was added. Section reorganization was considered and dismissed, as there would be no new information or added value from this effort. A third-party contractor prepared the EIS and spill scenarios after reviewing the proposed project. Donlin Gold has developed Oil Discharge Prevention and Contingency Plans (ODPCPs) to meet State of Alaska response planning requirements and inform the NEPA process. The ODPCPs consider similar scenarios and have information related to fate and transport and the amount and placement of cleanup equipment. There are two ODPCPs; one for vessel operations and the other for the terminal and tank farm. These plans would be updated post-NEPA and prior to construction.
FSR 16	Clarify if dispersants would be used to respond to diesels spill from ocean barges.	Text edited to clarify that the use of dispersants in not typically considered for response to non-persistent oils.
FSR 17	The Corps should include information for spill frequencies and volumes evaluated based on spill incidents in Alaska, the United States, and abroad. Frequency and volume of reported spills at regulated facilities in Alaska should be reported by the Corps in the EIS. More quantitative analysis, including probabilistic modeling, should be included. Use a cyanide spill from 2010 at Fort Knox as an example of a real spill scenario in the spill risk analysis for cyanide.	Suggested edits were made as appropriate. Frequency and volume of materials have been edited to reflect suggested statistics. Donlin Gold has developed Oil Discharge Prevention and Contingency Plans (ODPCPs) to meet State of Alaska response planning requirements and inform the NEPA process. The ODPCPs consider similar scenarios and have information related to fate and transport and the amount and placement of cleanup equipment. Considering the relatively modest amount of diesel that would be

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		transported in any single compartment and the other proposed mitigation measures, the Corps determined that impact determinations using quantitative fate and transport models would not differ substantially from the impacts determined using the qualitative approaches applied and would also not facilitate a better comparison of alternatives. Spill response plans, including training, are required by the State of Alaska and will be finalized after the NEPA process. Donlin Gold has developed draft response plans that are appended to the EIS. They include measures and commitments to prevent spills, preposition equipment and train personnel to be ready for spills should they occur, and response measures that would be implemented. The example from Fort Knox is not applicable, as that mine uses a heap leach field for cyanide; the kind of spill that occurred there would not occur at Donlin, where there is no heap leach field and the process is done indoors and under controls.
FSR 18	The Corps should include additional quantitative assessments of spill risk potential for a variety of spill scenarios applying the use of probabilistic modeling for those assessments.	Additional information has been added to the EIS to help the reader distinguish the differences among the alternatives related to spill likelihood and potential impacts should a spill occur. With respect to the use of quantitative modeling, see the response to FSR 17.

2.17 GEOLOGY / SEISMIC ACTIVITY

Seismic risks, soils stability, permafrost, fault lines and earthquakes.

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GEO 1	Insufficient information on the location and nature of known paleontological resources is provided in Sec. 3.1 to support assessment of impacts or mitigation measures. Specific issues include: • Information on the presence of paleontological resources in the area is not available; • Known fossil-bearing localities in the McGrath quadrangle along the proposed pipeline corridor are not adequately described in the text of Section 3.1.2.3.4 (vertebrate, invertebrate, age, etc.); • Table 3.1-2 contains "X" designations top indicate data gaps, but also has "N / A" designations in other places, causing confusion; • Some areas of the proposed project footprint are designated PFYC 3b, where analysis of effects is not possible without additional field reconnaissance.	Available paleontological resource information has been reviewed, and additional information and more detailed mapping has been added to the EIS where appropriate. Additional text has been added to Section 3.1.1.2 (and / or moved up from Section 3.1.2.1.4) regarding BLM regulatory framework for assessing paleontological resource significance. Additional desktop geologic, archival, and GIS analysis has been conducted to enhance Affected Environment sections as follows: 1) information has been presented on newly reported fossil locales from Reuther et al. (2014), UA Museum of the North fossil database, and other archival sources to identify and characterize additional paleontological sites in the project area that are not already included in the EIS; 2) existing PFYC 3b and data gap designations have been revised based on the additional data reviews, USGS geologic mapping information, and Quaternary surface deposits and landforms; 3) information on fossil content, characteristics, and significance of paleontological sites presented in pipeline Figure 3.1-6 and Table 3.1-1 has been added, and those which are actually within pipeline ROW have been identified; and 4) the GIS analysis has been revised to present expanded map figures of PFYC values, fossil locations, and geologic information in the mine area, transportation corridors, and pipeline. Environmental Consequences (Section 3.1.3.1.3) have been revised based on results of additional data compilation and

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		mapping.
GEO 2	The Corps should include additional analysis of the presence of faults within the region, and potential impacts on the proposed project. Specifically, the following issues should be further considered: • The potential presence of active splay faults in the region; • The potential presence of active blind faults in the region; • Consistency in the definition and designation of "active" vs. "inactive" faults; and, • The incorporation of newly available high resolution imagery data (available through the National Geospatial-Intelligence Agency) in the evaluation of faults.	Research and documentation of active faults in the vicinity of the proposed project identifies the Denali-Farewell Fault approximately 150 miles to the southeast of the proposed project site as the nearest "active" fault system, showing evidence of surface movement within the Pleistocene and Holocene (<15,000 years BP). The age of the Iditarod-Nixon Fork Fault 15 miles from the mine site is considered questionable; however, this fault was treated as active in the seismic hazard analyses (Section 3.3.3.2.1, Earthquakes) based on seismicity in the subsurface that may be associated with it. While there are multiple fault traces nearer to the proposed project site, including the Donlin Fault, these features are not considered to be seismically active at the surface. Text has been edited in 3.3.2.1.1 to clarify. There is no indication in available literature that "blind" or otherwise unknown faults are present in the vicinity; however, newly available imagery provided by the NGIA and publicly available online has been reviewed, and interpretation of that imagery in the context of faulting in the proposed project vicinity has been added to Section 3.3. In addition, as discussed at the December 2016 Mine-Water Workshop, a possible short fault along Crooked Creek will be the subject of further field study by Donlin Gold during final design.
GEO 3	Information on the potential impacts of earthquakes on proposed project facilities should be clarified. Specifically, the following issues should be addressed:	• Text has been edited in Section 3.3.2.1.1 to provide context in describing seismicity of the project areas to other parts of Alaska.

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	• More accurately describe the relative seismicity of the proposed project region relative to other locations within Alaska; • Provide information on the TSF and pipeline design criteria regarding earthquake magnitude, preferably based on the commonly understood Richter Scale; • Consider using a more conservative probabilistic method-determined MCE (10,000-year event) as the MDE for the proposed project versus the currently applied MDE modeled through deterministic means (5,000-year event).	• Discussion of the classification of earthquake magnitude has been added to Section 3.3.2.1.1, and reference to earthquake design elements specific to earthquake magnitude have been added to Section 3.3.2.1. Magnitudes are presented in Moment Magnitude Scale consistent with current practice (Richter Scale is not typically applied to earthquake study).Additional information has been added to Section 3.24.7 (Spill Risk – Impact Reducing Measures) on pipeline earthquake design magnitudes. • As discussed in the December 2016 Mine-Water Workshop, both the probabilistic and deterministic methods have been used to develop the MDE for TSF dam design, consistent with ADNR Dam Safety permitting guidelines. Text has been edited in Section 3.3.3.2.1 to clarify methods and earthquake magnitudes.
GEO 4	Paleontological resources are covered by specific regulations and policies, and should be presented as an independent section in the EIS. Additional clarification should be provided on the applicability of federal and State regulations to paleontological resources on private lands.	The existing section providing information on paleontological resources has been renamed to include the additional resource ("3.1 Geology and Paleontology"), so that the information can be more easily found, yet retained as independent subsections, without renumbering the entire Chapter 3 sections, figures, tables, and callouts. There are a number of independent EIS examples where paleontology is included effectively as a subsection under geologic resources (e.g., ASAP, Pt. Thomson, Ruby Pipeline). Clarification on the scope of federal and State regulations regarding protection of paleontological resources on private lands has

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		been added to the regulatory context section for paleontology.
GEO 5	The assignment of magnitude of cumulative impacts from the proposed project on paleontological resources, and the characterization of resource importance should be revised. Specifically, the following issues should be addressed: • Possible inconsistency in the assignment of "minor cumulative impacts under Alternative 2, but "moderate" cumulative impacts under Alternative 4; • Possible underestimation of "minor" cumulative impacts assigned to Alternative 2 based on the overall size of the project; and, • Possible overestimation of gravel resource importance in the context of resource accessibility.	The Corps has determined that overall impact summary levels be removed from the document, and that extent definitions be revisited. Summary statements have been updated accordingly.
GEO 6	Additional information regarding post-closure stability of the pit walls and TSF should be provided, including the following specific items: • Information on potential unstable soils that could cause slope failure at the TSF; • Clarification of responsibilities under the Reclamation Plan specific to ADNR review and approval of 5-year updates; • Build out dimensions of the tailings dam; and • Clarification that rock used to fill the CWD is non-acid generating.	All overburden and unstable soils within the TSF dam footprint would be excavated to bedrock prior to dam foundation construction, and would not present a concern for TSF dam failure (see Sections 3.2.3.2.1, 3.2.3.2.2, and 3.3.3.2.1). Text has been added to Section 3.3.3.2.2 (Slope Stability, Mine Site) to address stability of side slopes beneath the TSF impoundment area. Additional language has been added to Section 3.3.3.2.2 to reference 5 year review process. Table 3.3.2 has been expanded to show build out dimensions of all proposed dams, including TSF dam and water dams. Text describing planned closure of CWD sites has been supplemented to indicate that no potentially acid generating (PAG) rock will

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		be used as backfill.
GEO 7	Consider whether impacts to paleontological resources should be designated as regional rather than local in extent; and, whether impacts to Kuskokwim River banks will be low intensity.	The geographic extent of potential impacts is based on criteria presented in Table 3.1-3, with local defined as "limited geographically; discrete portions of the EIS Analysis Area affected," and regional defined as "affects resources beyond a local area, potentially throughout the EIS Analysis Area." Based on those definitions, potential impacts to paleontological resources are considered local from the perspective of the overall EIS Analysis Area. The areal extent of disturbance to potential fossil-bearing geologic formations at the mine site or along the proposed pipeline corridor may locally affect paleontological resources within those formations; however, it is not expected that paleontological resource disturbance would be more than local. The intensity of potential effects of barge traffic on Kuskokwim River banks are expected to be low, particularly relative to natural processes (river flooding and ice movement).
GEO 8	An erroneous reference is present in Section 3.1.2.1.2 and in associated Chapter 9 text in relating to mineralization conditions in southwest Alaska. Reference should be removed.	The reference citation regarding mineralization in Southwest Alaska has been corrected to identify the original source.
GEO 9	Characterization of "long-term" as a duration of "several seasons" with regard to cleanup of spills impacting bedrock should include cited documentation, or otherwise be clarified.	Text in Section 3.24.6.1 has been clarified to remove subjective characterization of "long-term" as equivalent to "several seasons."
GEO 10	At the location of the waste rock storage facility, existing soil core data may not adequately characterize ground stability	Geotechnical analysis of bedrock underlying the proposed waste rock storage area are adequate to support preliminary design as outlined in WRF Facility Design, Final Report

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	to the depth necessary to support final design.	(BGC 2011b). Additional field investigations are currently planned by Donlin Gold at the mine site as part of final design.
GEO 11	Additional explanation of the mitigation of major impacts through final design should be provided. Specifically: • Clarification and reassignment of lower magnitude and intensity designations should be considered where design and/or mitigation plans effectively eliminate environmental effects; and, • Clarification of permit-required mitigation that will occur to prevent erosion of unconsolidated material.	Definitions of Magnitude of Intensity levels for geohazard effects (Table 3.3-1) have been removed Clarification has been added to Section 3.1.3.2.2 to reflect permit-required mitigation that will occur to prevent erosion of unconsolidated materials.
GEO 12	An error in the stated areal extent of weathered bedrock excavation within the TSF dam footprint in Section 3.1.3.2.2 should be corrected. The TSF dam footprint is less than the 2,400 acres stated.	The error in the extent of weathered bedrock excavation planned for the TSF dam has been corrected in Section 3.1.3.2.2.
GEO 13	Include the location of existing and proposed borrow sites on an aerial map. Include a table that includes information regarding each borrow site, such as area, depth, volume of gravel material, etc. similar to Table 2.3-9, as an example. Also, conduct geological characterization of the quality of the rock material for PAG and potential ARD/ML, Hg, and As.]	Material sites are shown on Figure 2.3-12, and in Appendix D, and site-specific information on volume, material type, area, etc. is provided in Table 2.3-9. Cross references to this information have been added to Section 3.1.2.1.3. As outlined in Table 5.2-1, evaluation of material sites for ARD and metals leaching potential will be conducted prior to use of borrow material.

2.18 GROUNDWATER IMPACTS

Impacts to groundwater systems and aquifers from tailings, (transportation of groundwater – how it moves underground).

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GRD 1	Concerns were expressed about the limitations of the groundwater model used to the predict behavior of the shallow aquifer and losses from Crooked Creek: • As the groundwater pressure head in the bedrock drops below the bedrock, an unsaturated zone may develop in the bedrock while the shallow aquifer remains saturated and functions as a perched aquifer. The groundwater model MODFLOW is not capable of simulating certain dewatering conditions in bedrock, and may be inadequate to predict seepage pathways from waste facilities. There could be transport of contaminants from the TSF and WRF to streams. • The actual thickness of the shallow aquifer may vary from that assumed in the model. Explain how this would affect model predictions.	Additional information is provided and descriptions have been provided in the EIS as follows: • The groundwater model has insufficient vertical resolution to simulate a hypothetical perched aquifer in non-lithified materials (BGC 2017b). However, a combined analysis of groundwater flow in the bedrock aquifer, plus an analysis of the surficial hydrogeology of the site, has been conducted in order to predict potential seepage pathways from the WRF. In bedrock, the model results show that groundwater gradients, and thus groundwater flow directions, are towards the pit from the WRF (BGC 2014c, Drawing 50 and BGC 2017b). In the non-lithified deposits, drainage and shallow groundwater flow directions, would be controlled by local topographic relief and the location of the WRF relative to the American Creek valley and contributory drainages. BGC (2017b) also shows that the destination of seepage water from the WRF would be to the pit or pit lake and not to Crooked Creek. • Clarifying text has been added to Section 3.6, Groundwater Hydrology to address this. • A robust flow path analysis has shown that groundwater in shallow or perched aquifers would

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	• The connection between the shallow and bedrock aquifers is not well demonstrated, and may affect whether mine contact water in the shallow zone could bypass the pit. The contrast between higher K in the colluvium and low K in the bedrock could cause seepage from waste facilities to move laterally through the shallow groundwater rather than enter deeper bedrock. There is a significant probability that a perched aquifer will form in the shallow aquifer as dewatering lowers the groundwater table. This will short-circuit seepage from the waste rock dump to Crooked Creek and its tributaries. There is much uncertainty regarding the shallow aquifer and whether it would drain towards the pit. The Draft EIS and supporting studies treat the shallow and bedrock groundwater system as being connected through the mining period, but there is no evidence supporting the assumption. The only potential mitigation would be a liner beneath the waste rock with a leak capture system. • The pump tests did not stress the system sufficiently (i.e., they did not actually test what occurs if the potentiometric surface drops below the top of the bedrock) to estimate the potential for a hydraulic disconnect between the shallow and bedrock aquifers.	also be captured by the pit. The pit would intercept all surface water and groundwater flow down the American Creek valley. The degree of connection, (i.e., whether flow occurs through fully saturated flow or if parts of the flow system include unsaturated flow and a perched aquifer) does not change the flow path analysis (BGC 2017b). Therefore, this does not justify installing a liner and leak capture system beneath the WRF. • The pumping test next to Crooked Creek was specifically performed to better evaluate the connection between bedrock and the shallow aquifer, and drew the potentiometric surface many feet down into the bedrock aquifer. The pumping tests were conducted according to industry standard protocols (Sterrett 2007) to determine aquifer parameters. The "potential for a hydraulic disconnect" is not an ordinary objective of pumping tests, and is better addressed by three-dimensional simulations over extended periods of time, such as were performed by the groundwater model.

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	• Clarifications are needed regarding baseline descriptions of vertical gradient, permafrost extent, and recharge and discharge from the shallow aquifer. • Hydrologic problems at mine sites (e.g., Goldstrike Mine in Nevada) are often related to a failure to recognize springs or shallow perched groundwater.	• Clarification has been added to Section 3.6, Groundwater Hydrology. • Numerous articles available online regarding hydrologic problems at Goldstrike Mine reveals that the bulk of the problems there are related to high evaporation rates in the pit lake, not a failure to recognize springs or shallow perched groundwater, although clearly they could be affected (e.g., Coffey 2010). Most older mine sites have not been subjected to the extensive background hydrologic data collection and evaluation process as at Donlin Gold. At the Donlin Gold Mine Site, springs, areas of upwelling groundwater, and shallow groundwater are recognized, described, and included in the groundwater analysis and incorporated into project design features, such as rock underdrains of the TSF and WRF, and shallow groundwater capture systems for the WRF and TSF. The problems alluded to at other mine sites appear not to be relevant to the Donlin Gold site. • Clarifying text has been added to Section 3.6, Groundwater Hydrology.
	• Clarify what is meant by gradients "not large compared to the scale of the map." • Model Layer 1 has a sharp transition from alluvium along Crooked Creek to colluvium surrounding the alluvium. Conductivity changes from 300 to 0.6 ft/d	• The sharp transition described was modeled in detail to simulate pumping tests of bedrock and alluvial wells near Crooked Creek as part of the calibration process, and is extensively described in BGC (2014c, pp. 29-32 and accompanying figures). These simulations show that the numerical code functioned

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	along a long reach of the stream. Such large changes in K between adjacent cells often leads to water balance errors in the model solutions. The potential for local errors which can lead to large inappropriate head changes should be addressed. • The model simulates the high K alluvium as being surrounded by very low K bedrock or colluvium, which essentially disconnects the alluvium from the rest of model domain; the model conceptualization as simulated effectively isolates the alluvium. Using more appropriate K values to simulate the alluvium and surrounding formation would provide a more accurate simulation of flow across the formation boundaries and of the surface / groundwater interchange at Crooked Creek. The alluvium is effectively isolated from the effects of dewatering by the model design (i.e., lowering of potentiometric surface below top of bedrock that causes decoupling from the alluvial aquifer). • Calibrated horizontal and vertical K in the alluvium under Crooked Creek is 300 and 70 ft / d. These values are substantially higher than the colluvium, which are respectively 0.2 and 0.06 ft / d. These K estimates for alluvium are about three times higher	correctly and that there were no unusual "large inappropriate head changes," and therefore no need to address the "potential for local errors." • The model does not disconnect the alluvium from the bedrock or isolate the alluvium. Vertical flow between the two units is governed by Darcy's Law, which uses an appropriate mathematical average K value between the units to compute flow. The model report presents abundant information about the flow of water from Crooked Creek through the alluvium and into the bedrock aquifer. The K values used are the result of a very detailed calibration process and are suitable for the geological materials present. Arbitrarily using "more appropriate" K values that do not reflect field testing or model calibration results would be inappropriate. There is no evidence that the values arrived at are not appropriate, or that different, perhaps arbitrarily assigned values, would result in a "more accurate simulation of flow." The Corps disagrees with the premise and implications of this comment. • The aquifer test for the alluvium conducted in 2013 produced the greatest "discharge volume or head displacement" of all hydraulic tests in the alluvium and thus best overcomes the scale dependency limitations of slug tests as described by BGC (2014g). The 2013 testing found that "the best estimate (i.e., geometric mean of test results) of hydraulic conductivity (K) in the alluvium is approximately 384 ft / d." The K values for the alluvium used in the

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	than the observed values.	calibrated model, therefore, are concluded to be reasonable.
	• Specific yield (Sy) for the alluvium is extremely low, being set at 0.01, and is suspect. The amount of water drawn into the bedrock from the alluvium due to dewatering could be grossly underestimated. Together the high K and low Sy in the alluvium would serve to minimize the simulated flux from the alluvium into the bedrock.	• The Corps agrees that the extremely low specific yield for the alluvium (0.01) is suspect. As noted by BGC (2014f), it may have been the result of rainfall during the pumping tests or a Crooked Creek boundary effect. However, the effects of the concern are not considered significant to the findings of the model for the following reasons: a) the alluvium is not significantly dewatered because the creek provides a continual source of water to keep heads high. Because of this lack of substantial dewatering and the small area of the alluvium compared to the size of the model domain, the amount of water released from storage would be minimal no matter what the specific yield is; b) the duration of the simulation period of interest, of years to decades, means that the quantity of water released is extended over a very long period of time, which also contributes to the minimal rate of release. For these reasons, the amount of water drawn into bedrock from the alluvium due to dewatering is not considered to be grossly underestimated by the groundwater model.
	• The isolated alluvium acts as a tub in which water is	• The Corps agrees that water in the alluvium is easily exchanged with the stream; however, as described above, the alluvium is not isolated. Water leaks from the alluvium into the bedrock aquifer as described by

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	easily exchanged with the stream. • The colluvium is described as "well-graded materials ranging from cobbles and gravel to sand, silt and clay" (BGC 2014c, p 8). Unless the fine silt and clay materials fill most of the pores in the cobbles and gravel, K should be much higher. • The bedrock property Sy used in the model for backfill material (0.003) was in error, which would cause the model to underestimate stream losses. Crooked Creek flows would be decreased much more than that disclosed in the Draft EIS. • The underestimation of bedrock K away from the pit minimizes dewatering effects. • Insufficient baseline information is provided to assess whether the stream reach near the mine is	BGC (2014c) and BGC (2017a). • It was confirmed during one of the project technical working group meetings that the colluvium does contain substantial fine material mixed in with the sand and gravel to render the hydraulic conductivity quite low, consistent with the description of "well-graded" (also known as poorly sorted) and reflecting the K values reported. • The backfill material included in the model was assigned a Sy value of 0.33, not 0.003 (BGC 2014c, page 44), which would not result in underestimation of stream losses as suggested. • Bedrock K away from the pit is based on calibration of the model which is driven by the high groundwater gradients (approximately 0.03) across the flow field and are generally consistent with hydraulic test data obtained at the site. Sensitivity results show that higher K values generally result in worse calibration. The K values used away from the pit are justifiable and are not considered to be broadly underestimated. Therefore, pit dewatering effects are not likely to be broadly minimized as a result of this factor (see also GRD 4). • Existing data from stream gages is insufficient, by itself, to determine gaining or losing segments of Crooked Creek; however, other data are available. The upward hydraulic gradients found near Crooked Creek and the elevations of shallow groundwater

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	gaining or losing, an important parameter in model calibration.	levels higher than the stream support the inference that Crooked Creek is mostly a gaining stream near the proposed mine. Also, the presence of wintertime flow in the stream is generally regarded as evidence of a gaining stream. Additional analysis in response to RFAI #100 (BGC 2017a) shows that numerous short alternating segments of gaining and losing creek may be present, possibly associated with short-term dynamics or local stream / aquifer conditions. The base-case model was calibrated using summertime flow data and wintertime flow estimates and acceptable matches with both were achieved (BGC 2014c, p. 28-29). Additional information about the projected capture of water from Crooked Creek and from underflow from the alluvial aquifer is provided by BGC (2017a) in response to a question about these topics at the December 2016 Mine-Water Workshop.
	• The Draft EIS notes that predictions of the impacts due to dewatering are very uncertain. Various uncertainties acknowledged in the Draft EIS could increase the flow loss from the creek.	• The Corps disagrees. The EIS does not state that predictions of the impacts due to dewatering are "very uncertain". Uncertainties could increase or decrease the estimates of flow losses from the creek compared to the base-case estimate; the base-case estimate should be regarded as an estimate within a potential range of estimates determined from the technical analysis.
	• Errors in the conceptual flow model and numerical groundwater model cause the Draft EIS to under-	• The Corps disagrees that errors occur in the conceptual or numerical models; errors have not been demonstrated, only postulated in comments. The postulated errors described are either the result

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	predict the dewatering impacts.	of incomplete understandings of the work or, in some cases, improper conceptual understandings. Where needed, additional explanation has been added to the EIS. Uncertainties identified could either under-predict or over-predict dewatering impacts, and have been acknowledged and taken into account in the analysis.
	• As discussed during the December 2016 Mine-Water Workshop, currently available groundwater level measurements are insufficient to construct and calibrate a defensible numerical groundwater flow model to estimate required pit dewatering rates and perform groundwater-related effects analyses, including estimates of: dewatering-induced drawdown of groundwater levels (areal extent, depth, and magnitude) and recovery following closure; changes in stream flows due to pit dewatering (areal extent and timing) and recovery following closure; the rate of formation of the pit lake; and a range of other project/closure-related effects relevant to NEPA analyses and disclosure.	• The Corps disagrees. This is a subjective comment as there is no standard for determining that a larger number of groundwater level measurements would be sufficient. The numerical groundwater flow model closely follows modeling protocol and processes identified by Anderson and Woessner (2002) to develop a model that is "capable of producing useful results i.e. that the model is valid". Extensive documentation, including use of a robust set of 183 hydraulic head calibration targets (BGC 2014c) has been produced for this project, substantiating the usefulness and validity of the model results for the purposes identified in the comment.
	• Clarify whether a range of hydraulic conductivities (rather than a single value) should be applied to the colluvium placed beneath and over the WRF, and encapsulating the PAG cells, to better inform seepage volume from the WRF into the pit lake. Bedrock at depth has a range of K values extending across three	• The wide range of K values in bedrock is caused by the very irregular distribution of fractures. The use of terrace gravels and colluvium for the cap will result in disturbance and mixing of the native materials, such that the resultant cap material is likely to be more uniform (i.e., blended) than either the native materials or bedrock, and the assigned K is reasonable for the material and in the middle of the

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	orders of magnitude; explain if this range should be applied to the WRF cover material.	tested range. Fractured bedrock would be expected to have a much wider range of K than terrace gravel / colluvium used for an engineered cover system. Furthermore, modeling results show a relatively minor influence on WRF seepage between compacted and uncompacted caps (O'Kane Consultants, Inc. 2009), indicating a low correlation of seepage with K. This is likely a result of the pattern of precipitation inputs to the cap and the ability of caps of all K values modeled to infiltrate the portion that does not run off or evaporate / transpirate.
GRD 2	Key components of the groundwater model are considered inaccurate or biased due to a lack or scarcity of data and assumptions regarding scale and regional flow systems (see also GRD 11): • Based on information provided in the Draft EIS (Section 3.6.1.2.1), groundwater level measurements collected to date are limited to the upper 800 feet of the mine site, and largely limited to 400 feet below ground surface (ft bgs). Two co-located groundwater level measurements appear to have been made at roughly 800 ft bgs, and a maximum of ten measurements during any given period from about 400 to 600 ft bgs. All other reported groundwater level observations appear to have been made at 400 ft bgs or less (the upper 30 percent of the planned depth of the pit), with no such critical measurements below about 800 feet (i.e., the lower 40 percent of the planned depth of the pit and portions of the	• The Corps disagrees that wells and pump tests are not deep enough to adequately characterize local and regional groundwater flow. First, the assessment of deep water-level deficiency is incorrect, and a more accurate summary of deep groundwater level measurements is provided below and in cited references. Second, geological sampling at the full depth of the pit has shown that there is no "new" uncharacterized geological unit or formation at depth; thus, shallower data are applicable for the characterization provided that suitable accommodation is made for depth- and pressure-related effects (which has been done). Third, packer test data are shown to be adequate to characterize

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	groundwater flow system that underlie the future pit and are relevant to the groundwater effects analyses.) As discussed in the December 2016 Mine-Water workshop, currently available groundwater level measurements are insufficient to develop a conceptual model of groundwater flow at the mine site (under pre-project conditions) to depths needed to evaluate the potential effects of the project, i.e., depths approaching those at which the project is likely, or certain, to have groundwater-related effects (greater than or equal to 1,400 feet, the planned depth of the pit and pit dewatering). Wells and pump tests are not deep enough to adequately characterize local and regional groundwater flow, and may be inadequate to predict transport of contaminants at depth. No large scale tests below 800 ft bgs have been completed; thus, there is a limited understanding of deep bedrock flow conditions. Additional groundwater level data at adequate depths and times are needed to improve the reliability of the model predictions.	larger-scale pumping test results (BGC 2014c, Drawing 12), and 40 packer tests were conducted at depths greater than 800 ft (BGC 2017e, page 29), yielding an adequate understanding of conditions at depth for the analysis. Of the 198 permanent stations where water-level data have been collected, 21 were deeper than 330 ft and 5 were deeper than 800 feet. Importantly, vertical hydraulic gradients were measured at 29 monitoring well or piezometer nests (BGC 2014g) and were consistent with the conceptual and numerical models showing downward flow in upland areas and upward flow in valley bottom locations. Fourth, regional groundwater modeling results (BGC 2017e) confirm that regional flows systems that have been hypothesized to exist at depth have been evaluated to depths beyond which the project is likely or certain to have effects, and found no indication that such regional flow systems exist at relevant depths as a result of high topographic relief and the dominance of local groundwater flow systems. The modeling confirms that it is unlikely that additional or deeper water level or packer or pumping test data would materially change the characterizations or assessments made or the reliability of the model predictions. Thus, additional information is not considered necessary to disclose project effects and develop a reasoned choice among alternatives. Nevertheless, additional boreholes (i.e., exploration and geotechnical) would be drilled and hydrogeologic testing (e.g., dewatering well testing)

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		would be conducted as the project develops. There would be opportunity at that time for Donlin Gold to collect additional deep hydrogeologic data and to incorporate those data into future refinements of Donlin Gold's water balance and water management practices. Appropriate language has been added to Chapter 5 to include this adaptive management strategy (Tables 5.7-1A and 5.7-1B).
	• Lateral coverage of wells and pump tests is sparse.	• Lateral coverage of wells and pump tests presented by BGC (2014c), especially because pump tests closely match more widely available packer tests, is adequate to characterize the major hydrogeologic units and flow systems at the site, and to parameterize and calibrate the groundwater flow model to simulate the natural flow field and the primary effects of the mine and mine facilities. As indicated in Draft EIS Chapter 5, Mitigation (Tables 5.7-1A and 5.7-1B), periodic review of the model after dewatering begins would allow verification and refinements of the model, if needed. Additional wells and pump tests are not considered needed as a result of this comment.
	• Pump tests were not conducted for a long enough period of time.	• There is no applicable standard period of time required for pump tests. While some tests were relatively short (less than one day), others were long (multiple days, up to a 10-day constant rate test) (BGC 2014c). Overall, the length of pumping tests conducted is considered adequate to characterize the major hydrogeologic units at the site, and to parameterize and calibrate the groundwater flow

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	• Most of the hydrogeological properties estimated for the Draft EIS are for a small scale and yield conductivity values that are much too low for regional flow analysis, causing the Draft EIS to predict impacts limited to the areas closer to the mine. • A mine that intersects and excavates significant portions of a formation affects flow at a regional level, and therefore needs property measurements at that scale.	model to simulate the natural flow field and the primary effects of the mine and mine facilities. As indicated in EIS Chapter 5 (Mitigation), periodic review of the model after dewatering begins would allow verification and refinements of the model, if needed. Additional long-duration pump tests are not warranted as a result of this comment. • The Corps disagrees. The appropriate values of hydraulic conductivity and storativity for a regional flow analysis are not normally determined solely by aquifer testing (packer or pump testing) (Shulze-Makuch et al. 1999; Ingebritson et al. 2006). Aquifer test findings are useful initial estimates of formation properties, but a rigorous model calibration process, such as BGC (2014c) performed, that incorporates measured flow-field gradients, measured and estimated fluxes to streams, measured and estimated recharge fluxes, and measured natural and pumping-induced water-level fluctuations, provides a much more robust and data-derived determination of appropriate values of formation properties suitable for the regional analysis than would simple use of small-scale property tests as is implied. • The Corps disagrees. Regional scale groundwater flow models are constructed routinely without field measurements of aquifer parameters at a similar scale (Schulze-Makuch et al. 1999). Property measurements at a regional scale are almost impossible to obtain because of the scale and duration of testing implied. Ingebritson, et al. (2006)

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	• The limited available groundwater level data from deep bedrock have been averaged over years, which affects calibration of the model. • Hydraulic conductivity commonly increases with increased scale of measure, a factor that was not considered in the model. The currently available groundwater level measurements are insufficient to calibrate aquifer properties for bedrock units at field scales to depths at which the project is likely, or certain, to have groundwater-related effects. Depth decay has been incorporated with significant impacts on both the calibration and predictions of the numerical model, albeit poorly supported by	summarize this point by stating that "There is no direct way to measure larger-scale (larger than in situ testing [perhaps ›10^5 m^3]) permeabilities, but larger-scale "regional" values are often inferred from the results of numerical modeling analysis". As a result, such regional flow models are considered to be a valid method for determining the "volume of material tested" (e.g. see Figures 3, 4, 5, and 7 of Schulze-Makuch et al. 1999). • Seasonal groundwater level fluctuations are noted to be less than 66 ft, and commonly much less than that (BGC 2014g), compared to a field-measured flow field in the simulated region that encompasses approximately a 1000-ft drop in head across it. This represents a potential error of less than approximately 6 percent, which is considered normal and acceptable for a model of this type and scale. Therefore, potential inaccuracies caused by averaging head data are not considered meaningful. • There is an extensive analysis that supports the concept of hydraulic conductivity increasing with increased scale for the alluvial aquifer (BGC 2014g) and the results were incorporated into the numerical model (BGC 2014c). The possibility of hydraulic conductivity increasing with scale of measurement in bedrock was considered and not found to be a significant factor. While Schulze-Makuch (1999) shows this to be a factor for some geological formations, none of those formations examined are comparable to the intruded Kuskokwim Group rocks

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	analytical parameter estimates, based on hydraulic field tests interpreted without respect for the scale of the tests (largely packer tests influenced by minimal secondary structures).	at the project site. Also, the scale-dependent relationships identified are not found to exist in some formations (Schulze-Makuch et al. 1999, Figure 7). Furthermore, after examining this matter in some detail, Ingebritson et al. (2006) concluded that "the preponderance of the evidence seems to suggest either that there is no consistent and systematic scale-dependence of permeability, or at least that any trend towards higher permeability at larger scales does not continue between in situ and regional scales." BGC (2017c) expanded upon their earlier analysis (BGC 2014c) of possible scale dependence of K in bedrock, and found that the higher K values (within the large three-order of magnitude range in K values at any given depth) are associated with a "greater number of fractures and better connectedness". Thus, the large number boreholes and tests likely increases the likelihood that the dataset adequately characterizes the wide range of actual fracture permeability and interconnectedness of bedrock. BGC (2017c) also reiterated that the larger-scale testing involving pumping tests closely matched the findings of the distribution of hydraulic conductivity determined by the packer tests, indicating that the scale effect was not apparent in a comparison of the two types of in situ testing. Considering these findings, the water level data from 198 water level measuring stations provide adequate data to calibrate aquifer properties for bedrock units at field scales to depths at which the project is likely, or certain, to have groundwater-related effects. Any uncertainties associates with the

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	• No groundwater level measurements have been analyzed to determine if local (topographically controlled) flow transitions into the regional groundwater flow system at depth, creating the potential for offsite transport of contaminants in the subsurface during certain stages of the formation of the pit lake and thereafter under the current closure plan.	"scale effect" described herein are adequately addressed by the sensitivity analysis (BGC 2014c), and there are not expected to be any undisclosed "significant impacts" on the resulting calibration or predictions of the numerical model. • Data from 198 permanent water level monitoring stations across the project area, including 21 installed at depths greater than 330 ft, and 5 installed at depths greater than 800 ft were analyzed to evaluate the possible presence of a regional groundwater flow system and no evidence of such a system was found. This comment presumes that a regional groundwater flow system exists at a depth relevant to the project. BGC (2017e, Figure 2-9A and B) suggests that such a flow system is either not present or occurs at a depth in the vicinity of 10,000 feet or below, well below the depth of potential project effects. This is because the high topographic relief in the area creates deep local groundwater flow cells. Both regional and base-case modeling have shown that hydraulic containment of the pit lake would occur under a variety of aquifer scenarios during both development and post-closure time periods (see additional information under GRD 11).
	• Data should be obtained and analyzed to address the critical deficiency of deep head data used in the conceptual hydrogeologic model and groundwater effects analyses. Static (pre-test) head measurements	• Static (pre-test) water levels in deep packer test boreholes are not available because the low hydraulic conductivity of the formation would have required several hours to months for them to have equilibrated (BGC 2017e). Also, holes not subsequently monitored for water levels were

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	from packer tests conducted in 13 deep holes at depths of ~800 to 1,500 ft bgs should be available (according to BGC 2007a) and may be useful in detecting any regional flow encountered at ≤1,500 ft bgs; but would not be sufficient to characterize the regional gradient (if present) since they were collected over a series of years (2004-2007), and would not provide information about conditions at the depth of the lower ~20% of the planned pit (≥1,500 ft bgs) or greater depths at which dewatering impacts will occur.	grouted and abandoned and are no longer available for measurements (BGC 2017e). BGC (2014c) reported 183 calibration targets for the groundwater flow model. Additional calibration targets are not likely to meaningfully improve the simulation results. Periodic review of the model after dewatering begins would be a much more effective methodology to facilitate verification and refinement of the model, if needed. This is included in EIS Chapter 5, Mitigation. (See additional discussion in GRD 11.)
GRD 3	There are concerns regarding the role of faults and folds on groundwater flow: • There is a lack of baseline data to evaluate the role of faults on groundwater flow, especially outside of the pit area. Additional information should be provided, especially regarding faults in Anaconda and American Creek valleys, including fault gouge and fault damage / fracture zones in the hydrogeologic conceptual model. The groundwater effects analyses should be revised to include this important information. The model and Draft EIS require much more information about faults. • The omission of faults as potentially significant structures from the groundwater model is poorly supported, physically untenable (given direct observations of fault gouge and major fault	• Additional information about the tectonic history relevant to faulting and groundwater flow has been added to Chapter 3.6. Also, additional detail about the observations of faulting and fracturing in outcrops and core, and the latest revisions to the general fault understandings of the area, largely as provided by BGC (2017c), will be added. The Corps believes that this information provides sufficient baseline data, along with other hydrogeologic data and analysis presented, to sufficiently evaluate the role of faults on groundwater flow. • The Corps disagrees. Faults have not been omitted as "potentially significant structures" from the model. Model sensitivity runs were specifically made (BGC 2014c, 2017e) to consider the potential effects of faults

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	damaged / fracture zones in core), and based primarily on sparse available hydraulic field observations, which cannot be reasonably expected to reveal the hydraulic character of these discrete structures regardless of scale, and may be affecting the optimization of bedrock units in the model and predictions regarding groundwater flow and areal extent of dewatering drawdown. The currently available groundwater level measurements are insufficient to investigate the hydraulic significance, and / or characterize the hydraulic properties, of major fault gouge and fracture zones at the scale of the effects analyses (numerical model simulations); e.g., major fault gouge and damaged zones which have been documented in core in the vicinity of the planned pit through the full depth of the future pit and pit dewatering. Due to the potential effect of this omission on the results of the groundwater effects analyses, this deficiency should be remedied, particularly in the case of known faults of similar extent and depth as the proposed open pit.	on model results. The base-case model results that did not specifically simulate fault-based enhanced or reduced hydraulic conductivities reflect the findings of abundant and robust data sets: 1) Extensive test drilling, coring, hydraulic testing, and water-level measurement results did not identify any fault structures that would be classified as significant conduits or blockages for groundwater flow. Fault gouge and fracture zones observed in cores (BGC 2017c) are not necessarily indicative of large through-going hydraulic structures; 2) With 198 monitoring wells for hydraulic head (BGC 2014g), the data set for characterizing the flow field should more appropriately be characterized as robust rather than as "sparse". It is this flow field, controlled primarily by local topographic relief (BGC 2014g, Drawing 2), that provides primary field evidence against the presence of major conduit or fault-block controlled flow. Examination of this flow field reveals that the groundwater gradient is approximately 400 to 500 feet / mile from the western area of the proposed pit to the eastern area, compared to a down-valley groundwater gradient in the much more permeable alluvium associated with Crooked Creek of approximately 25 feet / mile. If major conduit-type faults existed, the westerly groundwater gradients in the bedrock would be much lower and the base-case calibrated groundwater model would likely have needed to simulate these features explicitly in order achieve an adequate calibration. It is also apparent from the lack of water table discontinuities on the

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	• Sufficient groundwater level measurements should be obtained to evaluate the role / effect of these potentially hydrologically significant structures through the calibration (recalibration) of the numerical groundwater flow model. • The influence of large-scale folds potentially creating zones of enhanced fracture flow should be evaluated. High K faults could increase mine dewatering rates.	flow field that major fault-block bounded blockages of flow do not exist. The Corps does not believe that there are any deficiencies identified as a result of this comment that warrant remedies. Additional information has been added to Chapter 3.6 (Groundwater Hydrology) to clarify the possible effect of encountering enhanced or reduced permeability faults or folds on groundwater and related resources and mine facilities, and Chapter 5 (Mitigation) to clarify monitoring and adaptive management features designed to address these conditions, such as groundwater production rate and water-level monitoring, possible grout-sealing of water-producing fracture systems, and adjustments to water management and treatment facilities. • With 183 hydraulic head calibration targets, the Corps believes that an adequate number of measurements have been obtained for the base-case model. Additional groundwater level measurements will be obtained as the pit dewater system is developed and as dewatering progresses. These data would then be used to reevaluate the role of potentially hydrologically significant structures and support revision / recalibration of the numerical groundwater flow as needed. • A large scale fold is noted in Figure 3.1-3 of the Draft EIS. Examination of the groundwater flow field (BGC 2014g, Drawing 2) does not reveal any significant deviation of groundwater contours that would be associated with potential enhance fracture flow

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	• Conducting a model sensitivity analysis without actually simulating the faults is insufficient planning for the faults. • If there are sufficient data, the Draft EIS should provide a plot of K versus distance from a fault to estimate whether there is a trend.	associated with this structure. No other anomalies in the flow field have been identified, either, that would be associated with other potential enhanced fracture flow zones associated with folds. • Sensitivity runs simulated the faults, as detailed by BGC (2014c, pp. 48-50 and Drawing F-1 of Appendix F). Model blocks or cells at the locations of the major faults identified in the area were explicitly coded with differing model parameters for the simulations. Robust sensitivity analysis as was conducted is a standard methodology for addressing sources of uncertainty in models of this type. Planning for faults is considered adequate for this analysis. This topic merits reexamination during the periodic review and revisions of the groundwater model during the life of the mine. Text has been added to Chapter 5 (Mitigation) to address this. The Corps believes that planning for the faults is sufficient. • This task would be very difficult and complex to implement, the results would be difficult to interpret, and the effort of doubtful value. There are a large number of faults and K determinations, and the work would need to account for the subsurface x-y-z location of both the K determination (packer or pumping test, sometimes in slanted holes) and the dip of the fault planes, in order to determine the perpendicular distance to the planes and evaluate true distance spatially. Also, since a pumping test measures a large volume of aquifer, determination of the "distance" from faults would be problematic.

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	• Per NEPA regulations, where information relevant to reasonably foreseeable significant adverse impacts is "essential to a reasoned choice among alternatives and the overall costs of obtaining it are not exorbitant," agencies must include that information in the EIS. If the information cannot be obtained, agencies must note that the information is incomplete or unavailable, explain its relevance, summarize existing credible scientific evidence, and evaluate impacts based on theoretical approaches or research methods generally accepted in the scientific community.	Some K determinations would likely be in approximate equal proximity to two or more faults, further complicating the analysis. In addition, the known relationship of K with increasing depth would need to be accounted for, making this a more complex multivariate analysis than proposed. Because faults can be the cause of either higher or lower hydraulic conductivity, it would be unlikely that anything definitive could be determined from the plots derived. Because of the combination of the high complexity and the minimal likelihood of useful information coming from the analysis, construction of the requested plot appears to not be warranted and is not advised. • Noted. Draft EIS Section 3.6, Groundwater Hydrology, has been revisited in light of additional information provided by Donlin Gold (e.g., BGC 2017c). Text includes the availability of data and notes where data are incomplete and generally accepted analytical modeling approaches are used.

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GRD 4	Concerns were expressed regarding bedrock hydraulic conductivity (K) and storage (S) parameter values used in the model: • Individual estimates of bedrock conductivity have been grouped and averaged as a function of drill hole collar elevation, for which there is no apparent physical basis.	• There is a physical basis for the analysis. Locations of stream drainages in areas with bedrock-controlled topography are commonly associated with areas of structural or stratigraphic rock weakness, and thus, perhaps more rock fracturing or faulting and greater permeabilities. The Crooked Creek Fault, for example is inferred to run along the axis of Crooked Creek. Examining the data by drillhole collar elevation is a means of testing whether upland areas, in general, are less fractured (and presumably less permeable) than valley-bottom areas. Minor differences were found and appropriately incorporated into the model parameterization and calibration process (BGC 2014c).
	• Individual estimates of bedrock conductivity have been grouped and averaged with no regard to rock type or scale of test, compromising utility in the model. This lumping may have a significant effect on the outcome / quality of the groundwater effects analyses, or artificially reduce the estimates of drawdown and stream flow effects. No rationale is provided for assuming that the permeability of sedimentary and intrusive rocks are indistinguishable from each other. This appears to be an outcome of the limitations of the available hydraulic test and groundwater level data. The conceptual hydrogeologic model should be revised	• Rationale has been added to the EIS regarding the primary and secondary permeability characteristics of different rock types. The finding of broadly indistinguishable permeabilities is not likely related to limitation of hydraulic-test or water-level data; rather, it is likely related to the extremely low primary (intergranular or intercrystaline) permeability of all rocks types and that all rock types were subjected to the same local and regional geological stresses and faulting episodes that created much of the secondary (fault and fracture) permeability. Individual estimates of bedrock conductivity have been extensively analyzed with

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	to reflect that the hydraulic field tests performed to date are not sufficient to differentiate the conductivity of basic rock types (e.g., greywacke, shale, siltstone, and broadly speaking intrusive rocks), and are likewise insufficient to differentiate the conductivity of particular sedimentary formations identified in the vicinity of the planned pit.	regard to rock type and scale of test by BGC (2014g, pp. 17-21; Tables 5, 6, and 7; and Drawings 25, 27, and 28). The discussion includes appropriate references to scale effects from the literature. The results of this analysis have shown that the bedrock units exhibit considerable geological complexity and heterogeneity which has been incorporated into the parameterization and calibration of the model (BGC 2014c, Table 7) by discrete parameterization of nine different rock units in the pit area. The major effects of the complexity and heterogeneity have been further evaluated with the sensitivity analysis. The rationale for the "lumping" used in the model, mainly for areas away from the pit area, is that 1) all nine of the individual rock units exhibit a relatively narrow range of hydraulic conductivity; and 2) there is a large amount of interbedding and structural deformation in the sedimentary flysch-sequence rocks (BGC 2014g) making classic stratigraphic differentiation and characterization across a broad area difficult, at best. The Corps disagrees that the characterization of hydraulic conductivity of the different rock units presented is the result of an insufficient number of hydraulic field tests. The "lumping" is not considered to have a significant effect on the outcome/quality of the groundwater effects analyses, in part because the information derived from in situ field tests is subsequently adjusted through the model calibration process before the model is completed. Revisions to the

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	• The low geometric mean used in the model could drastically underestimate contaminant movement in the pit filling or dewatering periods. • Explain how the range of conductivities affect hydraulic gradient during pit filling; additional modelling may be warranted. • The wide range of K and specific storage values provide little information that can be used to constrain calibration of storage coefficients in the model.	model are not warranted on the basis of this SOC. • Hydraulic conductivity is less important in controlling contaminant movement than maintenance of hydraulic containment, which would occur. Nevertheless, because contaminant movement rates, in general, are proportional to hydraulic conductivity, a "drastic" underestimation of contaminant movement would imply a correspondingly "drastic" underestimation of hydraulic conductivity, for which there is no significant factual basis and for which the Corps does not believe exists. • In general, higher hydraulic conductivities during pit filling would result in lower hydraulic gradients (i.e., the pit lake would fill faster). Lower hydraulic conductivities would result in higher hydraulic gradients. The effects of these scenarios on pit filling rates are explored in the sensitivity analysis (BGC 2014c). A reasonable range of hydraulic conductivities were evaluated by the sensitivity analysis and further modeling is not warranted. • Because "values of storativity (and, by inference, specific storage) are not easily obtained" (Anderson and Woessner 2002, p. 197), it is not unusual for field data to provide only general constraints to the calibration of specific storage in a model. The calibrated values used "display good agreement to values obtained from testing" (BGC 2014c), and are within the range of values expected for a fissured,

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	• The assumptions that K decreases with depth and decreases away from the pit are not supported by the data (i.e., the low conductivity is not justified by observed pump test values), leading to arbitrarily low estimates of bedrock conductivities, particularly at depth, and may be causing estimates of dewatering rates, areal extent (stream losses), and pit filling rates to be too low.	jointed rock aquifer (Anderson and Woessner 2002, p. 41). Also, a sensitivity analysis was performed that identifies the dependence of model results on potential uncertainties in the values of specific storage used in the model. • The Corps disagrees based on the following. Both the packer test and pump test data (BGC 2014g, Drawings 23 and 28) show clear trends of decreasing K with depth, consistent with the well-accepted concept that water-bearing rock fractures tend to squeeze shut with increasing pressure at depth. Drawing 28, in particular, clearly shows that conductivity is justified by the pump test data. Also, in addition to fractures created by regional tectonic forces, bedrock permeability closer to the land surface is enhanced by jointing and weathering (BGC 2017c). The basis for the concern about K decreasing away from the pit is not clear. Table 7 of BGC (2014c) indicates that the values used for the undifferentiated Kuskokwim Group away from the pit are not very different from the values used in the pit area, and are within the ranges of values determined from pumping and packer tests. These values were determined as a result of the calibration process; thus, it is not appropriate for the values to be based solely on field-measured parameters. For example, the model must reasonably reproduce the approximately 1,000-ft drop in hydraulic head across the flow field. This is a relatively steep hydraulic gradient for a groundwater flow system and

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	• The currently available groundwater level measurements are insufficient to calibrate aquifer properties for bedrock units, including the assessment and verification of any systematic decrease in the hydraulic conductivity of bedrock units (at field scales), which may or may not exist between the land surface and 1,400 plus feet below ground surface, a modest depth. To date, depth decay has been hypothesized and explicitly incorporated in the numerical groundwater model used to perform groundwater-related effects analyses, with significant impacts on both the calibration and predictions of the numerical model. • The low K values away from the pit may prevent the expansion of drawdown away from the pit.	relatively low values of K are required in order for the model to meet its calibration targets. Thus, the K values used in the calibrated model are not considered to be either arbitrary or unreasonably low such that they would cause estimates of dewatering rates, areal extent (stream losses), or pit filling rates to be too low. • It may be true that currently available groundwater level measurements are insufficient to calibrate aquifer properties; however, it is difficult to know for sure. Numerical models, in general, are known to provide non-unique solutions to groundwater flow problems, and a comparably calibrated model that does not incorporate a systematic decrease in K with depth may be achievable. The reason that the model includes a decrease of K with depth is not because of the water-level measurements, however; rather it is because of the overwhelming and conclusive data and analysis showing that K actually decreases with depth at the site (BGC 2014c, 2014g, 2017c). • The Corps agrees that, in general, higher K values would result in greater expansion of the drawdown cone; however, this would not justify the use of higher K values. The K values used, and the size of the cone of depression to a significant geographic area away from the pit, are well documented (BGC 2014c). • The sensitivity results provide indication of the range of potential model outputs should selected

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	• The sensitivity of the model predictions to bedrock properties further indicates that the model could have grossly underestimated impacts to streamflow. The sensitivity results regarding bedrock K verifies the points above about how low K estimates could have caused the model to underestimate dewatering, the extent of the drawdown, and impacts on streamflow. Pit lake refill time was also sensitive to bedrock K (BGC 2014c, p. 55). The increased bedrock K causes the pit lake to fill from 14 to 30 years faster, reflecting the higher flow to the pit, and decreased K increased the fill time by about 12 years. • Under NEPA requirements, the Corps is required to ensure the scientific integrity of all discussions and analyses presented in the Draft EIS, providing a "full and fair" discussion on the environmental effects of any proposed actions. Given that the hydrological modeling, and more specifically the groundwater model, is a fundamental component to evaluate the effects of many of the major aspects of the project, getting it "right" is imperative.	parameters be different than the base-case model. While some amount of model uncertainty is expected, the modeling effort is considered sufficiently robust and reliable to provide reasonable simulations of future events for this analysis. Potential uncertainties in the model or range of results in the sensitivity analyses provide the justification for robust and adaptive facility planning, and periodic review and revision of the model as pit dewatering progresses (see Chapter 5, Tables 5.7-1A and 5.7-1B). • The Corps believes that the highest standards of scientific integrity of all discussions and analysis presented in Chapter 3.6 and supporting materials has been achieved, and that a "full and fair" discussion of the environmental effects of proposed actions has been presented. The Corps concurs that the groundwater model is a fundamental component of the evaluation; however, it is important to understand that the model is a very complex management tool that can guide decision-making. The very nature of the tool is such that there is some latitude in getting predictions about the future exactly "right". For this reason, the Corps believes that the predictions made are "approximately right" and that appropriate and robust mitigating measures, monitoring, and adaptive management methods are incorporated throughout the analyses presented to manage uncertainties that cannot be completely resolved in advance of the project.

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	• There could be abrupt transitions among various parameter zones within a layer. This could have large effect on the flow patterns if the changes are substantial.	• There were no anomalous results related to this potential scenario.
GRD 5	Concerns were expressed regarding model setup and calibration issues: • The distribution of groundwater level data being dominantly from drainages (as opposed to ridges) biases the model calibration.	• A review of well locations (BGC 2014c, Appendix A) shows that wells are broadly distributed across the area where major facilities would be located in sufficient density to define the flow field. More data are located in stream valleys in Layers 1-3 (Drawing A-1) than in upland areas; however, this is partly the result of more intensive efforts to understand stream-groundwater interactions in the critical Crooked Creek valley and other stream locations. Biasing the spread of information by focusing on areas of greatest hydrogeologic interest is not unusual; the geographic spread of data, in general, should not be statistically random across such a large model domain. Deeper layers of the model (Drawings A-2 and A-3) appear to show a more equant distribution of water-level data between upland and valley locations. For these reasons, potential "biases" in model calibration resulting from the locations of monitoring well data are not considered material to the calibration results.

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	• The initial calibration scenario in the BGC (2014c) source document is confusing. Additional information should be provided regarding initial conditions, how long it was run, head values, and how averaging across seasons is appropriately representative, given calibration methodology. • Clarifications and additional detail on the second calibration are needed regarding stress periods and storage parameters. • Numerous poor matches between modeled and measured drawdowns and hydrographs suggest that K and Sy values could be substantially off-target for both alluvium and bedrock, claims of good matches are not appropriate, and additional improvements in the calibrations are warranted.	• The EIS has been revised to clarify these items. • The EIS has been revised to clarify these items. • Use of terms such as "good, or "poor" referring to the closeness of the matches is subjective. The EIS has been revised to describe the matches more objectively. Several factors, however, suggest that additional improvements to the calibrations are not warranted: a) Aquifer heterogeneity and scale factors are appropriately described as causes of the some of the lack of close matches described. These factors are common features of this type of modeling and are unlikely to be resolved by additional calibration efforts. b) Adjustment of model parameters may improve matches in one area only to worsen them in others, as noted in the sensitivity analysis. BGC (2014c) provided extensive documentation on what is likely a near-optimum calibration that meets or exceeds commonly accepted calibration criteria. It is considered unlikely that further calibration effort would meaningfully improve the calibration or the

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	• No clear hypothesis has been advanced concerning the locations of definable / defensible boundaries for groundwater flow north, east, and south of the mine site to depths of 1,800+ ft bgs, which must be sufficiently distant from the pit to be utilized during predictive numerical simulations of pit dewatering. Nor has any rationale been provided for conditions that can be prescribed at the base of the numerical flow model, or the elevation at which the base should be defined. Lateral and vertical boundary conditions in the model are unrealistic, have pervasive effects on other parameters in the model, and preclude any simulation or accounting of the effects of regional groundwater flow. Specifically, the currently available groundwater level and hydraulic head measurements are insufficient to identify defensible locations for the lateral model boundaries, or assign defensible conditions on the lateral model boundaries.	predictive results of the model. c) Further enhancement of the model would likely require substantive new data on development-scale hydraulic stresses, such as that obtained through dewatering of the pit. Review and revision of the model at that time would be warranted, as indicated in EIS Chapter 5, Mitigation. • The currently available hydraulic head data clearly identify divergent groundwater divides between Queen Gulch and Lewis Gulch, between Lewis Gulch and American Creek, between American Creek and Omega Gulch, between Omega Gulch and Unnamed Creek SE1, between Unnamed Creek SE1 and Anaconda Creek, between Anaconda Creek and Crevice Creek, and between Anaconda / American Creek valleys and Bell Creek (BGC 2014c, Drawing 7; EIS Figures 3.5-1 and 3.6-2). This pattern of groundwater divides matching surface drainage divides is reasonably extended to more distant divides, such as the divide between Dome Creek and Ophir Creek and the divides on the west side of Crooked Creek that serve as model boundaries (BGC 2014c, Drawing 22). The well-documented divide between Anaconda/ American Creek valleys and Bell Creek serves as another model boundary. The divide between Anaconda and Crevice Creek valleys serves as another model boundary. Anderson and Woessner (2002) provide that no flow boundaries are typically defined at groundwater divides, matching the setup of the Donlin Gold model. Another factor influencing

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	• Due to substantial issues raised in comments on the groundwater model, collection of additional groundwater level observations at adequate depths / times is recommended, followed by consideration given to updating the model structure (including boundary conditions) and calibration to	the selection of boundaries in transient models is that boundaries should be far enough from the area of primary interest that the transient stresses of the system do not reach the boundaries during the simulation (Anderson and Woessner (2002, p. 102). This condition has been met (BGC 2014c). Anderson and Woessner (2002, p. 100) note that a two-order-of-magnitude contrast in hydraulic conductivity may be sufficient to justify placement of an impermeable lower boundary. Packer test data show that deep hydraulic conductivity measurements are approximately two orders of magnitude lower than shallow ones (BGC 2017c, slide 4), and further decreases are expected to occur at even greater depths (BGC 2017e). BGC (2017e) further found that examination of a larger regional context confirms that the boundaries used for the base-case model are reasonable. Abundant documentation is available to demonstrate that the currently available groundwater level and hydraulic head measurements are sufficient to identify defensible locations for the model boundaries and to assign defensible conditions on the model boundaries. (See additional information regarding regional flow in GRD 11.) • The Corps disagrees that the issues raised are substantial or that collection of additional water-level information is warranted. The information presented in response to RFAIs developed based on these comments (BGC 2017a, 2017b, 2017c, 2017d, 2017e,

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	improve the reliability of the following estimates: pit inflows / required dewatering rates; dewatering-induced drawdown in the vicinity of the site (areal extent, depth, and magnitude) and its recovery; changes in stream baseflows due to pit dewatering (areal extent, magnitude, and timing) and their recovery; formation rate of the pit lake; and other project / closure-related numerical analyses.	2017f and Donlin Gold 2017a), together with the responses to the comments in this section, provide the basis for the Corps' determination that these concerns have been adequately addressed and that the model structure and calibration are adequate to provide the identified estimates.
GRD 6	There are concerns regarding long-term hydraulic containment of the pit lake: • Groundwater flow and contamination would not always be towards the pit, and the description of groundwater flow during rising water in the pit lake is not clearly articulated. • Comments recommend that the EIS discuss the modeling results and the conclusions made regarding groundwater contaminants not migrating away from the pit. Because groundwater flow away from the pit lake continues until it is almost full, and because the gradient towards the lake after it reaches a steady state is very small, pathways may exist for contaminated groundwater to leave the pit lake at various depths and not return. Given that water at depth in the pit lake is certain to flow out of the former pit during the formation of the pit lake and once "maximum managed stage" is established, any contaminants generated or disposed of in the pit at or following closure can be expected to be transported away from the pit lake over time, its fate	• EIS Section 3.6, Groundwater Hydrology, has been clarified. • Analysis has shown that flow of contaminated lake water into groundwater remains close to the pit lake, and that much of this water actually goes into re-saturating the waste rock emplaced into the pit (e.g., BGC 2016b, slide 14). This contaminated water essentially goes into storage in the aquifer until the pit lake fills, after which time it gradually flows back into the pit lake. While the gradient towards the pit lake after the pit lake fills is small, a layer-by-layer analysis of head from the model shows that hydraulic containment of all of the water in the pit lake and water that has previously left the pit lake is maintained throughout the pit filling, closure, and post-closure periods (BGC 2017f), and that there are no pathways for contaminated groundwater to leave

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	unknown absent improvements in the current groundwater flow model. During pit lake maintenance, the Draft EIS does not suggest that the pit lake would be maintained as a hydraulic sink. Therefore, discharge from the pit lake via groundwater could occur. It is important to evaluate the rate and area of groundwater migration during the period when the pit lake is filling.	the pit lake at various depths and not return. Section 3.6 has been amended to clarify that the pit lake would be maintained as a hydraulic sink, and that discharge from the pit lake to groundwater outside of the zone of hydraulic containment would not occur. Language has been added to Chapter 5 (Tables 5.7-1A and 5.7-1B) that groundwater monitoring during operations, closure, and post closure should be sufficiently adequate to show that overall hydraulic gradient towards the pit from Crooked Creek is always maintained.
	• Concerns were expressed that after the pit fills, contaminated groundwater could flow toward Crooked Creek. It is unclear how groundwater will continue to flow towards the pit once the pit is full. Describe in the Draft EIS why the groundwater would not flow through the pit and continue towards Crooked Creek, carrying contaminants with it. BGC should verify groundwater flow directions towards the pit lake because escaping pit lake water would degrade surrounding groundwater.	• Groundwater flows from areas of high hydraulic head to areas of low hydraulic head. Under natural conditions, the head (i.e. water levels in wells near the creek) in the alluvial aquifer are higher than the creek and groundwater is inferred to flow into the creek (BGC 2014g). After the pit is "full," the managed maximum water level (the head) will be maintained at a level no higher than 10 to 30 feet lower than the head of Crooked Creek near the pit. Thus, the direction of groundwater flow will be from the creek towards the pit lake. The text of Section 3.6 has been clarified on this point.
	• The mine site is split between Crooked Creek and the headwaters of the Iditarod River. Water seeps down through the cracks and comes out to the headwaters	• The mine site would be very close to Crooked Creek. The cracks in the headwaters of the Iditarod watershed that feed springs in that area are at a much higher elevation, and the contaminated water at the mine would be prevented by the force of

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	of each spring. Explain how contaminated holding water at the mine would be prevented from seeping through cracks of these streams at the headwaters, and how groundwater flowing from the mine site would be prevented from crossing over to the Iditarod watershed. • The pit lake could fill much faster than predicted and more contamination pushed into the surrounding groundwater system due to differential pressure on groundwater. • After the pit lake level reaches a steady state, contaminated water below the finite vertical extent of capture could flow out of the pit lake and offsite. Other comments note that the water level would be permanently managed to prevent untreated water from leaving the pit lake. This level would be maintained by pumping from the pit lake, treating the pumped water to meet water quality standards, and discharging it to Crooked Creek. Management of the pit lake level permanently would prevent contaminated water from leaving the lake. • Additional analysis of potentiometric surfaces at each model layer are warranted to estimate where groundwater discharging from the pit lake would go.	gravity from rising up over or through the surrounding hills and crossing over into the cracks or tributaries in the Iditarod watershed. • If the pit lake were to fill faster than the base-case scenario, the pit lake would still maintain hydraulic containment and any contaminated water "pushed" into the surrounding aquifer would be temporarily stored until it eventually flowed back into the pit lake. • The "finite vertical extent of capture" is well below the bottom of the pit lake, as shown in BGC (2017e). Based on regional modeling, for example, the capture zone is projected to extend to a depth of approximately 9,000 feet below sea level, far below the depth at which contaminated water could flow out and go offsite (BGC 2017e). The Corps does not agree that this is a viable scenario for offsite migration of lake water. The activities described in the comment would make the lake a "terminal lake" (Niccoli 2009) with groundwater flowing towards the pit lake from all directions. (See also description within GRD 6 below about partially penetrating sinks). • The additional analysis requested of potentiometric surfaces at each model layer are presented in BGC (2017f).

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	• The pit lake could fill much slower than predicted, like what happened at the Goldstrike Mine in Nevada, which caused much longer deficits in the aquifer and adjacent river than expected, and related overestimation of contaminant dilution. • The pit lake essentially would exist forever, so the planning must account for all potential inflows and climate change. • The managed lake elevation is intended to provide adequate freeboard and a maintain water level such that the groundwater would continue to discharge to the pit lake, rather than creating a flow-through pit lake. The gradient is "slight" (BGC 2015g, p. 2), however, which suggests that it could reverse, so that pit lake water would discharge from the lake	• The slow rate of filling at Goldstrike Mine is related to the high evaporation from the lake in the dry climate. For example, Myers (2015) in a review of pit lakes in Nevada found that "pit lake evaporation will prevent pit lakes from recovering to pre-mining groundwater levels because the pits will effectively resemble a large diameter well pumping at the evaporation rate." The comparison of mine pit lakes in Nevada to the Donlin Gold site is not appropriate because of the radically different climate in southwest Alaska, except that planned pumping to manage long-term lake stage effectively mimics evaporative water loss to make the Donlin Gold pit lake function like a terminal lake (see additional discussion within GRD 6 below). • The analysis leading to the long-term managed lake level considers long-term hydrologic variables and climate change scenarios on pit lake evolution, as specifically described in Section 3.26.4.2.2, Climate Change, Water. • The "slight" gradient is in comparison to the steep groundwater gradients that would be present during pit dewatering. The gradient would still be several times larger than the down-valley water-table gradient in Crooked Creek valley next to the mine (BGC 2014b, Drawing 19) and the gradient of Crooked Creek itself. Just as the down-valley gradients in Crooked Creek valley are sufficient to keep water from flowing upstream, the gradient between Crooked Creek and the pit lake would be

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	occasionally. • The groundwater model should consider the groundwater/pit lake relationship when the pit fills to its crest, as it could do during extreme wet conditions. • The Goldstrike Mine history illustrates that the science related to groundwater use at mines is far from certain, and there is risk of permanent changes that could have extreme impacts on water availability in the future. Barrick's history, and the uncertainties in predicting long-term impacts, all raise serious concerns regarding water use at the mine and its future impacts.	sufficient to prevent any gradient reversal that could lead to the condition of concern, "that pit lake water would discharge from the lake occasionally." • The pit is not expected to ever fill "to its crest" (i.e., the elevation of the spillway). The maximum managed stage of the lake would allow sufficient freeboard to accommodate extreme wet conditions, and if needed, the treatment plant could be operated year-round or expanded. Thus, modeling of that hypothetical scenario would not be useful, and is considered an ultra-low probability event and not reasonably foreseeable. • The permanent changes postulated at the Goldstrike Mine appear to be related to an underappreciation of the role of evaporative losses in a dry climate. Without such climate forcing, the permanent changes described by the Donlin Gold EIS (formation of a pit lake and long-term water treatment, among others) are considered to adequately describe long-term impacts. The history of "extreme impacts on water availability" in the western contiguous United States are not transferrable to the Donlin Gold site, due to the much wetter and colder climate, lower rates of evapotranspiration, and orders of magnitude lower water use in the vicinity of the Donlin Gold site. While there are clear uncertainties in the science related to groundwater analysis at mines, the large amounts of static and dynamic data collected at the Donlin Gold site, and the extensive technical analyses performed using state-of-the-practice

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	• The Draft EIS does not adequately discuss changes to mine site hydrology due to the mine pit and pit lake. Agencies must insure the professional and scientific integrity of the discussions and analyses in EISs. An agency contravenes this requirement by using a model that produces obviously inaccurate results or that incorporates unreasonable assumptions. Ultimately, in relying on a flawed scientific analysis, an agency fails to provide a "full and fair" discussion of the proposed action's environmental effects. The Draft EIS does not adequately discuss the effects of pit dewatering or the formation of the eventual pit lake on surface water.	methodologies that have multi-decadal track records, are deemed sufficient for characterizing long-term impacts of the project on groundwater for the purposes of NEPA. • The presence of model uncertainty does not imply model inaccuracy. Groundwater models of this type are known to be "non-unique" in the sense that different combinations of model parameters can provide similar model results. Base-case models are a simulation of a complex system for which other model outcomes that are nearly as "reasonable" may exist. Thus, model output can be considered as one realization of a probability density function such as a classic bell curve. The base case model should be providing results that are near the center of the bell curve. The sensitivity analyses can be thought of a measure of the spread of the bell curve, and an indication of how model results may reasonably differ from the base case results based on reasonable variations in aquifer parameters and boundary conditions. Users of model results, therefore, should rely on both the base-case model results and the results of the sensitivity analyses to have a comprehensive assessment of the systems simulated. The calibration process, sensitivity analysis, and related documentation for this project provides sufficient professional and scientific integrity to justify the analysis. Variations in model results described do not mean that the model is "obviously inaccurate" or incorporates "unreasonable

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	• Comments recommend using a worst-case and projected conductivities scenario during post-closure to determine the maximum contamination of the bedrock aquifers, so that mitigation measures can be proposed and implemented in case of significant groundwater contamination. In the worst-case scenario, significant groundwater contamination could occur prior to the pit lake start of pumping.	assumptions." The Corps does not agree with the premise that the scientific analysis is flawed or invalid. The model analysis is an integral part of a "full and fair" discussion of the proposed action's environmental effects as presented in the EIS. Although the EIS adequately discusses the effects of Donlin Gold's project, additional text and analysis has been incorporated into EIS Section 3.6 to more fully discuss and clarify the effects of pit dewatering and the formation of the eventual pit lake on surface water. • Language has been added to EIS Chapter 5 (Table 5.7-1A: to include a recommendation that Donlin Gold conduct a reevaluation of the groundwater model and sensitivity analysis of potential contaminant migration from the pit lake after Year 15 of mining, when the ACMA pit is within a few 100 feet of its maximum depth. Worst-case scenario planning, however, is not required for a NEPA analysis. As explained in the responses to these comments, the Corps has determined that the large amounts of data collected at the Donlin Gold site, and the extensive technical analyses performed using state-of-the-practice methodologies, are deemed sufficient for characterizing long-term impacts of the project on groundwater. • The Corps does not agree with the comment. The "fundamental considerations" that support the "in general" situation are not clear and appear to be incorrect. Abundant technical literature going back

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	• There are substantial implications under the current closure plan for potential off-site contaminant transport via regional groundwater flow in the vicinity of the pit, in addition to the transport of contaminants to local streams via local topographically controlled groundwater flow, which has been demonstrated to exist. Based on fundamental considerations related to the configuration of groundwater flow to a partially penetrating groundwater sink, hydraulic containment through the full depth of the Donlin Gold pit lake will not, in general, exist or persist during either filling of the pit or once maximum managed stage is established. • Published work on the conditions under which a pit lake may become a "terminal sink" (i.e., be fully hydraulically contained as of its final configuration – notably a less stringent condition than hydraulic	50 or more years describe partially penetrating pumping wells, or sinks. The literature generally has to do with estimating formation properties from aquifer tests performed on wells (or sinks, in general) that partially penetrate aquifers. An example is a recent paper by Dagan and Lessof (2011) that also contains a diagram of aquifer flow fields under partially penetrating sinks that closely mimic the pit lake. These flow fields (Dagan and Lessof 2011, Figure 4) demonstrate that the "lines of constant head," or potentiometric contours, show that all flow in the flow field would be towards the partially penetrating sink, confirming complete hydraulic containment similar to the pumped pit lake. This supports the analyses presented in the EIS that hydraulic containment through the full depth of the Donlin Gold pit lake would exist and persist during dewatering, filling of the pit lake, and once maximum managed stage is established. • The referenced papers by McCullough et al. (2012), McCullough et al. (2013), and Niccoli (2009) all fail to consider a pit lake such as proposed by Donlin Gold in which water from the lake is pumped, treated, and discharged away from the lake, effectively making the pit lake fit their description of a "terminal sink." Long-term pumping of lake water is functionally identical to what happens in a "terminal" pit lake that has "evaporation as the only discharge" in an arid climate (i.e., all groundwater flows towards and into the pit lake). Donlin Gold proposes pumping

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	containment throughout its filling) versus a "flow-through" pit lake (either type of condition being possible) should be considered in the Draft EIS. In general, pit lakes that are terminal sinks may exist under arid conditions (high rates of evaporation at the lake's surface), and most of the pertinent research is from arid portions of Australia. This includes papers by McCullough et al. (2012, 2013), which describe conditions under which a pit lake would or would not be "flow through" vs a groundwater sink (in all directions). It takes a reliable numerical groundwater flow model (as opposed to the current "water balance model" which only makes assumptions about water inflows and outflows to the pit / lake to approximate changes in water chemistry), to assess whether conditions exist to render a pit lake a terminal sink during its formation. The current numerical groundwater flow model has too many issues to reliably perform such an evaluation. While there is not much published on the topic, McCullough et al. (2012, 2013) provide useful background on pit lake hydraulics, and a book by the same author (McCullough 2014) is one of the best references on the subject. The Draft EIS indicates an estimated 19.8 in / yr precipitation at Crooked Creek, and an estimated 12.6 in / yr pit lake evaporation. Although a somewhat oversimplification of the hydraulics, Niccoli (2009) suggests that where precipitation exceeds the rate of pit lake evaporation, pit lakes are often "flow-through".	2,911 gpm (Figure 3.5-28 of the EIS), or around 200 million cubic feet per year during years 52-200 after closure. Using a pit lake area of 40 million square feet yields a rate of water removal equivalent to evaporation of approximately 60 inches per year across the lake surface, compared to "estimated 19.8 in / yr precipitation at Crooked Creek, and 12.6 in / yr estimated pit lake evaporation." Thus, the managed pit lake fits neatly into Niccoli's (2009) terminal pit lake model where all groundwater flows into the lake. McCullough et al. (2013) summarizes the hydrologic regime of a terminal lake: "If the steady-state pit lake elevation stabilizes below the surrounding pre-mining groundwater level, the pit lake becomes a terminal sink, with no water released into the environment through seepage into the groundwater system." At the Donlin Gold Mine Site, the pre-mining water table at the planned pit rim varies from approximately 20 to more than 800 feet above the future maximum managed pit lake level of 331 ft (BGC 2014g, Drawing 2). Thus, the literature cited in the comment supports the robustness of Donlin Gold's plan to prevent release of contaminated lake water to the groundwater environment and the Corp has fully considered the matters requested. Furthermore, Donlin Gold has provided the hydrologic information described by Niccoli (2009) to determine the hydrologic status of a pit lake (except for future pit dewatering rates, which are planned to be collected), and the Corps disagrees that the groundwater modeling "has too many issues

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	• If regional flow away from the pit is identified, provide discussion of the following related effects: whether the freeboard needs to be increased (e.g., a managed lake level 500 ft below the pit rim) to maintain hydraulic containment by the pit; and how the plan for placing waste rock backfill in the pit in late operations might change due to regional flow and / or the need for a lowered managed lake level.	to reliably perform" an evaluation of the hydrologic status of the pit lake. The results of regional flow modeling in the response to RFAI #98 (BGC 2017e) indicate that regional flow away from the pit lake would not occur. These results have been incorporated into revisions of Section 3.6 of the EIS. Thus, based on the results of regional flow modeling, potentially related issues such as freeboard and backfill management are expected to be the same as those analyzed in the EIS and updated in the Final EIS based on other comments received. (See also GRD 11 and WAQ 18.)

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GRD 7	Additional information is needed regarding the dry stack alternative: • Confirm that pending information in previous drafts regarding liner options has been added. • Clarify that impacts to groundwater under the lined dry stack option would be no different than Alternative 2. • Explain whether progressive reclamation of the dry stack would reduce the amount of water in the tailings and the time needed to achieve low seepage rates in post-closure. One of the key differences between Alternatives 2 and 5A is that the dry stack can be progressively reclaimed during operations, while the wet slurry TSF cannot. This provides an opportunity to place an impermeable cover on sections of the dry stack, which would stop meteoric water from entering those sections and allow those sections to begin to drain down. By the time the mine begins closure, there may only be a small section that has not been covered. Therefore, the volume of water entrained in tails in a traditional TSF could be much higher than that entrained in a dry stack at the end of mine life, resulting in a difference in the amount of time needed to achieve a low rate of seepage (18 gpm). Explain if this was this considered. • Provide a better comparison in Section 3.6 and the Executive Summary between Alternatives 2 and 5A regarding: 1) the time until the seepage pump system	• This is confirmed. Information on the two liner options (Unlined Option and Lined Option) has been revisited and revised as appropriate in Section 3.6, Groundwater Hydrology. • This has been made clearer in Section 3.6. • Progressive reclamation would reduce infiltration on some slopes, but others would remain open for continued stacking throughout operations. While the BGC (2015d) seepage model assumes zero-flux through the cover at closure rather than a slowly decreasing flux throughout operations, the latter is not expected to produce materially different results over the time-scale of the model (200 years). • The requested information has been added.

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	for the dry stack or TSF can be decommissioned (thus removing this risk of failure / water contamination), and 2) the time until the water treatment plant needs to begin treating pit lake water (thus beginning the risk of water contamination from pit overflow or WTP breakdown). With the current Draft EIS, it is not possible to reasonably compare the risks of Alternatives 2 and 5A. • Explain why the dry stack in Alternative 5A would be unlined, and whether lining it could be considered as a mitigation measure.	• Based on the results of dry stack seepage analysis using several liner scenarios (BGC 2015d), a lined scenario was added as an option under Alternative 5A (Lined Option). As such, it is considered a design feature under this alternative, rather than a mitigation measure. The unlined option was also retained under Alternative 5A (Unlined Option), as it has some feasibility and cost advantages (AECOM 2015e).
GRD 8	Concerns were expressed regarding the potential escape of groundwater from the TSF past the seepage recovery system (SRS): • Drawdown occurs under the tailings impoundment, but it would not draw groundwater to the pit because the ridge in the groundwater table between the tailings and the pit would not be eliminated. Seepage escaping the TSF underdrain would flow through the colluvium under Anaconda Creek and either discharge into Anaconda Creek or into the alluvium around and ultimately into Crooked Creek. The proposed SRS pumping rate and well spacing	• The BGC (2014b) Water Resources Management Plan states that "a seepage recovery system consisting of a collection pond, pumping system, and groundwater monitoring / collection wells, will be part of the TSF to maintain no discharge from the TSF." This system is designed to ensure that "no discharge" will be maintained through the concept of hydraulic control, meaning that all relevant water flows to one or more hydraulic sinks, from which water is pumped to acceptable discharge locations, and that no seepage

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	would be insufficient to contain contaminated groundwater from the TSF. Well spacings might need to be few hundred feet.	would escape the system. Preliminary analysis concludes that the SRS pond and four pumping wells are sufficient to maintain hydraulic containment. If detailed design efforts during installation, testing, and final design of the system indicate that additional hydraulic sinks are required in order to maintain hydraulic control, it would only be a minor design or construction effort to install them. These design and construction efforts are generally included in Table 5.2-1 in Chapter 5. Text has been added to the Additional Mitigation and Monitoring discussion of Section 3.6.2.2.6 and to Tables in Section 5.7 in Chapter 5 to clarify that testing and demonstration of adequate hydraulic containment of TSF seepage by the SRS monitoring / pumping wells will be performed. The premise of the comment that uncontrolled seepage would escape the hydraulic containment system is unsubstantiated, not sufficiently likely, and subject to final design refinement, such that further evaluation as part of the EIS is not merited.
	• SRS pumping would only draw from the surficial aquifer and bedrock interface.	• The two deeper wells, at 328 ft deep each, are anticipated to be tapping bedrock considerably below "the surficial aquifer and bedrock interface." In any event, SRS pumping is anticipated to achieve hydraulic containment of contaminated groundwater (see also response to 1st bullet above).
	• The groundwater model does not describe the boundary used to simulate the TSF underdrains.	• The underdrain boundary condition is modeled as stream cells (Drawing 34, BGC 2014c).

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	• Suggesting that a failure would not be addressed for weeks is implausible and therefore represents a worst-case condition and should not be included in the NEPA analysis. The likelihood of SRS failure would be very low due to inspection, maintenance, contingency plans, and real-time monitoring. • Clarify the volume and spatial extent of seepage from the TSF that would be collected in the SRS, and how it would be different under the dry stack alternative.	• Language has been added to Chapter 5 (Impact Avoidance, Minimization, and Mitigation) to describe that regular inspections and maintenance of the SRS system would be performed, and specific contingency / back-up plans would be in place, so that if such a failure were to occur, the situation would be identified and response actions begun immediately. As a result, the likelihood of SRS failure resulting in a release has been modified to "very low" during operations and closure. However, because there is no defined ending time for operation of the SRS system, and operations could continue for many decades, during which time there would be reduced staffing levels and the possibility of weather-induced or mechanical failure of one or more components of the system, the description in the EIS of a low probability of failure has been retained for the post-closure period. • Requested clarifications have been added to the Final EIS.
GRD 9	The Corps should re-evaluate the groundwater impact levels identified in Sections 3.6 and 4.3 (cumulative) regarding the extent of effects (local vs. regional) and overall summary levels, given the extensive comments on other parts of the groundwater analysis because: • Substantial deficiencies exist in the current hydrogeologic data and analyses for the mine site.	The Corps has directed that overall impact summary levels be removed from the document, and that extent definitions be revisited. Summary statements have been updated accordingly following revisions to the groundwater analysis. • Extensive data collection efforts, including supplemental aquifer testing near Crooked Creek prompted by reviews for the EIS (BGC 2014f), are

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	• Direct (and cumulative) effects to groundwater-related resources, including impacts to stream flows and water quality, have not been adequately characterized. In particular, net overall groundwater-related impacts following closure have not been demonstrated to be "minor."	considered sufficient for characterizing groundwater resources in the project area and for assessing impacts. The technical analysis has been improved as a result of comments on the Draft EIS, such that perceived deficiencies have been addressed and the analyses provided are considered adequate. • The term "minor" has been removed from the EIS. The Corps believes, however, that direct and cumulative effects to groundwater-related resources have been adequately characterized.
GRD 10	Clarifying edits should be made in the groundwater section regarding the following. • Change domestic water use at the camp from 70 to 55 gallons per day (gpd) / person, as it is more representative of Alaska projects (e.g., Red Dog Mine). • Add the number of measurements used to make up the estimates of K values in Table 3.6-2. • Include a reference to where sensitivity analyses can be found to the discussion on Fracture Flow Analysis. • Add language to the South Overburden Pile fate and transport discussion regarding the reactions between dissolved constituents and the aquifer material leading to precipitation.	Edits have been incorporated into Section 3.6 in response to comments assigned to this SOC.

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	• Review the monitoring summary information against the updated Water Resources Management Plan and revise as necessary.	
GRD 11	Concerns were expressed regarding the omission of possible regional groundwater flow systems in the analysis: • The model no-flow boundaries are not realistic. The Draft EIS implies that groundwater "no-flow" conditions exist at all depths at which the project may have groundwater-related effects (1,800 ft bgs) at a combination of locations that are implied to surround the entire mine site (but are so far largely undefined), which is physically untenable. Information provided in this regard is limited to Figure 31 of the BGC (2014c) Conceptual Hydrogeologic Model report, which suggests that Crooked Creek acts as a groundwater "no-flow" boundary at all depths of interest on the west, including 1,800+ ft bgs, which is again physically untenable.	• Regional and intermediate-scale flow modeling (BGC 2017e) shows that the high topographic relief in the area, in general, confirms that the boundaries used are appropriate (see also GRD 5). The vertical boundaries in the base-case model closely match the topographic and groundwater divides present in the vicinity of the mine, while the bottom no-flow boundary is more complicated. Regional modeling shows that some flow does cross this boundary of the base-case model; however, the amount of water is relatively small and hydraulic containment of the pit lake water is maintained throughout lake filling, closure, and post-closure time. There is no "no flow" boundary shown on Figure 31 of the Conceptual Hydrogeologic Model report (BGC 2014c); the "groundwater divide" shown on the figure references a vertical plane oriented towards the low ridge separating Anaconda Creek and a neighboring small drainage to the north, not anything directly related to Crooked Creek. Crooked Creek in the model was simulated with a Streamflow Routing package (BGC 2014c), which is physically tenable and is not a no-flow boundary. • Regional and intermediate-scale flow modeling (BGC

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	• Given the significant impact of lateral boundary locations and conditions on the results of the groundwater effects analyses, this boundary deficiencies must be remedied before the numerical groundwater flow model is constructed / calibrated (or reconstructed / recalibrated), if the analyses are to provide a useful and defensible assessment of the groundwater-related effects of the project.	2017e) confirm the hypotheses presented in the conceptual and numerical model reports (see Section 5.7.4 of BGC [2014c]) that high topographic divides create topographically driven local flow systems that are of primary concern for the analysis, and that these topographic divides provide suitable justification for model boundaries. Furthermore, these divides were selected and subsequently shown to be sufficiently distant from the zone of influence of mine dewatering so as to not be a limiting factor of the modeling. Additional clarity on the role of the selection of the boundary at the base of the model has been provided by BGC (2017e). Additional work (BGC 2017e) has shown that the boundary conditions used for the modeling work are not a significant deficiency and no remedy is needed. (See also GRD 5).
	• Regional groundwater flow should be identifiable as head or groundwater level measurements that are relatively uniform (in space) and roughly southwesterly given the topography of the overall region, i.e., toward the Kuskokwim River and extensive marshlands further southwest. If regional groundwater flow is encountered at depths intersected by the pit or affected by pit dewatering, then the areal extent of dewatering-induced drawdown, areal extent of reduced streamflows, and inflows to the pit may be significantly underestimated by the current NEPA analyses. Given the clear presence of regional groundwater	• As discussed during the December 2016 Mine-Water Workshop, any regional flow system with the potential to transport contaminants away from the pit lake would have to exhibit water levels (or hydraulic head levels) in the aquifer below or adjacent to the pit lake lower than the maximum managed pit stage (or hydraulic head) of 331 ft above sea level. This is because water flows from areas of higher head to areas of lower head. BGC (2014g) reviewed vertical hydraulic gradients in upland and lowland (near-creek) areas in the project area and found that gradients in lowland areas were either upward or near zero. In other words, hydraulic head readings at

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	flow at some depth in the area of the mine site / pit, and its potential implications for groundwater flow in excess of current estimates into the site and offsite transport of contaminants, this model deficiency should be resolved. As discussed during the December 2016 Mine-Water Workshop, currently available groundwater level measurements are insufficient to identify and characterize any regional groundwater flow which may be present at depths at which the project is likely, or certain, to have groundwater-related effects (greater than or equal to 1,400 feet), including potential off-site transport of contaminants of environmental concern from the pit under the current closure plan.	depth were near creek levels at the site or above. At American or Crooked Creeks near the pit, for example, deep groundwater levels of 349 ft above sea level or higher were observed. Existing data and modeling results indicated that, with upward gradients, water levels (or hydraulic heads) would get higher at deeper levels. Should a regional flow system exist in this area with the potential to transport contaminants away from the pit lake, there would have to be a reversal of these gradients and hydraulic heads would need to exist that would be lower than 331 ft above sea level. Furthermore, these low heads would need to progress to even lower heads all way to the eventual discharge point of the flow system, such as the Kuskokwim River or the Bering Sea coast. Regional scale modeling (BGC 2017e) has failed to show conditions, either under base case or sensitivity analysis scenarios, that such flow systems could exist. This is because of the high-relief local topographically driven flow cells present. There is no data to support the existence of such a flow system and the Corps disagrees that there is a "clear presence of regional groundwater flow at some depth" of relevance to the proposed project. Furthermore, the possibility of its occurrence is such an ultra-low probability event that its consideration under NEPA or further collection of deeper hydraulic head data is not warranted.
	• Instructive groundwater flow nets and simulations published by Toth (1963) and Winter (1976, 1999)	• The use of the terms "regional" and "local" flow systems or cells in this comment is not clearly

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	were cited during the December 2016 workshop to suggest that regional groundwater flow at the depth of the planned pit and potential groundwater-related project effects (1,400 plus ft bgs) is unlikely at the Donlin Gold site given the topography of the land surface (overall area), and / or absent an anomalously high-conductivity zone at depth below the site. Rather, the instructive flow nets and simulations prepared by Toth and Winter for hypothetical vertical cross-sections (through hypothetical groundwater flow systems) incorporated, by design, "no-flow" conditions on the lateral boundaries which precluded the simulation of regional groundwater flow in those examples and constrained all groundwater flow in the hypothetical systems to local flow cells. As such, the work of Toth (1963) and Winter (1976 and 1999), while instructive for the conditions simulated, have no relevance or implications for the presence or lack thereof of regional groundwater flow at the Donlin Gold site at the depths at which the project is likely or certain to have groundwater-related effects. • Provide information on the feasibility of utilizing new or existing deep exploratory holes to determine	understood, as it seems to contradict Toth's (1963) and industry-wide long-established usage of those terms. The work of Winter (1976; 1999) consists of substantially more than just simulations of hypothetical flow systems; Winter (1999) describes 11 field investigations of groundwater flow systems around lakes in Canada, North Dakota, Wisconsin, Minnesota, Indiana, New Hampshire, Florida, and Delaware in a variety of hydrogeologic and climatic settings and shows simulations of those flow systems. Winter (1999) examined both two-dimensional and three-dimensional features of groundwater flow systems around lakes. The principles described in the cited papers are highly relevant and foundational to studies of lakes and groundwater interactions, especially those projected to occur at Donlin Gold, and are consistent with other studies such as McCullough et al. (2012, 2013) and Niccoli (2009). Nevertheless, BGC (2017e) went far beyond two-dimensional conceptualizations at the project site to develop fully three-dimensional conceptual and numerical evaluations of groundwater flow systems at a regional scale using actual hydrogeologic, drainage, and topographic information for the area. This work confirms that regional flow systems are not expected to occur at the proposed pit at any depth of relevance to the project under any reasonably foreseeable hydrogeologic scenario. • BGC (2017e) (response to RFAI #98) provides

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	the existence or non-existence of regional groundwater flow. Explain if existing drill hole logs have groundwater data, or could be re-drilled through upper cement to conduct hydrologic testing. Provide suggestions on other methods of collecting data that would inform the analysis of regional flow. • If regional flow is identified, provide discussion of the following related effects: how the intersection of deep fresh groundwater by the pit affects pit lake stratification; how the change in pit lake stratification affects ecotoxicity, particularly for waterfowl; and	additional detail on existing drill-hole data collected at the mine site. As discussed at the December 2016 Mine-Water workshop, advancing new deep wells would cost on the order of millions of dollars. Accessing previously cemented drill holes for deep hydrologic testing would not cost significantly less, as they were originally drilled at narrow core diameters and were grouted and abandoned (BGC 2017e). The holes, if re-drilled, would likely have to equilibrate for hours to months before static conditions would occur, and may require the use of casing to hold the holes open for that long. Other methods of obtaining data that would inform the analysis of local and regional flow can be evaluated through methods proven at other lake-aquifer systems, such as reported by Winter (1999) and other investigators (e.g., Anderson and Woessner 2002, Anderson and Munter 1981, and Munter and Anderson 1981) using conceptual and numerical groundwater model analyses that use known topographic, structural and stratigraphic geologic, and hydrologic data, combined with subsurface mine-area data, to evaluate the possible presence or absence of regional flow conditions. Additional regional flow modeling based on these data sources has been performed and reported by Donlin Gold in response to RFAI #98 (BGC 2017e) and has been reviewed by Corps SMEs and incorporated into EIS Section 3.6. • The results of regional flow analysis and modeling in

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	how changes in the pit lake might affect water treatment for both Alternatives 2 and 5A, including treatment methods, volume, and by-product waste disposal.	the response to RFAI #98 (BGC 2017e) confirms that regional flow systems are not expected to occur at the proposed pit at any depth of relevance to the project under any reasonably foreseeable hydrogeologic scenario. These results have been incorporated into revisions of Section 3.6-Groundwater of the EIS. Thus, based on the results of regional flow analysis and modeling, potentially related issues such as pit lake stratification, effects on ecotoxicity, and WTP methods are expected to be the same as those analyzed in the Draft EIS and updated in the Final EIS based on other comments received. (See also WILD 5 and WAQ 5, 9, 10, 25, and 31).
GRD 12	The Corps should consider revisions to adaptive management and monitoring of the pit lake: • Given the uncertainties in the groundwater model and concerns that the impacts could be significantly greater than those identified in the Draft EIS, it is unclear if periodic revisions to the model during operations and post-closure would mitigate groundwater impacts. Other comments strongly encourage re-examination and revision of the groundwater model in operations and post-closure as described in the Draft EIS. Model revisions should include verification of the original model to assess the accuracy of the EIS predictions; if revisions differ substantially from that in the EIS, new NEPA analysis should be completed based on new predictions.	• The four main areas of potential changes in groundwater impacts stemming from uncertainties associated with the groundwater model are related to the following topics: 1) more or less water may need to be pumped, treated, or discharged to dewater the pit; 2) more or fewer impacts on Crooked Creek; 3) hydraulic containment of contaminated groundwater; and 4) changes in the timing and eventual rate of pumping, treating, and discharge of pit lake water during closure and post-closure. Each of these are evaluated with significant deviations in all key model parameters as part of the sensitivity analysis. The proposed design features, mitigation measures, monitoring, and adaptive management measures incorporated into the Final EIS are considered to be sufficiently robust to be capable of managing groundwater impacts approximating the

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	• Model revisions should include new information gained during operations such as bedrock K, modelling faults discretely rather than as a porous medium, and altering the distribution of recharge. • Groundwater monitoring should assess at least every three years whether dewatering drawdown has extended beyond the monitoring system, and if significant at distant wells, additional monitoring wells should be installed. There is a lack of monitoring and adaptive management for potential spread of drawdown due to faults.	range of potential impacts presented. Because there are no identified but undefined potential impacts associated with uncertainties of the model, a new NEPA analysis would not be expected to be warranted as a result of revisions to the model. • Model revisions should include new information gathered during operations; however, decisions regarding revisions to the model should be driven by the information collected and not specified a priority. There are significant technical challenges associated with modelling faults discretely related to parameterizing the model. It is agreed, however, that consideration of these potential changes should be duly given at the time. Edits have been incorporated into Chapter 5, Tables in Section 5.7 regarding groundwater model revisions. • Additional language has been added to Section 3.6 and Chapter 5 (Tables 5.7-1A / B) to include monitoring and adaptive management activities for the potential spread of drawdown due to faults, either as observed in monitoring wells or as observed as unexpected flow of water from faults or folds into the pit or pit dewatering systems.
GRD 13	Clarification is needed regarding the level of effects on existing or potential drinking water uses of groundwater.	Text has been clarified in Section 3.6 as suggested.
GRD 14	Clarification is needed regarding pumping and gravity flow. • Explain whether gravity flow of TSF and WRF seepage to the bottom of the pit lake would work.	• Clarification regarding the viability of gravity flow has been added to the text in Section 3.6. The pit rim, where it intersects the course of American Creek, would be about 150 feet higher than the maximum

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	• Explain whether additional pumping of water from the TSF or SRS would be needed to get the water to flow to the bottom of the pit lake from the pit rim. • Revise the post-closure WBM (Draft EIS Figure 3.5-28) to indicate both gravity flow and pumping from the WRF to the pit.	managed stage of the pit lake. Once the water gets to the pit rim, gravity-driven flow will allow it to flow to the bottom of the lake, because the total hydraulic head at the pit rim will be many tens of feet higher than the total hydraulic head at the bottom of the pit lake. The high pressure head at depth is more than offset by the higher elevation head at the pit rim. • Pumping is currently planned to get the TSF seepage from the SRS to the pit rim. Additional pumping from the pit rim to the bottom would not be needed. • Seepage flow from the WRF would reach the pit only through gravity flow.
GRD 15	The EIS should provide a description of the change in cone of depression and spatial extent of groundwater contamination in the event that dewatering pumps fail.	The Corps disagrees with addressing this scenario. This is an ultra-low probability / worst-case event beyond the scope of NEPA analysis. This is because a large number of pumps would need to fail simultaneously, and the short-term effect would be flooding of the mine workings, which would drive sufficient precautionary measures such that this would not be a reasonably foreseeable scenario for NEPA analysis. Also, after the first few years of pumping, the cone of depression would likely take a very long time (years) to reverse gradients before contaminated water would escape hydraulic containment.
GRD 16	Concerns were expressed regarding the technical complexity of the groundwater modeling topic, and the need for review by an independent contractor. The Corps and cooperating agencies should respond fully to the May 11, 2016 technical memorandum prepared by Tom	Section 3.6 has been revisited and edited as appropriate to be more understandable to the general public, while retaining technically rigorous content and analysis as required. In addition to expert and external reviews of the Donlin Gold team's work as described by BGC (2014c, pp. 20-21), subject

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	Myers.	matter experts (SMEs) on the Corps EIS team conducted independent reviews of Applicant technical source documents as part of the impact analysis, resulting in significant data collection and modeling enhancements to address SME concerns. In addition, extensive and comprehensive independent technical review comments submitted by Myers (2016) and agencies (e.g., USFWS 2016b) have been incorporated into the comment analysis, and the EIS has been updated as noted in responses to the various SOCs that these comments were coded to. Model uncertainty and the fundamental role the model plays in the EIS process have resulted in identification and inclusion of adaptive management and mitigation measures that are considered adequate for the purposes of the EIS without further technical review. Further technical review is not likely to reduce the irresolvable uncertainty associated with models of this type and is not warranted.
GRD 17	Concerns were expressed regarding treatment of recharge in the model: • The recharge method does not account for variability due to precipitation, slope, or geology. The Draft EIS does not provide a reference for the groundwater recharge estimate.	At the scale of the model encompassing several watersheds and as a result of the geological factors described by Donlin Gold (2017a), variability of recharge resulting from variations in precipitation, slope, and geology are not considered sufficiently important to prompt revisions in the analysis or impose significant interpretive limits on model accuracy (see also additional comments in this GRD). During the calibration process, variations in recharge were evaluated and the model was found not to be sensitive to this parameter, so a uniform recharge rate was applied for the calibrated model (BGC,

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		2014c, pp. 24-25). The reference for recharge estimates (BGC 2011b) has been added to Section 3.6.1.3.2.
	• Very low amounts of recharge appear to percolate to deep parts of the model. The model description does not present the simulated amount of groundwater recharge that percolates into deep bedrock, which could affect dewatering estimates, but it should. If more recharge flowed through deep bedrock, dewatering rates would be higher.	• RFAI #104 requested further information on deep percolation of recharge, which was provided by Donlin Gold (2017a). The analysis shows significant percentages of recharge flowing to deeper portions of the model (15% of recharge flowing to a depth of 1,243 ft below ground, for example). The hypothetical case described would likely be true if bedrock had a higher K; however, the K values assigned are well-justified by the field information provided and the model calibration performed. Arbitrary adjustment of K just to make dewatering rates higher is not warranted. The results of model simulations with higher K values on dewatering rates are adequately described by the sensitivity runs (BGC 2014c).
	• The model does not simulate groundwater recharge inside the pit but should.	•
		• The Corps disagrees with this assessment. The modeling report (BGC 2014c) assumes that "water within the pit will be managed to reduce infiltration." This means that most rainfall and snowmelt would quickly runoff the steeply sloping rock walls during precipitation events, that areas of potential water ponding that would facilitate recharge would be drained, and that a portion of any infiltration that did occur would evaporate during subsequent post-
	• The conceptual hydrogeologic model includes no information that can be used to constrain estimates of groundwater recharge during the	

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	construction / calibration of the numerical groundwater flow model, either recharge rates or factors affecting its spatial and temporal distribution. The model should be revised to include any available information, or the lack thereof, regarding this critical component of the site's hydrogeology, which significantly effects the calibration of the numerical flow model and subsequent analyses. Some of this information has been provided in the description of the numerical model, but not as part of the conceptual model. • It seems somewhat untenable, that areally distributed recharge to the groundwater system would be adequately simulated as uniform over the entire model domain, given that, depending on location, sedimentary rocks, intrusive rocks, colluvium, or alluvium predominate at the near surface with significantly different hydraulic properties. This is significant in that the distribution of groundwater recharge has a pronounced effect on the optimization of both aquifer parameters and streambed conductivities, with particular implications for the reliability of estimates of dewatering impacts on stream baseflows, as well as pit inflows (required dewatering rates) and the rate of formation of the pit lake.	event periods. Whatever amount of groundwater recharge that would occur during the mining phase is anticipated to be minor and inconsequential to the scenarios simulated. The assumption of zero recharge inside the pit is considered reasonable. • Additional information regarding factors affecting the spatial and temporal distribution of recharge has been prepared (Donlin Gold 2017a) and EIS Section 3.6 has been revised to reflect the new information. • It is agreed that variable distribution of recharge in arid climates can be an important factor where "flashy" runoff from mountainous areas and subsequent infiltration and recharge in low-lying streams and river valleys can dominate over rainfall. In more humid, colder, and less steep locations such as at Donlin Gold, however, these conditions do not apply, and recharge from regionally pervasive (and frequently low-intensity) rainfall events and snowmelt provides plausible mechanisms for uniform areal recharge. Upland areas are considered to provide greater recharge than valley bottom areas (Donlin Gold 2017a). Practically all surficial soils and bedrock identified in the comment, while variable, are, as a result of weathering, jointing, frost shattering and other factors, sufficiently permeable to permit infiltration of all but the most intense rainfall events (Donlin Gold, 2017a). The areal

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		distribution of recharge was varied during calibration of the model; however, such variations were not found to improve the calibration of the model and a uniform application of recharge was used. Sensitivity runs (SR6 and SR7, BGC 2014c) demonstrate that recharge is not as critical a component of the model and subsequent analysis as suggested. Thus, the assumption of uniform recharge in the model is considered reasonable for the purposes identified in the comment.
	• Dewatering removes water out to the extent of an influence zone where the dewatering pumpage equals the sum of recharge that is captured and streamflow induced to recharge.	• The lengthy discussion summarized by this SOC has an incorrect conceptual foundation, as it describes the source of only some of the water removed through dewatering. The capture zone of the pit dewatering pumping is larger than the zone of influence (Drawings 39 and 40, BGC 2014c). Dewatering also captures water provided by lateral groundwater flow towards the pit from outside of the zone of influence. This is water that would otherwise discharge naturally from the aquifer. Recharge, while important, is not as critical as portrayed.
	• Recharge affects the Draft EIS predictions by its effects on groundwater model simulations. In general, higher recharge means higher discharge, and calibrating a model using higher groundwater	• Recharge is one of the most difficult hydrogeological parameters to estimate. There is concurrence that the estimate used for the model, 5.5 inches per year, is not unreasonable and compares favorably with recharge estimates derived for other non-arid areas (Donlin Gold 2017a).

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	flux rates would lead to higher estimated K values. Together, high recharge and high K could lead to higher dewatering estimates. The amount used for this project, 5.5 in/yr, is not unreasonable, although it is higher as a proportion of annual precipitation than most areas. Because snowmelt is a slow process, the estimate is not unreasonable. • The currently available groundwater level measurements are insufficient to calibrate areally distributed groundwater recharge jointly with aquifer properties. Values of the former are currently largely based on the output of a water balance spreadsheet, are uncertain, and have a significant effect on the calibration of aquifer properties (rock units and fault zones).	• This is an inaccurate summary of how recharge values were determined. In response to RFAI #104 (Donlin Gold 2017a), BGC described an iterative calibration process between the surface water model and the groundwater model, and the matching of the models with monthly flow data at the USGS gage near the mouth of Crooked Creek. As a result, and in consideration of other information provided in GRD 17, the Corps believes that ample documentation has been provided that the currently available groundwater level measurements are sufficient to calibrate areally distributed groundwater recharge jointly with aquifer properties in conjunction with the surface water model.

2.19 HAZARDOUS MATERIALS

Concerns about the potential for hazardous material storage, spills and impacts to resources or the environment. Chemicals associated with mine process and storage of materials (cyanide, mercury, arsenic, acids).

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HZM 1	There was a concern expressed that the factors that could affect mercury methylation would increase with mining operations. The Corps should acknowledge the increase of methylmercury production.	Additional information has been added to EIS Sections 3.7 and 3.22 (Water Quality and Human Health) to address this concern, as described in WAQ 21. Specifically, new edits have been incorporated into Section 3.7.2.2 and Section 3.7.2.1.1. As a result of the December 2016 Mercury Workshop, a focused Human Health Risk Assessment (HHRA) was developed by Donlin Gold that incorporates suggestions on methylation discussed in comments and subsequent meetings and memos (EPA 2017b, AECOM 2017b, Weglinski 2017). The HHRA was the basis of the Focused Risk Assessment (FRA), Appendix AB. The following was included in the FRA and Sections 3.7 and/or 3.22 regarding mercury methylation: literature review/discussion of mercury speciation models recommended by EPA (SERAFM and D-MCM) and any others that are pertinent; incorporation of elements from these models into the HHRA if appropriate; rationale for predicted rates of mercury methylation in the future; basis for predicted future concentrations of mercury and methylmercury in surface water; use of multiple lines of evidence where available (e.g., past model predictions in ARCADIS [2014] vs. field measurements in Donlin Gold [2016b]) to support assertions about predicted concentrations of mercury and methylmercury in surface water, and predicted rates of methylation in the future; discussion of assumptions that sulfate stimulates methylation, that changes in carbon loading would stimulate methylation, and

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		that "new" mercury is more readily methylated than "old" mercury; and adjustment (increase) in predicted methylation rates to account for these assumptions, if necessary to be appropriately conservative in the HHRA.
HZM 2	Risks associated with mine tailings storage and the potential for toxic byproduct to contaminate the environment, affecting health was a concern. Concern was also expressed that seismic activities causing release of millions of gallons of toxic water and tailings into the Kuskokwim River would impact river subsistence resources, drinking water aquifer systems, and anadromous fish populations such as Chinook salmon.	The EIS discusses the potential consequences of hazardous substances and the impacts to resources in the environment and to human health, as elaborated in Section 3.7 Water Quality, 3.8 Air Quality, 3.22 Human Health, and 3.24 Spill Risk. The impacts analysis is based on careful consideration of the project design, applicant proposed mitigation measures, past occurrences, and probable risk.
HZM 3	Concerns were expressed about the mercury capture process.	The description of mercury capture in Chapter 2 was edited as appropriate based on these comments, and is adequate. Section 3.2 Soils, Section 3.7 Water Quality, Section 3.8 Air Quality, and Appendices H and AB provide additional information on baseline and predicted levels of mercury in various media at the mine site facilities.
HZM 4	Storage and transport of hazardous materials, particularly mercury and cyanide, was a concern. Details on how cyanide and mercury would be transported and the effectiveness of proposed storage containers for chemicals should be provided by the Corps. The EIS should address the safety of storing cyanide, mercury, and explosives at the Bethel Port and Angyaruaq (Jungjuk) Port facilities and provide details on how highly toxic chemicals would be transferred from the sea barges to the smaller river barges.	Details on how cyanide and mercury would be transported and transferred between vessels are described in Chapter 2. Materials would be transported in compliance with regulatory requirements and in containers that are built for purpose. As discussed in Section 3.24.7, one impact-reducing measure would be to equip containers with GPS devices for tracking during transport. Note that any actions that would occur at the Port of Bethel at the Bethel Yard Dock are not part of the proposed action, and are considered connected actions pursuant to NEPA (40 CFR 1508.25). At this time, it is not known that connected

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		actions would occur. However, connected actions are analyzed for some resources in or near the Bethel Yard Dock in the context of resource impacts in Chapter 3, Affected Environment and Environmental Consequences. See Chapter 1, Section 1.2.1, Connected Actions.
HZM 5	Concerns were expressed with mercury, cyanide, arsenic, and explosives (ANFO) released to air, water, soil, and sediments through mill and stack emissions, waste rock and fugitive emissions, contaminated dust, and water discharges.	The EIS discusses the fate and behavior of materials, how they would be transported, the likelihood of releases, and the impacts of releases in Sections 3.7, 3.8, and 3.24. Mitigation measures and protections against spills are examined. Fugitive emissions, contaminated dust and water discharges are discussed in Section 3.8 Air Quality, Section 3.10 Vegetation, and Section 3.7 Water Quality, respectively.
HZM 6	The possibility of renewed environmental or health hazards from existing sites disturbed by construction activities should be disclosed as project activities at the proposed Bethel Port have the potential to disturb existing known and unknown environmental hazards that exist at the proposed site. The EIS should include a discussion of how distance, hydraulic gradient and permafrost melting would contribute to impacts.	Section 3.2.2.2.4 discusses contaminated sites, and Section 3.2.3.2.4 discusses the impacts of the Bethel Yard Dock expansion in relation to those sites. The effect of permafrost on those sites is also discussed, in Section 3.2.3.2.2. Note that any actions that would occur at the Port of Bethel at the Bethel Yard Dock are not part of the proposed action, and are considered connected actions pursuant to NEPA (40 CFR 1508.25). At this time, it is not known that connected actions would occur. However, connected actions are analyzed for some resources in or near the Bethel Yard Dock in the context of resource impacts in Chapter 3, Affected Environment and Environmental Consequences. See Chapter 1, Section 1.2.1, Connected Actions.
HZM 7	Chemical compositions of substances rather than the use of trade names of hazardous materials (e.g., F-549, UNR 829, as well as general categories such as flocculants, anti-scalants, and water softening agents) should be used as this	Clarifying information was added where appropriate. The Plan of Operations Integrated Waste Management Plan and the Project Description Prepared by Donlin Gold provide more information on chemicals than what was provided by

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	information is necessary for affected communities to fully evaluate the risks associated with the mine facility.	the EIS (available at donlingoldeis.com / BackgroundDocuments).
HZM 8	Arsenic, antimony, lead, antifreeze and acid washing were a concern both in processing and in spill scenarios.	Clarifying information was added where appropriate in Chapter 2, Section 3.24.6.2.1, and Section 3.8.3.3.1. The Plan of Operations Integrated Waste Management Plan and the Project Description prepared by Donlin Gold provide more information on chemicals than what was provided by the EIS (available at donlingoldeis.com / BackgroundDocuments).
HZM 9	Cyanide effects should be clarified in the document. Discussion should include: impacts of catastrophic failure to cyanide-sensitive groups of aquatic organisms including salmon; uncertainty regarding the toxicity of various forms of cyanide to living organisms due to the limitations of routine analytical techniques for measuring cyanide and the presence of breakdown cyanide forms in mining waters, which makes determining which chemical constituents are actually causing a toxic response difficult; information that breakdown compounds are known to be toxic to aquatic organisms that persist in the environment for a long period of time, some of which can accumulate in plant and fish tissue; limitations of cyanide monitoring (free cyanide, weak-acid-dissociable cyanide, and total cyanide) which often overlook other toxic breakdown products of cyanide, such as cyanates and thiocyanates; and lack of established water quality criteria for most forms of cyanide derivatives found in mining-related waters.	Clarifying information was added where appropriate in Section 2.3, Section 3.7, and Section 3.22. Refer to Appendix AB for information on the health impacts from cyanide. Alternatives for extraction practices that do not use cyanide that were considered and dismissed are listed in Table 2.4-1 and Appendix C. A NEPA review assumes that all Best Management Practices will be used, all permit stipulations will be complied with, and that safety precautions in transport are successful. Reasonably foreseeable scenarios are included in the NEPA review. Spill response plans specific to cyanide would be developed to satisfy regulatory requirements after the NEPA process.
HZM 10	Further clarification of potential impacts from a cyanide release should be included.	Additional clarifying information was added where appropriate in Sections 3.24.4, 3.24.5, and 3.24.6, and verified

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		when necessary. Spill response plans specific to cyanide would be developed to satisfy regulatory requirements after the NEPA process.
HZM 11	Concerns were expressed regarding the transport of mercury to and from the proposed project site.	No mercury would be transported to the project site. Clarifying information was added to Section 3.24.4 to address the comments. Suggested mitigation has been added to Tables in Section 5.5. Additional information from the World Shipping Council was also added to describe the number of shipping containers that are lost from container vessels. The Plan of Operations Integrated Waste Management Plan and the Project Description prepared by Donlin Gold provide more information on chemicals than what was provided by the EIS (available at www.DonlinGoldEIS.com/BackgroundDocuments). Spill response plans specific to mercury would be developed to satisfy regulatory requirements after the NEPA process. Mercury would be backhauled on return barges to permitted long term storage facilities. See response to HZM 13 for related issue.
HZM 12	The Corps should clarify the cleanup guidelines for sediments; if there was a tailings dam breach, most of the tailings would end up in the floodplain creeks. Clarify the information presented in Tables 3.7-33, 3.7-46, and 3.7-122.	The original text is correct. The most stringent ADEC cleanup guideline for mercury in soil is 1.4 mg/kg (in locations where there is potential for migration to groundwater), and mercury concentrations in the tailings generated under Alternative 2 would not be expected to exceed that cleanup guideline value. Table 3.7-47 describes possible concentrations of constituents in tailings generated under the dry stack Alternative (Alt 5A); the mercury concentration predicted in the dry stack

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		tailings, shown in Table 3.7-47 is 1.2 mg/kg, which is below the cleanup guideline for soils.
HZM 13	The Corps should include a quantitative fate and transport model for a loss of a mercury container in the analysis of alternatives.	The suggested scenario of a breach of a mercury container into the Kuskokwim River requires a complete chain of at least three unlikely events: 1. A river barge traveling downstream at an average speed of ten knots (River Barge Fleet Design and Operation, AMEC 2013) would need to ground or strike another vessel or object with enough force to break the shipping containers free from the lashing gear, 2. The shipping containers would then need to fall off the deck and into the water, and 3. The mercury containers within the shipping containers would then need to breach and discharge their contents to the river. This combination of events is conceivable but very improbable: • The barge speed of ten knots would limit barge and container damage, • Containers would be secured to the barge to prevent movement, • A container falling into the water and then to the river bottom would not be likely to strike and be damaged by sharp rocks because the river bottom is sand, gravel, and cobbles, • Mercury containers are extremely robust (Metzger 2016), and • Crowley and Alaska Marine Lines, major shippers of containerized freight in Alaska and the Pacific Northwest, have not had any incidents in Alaska in at least the last decade with similar sized containers

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		being lost overboard (Tague 2016; Stuart 2016). • The Corps has determined that loss of a container of mercury overboard and subsequent loss of contents is not a reasonably foreseeable scenario and should not be analyzed in the EIS. Additional information from the World Shipping Council was also added to describe the number of shipping containers that are lost from container vessels. The Plan of Operations Integrated Waste Management Plan and the Project Description prepared by Donlin Gold provide more information on chemicals than what was provided by the EIS (available at www.DonlinGoldEIS.com/BackgroundDocuments). Spill response plans specific to mercury would be developed to satisfy regulatory requirements after the NEPA process. A design feature was added to Table 5.2-1 on the inclusion of tracking devices mercury containers.
HZM 14	Further clarification of potential impacts from mercury volatilization should be provided.	Clarifying information was added where appropriate in Sections 3.24.4.4 and 3.24.6.2.2.1. Additional information on mercury in the air is given in Section 3.8, Air Quality, and AIQ 11. An additional heath risk assessment has been developed for mercury; see Section 3.22, Human Health.
HZM 15	The methodology used to determine the likelihood of a hazardous materials spill should be clarified and given context. It was stated that the likelihood of a very large cyanide or mercury spill is extremely low and the Draft EIS does not fully describe the fact that such a spill should not be reasonably expected. Language should be included noting	NEPA does not require statistical determination of spill probabilities. The EIS notes that the determinations of likelihood are qualitative, and there are no precedents for such spills. This approach is frequently used in NEPA documents and is in order with best practices.

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	that there is a lack of precedent for a large spill with the specific control measures proposed by Donlin Gold.	
HZM 16	Concerns were expressed on the transport of cyanide compounds for the proposed project, and more detailed cyanide spill scenarios were requested. Include a scenario where a cyanide tanktainer ruptures into the Kuskokwim River. Clarify details about cyanide transport and fix inconsistencies.	Clarifying information was added where appropriate in Sections 3.24.4, 3.24.5.7, and 3.24.6.2.2.1. The amount of cyanide in each shipment would be determined at time of shipping. The estimates given are sufficient for analysis within the impact assessment framework for spill risk in Section 3.24.3.3.2 Production of sodium cyanide at the mine site is not practicable and cost-prohibitive. The Plan of Operations Integrated Waste Management Plan and the Project Description prepared by Donlin Gold provide more information on chemicals than what was provided by the EIS (available at www.DonlinGoldEIS.com/BackgroundDocuments). Further information was added regarding the risk of losing shipping containers from the World Shipping Council. The suggested scenario of a breach of a cyanide container into the Kuskokwim River requires a complete chain of at least three very unlikely events: 1. A river barge traveling upstream at an average speed of four knots (River Barge Fleet Design and Operation, AMEC 2013) would need to ground or strike another vessel or object with enough force to break the cyanide containers free from the lashing gear, 2. The cyanide containers would then need to fall off the deck and into the water, and 3. The cyanide containers would then need to breach and discharge their contents. This combination of events is conceivable but appears very improbable:

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		• The barge speed of four knots would limit barge and container damage; • Containers would be properly secured to the barge to prevent movement; • A container falling into the water and then to the river bottom would not be likely to strike and be damaged by sharp rocks because the river bottom is sand, gravel, and cobbles; • Tanktainers are extremely robust; and • Crowley and Alaska Marine Lines, major shippers of containerized freight in Alaska and the Pacific Northwest, have not had any incidents in Alaska in at least the last decade with similar sized containers being lost overboard (Tague 2016; Stuart 2016). The Corps has determined that loss of a container of cyanide overboard and subsequent loss of contents is not a reasonably foreseeable scenario and should not be analyzed in the EIS.
HZM 17	The Corps should develop spill fate models that quantify the area impacted and the duration contaminants would be in the system were a chemical release to occur at the mine site or during the transportation of fuel, cyanide, or mercury. The Corps should include a quantitative analysis of a cyanide tanktainer breach.	The probability of a chain of events that would be necessary for a breach of a cyanide or mercury container into the Kuskokwim River is conceivable but is very improbable and would be considered worst case: • The barge speed would limit barge and container damage, • Containers would be secured to the barge to prevent movement, • A container falling into the water and then to the river bottom would not be likely to strike and be damaged by sharp rocks because the river bottom is

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		sand, gravel, and cobbles, • Containers are extremely robust, and • Crowley and Alaska Marine Lines, major shippers of containerized freight in Alaska and the Pacific Northwest, have not had any incidents in Alaska in at least the last decade with similar sized containers being lost overboard.

2.20 HYDROLOGY (SURFACE WATER)

Impacts to streams, local waterbodies, disruption in local water patterns. Riverine systems, wave impacts to shore banks and surface waters. Lower surface water levels.

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HYD 1	Clarifying edits should be made to text and tables to improve understanding of the Hydrology Section.	Edits have been incorporated into Section 3.5 to add clarity.
HYD 2	Discussion of stream classification should be expanded to include information on stream system type by linear footage, and an explanation of the functions each of those systems provide.	Streamflow reductions during construction and closure, as well as channel dimension estimates resulting from streamflow reductions during operations and closure are discussed in detail in Section 3.5. Main channel and off-channel habitat analysis during operations and closure is discussed in detail in Section 5.13.
HYD 3	Additional information and clarifications are needed regarding snowmelt: • Clarify whether discharge information at the mine site includes the period of snowmelt, and if the data are representative of peak flow. • Explain whether required dam flood storage volumes would change if a 100-yr snowmelt event were a rain-on-snow event.	Edits have been incorporated into Section 3.5 related to discharge measurement data. Dam flood storage volumes were based on applicable state, federal, and industry standards. Additionally, dam storage volumes are based on mine operation fresh water. Dam spillways are designed to pass the IDF (100-year peak instantaneous flood), which is based on dam hazard classification. Neither of these design elements would require changes to manage a 100-year rain-on-snow snowmelt event.
HYD 4	More information is needed regarding precipitation / stream flow data and predicted water quantities: • Explain why an older data set was used to determine average precipitation. • Confirm and explain why the difference between the	As described in the precipitation data section of Section 3.5.2.1.3, the limited onsite precipitation data required the use of regional climate stations with long-term precipitation data sets to develop a long-term (71-year) synthetic precipitation data set for the mine site.

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	above-average and below-average precipitation scenarios is so small. • Discuss uncertainty or range of values, and assess whether there is a change in precipitation trends in 10-year increments. • Update stream flow records to include most recent data collections where available. • Water quantities at the mine site may be over- or underestimated; case studies at other mines have shown that inadequate estimates have led to offsite water quality issues. • Review Executive Orders 11988 and 13690 and New Floodplain Guidelines issued by the Water Resources Council to implement them, and incorporate as necessary into the EIS. • Explained when the mine pit emergency spillway would be constructed. • Clarify where water would come from in winter for use at the mine.	The three precipitation scenarios (below average, average, and greater than average) represent a deterministic analysis of site runoff and provide the best representation of possible precipitation trends expected at the site during the construction and operations periods. Each scenario represents a consecutive 30-year period from the precipitation record. Edits have been incorporated into Section 3.5 related to uncertainty associated with the synthetic precipitation data set. Streamflow data updated at monitoring locations where new flow data were available. Edits incorporated to mine water balance discussion to include mine water balance sensitivity analysis summary. Executive Orders 11988 and 13690, and Water Resources Council floodplain guidelines were reviewed and applicable edits were incorporated into appropriate locations in Section 3.5. As stated in Section 3.5.3.2.1, at the time mining in the ACMA Pit ends, an emergency spillway will be constructed. Process water during winter operations would come from a range of sources, including pit dewatering wells, recycled water from the TSF, and stored water beneath ice in freshwater impoundments.
HYD 5	The Corps should re-evaluate impact ratings and summary impact conclusions used in the analysis of effects on surface water hydrology. Clarify and give more justification for	The Corps has directed that overall impact summary levels be removed from the document, and that extent definitions be revisited. Summary statements have been updated

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	ratings.	accordingly following revisions to the hydrology analysis.
HYD 6	The EIS should reflect information included in the most recent version of the Water Resources Management Plan.	Edits will be made in the document to reflect changes in the 2016 WRMP update pending receipt from Donlin Gold.
HYD 7	Potential stream flow impacts on Anaconda Creek, and Crooked Creek and its tributaries, should be discussed in greater detail: • Clarify or provide additional discussion on the following: what month the maximum flow reductions occur; flow losses in the event of high bedrock conductivity; dewatering loss effects on Anaconda Creek; what percentage of Crooked Creek flow the treatment plant discharges represent; and what percentage of flow that post-closure streambed losses to the pit lake represent. • The separate discussions of streamflow alterations from damming vs. dewatering are confusing. The EIS should tabulate all of the predicted streamflow losses from different activities in the same table so that their magnitude can be compared. • Natural variability in stream flow should be presented before the estimated impacts for context. • Water balance diagrams should be adjusted to account for Crooked Creek loss from dewatering. • Involve and inform residents as to the predicted stream flow reductions. A third party should review studies and present them in a form that is understandable to the public.	Edits have been incorporated into Section 3.5 text and Table 3.5-26 related to the following: Crooked Creek and tributary streamflow losses, natural streamflow variability, gaining/losing reaches along Crooked Creek, managed pit lake level, water balance model (WBM) diagrams and WBM sensitivity analysis. Table 3.5-26 summarizes predicted streamflow losses for each affected stream under various scenarios. Per Corps direction, technically complex details related to Section 3.5 have been added to Appendix G (e.g., additional streamflow loss data). The results of the Draft EIS were presented to Crooked Creek and other Kuskokwim River villages during the public review period. Subject matter experts on the Corps EIS team conducted independent reviews of applicant technical source documents as part of the impact analysis. In addition, independent review comments by agency and NGO hydrologists on the groundwater model (which informs the prediction of streamflow losses) have been incorporated into the comment analysis, and the EIS has been updated as noted in GRD responses.

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HYD 8	Additional hydrologic analysis of spill scenarios should be provided: • Describe spill impacts associated with the different alternatives that affect the Montana Creek / Iditarod watershed. • Provide additional description of erosion / scour effects and long-term stream morphology changes under the tailings spill scenario.	Edits have been incorporated into Section 3.24 related to potential spill impacts and long-term stream morphology changes.
HYD 9	The Draft EIS should either remove the Snow Gulch Reservoir from the plan, to avoid impacts to that tributary watershed, or provide better justification for its need. It should consider whether the water otherwise obtained from Snow Gulch could be obtained by dewatering at higher rates temporarily.	Snow Gulch is primarily a contingency freshwater source for process water during periods of drought, and may also be used for fire suppression, dust control on roads, etc. The use of wells instead of the reservoir to supply water during drought years was considered in RFAI #105 (Donlin Gold 2017b). The bedrock around the mine is not a classic aquifer – it is comprised of low-permeability fractured rocks that yield relatively low rates of water compared to virtually instantaneous high flow rates that would be available from Snow Gulch reservoir. It is economically critical that the mine can operate with a continuous supply of water that is available when needed. Substituting stored reservoir water with less reliable groundwater sources would require having a large well field available to compensate for higher productivity risk. RFAI #105 indicates that up to 50 wells and appurtenant infrastructure (well pads, roads, gathering system) would be required to provide sufficient demand during extended dry periods. A large well field system such as this would be more operationally complex, less reliable, and prohibitively difficult to manage, particularly in winter, compared to a

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		low-maintenance passive reservoir system. Because of higher uncertainties in productivity, groundwater sources are typically not used for large mine operations unless surface water is a scarce resource. There is no obvious advantage or environmental benefit to a well field compared to the reservoir. It is estimated that use of wells would impact 55 fewer acres of wetlands overall compared to the reservoir; however, Snow Gulch is currently considered to be in an environmentally degraded condition due to placer mining activity. There would be little difference in net flow in Crooked Creek between the two scenarios. The reservoir would temporarily reduce Snow Gulch flow to Crooked Creek, and the wells would reduce baseflow discharge to Crooked Creek through increased groundwater pumping and lowering of the water table. The alternative water supply options (additional dewatering and well field option) have been added to EIS Appendix C (Alternatives Development Process) as mine options considered and dismissed based on lower reliability and higher operational complexity, and lack of obvious environmental benefit to wetlands and fish. In addition, text has been added to Section 3.5.3.2.1 to summarize the operational rationale for the reservoir.
HYD 10	Additional analysis related to flooding, scour, and aufeis impacts along the pipeline should be included: • Concern was expressed regarding the lack of historical data for flood events between MP 150 and 220. Incorporate local knowledge of flood and erosion events into baseline conditions, and provide	Pipeline burial and cover depths have been added to Table 3, Appendix G. Text added to Section 3.5 related to scour potential, safety factor added to pipeline burial depth, and widths at open-cut stream crossings. Edits have been incorporated into Section 3.5 impacts analysis related to flooding, scour, and aufeis.

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	additional explanation of the risk of pipeline failure due to scour in this area, like what happened in the Yellowstone River. • Provide additional information on conditions that cause aufeis effects and their likelihood.	
HYD 11	Provide additional analysis of cumulative effects from Crooked Creek stream losses, both naturally occurring and project-related Kuskokwim riverbank erosion, and interrelated effects with wetlands.	Edits have been incorporated into Chapter 4, Cumulative Effects, to address these concerns (see also NEP 12).
HYD 12	Additional analysis related to water withdrawals is needed: • Provide additional data on proposed water use resources, including those for all alternatives, not just Alternative 2. • Evaluate the effect of water withdrawals needed to build the ice road along Crooked Creek for BTC road construction. • Provide information on the limited water available from kettle lakes in the Upper Kuskokwim region that are shallow and freeze solid during most winters.	Edits were incorporated into each alternative related to water use (if water use differs from Alternative 2). A winter snow trail would be developed along Crooked Creek to allow temporary transportation of construction supplies to the mine site. The winter trail would consist of compacted snow using snow compaction equipment that would not require the use of water. Baseline surface water data for the proposed extraction sites along the pipeline route are listed in Appendix G. If a potential water source freezes solid (lakes and smaller streams), then it would not be a winter source of water.
HYD 13	Clarifications and updates are needed regarding regression equations used in peak flow and flood estimates: • Clarify the error for basin sizes outside of the applicable range of the equations. • Estimates should be updated using new USGS	• In general, as drainage area gets smaller, there will be more error associated with the estimate. • While it is acknowledged that the 2016 regression equations are based on a decade or more data than

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	equations in Curran et al. (2016).	the old ones, recent experience with the new equations suggests that they may systematically underestimate or overestimate actual discharge data for certain regions of Alaska, due to a change in the statistical treatment of the regional data. For example, a comparison between flow estimates using the 2016 equation for the North Slope and actual flow data revealed that the 2016 equation underestimated actual flow in 25 of 27 streams studied (Aldrich 2016, personal communication). Anecdotal information with other practitioners have indicated similar issues in other areas of Alaska. Additionally, flood peak magnitudes are included in the EIS for comparison purposes, and are not presented for design purposes.
	• Clarify the peak discharge description for Anaconda and Crevice creeks.	• Text in Section 3.5 has been edited to clarify.

2.21 WATER QUALITY AND QUANTITY

Comments and concerns regarding impacts to water quality and quantity from construction and operation. Pit water and tailing dam management. Water budget available for the mine during operation. Erosion, turbidity, temperature changes, barge traffic concerns causing changes in turbidity.

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WAQ 1	The Corps should provide additional information on baseline water and sediment quality in the mine area regarding the following: • Uranium data should be included for surface water and groundwater.	Additional information has been provided as follows: • Uranium analyses have not been conducted as part of the Donlin Gold monitoring program; USGS studies in the mine area included uranium analyses from surface water, seeps, and wells as reported in Section 3.7.2.1.1, Table 3.7-5. The most stringent numeric water quality standards for uranium is 30 ug/L (for drinking water), while the USGS data show that the mean concentration of uranium in unfiltered surface water from the proposed mine site is 0.34 ug/L, approximately 88x below the threshold value. In addition, meteoric water mobility tests reported in Table 3.7-29 demonstrate that concentrations of uranium in tailings leachate are far below the standard for drinking water (1.19 ug/L vs. 30 ug /L, respectively). There is no evidence that uranium is a potential contaminant of concern in water in the vicinity of the proposed mine site, and similarly no basis for concern in relation to the alternatives analyzed in the EIS. • Concentrations of total mercury and dissolved

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	• Additional analysis of total vs. dissolved mercury loading should be provided. • Sediment sample locations should reflect dominant wind directions and watersheds of expected dust deposition.	mercury in surface water are provided in Tables 3.7-2 et seq. The data show that the majority of mercury found in surface water is not dissolved mercury, but rather particulate (or colloidal) mercury (i.e., mercury associated with particles or colloids). These data support the conclusions of the loading study, which states that "the data suggest that a substantial fraction of the total mercury load in the Crooked Creek watershed (measured as total mercury in the water) is associated with particles." • Total metals results in stream sediment samples for nine locations representative of the Proposed Mine Area (Figure 3.7-8) are summarized in Table 3.7-13. In addition, results of sediment sampling from eight locations in the project transportation corridor are described in Table 3.7-14. Dominant wind directions for the mine site have been added Table 3.4-1 (from the southeast 35percent of the time and from the north-northwest 25percent of the time). While there are limited sediment data south-southeast of the mine site, it is reasonable to assume that sediment chemistry in Crooked Creek tributaries in this area would be similar to that of background sediment samples above placer and mineralized areas described in Section 3.7.2.3.1. Thus, for the purposes of NEPA disclosure and alternatives analysis, the current sediment data are considered representative of areas where dust may be deposited as a result of project activities. Patterns of predicted dust deposition are also based on a number of factors

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		besides wind direction, such as topography, temperature, and humidity. Text has been added to Chapter 5 (Mitigation), Tables 5.7-1A and 5.7-1B to consider additional stream sediment sampling in tributaries south-southeast of the mine site for comparison to future dust effects.
WAQ 2	Concerns were expressed regarding baseline conditions in the Kuskokwim River: mineralized areas, existing contamination from Red Devil Mine, and changing turbidity in the river.	Baseline water quality conditions in the Kuskokwim River, and the factors that drive spatial and temporal changes in Kuskokwim River water quality with respect to metals and suspended sediment, are addressed in Section 3.7.2.1.2. A description of mercury transport at a regional scale by Nelson et al. (1977) suggests that mercury is concentrated in hotspots near lode sources, both in mined and unmined areas, the influences of which decrease over short spatial scales due to the effects of dilution and mixing driven by water and sediment discharge in the main stem of the Kuskokwim River. Additional data on baseline turbidity in the Kuskokwim River has been added to Section 3.7.2.1.2.
WAQ 3	Clarification should be provided on pipeline abandonment and the effects of reclamation on groundwater drainage and water quality along the pipeline.	Pipeline decommissioning, abandonment, and reclamation are described in Section 2.3.2.3.6. In general, pipes would be purged and cleaned. All above-ground facilities would be removed, including compressor stations, piping, equipment, buildings, fencing, above-ground river crossing structures, access road culverts, and tanks. Above-ground pipelines would be removed to 1 foot below grade and underground pipelines would be capped and abandoned in place. As such, there would be minimal effects on groundwater quality. Some below-ground facilities, such as valves, may be excavated at certain locations.

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WAQ 4	Applicable water quality standards and water quality regulations should be addressed or modified: • Provide clarifications on standards for mercury, selenium, ammonia, and hardness-dependent constituents. • Provide clarification on the regulation of groundwater.	The EIS has been edited to address these concerns. Specifically, as described in Section 3.7.1.2.2, drinking water from groundwater sources is regulated by 18 AAC 80 (ADEC 2012c) and by EPA (2013k). As described in Section 3.7.1.2.1, water quality in this section is described in relation to WQS (WQS), which include use classifications, numeric and narrative water quality criteria, and an anti-degradation policy. On February 27, 2004, EPA partially approved revisions to WQS for the State of Alaska, while taking no action on Alaska's proposed acute and chronic freshwater aquatic life criteria for mercury and selenium. Therefore, the new aquatic life criteria for mercury and selenium will not be in effect for CWA purposes until a decision is made by EPA about whether these criteria can be approved. In the interim, the previously approved aquatic life criteria for mercury (2.4 µg/l acute and 0.012 µg/l chronic, both as total recoverable) and selenium (20 µg/l acute and 5 µg/l chronic, both as total recoverable) will remain the applicable CWA standards (65 FR 24643). Section 3.7, Water Quality, text and tables have been revised to incorporate revised ammonia criteria contained in SRK (2017), which are based on site-specific temperature and pH conditions. ADEC guidance (APDES Permits Reasonable Potential Analysis and Effluent Limits Development Guide, July 2014) for use of receiving water hardness to determine WQS has been followed in Section 3.7 for comparisons to baseline water quality and contact water that will be treated and discharged to Crooked Creek, consistent with SRK (2017) and Donlin Gold's (2017) APDES permit submittal. Hardness-

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		dependent criteria used for comparison to predicted concentrations in mine water treatment facilities, such as the TSF and pit lake, were calculated based on predicted hardness values for these facilities. As described in EIS Sections 3.6.1.1 and 3.7.1.2.2, ADEC, ADNR, and EPA establish water quality standards that protect groundwater use and quality. Permits under 18 AAC 72 or 18 AAC 83 would be necessary to discharge to groundwater.
WAQ 5	Several aspects of the water treatment process need further explanation: • Explain why wastewater will not be immediately treated after closure. • Clarify treatment and handling of pit dewatering water. • Explain how requests for variations from permit standards would be handled. • Analyze how water may affect resources in the aquatic system, even though it is treated to standards.	Additional information has been added as follows: • During the closure period, tailings pond water and other contact water would be directed to the pit to be contained prior to permitted discharge. The pit is a design element of the water containment and treatment process, and not considered "Waters of the United States" under the CWA, and directing water to the pit would not be considered discharge. There would be no need to treat water in the pit until it reaches the design level of approximately 30 feet below the rim, and permitted discharge occurs, which is predicted to be approximately 52 years after closure. • The definition of "contact water" has been clarified in Chapter 2. Contact water released to Crooked Creek would be treated to meet AWQC prior to discharge.

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	• Provide clarifications regarding the amount and disposal method for the RO brine and other WTP wastes.	• While Donlin Gold has not requested any variances related to its wastewater discharge application, requests for permit variances would be handled by the relevant permitting agencies. • Water quality standards are considered protective of the designated use of the water body receiving the discharge, such that there would be no adverse effects on either ecological or human receptors. Impacts to water quality in relation to the most stringent established water quality standards are described in Section 3.7 of the EIS. Though treated to standards, mine water use may also affect flow volume in Crooked Creek and its tributaries. Impacts to fish and other aquatic resources from these effects are described in Section 3.13, Fish and Aquatic Resources, which presents an analysis of expected consequences based the regulatory framework associated with management and protection of area fisheries and aquatic habitats, and the diversity, abundance, and distribution of fish. • Each of the steps of the water treatment process produces a waste stream that would need to be disposed (Hatch 2015). During operations, the sludge from the high-rate clarifier (HRC) would be sent to the TSF. The greensand filter would be backwashed intermittently and the wastewater sent to the TSF. The brine from the RO process would then be returned to the process plant as a source of reclaim water, except during construction, when the volume of brine is expected to be less. During that period, it

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	• Provide information on the effectiveness and availability of greensand proposed for use in the treatment plant.	would report to the Lower CWD. Waste streams from the WTP are described in Table 3.7-41 in the EIS. As described in BGC (2015j) (Dry Stack Water Balance with Advanced Water Treatment) disposal of these waste streams would be similar under Alternative 5A. Brine waste from the post closure WTP would be sent to the bottom of the pit lake through a pipe. • Greensand filtration is a proven technology. It is widely used for pre-treatment of RO feed from well sources and in the direct treatment of groundwater streams for drinking water purposes. Manganese greensand is capable of removing iron, manganese, and arsenic from water through oxidation and filtration. When the oxidizing capacity of the Manganese Greensand bed is exhausted, the bed is regenerated with a weak potassium permanganate (KMnO4) solution. Thus, manganese greensand media is reusable. Manganese Greensand is produced by coating glauconite particles with manganese oxide in various valence states. Synthetic ion exchange resins that perform similar functions are also widely available. There is no indication that commercial availability of manganese greensand, or other WTP media would limit the feasibility of the proposed WTP.
	• Provide case studies of mines using zeolite to remove arsenic and manganese at similar scales to ensure that current technology is being applied	• Ion exchange (IX) is one of several technologies recommended by EPA for treatment of mining-influenced water. There are various types of ion exchange media available. When selecting the suitability and design of an IX system, important

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		considerations include the type of IX media, the volume and type of regenerant, the backwash water source, backwash quantities, the need for pre-filtration of solids, column configuration, the need for pH adjustment before and after IX, and cycle length. While the specific IX/sorbent media to be used in the post closure WTP has not been specified, zeolites are a widely accepted media for removal of arsenic (Shevade and Ford, 2004; Mohan and Pitman 2007), heavy metals, and other cations (Zamzow et al. 1990), and are currently used for water treatment at the Kendall and Buckhorn mines in the United States, as well as large copper mines in Chile (Vidal et al. 2009).
WAQ 6	Clarify which wastewater treatments systems will be used to operate the mine: • Updated water management and treatment documents have been completed by the applicant since the Draft EIS. Review and provide updates to Section 3.7 as necessary. • There may be discrepancies between what methods were described during public meetings and what is in the Draft EIS.	Section 3.7 has been revised to clarify which wastewater treatments systems would be used during the operations and post-closure periods: • The updated Water Resources Management Plan and Segregated Flow Advanced Water Treatment Report have been reviewed and updates made in Section 3.7 where pertinent. • The document includes water treatment methods selected in the Hatch (2015, 2017) water treatment reports, which involve iron co-precipitation with manganese greensand filtration and a reverse osmosis polishing step.

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		• Over the course of the EIS process the water treatment plant design has been refined as the volumes and composition of the water to be treated have been constrained. The water treatment plant design has become more specific over the course of the EIS process, but the general principals of the water treatment plant design have remained consistent. This increased specificity of the WTP design removes uncertainty but does not affect other aspects of the impact analysis.
WAQ 7	Concerns were expressed regarding the analysis of tailings water chemistry: • Additional information or clarifications are needed on several aspects of tailings chemistry. • The information is too important to be in an appendix.	The tailings pond water and pore-water quality in buried tailings are described in Table 3.7-34 in the Final EIS and Table H-8 in Appendix H, Geochemistry. The concentrations shown in these tables include the 3x concentration factor due to recirculation, as described in the EIS text and Section 3.6 of Appendix H. The calculations are shown in SRK 2015 (b), Revised Process Pond Water Predictions – DRAFT. Other overall comments on the Draft EIS expressed concerns that the main text was too lengthy and detailed. The Corps has directed that where practical, information should be moved to appendices. Section 3.7 and Appendix H have been restructured accordingly.
WAQ 8	General concerns were expressed regarding the treatment and discharge of mine water: • There are concerns that large amounts of water used at the mine site would remain contaminated, and that water with chemicals would be discharged affecting drinking water and fish. Other comments noted that	Section 3.7 has been revised to clarify the following: • All discharges of treated mine water to waters of the United States would meet the most stringent applicable water quality criteria. • The effluent water quality predictions are based on observations from a pilot scale plant used to treat a

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	discharged water would be treated to meet standards prior to discharge, including those protective of fish. Confirm or clarify. • The mine should be designed so that long-term water treatment is not needed. Other comments support the treatment plant approach to ensuring that discharge waters meet water quality standards.	bulk water sample from the pit area as well as on operational data from full scale HDS plants in use at other mines. • During operations, the projected TDS and sulfate concentrations in the RO brine are below the steady-state concentrations in the TSF; this WTP waste stream can be accepted in the reclaim water tank for direct use in the process plant. • Long-term management of mine contact water by pit lake containment and groundwater flow management is a standard and proven mine management strategy used at similar sites around the world. Long-term pumping and treatment of pit lake water is necessary to maintain containment, and would be funded by financial assurance instruments set up by the applicant with ongoing state oversight.
WAQ 9	More detail should be provided regarding the stratification of the pit lake and how Donlin Gold intends to maintain pit-lake stratification: • Explain possible changes in water treatment methodologies and costs in event of pit lake de-stratification or overturn, and if it would be possible to meet water quality standards using currently available technologies.	• The pit lake water would remain treatable even in the event of de-stratification or overturn; however, treatment cost would be expected to increase under those conditions. As described in the Water Resources Management Plan, a post-closure WTP would be constructed 5 years prior to the pit completely filling, and treatment would begin 2-3 years before filling is complete and discharge commences to allow a comfortable freeboard. The WTP would use conventional chemical precipitation technology and would target elements such as arsenic, manganese, antimony, and mercury. As a polishing step, either conventional or proprietary ion

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	• Explain potential technical and cost implications of mitigation options in the event that the pit lake overturns.	exchange processes may be employed if necessary to reduce selenium levels to below 5 µg/L before the treated water is discharged to the environment. As described in Appendix H, reverse osmosis may be required to treat the pit lake water to meet the most stringent applicable water quality criteria in the event of a complete mixing or de-stratification event. Clarification has been added to Section 3.7.3.2.2, Closure, that the proposed post-closure WTP process may not be adequate to treat certain constituents (e.g., selenium and TDS), and that the design would be updated closer to the end of mine life using updated technologies (SRK 2017). • As discussed in the December 2016 Mine Water Workshop, WTP costs in post-closure would be paid through a 3rd party trust fund established to meet State financial assurance requirements. WTP design and costs would be subject to a 5-year review cycle by the State. Even if treatment costs were to double, they would be dwarfed by inflation and earnings in the trust fund. • Stratification could change over time depending on inputs, although the effect of groundwater inflow and pumping is expected to dominate changes in WRF seepage. A range of effects at different periods in post-Closure is included in Appendix H • (Tables H-15 and H-16) and Section 3.7.3.2.1. • Additional water quality scenarios have been added to Appendix H to describe potential pit mixing and

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	• Explain if initial stratification, when tailings pond input dominates, would be different from later stratification, when WRF seepage dominates. • Explain potential causes of pit-lake overturn and indicate how Donlin Gold intends to maintain pit-lake stratification. The Draft EIS understates ecological risks by incompletely analyzing the possibility of pit-lake overturn. The typical cause of such mixing is extreme weather, but other factors such as the temperature of inputs to the lake may also influence the stability of stratification.	rise of the pycnocline over time, including potential causes of mixing. • Maintenance and monitoring of the pit lake is included in Section 2.3.2.5, Section 3.7.3.2.1, and Appendix H (see WILD 5 for implications to ecological risk). Additional measures being considered to monitor the pyncocline and help maintain stratification are included in Chapter 5 (see also response to comment WAQ 11). A monitoring recommendation to evaluate de-stratification possibilities has been added to the Final EIS (Chapter 5) and is discussed in Section 3.7.3.2.7. The measure calls for conducting seasonal- and depth-specific lake monitoring for certain constituents in post-Closure, and will be considered by appropriate resource agencies, as practicable.
WAQ 10	Concerns were expressed about the capacity of the treatment plant, contingency plans for avoiding treatment plant overflow, and the ability to treat water in perpetuity in the event of plant or pump failure. If higher groundwater flow is encountered in the pit while mining, explain what 2,000-4,000	As described in Section 3.7.3.2.2, during operations, water would be treated using a water treatment process developed by Hatch (2015, 2017) to meet applicable water quality-based permit limitations. Design maximum and average flow rates are provided in SRK (2017b) and Hatch (2017) for the

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	gpm extra flow might look like when added to the Lower CWD or TSF; i.e., how long it would take before there is no more excess storage capacity under low and high precipitation scenarios.	purpose of preliminary sizing of the Operations WTP, and to provide an understanding of the relationship between peak and average flows from the different sources. Groundwater inflow estimates for dewatering wells are based on the base-case (i.e., best estimate) hydraulic conductivity (K) scenario resulting from the calibrated groundwater flow model (BGC 2014c, 2015f). While there are uncertainties in the groundwater model, the degree of uncertainty is considered within the range of normal for such a model. Other flow inputs to the WTP are based on either maximum summer weekly precipitation estimates (for the SRS), or are fixed based on treatment limitations or dam capacity considerations (TSF and Upper CWD). The design basis for the operations phase WTP is 4,441 gpm based on the maximum capacity expected during the life of the mine. As discussed in the December 2016 Mine-Water workshop, the WTP would have the capacity to treat 2-3 times more dewatering water during construction years, and could be scaled up to accommodate about 50% more (6,600 gpm) in mid-operations on a temporary basis. WTP capacity requirements are expected to be much lower early in the operations period, which would allow the water management plan to be adjusted without exceeding the capacity of the WTP, in the event that higher than expected groundwater flow is encountered in the pit while mining. If substantially more dewatering water needs to be treated in operations, several adaptive management measures can be employed: extend the treatment season beyond April-November; store more water in the TSF which would have excess capacity; reduce rates of groundwater pumping;

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		and / or expand the WTP which would take about 2 years. Several of these could be used in combination to ensure that the capacity to store excess water on the site would not be exceeded. Additional text has been added to Tables in Section 5.7 to include these measures. As the pit fills over approximately 56 years, water level and quality (at different depths) would be monitored, and the groundwater model re-calibrated as data become available. The design flow of the post-closure WTP would be updated based on this information. The WTP would be constructed five years prior to the pit completely filling. Unrestricted flows from the pit to Crooked Creek, in the absence of pumping and water treatment, would average about 2,800 gpm. The post-closure WTP is currently designed for a maximum capacity of about 7,500 gpm, which would require an average annual operating period of just over 6 months per year; longer operating periods may be required for years with above-average precipitation. The pit lake level would be maintained such that there is sufficient freeboard to provide storage for several wet years in a row plus upset flood events (see WAQ 18).
WAQ 11	Modelling of the pit lake water quality should better simulate the quality of actual groundwater inflow, which is not homogeneous. More information on the chemistry of the pit lake should be included in the EIS.	The chemistry of groundwater and the pit lake is explained in Sections 3.7.2.2.1 and 3.7.3.2.1, and Appendix H. The latest pit lake model is described in Lorax (2015, 2017) which includes assumptions on inflow water quality from groundwater and other sources, and extends out to 200 years. The EIS and source documents disclose limitations and uncertainties in the model and inputs, which are incorporated into the analysis to provide a range of likely effects. While we concur that baseline groundwater quality is

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		not homogeneous throughout the bedrock aquifer (Table 3.7-10), the range of concentrations is small compared to the predicted quality of pit lake inputs that are likely to drive pycnocline development (Tables H-12 and 13). Chapter 5 includes a number of groundwater and lake monitoring measures to evaluate whether the pit lake is stratified, whether the water being delivered at depth is aiding or detracting from the optimal pit lake stratification, and whether water from various sources would improve stratification if delivered to an alternate depth. In addition, Chapter 5 includes measures to rerun the pit lake model at specified intervals in post-Closure using the latest monitoring results to predict the estimated duration of the pycnocline and evaluate whether groundwater and reclaimed WRF runoff and seepage water delivered below the pycnocline could tend to shorten its lifespan. Based on the modeling results, piped water from the reclaimed WRF and any other controlled water inputs to the lake could be delivered to the pit lake at such a depth so as to maximize the lifespan of the pycnocline while minimizing adverse impacts to surface water quality at the surface of the lake.
WAQ 12	More information on acid rock drainage (ARD) and weathering of PAG and NAG rock in the WRF should be included regarding the following: • Waste rock porewater quality predictions;	• SRK (2007, 2012e) uses a multi-step calculation to achieve pore water quality predictions shown in the EIS; these predictions are based on the humidity cell testing (HCT) data available at the time that the calculations were performed. The more recent HCT data are consistent with the previous HCT data, and the porewater predictions would not change

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	• Classification of waste rock during operations; and • Waste rock management to produce a well-mixed blend.	substantially using the new HCT data. • Classification of waste rock during mining would be as described in the Waste Rock Management Plan (WRMP) (SRK 2012e). Blasthole cuttings would be collected during operations for analysis at an onsite laboratory to decide on waste rock segregation. Sample density would depend on geologic conditions, and would include testing for ABA and NPCO3 / AP ratio, at the same time as ore grade for short-term planning. Based on the results, the material would be classified according to waste rock type and the information used to assign material types to areas of the active bench. Each area would be assigned a destination code and tracked via an automated routing system that integrates test data with GPS-enabled loading and hauling vehicles. Real-time updates of the digging face in relation to ore grades and waste rock types would be tracked on an electronic map available to shovel operators via an on-board computer screen, so that the type of material loaded into trucks would be known at all times. This methodology would ensure that ore and waste rock types are mined and delivered to the correct location. • As described in SRK (2007) "Metal Leaching and ARD Assessment," the ability to blend waste rock to eliminate drainage quality concerns depends significantly on the scale of mixing. Mehling et al. (1997) define ideal and non-ideal waste rock blends as follows:

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		• In an ideal blend, acidic conditions do not migrate; rock mixing occurs at a small enough scale that acidity produced at the grain scale is dissolved in non-acidic water produced by dissolution of nearby carbonate minerals. Typically, flow paths through PAG components must be no longer than several feet for ideal blending to occur. • In a non-ideal blend, acidic porewaters are produced that are neutralized internally either by reaction with carbonate minerals or by mixing with non-acidic porewaters. The former process usually results in coating of carbonate minerals, effectively preventing them from further acid neutralization. The latter process results in formation of precipitates further downstream. The development of acidic conditions in non-ideal blends may result in contaminant migration persisting in the drainage following the neutralization reactions due to incomplete precipitation. Ideal blends require a significant commitment to waste dump management such that PAG and non-PAG rock are intimately mixed and thinly layered to achieve sufficient mixing at a small enough scale. Non-ideal blends require less operational control but produce poorer quality drainage. The target of a non-ideal blend should be acid neutralization by mixing of acidic and non-acidic porewater, rather than contact with neutralization minerals, in order to reduce the significance of blending.

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		The EIS acknowledges that the WRF is predicted to contain more than adequate neutralization potential to neutralize the total acidity that could be produced by sulfide oxidation. Initially, the range of WRF drainage water qualities estimated by SRK (2007) was used to provide boundaries for estimating CWD water quality in the EIS (Tables 3.7-31 and H-6). It should be noted that ARD water quality prediction is an evolving science and needs to be corroborated with many decades of mine-site data. All predictions of future water quality are estimates based on a number of assumptions, and likely represent order-of-magnitude approximations. If the NAG and PAG 5 rock are well blended within the WRF, then the chemistry of seepage is predicted to remain relatively constant over time throughout the life of the mine, using the mixing approach for NAG and PAG 5 rock discussed in the Plan of Operations (SRK 2016d). Even if the rocks are not well mixed, no major change is expected for approximately the first 20 years of operations (SRK 2007, 2016g). SRK (2007), Section 2.4.4 Waste Rock Mixing, provides in depth discussion of blending.
WAQ 13	Additional information should be provided regarding the fate of mercury that would end up in the pit lake.	Estimates of mercury concentrations in Pit Lake Surface Water are provided in Table 3.7-36 and 3.7-37 for a range of different scenarios, including the base case, groundwater sensitivity case, complete mixing, extreme winds sensitivity, and decreased salinity sensitivity. In addition, Appendix H, Section 4.4 (Pit Lake), includes a detailed analysis of the sources and distributions of mercury and other constituents in the pit lake water for a range of different scenarios, and a

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		discussion of how the sources and distributions of constituents in the pit lake water would change over time. Recognizing that pit lake surface water would likely be supersaturated in Hg(0)(aq) compared to the air above, volatilization could result in a flux of Hg(0) from the water into the atmosphere. Direct impacts to air quality would be caused by Hg emissions from fugitive, mobile, and stationary sources; the estimated emissions during the closure and phase are summarized in Section 3.8, Air Quality, (Table 3.8-25). As indicated in Section 3.8 of the EIS, mine site emissions during the closure and reclamation phase would be below air quality permit thresholds, and would meet regulatory standards; thus, the magnitude of the impacts would be considered low.
WAQ 14	Concerns were expressed regarding baseline and predicted levels of arsenic in the mine area: • Provide a comparison of baseline arsenic to other areas of Alaska. • Clarify that the purpose of performing waste rock geochemical characterization is to manage potential ARD / ML, including arsenic, leading to appropriate containment and water treatment methods.	The Final EIS has been updated to include the following information: • Additional information regarding baseline comparisons to other areas of Alaska has been added to Section 3.2.2 for soils and Section 3.7.2 for water and sediment. • As shown in Table 3.7-16 of the EIS, the definitions of different categories of NAG are based on both acid generating potential and concentrations of arsenic. The only differences between categories NAG 1 and NAG 2, and between NAG 3 and NAG 4, are the arsenic content. (Categories NAG 1 and NAG 3 were not used. • In the Donlin Gold waste rock there is some

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	• Explain the sources of potential arsenic increases from the rock and mine operations. • Develop plans for arsenic management and monitoring, and additional testing of groundwater for ML.	correlation between [As] and [S] at higher sulfur concentrations; however at low sulfur concentrations (low AP), there is no apparent correlation between [As] and sulfur (see SRK 2007, Table 2-11). • Arsenic has the potential to be leached at both acid and neutral-to-basic pH values, even from NAG rock; however, any arsenic laden leachate from the WRP would be captured by the CWD during operations, and by the pit lake during post-closure, and would not be released to the environment. Any seepage from the CWD would be captured and would not migrate off site (see Appendix H, Section 3.2). • The purpose of performing waste rock geochemical characterization is to manage potential ARD/ML, but it does not eliminate the need for water treatment, for arsenic. The EIS includes a plan to address ARD/ML from the WRF and to test the groundwater for potential leaching of contaminants. (See Appendix H, Section 3.2).
WAQ 15	The EIS should describe the potential need for a mixing zone.	Donlin Gold is not proposing any mixing zones as part of its Alaska Pollutant Discharge Elimination System (APDES) Permit application. The document has been revised to include information from the APDES Permit application submitted to the State of Alaska (Donlin Gold 2017), as well as information from the revised Water Resources Management Plan (SRK 2017) and revised Hatch (2017) Water Treatment Report. It is noted that for salmon spawning streams no mixing zone

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		could be authorized under current regulations.
WAQ 16	Water quality, additives, and the quantity needed for hydrostatic testing the pipeline should be identified.	Potential water extraction sites for pipeline construction, extractions rates, and potential annual volumes extracted are shown in Table 2.3-18 of the EIS. To conduct hydrostatic testing, tests of individual segments typically would be conducted in a sequence in which the test water would be transferred from one segment to another. Test water would be obtained from approved sources in accordance with permit requirements; screens on the intake hoses at surface water sources would be used to prevent entrainment of fish or other aquatic species and to monitor the withdrawal rate to maintain adequate downstream flow to support aquatic life. Volumes of water required would vary depending on hydrostatic test segment length but could be up to 15 Mgal. An APDES permit would be acquired for the discharge of hydrostatic testing water. Once hydrostatic testing has been completed, test water would be discharged back to an approved location through a filtration device. Discharge of the hydrostatic testing water may require a wastewater discharge permit if any foreign substances are added to the water. Water would be tested before discharge, as required by project permits. Energy dissipating devices and/or filter bags would be used to prevent scour, erosion, suspension of sediment, and damage to vegetation. Discharge rates would be monitored and kept within a range appropriate to maintain the effectiveness of the energy-dissipating devices. Discharges of hydrostatic test water would meet the requirements of the applicable APDES General Permit.

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WAQ 17	Overall concerns were expressed regarding the water quality analysis: • Relying too heavily on applicant modeling studies which shows inherent bias; and • Comparisons with water quality impacts at other mines.	The analysis of impacts to surface water, groundwater, and sediment quality described in Section 3.7.3.2, et seq. of the EIS are established on a robust base of information generated by a variety of sources, including scientists, consultants, and government agencies over the past 20+ years. The methods for water quality prediction applied in the EIS, particularly those for the prediction of acid rock drainage and mobility of metal ions, are well-established in peer-reviewed scientific literature that is referenced throughout Section 3.7 and in Appendix H of the EIS. These methods generally represent the most current techniques for mine water quality modeling, and the efficacy and reliability of these methods has been verified by controlled comparison of measurements to modeled results for numerous projects in a wide range of geomorphic settings. Likewise, the mitigation measures proposed in the EIS are generally derived from real world experience with water management at other analogous mine sites. The impact predictions and proposed mitigation measures are based on real world experience and objective methodology. For example, the meteoric water mobility procedure used for prediction of concentrations of metal ions in mine water in Section 3.7.3.2.1 is based on a method developed by the Nevada Division of Environmental Protection and tested using samples from numerous mine sites. The acid base accounting procedures are based on the Sobek method, recommended by the USGS, and approved by EPA. Humidity cell test results are included in Section 3.7 for the specific purpose of investigating the potential for long-term leaching. Mitigation measures (and adaptive management) are based on the principle that water quality

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		predictions would be compared to measured data during construction, operations, and closure in order to efficiently manage potential water quality impacts and ensure compliance with applicable regulations.
WAQ 18	Concerns were expressed regarding impacts to water quality in the event that the pit lake overflows in post-closure, and that climate change is not adequately taken into account to predict the likelihood of this event.	According to the numerical hydrogeologic model developed by BGC (2014c, 2015g), for about 52 years after pit dewatering is stopped, water would flow into the pit from groundwater at higher elevations, and from the pit into backfilled waste rock and localized bedrock surrounding the pit, from which groundwater had been removed during mining. As groundwater levels recover and the lake reaches its maximum managed water level, flow out of the pit lake would cease and groundwater would move towards the pit from all directions. The managed final elevation of the pit lake is approximately 30 feet below the designed spillway overflow elevation of 359 feet AMSL (BGC 2015l). This design water level (freeboard) would be low enough to accommodate multiple wet years in a row plus upset flood conditions. Given State oversight and financial assurance for post-closure activities, it is considered extremely unlikely that there would be unrepairable or unmanageable pump or treatment failures in the timeframe it would take the lake to reach its crest and overflow (about 6 years). Such a worst-case scenario in NEPA is discouraged by the Council on Environmental Quality. As described in Section 3.5 Surface Water Hydrology, and Section 3.26, Climate Change, climate change is indeed taken into account in developing the hydrologic model. Monthly precipitation levels from rainfall and snowfall estimated for the proposed mine site based on the 100-year synthetic dataset are listed in Table 3.26-3,

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		Climate Change.
WAQ 19	Concerns were expressed regarding impacts to drinking water: • The document should clarify if drinking water in Kuskokwim River villages would be monitored throughout the life of the mine and beyond, and plans for protecting drinking water in the event of a disaster. • The Draft EIS overstates the likelihood of drinking water bans.	Concerns regarding impacts to drinking water are addressed as follows: • Regular monitoring of public drinking water supplies would continue as required by permit. Plans for protecting drinking water in the event of a disaster would be outlined in an Emergency Action Plan as required under the Alaska Dam Safety Program. • The EIS mentions "drinking water bans" only in relation to spill risk and unplanned discharges of materials, and not in relation to activities considered as part of the alternatives. The EIS is very clear that the impacts resulting from high-consequence, low-probability occurrences are not part of the project design, but represent upset or system failure. The EIS clearly states that "drinking water bans" are unlikely, but could possibly occur as a result of a spill, dam failure, or other low-probability event.
WAQ 20	Concerns were expressed about seepage from the mine site facilities, including: • General concerns regarding the potential for seepage from the tailings, WRF, and contact water reservoirs to affect Crooked Creek; • Clarification regarding onsite vs. offsite water contamination;	• Although the seepage from WRF and TSF would potentially not meet water quality standards, these waters would be contained on-site and would not be discharged to the environment without treatment to comply with the most stringent applicable standards. • Summaries of the predicted chemistry of the Lower and Upper CWD, the TSF impoundment, SRS during operations, and the pit lake post-closure are provided in Section 3.7 and Appendix H to the EIS. Although these process-related waters would not be considered

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	• Clarifications regarding chemistry of the SRS water; and, • Concerns regarding the lifespan of the liner.	waters of the State of Alaska or subject to the APDES permitting program, their expected water chemistries are presented in comparison to most stringent Applicable Water Quality Criteria (AWQC) to provide the reader with a frame of reference for understanding the predicted concentrations of constituents. Hardness-based criteria used in comparison to onsite untreated facility waters are generally based on a maximum hardness of 400 mg / L to reflect predicted high levels of calcium and magnesium in these waters. Above this value, hardness-dependent criteria do not change. • As described in Section 3.6 (Groundwater Hydrology), the liner under the TSF would prevent seepage from the TSF, and the SRS pond would collect water from the underdrain. Based on laboratory testing, the lifespan of liners of the type proposed to be used under the TSF is on the order of 1,000 years. The hydraulic containment system of the SRS would require monitoring, analysis, operation, periodic repair, and management to assure its continuing function and effectiveness.
WAQ 21	More detail and revised information should be provided about mercury methylation at the Mine Site: • The Draft EIS does not provide information on baseline measurements of methylmercury in water. • Additional information on mercury cycling such as site-specific sources, sinks, and stream and sediment	Additional information has been added to EIS Sections 3.7 and 3.22 (Water Quality and Human Health) to address these recommendations, as described below. Specifically, new edits have been incorporated into Section 3.7.2.2 and Section 3.7.2.1.1. Baseline methylmercury measurements in Crooked Creek presented in the EIS included one sampling event in 2013

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	processes should be provided. • Revise the analysis of the effect of increased sulfate deposition from mine activity causing increased methylation rates. • The results from several studies have shown that that newer inputs are more bio-available than older mercury (Harris et al. 2007, Orihel et al 2008). If there are any studies out there that have shown the opposite to be the case, they should be cited in the text. Assumptions such as the linear relationship between atmospheric deposition rates and mercury concentrations in surface water and sediment may underestimate future fish mercury concentrations. Recent literature should be used to better predict site-specific future methylation rates and fish mercury concentrations. • Existing soil and sediment samples collected for sulfate testing and used for methylation analysis are not proportionally representative of the landscape, and may be inducing bias into the interpretation of methylation rates. Collect additional soil and sediment samples (e.g., for sulfate, SRB, and TOC) to ensure there is no bias, and help understand if methylation rates could reasonably change in the future. • The model used to estimate baseline methylmercury concentrations in water is driven by unrealistically high organic carbon concentrations, which may overestimate baseline conditions and lead to	(Section 3.7.2.1.1; Table 3.7-6). This table has been expanded to include five additional sampling rounds conducted in 2014-2015 (Donlin Gold 2016b). Baseline data from the literature, describing methylmercury concentrations in the Kuskokwim River water, have also been added to the document. Additional text has been added to Section 4.7.2.2.2 to explain that methylmercury is a transient species in wetlands and other aquatic systems. In most aquatic systems, including wetlands, in situ production (methylation of inorganic mercury to methylmercury), rather than input from runoff water or atmospheric deposition, is the major source of methylmercury (Li and Cai 2013). The reverse process, demethylation of methylmercury, simultaneously occurs in the natural environment. Natural demethylation occurs primarily via photochemical reactions driven by sunlight (Zhang and Hsu-Kim 2010; Naftz et al. 2011). However, demethylation also occurs via microbiological and non-photochemical abiotic pathways under a wide range of environmental conditions (Khan and Wang 2010; Johnson et al. 2015). Experiments using isotope-labeled methylmercury compounds added to lake sediments determined the calculated half-life for methylmercury in sediments was 1.7 days, suggesting a rapid turnover and low persistence of methylmercury in lake sediments (Hintelman et al. 2000). Similar experiments conducted using contaminated lagoon sediments determined apparent first order demethylation rate constants of ~0.6 / day, which were much greater than the observed methylation rate constants ranging from near

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	underestimating increases due to mine activity. • Perform laboratory tests with sediment, tailings, and sediment porewater to inform the analysis of methylation potential from the introduction of WTP effluent and tailings dust, and identify the Hg(II) content of porewater. Sediment tests should apply future effluent concentrations under a range of temperatures and dissolved organic carbon concentrations.	zero to 0.054 / day, indicating rapid mercury cycling in sediments with elevated porewater concentrations of sulfate and mercury, and overall net demethylation of mercury in contaminated sediments (Hines et al. 2012). Sulfate-reducing bacteria (SRB) facilitate both methylation and demethylation processes (Bridou et al. 2011). Experiments using species-specific isotopic tracers for inorganic and methylmercury to simultaneously determine the methylation and demethylation potentials of specific SRB strains showed that all of the methylating SRB strains also demethylate methylmercury (Bridou et al. 2011). Rates of mercury methylation and demethylation were related to the bacterial activity, but were not dependent on the type of metabolism used by the tested bacteria (sulfate reduction, fermentation, or nitrate respiration). The results demonstrated that SRB contribute to methylmercury demethylation under anoxic conditions, leading to Hg(II) as the end product. Based on the observed transformation rate constants for microbial methylation and demethylation processes, the authors concluded that methylation is the slower process, mainly controlled by the assimilation of Hg(II), whereas demethylation is faster and not dependent on the MeHg concentration (Bridou et al. 2011). The slowness of methylation relative to demethylation in the environment explains the extremely low steady-state concentrations of methylmercury observed in environmental matrices, even under the anoxic circumneutral-pH conditions requisite for SRB activity. Thus, in order to meaningfully estimate potential changes in mercury methylation that could occur in response to the

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		proposed action and alternatives, one must consider net mercury methylation, which includes the combined effect of changes to both methylation and demethylation processes, both of which often involve the activity of SRB and occur simultaneously in wetlands and other aquatic systems. In light of the complexity of mercury cycling in the environment, and the uncertainties associated with current state-of-the art mercury speciation models, the EPA has acknowledged that predictive mercury speciation models are not necessarily the best way forward. Instead, the EPA has recommended inclusion of the following assumptions: new mercury is more available for methylating than old, and sulfate stimulates methylation. If there are any predicted changes in carbon loading, then this would potentially stimulate methylation as well. It may be the case that applying such assumptions would over-predict methylmercury production, but would be necessary to ensure that the predictions are really erring on the side of being conservative. As a result of the December 2016 Mercury Workshop, a Human Health Risk Assessment (HHRA) was developed Donlin Gold (ERM 2017d) that incorporates suggestions on methylation (EPA 2017b, AECOM 2017b, Weglinski 2017) and is referenced in to Section 3.22-Human Health. While additional sampling and laboratory testing are scientifically intriguing, these are not necessary to complete the analysis of impacts to water quality or the HHRA to industry standards for the purposes of NEPA. The following was included in the HHRA and Sections 3.7

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		and / or 3.22 regarding mercury methylation: literature review / discussion of mercury speciation models recommended by EPA; incorporation of elements from these models into the HHRA; rationale for predicted rates of mercury methylation in the future; basis for predicted future concentrations of mercury and methylmercury in surface water; predicted rates of methylation in the future; discussion of assumptions that sulfate stimulates methylation, that changes in carbon loading would stimulate methylation, and that "new" mercury is more readily methylated than "old" mercury; and adjustment (increase) in predicted methylation rates to account for these assumptions.
WAQ 22	Clarification should be provided on atmospheric deposition of mercury and acid rain, and the duration of project impacts to water.	As described in Section 3.7.3.2.2, and Section 3.7.3.2.4 (pp. 3.7-169 et seq.) one primary source of impacts to water and sediment quality at the mine site during operations would involve increased mercury (Hg) concentrations in water and sediments as a result of atmospheric deposition. A conservative estimate of the potential changes in mercury concentrations in surface water due to atmospheric deposition resulting from activities proposed under Alternative 2 is described in Section 3.7.3.2.2, under the heading "Inputs of Mercury from Runoff and Atmospheric Sources" (pp. 3.7-150 et seq.). Also, Table 3.8-24 shows the project's predicted stationary source (due to stacks) and fugitive Hg deposition based on CALPUFF modeling results. The maximum annual predicted contribution from the project's stack and fugitive sources is 4.7 μg / m2. Baseline deposition is 8.4 μg / m2; the project's sources could increase deposition by up to 56 percent in some areas (Environ 2013, 2015). There are no standards or guidelines for Hg

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		deposition. Mercury concentrations in surface water would return to pre-activity levels after completion of the project as a result of natural attenuation processes such as dispersion to other environmental matrices and dilution with natural water from meteoric, groundwater, and other surface water sources. As described in Section 3.8, the emissions of pollutants that contribute to acidification of meteoric water (SO_2 and NO_x) would be relatively low under any of the alternatives. Considering the relatively low emissions of SO_2 and NO_x associated with the project alternatives, and the relatively high buffering capacity of natural waters in the project area, "acid rain" would not cause any project-related impacts to water quality.
WAQ 23	Sediment quality and sedimentation should be addressed in greater detail, including: • Clarification on the relationship between sediment and water quality. • Clarification regarding impact levels compared to regulatory guidelines.	Sections 3.7 and 3.8 have been edited on the basis of these comments.
WAQ 24	Water quality where the proposed pipeline will cross streams should be addressed.	Water quality impacts where the proposed pipeline would cross streams is addressed in Section 3.7.3.2 (see pp. 3.7-162, et seq.). The majority of rivers and streams on the pipeline route would be crossed by open cutting in the winter months when flows are lowest and disturbance of the river and streambanks can be held to a minimum. Occurrences of high intensity impacts could occur but are expected to be reduced within a short timeframe. As noted in the EIS, effects of

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		pipeline stream crossings would be local, as sources of impacts would be restricted to discrete locations within the project area where the pipeline crosses streams. Sediment control measures specified in the ESC Plan (SRK 2013b, Appendix H) would minimize the potential for erosion impacts to move downgradient. The EIS has been revised to acknowledge that localized high-intensity effects would likely occur at some open cut stream crossings, as well as in areas needing ditch maintenance, but such high intensity impacts would be temporary in nature, and would influence only a very small fraction of the project area.
WAQ 25	Additional information or revisions to Alternative 5A-Dry Stack should be provided on the following topics to provide a better understanding of the differences between alternatives: • Provide a comparison of the treatment system differences and wastes produced between Alternatives 2 and 5A. • Provide clarifications and additional information on the seepage flow, cover design, pit lake chemistry, and pit filling rates.	Edits have been incorporated into Section 3.7 in response to comments assigned to this SOC: • The text of the EIS has been edited to more clearly describe the water treatment strategies proposed for operations and closure under Alternative 5A. Under Alternative 5A, sludge from the HRC and greensand water treatment processes would be placed in the TSF operating pond. During operations, brine generated as a byproduct of reverse osmosis water treatment would be sent directly to the process plant as a source of reclaim water for process. • Additional details regarding flow rates of process and wastewater under Alternative 5A are provided in Section 3.5 (Surface Water Hydrology), 3.6 (Groundwater Hydrology), 3.7 (Water Quality), as well as in the memorandum "Dry Stack Water

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	• Clarify whether groundwater mounding in the dry stack would cause stability issues.	Balance with Advanced Water Treatment." (BGC 2015j). Section 3.7 has been revised to clarify that the dry stack cover system would use the same material as Alternative 2 with the addition of an impermeable geomembrane liner incorporated into it. • Stability issues from groundwater mounding and entrained moisture are addressed in Section 3.3.3.6. Groundwater mounding is unlikely to exceed the dam crest height and cause stability issues under either the Unlined or Lined Options in Alternative 5A, because water accumulation would be minimized through the use of diversion channels (both options), underdrains (Unlined Option), and a pumped overdrain (Lined Option). (Without the pumped overdrain in the Lined Option, groundwater could build up and become a stability issue above the dam height.) Groundwater mounding below the dam crest height under either option is not expected to cause stability concerns, given that the upper Operating Pond dam would be of similar design to the TSF dam, would be expected to withstand similar earthquake and stability loadings, and would remain at Closure (only the downstream face regraded); thus, it would still serve as a buttress to the dry stack in post-closure. • As stated in the EIS in Section 3.7: "The risk of SRS pump failure under the Unlined Option would be worse than that of the Lined Option or Alternative 2, due to the longer time that the SRS would need to remain operational and be maintained in post-

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	• Clarify the difference in SRS pump failure risk between Alternatives 2 and 5A. • Provide water quality information for the operating pond under Alternative 5A, and apply it to the water-only dam spill scenario for this alternative. • Explain the difficulties, existing technologies, and limitations for treating operating pond and pit lake water; and describe the volume of water that can be treated and discharged.	closure." For this reason, the analysis of Alternative 5A-Lined Option includes a discussion of pump failure risk more detailed than the analogous analyses for Alternative 5A-Unlined Option and Alternative 2. • The operating pond water quality is a function of the tailings production method and process plant requirements. It would not be expected to change substantially based on the type of tailings management. The Lorax pit-lake models assumed the same TSF surface water quality for both Alternatives 2 and 5A (see also DAM 6). • Water treatment would be used for both Alternatives 2 and 5A, where water is initially treated with a high rate clarifier (HRC) and greensand filter, followed by reverse osmosis (RO) as required (Hatch, 2015). A disadvantage of this system when compared to other treatment options considered is that a brine is produced from the RO process (75% recovery), which then needs to be managed. Specifically, the brine would be sent directly to the process plant as a source of reclaim water for process. The brine could be pumped to the TSF, but this cycle is less efficient, as the brine would mix with the supernatant pond and eventually be used for reclaim anyway. The water treatment WTP would have a maximum capacity of 4,672 gpm (1,061 m3/h). The above assumptions have been carried forward into the WBM for Alternative 5A, as described in BGC (2015j) (Dry Stack Water Balance with Advanced Water Treatment).

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WAQ 26	Dust impacts from the dry stack tailings alternative require additional explanation or revisions: • Explain whether the dust estimates under Alternative 5A account for progressive reclamation and the lack of a tailings beach; also, summary impact levels for Alternative 5A seem biased high; other comments suggest the dust estimates under this alternative may be too low.	Edits have been incorporated into Section 3.7 in response to comments assigned to this SOC, as appropriate: • As described in the EIS in Section 3.7: The primary impacts to surface water quality associated with Alternative 5A would be related to fugitive dust from the dry stack tailings facility and potential runoff from precipitation to the surface of the tailings stack. The EIS includes a relatively detailed analysis of the influence of fugitive dust from the dry-stack TSF on surface water quality on pp. 3.7-195-3.7-197. The analysis, based on dust estimates in Air Sciences (2015c), takes into account the lack of a tailings beach as well as partial reclamation throughout operations under Alternative 5A. After partial reclamation (of south- and west-facing slopes only), about 1,500 acres of the dry stack is assumed to be exposed at closure, out of a total of 2,500 acres which is the size of the final closure cover. As stated on p. 3.7-195 of the EIS: "The amount of fugitive dust generated by wind erosion would depend upon the frequency and magnitude of disturbances of the erodible surface of the tailings material, and the rates of progressive reclamation of the dry stack tailings facility during the operational period, as each new lift would expose un-reclaimed tailings material to wind and precipitation. Besides concurrent reclamation, the dry stack dust would be mitigated through the application of a polymer dust control at 3-foot lift intervals and windbreaks (BGC 2014a)."As described in Section 3.2, Soils, and Section 3.8, Air Quality, the

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		dry stack would have a 60 percent greater surface area potentially exposed to wind erosion than the exposed tailings beach under Alternative 2. This increase represents about a 0.1 percent increase in fugitive dust emissions for the mine site as a whole, as other major sources of dust would not change under this alternative (e.g., pit, roads). The amount of dust generated from the dry stack under Alternative 5A relative to the tailings beach under Alternative 2 may be higher than a simple surface area correlation would suggest, however, due to lower moisture content, increased heavy equipment use, and higher elevation of exposed tailings (greater wind exposure) at the dry stack.
	• Differences in mercury methylation rates and sediment impacts between Alternatives 2 and 5A are not well supported.	• While deposition of mercury could increase slightly due to the small increase in fugitive dust, an increase in production rates for methylmercury in the environment would be unlikely, as the dust source would be primarily in an inorganic form that is unlikely to methylate.
	• Explain the difference in mercury volatilization of pond water between Alternatives 2 and 5A.	• Volatilization of mercury from pond water is a function of surface area and concentration. Assuming mercury concentrations in Alternative 2 TSF reclaim water and Alternative 5A Operating Pond water are roughly similar (see WAQ 25), emissions would be proportionate to their surface area. While the maximum size of the Operating Pond (1,070 acres) is roughly 1/3rd larger than the maximum TSF pond size (about 800 acres), their average annual sizes are roughly similar: about 500 to 600 acres each (Environ

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		2015; BGC 2014a). Thus, their total mercury emissions over the LOM are expected to be roughly the same. During closure, Operating Pond and SRS water would be transferred to the pit until seepage flow through the dry stack reduces to the point that the SRS may be able to be decommissioned. Mercury volatilization from pit lake water under Alternative 5A is expected to be the same as Alternative 2 (see also AIQ 11).
WAQ 27	Concern was expressed about the potential impacts to water quality from fuel spills or a tailings dam release. The Corps should include additional analysis or clarifications on impacts of potential spills on water quality.	Section 3.24.6.7.1 has been edited on the basis of the comments included in this SOC. • For a fuel spill, the analysis recognizes that the duration of impacts to groundwater resources from spilled diesel would likely be greater than the duration of impacts to surface water resources. However, the analysis maintains that the duration of the impacts would be considered temporary because concentrations of total aqueous hydrocarbons would return to below threshold levels specified by the applicable water quality criterion as a result of response and cleanup efforts occurring during the span of the project. • For a tailings release, tailings, water, and entrained native materials would impact water quality downstream, with the duration and intensity of impacts dependent on the seasonal timing of the release, As described in BGC 2015n, the tailings deposited at the bottom of the TSF were assumed to be fully consolidated at the end of operations, with a

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		solids concentration by volume of approximately 50%. Therefore, a hypothetical release would also be expected to consist of a mixture with a solids concentration also of approximately 50%, thereby reducing the speed of flow following a release event.
WAQ 28	Cumulative effects for water quality should receive additional analysis or clarifications on the following: • The role of past mining activities and naturally occurring mercury in cumulative effects. • The additive effects of a potential tailings dam release with climate change. • The role of power plant emissions co-deposition with mercury in affecting nutrient ratios and mercury methylation rates in light of climate change. • The lack of additive effects analysis on Crooked Creek from a combination of soil erosion and groundwater drawdown. • The long-term implications of toxic metal contamination in the Kuskokwim basin. • The comparison of cumulative effects between Alternatives 5A and 2.	The analysis of cumulative effects to surface water and sediment quality have been edited on the basis of comments included in this SOC.
WAQ 29	Clarifying edits should be made in the water quality section. Several source documents and water quality data in Excel format have been requested for review.	Edits have been incorporated into Section 3.7 in response to comments assigned to this SOC. Requested documents have been added to SharePoint and the Administrative Record (Enos 2013b; Lorax 2015; SRK 2015d; Donlin Gold 2016).
WAQ 30	The EIS should include information on potential water	Section 3.13.3.2.1 (Fish and Aquatic Resources) has been

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	temperature changes (in receiving waters) downstream of the Snow Gulch reservoir and spillway.	updated on the basis of this comment to include discussion of water temperature impacts. Construction and operation of a dam and freshwater reservoir in the middle reach of the Snow Gulch watershed is proposed as a source of freshwater for the ore processing plant. Water temperature changes in the downstream segment below the dam could occur as a result of reduced flows, and could vary depending on how water releases below the proposed dam are managed.
WAQ 31	Questions are raised as to whether an impermeable cover over the PAG cells and/or the entire WRF could lead to improved pit lake water quality and eventual decommissioning of the water treatment plant (WTP): • Suggestions have been made that such a cap could compromise the strength and integrity of the structure. Explain why this is the case and whether the decision on cover type is based on budget or geophysics.	• As described below, an impermeable cover on the WRF could have slope stability issues with potential slip planes on both sides of the liner, which could compromise the strength and integrity of the outer part of the WRF; would cost more in terms of increased materials and labor intensiveness; and would potentially have a larger footprint or height due to benching requirements, and a larger area of disturbed ground for material site excavation. Stability and Related Issues: Impermeable cover placement requires more stringent grading of top surfaces and side slopes than permeable covers to accommodate a more complex cover system (geomembrane liner sandwiched in between engineered soil/crushed rock bedding and a protective cover over the liner). Liner bedding requirements are also more stringent (maximum particle size of less than 1-inch and no sharp fragments) to reduce the risk of puncturing the liner or protruding into it. Additional transition zones may be needed as filters to reduce the risk of bedding

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		particles eroding into the WRF, and protective cover particles migrating down-slope. All this is necessary to reduce the risk of destabilization the bedding and cover zones. Cost Issues: Installation of an impermeable cover would increase the time and cost of cover construction, which is a significant factor in a cold region mine with year-round operations. Liner installation is less efficient and more problematic in freezing conditions, with the potential for "ballooning" out in the summer as the liner material expands. It is also more difficult to place and compact frozen materials to meet state-of-practice construction quality objectives. The bedding and cover soils must be compacted by small compaction equipment so that the placed materials will remain stable on the slope. Use of small equipment for this purpose is labor intensive, as is the experience at Red Dog Mine in Alaska. Footprint: Placement of a liner over the WRF slope would require the slope to be benched, to allow the liner to be anchored into the crest of the slopes to prevent it from slipping and destabilizing the slopes and cover; and to have wide enough benches to accommodate drainage ditches to control surface runoff. The need for benches for impermeable covers typically results in overall flatter slopes, a larger footprint, and increased land disturbance than would be needed if there were no benches. The more stringent material requirements for the cover system may also require a larger material site volume and footprint than with a permeable cover.

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	• Explain whether an impermeable cap would cause the pit lake to overturn sooner, have better surface water quality, or be easier to treat. Explain whether an impermeable cap could lead to eventual cleanup of pit lake water and decommissioning of the WTP, and if so, how long it would take. In an early closure scenario, explain whether an impermeable cap could allow the pit lake to clean up enough (through freshwater input) such that the WTP could be closed. If so, compare the cost of an impermeable liner over the full WRF to the cost of water treatment over different time periods.	• An impermeable cap over the WRF would decrease the rates of infiltration of meteoric water to the WRF during the post-closure period, resulting in lower flow rates of seepage from the WRF to the pit lake. However, inputs to the pit lake from groundwater, highwall sloughing, and backfill would still necessitate treatment of pit lake water in perpetuity in order to meet water quality standards prior to discharge, even in the absence WRF seepage. Therefore, there would be minimal environmental benefit from installing an impermeable cap over the WRF. The effects of a WRF cap on pit lake stratification and destratification processes would depend on the management of runoff from the impermeable cap. If runoff from the cap is discharged to surface water without ever entering the pit lake, then it would take longer for the pit lake to fill. As described in Appendix H (Section 4.4.2.6), the pycnocline would move up through the water column with time in all cases, because each year water would be removed and treated from above the pycnocline, while the volume of water in the hypolimnion (i.e., below the pycnocline) would increase due to ongoing groundwater influx below the pycnocline and additional water pumped to the lake bottom. A shallow seasonal pycnocline would likely form, due to snow and ice melt, with lower surface-water concentrations in late-spring and summer and higher concentrations in fall and winter. Waste rock management practices during the post closure period, including placement of an

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	• Suggested edits to Draft EIS Figure 3.6-9 (depicting post-closure inputs to the pit lake) include adding pumped waste rock seepage and removing TSF seepage, as the TSF would not contribute to the pit lake after it is full.	impermeable cap on the WRF, would likely influence the temporal dynamics of pit lake stratification and destratification processes. But in any case, the pit lake surface water quality would not meet water quality standards, and would require treatment in perpetuity before discharge to prevent pit lake overflow. • Waste rock seepage would be part of the discharge from the American Creek watershed, which is already included on the figure. While TSF liner leakage to the SRS is expected to decline as the tailings consolidate and porewater is diluted with groundwater / underdrain flow, baseline groundwater quality is known to exceed ADEC discharge criteria and SRS discharge to the pit lake would continue until the water quality meets criteria applicable under APDES permitting. Thus, it is possible that TSF inputs to the pit lake would continue beyond the predicted pit-filling time.

2.22 NOISE

Impacts from noise from the mine, along river systems and in the pipeline corridor from project construction and operation.

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NOI 1	Concern was expressed that information on potential noise and disturbance impacts from the natural gas pipeline, particularly the compressor station within the Susitna Flats Game Refuge, was not adequately discussed or analyzed.	Supplementing the compressor station construction and operations noise analysis presented on pages 3.9-63 through 3.9-66 of the EIS, additional noise analysis and impact assessment has been added under the Pipeline Above-ground Facilities Compressor Station subheading of Section 3.9.4.3.3 with respect to seasonally occupied cabins and noise-sensitive terrestrial wildlife on Susitna Flats State Game Refuge (SFSGR) that are within a mile of the proposed natural gas compressor station and metering station intended for installation at (or near) Project mileposts (MP) 0.4 and 0.0, respectively. Details include consideration of anticipated compressor station and metering station construction and operation, with estimated Project-attributed day-night sound level (Ldn) compared to baseline Ldn already summarized in Table 3.9-9 of the EIS.
NOI 2	Additional refinement of the noise analysis should occur.	As Section 3.9 presents a discussion of noise and vibration effects that focuses attention on communities and other human receiver locations, additional references have been added to Sections 3.12 and 3.14, under which potential noise and vibration effects to wildlife are addressed as part of discussion of these resources. Further explanation has been added to Section 4.3.1.9 as to why cumulative noise effects are characterized as minor with respect to RFFAs, including the anticipated occurrence of project blasting and machinery noise.

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		A typographical error has been corrected with respect to a referenced helicopter noise level on Table 3.9-28, which is now consistent with information that already appears on page 3.9-39 under the Air Transportation subheading. The correct reference noise level is already used in analyses of anticipated aircraft noise effects as described on pages 3.9-40 through 3.9-41 under the Air Transportation subheading of Section 3.9.4.3.2. Additionally, some context has been added to page 3.9-50, under the Summary of Transportation Facilities Impacts subheading of Section 3.9.4.3.2, with respect to types of anticipated project noise sources and their similarity to those already present in (or expected for) developed areas like Dutch Harbor.

2.23 SOILS

Comments and concerns regarding impacts to soils.

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SOL 1	The Corps should provide clarifying edits in the soils section, specifically including the following: • Accessibility, implementation and management of ESC / stabilization response measures (e.g., remote regions) and associated intensities; • Erosion regulation and APDES program implementation; • Footnote citations; • PAG usage for road construction: and, • Percent occurrence of soil types associated with project components.	Additional clarification has been added to reference the ESCP, in addition to remote site access (e.g., pipeline components) time expectations for foreseeable scenarios requiring significant response measures. The pipeline per Section 3.2.3.2.3 will be cleared of vegetation every 10 years with bi-annual monitoring. These clarifications have resulted in changing the erosion intensity to "low to medium" during pipeline construction. Similarly, the summary of impacts to soil criteria remains as described in Table 3.2-13. Clarification has been added that erosion is not regulated, but rather impacts associated with sediment discharge to receiving waters, and ADEC implements the APDES program. Requested footnote citation modifications have been made (i.e., Table 3.2-12), and clarification added stating that PAG will not be used for road construction materials for all alternatives. Existing figures in the EIS provide a visual depiction of soil type occurrence associated with each project area of interest and sufficiently represent the source data (NRCS) for comparative illustration purposes.
SOL 2	The Corps should provide additional information on soil erosion and sedimentation, and spill impacts on soils,	Erosion impacts on remote project segments associated with the pipeline are addressed in SOL 1. Mitigation measures to

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	specifically to include analysis of the following: • Post construction erosional processes and response measures at pipeline waterbody crossing due to construction related disturbances, permafrost thaw, and/or ORV disturbances; • The remoteness of potential erosional losses at water body crossings and potential impact to downstream fish and fish habitats; and, • Potential impacts to soil from mercury in the TSF in the event of a partial dam failure.	alleviate erosion derived from ice-rich permafrost thaw at waterbody crossings are discussed in Section 3.2.3.2.2. Erosion stabilization response will be site-specific based on immediate post construction stabilization and restoration efforts and follow-up restoration measures. Based on this rationale, the impact intensities determined in Section 3.2 are considered appropriate. Additional ORV discussion is presented in SOL 13. In-stream or sediment transport processes are not addressed in Section 3.2 but are evaluated in Section 3.7. Impacts to fish from these processes are appropriately described in Section 3.13. Text has been added to Section 3.24.6.2, Soils to describe the effect of mercury in a TSF release. TSF release scenarios to waterbodies and associated sediment, including impacts from mercury, are further discussed in Section 3.24.6.7, Water Quality.
SOL 3	Concern was expressed about the concentration of heavy metals, mercury, and other hazardous chemicals that may occur in the soil as a result of the proposed project. • Sulfate concentrations in soil (low) are more relevant to methylation rates than the C/N ratio rationale; • Sulfate concentrations at selected sampling sites (soil and surface water) were not representative of sulfate concentration variabilities that could promote methylation; and, • Existing reference to potential fugitive contaminants	With regard to methylation rates in soil based on sulfate and C/N ratios, sulfate, dissolved organic carbon, and oxidation-reduction potential (ORP) are all important factors that could potentially influence methylation potential for mercury in the environment, in addition to direct measurement of different forms of mercury (total, dissolved, methyl). Methylation of mercury requires the simultaneous occurrence of several conditions including anoxia, availability of carbon, sulfate and/or iron, and other nutrients, presence of mercury-methylating bacteria, and pH values amenable for mercury methylation. A change in any one of the factors necessary for mercury methylation

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	of concern and ADEC cleanup levels unreasonably implies the mine would become a contaminated site.	would not necessarily result in increased methylation rates. As described in ARCADIS 2014 and Section 3.7 of the EIS, sulfate levels in the wetland systems in the study area are insufficient to support high activity of sulfate reducing bacteria (SRB), the microorganisms predominantly responsible for mercury methylation (ARCADIS 2014). Even if sulfate concentrations were to increase in some areas, the low concentrations of nutrients and acidic pH would continue to limit methylation potential. Current rates of mercury methylation in wetlands and uplands in the vicinity of the proposed mine facilities are low, and are not expected to increase as a result of the activities proposed under Alternative 2. Baseline methylmercury measurements in Crooked Creek presented in the Draft EIS included one sampling event in 2013 (Table 3.7-6). This table has been expanded to include five additional sampling rounds conducted in 2014-2015. Baseline Kuskokwim River data from the literature have also been added to the document. Baseline information describing sulfate concentrations in surface water is provided in Tables 3.7-2, 3.7-3, 3.7-4, and 3.7-5. Baseline concentrations of sulfate in groundwater and sediment are provided in Section 3.7.2.2 and 3.7.2.3, respectively. Discussion of mercury methylation in Section 3.7.3.2.2 has been revised for clarity. For potential fugitive contaminants of concern from anticipated dust sources, ADEC cleanup levels were referenced in Section 3.2.3.2.4 for screening criteria purposes only and were not intended to imply relevance pertaining to a contaminated site. Additional clarification has been made by modifying project applicability to the

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		referenced ADEC values. Additional clarifications regarding ADEC cleanup levels can also be found under response SOL 10.
SOL 4	The Corps should recalculate the soil disturbance area, and re-evaluate corresponding impact summary levels as appropriate, including those associated with cumulative effects.	Soil impact areas have been predominantly calculated using GIS that incorporated electronic project planning and design documents (schematics, et. al.), and estimates as appropriate (e.g., Mine Site wetlands disturbance through dewatering). This includes total planned soil disturbance acreages for project components during construction, operation and remaining disturbed areas required for post closure. Specific soil disturbances (acreages) from project components throughout the project life cycle are described in Section 3.2.3.2.1 (i.e., Mine Site, Transportation Facilities, and Natural Gas Pipeline The objective of current format (presentation) is to provide the public with a description of the phased disturbance process (e.g., successive WRF development), and total disturbance (i.e., 2,500 acres). At this time there is no plan to reiterate all the specific soil disturbances associated with each project component and phase in Chapter 4 for Cumulative Effects comparison. The intent of Chapter 4 is to generally summarize total acreages of disturbances previously described in Section 3.2.3 for

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		cumulative evaluation and comparison amongst alternatives. Furthermore, the cumulative effects for soil disturbance and erosion do not include waterbody sediment transport processes as these are included in other resource sections (e.g., propeller scour detailed in Section 3.5). The Corps has directed that overall impact summary levels be removed from the EIS. Summary statements have been revisited and updated accordingly. Additional cumulative impact inquiries are presented in SOL 5. Specific acreages of soil disturbances and erosion descriptions for project components and phases are described in Section 3.2.3, and regional soil type distribution figures for each project component are provided in Section 3.2 to visually illustrate regional comparisons. Relative comparison of soil disturbance to other alternative geographic boundaries (e.g., watersheds) can be made using information contained in relevant chapters of the EIS (e.g., drainage basin areas provided in Section 3.5).
SOL 5	The Corps should revise impact assessment levels as conclusions were thought to be inaccurate or not supported by analysis: • Cumulative effects reorganizational structure pertaining to impact presentation and summary of disturbance; • Soil impact (Section 3.2.3) determinations pertaining to erosion (i.e., pipeline construction) and arsenic bearing dust deposition;	The Corps has revisited the structure of Chapter 4 (Cumulative Effects) with the intent of enhancing presentation and continuity amongst resources (e.g., soil) evaluated. Per Corps direction, summary impact levels have been removed from the EIS, including Chapter 4. Determination of context for erosion during pipeline construction (Section 3.2.3.2.3) and net overall effects associated with arsenic at the mine site are respectively based on erosion potential provided in planning documents (SRK 2013b), and incremental risk (arsenic) associated with

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	• Soil quality Alternative 2 cumulative impact ratings pertaining to pit lake and TSF post closure conditions; and further clarification of "temporal duration" determinations and associations with wetlands and aquatic resources; • Soil cumulative effects analysis between Alternative 2 and 5A pertaining to tailings release and dam failure and related mercury modeling; and • Evaluation of contaminated site intensity impact determination pertaining to the natural gas pipeline (Section 3.2.3.4); corresponding revisions to Table ES-13 and 2.3-44; and location of impacts.	the maximum predicted increase due to project-related inputs and relatively small increase in soil concentrations over the life of the mine. Other impact level assessment determinations that are considered to warrant no additional impact change include those made for the TSF and pit lake based on planned design expectations for mitigation and management. No changes have been made to impact determinations for temporary pipeline ancillary facilities based on further clarification of "temporal duration" of temporary pipeline ancillary facilities made in Section 3.2.3.2.1. Temporal impact descriptions specific to wetlands and aquatic resources from these project components can be found in Sections 3.11 and 3.13. Additional spill fate modeling has not been included in the document, per AECOM (2017d) Technical Memorandum ("Donlin Gold Project EIS – Response to: Enclosure 1. The U.S. Fish and Wildlife Service Request for Spill Fate Analysis on the Kuskokwim River and Kuskokwim Bay") and discussions at the December 2016 Mine-Water Workshop. However, mercury has been added to the existing analysis of partial dam failure impacts on soils in Spill Risk Sections 3.24.6.2.1 (Alternative 2) and 3.24.6.2.5 (Alternative 5A); and the impacts have been revisited in relation to cumulative effects in Chapter 4. Clarification regarding general locations of impacts determinations to contaminated sites has been revised in the ES where appropriate based on information presented in Section 3.2 for Project components (e.g., Transportation -

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		Dutch Harbor; Pipeline - Farewell Airstrip).
SOL 6	The Corps should better define and analyze mitigation measures for soil issues. • Contextual definition of "natural rehabilitation", "soil productivity", "reclamation", and "mitigation" (based on inquiries as appropriate); • Availability of alternative sediment transport mitigation measures (settlement ponds) during pipeline construction (snow stockpiles); and, • Mine site reclamation and soil mitigation plan reference; and project incorporation of future developments (innovations) in reclamation / mitigation approaches.	Multiple revisions have been made throughout applicable subsections of Section 3.2 that address clarifications associated with the following: • Additional detail has been added to Section 3.2.3.2.2 that better describes "natural rehabilitation" in regards to permafrost disturbance (e.g., It is possible in some unique scenarios that natural rehabilitation of the disturbance from on-going thaw may be a more suitable approach); • Implied context for soil productivity references has been added to Section 3.2.3.2.3; • Additional reference to the soil mitigation plan pertaining to mine site reclamation has been added to Section 3.2.3.2.3 and Appendix F; • Reference to mitigation opportunities associated with sediment loading and transport processes potentially derived from snow stockpile meltwater runoff (e.g., settlement ponds) has been added to Section 3.2.3.2.3; • Additional detail describing the relationship and differences between mine site mitigation and reclamation (e.g., reclamation resource materials) has been added to Section 3.2.3.2.1; • Additional reference and clarification to consider future advancements in mitigation processes as stated in Sections 3.2.3.2.1 and 3.2.3.2.3 (e.g.,

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		additional measures may be introduced pending innovations in reclamation and mitigation techniques as they become available). This would be continually evaluated in terms of BMPs, and future reclamation advancements which would be most prominent during mine closure based on continued improvements in industry tested practices.
SOL 7	The Corps should clarify the fugitive dust analysis and spill impacts to soils, and describe how impacts were quantified for the following: • Evaluation of fugitive dust sources and emissions from pipeline construction activities and impacts to associated receptors and biotic transfers (i.e., wetlands, vegetation);	• Pipeline fugitive dust emissions are included in the estimates of particulate matter (PM) in EIS Section 3.8, Air Quality; additional text has been added to Section 3.8 to clarify this. In addition, an analysis of dust deposition impacts along the pipeline has been added to Section 3.2, Soils based on PM estimates and scaling from the mine road deposition model. Pipeline dust control and abatement measures would be consistent the Fugitive Dust Control Plan (FDCP) (SRK 2013b, Air Sciences Inc. 2015d). The intensity of fugitive dust impacts from pipeline construction is generally expected to be low for several reasons: the type of moisture laden materials present (e.g. peat); primary construction during winter; immediate access to emission controls (watering) during summer as necessary; temporal duration during construction followed by immediate reclamation measures (surface stabilization); limited fetch over disturbed surfaces; lack of significant mineralized sources; and proposed testing for PAG at material sites and use of alternative sites if necessary. • Revisions were made to Section 3.2 to indicate that

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	• Evaluation of effects associated with PAG sources as road construction material; • Further evaluation of cumulative effects, including reconsideration of the geographic extent of analysis, and inclusion of mercury and arsenic effects; • Evaluation of soil quality / contaminated sites impacts to soil from a TSF failure under Alternative 5A; and	PAG will not be used as road construction material; refer to the FDCP included in an appendix; and describe pipeline O&M inspections of salvaged and revegetated surfaces that provide dust control. See also responses to WET 5 and VEG 4. • The geographic extent of cumulative effects analysis for fugitive dust is consistent with that requested in comments, i.e., on the order of several miles from the project footprint as indicated in Section 4.3.1.2.3, Soil Quality / Contaminated Sites. An analysis of the direct effects of mercury and arsenic in fugitive dust on soils is provided in Section 3.2.3.2.4, Soil Quality / Contaminated Sites; text has been added to the associated cumulative effects discussion (Section 4.3.1.2.3,) to provide better cross-referencing and summary of the direct effects analysis. • As indicated in Section 3.24.6.2.5, a spill from the Alternative 5A Operating Pond dam would have the same effects on soils as the water-only scenario under Alternative 2. Additional text has been added to this section to summarize these impacts. • The 6.6 percent percent increase in PM is based on comparative air emissions calculations provided by Air Sciences Inc. for Alternative 5A dust generating sources (Rieser 2015b, Air Sciences 2015c). Concurrent reclamation is planned under this alternative, but would be limited to south- and west-facing slopes with successive tailings lifts per Section 3.2.3.6.4. Accordingly, dust estimates are

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	• Percent increase in fugitive dust emissions of 6.6% under Alternative 5A compared to Alternative 2, and whether the estimate accounts for incremental reclamation.	based on an end-of-mine life TSF source area of 1,500 acres for "exposed" dry stack surfaces, out of a total size of the final closure cover of 2,500 acres.
SOL 8	The Corps should provide additional explanation for permafrost project impacts and how the project will address climate change issues in terms of permafrost resources. • Presentation of permafrost as a separate impact (resource) and impact summary item; • Clarification of planned pipeline installation and operation methods, and monitoring to evaluate changes in permafrost degradation attributed to operation and climate change; • Complimentary mechanisms pertaining to permafrost degradation in thaw unstable soil resulting in post thaw effects (erosion, thermokarst, ponding); • Actions proposed and monitoring for permafrost stability inherent to specific project components (i.e., TSF and WRF); and, • Re-evaluation of permafrost boundaries based on measurable impacts relative to cumulative effects per the CEQ handbook for Considering Cumulative Effects (CEQ, 1997).	Impacts to permafrost are described in separate subheadings in Section 3.2 for each project component and alternative, and the present approach is considered appropriate for resource evaluation based on the physical inter-relationship between soils and permafrost. As described in Chapter 2, the pipeline would be installed underground except at two fault crossings, and operated at near seasonal or ambient ground temperatures to minimize thermal disturbance to surrounding permafrost. The pipeline would be surveyed once each calendar year, including infrastructure for maintenance and in-line smart pigs. Subsurface thermistor strings would be deployed in appropriate areas (permafrost) to read and document temperature variations. Planned pipeline design; BMPs during construction; and restoration, monitoring, and ESC mitigation response measures as described and referenced in Chapter 2 and Section 3.2 would be implemented throughout the pipeline span as appropriate, including sensitive areas of thaw unstable soil. Under Alternative 2, the TSF would be built in the Anaconda Creek Valley and the WRF in the American Creek Valley. Per Section 3.2.3.2.2, overburden and ice-rich materials in the TSF dam footprint would be excavated to bedrock followed by replacement with suitable fill material.

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		The purpose of this is to increase the strength and stability of the dam foundation by locating it directly on bedrock. These actions are expected to reduce the likelihood and magnitude of impacts from permafrost hazards on dam stability to low likelihood and low intensity. Progressive widespread thaw settlement is anticipated across the Anaconda Creek valley bottom beneath the TSF impoundment over the operational period, and thawing of remaining permafrost soils could result in differential settlement. This effect would be partially mitigated by pre-thawing during construction: liner bedding material sourced from gravel deposits would be placed on top of the stripped soils, compacted, allowed to thaw over one summer season, and re-compacted prior to liner installation. The liner material type (LLDPE) has been selected based on known material types and expected settlement scenarios. If actual foundation conditions encountered during construction are more variable than anticipated, pre-thawing and re-compaction during construction are expected to mitigate the risk of differential settlement causing a compromised liner. Clarification has been added that specific monitoring requirements would be based on final design and construction per a Tailings Dam Operation and Maintenance Manual; however, general monitoring requirements would be performed as required, daily, weekly, monthly, and annually. Per Chapter 2, monitoring during construction and operations would also include visual inspections of the TSF for erosion, mass stability, seepage areas, debris, and storm water control structures. Instrumental monitoring of mass stability would also occur.

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		The WRF would be constructed in the American Creek Valley. No reference to a permafrost "donut" hole feature (noted in a specific comment) was found in the Waste Rock Facility Design Report (BGC 2011b). The CEQ handbook for Considering Cumulative Effects (CEQ, 1997) is not rigid guidance or definitive, but rather a guide to developing study-specific approaches. No specific reference to measurement of impact distance as a standard is provided; rather, the most appropriate boundary is dependent upon the characteristics of resource-specific effects. Cumulative effects on permafrost primarily include incremental project impacts at or near the project footprint, combined with climate change in exacerbating those effects and other nearby man-made activities. Indices used in the analysis in Section 4.3.1.2.2 are based on anticipated trends from available climate models and project-induced permafrost degradation, which provide a measure of subsurface effects that do not extend very far laterally from the area of immediate vegetation removal. Text has been added to this section to acknowledge the small contribution of project GHG emissions to global climate change that could potentially have a wider effect on other resources such as permafrost.
SOL 9	The Corps should clarify or provide additional detail regarding soil impact consequences and response measures associated with the partial TSF failure scenarios.	The descriptions provided in Section 3.2, Soils, represent generalized physical and chemical changes (anticipated) based on the two dimensional model to perform quantitative impact analyses. This includes descriptions of general geomorphological changes (aggradation and deposition) on final model outputs regarding deposition.

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		Additional clarification has been added to describe potential geomorphological outcomes associated with each scenario based on existing bed and bank material types (soil and sediment); existing drainage characteristics impacted; and model outputs. Clarifications also include qualitative descriptions of post release depositional bed material descriptions (e.g., fines), and probable restoration alternative decision processes.
SOL 10	The Corps should clarify the use and applicability of ADEC cleanup standards per 18 AAC 75 (i.e., WAD cyanide or metals in baseline soils) to the project as stated in the Draft EIS and comparison to plant and animal receptors. In addition, clarify discrepancies associated with comparison of metal concentrations in dust and baseline samples.	Further clarification and rationale has been provided regarding ADEC 18 AAC75 soil cleanup thresholds relative to free or physiologically available cyanide levels (10 ppm). Additional clarification has been added to footnote "7" of Table 3.2-6, stating, "Cleanup levels are shown to identify metals requiring further analysis." The reference to "mercury" was retained in text in Section 3.2, Soils and Table 3.2-5 to clarify predicted concentrations in sources, and removed from cited text in Section 3.22, Human Health, as reported values did not comparatively exceed ADEC threshold standards for either baseline soil or sources.
SOL 11	The Corps should provide further clarification regarding wake induced impacts to soil from barge activities in addition to re-evaluation of wake induced impacts to known contaminated sites along barge traffic routes (i.e., river shoreline).	Wake-induced shoreline erosion from barge traffic is referenced in Section 3.2.3.2.3, and additional cross reference to Section 3.13.3.2.2 has been added to page 3.2-101 of the document. Further review of contaminated site locations along barge transit routes has been conducted, and it was determined based on readily available information that wake induced erosion impacts would be improbable to existing contaminated sites relative to ongoing natural physical processes (i.e., clarification added).

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SOL 12	The Corps should provide additional analysis on ice rich overburden in Alternative 5A.	Per section 4.3.1.2.2, the permafrost cumulative effects rationale and minor impact level determination specific to excavation of ice-rich overburden under Alternative 5A with respect to the additional dam footprint is considered representative. However, additional evaluation regarding permafrost degradation based on TSF thermal property differences between Alternatives 2 and 5A has been performed, and clarification has been added to both Sections 3.2.3.6.2 and 4.3.1.2.2.
SOL 13	The Corps should provide further clarification regarding impacts to soil from ORV operation and re-evaluation of ORV usage based on provision of additional information and / or inquiry.	Information from the Matanuska-Susitna Borough, including recommendations regarding ORV use along pipeline ROWs were evaluated. Clarification impact determinations have been revised accordingly in Section 3.2.3.2.3. Specific references to ORV usage associated with access from the mine access road have been removed from Section 3.2 based on preliminary access limits outlined by Donlin Gold.

2.24 TAILINGS DAM

Comments regarding concerns over the stability of the tailings dam, potential for tailings dam failure, and impacts of a failure.

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DAM 1	The plan is to construct the TSF dam out of waste rock. Due to the risk of rock degradation for PAG rock, it is important that the onsite classification of the rock is correct. Describe the plan to ensure that onsite classification of the rock will occur during construction. Provide details of storage of frozen material unsuitable for use in dam construction (for both Alternatives 2 and 5A).	More information was added as appropriate describing how the proposed project would ensure onsite classification of rock that will be used for dam construction. Refer also to the Waste Rock Management Plan. Frozen or other material unsuitable for use in dam construction would be placed in the overburden stockpiles or in the waste rock facility.
DAM 2	Concern was expressed about a variety of potential negative impacts that could occur in the case of a breach or failure of the tailings storage facility dam. Recent and historical incidents and examples were discussed, such as Rock Creek, Mount Polley and Gold King. Lessons learned from these examples should be used to ensure that the highest standards are insisted upon by the regulatory agencies.	The impacts to the environment in the event of a partial tailings dam failure are discussed by resource in Section 3.24.6. Both the TSF and Snow Gulch Reservoir dams would be subject to the Alaska Dam Safety permitting process which includes failure modes effects assessment. The Alaska Dam Safety office is well versed on these historical events and will take lessons learned into consideration when deciding if it should issue the approval to construct.
DAM 3	The Corps should consider a worst case failure scenario of the tailings dam, and it should be considered a reasonably foreseeable outcome in the NEPA context. The EIS does not explain the decision to analyze the selected scenario. The analysis should consider the probable maximum flood and should show the routing of tailings.	The Council on Environmental Quality discourages the use of a worst-case scenario in the NEPA analysis. The scenarios presented in the document are from the early stage failure modes effects assessment (FMEA) and represent the most impactful of the scenarios that are not considered worst case.

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		As described in Section 3.24.3.5.2 of the document, the early stage FMEA considered a variety of release scenarios, and found a partial tailings dam release to represent the most potentially impactful of the low probability-high consequence failure modes. Catastrophic worst-case failure was evaluated, and found to be very unlikely to occur, with a frequency of once every 1,000 years (i.e., worst case), and not appropriate for the NEPA review process. The process used to determine the appropriate scenario is described in Section 3.24.3.5.2 and the factors contributing to the cause of the scenario included flooding. Routing of tailings for the scenario is presented on Figure 3.24-3. A complete dam breach scenario would be developed as part of the Alaska Dam Safety permitting process and would also include preparing an inundation map.
DAM 4	The Corps should analyze a tailings dam failure scenario of 20 percent or more of the tailings, rather than the scenario analyzed in the Draft EIS.	The scenarios presented in the document are from the early stage failure modes effects assessment and represent the most impactful of the scenarios that are not considered worst case. As described in Section 3.24.3.5.2 of the document, the early stage FMEA considered a variety of release scenarios, and found a partial tailings dam release to represent the most potentially impactful of the low probability-high consequence failure modes. Catastrophic worst-case failure was evaluated, and found to be very unlikely to occur, and not appropriate for the NEPA review process. The request for a new scenario of 20 percent of the contents does not appear to have any precedent in NEPA, nor is it

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		industry practice to analyze or plan for an arbitrary failure rate that loses 20 percent of the material retained by a dam. Emergency Action Plans will be required by the State of Alaska Dam Safety Program.
DAM 5	The Corps should include additional modeling and analysis on various aspects of the tailings storage facility, including detailed flow routing of slurried tailings, and an expanded discussion of remediation and cleanup in case of a tailings dam failure. The analysis should expand to show how the effects and cleanup would change in different seasons. The dam design should be vetted by an independent tailings dam review board.	Edits and additional information were made as appropriate to the scenario, and more detail was provided on cleanup and remediation efforts. Impacts to environmental resources are discussed in Section 3.24.6, including hydraulic routing of 2 million cubic meters of tailings and water slurry. The dam design will be subject to review by the Alaska Dam Safety office to include a Failure Modes Effects Analysis which is an independent review by dam safety experts. The State of Alaska Dam Safety Program regulations also require development of Emergency Action Plans for dams such as proposed by Donlin Gold. Emergency Action Plans include detailed procedures for emergency and remedial response and inundation maps based on dam break analysis as required by ADNR dam design and construction guidelines and the ADNR Certificate to Operate permit. The basis on which the failure scenarios analyzed in the EIS were developed is described in the responses to comments DAM 3 and 4.
DAM 6	The probability and potential impacts of dam failure under Alternative 2 and 5A need to be compared. The volume of tailings stored for both alternatives 2 and 5A should be clearly presented. The Corps should provide additional information on contaminant load of materials that could be released under	The amount of tailings generated would be the same under either Alternative 2 or 5A because the same amount of ore would be processed; this has been clarified in Section 3.24.3.5.3. The contaminant loads for materials that could be released are presented in Sections 3.24.6.2 and 3.24.6.7 for

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	the scenarios for Alternatives 2 and 5A to help differentiate between alternatives.	each alternative. For the purposes of this EIS, it is assumed that a release from the Alternative 5A operating pond would be similar to the water-only release modelled for the TSF dam for Alternative 2. It would likely be permitted as a high-hazard Class I dam by ADNR, like the TSF. The dry stack facility is a stable land form, and a failure is not a viable scenario for analysis.
DAM 7	Concern was expressed about the impacts of climate change, melting permafrost, or extreme weather events on the tailings dam facility.	The Tailing Storage Facility would be designed and operated to withstand extreme weather events (e.g., Red Dog Mine and others in the Arctic and sub-Arctic). Part of the design is to excavate the overburden under the dam so that the foundation is built on bedrock, mitigating issues associated with melting permafrost. Text edited to clarify intention of spill scenarios; the causes of the failures are detailed.
DAM 8	Concern was expressed about impacts of earthquakes on the tailings storage facility.	Tailing storage facilities are designed and operated in highly seismic areas worldwide to resist impacts of earthquakes. The probability and effects of earthquakes on the tailings dam are discussed in Section 3.3.3.2.1.
DAM 9	Clarifying edits should be made to the tailings storage facility dam discussion.	Suggested edits and clarifications added as appropriate. Impacts to the environment as a result of a tailings dam breach are described in Section 3.24.6.
DAM 10	Several comments regarding drainage in the Donlin Gold TSF: • Question the effectiveness of surface evaporation at tailings impoundments in arid areas in promoting tailings dewatering, and its applicability to the TSF;	• During the December 2016 Mine-Water Workshop, the discussion of “evaporative dewatering” of tailings impoundments was incidental and was not intended to apply to Donlin Gold. Dewatering of tailings by evaporation is only possible in arid

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	• Suggest the use of toe drains or drain layers to dewater the tailings in the TSF; and	desert areas, and can only dry out the upper few feet of tailings as evidenced by the desiccation cracks that typically occur. At Donlin Gold, the term "evaporative dewatering" can be applied to the spraying of tailings pond water to the atmosphere to reduce the water volume in the tailings facility. This has been effective at the Pend Oreille and Kettle River / Buckhorn mines in Washington, which are in mountain locations that have heavy winter snows and freezing conditions, along with short construction seasons and operations constraints like Donlin Gold will have. A pattern of wick drains or prefabricated vertical drains were also mentioned at the workshop as a way to enhance dewatering at the end of mine life. These can provide short drainage paths for pore water to escape soft compressible soils, accelerate surcharge drainage and consolidate tailings faster, thereby speeding up closure construction. They would not, however, desaturate the tailings or result in a different terminal density. • There was discussion at the workshop about installing toe drains or underdrains in the tailings facility directly above the liner and continuing these through the dam, the purpose being to enhance the release of pore water from the tailings and decrease tailings saturation to provide drier and more stable tailings. Other mines that use versions of this concept, however, have shown after several decades that tailings at the upstream toe of the dams remain saturated with little, if any, pore water reduction.

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	• Request support for the assertion that the tailings would always remain saturated, since the failure to consider draining the tailings in post-closure depends on this assumption.	Toe drains are an integral part of tailings dams, and are typically constructed on the downstream side of a dam liner for the purpose of channeling seepage out of a dam and controlling the phreatic surface in the dam to maintain the required dam stability and prevent the dam from becoming saturated. At the Donlin Gold TSF, the underdrain and rock fill outer shell serve the function of a toe drain to capture leakage coming through the liner and reduce the phreatic surface in the dam. A toe drain that would remove water from the TSF tailings from the above the liner, or horizontal wick drains in the tailings (also known as "hot drains"), would need to run through holes in the liner to drain effectively, compromising its integrity in preventing leakage to the environment. • The TSF is planned with a liner over the upstream face of the dam and ground surface of the entire tailings facility, creating a "bath tub" so that the entrained pore water in the tailings will not drain out through the tailings dam. This is the design used for other slurry tailings sites such as the Kettle River / Buckhorn Mine in Washington. Water that would be removed from the capillary rock layer in the cover would be mostly bleed-water from compression of the near-surface tailings. The cover is not designed to be impermeable, and some infiltration could enter the capillary rock layer. With minimal evaporation expected, most of the tailings will not be able to reduce in saturation. The plan to

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		not drain the Donlin Gold tailings is not based on the assumption that they would always remain saturated; rather it is based on the very low risk of dam failure (see Section 3.3 Geohazards), combined with other feasibility concerns, such as potential liner damage from a drain layer or introduction of weak points in the liner or dam if additional drains are installed.

2.25 BIRDS

Comments related to potential impacts to migratory birds and waterfowl populations, abundance, diversity, migratory patterns, and potential for displacement from project components. Attraction of birds to tailings ponds. Potential for impacts to ESA-listed birds.

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BIRD 1	An Avian Protection Plan should be developed by Donlin Gold to articulate how impacts on migratory birds and their habitat from the mine, pipeline, transportation corridor, and other associated infrastructure would be reduced. The plan should include mitigation methods to keep birds out of mine contact water.	Design features, Standard Permit Conditions, and BMPs will be applied to minimize impacts to avian species through construction and operation of the mine, pipeline, and transportation system. Important design features, Standard Permit Conditions, and BMPs for reducing impacts to birds are discussed in Section 3.12-Wildlife. Other methods of protection to keep birds from mine contact may be considered. Specific recommendations for additional mitigation, monitoring, and adaptive management measures have been added to Chapter 5 for consideration by the Corps and appropriate resource agencies, as practicable.
BIRD 2	The Corps should revise bird density information. Concerns were expressed that many of these density estimates should be considered minimums as they were based on data with a known negative bias. Surveys completed at the Donlin Gold Mine were not thought to be well timed, since they were conducted after sunrise during a 12-hour period that potentially extended into late afternoon and early evening (ARCADIS 2012). This sampling technique may have increased variability and biased the results by creating a time-of-day effect. Data on relative abundance contained in Table 3.12-22 was thought to not be reliable because most surveys were completed outside of the recommended survey period (Handel and Cady 2004), resulting in variable detection rates due to changes in the start date and start	The bird density information is based on information available from the site-specific surveys. Text has been added to clarify that due to the timing of the surveys the numbers are likely to be biased low and potentially skewed toward higher numbers for species that are vocal later in the day. Therefore, the actual numbers of nesting pairs affected may be higher than the estimate, but the data is judged to be sufficient to determine that the loss of nesting habitat would not cause population-level declines in any species. Existing nesting data is sufficient for analysis within the impact assessment framework in Section 3.12-Wildlife, which describes the impacts generally (nesting habitat loss, temporary disturbance during construction, change in food sources, etc.), rather than specifically (numbers of nesting

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	time; revisions are suggested. Concern was expressed that the estimated number of bird pairs affected in the proposed mine site are viewed to be unreliable (biased low), as they were based on point-count survey data that was often collected during periods of the days when most species have low detection rates.	pairs - which is subject to change annually).
BIRD 3	Concerns were expressed that the Ecological Risk Assessment (ERA) was inadequate to address potential risk to birds. The ERA should be expanded to include more bird receptor species, and for the tailings storage facility and contact water ponds. Long term monitoring of wildlife tissues should be conducted to ground truth estimates of chemical exposure.	Edits and additional information were made as needed to clarify what receptors and exposure routes were included in the ERA (ARCADIS 2013b,ERM 2015, included in Appendix S).The four birds included in the ERA were selected to be representative species. As noted in the ARCADIS (2013) ERA: Because not all individual species or wildlife trophic components of an ecological system are practical to evaluate quantitatively (EPA 1998a,b), several representative species were chosen in association with the AEs. Selection of these indicator species was based on consideration of all functional groups, their potential for exposure by direct and indirect pathways (i.e., exposure through food web interactions), regulatory guidance, and other stakeholder considerations, including subsistence use. These four birds are ADEC default recommended indicator species and represent herbivores, invertivores, and carnivores. The level of information presented in the ERA is not meant to be an exhaustive analysis. Long-term monitoring of wildlife tissues is included as a suggested monitoring measure in Chapter 5.
BIRD 4	The Corps should analyze the impact of barge traffic on bird species that nest in banks along the Kuskokwim River,	Barge traffic impacts on bank-nesting birds were described in Section 3.12-Wildlife under the Increased Barge Traffic

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	including bank swallows.	subheading. Bank swallows have been added to the list of species observed in the project area known to nest along shorelines in the associated table in Section 3.12.
BIRD 5	The Corps should include more analysis to support impact conclusions made on barge traffic impacts to birds. Cumulative and interrelated effects of river disturbance should also be discussed in greater detail.	The slow speed of the barges was mentioned in regard to the risk of a barge colliding with an eider, and was not meant to suggest that the slow speed reduced the risk of an eider colliding with the barge. This has been clarified in the text. Additional analysis has been added to support the impact conclusions, including cumulative and interrelated effects of all types of disturbance along the river.
BIRD 6	Clarifying edits should be provided in the Wildlife Section regarding birds.	Suggested clarifying edits have been made.
BIRD 7	The Corps should consider conducting additional field surveys and analysis on bird populations.	The Corps has determined that additional bird field surveys are not necessary as current analysis of existing field surveys is sufficient to describe the impacts generally (nesting habitat loss, temporary disturbance during construction, change in food sources, etc.), rather than specifically (numbers of nesting pairs - which is subject to change annually).
BIRD 8	The Corps should clarify Table 3.12-40 as it was thought to not be valid to make inferences about bird densities in the proposed pipeline corridor based on the results of Hinkes and Engels (1989). The pipeline corridor crosses four ecoregions: 1) Kuskokwim Mountains. 2) Tanana-Kuskokwim lowlands, 3) Alaska Range and, 4) Cook Inlet Basin (Nowacki et al. 2001). The data that are presented were not thought to apply to the vegetation types in each of these ecoregions. It was recommended that surveys be conducted for birds along the proposed pipeline corridor.	Bird density information is presented in Section 3.12-Wildlife ("Density estimates were available for 16 of the 18 most common species from the Mine Site and Transportation Corridor area study") and in Table V-3.12-7 in Appendix V A Hinkes and Engles (1989) study was reviewed and referenced for bird densities, which were estimated on unburned and recently burned sites at the Bear Creek and Farewell Burn areas located approximately 25 miles southeast of McGrath, between the western slopes of the Alaska Range and the South, Windy, and Middle forks of the

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		Kuskokwim River in the vicinity of Milepost 150 of the Pipeline. The acreages have been revised to reflect only that portion of the pipeline corridor that lies within that Ecoregion. Additional text has been added to explain the limitations. No additional field work was conducted as the information available for analysis was determined to be adequate by wildlife Subject Matter Experts within the impact assessment framework presented in Section 3.12-Wildlife.
BIRD 9	The Corps should conduct more intensive surveys beginning earlier in the season to accurately quantify active vs. inactive nests. The information contained in Table 3.12-29 is thought to be biased low. Concern was expressed that raptor surveys completed in the proposed project area and pipeline corridor were completed too late in the season to accurately document all nest locations. Surveys should have been completed by early to mid-May, not early to mid-June. Likewise, because of incomplete detection rates, surveys should have been conducted more intensively at spaced intervals within the full Pipeline corridor, (e.g., at the Mine Site they were completed at 0.25 mile intervals). This information was thought to be useful for identifying regional hot spots (i.e., the Skwentna River) that have a relatively high diversity and abundance of nests; however, identifying the majority of raptor nests within the Pipeline was thought to require more sampling intensity during the appropriate time in May. Text should be revised accordingly. It was recommended that aerial surveys be initiated during the early nesting period (~first week in May) prior to leaf-out, as surveys completed during June would have been biased low	Pre-construction raptor nest surveys are included as a design feature (Table 5.2-1 in Chapter 5). Donlin Gold would follow the recommendations provided by USFWS regarding timing of these surveys. If occupied nests are found close to areas of proposed activity, the activity would be scheduled to occur outside the nesting season if feasible. If not feasible, USFWS would be consulted to assist in determining measures necessary to avoid impacts to nesting raptors. It has been clarified in the text that additional bird field surveys were not conducted prior to the permit decision because they were assessed as being no necessary to determine the level of impacts within the impact assessment analysis framework of Section 3.12-Wildife.

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	due lower detection rates after leaf-out with a higher percentage of failed nests (as most nest failures occur early). Future surveys should be completed using all known stick-nest locations during the first two weeks of May.	
BIRD 10	The Environmental Consequences section should be expanded to include effects on IBAs and distant populations affected by migratory birds, and In addition recommend analyzing impacts on the rock sandpiper and its habitat. The Corps should revise the information on Table 3.12-14 as the effect of habitat loss / alteration would result in fewer birds nesting in the area. It was suggested that assuming displaced individuals would disperse to other areas is not accurate, as this implies adjacent habitat is not already at or near carrying capacity. Concern was expressed that adequate logic was not established, and if untrue, any loss of nesting habitat would result in a long-term decrease in numbers, as well as a reduction in long-term productivity potential.	Regarding birds displaced by habitat loss or disturbance, the text in Final EIS Section 3.12-Wildlife, subheading Habitat Loss or Alteration, has been revised to clarify that it is unknown whether or not adjacent habitat is currently at carrying capacity, and that the intensity of the impact would increase if the adjacent habitat is full. Rather than basing the impact analysis on the assumption either way (at carrying capacity or not), the analysis has been revised to include the impacts under either scenario.
BIRD 11	Concern was expressed about summary impact level of an ocean barge rupture and large diesel release on birds. The Corps should emphasize the extremely low probability of a very large spill occurring based on historical Alaska and US records. In addition, because of secondary containment, the effects of a tank farm release to birds should be minimal.	Text has been changed as suggested in appropriate sub-sections.
BIRD 12	The Corps should provide more specific information on the biological opinion concerning potential spill effects of oil and dispersants on wildlife.	Diesel fuel would be primary source of hydrocarbons transported to the mine site. Text has been added with more specific information regarding the potential effects from the suggested reference.

2.26 FISH

Comments related to potential impacts to fish (salmon, sheefish) populations, abundance, diversity, migratory patterns and potential for displacement from project components. Impacts to fish from barging activities.

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FISH 1	The Corps should provide more quantified analysis or clarify existing analysis discussions on how the project would affect fish habitat and stream conditions, particularly in American and Crooked Creek.	Impacts to American Creek were analyzed and discussed in Section 3.13-Fish and Aquatic Resources Section. This section provides quantitative details on the predicted habitat and fish loss within the Facilities Study Area. Effects to stream flows and water levels from the project were analyzed as well. Additional text has been added to describe the effects of reduced stream flow in Crooked Creek on habitat depth and salmon redds. Suggested edits concerning water withdrawal requirements have been addressed in Section 3.5-Surface Water Hydrology. Other suggested edits and clarifications have been made to the document as applicable and relevant.
FISH 2	Concern was expressed that impact level determinations for fish and fish habitat were not accurate or that insufficient information was included to support conclusions.	Text has been revised to eliminate the summary impact conclusions of no effect, negligible, minor, moderate, or major. The descriptions of impacts using the four impact factors (intensity, duration, extent, and context) and levels within each factor remain. Impacts have been quantified as much as possible and rationale included for the assessment and analysis of each impact factor. Where appropriate, additional clarifying text was added to the assessment of the impact.
FISH 3	The Corps should include additional analysis of impacts to fish and aquatic resources (e.g., fish rearing, migration, spawning habitat, and incubating eggs) from reduced flows in Crooked Creek below the pit dewatering wells zone of	As discussed and analyzed in Section 3.13, past baseline studies have identified sockeye salmon in Crooked Creek and Getmuna Creek. Water quality data from baseline studies has been reviewed to assess relationships between

Category Code	Statement of Concern	Response
	influence when advanced water treatment of groundwater is discharged. Potential impacts to fish and aquatic resources from water temperature variability relative to releases from the Snow Gulch Reservoir and from establishment of minimum flow levels in Crooked Creek also should be evaluated.	tributary turbidities and rearing coho salmon presence. Text was added to evaluate potential freeze-up of Crooked Creek during low flow periods in winter. Where appropriate, additional clarifying text was added to the assessment of changes in streamflow for comparison in the section.
FISH 4	Concerns were expressed about potential changes to the ecosystem due to the mine, emphasizing importance of salmon within the ecosystem.	Residents of the project area expressed concern about the impacts to fish and fish habitat, particularly Chinook salmon. Section 3.13-Fish and Aquatic Resources includes discussion of the consequences of decreased fish habitat in the Kuskokwim River watershed. Section 3.13 summarizes potential impacts from the overall mine site to in-stream habitat removal and disturbance or loss of fish and benthic biota. Additional text has been added to Chapter 4, Cumulative Effects, to address subsistence and commercial fishing activities.
FISH 5	Concern was expressed regarding the basis for effect determinations relative to increased barge traffic on salmon migration behavior (adults and seaward migrants).	Direct and indirect effects on salmon and other fishes from vessel traffic are described in Section 3.13; effects of fish injury, mortality, and behavior are described as well. Evaluated impacts were related to riverbed scour and bank erosion; displacement and possible stranding of larval and young-of- year fish; behavioral disturbance during fish migration, rearing, and feeding; and possible fish injuries or mortalities from propeller strikes or shear forces. In certain shallow or confined channel segments upriver of Aniak, adverse impacts are expected to occur. Elsewhere in the navigation corridor, where the channel is generally wider and deeper, the chance of adverse impacts is lower.
FISH 6	Concern was expressed that barge traffic could adversely	Monitoring and additional mitigation and adaptive

Category Code	Statement of Concern	Response
	affect salmon production and that more specific locations of risk should be identified where fish stranding or bed scouring might occur. It was therefore requested that the Corps conduct additional (and "more rigorous") studies to more precisely determine locations of risk relative to barging impacts on fish and aquatic resources along the river navigation route, especially with regard to stranding risk in narrow or shallow channel segments and elsewhere along the route.	management measures being considered to better identify and assess the nature, intensity, timing, and specific locations of potential vessel-related impacts on fish and aquatic life and habitat along the navigation route using tug and barge combinations is included in Chapter 5. Comments concerning how pre-construction monitoring may be useful in developing and implementing adaptive management measures to mitigate the potential adverse impacts described in the EIS are noted. Identifying specific locations that may be affected by the potential adverse effects described in the EIS was not assessed to be necessary to make a reasoned choice among barging alternatives because the effects are not dependent upon location, but rather associated with all barge activity. Similarly, effects from non-project boat / barge traffic have also been assessed to provide context relative to existing vessel traffic. Concerns regarding changes to river geomorphology from prop scour are addressed in Section 3.5-Surface Water Hydrology.
FISH 7	The Corps should provide clarifying edits or reorganize results and information in the Fish and Aquatic Resources Section. Additional text is needed to further explain fish sampling techniques. Information presented in this section that relies on fisheries data should be updated to include data from the most recently available sources (e.g., Kuskokwim Area Management Report and Anadromous Waters Catalog).	Suggested edits and clarifications have been made to the document as applicable and relevant. References were verified and added / updated as necessary to support information presented in this section. Tables associated text was updated and edited for consistency. Where appropriate, additional clarifying details were added to the fish sampling data presented throughout the Fish and Aquatic Resources Section.
FISH 8	The Corps should include additional studies and analysis on potential impacts from barging and other project activities	More recent literature on rainbow smelt has been reviewed and incorporated into the analysis of the EIS as appropriate.

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	and features relative to rainbow smelt. Concern was expressed that rainbow smelt abundance and life history is poorly understood.	In 2014, 2015, and 2016 surveys were conducted to determine the timing, distribution, and habitat associations of rainbow smelt spawning in the Kuskokwim River. Discussion of impact of wake forces from barge traffic, including wake forces along shorelines, on rainbow smelt is presented in Section 3.13-Fish and Aquatic Resources. Details on spawning location and timing are given. Impacts from prop wash, causing potential riverbed scour and degradation of aquatic habitat, are discussed. In addition, Donlin Gold will develop and implement a rainbow smelt monitoring program by working with local fishers to sample harvested rainbow smelt to establish age distribution patterns within the spawning population. The goal of this monitoring 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.
FISH 9	The Corps should include additional information on the potential effects of contaminants on fish. Concern was expressed about the potential for increases in methylmercury and subsequent impacts to fish and the subsistence community especially since pike, burbot, and other resident	Fish tissue analysis is provided in Section 3.13-Fish and Aquatic Resources. Fish tissue monitoring for development of site-specific bioaccumulation factors for methylmercury evaluation is included in tables in Section 5.7 in Chapter 5. Information on potential impacts of human fish

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	species now comprise an increasing proportion of the local diet.	consumption is discussed in Section 3.22-Human Health. Clarifying edits have been made in Section 3.13.3.2.1 to address concerns for surface water concentrations in Crooked Creek.
FISH 10	Concern was expressed about potential impacts to fish and the regional Kuskokwim subsistence fisheries from potential spills of fuel and hazardous / dangerous materials, contaminated runoff, barge operations, HDD river crossing methods, tailings dam failure, and metals emissions. The Corps was requested to include additional analysis regarding such impacts.	Potential risks from frac-out on overwintering fish during winter HDD river crossings would be monitored and addressed by frac-out control BMPs specified in site-specific HDD Operations Plans as discussed in Section 3.13-Fish and Aquatic Resources (Section 3.13.3.4.3). The extent of acute and sublethal (chronic) impacts to juvenile and adult salmon and other fishes from exposure to spills would depend on the type, magnitude, location, and timing of the release. The toxicity of a fuel spill can be limited for salmon since juvenile and adult life stages are mobile, can be selective in the foods they ingest, and possess enzymes that can detoxify many oil compounds (NOAA 2016). Indirect impacts to salmon embryonic and juvenile life stages from sublethal exposure to fuel spills, however, can adversely affect the fitness and survival of adult life stages with consequences that extend to interdependent predatory species in the ecosystem (NOAA 2014a). A potential tailings dam failure could result in impacts to various life stages of fish and other aquatic life that could persist for several years or longer; impacts are discussed in Section 3.24-Spill Risk and mentioned in Section 3.13. Potential impacts of metals emissions on fish and aquatic resources in the mine site area involving Crooked Creek and regional watersheds receiving air emissions are also discussed in Section 3.13 (Section 3.13.3.2.1).
FISH 11	The Corps should revise the EFH assessment by including more information on timing of consultation, and additional	The EFH Assessment (Appendix Q) includes additional analysis and clarified existing information based on draft

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	analysis or clarity of included analysis. Concern was expressed that EFH information was inadequate to understand differences in alternatives.	document reviews. Sections 5.2.1, 5.3, and 5.4 in the EFH Assessment describe mitigation measures designed to minimize effects on EFH, which includes complying with all ADF&G Title 16 permits as well as ADNR Temporary Water Use Permits and APDES permits. Furthermore, mitigation of unavoidable habitat losses would be achieved through a series of compensatory habitat modifications as detailed in EFH Section 5.2.2. The EFH Assessment addresses the proposed action (Alternative 2) only; it does not analyze project alternatives as the EFH Assessment process is separate from the NEPA process. Text has been added in Section 3.13-Fish and Aquatic Resources explaining such.
FISH 12	Concern was expressed that information and impact analysis related to new in-water structures and maintenance dredging in the Kuskokwim River at the expanded Bethel cargo terminal and proposed Angyaruaq (Jungjuk) Port barge landing was insufficient relative to dredge volumes, locations, uses of dredge materials and effects on fish and fish habitat.	In-water impacts at the expanded Bethel cargo terminal and Angyaruaq (Jungjuk) Port barge landing are described in several locations including Section 3.5-Surface Water Hydrology, Section 3.13-Fish and Aquatic Resources, and Section 3.2- Soils. As described in these sections, an 850 foot open cell sheetpile bulkhead would be constructed at the Bethel terminal that would extend into the river. No maintenance dredging is anticipated at either dock facility (Angyaruaq [Jungjuk] or Bethel [a connected action, see Chapter 1, Section 1.2.1, Connected Actions]). Donlin Gold has modified the design for the Angyaruaq (Jungjuk) port such that it no longer includes an off-channel fuel berth. It is anticipated that this design would eliminate the need for dredging to maintain this facility. Silt and sedimentation control measures would be installed during in-water construction to protect adjacent aquatic habitat and water quality. Standard Permit Conditions and BMPs are described in Chapter 5.

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		Note that any actions that would occur at the Port of Bethel at the Bethel Yard Dock are not part of the proposed action, and are considered connected actions pursuant to NEPA (40 CFR 1508.25). At this time, it is not known that connected actions would occur. However, connected actions are analyzed for some resources in or near the Bethel Yard Dock in the context of resource impacts in Chapter 3, Affected Environment and Environmental Consequences. See Chapter 1, Section 1.2.1, Connected Actions.
FISH 13	The Corps should include additional analysis and clarify existing information on impacts to fish and streams from the proposed pipeline. There is concern that stream crossings from the proposed pipeline are not adequately addressed in the Draft EIS.	Residents of the project area have expressed their concern about effects to fish habitat and ecology by the proposed pipeline. The EIS discusses effects to important spawning areas from the proposed pipeline. Where appropriate, additional text and edits were made to the text to clarify affected fish and aquatic resources along the proposed pipeline. The implementation of construction BMPs and permit requirements including those to be specified in the Title 16 Fish Habitat Permit would minimize impacts to fish habitat, including sheefish spawning grounds. Stream crossing methods and shipping upriver past Jungjuk are discussed in Chapter 2, Alternatives.
FISH 14	Concern was expressed that bridges, culverts and other water crossings could affect fish and are not fully addressed.	Revisions have been made to Section 3.13-Fish and Aquatic Resources to clarify that bridges are proposed for installation at all fish-bearing water crossings. Effects to fish would also be mitigated through the implementation of specifications included in the Title 16 Fish Habitat Permit as stated throughout this section.
FISH 15	The Corps should more clearly define and analyze mitigation and monitoring of fish and aquatic resources in	Chapter 5 includes design features, Standard Permit Conditions, BMPs, and other mitigation and monitoring

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	areas affected by the proposed project.	measures associated with fish and aquatic resources, as well as other related resources (e.g., surface and groundwater hydrology and water quality). In addition, Donlin Gold will develop (through the State of Alaska Title 16 permit application process) an aquatic resources monitoring plan for Crooked Creek. The objectives of this plan are to monitor for major changes to aquatic communities, monitor for small scale and incremental changes to aquatic communities, and guide results-based refinement to the monitoring program. The plan will include both biological and flow components collected from a number of sampling locations throughout the watershed. Sample locations will be determined in part to facilitate comparisons with baseline data. Bio-monitoring will include fish presence / abundance, invertebrate and periphyton sampling, and fish whole body metal concentrations. Surface water sampling will include a characterization of winter habitat / passage by examining freeze down patterns at various locations in Crooked Creek. The plan will also include sediment sampling. It is expected that flow monitoring requirements will be established by the Alaska departments of Natural Resources and Fish and Game respectively through water rights authorizations and Title 16 permits. The aquatic resources monitoring plan would be used to integrate the applicable biological, chemical, and physical data sources to assess potential effects on aquatic resources in the watershed holistically and to drive mitigation measures or other project modifications as necessary.

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FISH 16	Additional fish and aquatic species and habitat should be considered and discussed, including more recent rainbow smelt surveys, occurrence of broad whitefish, and spawning Bering cisco in the Kuskokwim River.	Additional fish species other than salmon occurring in the Kuskokwim River Drainage are listed in Section 3.13-Fish and Aquatic Resources. Overwintering resident fish in the Kuskokwim River system are described as well. Revisions have been made to the section to include additional information on Bering Cisco, and more recent (2014-2016) rainbow smelt surveys. Tables have been updated accordingly to reflect species occurrences noted by reviewers.

2.27 HABITAT

Comments associated with terrestrial habitat requirements, or potential habitat impacts from project components and operations. Comment focus is habitat impacts, rather than specific resource topics such as wildlife or fish.

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HAB 1	Concern was expressed that the pipeline route traverses extremely sensitive, fragile habitats (e.g., delicate soils, slow growing vegetation, and wetlands) that would not recover well once disturbed and would be difficult to repair. The Corps should consider the implications to habitat where the proposed pipeline route traverses transitional wildlife habitat from approximate milepost 150-194 on the north side of the Alaska Range on State lands. The Corps should consider mitigation to minimize impacts. The fragility of the tundra environment, including the slow growth of the lichens, should be considered in terms of construction and heavy machinery impacting this environment.	Section 3.10-Vegetation and Nonnative Invasive Species discusses important design features, Standard Permit Conditions, BMPs, and suggested mitigation measures regarding vegetation removal impacts. The Donlin Gold Reclamation and Closure Plan (SRK 2017f) provides details on reclamation practices. Seeding, among other measures, is intended to initiate successional processes through which natural plant communities can become reestablished.

2.28 VEGETATION

Comments related to concerns about vegetation and potential for disturbance from project components.

Category Code	Statement of Concern	Response
VEG 1	The analysis area or geographic scope applied to vegetation should be revised or clarified. Suggestions were given to: recalculate disturbance areas of the project within ecoregions as the actual footprint of disturbance should be standardized with an agreed upon disturbance buffer for the Kuskokwim River Transportation corridor. Refine the geographic scope for the vegetation analysis, and map the Project Area footprint. Provide a description of the baseline conditions in the Kuskokwim Mountains ecoregion. Conduct analysis at relevant USGS hydrologic unit codes that would be affected, and use a boundary of disturbance such as a set width from centerline of the pipeline.	Geographic scope for vegetation analysis was clarified and presented as appropriate at a level sufficient for analysis by ecoregion, based on field study and pre-field mapping done by USGS Hydrological Unit Code level 10 for the Wetland Section analysis level. Level 10 HUC data tables are too long to include in the Section, but an explanation of how the analysis was done is included. Full HUC 10 data tables for vegetation / wetland type are included in the PJD (Michael Baker 2016, 2017a, 2017b). Quantified disturbance was presented by acres disturbed by component. Disturbance areas have been recalculated with updated project disturbance footprint locations, and included in tables in Sections 3.10-Vegetation and Nonnative Invasive Species and Section3.11-Wetlands. Information on ecoregions as well as Ecosystems of Conservation Concern has been included using publications, including recent analysis done by the Alaska Center for Conservation Science (formerly known as the Alaska Natural Heritage Program).
VEG 2	Discussion of reclamation is insufficient and more details regarding the reclamation plan should be included. Describe how many acres would be reclaimed. Release the Stabilization, Rehabilitation and Reclamation Plan to review impacts.	Discussion of Donlin Gold's Reclamation and Closure Plan (SRK 2017f) has been included in Section 3.11-Wetlands. Details of reclaimed acres will be included in the Stabilization, Rehabilitation, and Reclamation Plan (SRRP) developed by Donlin Gold. The Compensatory Mitigation Plan by Donlin Gold would be finalized after the permitting

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		phase, separate from the NEPA process. See CWA 4 for more details on the CMP.
VEG 3	Clarifying edits and section reorganization should be applied to the vegetation section. Add language to introduce the discussion of potential effects. Explain how the ground will not be damaged after clearing for pipeline and mine site construction. Also describe how long term vegetation loss would not occur, and revegetation processes.	Geographic scope for vegetation analysis in Section 3.10-Vegetation and Nonnative Species, has been clarified to state that analysis was done in field surveys and in pre-field mapping at the HUC 10 level to match Section 3.11-Wetlands. Discussion has been clarified as appropriate and sufficient to address potential effects to vegetation and wetlands in Sections 3.10 and 3.11. The Assessment Criteria Table for vegetation details the analysis framework for assessing impacts to vegetation, including above and/or below ground damage. Specifics on duration of vegetation damage and/or loss is included in the Assessment Criteria as a factor of analysis.
VEG 4	Impacts from dust on vegetation should be analyzed further. Estimate acres of vegetation impacted by dust, and the impacts of dust from a tailings dam breach. The Corps should describe the role of vegetation as filtration of contaminants for water bodies and direct reduction of fugitive dust. The Corps should analyze revegetation as a dust control measure. The Corps should discuss arsenic impacts on vegetation and whether there will be monitoring for contamination and changes in plant communities.	Additional references have been incorporated and language has been clarified on fugitive dust impacts in Section 3.10-Vegetatoin and Nonnative Invasive Species and Section 3.11-Wetlands,) with cross references to Section 3.2-Soils and Section 3.5-Surface Water Quality. The area that would be exposed to windblown dust would not all equate to impacts on vegetation or wetlands. Vegetation impacts from a tailings dam breach are discussed in Section 3.24-Spill Risk. The size of the area and duration of exposure to dust from a tailings dam breach is dependent on a number of variable conditions, including size and shape of the tailings breach, weather conditions, season, and timing of response. Because a large portion of the tailings would flow

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		into creek valleys, exposure to drying and protection for winds would complicate any potential analyses. Section 3.7-Water Quality discloses the contaminant levels that would exist in the TSF. Arsenic impacts are discussed in Section 3.2-Soils. Discussion of fugitive dust in terms of arsenic and mercury impacts on wildlife is included in Section 3.12-Wildlife. Section 3.11-Wetlands discusses areas of wetland vegetation that could be impacted by fugitive dust from normal mine operation, although the actual area impacted would depend on the amount of fines in sources at the mine site and used for roads. Anticipated changes in wetland plant community diversity and productivity from fugitive dust deposition were described. Wetland uptake of contaminants is discussed in Section 3.24-Spill Risk and Section 3.11-Wetlands. Revegetation would be used throughout the project for erosion control to reduce sediment input to waters and to reduce fugitive dust from reclaimed areas, per design features, Standard Permit Conditions, and BMPs; mitigation measures may be adopted as included in Chapter 5.
VEG 5	The Corps should describe vegetation impacts from pipeline operations and maintenance. Vegetation would be limited to small brush and grass; trees would not be allowed to grow on the pipeline. Describe how trees would be removed, how equipment would have risk of introducing invasive plants for life of the pipeline.	Discussion has been clarified where appropriate on proposed brushing in the Pipeline component and its impacts on vegetation and vegetation regrowth. The PHMSA regulations require 50' of brushing. Trees would be removed during construction using heavy equipment, and then regrowth would be brushed mechanically. Discussion of potential introduction and spread of nonnative

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		invasive species (NNIS) has been expanded where appropriate. Important design features, Standard Permit Conditions, BMPs, and suggested mitigation measures regarding NNIS are discussed in Section 3.10, and included in Chapter 5. Donlin Gold's Invasive Species Prevention and Management Plan for the pipeline component is included as Appendix U.

2.29 WETLANDS AND AQUATIC COMMUNITIES

Filling of wetlands and alterations of wetlands habitat, fragmentation and loss of wetland habitat as a result of project components.

Category Code	Statement of Concern	Response
WET 1	Clarifying edits should be included in the Wetlands Section.	Recommended clarifying edits and language has been made as appropriate. Because of the complex nature of interrelationships between micro-topography, surface and groundwater hydrology, the hydrology, and resiliency in wetland communities, impacts are not know with certainty, and some level of uncertainty is justified. Uncertainty was described for the magnitude of indirect effects, although the analysis assumes all indirect effects are certain to occur. The wetland analysis was revised to clearly use restoration only when the goal of reclamation is to re-establish wetland vegetation, hydrology, and wetland functions. With respect to mitigation for wetlands, compensatory mitigation is used when referencing mitigation to compensate for loss of wetlands or reductions in wetland function. Because of the common usage and general nature of the term mitigation, it is not possible to ensure that all usage of "mitigation" within the EIS equates to "compensatory mitigation" specific to the requirement for wetlands. Other types of mitigation were described, but were not identified as compensatory. Only impact reducing measures incorporated into the project design were assumed to be implemented when assessing impacts.
WET 2	Concerns were expressed that wetland analysis was insufficient or not presented adequately to fully evaluate the potential adverse impacts to wetlands and aquatic resources,	Discussions concerning wetland methodology and analysis were reviewed for completeness and clarity for all of Section 3.11-Wetlands. The wetland data summarized in the EIS

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	including concerns with scope of analysis or specific considerations such as shoreline erosion. The Corps should more fully analyze cumulative effects to wetlands.	accurately describes wetland resources in the region, and impacts as calculated are a conservative overestimate of the area of wetland impacts. Additional field verification studies were completed with respect to upland / wetland mosaics. The Preliminary Jurisdictional Determination (PJD) was revised to eliminate jurisdictional inconsistencies with respect to mosaic classes, to ensure consistency with the Alaska Regional Supplement to the Corps' wetland delineation manual, and cover the extent of alternatives. The revised PJD (Michael Baker 2016, 2017a, 2017b)will be applied to update the Section 10 / 404 permit application completed by the Applicant, not the Corps. The revised numbers (acres) from the revised PJD have been added to the Final EIS Section 3.11. Impact areas were compared to the study areas as described. Clarification has been added that HUC level 10 was used in the analysis because HUC level 8 does not provide enough detail, whereas HUC 12 is too detailed. The Section 3.10-Vegetation and Nonnative Invasive Species has also been analyzed by ecoregion using vegetation type data collected at the HUC 10 level to track what is presented in Section 3.11. Potential indirect effects to wetlands were quantified for fugitive dust, groundwater drawdown, permafrost degradation, and areas where barge wake energy could increase shoreline erosion rates based on an analysis of erosion and deposition along the Kuskokwim River (Styles and Gailani 2016, BGC 2017g)). The buffer distance for dust was re-evaluated and based on review of additional local and published resources the 328-foot buffer distance was

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		retained (see Donlin Gold Mine Project EIS - Wetland Chapter Comments on Dust Impacts, September 9, 2015, which is AECOM 2015g in Chapter 9). Cumulative effects on wetlands are addressed in Chapter 4. As noted, the largest cumulative loss of wetlands is likely to be through increased evapotranspiration and permafrost degradation as a result of global climate change. It is beyond the scope of the EIS to quantify this potential loss.
WET 3	Concerns were expressed about the adequacy, appropriateness, methodology, and information presented in the Functional Analysis. The EIS should incorporate the Corps functional assessment method, and the revised wetlands and aquatic resources information into the EIS.	While a functional assessment was not prepared prior to the EIS, the Corps will consider wetland functions when it conducts its 404(b)(1) evaluation prior to signing the Record of Decision (ROD), as described in Section 3.11.1.1.1 of the FEIS. Section 404 of the Clean Water Act (CWA) establishes a program to regulate the discharge of dredged or fill material into waters of the United States (WOUS), including wetlands. Section 404 requires a permit before dredged or fill material may be discharged into waters of the United States, unless the activity is exempt from Section 404 regulation. Proposed activities are regulated through a permit review process. An individual permit is required for potentially significant impacts. Individual permits are reviewed by the U.S. Army Corps of Engineers (Corps), which evaluates applications under a public interest review, as well as the environmental criteria set forth in the CWA Section 404(b)(1) Guidelines, regulations promulgated by EPA.A brief discussion on wetland function is included in Section 3.11.2.3.
WET 4	Effects on bogs and fens should be discussed in greater detail due to this type of ecosystem's unique character, including	The CWA Section 404 compensatory mitigation process and 404(b)(1) analysis are separate from the NEPA process. A

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	discussion of compensatory mitigation specific to this vegetation type. The Corps should include discussion of long term impacts to these ecosystems by ice roads after construction is completed.	complete Compensatory Mitigation Plan (CMP) and CWA Section 404/10 RHA Permit application is not required by the Corps to complete the NEPA process, but versions of whatever status these documents are in will be included as Appendices when the Final EIS is published. Impacts to floating mat bogs and fen wetlands are listed separately in impact tables, and impact to these wetland types are described. Impacts to bog and fen types are described as permanent conversion/alteration to open water. Impacts from the Beluga pipeline were investigated and resulted in the addition of these wetland classes as separate entries in the impact tables. Proposed winter ice road routes generally follow existing trails and the routes selected are not likely to cross floating mat bogs and fens because these areas lack sufficient stability for larger vehicles. Crossing floating mat bogs or fens with large vehicles would require freezing the water beneath the vegetation mat to safely transit vehicles.
WET 5	Concern was expressed that impacts from dust on wetlands was not adequately analyzed or that sufficient information was discussed.	Additional investigation into published studies on the sources and extent of dust impacts were completed and addressed in a technical memo on this topic (AECOM 2015g). As a result, the estimated impact area was retained. Mitigation such as haul and access road watering would minimize the total area affected by dust deposition. The discussion of fugitive dust is provided in Section 3.11.4.2.1 of the FEIS.
WET 6	Concerns were expressed that impact assessments were not accurate or not supported by analysis in the Wetlands Section.	Direct and indirect impacts to wetlands are presented quantitatively, based on the footprint area for excavation, fill, and vegetation clearing; and estimated impact areas for

Category Code	Statement of Concern	Response
		indirect effects from fugitive dust and groundwater drawdown. Impact criteria summaries were removed. Context for wetland impacts was based on the wetland areas within the study areas in the PJD (Michael Baker 2016, 2017a, 2017b). Concerns regarding the analysis of dewatering is addressed in Section 3.11.4.2.1 of the FEIS.
WET 7	The Corps should clarify analysis and information concerning disturbance buffers for wetlands.	Section 3.11 Assessment Criteria was reviewed for clarity in terms of analysis of disturbance buffers for wetlands. Previously disturbed wetland areas within the Mine Site are illustrated on maps and graphics are presented to illustrate the types of disturbances. The PJD (Michael Baker 2016, 2017a, 2017b) was conducted along the proposed pipeline route, with a similar but not exactly equal analysis area on either side of the linear proposed pipeline feature due to varied terrain and field access ability. The pipeline wetland / vegetation mapping extends approximately 500 feet from the pipeline centerline, and less from ancillary roads and other features.
WET 8	Concern was expressed about long-term impacts to wetlands from groundwater changes. The Corps should include analysis and information about these impacts. If bedrock conductivity and dewatering rates are higher than expected, describe whether more wetlands would dry up than currently estimated, and if there are implications for mitigation.	Potential dewatering is discussed in Section 3.11-Wetlands, in Section 3.11.4.2.1. Potential indirect effects to wetlands may include drying due to groundwater depletion which could occur as a result of bedrock conductivity being higher than expected as more dewatering may occur. Wetlands within the mine site are generally precipitation-recharged rather than groundwater-recharged. A characteristic of many histosols in similar systems is a fairly impermeable layer of peat which limits hydraulic conductivity between surface and lower layers, and most bog systems are not recharged through

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		groundwater. There is evidence in similar systems that wetland dewatering results in impacts to histosols (organic / peaty soils) including hydrocompaction, with the potential for irreversible impacts as elasticity of these organic materials is not indefinite. Clarification on potential impacts to wetlands due to groundwater changes has been added to Section 3.11-Wetlands. Wetland analysis has included available groundwater modeling information and explains the limitations inherent in this modeling approach. The CWA Section 404 compensatory mitigation process and 404(b)(1) analysis are separate from the NEPA process. A complete Compensatory Mitigation Plan (CMP) and CWA Section 404 / 10 RHA Permit application is not required by the Corps to complete the NEPA process, but versions of whatever status these documents are in will be included as Appendices when the Final EIS is published. Reclamation activities would be subject to a monitoring program under Standard Permit Conditions to ensure regrowth and stability at sites.

2.30 WILDLIFE

General comments related to potential impacts to wildlife (mammals), unrelated to subsistence resource concepts. Potential for impacts to ESA-listed mammals.

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WILD 1	Concerns were expressed on how the pipeline corridor could impact wildlife, including increased hunting pressure, greater attraction for wildlife movement and browsing, barriers to movement for small animals, behavioral impacts from increased flights and worker construction camps, and degradation of important transitional habitat including mineral licks.	The impacts of the pipeline corridor and the mine site activities on wildlife, including all the impact mechanisms mentioned, are described in Section 3.12-Wildlife in the Environmental Consequences Section for the Pipeline component and the Mine Site. Impacts to species with a designated status under the Endangered Species Act are described in Section 3.14-Threatened and Endangered Species.
WILD 2	Concern was expressed that mine activities may cause behavioral changes in wildlife, including range changes and avoidance due to noise or other human-caused activities.	Behavioral changes are described as a key impact of the mine in Section 3.12.3.2.
WILD 3	Concerns were expressed about wildlife exposure to arsenic and mercury, or other potential contaminants. Monitoring of wildlife tissue samples should take place throughout the life of the mine. More information should be provided on the LOEC (Lowest Observed Effect Concentration) discussion as baseline soil levels of arsenic and mercury are higher than LOEC. A map of baseline soil arsenic with discussion of potential increases should be included. Adequate mitigation should be discussed in the event of levels being higher than acceptable.	Baseline estimates and baseline HQ results are presented in Section 3.12-Wildlife for arsenic and mercury with an updated discussion on risk based on BLM criteria (Ford 2004). Maps are available with additional location information in Section 3.2-Soils. Additional discussion of contaminants including is included in various sections, including Section 3.2-Soils; Section 3.5-Surface Water; Section 3.7-Water Quality; and Section 3.24-Spills Risk). Design features, Standard Permit Conditions, BMPs, and suggested mitigation is discussed in Chapter 5. Biological monitoring (such as testing of fish tissue, feathers, or animal hair) is included as monitoring measures in Chapter 5.

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WILD 4	Concern was expressed about the completeness of information and the adequacy of analysis on impacts to marine mammals, particularly North Pacific right whales and Cook Inlet beluga whales, in terms of marine and riverine barge traffic, barge noise, behavioral changes, injury and collision risk. The Corps should also consider future oil and gas development in Cook Inlet and climate change impacts on marine mammals in terms of cumulative effects.	Text has been clarified where appropriate in Section 3.14-Threatened and Endangered Species to support the impact analysis for North Pacific right whales and Cook Inlet beluga whales, particularly regarding impacts from vessel strikes. The presence of North Pacific right whale critical habitat within the barge corridor has been sufficiently addressed in Section 3.14. Chapter 4 has been updated as appropriate regarding impacts to marine mammals and ESA-listed marine mammal species. Additional ESA-listed species avoidance measures have been addressed in the revised BAs for NMFS and USFWS species (Appendix O). Climate change impacts are discussed in Section 3.26-Climate Change. Cumulative impacts due to climate change are discussed where appropriate to the level required by NEPA in Chapter 4.
WILD 5	Concerns were expressed that the information, models, and analysis presented in in the Ecological Risk Assessment (ERA) were inadequate and did not support conclusions. The Corps should include more information or models on water quality, multiple metals analysis, bioassays, COPCs, different receptors, and scenarios such as a poorly mixed PAG or turned over pit lake. Case studies should be provided in the ERA. The following specific concerns relate to pit lake ecotoxicity: • The Draft EIS includes an analysis of impacts to wildlife from pit lake water, which uses water quality estimates based on the lake being stratified, with	Edits and additional information were made as needed to clarify what receptors, exposure concentrations, and exposure routes were included in the 2013 ERA (ARCADIS 2013b) and the 2015 ERA Addendum (ERM 2015). • The ERA (Appendix S), shows no or low risk to ecological receptors. The level of information presented is not intended to be an exhaustive analysis, and is sufficient for a realistic understanding of impact analysis. However, different timelines of interest have been evaluated and added to the EIS, including a complete overturn scenario in Appendix H (see Table H-15). Overturn scenario risk

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	poor water quality on bottom and fresher water on top. However, pit lake modeling in the Draft EIS predicts that the pit lake would eventually mix after 100-200 years. The toxicity of pit lake water after it overturns or mixes should also be analyzed. • Explain changes to the toxicity of pit lake water under a scenario where either the PAG cells or the entire WRF have an impermeable cover. • The Draft EIS does not adequately address the possible effects of exposure to pit-lake contaminants. In lieu of discussing such impacts on terrestrial mammals and birds, the Draft EIS quotes extensively from the ERA which relies on flawed analysis. • The ERA evaluates the effects of several chemicals of potential concern in the pit lake individually, but not in combination. This approach underestimates the risks of contamination. To capture cumulative effects of multiple stressors, the EPA recommends constructing response relationships for each stressor and combining them, or analyzing responses to the entire set of stressors. Limitations in the data or models need to be acknowledged and disclosed.	to wildlife is discussed in Section 3.12-Wildlife. Concerns may be met by adaptive management as needed over time and mitigation to prevent wildlife / pit lake interaction after closure, as described in Chapter 5. • Potential risks associated with several extreme overturn scenarios were evaluated in Chapter 2 of the EIS. Elevated concentrations of all metals in these overturn scenarios resulted in higher risks than those identified in the ERA, where the results showed low or no risk depending on the receptor (Appendix S). Although difficult to quantify, the installation of an impermeable cover over the PAG cells and / or the entire WRF would decrease flow rates of seepage from the WRF to the pit lake resulting in less toxicity and risk for wildlife receptors associated with the pit lake. However, additional inputs to the pit lake from groundwater, high wall sloughing, and backfill would still necessitate treatment of pit lake water in perpetuity in order to meet water quality standards prior to discharge, even in the absence of WRF seepage. Therefore, there would be a minimal long term environmental benefit from installing an impermeable cap over the WRF (see also WAQ 20). • Disagree. See above responses regarding validity of ERAs performed. Assumptions are described in detail in Section 3.12, Wildlife. • Comment acknowledged. However, review above responses regarding validity of ERAs performed.

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WILD 6	The Corps should reorganize the Wildlife and TES Sections, and include clarifying edits. Additional details should be provided on wildlife avoidance and risks of small spills of industrial fluids to terrestrial mammals.	Suggested edits and clarifications in Section 3.12-Wildlife and 3.14-Threatened and Endangered Species have been made to the document as applicable and relevant. Summary impact determinations have been removed. The analysis of contamination and fuel spills to terrestrial mammals has been expanded to include various small industrial fluids (e.g., glycol). Donlin Gold will develop and implement a Wildlife Avoidance and Human Encounter / Interaction Plan as part of the permitting process, with multiple agency input.
WILD 7	Concern was expressed that impact level assessments in the Wildlife Section were inaccurate or that not enough information or analysis was included to support the assessment.	The impact assessment framework has been carefully described in Section 3.12-Wildlife. The conclusions have been revised to eliminate summary labels (i.e., minor, moderate, major), and as appropriate the rationale statements for conclusions have been improved. Analyses, both qualitative and quantitative (where possible), are discussed for impacts to wildlife in the four context categories with appropriate, commonly used, NEPA-specific levels (intensity / magnitude, extent, context, duration).
WILD 8	Concerns were expressed that analysis on wildlife and TES impacts was inadequate or conclusions were inaccurate. The Corps should include additional analysis and information in the wildlife section for spill impacts, increased hunting practices, vessel strikes on marine mammals, TES species in general, and displacement of predators and game species. The Corps should also reconsider revising discussion of cumulative effects to wildlife to take into account all environmental stressors.	Text has been changed as suggested in appropriate sections. More specific information has been added from USFWS 2015 regarding oil spill impacts on birds. The analysis of barge-induced bank erosion has been expanded. The analysis of vehicle / wildlife collisions on the access road has been revised to clarify that there is no established correlation between slow speeds and reduced risk.

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WILD 9	Concerns were expressed about potential for toxicological effects of mercury on wildlife associated with spills, sublethal concentrations, and bioaccumulation.	Discussion on toxicological effects of mercury in wildlife and its bioaccumulation has been added where appropriate. Human Health impacts are discussed in Section 3.22-Human Health.

2.31 NONNATIVE INVASIVE SPECIES

Comments that are related to nonnative invasive species.

Category Code	Statement of Concern	Response
INV 1	Introduction of invasive species through a variety of vectors is a major concern due to the variety of adverse impacts on many resources, including "subsistence native resources and critical habitat areas important for fish and wildlife species"[NOTE: critical habitat was not defined in the public comment as being Critical Habitat in the context of ESA] Ballast water should be addressed as an invasive species concern, particularly with the volume of barging proposed, as it has been documented and well-studied as a major vector for spreading invasive species of all taxa in aquatic systems with impacts throughout the ecosystem. Additionally, thousands of tons of construction equipment, materials, and supplies will be brought to the mine for decades. Invasive insects, plants, rodents, seeds, and airborne infestations should be acknowledged and discussed. Monitoring should take place for all barges, vessels, vehicles, cargo, equipment, supplies, and personnel entering all sites for the life of the project and during post-closure activities associated with the project to prevent invasive species introduction of all taxa. Mitigation should take place to avoid or minimize introduction of invasive species of all taxa. Potential impact to subsistence resources and critical habitat should be disclosed. A plan for control and eradication of any invasive species that are introduced should be in place to preserve these resources.	Nonnative invasive species (NNIS) discussion has been expanded. Section 3.10 has been renamed Vegetation and Nonnative Invasive Species. All taxa descriptions of impacts are included for terrestrial and aquatic plants, terrestrial mammals, aquatic and marine animals, insects, and pathogens as information is available. Text was added to clarify what a nonnative invasive species is versus a native species that may be considered weedy (such as fireweed or foxtail). Section 3.10 text was updated to include details on regulations, vectors, and potential impact was added. Important design features, Standard Permit Conditions, BMPs, and suggested mitigation measures are discussed in Section 3.10. Additional suggested mitigation is discussed in Chapter 5. Ballast water and construction equipment were recognized as major NNIS vectors although none of the activities associated with Donlin Gold's proposed action involve the use of ballast water; barges do not use ballast water. Donlin Gold will develop and implement an Invasive Species Prevention and Management Plan (ISPMP) for the pipeline component with input from the BLM and the State of Alaska SPCS (Appendix U).

Category Code	Statement of Concern	Response
INV 2	The analysis of invasive species should consider important direct sources of invasive species introduction or cumulative effects on the native ecosystems in order to take a hard look at impacts under NEPA. The Corps should explain likelihood that invasive species mitigation measures will succeed, or how mitigation will replace ecological functions lost to invasive species in the likely case of introduction and spread to new areas of Alaska due to this project. Irrational reliance on mitigation measures focusing on best management practices (BMPs) and construction equipment should be expanded to include likely and significant sources of invasive species introduction including vessels and recreational equipment. Increased recreational use in the mine site vicinity and on the natural gas pipeline right-of-way and maintenance roads should be acknowledged and discussed as another possible vector that may facilitate the spread of invasive species. Population growth in communities such as Bethel, which already has a relatively high invasive species population, and increased use of the surrounding areas, should also be considered. In terms of cumulative effects, analysis should include consideration of climate change combined with invasive species, wetland loss, and habitat modification. Mitigation measures should be included that are aimed at any of those combined effects.	Donlin Gold will develop and implement an Invasive Species Prevention and Management Plan (ISPMP) for the pipeline component with input from the BLM and the State of Alaska SPCS (Appendix U). The Final EIS document includes information included in the currently available version of the ISPMP. The ISPMP contains information on EDRR and a HAACP. Text concerning potential recreational use changes causing an increase in NNIS introduction potential has been included as appropriate. Cumulative effects discussions were expanded to reference discussion on climate change on potential nonnative invasive species habitat and spread, primarily discussion in Section 3.26-Climate Change, as appropriate under current guidance (see CLIM 1). Population growth of communities due to the proposed project leading to potentially greater infestations is not included; however, NNIS are discussed as being commonly associated with areas of human presence or vectors of human movement
INV 3	Concern was expressed about nonnative invasive species impact on the project area. Additional analysis and information should include: structure, content, information, terminology, and analysis concerning invasive species should be clarified, revised, and expanded to meet the intent and purpose of NEPA. Analysis and information for each	Typically, in NEPA documents invasive species are discussed in the Vegetation Section. Expanded discussion of NNIS will remain in Section 3.10, rather than be repeated in Chapter 2. Analysis and discussion of NNIS is included as appropriate by alternative following the document's analysis framework. Donlin Gold will develop and implement an Invasive Species

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	alternative, and included in Chapter 2 as well as in Biological Sections. Specific protocols for invasive species inspection and response, and Best Management Practices (BMPs) for Right of Ways (ROWs) in Chapter 2 by alternative as well as in Biological Sections; include protocols for inspecting all modes of transportation for nonnative invasive species, and the appropriate response action if something is found. Address and incorporate the 2014 ROW Best Management Practices for nonnative invasive species. Provide an invasive species prevention, monitoring and management plan for temporary work areas, construction camps, access roads and routes, material source sites, airstrips, water use and extraction sites and ancillary facilities outside of the ROW. Describe the Nonnative Invasive Species Prevention Plan (NNISP), and discuss what infrastructure / facilities would be incorporated and what kind of treatments and / or mitigations would be employed for each alternative. Clarify how the project will prevent invasive pike from spreading as a result of the pipeline. Conduct a baseline survey of all affected lands for this project. Justify impact ratings and include more information on direct, indirect, and cumulative effects.	Prevention and Management Plan (ISPMP) for the pipeline component with input from the BLM and the State of Alaska SPCS (Appendix U). See INV 2. Prior surveys for NNIS represent a comprehensive baseline study for NNIS presence within the proposed project area, and further baseline studies are not planned. Text has been clarified reflect the comprehensiveness of the area covered in prior surveys conducted by experts and recorded in various surveys as well as in the statewide nonnative invasive species database, AKEPIC. Additional NNIS surveys are suggested as a monitoring measure in Chapter 5. Section 3.10 text referring to survey mileage and acreage in prior nonnative invasive species studies has been clarified. Information on NNIS surveys along the Kuskokwim River in port sites was included. Information on recorded location is included in Figures depicting NNIS locations. Distance of recorded locations of NNIS to disturbed areas (such as town sites, landing strips, and ports) can be determined from Figures that depict nonnative invasive species locations. Further analysis of quantified distance information would not provide additional insight into impacts as distribution of most locations occur within villages or within disturbed sites, and there is no metric specified from or where to measure distance. The issue of potentially invasive northern pike is acknowledged as a concern for areas in which northern pike is considered nonnative. Information on northern pike native versus nonnative invasive range from ADF&G has been included.

Category Code	Statement of Concern	Response
INV 4	Concern was expressed that nonnative invasive species prevention and management is best addressed and practiced across the landscape, not based on land owner / manager jurisdiction. Suggestions were given to develop an all-inclusive Chapter to address the prevention, management and monitoring for all taxa nonnative invasive species. Concern was expressed that without a separate Chapter 3 Section in the document to address all taxa of nonnative invasive species prevention, mitigation and management, this issue of concern would not be given due diligence with alternative design features and impact analyses.	A comprehensive, landscape-level approach to prevention, detection, eradication, or other practices is embraced in the combined Applicant, BLM, and State of Alaska SPCS efforts on the ISPMP (Appendix U). Additional information on NNIS has been included in Section 3.10 as appropriate. See also INV 1 and INV 2.
INV 5	Clarifying language should be included to meet the concern expressed that an invasive species plant removal compensatory mitigation Permittee Responsible Mitigation (PRM) would be confused with permit responsibilities for prevention and removal of invasive plants.	Design features, Standard Permit Conditions, BMPs, and suggested mitigation and monitoring measures are discussed in Section 3.10. More information is available in Chapter 5. Clarity in discussion of types of mitigation has been applied throughout the Final EIS.

2.32 CULTURAL RESOURCES

Impacts to archeological and cultural resources as a result of mine and related mine infrastructure facilities construction, and operation.

Category Code	Statement of Concern	Response
CUL 1	Concerns were expressed about impacts to cultural and archaeological interests in the case of a tailings spill.	Consideration of the potential effects of a tailings spill has been added as suggested.
CUL 2	Concern was expressed that relevant ethnographic, ethno-historic, subsistence and language sources in the Draft EIS was missing, and that analysis inadequate. The Corps should include additional literature and sources to analyze cultural resources thoroughly.	As numerous reviewers have noted, considerable data on regional ethnography, ethnohistory, language, and subsistence are available in primary and secondary references but were not summarized in the draft document. Available references have been reviewed and additional information on these topics has been incorporated into the document as requested. Additional information on resources of traditional, religious, or sacred importance is was solicited from interested parties during the ongoing NHPA Section 106 process. Data gathered during this process will be incorporated into the analysis and effects determinations in Section 3.20, Cultural Resources.
CUL 3	Concerns were expressed that the analysis and associated impact conclusions associated with cultural resources was inadequate or incorrect.	Impacts to the INHT and other historic properties area topic of considerable attentions. Analysis and effects determinations in Section 3.20, Cultural Resources, have been revisited in light of the comments received and revised as appropriate.
CUL 4	Concern was expressed about the discussion of eligibility, and the conclusions presented in the document, of sites for the National Register of Historic Places (NRHP).	Determinations of eligibility of sites for inclusion in the NRHP was the subject of considerable discussion during discussions between the Corps, BLM, and the SHPO. As a consequence of these discussions, the eligibility of a number of sites previously recommended as not eligible was

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		reassessed. This reassessment addresses the potential for the presence of archaeological districts that may incorporate some of these sites. Results of the reassessment are included in the Final EIS.
CUL 5	Concerns were expressed about discussion and development of the Section 106 Analysis Programmatic Agreement (PA) and the Area of Potential Effect (APE) for cultural resources.	Finalization of the Project APE and the development of a PA are two primary goals of ongoing Section 106 compliance meetings between the Corps, BLM, and consulting parties. Information collected and decisions reached during these meetings will be reflected in the PA and incorporated into the EIS.
CUL 6	The Corps should provide clarifying edits in the Cultural Resources Section.	Presentation of the results of archaeological survey and treatment of archaeological sites in the document has been revisited and clarifying edits made to the document as appropriate.

2.33 IDITAROD NATIONAL HISTORIC TRAIL

Comments related to the Iditarod National Historic Trail (INHT), including cultural significance, recreational impacts, and regarding user groups.

Category Code	Statement of Concern	Response
IDIT 1	It was remarked that the Alternative 2 route for the pipeline was selected to minimize disturbance to known historic landmarks such as the Iditarod Trail, and noted that the Iditarod Trail was originally created and used for the purpose of the Gold Rush in 1910.	Edits regarding the history of the INHT were made to Section 3.15.1.1.2 as appropriate. Section 3.16.3.2.5 notes elements of the proposed pipeline design intended to minimize impacts to the INHT.
IDIT 2	Belief was expressed that Alternative 2 in the Draft EIS could be built and operated with minimum or no negative impact to the trail or users. By working closely with residents and the Iditarod Trail Committee, Donlin Gold optimized the pipeline design by aligning it to minimize impacts to the Iditarod National Historic Trail and its users. Some users expressed appreciation and noted that the project would have minimal negative impacts to the trail by design, during construction and timing of the Iditarod and Iron Dog Races.	These comments were taken into consideration when analyzing impacts to the INHT on recreation as discussed in Section 3.16.3.2.3. Section 3.16.3.2.5 notes elements of the proposed pipeline design that minimize impacts to the INHT.
IDIT 3	The Corps should revisit the impact conclusions associated with the INHT as a cultural resource under Alternative 6A.	Impacts to the INHT are a topic of considerable concern. Analysis of potential miles of the INHT affected by temporary access routes and the ROW have been reevaluated as requested. Revised results have been incorporated into the EIS.
IDIT 4	Alternative 6A, the Dalzell Gorge route, was thought to increase overlap and negative impacts with the INHT and was thought to be considerably riskier to build.	Impacts to the INHT are described in Section 3.16.3.7.
IDIT 5	Concern was expressed that the classification of the INHT as	Rating of the context of the INHT has been revised to

Category Code	Statement of Concern	Response
	an important rather than a unique resource was incorrect. Designation of a trail resource under the National Trails System Act is equal in stature to the Wilderness Act or Wild and Scenic River Act. Any classification of a National Historic Trail below unique is deficient. In Section 3.20 Cultural Resources, the impacts are high intensity (loss of integrity on criteria other than D), impacts are permanent, extent is extended (affects the integrity of the INHT, which extends far beyond the EIS analysis area), and the trail is unique in context. This would result in a high impact to the INHT.	eliminate the terminology of important and unique. The analysis was based on visual simulations, the proposed project's maintenance and rehabilitation plan, design features for minimizing impact, projected challenges, and professional experience and knowledge. Comments were taken into consideration, and appropriate edits have been made to Sections 3.0, 3.15.3.2.3 and Section 3.16.3.2.3, 3.17, and 3.20.
IDIT 6	The Draft EIS was thought to minimize the impacts of roads, camps and airstrips used during construction of the pipeline on the Iditarod Trail. Shoofly roads would frequently have permanent effects, irretrievably alter the Happy River Steps stretch of the INHT, and degrade the recreation experience in combination with other construction activities. Recreational activities would be displaced during pipeline construction and users would likely avoid the area to seek recreation opportunities elsewhere. It is unclear whether the pipeline corridor and construction roads will be mitigated enough to prevent permanent scarring impacting visual quality or attract increased recreational use following construction.	Additional language has been added to assess impacts of construction support facilities (i.e., winter access corridor, temporary roads, material sites, camps, and shoofly roads). Provisions for reclamation and revegetation of construction facilities, found in Section 2.3.2.3.6, have been reassessed. Concerns for the potential for additional recreationists on the pipeline ROW and the INHT were considered. As noted, recreational activities will be temporarily displaced in active construction sites during the construction phase, but much less so during operations. Impacts are described in Section 3.16.3.2.3. After the pipeline is decommissioned, the ROW would no longer be cleared and would not facilitate ORV or ATV traffic. It is possible that continued use would keep the access open, but given the remote location and terrain use would be expected to decline. Project designs that were incorporated to minimize impact to

Category Code	Statement of Concern	Response
		the INHT and users are described in Section 3.16.3.2.6.
IDIT 7	The EIS should revisit the analysis of visual impacts and viewshed analysis associated with the Iditarod National Historic Trail (INHT). It was thought that as currently written it fails to adequately disclose the impacts on visibility during construction and it does not disclose the portions of the INHT that would be affected by construction activities. The photosimulations do no depict impacts of construction infrastructure. Specific comments include: • The Draft EIS is overly reliant on SQRU framework and consistently under values the potential impacts to the INHT. • The visual analysis should split out impacts to the INHT from the rest of the visual section. • The visual resources section misstates the severity of impacts by focusing on overall Scenic Quality, which represents a large acreage, and as a result dilutes the impacts on the immediate trail corridor of the INHT. By overly focusing on the middle to far viewing areas, the analysis is built to underestimate the immediate foreground impacts to INHT users. • The analysis of impacts on visual resources does not consider wintertime views, when recreational use of the INHT is at its highest; does not adequately consider effects on aerial views; improperly assumes that the pipeline is the vantage point rather than the INHT; and selects key observation points that only infrequently see use.	Detailed methodology for viewshed models is provided in Section 3.17.3.1.1. To establish a record of potential changes to inventoried values of the INHT, the analysis seeks to document changes to key factors assessed for visual quality, and potential changes to landmark features or view areas. It is understood that the overall scenic quality score represents the larger geographic area of the SQRU; however the analysis also discloses where anticipated visual impacts would be experienced by INHT users within the immediate foreground. Medium intensity impacts are expected where the trail passes through SQRU AR-6 (Alaska Range/Kuskokwim Lowlands), and medium-high intensity are expected in SQRU AR-1 (Happy Valley). Where the ROW passes through the more forested areas of the Upper Matanuska Valley, impacts are expected to be of medium intensity. Expected changes in the integrity of the landscape, as viewed from the confluence of the Skwentna and Happy rivers are stated. Reduction in scores for cultural modifications are also noted, often at a value of -4. Seasonal use was considered in the impacts analysis, particularly with regard to phasing of construction-related impacts. See also Section 3.20.3.3.3 for impacts to the setting and Scenic Quality Rating Units. Section 3.17.3.3.3 explains how construction activities were included into the analysis of the INHT impacts.

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IDIT 8	The Corps should consider the intent of the Iditarod National Historic Trail Comprehensive Plan when analyzing impacts to the trail. The pipeline construction activities were considered to be intrusive to a fragile wilderness and would heavily change the character of the race and the untouched and wild nature of those portions of the Iditarod Trail. The pipeline and corridor were thought to negatively impact the INHT, and would disturb the cultural and aesthetic values of the trail, resulting in a decrease in the scenic beauty, decreases in the opportunity to seek solitude, an increase in noise pollution, and a decrease in the desirability by some user groups to use the Trail. The Corps should preserve the integrity of the world class INHT corridor by managing it for its scenic, historic, and cultural characteristics.	Concerns for the impact to the INHT were taken into account when determining the conclusions from the pipeline component. Impacts are described in Section 3.16.3.2.3. The State of Alaska and the BLM are cooperating agencies in the NEPA process, and both have responsibilities for managing the Trail, including the affected segments of the INHT: the State as landowner, and the BLM as Trail Administrator. Project designs that were incorporated to minimize impacts to the INHT and users are described in Section 3.16.3.2.6.
IDIT 9	Concern was expressed that the Draft EIS impact ratings understate the effects that the proposed pipeline would have on the INHT.	Concerns for the impact to the INHT were taken into account when determining the effect to recreation from the pipeline component. Impacts were revisited after concerns were raised during the public comment period. Edits were made as necessary to Section 3.16.3.2.3. Project designs that were incorporated to minimize impact to the INHT and users are described in Section 3.16.3.2.6.
IDIT 10	The Corps should revisit the use of the methodology of using pipeline corridor intersections and distances collocated with the Iditarod National Historic Trail. Using the number of intersections / crossings between the INHT and the pipeline was thought to minimize the impacts to the Trail. The pipeline was said to repeatedly intersect / be collocated / adjacent with the INHT every few miles for 64 miles, which was thought to be a lot more than the 14.5 miles	The analysis of impacts to the INHT is found in several sections: 3:15 Lands, 3.16 Recreation, 3.17 Visual, and 3.20 Cultural Resources. The quantification of collocation and proximity is one dimension of this analysis, followed by extensive discussion in Section 3.16 of effects on access by recreationalists during the construction period and during operations. Impacts to the setting, qualities, and values of the trail are discussed in Section 3.20, and the visual impacts

Category Code	Statement of Concern	Response
	stated in the text and used for analysis of impacts. Specifically, the Draft EIS should expand its definition of "proximity" to capture the full range of potential impacts to the INHT. It was noted that impacts to the historical and recreational qualities of the Trail from pipeline crossings is lost in the arbitrary 1,000-foot "proximate" analysis.	from vegetation clearing are discussed in Section 3.17. Alongside the other dimensions of estimating impacts, this quantification does not underestimate impacts to the INHT.
IDIT 11	The EIS should provide more information on the Section 106 compliance process and eligibility criteria for the INHT.	Information on the Section 106 process and eligibility criteria for the INHT has been updated in Section 3.20 to reflect the development of the Programmatic Agreement.
IDIT 12	The BLM has continued discussions with cooperating agencies and requested formal engagement from the solicitor's office about the interpretation and possible implications of the "substantial interference" section of the National Trails System Act (NTSA) (section 7c) as it relates to project impacts on the INHT. While the proposed pipeline route will have an effect on the INHT, the extent of responsibility under the NTSA still needs to be determined and what, if any, revision to the EIS may be necessary to adequately assess impacts to INHT.	The BLM researched conveyance documents and concluded that the BLM does not have management authority under the National Trails System Act in the townships where pipeline corridor overlaps with the INHT right of way. No additional analysis on this aspect is required.

2.34 ENVIRONMENTAL JUSTICE

Comments related to potential impacts to low income and minority populations as result of the proposed project.

Category Code	Statement of Concern	Response
EJ 1	The human rights and environmental practices of the applicant, parent companies, and subsidiaries should be investigated.	An investigation of human rights practices of the companies involved in the project is outside the scope of NEPA.
EJ 2	It was remarked that a disproportionate share of negative environmental consequences will fall on various local native communities and the Draft EIS should have concluded that the project will result in unfair treatment.	The purpose of a NEPA review is to disclose potential impacts. When determining the impacts to environmental justice from the proposed project, the EIS takes into account the beneficial effects to the economy, as well as the effects to subsistence (both beneficial and adverse), to health resources (beneficial), and from climate change (adverse). Section 3.19, Environmental Justice, concluded that Alternative 2 would raise an environmental justice concern, in that both economic benefits and environmental impacts would disproportionately affect (beneficially and adversely) the Alaska Native communities within the EIS Analysis Area and raises an environmental justice concern.
EJ 3	The Corps should include more proactive and collaborative interactions with the communities in areas such as monitoring, creating and sharing data over the course of the active and closed periods of the mine, and the ability to meet the demands of changing conditions with communities as partners.	The Corps acknowledges that Donlin Gold conducted a vigorous outreach program during the exploration period and modified the project design to include a natural gas pipeline as a result of residents' concern with the previously proposed volume of diesel barging. Donlin Gold operates the project under agreements with the ANCSA Corporation landowners: Calista and the Kuskokwim Corporation. This is an important avenue for on-going participation by Alaska Native shareholders, and the Corps supports the suggestion for ongoing participation by affected communities in monitoring and sharing data over the course of operations

Category Code	Statement of Concern	Response
		and closure period. A recommendation for a mitigation measure was added to tables in Section 5.5 to engage community and local employees in monitoring activities during mine operations and post closure phases.
EJ 4	The EIS should provide more discussion of ANCSA and its importance to Alaska Native self-determination. The No Action Alternative should more fully describe the Environmental Justice effects of not developing the project given the intent of ANCSA to provide for Alaska Native economic benefits and self-determination. Denial of the rights of TKC and Calista and their shareholder to develop and gain the benefits of their resources that they have selected for development would cause a major disproportionate impact on minority and low income populations. Further, since royalties would be shared with other ANCSA corporations, it was stated that there would be state-wide adverse effects on these populations.	Executive Order 12898 and the extensive agency policy and guidance on implementation emphasize self-determination, along with sustainable development. The text has been revised to describe the ANCSA mandate as part of the context for the Environmental Justice conclusions.
EJ 5	The EIS should provide linkages between the Environmental Justice and Human Health analyses and conclusions. Tables 3.19-5 and 3.19.6 provide an incomplete picture of the methodology and how the HIA process is reconciled with the NEPA process. The Corps should convert the health information into a format that is consistent with the resources presented in Table 3.19-8.	Tables 3.19-5 and 3.19-6 are shown to give context to how the analysis for this section was conducted relative to the State of Alaska, and a brief introduction to how the HIA was used. A reference to Section 3.22 (Human Health) was added to Section 3.19.3, and Table 3.19-8 in the Draft EIS has been combined into Table 3.18-7 for the Final EIS.
EJ 6	Alternative 1, No Action should be chosen, due to the nature of permanent and irreversible negative impacts to subsistence ways of life, cultural survival and basic human rights of many indigenous peoples around the world due to toxic contaminants released into waterways, airways, and	Comment acknowledged.

Category Code	Statement of Concern	Response
	food systems regional and globally.	
EJ 7	The Corps should address concerns about the violation of the human rights of local area residents, and concern that some regional leaders disregard local residents' voices, and significant economic interests may override local views.	The purpose of the EIS is to provide an objective scientific analysis of likely impacts from the proposed action and alternatives, and to identify appropriate mitigation measures that would reduce impacts. In reaching a decision on permits, the Corps pays attention to local residents and local and regional leaders, weighing all views expressed as part of the Public Interest Review pursuant to 33 CFR 320.1.
EJ 8	The EIS should revisit the impact conclusions associated with Environmental Justice under Alternative 1 and cross-walk the Environmental Justice section and the Socioeconomics section to minimize inconsistencies. • Explain how the project fits the description of and meets commonly understood principles of sustainable, community driven development. In the absence of a description, the position that Alternative 1 would pose an environmental justice related impact is untenable. • Cross-walk sections to minimize inconsistencies and avoid contradictory conclusions. Also, provide an economic analysis that confirms disproportionate economic impact of Alternative 1 (No Action).	The additional guidance documents suggested in comments were reviewed and the discussion regarding the No Action Alterative was revised and expanded upon. Regarding the concept of community driven, sustainable development, the ANCSA Corporation landowners, Calista and TKC, can reasonably be considered to act on behalf of their shareholders, most of who live in the affected communities. Development of non-renewable mineral resources can reasonably be considered part of a long-term development strategy which creates economic returns to be invested in further economic growth in a sustainable fashion.
EJ 9	The EIS should revisit direct, indirect, and cumulative impact conclusions associated with Environmental Justice. Give more information on impacts and justify conclusions. Reviewer disagrees with the conclusion that the project poses an environmental justice concern.	Text edited as appropriate to clarify topics raised in comments. The conclusion that the project poses an environmental justice concern was reviewed and the conclusion retained.
EJ 10	The Draft EIS's focus on jobs and socioeconomic factors was	The comments call for a more critical analysis of benefits to

Category Code	Statement of Concern	Response
	said to distract from real environmental justice issues. The environmental and social costs are, in turn, said to be grossly downplayed. This could ignore the reality that accidents at the mine could impact the Kuskokwim watershed and have effects on subsistence.	non-local parties (i.e., Donlin Gold) at the expense of local residents and environmental resources. The Corps has revised the format for impact conclusions, with minor adjustments in ratings, including a fuller explanation of EJ impacts under Alternative 1. Section 3.24, Spill Risk, addresses potential impacts to environmental justice from accidental spills of fuel or hazardous materials.
EJ 11	It was stated that while unemployment is a major problem in many remote rural Alaskan communities, the unemployment rates in the Y-K area are among the highest in the State. While most employment in the Y-K region comes from government and retail jobs, along with seasonal work, the Draft EIS noted that in recent years the Donlin Gold Mine has been a source of part- and full-time jobs in the region. The implication is that the Donlin Gold Mine will benefit otherwise economically depressed communities. However, with the exception of Bethel, most communities have continued to remain subsistence-based economies.	Clarifying language added, to acknowledge that affected communities rely on a mixed cash-subsistence economy, as detailed at length in Section 3.21 Subsistence. The EIS accurately portrays high unemployment and low incomes among the affected communities, alongside likely economic benefits of the proposed project employment and income.
EJ 12	The Corps should explain how effects of mercury on subsistence resources could be avoided. Mercury levels in fish in the Kuskokwim River are elevated due to contamination from historic mining. Further contamination of the Kuskokwim River system could have devastating effects on the health of the people, environment, and economy in the region.	A revised analysis has been prepared for potential mercury dispersal and impacts on water quality, fish and wildlife, and human health. Contamination from other historic mines pre-dates modern environmental management measures. See Sections 3.7 and 3.8 for revised analysis regarding Water and Air Quality. Sections 3.12 and 3.13 examine impacts to Wildlife and Fish. Section 3.22, Human Health, and Appendix AB, Focused Risk Assessment, includes the revised analysis regarding human health. Donlin Gold has committed to prepare a mercury management plan and this has been added to Table 5.2-1.

Category Code	Statement of Concern	Response
EJ 13	Concern was expressed that by assuming that all proposed management practices and mitigation will be successful, and all scientific predictions are correct, the Draft EIS ignored the fact that open pit gold mines do inevitable and irreparable harm to the environment and will be felt most on subsistence communities.	Review of environmental failures in historic mines, and mining in other less vigorous regulatory jurisdictions provides cautionary perspectives. However, the EIS must analyze the specifics of the proposed action and alternatives. Most of Chapter 3 analyzes routine operations in which environmental management measures function as designed. Section 3.24, Spill Risk, analyzes probabilities, fate and transport, and environmental consequences of spill types in which environmental management measures break down.

2.35 LAND, OWNERSHIP, MANAGEMENT, AND USE

Comments related to public and private land use; ownership, management objectives; loss/degradation of wilderness values – not traditional land use; land status and ownership.

Category Code	Statement of Concern	Response
LAND 1	The EIS should note that shareholders of the Calista Corporation and TKC specifically used their ANCSA entitlement to acquire the lands at Donlin Creek because of the mineral potential and with the intention of generating economic and employment opportunities in the region.	A description of ANCSA as it relates to this project is in Section 3.15.1.2. Text was added to clarify the intent of selection of this area by Native Corporations during the ANCSA land selection process.
LAND 2	The Corps should provide a detailed land status map of Alternative 4, the Birch Tree Crossing Road, to assist with analyzing increased access and/or mineral development along the road as compared to Alternative 2.	The requested map has been inserted. Use of the BTC road would be prohibited by the public, and therefore would not create new subsistence or mineral access.
LAND 3	The Corps should analyze how access along the pipeline corridor, construction access roads, and airstrips could open up access to adjacent private, state, and BLM lands. This could result in impacts on terrain and wildlife, increased competition for subsistence use areas, opening up opportunities for additional resource development, and permanent alteration of the wilderness character of the area.	For the pipeline corridor, the estimate of new user traffic takes into account the public use of a comparable access route nearby, already in place in the INHT. Summer travel conditions, costs, and distances to travel contribute to a relatively modest level of travel along the INHT outside of the race events. Increased use could occur near the east end of the pipeline. In the vicinity of the mine site, no new large population influx to villages is expected, due to the enclave structure of the worksite and the employer-sponsored transportation from larger population centers. In general, there would be no additional hunting tags or permits, which would limit the increase of use in the more remote parts of the ROW. Specific effects to recreation and subsistence are discussed in Section 3.16 and 3.21, respectively. Text modified for clarity.

Category Code	Statement of Concern	Response
LAND 4	Concern was expressed that removing the construction access roads and airstrips associated with the natural gas pipeline would limit access to public lands. Developing access routes through resource development projects such as the Donlin Gold project should be seen as a beneficial impact.	Although increased access to rural parts of Alaska could be considered by some as a beneficial impact, reclamation of temporary construction facilities was designed to minimize environmental impacts.
LAND 5	Concern was expressed that the pipeline construction will be more complicated and take more time than planned, and will diminish the scenic and solitude values associated with the property. This will negatively impact these values for other landowners in the Farewell area.	Additional language included to address impacts to scenic value for local landowners for the ROW segment west of Farewell Airstrip from MP 150 to 190.
LAND 6	Concern was expressed that the Draft EIS focused on land use changes relative to the Crooked Creek area, which resulted in an overstatement of potential impacts in the entire Calista region. The discussion of land use changes should identify local impacts, but also consider the regional context, particularly in light of ANCSA' s mandate and impacts that could be experienced throughout the Calista region.	The Corps has carefully considered the appropriate context for mine site impacts and the Crooked Creek drainage is an important ecological unit for assessing localized impacts. Clarification of the context of the project in relation to the Kuskokwim River drainage and the lands owned by Calista was edited for clarity when discussing impacts.
LAND 7	The Corps should revisit the contribution to the cumulative effects assessment associated with active mining claims near the proposed project. The EIS should address the cumulative effects of long term possible scenarios resulting from additional resource development on existing mining claims in the project area or natural gas pipelines to rural Alaska.	Chapter 4, Cumulative Effects, includes the cumulative impacts of "Mineral Exploration and Mining," including, Historic Kuskokwim River Basin mining: Red Devil, NYAC, Platinum, Nixon Fork, Small scale placer mining (e.g., Crooked Creek) and exploration activities at DeCoursey Mountain, Julian Creek, Chicken Mountain, Golden Horn, and Granite Creek, Chuitna Coal Project, Brazil Resources, Inc. Whistler Project and Localized construction material production (sand, gravel, and quarry rock). Information was added to the discussion in Section 4.3.3.1.1 on cumulative

Category Code	Statement of Concern	Response
		effects to land use.
LAND 8	The Corps should consider specific edits to the Land Ownership, Management, and Use section.	Suggested edits and clarifications made to the document as applicable and relevant.
LAND 9	The Corps should disclose whether eminent domain would be used to acquire access for the pipeline corridor and construction access routes.	Donlin Gold is in negotiation with all private land owners whose land the pipeline ROW would cross. If agreements cannot be made (and there is no indication of this) the pipeline would be rerouted. There is currently no assertion of eminent domain proposed for the land for the ROW. No changes to the document were made.
LAND 10	The EIS should not use BLM's 1981 Southwest Management Framework Plan to support the analysis as the MFP is out of date and not in compliance with current planning regulations and policies. Take out reference to the Federal Land Policy and Management Act (FLPMA) as a basis for BLM authority.	The understanding is that until the Bering Sea Western Interior Resource Management Plan and EIS is finalized, the active plan is the Southwest MFP. This is discussed in Section 3.15.1.1.1. Information on FLPMA has not changed, as it applies to various aspects of BLM resource management planning on BLM lands.
LAND 11	Concern was expressed that the Draft EIS oversimplified effects of complex land ownership patterns associated with Alternative 4 and that the alternative is impractical.	Text edited to note that additional time, permits, and expenses are associated with Alternative 4.
LAND 12	The Corps should revisit the land ownership analysis under Alternative 1.	Text edited for clarity.
LAND 13	Concern was expressed that granting a pipeline right-of-way would be inconsistent with the ADNR's Susitna Matanuska and Kuskokwim Area Plans, which state that no permanent structures or equipment should be placed in the INHT corridor if they could adversely affect the trail experience or access along the trail. State of Alaska undertakings in the MOU with BLM regarding the INHT (1987) are also asserted	The Susitna Matanuska Area Plan is discussed in Section 3.15.3.2.3. The purpose of the EIS analysis is to disclose the specific degree of impact of the proposed project, including impact on the INHT as a cultural resource and a historic property (Section 3.20, Cultural Resources). When granting the permits for State-managed lands, the ADNR would determine if the permanent structures along the INHT

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	to prevent such impairments.	would adversely affect trail experience and decide whether to grant permits. The ADNR and the BLM coordinate management of the INHT and would be working closely through this process.
LAND 14	The Corps should consider impacts to future management actions associated with the pipeline.	Increase of use is estimated to be generally low, with partial exception of ROW segments west of Farewell Airstrip, and there would be some, but minimal future management actions required. Text clarified.
LAND 15	The Corps should address specific comments on relocation of the Omnibus Route, 17(b) easements and RS 2477 rights-of-way in the mine and port area.	Suggested edits and clarifications made to the document as appropriate. Information updated in the EIS to reflect Donlin Gold's October 2016 Public Easement Plan.
LAND 16	Commenters expressed concern for public use of the pipeline ROW, and the Corps should consider adding mitigation measures related to increased access from the pipeline ROW. Clarify if the public would be allowed to cross the mine access road via ATV or snowmachine.	Suggested mitigation measures added to Chapter 5, Tables 5.5-1A and 5.5-1B,. Clarifications have been added to Section 3.16.3.2.2 regarding public crossing and winter use of the mine access road, when mine-related traffic would not be present.
LAND 17	The Corps should revise and/or delete the Section line easement discussion.	Section 3.15.1.5.2 has been edited for clarity.
LAND 18	Concern was expressed that the discussion of land use in Section 3.15 was too general, and neglected subsistence land uses. It would have been appropriate to have listed the various documents from the ADF&G Subsistence Division for the mine site area, the downstream areas along the Kuskokwim, and along the proposed Donlin Gold pipeline route.	Section 3.15 focuses on issues of land ownership, management and use. Details on subsistence use areas are found in Section 3.21 on Subsistence, where ADF&G Subsistence Division studies are described in detail. Text edited to add reference to Section 3.21.

2.36 NATURAL GAS SUPPLY

Comments related to impacts to natural gas supply in Cook Inlet.

Category Code	Statement of Concern	Response
GAS 1	The excess capacity in the natural gas supply designed by Donlin Gold should be acknowledged as an opportunity to provide energy for local communities in the Y-K region where there is currently a lack of infrastructure and fuel cost is high.	The EIS discusses the potential for the project to reduce energy costs for the region.
GAS 2	Options should be explored to cost-effectively transport natural gas in the proposed pipeline to create lower energy costs for the region.	While the proposed pipeline would be a common carrier and other entities could use it to ship gas, the Corps is not aware of any foreseeable projects to transport gas for other entities. Therefore, other projects are outside the scope of this EIS.
GAS 3	Improved transportation and communications infrastructure to support the mine could provide better services and lower cost of energy, goods and services to local residents.	Section 3.18-Socioeconomics of the EIS evaluates the potential benefits on infrastructure, goods and services.
GAS 4	The natural gas pipeline in the proposed project should be acknowledged as addressing concerns associated with barging impacts on the Kuskokwim River by reducing the number of diesel barges on the river.	Refer to Table 5.2-1 for acknowledgement.
GAS 5	There was support expressed that the proposed project could provide benefits through creating a more competitive market for Cook Inlet natural gas, helping meet area energy needs.	Comment acknowledged.
GAS 6	Concern was expressed about the supply of natural gas for the proposed pipeline, and whether there is enough natural gas in Cook Inlet to support the project, as well as support	Comment acknowledged. As stated in Section 1.9.3, the project will purchase natural gas on the open market from an existing pipeline, and natural gas is not a commodity that

Category Code	Statement of Concern	Response
	the city of Anchorage and the Kenai Peninsula.	is in short supply in Cook Inlet.
GAS 7	Concern was expressed that the costs for building the natural gas pipeline and LNG plant have not been fully disclosed, and the infrastructure needs would be greater than was included in the Draft EIS.	The primary use of the natural gas would be to power the proposed power plant at the mine. The power plant would not use LNG. Alternative 3A would construct a small LNG plant at the mine site to produce LNG to power mine trucks. These plants are common and would not affect the feasibility of the proposed natural gas pipeline.

2.37 PUBLIC HEALTH

Impacts to local communities' public health and infrastructure as a result of the project (e.g., disease, contaminants, lifestyle changes, behavior health, physical health). Health Impact Assessment. Industrial hygiene.

Category Code	Statement of Concern	Response
PHL 1	Concerns were expressed about public health and the overall well-being of communities in the Yukon-Kuskokwim (Y-K) region.	Comment acknowledged. Please see potential consequences to health section of the EIS - Section 3.22.4. Additional discussion and supporting documentation have been included to clarify potential health consequences and measures to minimize potential health impacts.
PHL 2	The NEPA process for analyzing human health should include discussion of the laws and regulations that are put in place to protect health. Concern was expressed about whether or not the HIA should be included within and analyzed as part of the EIS. Some concerns focused on specific HIA areas of analysis.	The HIA prepared by the Alaska Department of Health and Social Services has been incorporated as a source document for the Final EIS. Additional consideration has been given to supplementing the HIA, and additional analysis has been included as appropriate. The text has been edited to note that resources consumed by humans, such as air and water, are protected by legislation like the Clean Air Act and the Clean Water Act.
PHL 3	Concerns were expressed about the project's potential role in providing opportunities for jobs to local communities, which could potentially combat substance abuse, depression, and suicide rates in the region.	Comment acknowledged. Additional information has been included in the health section to clarify potential positive and negative benefits of increased income and the likelihood of positive and negative impacts occurring (including basis for likelihood).
PHL 4	Concerns were expressed regarding the potential for excessive risks to be placed on public health from the project.	Comment acknowledged. The EIS has identified and disclosed estimated likely effects of the proposed project on public health. Readers and stakeholders might well reach difference conclusions regarding what would constitute excessive risk.

Category Code	Statement of Concern	Response
PHL 5	Concerns were expressed on how project-related or outside influences may impact public health in communities in the region regarding infectious diseases, traffic, substance abuse, and other behavioral risks.	Comment acknowledged. Additional discussion and supporting documentation have been included to clarify potential health consequences related to social determinants, worker influx, housing plans, and transmission of diseases and measures to minimize potential health impacts.
PHL 6	Concern was expressed regarding evaluation of public health impacts; the Corps should include analysis on the existing health status of communities.	The HIA was prepared using established methods, addressing environmental, physiological, and social elements of health. The available data used characterizes the potentially affected populations.
PHL 7	Concern was expressed about project impacts, either positive or negative, on the potential for local medical services to be impacted in some way.	Discussions on how employment will facilitate participation in private health insurance and reduce burdening of public health systems have been included. In addition, discussion has been added to clarify negative and positive benefits of the project on local medical services. Clarification of planned mitigation to promote a healthy workplace and minimize transmittal of diseases has been included.
PHL 8	Concern was expressed regarding water and sanitation services and potential impacts to public health from the project.	The HIA evaluates the adequacy of water and sanitation services, recognizing the limitations of current infrastructure in many communities. Potential health impacts have been re-evaluated, based on the comments. Additional discussion has been added as appropriate concerning the potential for increased funding to upgrade water and sanitation infrastructure, including discussion of borough formation in Section 3.18 Socioeconomics.
PHL 9	Concern was expressed regarding workplace safety and potential impacts to public health from the project either through changes in substance abuse frequencies, injuries, or illness.	Discussion has been incorporated as appropriate to address the benefits of Donlin Gold's existing zero tolerance policy and drug and alcohol programs. Workplace safety is considered within the "fence" and will be addressed by

Category Code	Statement of Concern	Response
		existing workplace safety regulations (such as OSHA and MSHA).
PHL 10	Concerns were expressed about the potential impacts to mental health from the project, specifically emphasizing suicides, rates of depression, substance abuse, as well as the potential for the project to influence such rates and public health in the region.	The HIA presents the mental health baseline for the region; potential health impacts have been re-evaluated, including likelihood ratings and basis, where appropriate.
PHL 11	Concerns were expressed regarding the potential for the project to influence aspects of local community culture and described suggestions for communication and workplace integration between the communities and the project itself.	Some of the proposed mitigation measures have been practiced by Donlin Gold during the exploration period. Others have been added to the proposed mitigations in Table 5.5-1.
PHL 12	Concerns were expressed regarding potential impacts to subsistence resources and specifically food security as well as nutritional practices. Concerns focused on potential impacts to specific subsistence resources and the involvement and input of local communities.	The HIA provides a perspective on baseline conditions in subsistence practices as these relate to food security and nutritional practices. More detailed discussion of baseline subsistence harvest practices and potential project impacts on subsistence practices are found in Section 3.21 Subsistence.
PHL 13	Concerns were expressed about transportation related impacts on public health for the region. Specifically these included references to transportation access in regards to subsistence activities, as well as discussions of accidents or injuries related to motor vehicle, barge, or air transportation.	The impacts on health due to risks of accidents in surface, water, and air transportation have been revisited, and the basis for ratings clarified as appropriate. Impacts due to noise and emissions of transportation activities, including contributions to climate change have also been clarified as appropriate.
PHL 14	Concerns were expressed regarding potential spills or leaks of hazardous chemicals and impacts of any potential spill on public health in the region.	Text was revised in Section 3.24, Spill Risk, which contains an extensive analysis of spill types, probabilities, and environmental consequences. The discussion of spill risks and health consequences in Section 3.22 Human Health has been re-analyzed and edited as appropriate.

Category Code	Statement of Concern	Response
PHL 15	The Corps should further analyze public health aspects of the No Action alternative as compared to action alternatives.	Comment acknowledged. Edits were made as appropriate.
PHL 16	Concerns were expressed regarding potential impacts to public health from hazardous chemical exposure. The health of communities, subsistence resources, and water supplies were some of the main areas of focus for concerns. Specifically concerns also focused on mercury, arsenic, and cyanide within the Yukon-Kuskokwim ecosystem as it pertains to bioaccumulation, inhalation, and general exposure over the life of the project. The Corps should include more data analysis regarding baseline levels of arsenic, antimony, cyanide, and mercury to inform public health issues.	Based on a series of discussions focused on chemicals of concern, including a workshop discussion devoted to mercury, additional information and evaluation have been included in the EIS to better communicate these potential effects on public health. This information also includes additional evaluation requested of Donlin Gold, including an expanded human health risk assessment. Discussion of this additional information can be found in Section 3.22, Human Health.
PHL 17	Concerns were expressed regarding air quality impacts to public health from the project. Specifically concerns included requests for more information, clarification, and additional analysis related to air quality modeling and testing.	Based on a series of discussions focused on chemicals of concern, additional information and evaluation have been included in the EIS to better communicate these potential effects on public health. This information includes additional evaluation requested of Donlin Gold, including an expanded human health risk assessment and a Focused Risk Assessment (AECOM). Discussion of this additional information can be found in Section 3.22, Human Health.
PHL 18	Concern was expressed about long-term health risks due to potential contamination or persistent contamination. The EIS should include additional modeling of mercury bioaccumulation, sources and pathways for uptake and exposure to methylmercury in the food web. In addition, there should be long-term monitoring of the human health impacts, food consumption and exposure to methylmercury throughout the active mine life and during post-closure.	Based on a series of discussions focused on chemicals of concern, including a workshop discussion devoted to mercury, additional information and evaluation have been included in the EIS to better communicate these potential effects on public health. This information includes additional evaluation requested of Donlin Gold, including an expanded human health risk assessment and a Focused Risk Assessment (AECOM). Discussion of this additional

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	There are concerns with the potential bioaccumulation of methylmercury in the food chain, particularly in regards to traditional subsistence foods. Methylmercury is more readily retained by higher trophic-level organisms than other forms of mercury.	information can be found in Section 3.22, Human Health. Potential long-term monitoring included in Tables 5.7-1A and 5.7-1B, Monitoring and Adaptive Management being Considered by the Corps.
PHL 19	Commenters expressed concerns regarding baseline data.	Comment acknowledged. The most current baseline data were used in the analysis. Some information was added to Section 3.22, Human Health, as appropriate to address specific concerns.
PHL 20	The Corps should ensure data on mental health in the EIS are accurate.	Comment acknowledged. The HIA includes requested information. The correct reference for mental health data has been verified.
PHL 21	Concerns regarding the impact determinations and rating applied to the analysis.	The impacts on health have been re-evaluated and adjusted or clarified, where appropriate.

2.38 RECREATION

Impacts on recreation and tourism, recreational hunting and recreation patterns, usage near mine, along river systems and in pipeline corridor during construction and operation. Disruption of recreational experiences of Iditarod trail.

Category Code	Statement of Concern	Response
REC 1	Concern was expressed on the negative noise and visual impacts that the proposed project could have on the existing recreation setting along the pipeline ROW, including of the Farewell area. The loss of scenic value would affect both local residents and people who come to the area from around the world to hunt and recreate.	Concerns for the impacts to users along the INHT and in the Farewell area were taken into account in the EIS, in Section 3.16.3.2.5.
REC 2	The Corps should include information about the decline in Chinook salmon runs on the Yukon and Kuskokwim rivers, including recent commercial fishing statistics, a discussion on trends over time, and an assessment of the impact to the local economy. Some of this information is included in the Fisheries or Subsistence sections, and should be referenced or discussed in the Recreation Section as well.	Information about the Chinook salmon decline and resulting restrictions on commercial and subsistence fishing are provided in others sections including Section 3.13 Fisheries, 3.18 Socioeconomics and 3.21 Subsistence. As requested, references to those sections have been added to the Recreation Section.
REC 3	Concern was expressed about displacement of recreation activities due to barge traffic which could impact the quality of life of local residents, using Chuathbaluk as an example. • Many local residents use the Kuskokwim River for recreation activities, such as camping, fishing, swimming, berry picking, or boating on the river.	Text added in the Affected Environment Section 3.16.2.2.2 to include activities provided by comments. Overall recreational use of the Kuskokwim River remains low, and minimal displacement is anticipated.
REC 4	The Corps should revisit analysis of impacts to recreation at the mine site and along the pipeline ROW.	Edits were made to the text to clarify impacts to recreation near the mine site. The EIS analysis for pipeline impacts considered the entire pipeline, and used milepost 150-180 as an example.

Category Code	Statement of Concern	Response
REC 5	The Corps should revise conclusions to recognize that designation of a Section 17(b) easement should not be the sole criterion as an important resource; actual use needs to be considered.	The analysis in the EIS as it relates to Section 17(b) easements is a reflection of the land status, not the use, and refers to the fact that the easement is officially designated. Level of use was indicated by the rating for "magnitude or intensity," and was considered "low" for the mine site area.
REC 6	The Corps should include analysis on the likely increases in use of the pipeline ROW and temporary access roads. • The Draft EIS failed to analyze likely impacts of permanent recreational and transportation use of those new and claimed R.S. 2477 rights-of-way. The improvements and construction of maintenance roads on those claimed, but un-adjudicated R.S. 2477 routes will likely lead to increased use and degradation of primitive parts of Alaska. The Corps should consider those effects, and the cumulative impacts of increased use of the R.S. 2477 routes and pipeline in a supplemental Draft EIS. Increased use of those trails could lead to human-caused wildfires, made worse by climate change and the drying of interior forests.	Concerns for the potential for additional recreationists on the pipeline ROW and temporary construction access routes were taken into account in the EIS. Impacts are described in Section 3.16.3.2.5. Edits were made to Section 3.16.3.2.3 as appropriate to address the potential for additional use on R.S. 2477 easements. When the pipeline is decommissioned at the end of the project, the ROW would no longer be brushed, so over time ATV travelers would have to contend with regrown vegetation, except where frequent travel is sufficient to impede regrowth.
REC 7	The Corps should include further information on how prohibition of recreation activities would occur near the mine site.	Security around the mine property would be the responsibility of Donlin Gold and the landowner. Section 3.16, Recreation, discusses measures by TKC to restrict use, and restrictions on Donlin Gold employees regarding hunting, fishing, and other recreational uses.
REC 8	The Corps should provide clarification on recreational hunting rights on TKC lands during the mine life.	Statement added in the EIS that notes administration of hunting rights would be maintained during Construction and Operations phases.

Category Code	Statement of Concern	Response
REC 9	The Corps should include additional information and clarification on the nature and quantity of big game hunting in the vicinity of the proposed natural gas pipeline in relation to pipeline construction seasons.	Clarifying text added that notes when the majority of big game hunting open seasons occur in relation to pipeline construction.

2.39 SOCIOECONOMIC IMPACTS

Comments on economic impacts to local communities, and regional economy can include changes in the social or economic environments. Influx of construction and operations workers, employment, jobs, housing. Potential for out migration from communities. Boom and bust cycle.

Category Code	Statement of Concern	Response
SER 1	The Corps should include further discussion of the potential negative socioeconomic impacts of Alternative 1, No Action.	The Corps recognizes that baseline social and economic conditions in the project area are difficult, as described in Section 3.18.1, with low incomes, high rates of unemployment, and lower rates of educational achievement. In addition, as noted in the comments, these trends are likely to accelerate with declining federal funding and the large State of Alaska budget deficit. Section 3.18.2.2 concluded that the proposed Donlin Gold project would improve the employment and income conditions. For greater clarity, the discussion of impacts under the No Action Alternative (Section 3.18.2.1.1) has been revised to more clearly project the continuation of existing downward trends in baseline conditions, and to acknowledge the lack of potential project employment and income benefit opportunities. As a matter of logic, these potential future benefits are not characterized as creating adverse impacts in the No Action Alternative, since the starting point for analysis is the baseline conditions, not the conditions under project implementation.
SER 2	There should be acknowledgement of specific positive economic benefits for shareholders and residents in the region, including the provisions for revenue sharing under ANCSA 7(i) and 7(j).	Sections 3.18.1 and 3.18.2.2 estimates the direct and indirect levels of employment, income, sales, payments to ANCSA Corporations, and tax revenues if the project proceeds. The language has been reviewed and revised to ensure that the full range of socioeconomic effects is clearly described. For the cumulative case, this includes economic diversification

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		and sharp declines in state spending and declining oil revenues.
SER 3	Concern was expressed that the project would constitute a "marginal, short-term economic benefit," and that the "long-term economic negatives and risks of the project are downplayed," including concerns about sourcing of supplies and materials from outside of Alaska, and lost revenues to other economic sectors such as tourism.	Section 3.18 is focused on changes in employment and income and population associated with the proposed project and used the best available information to estimate likely local hire rates and purchases from Alaska. By the measures outlined in this section, the impacts are generally positive. Other risks and potential adverse impacts affecting people in the region are reviewed in other resource sections, including air quality, water quality, fish and aquatic resources, subsistence and human health as examples.
SER 4	There should be acknowledgement of positive economic benefits for the State of Alaska.	Section 3.18.2.2 describes employment of Alaskans, and purchases from Alaska suppliers and Alaska tax revenues. The text has been reviewed and modified to make these points clearly, and to address the potential for new employment to reduce State spending.
SER 5	There should be acknowledgement of specific positive impacts of jobs provided by the proposed project in a region with low levels of employment and high costs of living.	Section 3.18.2.2 includes estimates of employment and income. Section 3.18.1 describes baseline conditions. Additional discussion has been added regarding the context of declining state spending. On-going conservation restrictions resulting in declining commercial fishing revenues are discussed in Section 3.18.1.1.4.
SER 6	It should be acknowledged that the Donlin Gold mine project would provide or enhance education opportunities, including scholarship support for village residents and youth.	Additional discussion has been added to address the potential for increased scholarship support and improved educational outcomes associated with stable employment opportunities.
SER 7	Using the Red Dog Mine as an example, many of the local people who secured long-term employment at that mine	The Corps acknowledges the importance of the lessons from the Red Dog Mine regarding stability and out-migration of

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	moved out of the NANA region villages to live in Kotzebue and other parts of the state, taking their income with them. The Draft EIS should have addressed the likelihood that a similar scenario will occur in the Kuskokwim region, with workers hired by Donlin Gold moving away from the region. The relocation of the families of the mine workers has caused a drain of human resources in small villages in the region and that drain is expected to increase as the workforce of the mine increases. There were no tables or statistics concerning this issue.	employees at a large mining project. This topic is discussed in Section 3.18.2.2 Socioeconomics, including comparisons with the Red Dog Mine experience where 50% of NANA shareholders employed at the Red Dog Mine relocated to homes outside of the Northwest Arctic Borough. In addition, outmigration is discussed in Section 3.21 as an important potential sociocultural impact on subsistence. In this section, based on differences with the NANA Region, a revised estimate is made that 30% - 50% of the local hire workforce would relocate outside of the region.
SER 8	It should be acknowledged that jobs created by the proposed project would help solve outmigration problems.	Additional language on this point has been added to Section 3.18.2.2.1, and the discussion of mine employees residential stability and out-migration as it affects subsistence, has been updated in Section 3.21.
SER 9	Concern was expressed that wages paid for jobs generated by the proposed project should be fair.	Using the Red Dog Mine as an example, additional language on wage rates has been added to Section 3.18.2.2.1 to supplement existing discussion on estimated aggregate payroll during the construction, operations and maintenance phases.
SER 10	It should be acknowledged that providing employment opportunities has a positive social effect on communities, by helping the region achieve self-sufficiency and fulfill the much broader goal of self-determination.	Additional language has been added to acknowledge comments asserting that the project would increase opportunities, hope, and pride, and suggesting that increased employment would reduce safety net spending. Section 3.21 Subsistence describes the views of local leaders that increased incomes will improve subsistence production means for pursuing subsistence and the traditional way of life and may affect out-migration. Section 3.22.4.2 Human Health examines household incomes, employment, and education attainment as social determinants of health and

Category Code	Statement of Concern	Response
		concluded that the project would result in health benefits in this area.
SER 11	It should be acknowledged that stable jobs contribute to supporting a subsistence lifestyle as well as preservation of traditional culture and ways of life.	Acknowledgement of this point in the Section 3.18.2.2.1 Socioeconomics has been added. In addition, there is a substantive literature review and analysis on this point in Section 3.21.6.2 Subsistence. Additional discussion was added regarding sharing practices, in which employees support subsistence activities and provide food for many others.
SER 12	It should be acknowledged that there are many positive potential indirect business opportunities related to logistics, transportation, training, education, and health care associated with the proposed project.	Section 3.18.2.2.1 includes subsections entitled Indirect Effects that discuss these opportunities. Text modified to include input from comments regarding the importance of employees with paid health insurance on revenues at Indian Health Service facilities.
SER 13	It should be acknowledged that the job skill training provided by the proposed project will have long-term positive impacts on the regional workforce. Clarification on Donlin Gold's role in providing training, or what kind of opportunities would exist, should be provided.	Section 3.18.2.2.1 includes discussion of types of jobs involved with the proposed project. Additional information on workforce development, including Donlin Gold's role, has been added. A suggested measure has been added to tables in Section 5.5, for a partnership with the flight school in Bethel.
SER 14	There should be acknowledgement that formation of a borough in the region is possible if the proposed project continues, along with further discussion of the implications of borough formation.	Updated information on borough formation has been incorporated.
SER 15	The priority given to local hire should be noted as being positive and important. It should be noted that Donlin Gold has given priority for hire to the shareholders of TKC and Calista so that revenue will stay in the community.	Section 3.18.2.1.1 and Section 3.18.2.2.1 include discussion of local hire experience at the Donlin Gold camp during the exploration and field studies period and estimates for the Operations phase.

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SER 16	There should be clarity and assurances included in describing hiring policies to help ensure that Donlin Gold hires local workers.	Section 3.18.2.2 discusses the training and commitment to local hiring undertakings by Donlin Gold.
SER 17	The EIS should more fully analyze the impact of an influx of workers and residents to small communities and Bethel.	The Corps acknowledges that the topic is important. Discussion of potential for non-local mine employees to relocate to small communities is discussed in Section 3.18.2.2. After careful analysis, the Corps concluded that the likelihood of non-local workers relocating to the small communities would be low, but that migration to hub communities like Anchorage and Bethel would be likely. See discussion in Section 3.21.6.3.
SER 18	It should be acknowledged that proposed infrastructure (such as power generation, water treatment, and access roads) would benefit communities in the region.	Estimating long-term benefits of the Donlin Gold Project infrastructure is complex, as many facilities are dedicated to the project, and are slated to be demobilized at closure. The natural gas pipeline has potential to supply energy to the region during and after the mine operations phase, but an independent party must come forward to operate this line for use in the region (see Section 3.18.2.2.3). Some transportation improvements, including the Bethel Yard Dock and Farewell Airstrip will continue to serve the region after the operations phase independent of involvement in the Donlin Gold Project. Note that any actions that would occur at the Port of Bethel at the Bethel Yard Dock are not part of the proposed action, and are considered connected actions pursuant to NEPA (40 CFR 1508.25). At this time, it is not known that connected actions would occur. However, connected actions are analyzed for some resources in or near the Bethel Yard Dock in the context of resource impacts in Chapter 3, Affected

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		Environment and Environmental Consequences. See Chapter 1, Section 1.2.1, Connected Actions.
SER 19	It should be acknowledged that participation in the proposed project would help Calista participate in a more global economy.	The Corps acknowledges that the experience of partnering on the development and operation of the Donlin Gold mine would significantly increase the business expertise of the Calista Corporation and improve its competitiveness in national and international markets. Refer to Section 3.18.2.2.1.
SER 20	Tax revenues from the proposed project to the state and local government should be acknowledged as being beneficial.	Section 3.18.2 2 describes estimated tax revenues to federal and state governments. As in the cases of Prudhoe Bay and the Red Dog Mine, a borough could capture tax revenues if one is formed in the Kuskokwim region. The discussion of borough formation in the Central Kuskokwim has been updated.
SER 21	The EIS should include a focused cumulative impact analysis addressing the costs and benefits of a community transitioning from a subsistence economy to a cash economy.	The literature on social and economic change in Alaska does not indicate a categorical transition from a subsistence economy to a cash economy. Instead the concept of a cash-based mixed economy is used, in recognition of both a level of cash dependency alongside large levels of participation and production in subsistence activities. Additional discussion of the indirect impacts of cash revenue on subsistence has been added to Section 3.18.2.2.
SER 22	The EIS should discuss the potential effect of low gold prices leading to premature closure and identify the associated socioeconomic impacts to individuals, communities and the regional economy. The Closure Social Impact Assessment should be developed with meaningful engagement from the communities, addresses premature closure, and be	Additional discussion regarding early closure of the mine has been added, including reasons that may lead to temporary or permanent closure and appropriate management measures to be implemented. The loss of years of employment associated with early closure is also discussed. The Closure Social Impact Assessment will be

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	reevaluated at five year intervals.	most meaningful late in the mine life, since the workforce characteristics (i.e., skill sets) would be well established. A plan at the beginning of operations would necessarily be fairly generic.
SER 23	The EIS should more fully consider the socioeconomic effects of mine closure, including what some comments called a boom and bust cycle.	While there would be a peak with construction and reduced but steady level of economic activity in the region during project operations, the proposed project would generate a single round of development, not a cycle of repeated starts and stops. A Closure Social Impact Assessment would plan for impacts after mine closure. Additional language added to discussion of Closure and Reclamation in Section 3.18.2.2.2 to characterize socio-economic effects, other than reduced mine project employment.
SER 24	The EIS should recognize the positive social and economic benefits that have characterized the project throughout the exploration period, with the expectation that positive benefits will continue.	Section 3.18.2.1 describes the employment income and sales during the exploration period. For completeness, language was added to describe advance lease payments to Calista during the exploration period.
SER 25	The Corps should clarify the comparison of employment mine access construction and barging under Alternative 4, Birch Tree Crossing. The first refers to just the construction period, while the second refers to the full period of mine operation.	The requested clarifications have been added as appropriate to Section 3.18.2.
SER 26	The Corps should include language clarifying that during the construction period, workers would mostly reside in temporary remote camps, though some would be in Bethel for construction and transportation activities. These workers would not be spending money on hotels, restaurants, and shops in the smaller communities.	Clarification added to Section 3.18.2.

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SER 27	The Corps should consider additional socioeconomic analysis and impact conclusions regarding infrastructure and activities in Bethel, Tyonek and Beluga, impacts to commercial fishing, and a fuller account of disposable income and spending.	Analyses reviewed and augmented as appropriate to Section 3.18.2.
SER 28	The Corps should provide more clarification, information, or data regarding socioeconomic concerns, including income and employment, schools, workforce alignment with project jobs.	Analyses reviewed and augmented as appropriate to Section 3.18.2.
SER 29	Concern was expressed about the potential negative impacts of the proposed project on existing businesses along the proposed pipeline route.	Analysis of impacts to big game animals in the ROW is found in Section 3.17 (Visual), while discussion of new access and competition is found in Section 3.12 (Wildlife) and Section 3.21 (Subsistence). Additional economic analysis of impacts to existing guiding business has been developed and is found in Section 3.18 (Socioeconomics).
SER 30	The Corps should reevaluate the proposed socioeconomic monitoring effort, to ensure that adequate data and appropriate authorities are identified.	The Corps acknowledges that monitoring of socioeconomic effects of the project may be appropriate. In the absence of a borough planning department, Donlin Gold may choose to monitor project socioeconomic effects, recognizing that the developer will have limited authority to take remedial measures. A mitigation measure was added to Table 5.7-1A and 5.7-1B Monitoring and Management being Considered by the Corps.

2.40 SUBSISTENCE

Comments related to potential impacts to subsistence resources (harvest, sharing, and traditional use areas). Comments on need to protect subsistence resources and potential impacts to these resources. Perceived contamination and/or avoidance of subsistence resources.

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SUB 1	The Corps should more fully understand that subsistence is the way of life for the residents of the Yukon-Kuskokwim (Y-K) region and those on the Bering Sea coast, and take this into account in decision making. • Increased barge traffic and activity at the proposed Bethel Port and along the Kuskokwim River will affect subsistence lifestyles. • Impacts to subsistence gathering and fishing locations: along the river where the fish spawn, where people gather berries and wild plants for the winter, and where the moose and caribou feed that migrate in the area. Many people also remarked that the water that they drink is supplied from the Kuskokwim River. Harvesting salmon, pike, whitefish, blackfish, lush, and smelt is a way of life for families and the people of Kuskokwim River. Because the mine will have significant short- and long-term impacts on not only the Chinook salmon, but other fish and subsistence resources that local communities depend on, a complete and robust analysis of these impacts is crucial. • The proposed mining activities lack assurances to protect the resources and the people of the region; the costs to their lifestyle, anticipated and unintentional,	Residents of the project area, from the west side of Cook Inlet to the Kuskokwim River Basin to the Bering Sea Coast and the lower and middle Yukon River have spoken with deep conviction about the importance of the contemporary subsistence way of life. The Corps acknowledges that the EIS should describe the importance of a great variety of subsistence foods for local economies, local families, and cultural belief systems, as elaborated in Sections 3.21.1, 3.21.2, 3.21.4, and 3.21.5. Hundreds of household interviews and tens of hours of testimony on traditional knowledge were used as the basis for this description of the contemporary subsistence way of life. The Corps believes that the impacts analysis presented in Section 3.21.6, is sound and based on thorough consideration of the overlaps between project activities/impacts and subsistence resource habitats and subsistence use areas in open water and winter seasons, including increased barge activity at the Bethel Port. Spill impacts are examined in detail in Section 3.24, and mitigation measures are described in Chapter 5. More specific comments on impacts from particular project components are addressed below.

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	are a high risk. • Residents were very concerned about the level of mercury the mine will produce.	
SUB 2	The Corps should consider residents' remarks that the proposed Donlin Gold development plans have been sensitive to the subsistence needs of the region and sensitive to subsistence lifestyles, which was a concern because of increased cost of fuel and supplies in their area. • The people in the region rely on subsistence hunting and fishing for their livelihood. If the Donlin Gold project is conducted in compliance with the rules and regulations required and with modern technology, nothing will affect subsistence activities. • Donlin Gold has a plan in place to respond to any spills that help relieve concerns for protecting our subsistence way of life. The project is also far enough away from Chuathbaluk that it will have no impact on our berry picking.	The Corps recognizes that the contemporary subsistence way of life requires a certain level of income to support the costs of equipment, gas and supplies (as discussed in Changes in Employment and Income in Section 3.21.6). As the commenters noted, some residents have concluded that the Donlin Gold project would be constructed and operated with minimal impacts on subsistence resources and harvest practices. New project-related employment and income may help residents to continue their subsistence way of life.
SUB 3	The Corps should edit the Subsistence section regarding cultural compositions of the communities to acknowledge public concern about a change in rural status and greater potential for influx of population due to project employment. • Repeatedly in public meetings held by the Federal Subsistence Board, in conjunction with changing its rural determination criteria, hub villages have specifically cited the development of mines as a threat to their rural status. Increasing the population of the region or the flow of population from outlying villages into Bethel could affect the rural status of	Based on testimony expressing concerns about changes in rural status under the Federal Subsistence Management Program due to mining developments, a new section has been added to Section 3.21.3.2.3 entitled Changes in Population and Rural Status. This section acknowledges the public concern and provides an update on regulatory changes regarding Rural Determinations.

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	Bethel under Federal Subsistence rural determinations. Population thresholds have been removed from the board's regulation as a mandatory item, but could still be considered a factor in a future proposal to change Bethel's (or any other community's) rural status. • The industrial nature of the activity could also result in a non-rural determination (i.e., Prudhoe Bay). • This analysis concludes there is less likelihood for outside workers to move to the region due to their employment. The sentence states that commuting policies would likely limit the numbers of relocating workers, not that there would not be any relocating workers.	
SUB 4	The Corps should reconsider the adequacy of available baseline subsistence use studies and methods. This includes a need for studies of greens and birds, for example, not just fish, as well as new and current information for Quinhagak. Concern was expressed about an apparent failure to analyze impacts to all affected communities, not just those described as representative, and use of anecdotal information on behavioral disturbance to moose from barging. The Corps should revisit results of 2015 studies on rainbow smelt and the implications of propeller wash impacts on this vulnerable species, and provide additional information on contaminants in subsistence foods.	As shown in Table 3.21-3 for the Central Kuskokwim villages, subsistence uses of a wide variety of resources were considered, and information for all communities was considered, not just for the representative communities, unless data were not available or communities are not year-round residences (such as for Telida, Medfra, Georgetown, Napaimute, Atmautluak and Kasigluk). In June 2016, the Division of Subsistence published Technical Paper 417, which includes a comprehensive community survey for Quinhagak, along with five other Kuskokwim river, Bering Sea, and Yukon River communities. In January 2017, the Division of Subsistence published Technical Paper 393, a comprehensive community survey for Bethel. The new results have been incorporated into the EIS. Regarding methodologies, the text was revised to refer readers to the relevant sections of the technical papers consulted for this section. Additional

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		discussion was included to confirm use of 2015 and 2016 field study data on rainbow smelt, and to clarify the analysis of propeller wash impacts to this species (based on the discussion in Section 3.13 Fish). The subsistence impact discussion was revised to fully reflect findings regarding propeller wash forces in Section 3.5 Surface Water Hydrology. Detailed analysis of contaminants in Section 3.7 Water Quality and 3.8 Air Quality has been used as the basis for assessment of health risks from consumption of subsistence foods in Section 3.22 Human Health. The analysis in Section 3.21, Subsistence, draws on animal behavior from disturbance from Section 3.12, Wildlife.
SUB 5	The Corps should provide additional comparative analysis; context is needed on the impacts of mines and roads, such as Fort Knox mine and the proposed Yukon-Kuskokwim road.	Red Dog Mine is a better basis for comparative analysis, as it occurs on Alaska Native lands in a remote, non-road-connected Northwest Arctic region. Fort Knox is a less relevant comparison as it involved land previously subjected to placer mining, distant from Alaska Native communities, and connected by a 25-mile road to Fairbanks. Red Dog Mine impacts to in-migration and out-migration were considered in analyzing risks of demographic change at the proposed Donlin Gold mine. The Yukon Kuskokwim Road was found to be speculative, as no funding is available.
SUB 6	The analysis of subsistence use areas in the Draft EIS and ANILCA 810 documents should be updated with incorporated information from village meetings. • Correct areas of berry picking, fall activity locations, salmon fishing restrictions, wood gathering, transportation, locations of fish camps, and hunting areas.	Meeting transcripts were reviewed and comments on subsistence were identified. Additional information on subsistence use areas was incorporated.

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SUB 7	The analysis should clearly state that Calista and The Kuskokwim Corporation would continue to determine the extent of access for subsistence or any other uses. As such, the subsistence analysis conclusion that subsistence users from Crooked Creek may reestablish their use of the area should explicitly note that access to the site will depend on Calista and TKC future land use decisions.	Text revised to provide additional context. As private ANCSA corporation lands, the Donlin Gold Mine Site could be closed to use by others, particularly for safety during operation of the mine. The ANCSA corporations will manage access following closure.
SUB 8	The Corps should reanalyze the potential impacts of increased access and competition to subsistence users and subsistence resources in the proposed pipeline ROW. • New airstrips, proposed trails, and roads will increase access and competition, particularly at Farewell. • Existing baseline conditions at Farewell Airstrip should note that the facility would remain open regardless of the proposed project, and the current level of competition from hunters flying into Farewell Airstrip is of great concern to local communities. • The impacts of other pipeline construction projects on large mammal populations should be reviewed and cited. Specific animal and bird populations with areas of aggregation (e.g., nesting or grazing areas) affected by the pipeline should be identified and impacts on their populations discussed. • There was sentiment expressed that the pipeline ROW will not impact subsistence.	The Corps has considered the comments regarding pipeline corridor impacts, and acknowledges that additional discussion of the baseline conditions in usage and resulting competition in the vicinity of the Farewell Airstrip is warranted. The Corps has determined that larger estimated levels of surface access and competition along the pipeline corridor would be inaccurate since the Farewell airstrip already provides open access and currently receives regular use. Due to the remoteness, high cost of access at these distances from large population centers, and low population of the area, the project-related increases in the vicinity of Farewell would likely be minimal. Additional data from ADFG harvests tickets indicated that the majority of the subsistence activity by McGrath and Nikolai residents was concentrated on the Kuskokwim River, and the North Fork and South Fork of the Kuskokwim River (Unit 19C), rather than the northern foothills of the Alaska Range where the Pipeline ROW is found (Unit 19D) However, subsistence area maps for these communities do document use for some harvest activities along the Pipeline ROW, and local testimony identified this as a concern. As a

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		result, the EIS estimated low levels of increased competition along the Pipeline ROW. The more detailed biological analyses of impacts from the Pipeline to wildlife and birds are found in Section 3.12 and to fish are found in Section 3.13. Section 3.21 includes quotations with the conclusions from those sections. More information is now found in Section 3.21.6.3.3 on the screening of subsistence use area maps to identify which community use areas overall with the Pipeline ROW.
SUB 9	Appreciation was expressed for the pipeline construction season being scheduled to limit impacts to sport and subsistence hunting. It was also stated that the pipeline corridor would not result in increased access and competition or adverse impacts to land owners or subsistence resources.	Comment acknowledged.
SUB 10	The Corps should update the analysis of Alternative 4, as it was stated that impacts are underestimated in terms of subsistence, particularly regarding moose hunting, bird hunting, trapping and fishing.	Subsistence use areas for communities in the vicinity of the Birch Tree Crossing mine access road were reviewed, including Lower Kalskag, Upper Kalskag, Aniak, Chuathbaluk, Napaimute, and Crooked Creek. See revised analysis, with new maps of the overlap between subsistence use areas and the Birch Tree Crossing mine access road.
SUB 11	The Corps should reexamine the economic and demographic analysis of in-migration and out-migration and resulting impacts to subsistence should development occur. Clarify if in-migration to the Lower Kuskokwim Subregion would necessarily lead to increased subsistence harvests, and quantify this influx. Clarify whether Donlin Gold would limit the number of project employees moving to the Kuskokwim	The comments were considered; however, the EIS analysis of likely levels of in-migration and out-migration are sound, based on likely hiring practices, the industrial enclave model and subsidized commuting to the work place. In the Lower Kuskokwim Subregion, project-related employment would largely focus on the summer barge season. This is unlikely to bring a large number of out-of-region residents to establish new households in Bethel. It is highly unlikely that Donlin

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	River villages.	Gold would intervene to compel the housing choices of employees when they are off-shift.
SUB 12	The Corps should address deficiencies in the analytic methods for the conclusions about subsistence impacts. Overarching summary impacts for each project component should be removed. Analysis errs by overemphasizing beneficial effects while minimizing adverse effects. The Draft EIS should discuss how the mine access road would increase competition for scarce subsistence resources in post-closure.	The Corps acknowledges that summary impact conclusions fail to provide the necessary specificity. These have been removed from the analytic method for the EIS, and rationale statement for conclusions have been revised, and emphasize quantitative terms where possible. The Corps believes that the impacts analysis presented in Section 3.21.6, is sound and based on thorough consideration of the overlaps between project activities / impacts and subsistence resource habitats and subsistence use areas. Section 3.21.6.3.2 has been edited to include subsistence use on the mine access road after the mine closes.
SUB 13	The analysis in Section 3.21 Subsistence should more fully integrate conclusions from the physical and biological environmental analyses, particularly in regard to salmon population dynamics, fugitive dust, and dispersal of mercury and other air-borne contaminants affecting water quality, vegetation, and fish and aquatic resources.	The comments have been considered and the Corps concluded that the underlying physical and biological analyses are sound, and reasonable conclusions were drawn for consideration in the subsistence impact analysis. Where appropriate the text has been revised to more explicitly describe the linkage of the biological analyses to the conclusions regarding impacts to subsistence resources and uses.
SUB 14	The Corps should provide clarification that considers how the perception of contamination is addressed in context.	The analysis examines risks of actual and perceived contamination of waterfowl and likely effects on subsistence harvests. Mitigation measures through risk communication are proposed. Perceptions of contamination have been demonstrated to result in changes to subsistence harvest practices, notably in the case of the Exxon Valdez Oil Spill. This impact is properly disclosed in the EIS.

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SUB 15	The Corps should more fully explain the risks and consequences of contamination of subsistence food resources from heavy metals and other hazardous materials due to flooding and spills. The Corps should address how a disaster at the mine could cause catastrophic damage to the ecosystem and headwaters of the Kuskokwim River and would impact the subsistence way of life for the people of the Yukon-Kuskokwim.	The Corps has considered comments calling for revised spill scenarios in Section 3.24-Spill Risk, to include larger spill quantities, and has concluded that the scenarios presented are representative of reasonably foreseeable, that is not worst case, spill risks. For example, the TSF spill analyses were based on the initial failure modes effects assessment. The bases for each of the spill scenarios assessed are presented in Section 3.24-Spill Risk. The conclusions have been revised to eliminate summary labels (i.e., minor, moderate, major), and as appropriate the rationale statements for conclusions have been improved.
SUB 16	The Corps should more carefully analyze the effects of project transportation activities, including interference from barges with subsistence users' travel, effects of barge traffic disturbance to subsistence resources (including fish and moose) interference from the expanded Bethel Yard dock, and dredging.	The Corps has confirmed that the underlying analysis of propeller-generated wave forces from barging was sound. The analysis of wave impacts in Section 3.13 Fish and Aquatic Resources was revisited, and resulted in the same conclusions regarding subsistence fish resources in Section 3.21. Additional language regarding interference with subsistence user travel has been added. Barge noise impacts to moose along the river corridor was analyzed in the context of available literature on noise impacts to terrestrial mammals in Section 3.12-Wildlife. Additional analysis of hydrology and fishery effects from the Bethel Yard Dock Expansion has been included. Note that any actions that would occur at the Port of Bethel at the Bethel Yard Dock are not part of the proposed action, and are considered connected actions pursuant to NEPA (40 CFR 1508.25). At this time, it is not known that connected actions would occur. However, connected actions are analyzed for some resources in or near the Bethel Yard Dock in the context of resource impacts in Chapter 3, Affected Environment and

Category Code	Statement of Concern	Response
		Environmental Consequences. See Chapter 1, Section 1.2.1, Connected Actions.
SUB 17	The Corps should reconsider conclusions on impacts from contamination to subsistence resources during operations, including findings of the Ecological Risk Assessment (ERA, Appendix S) for waterfowl.	The Corps considered the comments and confirmed the validity of the conclusions. Summary labels are removed from conclusions, and additional specific language regarding the rationale for conclusions has been added. Characterization of the ERA findings regarding waterfowl have been revised in accordance with how the ERA is reported in Section 3.12-Wildlife.
SUB 18	The effects of new employment and income on subsistence activities should be more fully analyzed, clarifying the basis for estimates. • With appropriate flexibility, jobs and employment may be beneficial and contribute in a positive way to the subsistence lifestyle and practices by providing funds for traditional subsistence activities. While it is understood that the mine could cause some to leave the region, it is equally possible that the Project would cause many young men and male heads of mature households to remain when they would otherwise leave to look for work.	The Corps acknowledges that incomes and flexible employment would contribute to stability and success in subsistence activities. Minor clarifications in language were made in response to comments.
SUB 19	The Corps should include clarifying edits regarding subsistence concerns.	Comments identifying editorial clarifications or corrections were reviewed and adopted as appropriate.
SUB 20	The Corps should address the interaction of limited subsistence fishing windows with impacts from project barging activities. The EIS should include a commitment by the project proponent to work actively and engage the local communities on opportunities to improve access to	The Corps acknowledges that subsistence Chinook salmon fishing windows in early summer would interact with barge traffic and interfere with these subsistence practices. Additional analysis is provided in the EIS. Mitigation measures suggesting the DATROC be involved in facilitating

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	subsistence resources during the active life of the mine. For example, a local subsistence board could serve to advise the project proponent of potential conflicts with access to subsistence uses and recommend improvements to mine operations that would avoid and minimize subsistence conflicts.	consultation on subsistence issues are included in Chapter 5 and the response to MIT 35 in this CAR.
SUB 21	The Corps should review the BLM Section 810 Analysis conclusions and provide explicit clarification of the existing discrepancies. The Final EIS should acknowledge the apparent discrepancies and explain how the Corps and BLM can reach seemingly inconsistent conclusions. If a Final EIS fails to disclose and respond to expert opinions contradicting its conclusions, it may be held invalid. Additional analysis is needed for overlaps of project powerlines and bald and golden eagle areas, overlaps of the sheefish spawning areas and the pipeline corridor, and potential overlaps of McGrath, Nikolai, and Takotna non-salmon fishing areas with the pipeline corridor. While the ANILCA Section 810 impact thresholds are different than those under NEPA, determinations regarding the extent of impacts on subsistence resources in the EIS should be made consistent with the BLM 810 Analysis. The BLM noted they will continue to work with the Corps and its contractor to address this issue.	The Corps has reviewed the discrepancies between the BLM Section 810 Analysis and the EIS analysis. To address two discrepancies, additional analysis has been conducted regarding overlaps between the BTC mine access road and Aniak and Chuathbaluk subsistence use areas, and regarding use areas for McGrath, Nikolai, Takotna. Additional discussion of the Corps' rationale for the EIS conclusions has been inserted into Section 3.21.
SUB 22	Based upon the Section 810 Analysis, which concludes there could be substantial impacts to subsistence, the Corps should select the No Action alternative and consider additional mitigation measures.	Comment acknowledged. However, if the No Action Alternative were selected then no permit would be issued and there would be no mitigation measures at all.
SUB 23	The Corps should assess the sources of information and basis	Based on analyses of the discrepancies between the EIS and

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	for conclusions in the EIS analysis of subsistence impacts, compared to that in the Section 810 Analysis. The 810 Analysis overstates the proposed projects impacts on subsistence and the Draft EIS completed by the Corps better reflects the potential impacts of the project.	the Draft Section 810 analysis, the Corps concluded that the EIS conclusions regarding subsistence impacts at the mine site, the transportation corridor, and the pipeline corridor were appropriate, taking into account a careful analysis of temporal and spatial overlaps between project activities and habitats, subsistence resources, and subsistence use practices.
SUB 24	The Corps should revise the estimate of impacts at the mine site, as the current conclusions understate the likely impacts during operations and after closure.	The Corps believes that the EIS conclusions regarding subsistence impacts at the mine site were appropriate, taking into account a careful analysis of temporal and spatial overlaps between project activities and habitats, subsistence resources, and subsistence use practices. Summary impact conclusions have been removed.

2.41 TRADITIONAL CULTURE AND WAY OF LIFE

Comments related to potential cultural impacts (and values) or desire to maintain traditional practices, languages, or traditional land use areas (cultural continuity).

Category Code	Statement of Concern	Response
TWL 1	Concern was expressed about impacts of the proposed project resulting in permanent changes to Kuskokwim River's Yup'ik people's cultural survival, ecosystem, subsistence resources and health.	The Corps recognizes the central importance of contemporary subsistence practices for the identity and traditional way of life in the project area. This includes dimensions of healthy habitats and uncontaminated fish and wildlife resources, as well as continuing access to subsistence harvest areas.
TWL 2	Concern was expressed that the impacts of the proposed pipeline and corridor were not adequately studied, and would have negative impacts.	See also SUB 8 with this response: The Corps has considered the comments regarding pipeline corridor impacts, and acknowledges that additional discussion of the baseline conditions in usage and resulting competition in the vicinity of the Farewell Airstrip is warranted. The Corps has determined that larger estimated levels of surface access and competition along the pipeline corridor would be inaccurate.
TWL 3	Concerns were expressed about changes to traditional culture as a result of the mine activities and its potential economic changes.	See also concerns about the effect of project-related economic impacts in SUB 11 with this response: The comments were considered, however, the EIS analysis of likely levels of in-migration and out-migration are sound, based on likely hiring practices, the industrial enclave model and subsidized commuting to the work place. In the Lower Kuskokwim Subregion, project-related employment would largely focus on the summer barge season. This is unlikely to bring a large number of out-of-region residents to establish new households in Bethel. It is highly unlikely that Donlin Gold would intervene to compel the housing choices of employees

Category Code	Statement of Concern	Response
		when they are off-shift.
TWL 4	It should be recognized that the development of the project could provide economic opportunities and jobs for shareholders and residents of the region, and that as a result subsistence opportunities would be maintained and Alaska Native cultures would ultimately be preserved. • These types of opportunities will allow the young people to stay in their homelands and preserve their cultural integrity. • It was noted that this project does not pit development against a traditional way of life. • It was observed that this type of mining promises jobs and economic windfalls for their region, but with the caveat of possible pollution and changes to local culture and its associated subsistence lifestyle.	See discussion of income needed to sustain subsistence way of life in Section 3.21.6.1.3, and analysis of project employment and income on subsistence practices in Section 3.21.6.3.1. See also SUB 18, where this response is found: The Corps acknowledges that incomes and flexible employment would contribute to stability and success in subsistence activities. Minor clarifications in language made in response to comments.
TWL 5	The Corps should add clarifying edits regarding traditional culture and way of life.	No edits made, as the two measures cited in the comments as being the same are in fact distinct.

2.42 TRANSPORTATION

Impacts to transportation systems: airports, roads, and rivers as a result of the project. Impacts to existing barge traffic.

Category Code	Statement of Concern	Response
TRAN 1	Concerns were expressed that the increased number of barges will be very disruptive to residents' way of life. • The river is already busy with travelers and the increased amount of barge traffic would interfere with existing traffic, particularly when the river is shallow. • Subsistence fishermen would have to accommodate the barges by pulling in their nets and waiting until the barges pass. • Boaters would have to prepare for and accommodate the very large wakes, and it would be difficult for boaters to travel behind the barges or to pass the flotillas. • Those who use the river cannot count on the barges to go by exactly every eight hours.	The increase of barge traffic, over existing traffic, was determined to noticeably affect existing traffic, but would not acutely displace or preclude existing transportation activities. While this would be a large increase in barge traffic relative to baseline river traffic estimates, the additional barge traffic under Alternative 2 would be distributed along 199 river miles and interact on a limited basis with existing small boat use on the river. For that reason, there would be a noticeable increase in barge traffic attributed to the project. • Section 3.21 (Subsistence) identified impacts from barge wakes in narrow reaches of the river, with some fishing delayed or displaced to other places on the river. • There is a potential for increased safety risk to small boats from barge wakes. This risk has been taken into account when considering the impact ratings. • As part of the proposed project, Donlin Gold would create a communication program to keep local communities informed of the schedules and current status of barge traffic as well as to minimize displacement by barges of subsistence fishing and associated boat travel.
TRAN 2	The Draft EIS was thought to inadequately analyze the direct	Refer to Section 3.5.3.2.2 (Surface Water Hydrology, Bethel

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	effects the proposed Bethel port will have in Bethel and there are inconsistent references in the document. • Bethel is the center of the region. During barging season Bethel is the commercial and transportation hub for nearly all of the villages of the Yukon-Kuskokwim region. • Such reinforcement of the bank will divert stream channel energy away from the newly constructed section downstream to unprotected banks possibly causing an unknown amount of unnatural erosion that could possibly have significant repercussions with villages like Oscarville, especially considering cumulative effects from further upriver related to already reinforced sections. • The Draft EIS needs to include in the Cumulative Effects section a full description of the proposed Bethel Port Facility as a connected action with detailed analysis of how this facility will impact water current and erosion patterns, the risk to communities, and disruption to subsistence fishing activities. • The Corps should analyze the port facilities in the same way it analyzed other project components. • Additional environmental analyses on the proposed Bethel facilities that fully account for all of the facilities effects is needed, such as how barges will be maneuvered through the city, how river traffic will be managed, and how these planned operations and altered river flow affect subsistence, recreation, the	Cargo Terminal and Fuel Terminal / Tank Farm) and Section 3.21.6.2.3 (Subsistence, Bethel Port Site) for additional analysis regarding Kuskokwim River hydrology and potential displacement of subsistence fishing below Bethel. Effects of the Bethel Yard Dock on local transportation and how they are analyzed is discussed in Section 3.23.2.2.2 (Transportation, Port of Bethel). Note that any actions that would occur at the Port of Bethel at the Bethel Yard Dock are not part of the proposed action, and are considered connected actions pursuant to NEPA (40 CFR 1508.25). At this time, it is not known that connected actions would occur. However, connected actions are analyzed for some resources in or near the Bethel Yard Dock in the context of resource impacts in Chapter 3, Affected Environment and Environmental Consequences. See Chapter 1, Section 1.2.1, Connected Actions.

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	cost of goods, and the villages' access to their own barged supplies.	
TRAN 3	The air transportation discussion should include information on greenhouse gases.	GHG emissions as a result of the project are described in Section 3.8-Air Quality.
TRAN 4	The cumulative effects spatial analysis area (Figure 4.2-1) should be expanded to include the ocean vessel traffic route and potential direct, indirect, and cumulative impacts from the lower 48 United States (Seattle, WA) and Canada (Vancouver, BC) to / through Dutch Harbor and Bethel, as mentioned in Table 4.2-1. Since pipeline supplies would be brought in through Port MacKenzie and / or the Anchorage Port in upper Cook Inlet, the direct, indirect, and cumulative impacts associated with these facilities and activities should be evaluated in the EIS. The analysis area should also include the transportation of the gold ore bars for final refinement, which is a reasonably foreseeable future action.	The Corps has considered the spatial area for analysis of the direct, indirect, and cumulative effects of the proposed Donlin Gold Project. Project-related vessel traffic in the Pacific Ocean and Cook Inlet are described. However, these are a small level of overall traffic, and therefore not sufficient to trigger a full effects analysis in the Pacific Ocean or Cook Inlet. Increases in project-related air-transportation are also noted, and evaluated for impacts, such as contributions to greenhouse gases. Air transport of gold doré bars from the mine site to a refinery site is described in the EIS, but it is out of scope of this EIS to analyze airports and refinery sites outside of the project area. One of CEQ principles for cumulative impact analysis states: "It is not practical to analyze the cumulative effects of an action on the universe; the list of environmental effects must focus on those that are truly meaningful." Extending the cumulative analysis area to the "lower 48" and Canada would not provide a meaningful analysis.
TRAN 5	The EIS should acknowledge and clarify existing barge and boat traffic, and clarify the effects of barge traffic. • When considering the transportation facilities under the No Action alternative, ocean-going barge traffic	Clarifying edits were made to Section 3.23, Transportation. • Text for the analysis of the No Action Alternative has been revised in the transportation section, as well as other applicable resource sections.

Category Code	Statement of Concern	Response
	would continue into Bethel and river barge traffic between Bethel and points upriver also would continue. A clear statement of this reality in Chapter 2 would provide the basis for Chapter 3 to analyze the effects of the ongoing and ubiquitous waterborne traffic on erosion. • Describe how the transportation plan accounts for the difficulty in navigating the Kuskokwim Bay and Kuskokwim River. • A spill response plan should be developed to include environmentally sensitive areas in and near Kuskokwim River and Kuskokwim Bay. • Add more detail to the baseline information and justify impact ratings. • Clarify that the current use of 68 barges annually is the number leaving Bethel—that number is smaller for communities further up the river. • Minor text edits and typographical errors should be corrected.	• See Section 2.3.2.2.1 for details on how a barge-loading plan for each trip would be based on monitored river conditions and a forecast of the minimum available draft on the river for the duration of the trip between Bethel and Angyaruaq (Jungjuk) Port. Reference added to Transportation section. • Donlin Gold currently has spill response plans that would be revised in the post-EIS permitting phase. These would address comments calling for additional consideration of environmentally sensitive areas in and near the Kuskokwim River and Kuskokwim Bay. • Detail added to impact ratings table for Alternatives 3A and 3B. Detail added to Section 3.23.2.2.3 to justify the estimate of low rates of ORV use on the pipeline ROW. • Context added for barge congestion in Bethel. Text edited to clarify increase of project related traffic to baseline. No impacts are expected from an increase in cruise traffic to marine barge traffic. Note that any actions that would occur at the Port of Bethel at the Bethel Yard Dock are not part of the proposed action, and are considered connected actions pursuant to NEPA (40 CFR 1508.25). At this time, it is not known that connected actions would occur. However, connected actions are analyzed for some resources in or near the Bethel Yard Dock in the context of resource impacts in Chapter 3, Affected Environment

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		and Environmental Consequences. See Chapter 1, Section 1.2.1, Connected Actions. • Text added to Section 3.23.2.2.2 to clarify that although the actual baseline would be lower in communities further upriver, a baseline of 68 was used for the analysis. • Text edits made as suggested.
TRAN 6	Concern was expressed that the inclusion of Dutch Harbor, Alaska, in the impact assessment in relation to fuel barging was unnecessary and speculative. It was stated that whether or not a third party may require additional diesel storage simply extends the area of project influence beyond that required by the National Environmental Policy Act (NEPA).	Donlin Gold is not proposing to construct additional diesel storage at Dutch Harbor (Section 2.3.2.2.2). However, because the potential exists for future expansion, the EIS examined impacts from this as a connected action.

2.43 VISUAL RESOURCES

Impacts to visual resources from mine, along river systems and in pipeline corridor from project components and phases.

Category Code	Statement of Concern	Response
VIS 1	Concern was expressed that the negative impacts to the visual quality of the area would be far reaching and permanent, affecting more than just the surface disturbance at the mine site, at the barge landings, access roads, pipeline and corridor, Bethel barge landing, Dutch Harbor barge infrastructure, and airstrips.	The analysis focuses on the direct impacts of project components to visual quality, with discussion provided on the geographic extent of impacts based on viewshed models. To address potential far-reaching impact, the analysis also discloses expected indirect impacts. For instance, the level of barge traffic will be higher than what residents are accustomed to; the analysis addresses this change. Visual impacts are described in Section 3.17-Visual Resources.
VIS 2	Concern was expressed that simulation photos of how the area will look after construction could not be relied upon given the unknown conditions that may be discovered during construction. Impacts from historic activities were said to be visible throughout the region of Cook Inlet and the Rainy Pass traverse.	The simulations prepared demonstrate the anticipated appearance of project components under long-term, operational conditions. No simulations were prepared to demonstrate short-term, construction-related impacts.
VIS 3	The Corps should revise impact level conclusions, as conclusions were thought to be inaccurate or not supported by analysis for visual resources.	The text was clarified to indicate that scenic quality on non-BLM lands was ranked as part of the scenic quality inventory prepared for the INHT Comprehensive Plan. The intent of breaking down the impacts discussion to address specific phases of construction was to better understand the impact mechanisms of each phase. No changes to document were made. Visual impacts from the pipeline have been revised. Overall summary impact conclusions have been removed.
VIS 4	The Corps should clarify BLM's VRM class designations in the Affected Environment, and clarify meaning in the	The VRM Class III designation descriptions are located in to Section 3.17.1 and are applicable only to BLM-administered

Category Code	Statement of Concern	Response
	Environmental Consequences.	lands. Text edited as appropriate.
VIS 5	The Corps should clarify whether the analysis is of the cleared ROW width (150 ft) or the operations ROW (50 ft). Previous disposition comment is based on a 50 ft operations ROW. If such a width is used, it will result in an underestimation of impacts to visual resources.	Text edited to clarify that the analysis is of the operational ROW, with the exception of what is disclosed for construction-related impacts.

2.44 SOCIOECONOMICS VS. ENVIRONMENT

Comments weighing the tradeoffs and benefits between economic development and environmental impact.

Category Code	Statement of Concern	Response
SVE 1	Commenters expressed the view that if the project was designed and permitted properly, the environmental damage would be limited. The economic opportunity is not a tradeoff with the environment because Donlin Gold would implement design features that provide environmental protection. It is possible to have a balance between development and subsistence.	Section 3.1 through Section 3.26 include sections that outline the design features in the proposed project that are most important for reducing impacts to the physical, biological, and social environments. Comparisons to other mines in Alaska, such as Red Dog, are given where appropriate.
SVE 2	There was expressed sentiment that the project would create environmental damage, and the long-term impacts would not be worth the short-term benefits to the economy.	Refer to Section 3.18, Section 3.19, and Section 3.22 for the impacts to Socioeconomics, Environmental Justice, and Human Health. Section 3.1 through Section 3.26 discuss the impacts to several resources, and include sections that outline the design features in the proposed project that are most important for reducing impacts to the physical, biological, and social environments.
SVE 3	Commenters expressed the sentiment that the project cannot properly prepare for unintentional consequences such as a tailings dam spill, fuel spills, material leaks, and natural disasters. The long-term impacts would not be worth the short-term benefits to the economy.	Refer to Section 3.3, Section 3.7, Section 3.24, and Section 3.25 for discussions on Geohazards and Seismic Conditions, Water Quality, Spill Risk, and Pipeline Reliability. Section 3.1 through Section 3.26 include sections that outline the design features in the proposed project that are most important for reducing impacts to the physical, biological, and social environments.
SVE 4	There were comments that the project would create contamination of the air and water that would be costly to remediate, or irreparable. The mine should be monitored	The project would be subject to numerous monitoring requirements. Refer to Section 3.7, Section 3.8, Section 3.24, and Section 3.25 for discussions on Water Quality, Air

Category Code	Statement of Concern	Response
	and regulated for environmental damage. The long-term impacts would not be worth the short-term benefits to the economy.	Quality, Spill Risk, and Pipeline Reliability, which include the regulatory basis for oversight programs. Section 3.1 through Section 3.26 include sections that outline the design features in the proposed project that are most important for reducing impacts to the physical, biological, and social environments.
SVE 5	Commenters expressed sentiment that the project would impact traditional way of life. The long-term impacts would not be worth the short-term benefits to the economy.	Refer to Section 3.19, Section 3.20, and Section 3.21 for impacts to Environmental Justice, Cultural Resources, and Subsistence. Suggested mitigation measure added to tables in Chapter 5.
SVE 6	There was expressed sentiment that the project would impact subsistence and subsistence resources. The long-term impacts would not be worth the short-term benefits to the economy.	Refer to Section 3.19, Section 3.20, and Section 3.21 for impacts to Environmental Justice, Cultural Resources, and Subsistence. Section 3.1 through Section 3.26 include sections that outline the design features in the proposed project that are most important for reducing impacts to the physical, biological, and social environments.

2.45 DATA AND AVAILABLE INFORMATION

Comments about the inadequacy of data and requests to incorporate specific studies into the analysis in general terms. When related to a specific resource, it will be included in that resource.

Category Code	Statement of Concern	Response
DATA 1	The Corps should consider several submitted references (including a DVD and PDF documents submitted with comments) when reviewing and analyzing the project or as part of the project record.	Several comments received included requests to review and incorporate specific studies into the EIS with some commenters providing these references in support of their comments which included: A DVD that contained the files of sources citied within the written comments of one submission. It was requested that the Corps include this list of sources in the administrative record for this project; A document that was titled "Integrated Solid Waste Plan for the Community of Native Village of Nunapitchuk" to be used as an example for Donlin Gold and the Corps in developing waste plans; and Dichinanek' Hwt'ana: A History of the People of the Upper Kuskokwim who live in Nikolai and Telida. By Raymond L. Collins. Publication of the National Park Service, Denali National Park and Preserve. September 2000. Where appropriate these documents were reviewed, and revisions were made to the text.

2.46 NON-SUBSTANTIVE COMMENT

Submissions without substantive comments

Category Code	Statement of Concern	Response
NSB 1	Entire submission determined not to be substantive.	Comments that offered a general opinion or simply recommend specific decisions are not specifically responded to in the Final EIS. Comments also included concerns and issues that are outside the scope of the EIS. These comments were not responded to herein and were considered non-substantive comments and no further response is required.

2.47 RESEARCH, MONITORING, AND EVALUATION NEEDS

Comments on baseline research, monitoring, and evaluation needs, data gaps in general terms. When related to a specific resource, it will be included in that resource.

Category Code	Statement of Concern	Response
RME 1	The Corps should conduct more studies and research further into existing information for proper analysis of the potential impacts. The Draft EIS should look at the long history of the environmental impacts of hardrock mining both in Alaska and in the rest of the United States which is well-documented. Given the number of problems dating to the present, discuss how the proposed project would be less harmful than others have been.	Many studies from past and present mines were incorporated into the analysis in the EIS. All resource sections have been updated to include available recent relevant studies, including a mercury risk assessment conducted since the release of the Draft EIS.
RME 2	The Draft EIS predicts low to moderate risks of mine impacts by assuming that mitigation and best management practices that are in large part voluntary will prevent environmental hazards or effects. Although Donlin Gold must obtain necessary federal and state permits to operate its mine, there could be gaps in the ongoing regulatory oversight of hard rock mines that would exist after a Final EIS and Record of Decision are issued and permits are approved. These gaps would provide Donlin Gold with the opportunity to cut corners once the operation is approved, and prevent regulatory agencies from requiring specific changes in the future.	The EIS analysis was conducted to include mitigation measures and BMPs because they are part of the proposed project, as design features. Table 5.2-1 lists the design features intended to reduce impact. Tables 5.5-1A and 5.5-1B list additional mitigation measures. Construction and operation of the project would be subject to stringent overview by federal and state agencies and the operator subject to fines and other penalties for non-compliance.
RME 3	There should be automatic and publicly accessible air and water quality data collection. The stations should be immediately on-site and available for point sources and in the surrounding areas for diffuse emissions.	Suggestion was added to tables in Section 5.5 as a potential mitigation measure.

2.48 CLARIFICATION AND DOCUMENT INCONSISTENCIES

Comments that illustrate inconsistencies in the document or the document message. Requests for clarification or more detailed information in general terms. When related to a specific resource, it will be included in that resource.

Category Code	Statement of Concern	Response
CLA 1	Please identify the costs to Donlin Gold for right-of-way or encroachment permits required by them from public agencies.	Identification of the costs to the applicant are out of the scope of this EIS.
CLA 2	Clarify the compatibility of a three-layer polyethylene pipeline coating system and the pipelines cathodic protection system. What type of pipeline coating system is being considered for this project? Verify that the galvanic anodes will not be directly connected to the pipeline. What type of cathodic protection system will be used.	Clarifications made to text in the Executive Summary, Chapter 3 and Section 3.25 of the EIS as appropriate.
CLA 3	Reasonably foreseeable impacts did not consider a large enough area around the project, and did not include the Bethel port. The expansion of the Bethel port is not only reasonably foreseeable, it is necessary to the implementation of the project. This should be included in the cumulative impacts.	Environmental effects that may result from a 16-acre expansion of the Bethel Yard Dock (Section 2.3.2.2.3) were evaluated in the EIS as a connected action pursuant to NEPA. It should also be noted that cumulative impact analysis inherently accounts for all past, present and reasonably foreseeable future actions, thus including work that may later be proposed for the Port of Bethel. Note that any actions that would occur at the Port of Bethel at the Bethel Yard Dock are not part of the proposed action, and are considered connected actions pursuant to NEPA (40 CFR 1508.25). At this time, it is not known that connected actions would occur. However, connected actions are analyzed for some resources in or near the Bethel Yard Dock in the context of resource impacts in Chapter 3, Affected Environment and

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		Environmental Consequences. See Chapter 1, Section 1.2.1, Connected Actions.
CLA 4	Given the geophysical imagery and statements to investors, there is every reason to believe that if the mine is constructed, it will be expanded. While it is understandable that the permitting system allows an initial project to be permitted, then expanded, with impacts assessed at the time of application for expansion, nonetheless, this process could underestimate cumulative impacts. If the mine expands, all aspects that are continuing aspects from the original project should be assessed for the full life span, not for the additional expected life span. [Figure 9-1]	The evaluation of potential mine expansion is speculative and thus does not meet the criterion of reasonably foreseeable future action pursuant to NEPA. On this basis, future mine expansion was not within the scope of this EIS.
CLA 5	The word “ensure” appears over 230 times in the draft document. The document is optimistic in its overall assessment that several impacts will be inconsequential or that mitigation will circumvent any impacts. Ensuring anything is a lofty goal, but the reality is that although many things can be insured, relatively few things in life can be assured.	The occurrence of the term "ensure" was reviewed for usage and has been edited in the EIS as appropriate.
CLA 6	Using this vaguely defined term “perpetuity” in a draft document intended to solicit public comment could be considered misleading to the public by confusing the issue of just how long the mine area will remain a risk to the health and well-being of the people and subsistence resources on which they depend. Also, given the size of the Draft EIS, and the fact that most reviewers are likely to only focus on specific sections, this term should be more clearly defined in each section where it is used.	The term “perpetuity” is taken as the literal definition, “indefinite.” Regulations require post-closure activities must be adequate to cover performing reclamation and post-closure monitoring and maintenance. Refer to Appendices A and AA for information on the role of the State of Alaska and BLM regarding financial assurances.

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CLA 7	For informational purposes, the Alaska DEC Division of Water, Wastewater Discharge Authorization Program (WDAP) is currently working on issuing General Permit AKG332000 Statewide Pipeline Construction, Operation, and Maintenance (Pipeline GP), which will authorize wastewater discharges associated with hydrocarbon pipeline Construction, Operations and Maintenance. The following discharges are being considered for authorization in the Pipeline GP: Domestic Wastewater, Gravel Pit Dewatering, Excavation Dewatering, Hydrostatic Test Water, Secondary Containment, Mobile Spill Response, Horizontal Directional Drilling, and Storm Water.	Comment acknowledged.
CLA 8	Clarifications were requested in Section 3.24, Spills, regarding structure, tables, fate and behavior of materials, and minor wordsmithing.	Clarifications and text revisions were made as appropriate. The section impacts are structured by resource for ease in navigating the impacts to a resource of interest across all spill scenarios. All resources are included to show impacts as a result of the spill, as well as potential cleanup activities.
CLA 9	Two alternatives referenced in the Cumulative Effects section 4.3.2.3.2 should be moved to Alternative 3B.	Clarifications of text in Section 4.3.2.3.2 and Section 4.3.2.3.3 were made as appropriate.
CLA 10	There are discrepancies in AECOM's responses to the BLM (Technical Memorandums, July 28, 2015 and August 31, 2015), resulting in related determination of impacts by alternatives, and identification and evaluation of mitigation strategies. We recommend that all of these items be incorporated in the revised Draft EIS. This issue was not discussed at the May 5th meeting with the Corps and will require additional follow-up by both parties.	It is acknowledged that nonnative invasive species are best managed by a comprehensive, landscape-level approach to prevention, detection, eradication, or other practices Section 3.10 has been expanded to be the Vegetation and Nonnative Invasive Species Section. Information requested for nonnative invasive species has been included as appropriate in Section 3.10. The draft ISPMP by Donlin Gold addresses nonnative invasive species

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		concerns with introduction, spread potential, inspection, education, training, protocols, and prevention. The EIS text reflects the content of the draft ISPMP.
CLA 11	The Corps should clearly define the roles of various agencies. Identify State agencies at Section 1.1 and incorporate suggested text at Section 1.10.2 in regards to how the USFWS consults on Section 404 of the CWA.	Figure 1.1-2 has been removed. In Section 1.5.5 (previously 1.10.20) text at CWA added: During evaluation of CWA Section 404 of the federal permit application, the USFWS consults on impacts to fish and wildlife from the proposed or alternative projects as well as measures to mitigate these impacts. USFWS has the ability to elevate specific cases or policy issues pursuant to Section 404(q). Other recommendations were reviewed and incorporated into Appendix AA as appropriate.
CLA 12	As Donlin Gold will not be transporting ore concentrates along the access road, the Draft EIS reliance on the Hasselbach and Ford and Hasselbach studies to evaluate impacts along the Jungjuk Port Mine Access Road are not an appropriate basis for comparison. In addition, the Draft EIS should clarify how the ore will be transported.	Clarifications and text revisions were made as appropriate.
CLA 13	Add clarification regarding the risk of a tailings dam failure across alternatives.	Clarifications between alternatives and text revisions were made as appropriate.
CLA 14	There is a disconnect between Chapter 2 and Chapter 3 in the description of the construction corridor and one of the tables. Review location of Table 2.3-44.	Clarification and edits were made in the text at the description of the construction corridor in Chapter 2 where the construction corridor is 300 feet versus in Chapter 3 at Section 3.15.2.1.3 it was identified as a 150 foot ROW. Table 2.3-44 not moved.
CLA 15	The Draft EIS should add clarification on the transport of	At Section 2.3.2.3.4 the text was clarified to describe how the pipe would be delivered from the Beluga and Bethel staging

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	construction materials.	yards to the pipeline storage yards in regards to what type of equipment, number of vehicle trips required and during which season this would occur. Note that any actions that would occur at the Port of Bethel at the Bethel Yard Dock are not part of the proposed action, and are considered connected actions pursuant to NEPA (40 CFR 1508.25). At this time, it is not known that connected actions would occur. However, connected actions are analyzed for some resources in or near the Bethel Yard Dock in the context of resource impacts in Chapter 3, Affected Environment and Environmental Consequences. See Chapter 1, Section 1.2.1, Connected Actions.
CLA 16	The Draft EIS should clarify drainages at Section 3.1.2.1.1.	Text revised at Section 3.1.2.1.1 to describe the Kuskokwim River discharge to Kuskokwim Bay.
CLA 17	The Corps should be consistent with numbers, lengths, and quantities throughout EIS.	Suggested clarifications for consistency in use of measurements and quantities were incorporated as appropriate.
CLA 18	Suggest Section 3.11, Wetlands, be revised to clarify the project area in terms of the main project components. It is not clear if the Kuskokwim River Transportation Corridor was mapped by 3PPI.	In Section 3.11 clarifications were made as appropriate to clarify the difference between project area and entire EIS Analysis Area as both terms were used in this section. Clarification was made to the text to describe areas mapped by 3PPI in the Kuskokwim River Transportation Corridor.
CLA 19	The sentence at Section 3.13.3.2.2 "Daily traffic would typically consist of 20 trucks making 54 trips (half each for fuel and cargo) with a one-way trip requiring about 1.6 hours" is very clear and to the point; suggest it be included in other sections of the EIS.	This sentence is present in the EIS at page 3.13-153. Suggestions for this sentence to be incorporated into Sections 3.2 Soil, 3.10 Vegetation, 3.11 Wetlands, and 3.24 Spill Risk were considered and text was edited as applicable.

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CLA 20	For consistency and reader understandability, select one sequence and use for all descriptions.	Recommendations to revise the sequencing of the effects of the project (north to south versus south to north) have been incorporated as appropriate. In some instances the discussion of the resource fits better to be described by milepost or physiographic provinces and was retained as appropriate.
CLA 21	The Corps should make clarifying edits to Table 3.22-2 and 3.22-5. • Table 3.22-2 would be easier for the reader if census areas were listed vertically and the populations were listed horizontally • Data from Yukon-Koyukuk should also be presented in Table 3.22-2 and Table 3.22-5 (and should also be referred to in a consistent way as there is confusion with Y-K [could also mean Yukon-Kuskokwim]).	Suggested edits made to tables as appropriate.
CLA 22	The Corps should clarify the duration and impacts of the No Action Alternative. • The duration of the No Action alternative would be permanent if this alternative is to be evaluated in a manner consistent with the other alternatives. • Under the No Action, there is no “return” to pre-impact levels. The No Action alternative defines the pre-impact level of effects and serves as the basis for comparison. The action alternatives are the source of “new” impacts.	Agree. The No Action Alternative has been clarified in the EIS.
CLA 23	The first paragraph in Section 3.22.4.2.8 is a description of baseline conditions and should be moved to the affected environment discussion.	Section 3.22.4.2.8, page 3.22-87 at "Access to Routine Healthcare" edit was made where the first paragraph in this subsection is a description of baseline conditions and text

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		was moved to the affected environment discussion.
CLA 24	Suggest rewording the first paragraph in Section 3.24.2.5.	Suggested edit was made.
CLA 25	The first sentence in the final paragraph in Section 3.24.3.1.2 discusses the location of tank farms associated with the project. While the fuel tanks located at the airstrip may not be considered a tank farm, the Corps should mention the fuel tanks at the airstrip in this paragraph.	Clarification was made at Section 3.24.3.1.2 to note that there are fuel tanks located at the airstrip.
CLA 26	The Cowardin classification and acreage method is not a functional assessment but merely a classification and quantification of acres of wetland. This point needs to be clarified in the text. This section needs to specifically describe the Cowardin classification and acreage comparison methodology.	Recommendations for specific clarification on how the Cowardin classification method is used in the EIS were reviewed and incorporated into the Wetlands Section, Section 3.11, as appropriate.
CLA 27	There should be detailed time-line pictures of the environment in the area, so that people can see what it will look like and also a piece of the land fill lining they will use.	Section 3.17 of the EIS contains photographs of the project area and provides figures that show the estimated extents of views from key observation points. The description of the liner is found in Section 2.3.2.1.8 of the EIS.
CLA 28	Section 3.13 should be reorganized for clarity as there are some inconsistencies about what is actually being discussed.	Suggestions to edit Section 3.13 at pages 113 to 114 were made for clarity and last paragraph on page 113 was moved to a more appropriate section that discusses streamflow changes and freezing of spawning substrates.
CLA 29	Clarification and corrections were requested in parts of Chapter 1. • Chapter 1 should provide an introductory sentence or two in the text, or a footnote at the beginning of the	Recommendations for clarification in Chapter 1 were reviewed and incorporated as applicable. Three sections originally in Chapter 1 have been moved to Appendix AA: 1) financial assurance for reclamation and closure; 2) permits, approvals, compliance with executive orders and regulatory

Category Code	Statement of Concern	Response
	listing and description of the executive documents. • More specific identification and descriptions of highlighted issues up to the front • Needs acknowledgment that BLM has authority to - and likely will - require compensatory mitigation.	requirements; and 3) summary of permits, approvals, and consultations required. Descriptions of issues selected for analysis have been moved to Chapter 3.
CLA 30	Clarification and corrections were requested in parts of Chapter 2.	Recommendations for clarification in Chapter 2 were reviewed and incorporated as applicable.
CLA 31	Clarification and corrections were requested in parts of Chapter 3.	Recommendations for clarification in Chapter 3 were reviewed and incorporated as applicable.
CLA 32	Clarification and corrections were requested in parts of Chapter 4.	Recommendations for clarification in Chapter 4 were reviewed and incorporated as applicable.
CLA 33	Clarification and corrections were requested in parts of Appendix C.	Recommendations for clarification in Appendix C were reviewed and incorporated as applicable.

2.49 EDITORIAL

Comments associated with specific text edits to the document (i.e. grammar, punctuation, and consistency in usage).

Category Code	Statement of Concern	Response
EDIT 1	Comments suggesting specific global edits to the text of the EIS were identified.	Recommendations for specific global edits throughout the EIS were reviewed and incorporated as appropriate.
EDIT 2	Comments suggesting specific edits to the text of the Executive Summary of the EIS were identified.	Recommendations for specific edits in the Executive Summary were reviewed and incorporated as appropriate.
EDIT 3	Comments suggesting specific edits to the text of Chapter 1 of the EIS were identified.	Recommendations for specific edits in Chapter 1 were reviewed and incorporated as appropriate. Three sections originally in Chapter 1 have been moved to Appendix AA: 1) financial assurance for reclamation and closure; 2) permits, approvals, compliance with executive orders and regulatory requirements; and 3) summary of permits, approvals, and consultations required. Descriptions of issues selected for analysis have been moved to Chapter 3.
EDIT 4	Comments suggesting specific edits to the text of Chapter 2 of the EIS were identified.	Recommendations for specific edits in Chapter 2 were reviewed and incorporated as applicable.
EDIT 5	Comments suggesting specific edits to the text of Chapter 3 of the EIS were identified.	Recommendations for specific edits in Chapter 3 were reviewed and incorporated as applicable.
EDIT 6	Comments suggesting specific edits to the text of Chapter 4 of the EIS were identified.	Recommendations for specific edits in Chapter 4 were reviewed and incorporated as applicable.
EDIT 7	Comments suggesting specific edits to the text of Chapter 5 of the EIS were identified.	Recommendations for specific edits in Chapter 5 were reviewed and incorporated as applicable.
EDIT 8	Comments suggesting specific edits to the text of Chapter 9	Recommendations for specific edits in Chapter 9 were

Category Code	Statement of Concern	Response
	of the EIS were identified.	reviewed and incorporated as applicable.
EDIT 9	Comments suggesting specific edits to the Appendices of the EIS were identified.	Recommendations for specific edits in the Appendices were reviewed and incorporated as appropriate.

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4.0 COMMENT INDEX

4.1 STATEMENTS OF CONCERN FOR UNIQUE SUBMISSIONS

As discussed in Section 1.0, unique submissions were received during the public comment period and included an entire letter, email, or testimony at a public hearing. The content of submissions was broken down by comment, and then assigned to a SOC. Table 2 below is an index of each individual unique submission (alphabetical by last name or organization) and all SOCs that the content of those submissions were assigned. Public meetings are shown in Section 4.2 and form letters are shown in Section 4.3. All submissions are included in Appendix A, with individual comments illustrated in solid or dashed boxes and SOCs denoted.

Table 2: Comment Index by Individual

Commenter	Statements of Concern
Anonymous, 1	(DAM 2), (FISH 5), (SVE 2)
Anonymous, 2	(WAQ 26)
Anonymous, 3	(PHL 3)
Anonymous, 4	(NSB 1)
Anonymous, 5	(NSB 1)
Anonymous, 6	(NSB 1)
Anonymous, 7	(BARG 12), (FSR 2), (HAB 1)
Anonymous, 8	(BARG 12), (FISH 4)
Anonymous, 9	(MIT 9)
Anonymous, 10	(MIT 27)
Anonymous, 11	(SVE 2)
Anonymous, 12	(NSB 1)
Anonymous, 13	(SUB 1)
Anonymous, 14	(SUB 15)
Anonymous, 15	(SER 23), (SVE 2), (TWL 1)
Anonymous Kipnuk Resident,	(SER 10), (SER 5), (SER 8)
Abruska, Mattfi	(NSB 1), (LAND 1)
Adams, David	(IDIT 1), (LAND 1), (SER 15)

Commenter	Statements of Concern
Adler, Kerry	(BARG 5), (PAA 3), (SER 11)
Akers, Randy Pentair Valves & Controls	(SER 1)
Alaska Chamber Thayer, Curtis	(SER 12)
Alaska Community Action on Toxics Miller, Pamela	(AIQ 3), (AIQ 6), (BER 2), (BER 4), (BER 6), (BER 7), (BIRD 4), (CLA 3), (CLA 32), (CLA 4), (CLIM 12), (CLIM 4), (CWA 1), (DAM 2), (DAM 3), (DAM 4), (DAM 6), (DAM 8), (FISH 10), (FISH 11), (FSR 11), (FSR 13), (FSR 15), (FSR 17), (GEO 3), (GEO 5), (GRD 7), (HYD 12), (HZM 5), (HZM 7), (LAND 10), (LAND 2), (MIT 16), (MIT 2), (MIT 20), (MIT 27), (MIT 28), (MIT 3), (MIT 33), (MIT 4), (MON 11), (NEP 1), (NEP 6), (PAA 1), (PAA 14), (PAA 16), (PAA 22), (PAA 46), (PAA 9), (PHL 10), (PHL 11), (PHL 12), (PHL 13), (PHL 16), (PHL 17), (PHL 18), (PHL 19), (PHL 21), (PHL 6), (PHL 8), (SER 23), (SOL 3), (SUB 10), (SUB 19), (WAQ 10), (WAQ 21), (WAQ 25), (WAQ 27), (WAQ 28), (WAQ 29), (WAQ 9), (WILD 3), (WILD 4), (WILD 5)
Alaska Maritime Agencies Arts, Robert	(SER 12)
Alaska Miners Association Crockett, Deantha	(BARG 5), (PAA 36), (PAA 46), (PAA 5), (PAA 7), (SER 13), (SER 18), (TRAN 6)
Alaska Process Industry Careers Consortium DaSilva, Jana	(SER 2)
Alaska's Big Villages Network Wassilie, Carl	(BER 7), (CLIM 1), (CLIM 10), (CLIM 12), (CLIM 3), (CLIM 8), (CWA 3), (CWA 4), (CWA 5), (DAM 3), (DAM 5), (EJ 6), (GRD 1), (GRD 12), (GRD 16), (GRD 17), (GRD 2), (GRD 3), (GRD 4), (GRD 5), (GRD 6), (GRD 8), (HYD 7), (HYD 9), (HZM 4), (IDIT 10), (IDIT 6), (IDIT 7), (IDIT 9), (LAND 13), (LEG 1), (MIT 21), (MIT 29), (MIT 31), (MIT 7), (NEP 6), (NHPA 2), (PAA 14), (PAA 15), (PAA 27), (PAA 32), (PAA 9), (PHL 16), (SUB 12), (SUB 21), (SUB 4), (WAQ 10), (WAQ 11), (WAQ 20), (WAQ 9), (WILD 3), (WILD 5)
Aleut Corporation Fagnani, Michael Smith, Shirlee	(GAS 1), (SER 5), (SVE 1)
Alexie, Jesse	(PHL 16), (SUB 1), (TWL 1), (WILD 8)
Alexie, Margaret	(FISH 9), (FSR 3), (NSB 1), (SUB 1)
Alexie, Melanie	(SER 11)
Alexie, Morris	(DATA 1)
Alexie, Nicholai	(TWL 3)

Commenter	Statements of Concern
Kwethluk, Inc.	
Almond, Gary	(NEP 1)
Amberg, Alicia	(SER 4)
American Exploration & Mining Association Ellsworth, Matthew	(PAA 46), (PAA 7)
Anchorage Economic Development Corporation Popp, Bill	(GAS 5), (SVE 1)
ANCSA Regional Association Kompkoff, Gabriel	(TWL 4)
ANCSA Regional Association Reitmeier, Kim	(SER 2), (SER 24), (TWL 4)
ANCSA Regional Managers Imm, Teresa	(SER 2), (SER 24)
Andrew, Hadley	(NSB 1)
Andrew, John Kwethluk Joint Group	(FISH 4), (FSR 2)
Andrew, Melvin	(SER 11), (SVE 1)
Angapak, Nelson	(SER 13), (SER 16), (SER 9), (SUB 18)
Aniak Traditional Council Simeon, Laura	(SER 5)
Asa'carsarmiut Tribal Council Landlord, James	(CLIM 5), (DAM 2), (SVE 2), (TWL 3)
Ashby, Anika	(IDIT 1), (LAND 1), (SER 15)
Asicksik, Michael	(ANIL 11), (FISH 10), (FSR 3), (HAB 1), (SUB 1)
ASRC Energy Services-Houston Contracting Company, Inc. Blasinngame, Wade	(LAND 1)
Atmautluak Traditional Council Waska, Daniel	(NEP 1), (PUB 1)
Avalon Development Corporation Freeman, Curtis	(PUB 2)
Baker, Andy	(FISH 4), (SER 10)

Commenter	Statements of Concern
Barnes, Randy	(SER 4)
Beans, Robert	(GAS 1), (SER 5)
Beasley, Morgan	(BER 9), (FISH 10), (LAND 3), (PAA 12)
Benson, Brian Air Liquide America L.P.	(SER 5)
Bentler, Paul	(SVE 4)
Bering Straits Native Corporation Schubert, Gail	(SER 2)
Bethel Native Corporation Nelson, Jimmie	(NEP 1)
Bethel Native Corporation O'Quinn, Aaron	(BARG 10), (G2G 1), (HZM 6), (LEG 2), (NEP 1), (NEP 6), (PAA 49), (SER 17), (SUB 1), (TRAN 2)
Betts, Derek	(SER 5)
Bills, Steve TonaTec Exploration	(GAS 1)
Binkley, John & Judy	(SER 10), (SER 18)
Birch Ridge Golf Course Inc. Cowan, Pat and Myrna	(SER 18)
Birch, Aaron	(IDIT 1), (LAND 1), (SER 15)
Birch, Benjamin	(IDIT 1), (LAND 1), (SER 15)
Birch, Jerry	(NSB 1), (SER 11), (SER 13), (SER 18), (SER 4), (SVE 1)
Borell, Steve Borrell Consulting Services	(SER 13)
Borowski, John	(BARG 3)
Bradshaw, Ken Bradshaw and Associates, Inc.	(NSB 1), (SER 4)
Brady-Robertson, Donna	(NSB 1)
Brand, Randy	(NSB 1)
Brice Environmental Services Corporation Craig, Jones	(SER 11), (SER 2)

Commenter	Statements of Concern
Brice, Alba Brice Companies	(SER 5)
Brice, Sam Robert	(AIQ 1), (BARG 5), (BARG 9), (GAS 1), (GAS 3), (MIT 9), (NEP 1), (PUB 6), (SER 1), (SER 11), (SER 12), (SER 13), (SER 15), (SER 2), (SER 24), (SER 5), (SVE 1)
Brophy, Bill	(SER 2)
Brown, Jeremiah	(FSR 5)
Brown, Margaret	(SER 2)
Bryant, Zachary	(IDIT 1), (LAND 1), (SER 15)
Burkhart, Bert	(SER 18)
Burmeister, Aaron Tumet Industries, LLC	(IDIT 2)
Burris, Deanna	(SVE 2)
Burris, Ron	(SVE 5)
Bynum, Jack	(BER 13), (BER 7), (ESA 2), (FSR 1), (FSR 2), (HZM 5), (IDIT 8), (NEP 1), (NEP 2), (PAA 15), (PAA 22), (PAA 35), (PAA 47), (PUB 1), (RME 1), (RME 3), (WAQ 20)
Calista Corporation James, Monica	(SER 19), (SER 2), (SER 5)
Calista Corporation McAtee, June	(SER 2)
Calista Corporation Lechner, Sharon	(SER 19), (SER 20), (SER 4)
Calista Corporation Guy, Andrew	(GAS 1), (IDIT 1), (PHL 3), (PUB 6), (SER 1), (SER 11), (SER 2), (SER 5) (WILD 1)
Calista Corporation Hoffman, Robert	(SER 11)
Calista Corporation Samuelson, Earl	(GAS 1), (PHL 3)
Calista Corporation Paskvan, Bonnie	(SER 10), (SER 19), (SER 2)
Calista Corporation Werning, JoAnn	(PHL 3), (SER 12), (SER 2)

Commenter	Statements of Concern
Calista Corporation Weeden, Marva	(SER 8)
Calista Corporation Flanders, Su	(SER 2), (SER 8)
Calista Corporation Seebold, Frieda	(SER 11), (SER 13)
Calista Corporation Reid, Svetlana	(SER 10)
Calista Corporation Resnick, Norman	(SER 13)
Calista Corporation Kinegak-Friday, Kirsten	(GAS 1), (PHL 8), (SER 19), (SER 2), (SER 5)
Calista Corporation Owletuck, George	(GAS 2), (PHL 7), (PUB 2), (SER 13), (SUB 18), (SUB 23)
Calista Corporation Pohjola, Margaret	(SUB 2)
Cannon, Dave Kuskokwim River Watershed Council	(ANIL 9), (BARG 10), (BARG 11), (BARG 18), (BARG 9), (CLA 5), (DAM 3), (FISH 3), (FISH 4), (FISH 8)
Carmichael, Brenda	(TWL 2)
Carney, Doug	(NEP 1), (NSB 1)
Center for Science in Public Participation Zamzow, Kendra	(AIQ 6), (BER 2), (BER 4), (BER 6), (BER 7), (BIRD 4), (CLA 3), (CLA 32), (CLA 4), (CLIM 4), (CWA 1), (DAM 4), (DAM 6), (FISH 11), (FISH 9), (FSR 11), (FSR 13), (FSR 15), (FSR 17), (GEO 3), (GEO 5), (GRD 7), (HYD 12), (LAND 10), (LAND 2), (MIT 16), (MIT 2), (MIT 20), (MIT 27), (MIT 28), (MIT 3), (MIT 33), (MIT 4), (MON 11), (NEP 1), (NEP 6), (PAA 14), (PAA 16), (PAA 22), (PAA 46), (PAA 9), (PHL 10), (PHL 11), (PHL 12), (PHL 13), (PHL 16), (PHL 17), (PHL 19), (PHL 2), (PHL 6), (PHL 8), (SER 23), (SOL 3), (SUB 10), (SUB 19), (WAQ 10), (WAQ 21), (WAQ 25), (WAQ 28), (WAQ 29), (WAQ 5), (WAQ 9), (WILD 3), (WILD 4), (WILD 5)
Chefornak Traditional Council Tunuchuk, Mary	(DAM 7), (FSR 2), (SOL 8), (SUB 15), (TWL 2)
Chen, Jeff	(SVE 2)
Chenault, Mike Alaska State Legislature	(SER 2)

Commenter	Statements of Concern
Chikigak, Flora	(SUB 15)
Chimegalrea, Sam	(SER 5), (SVE 1)
Chimegalrea, Vernon	(SER 8), (SUB 18), (SVE 1)
Chuathbaluk Traditional Council Yaska, Patricia	(AIQ 11), (AIQ 3), (CLA 30), (CLA 31), (CLA 33), (CUL 3), (CWA 1), (DAM 1), (DAM 3), (DAM 4), (DAM 5), (DAM 9), (DAM 10), (EDIT 3), (EDIT 5), (FISH 10), (FISH 11), (FISH 7), (GEO 8), (GRD 1), (GRD 7), (GRD 11), (GRD 14), (GRD 6), (HYD 1), (HYD 4), (HYD 8), (HZM 2), (INV 3), (LAND 10), (MIT 16), (MIT 19), (MIT 7), (MIT 28), (NEP 3), (NEP 7), (PAA 14), (PAA 19), (PAA 30), (PAA 31), (PHL 11), (PHL 12), (PHL 14), (PHL 16), (PHL 5), (PHL 7), (PHL 9), (SER 1), (SER 13), (SOL 9), (SUB 17), (SUB 19), (VEG 4), (WAQ 1), (WAQ 10), (WAQ 11), (WAQ 12), (WAQ 20), (WAQ 21), (WAQ 25), (WAQ 26), (WAQ 5), (WAQ 9), (WAQ 31), (WAQ 5), (WAQ 9), (WET 1), (WET 8), (WILD 3), (WILD 5)
Chugach Alaska Corporation Kompkoff, Gabriel	(SER 18)
City of Bethel	(NEP 1)
City of Bethel Capela, Ann	(FSR 5), (HZM 4), (MIT 27), (NEP 9), (PHL 14)
Clautice, Karen	(SER 5)
Coghill, John; State Senator Hutchinson, Chad	(SER 5)
Coleman, Vivian	(SVE 2)
Columbia Helicopters, Inc.	(SER 18)
CONAM Construction Co. Kissee, Dale	(SER 4)
Constantine Metal Resources Ltd. Cornejo, Liz	(AIQ 1), (MIT 9), (NSB 1), (PAA 4), (SER 11), (SER 13), (SER 18), (SER 5), (SVE 1)
Cook Inlet Region, Inc. Brune, Jason	(ANIL 16), (GAS 1), (GAS 5), (PAA 4), (PAA 56), (SER 2), (SUB 18), (SUB 8)
Cook Inletkeeper Shavelson, Bob	(AIQ 6), (BER 2), (BER 3), (BER 4), (BER 5), (BER 6), (BER 7), (BIRD 3), (BIRD 4), (CLA 3), (CLA 32), (CLA 4), (CLIM 12), (CLIM 4), (CWA 1), (CWA 5), (DAM 2), (DAM 3), (DAM 4), (DAM 6), (DAM 8), (EJ 2), (ESA 2), (FISH 10), (FISH 11), (FISH 13), (FISH 2), (FSR 11), (FSR 13), (FSR 15), (FSR 17), (FSR 9), (GEO 3), (GEO 5), (GRD 7), (HYD 12), (HZM 5), (IDIT 6), (IDIT 8), (INV 2), (LAND 10), (LAND 2), (MIT 16), (MIT 2), (MIT 20), (MIT 27), (MIT 28), (MIT 3), (MIT 32), (MIT 33), (MIT 4), (MON 11), (NEP 3), (NEP 6), (NOI 1), (PAA 1), (PAA 10), (PAA 12), (PAA 14), (PAA 15), (PAA 16), (PAA 22), (PAA 23), (PAA 30),

Commenter	Statements of Concern
	(PAA 36), (PAA 39), (PAA 46), (PAA 50), (PAA 53), (PAA 9), (PHL 10), (PHL 11), (PHL 12), (PHL 13), (PHL 16), (PHL 17), (PHL 19), (PHL 6), (PHL 8), (REC 6), (SER 16), (SER 17), (SER 23), (SER 27), (SER 3), (SER 7), (SOL 3), (SUB 1), (SUB 10), (SUB 19), (SUB 22), (WAQ 10), (WAQ 20), (WAQ 21), (WAQ 25), (WAQ 27), (WAQ 28), (WAQ 29), (WAQ 9), (WILD 3), (WILD 4), (WILD 5), (WILD 8)
Cooper, Audrey	(CLA 1), (SER 22), (VIS 1)
Council of Alaska Producers Matthias, Karen	(GAS 1), (IDIT 4), (PAA 4), (PAA 46), (SER 1)
Cox, Robert Crowley Fuels	(GAS 1), (SER 8)
Craven, Danielle	(BARG 1), (HAB 1), (HZM 2), (HZM 4), (SUB 13), (SVE 2), (SVE 5), (TWL 3)
Cross, Ryan	(BARG 12), (MON 1)
Cruz Companies Cruz, Arianna	(SER 2), (SER 4)
Cruz Companies Cruz, Dave	(SER 2), (SER 4)
Dahl, Wilben	(SER 5)
Davenport, David Tunista Construction, LLC	(NSB 1)
Davis Constructors & Engineers Pepperd, Josh	(SER 5)
DeGroat, Malissa Construction Machinery Industrial, LLC	(NSB 1)
Deininger, James	(SER 1), (SER 10), (WET 6)
Demantle, Lulu	(SUB 1)
Denali Drilling, Inc. Ingalls, Hal	(SER 2), (SER 5)
Denali General Contractors Hamre, Chris	(GAS 1), (SER 10), (SER 11), (SER 12), (SER 18)
Denton, Steve	(SER 5)
Derendoff, Willis	(IDIT 1), (LAND 1), (SER 15)

Commenter	Statements of Concern
Diehl, David, Donhauser-Diehl, Esther	(DAM 7), (GAS 7), (PAA 8), (PUB 1), (SVE 2)
Diehl, Rainy	(AIQ 2), (BARG 18), (BER 3), (CLIM 3), (FSR 1), (FSR 10), (FSR 5), (GAS 1), (HZM 4), (MIT 22), (MON 9), (PAA 29), (PAA 8), (PHL 16), (PHL 9), (SUB 1), (SUB 17), (SUB 5), (WAQ 19), (WAQ 5), (WILD 1)
DiMarchi, Jack	(ANIL 13)
Diumenti, John	(SER 1)
Donhauser, Louise	(NSB 1)
Donlin Gold, LLC Foo, Stan	(ANIL 1), (ANIL 10), (ANIL 11), (ANIL 12), (ANIL 13), (ANIL 14), (ANIL 2), (ANIL 3), (ANIL 5), (ANIL 6), (ANIL 7), (ANIL 8)
Donlin Gold LLC Weglinski, Gene	(AIQ 7), (AIQ 9), (ANIL 6), (BARG 11), (BARG 12), (BARG 17), (BARG 4), (BARG 5), (BARG 6), (BARG 7), (BARG 8), (BARG 9), (BIRD 3), (BIRD 5), (CLA 12), (CLA 17), (CLA 22), (CLA 23), (CLA 29), (CLA 30), (CLA 32), (CLA 8), (CLIM 13), (CLIM 2), (CLIM 6), (CUL 1), (CUL 3), (CWA 2), (DAM 9), (EDIT 2), (EDIT 3), (EDIT 4), (EDIT 5), (EDIT 6), (EDIT 7), (EJ 4), (EJ 5), (EJ 9), (FISH 14), (FISH 2), (FISH 3), (FISH 5), (FISH 6), (FISH 7), (FISH 8), (FISH 9), (FSR 1), (FSR 11), (FSR 15), (FSR 4), (FSR 5), (FSR 6), (FSR 7), (FSR 8), (GEO 1), (GEO 11), (GEO 4), (GEO 5), (GEO 6), (GRD 10), (GRD 13), (GRD 6), (GRD 8), (HYD 1), (HYD 10), (HYD 11), (HYD 5), (HYD 6), (HYD 7), (HZM 10), (HZM 14), (HZM 15), (IDIT 4), (LAND 10), (LAND 11), (LAND 8), (LEG 1), (LEG 4), (MIT 17), (MIT 2), (MIT 4), (MIT 6), (MON 1), (MON 10), (NEP 3), (NEP 4), (NEP 5), (NEP 7), (NOI 2), (NSB 1), (PAA 18), (PAA 24), (PAA 3), (PAA 31), (PAA 46), (PAA 5), (PAA 7), (PAA 9), (PHL 10), (PHL 13), (PHL 14), (PHL 15), (PHL 16), (PHL 17), (PHL 19), (PHL 2), (PHL 21), (PHL 3), (PHL 5), (PHL 8), (PHL 9), (PUB 2), (PUB 5), (REC 4), (REC 5), (REC 9), (SER 10), (SER 11), (SER 17), (SER 26), (SER 27), (SER 28), (SER 30), (SOL 1), (SOL 10), (SOL 11), (SOL 13), (SOL 2), (SOL 3), (SOL 5), (SOL 6), (SUB 1), (SUB 10), (SUB 11), (SUB 14), (SUB 15), (SUB 16), (SUB 18), (SUB 19), (SUB 20), (SUB 7), (SUB 8), (TRAN 2), (TRAN 5), (TWL 5), (VEG 4), (VIS 1), (VIS 3), (WAQ 10), (WAQ 11), (WAQ 12), (WAQ 19), (WAQ 22), (WAQ 23), (WAQ 24), (WAQ 27), (WAQ 28), (WAQ 29), (WAQ 4), (WAQ 6), (WAQ 7), (WAQ 8), (WET 1), (WET 2), (WET 5), (WET 6), (WILD 6), (WILD 7), (WILD 8)
Doshier, Ronald R.J.H. Inc.	(IDIT 2), (SER 13), (SER 2)
Doyle, Karen	(SER 5), (SER 8)
Doyon, Limited Obed, Sarah	(SER 2)
Dufendach, Curt	(SER 4), (SVE 1)

Commenter	Statements of Concern
Durrant, Tom	(NSB 1)
Dyment, Hugh	(PHL 3), (SER 11)
Earthjustice Heisler, Peter	(BER 7), (CLIM 1), (CLIM 10), (CLIM 12), (CLIM 3), (CLIM 8), (CWA 3), (CWA 4), (CWA 5), (DAM 3), (DAM 5), (GRD 1), (GRD 12), (GRD 16), (GRD 17), (GRD 2), (GRD 3), (GRD 4), (GRD 5), (GRD 6), (GRD 8), (HYD 7), (HYD 9), (IDIT 10), (IDIT 6), (IDIT 7), (IDIT 9), (LAND 13), (MIT 21), (MIT 29), (MIT 31), (MIT 7), (NEP 1), (NEP 6), (NHPA 2), (PAA 14), (PAA 15), (PAA 27), (PAA 32), (PAA 9), (SUB 12), (SUB 21), (SUB 4), (WAQ 10), (WAQ 11), (WAQ 20), (WAQ 9), (WILD 5)
Earthjustice Saunders, Sarah	(DATA 1)
Earthworks Gestring, Bonnie	(NEP 1)
Earthworks, Alaska Community Action on Toxics, Northern Alaska Environmental Center, The Wilderness Society, Southeast Alaska Conservation Council, Inside Passage Waterkeepers, Cook Inletkeeper, Friends of Alaska National Wildlife Refuges Gestring, Bonnie	(AIQ 6), (BER 2), (BER 4), (BER 6), (BER 7), (BIRD 4), (CLA 3), (CLA 32), (CLA 4), (CLIM 4), (CWA 1), (DAM 2), (DAM 3), (DAM 4), (DAM 6), (DAM 8), (FISH 10), (FISH 11), (FSR 11), (FSR 13), (FSR 15), (FSR 17), (GEO 3), (GEO 5), (GRD 7), (HYD 12), (LAND 10), (LAND 2), (MIT 16), (MIT 2), (MIT 20), (MIT 27), (MIT 28), (MIT 3), (MIT 33), (MIT 4), (MON 11), (NEP 1), (NEP 6), (PAA 14), (PAA 16), (PAA 22), (PAA 46), (PAA 9), (PHL 10), (PHL 11), (PHL 12), (PHL 13), (PHL 16), (PHL 17), (PHL 19), (PHL 6), (PHL 8), (SER 23), (SOL 3), (SUB 10), (SUB 19), (WAQ 10), (WAQ 21), (WAQ 25), (WAQ 27), (WAQ 28), (WAQ 29), (WAQ 9), (WILD 3), (WILD 4), (WILD 5)
Edison Jr., John	(SUB 1)
Egnaty, Lorraine	(SER 5)
Ekamrak, Carl	(PHL 1), (WAQ 18)
Eklund, Jereme	(NSB 1)
Ellis, Mike	(IDIT 8), (NSB 1)
Enos, Robert (Nick)	(NEP 3), (SER 1), (SER 5)
Epchook, Chariton	(FISH 5), (SUB 15)
Epchook, Tanya	(SUB 1)
Erickson, Bryce Orion Marine Group, Inc.	(SER 12)
Erkmann, Sarah	(SER 2)
Eshleman, Michael	(BER 5), (NEP 5)

Commenter	Statements of Concern
Esparza, Dan Tunista Construction LLC	(AIQ 1), (GAS 1), (GAS 3), (MIT 9), (PUB 2), (PUB 6), (SER 1), (SER 11), (SER 12), (SER 13), (SER 15), (SER 2), (SER 24), (SER 5), (SVE 1)
Estes, Chad BDO	(SER 1)
Evan, Johnny Calista Corporation Board	(SER 11), (SER 2), (SER 6)
Evan, Laura	(SUB 17)
Evan, Morris	(SER 6)
Fagnani, Laurie MSI Communications	(SER 4), (SVE 1)
Fairbanks, Grant	(AIQ 1), (AIQ 2), (AIQ 6), (BARG 11), (BER 1), (BER 3), (BER 5), (BER 9), (BIRD 3), (DAM 4), (DATA 1), (FISH 5), (GEO 10), (GEO 2), (HYD 7), (HZM 5), (MIT 1), (MIT 28), (NEP 1), (PAA 10), (PAA 23), (PAA 8), (PHL 16), (PHL 19), (PHL 2), (PUB 4), (SER 22), (SER 7), (TWL 4), (WAQ 18), (WAQ 8)
Fairweather LLC Leary, Linda	(SER 5)
Fairweather LLC Fox, Rick	(SER 18)
Fellman, Lukas NC Machinery Co.	(IDIT 1), (LAND 1), (SER 15)
Ferris, Michael Alaska Enterprise Solutions	(SER 4)
Flagon, Andrew	(IDIT 1), (LAND 1), (SER 15)
Fox, Elizabeth	(HZM 2), (SUB 15), (TWL 1)
Friday, David	(BARG 8), (BIRD 3), (DAM 8), (PHL 3), (SUB 17)
Gabrielsen, Steve	(SVE 1)
Gagne, Scott	(NSB 1)
Gall, Rochelle	(SER 2)
Gallavan, Charles Tunista Construction, LLC	(SVE 1)
Gamache, Susan	(GAS 1), (LAND 1), (PUB 6), (SER 12), (SER 5), (SVE 1)

Commenter	Statements of Concern
Ganguli, Rajive	(SER 4)
Garlock, Bruce	(SVE 1)
George, Moses	(NSB 1)
Geraghty, Michael Oles Morrison Rinker & Baker, LLP	(SER 5)
Gerondale, Chad Construction Machinery Industrial, LLC	(SER 5)
Gerondale, Ken Construction Machinery Industrial, LLC	(SER 5)
Giessel, Cathy AK Senate	(LAND 1), (PUB 6), (SER 2), (SER 4), (SER 5)
Gilila, David	(BARG 8), (WILD 1)
Gillam, John	(SER 5)
Glavinovich, Paul Minerals Consultant	(SVE 1)
Gohlke, Karl Mechanical Contractors of Fairbanks	(NSB 1), (SER 11), (SER 2), (SER 8)
Golden Alaska Excavating, LLC Ryser, Rick and Lori	(SER 1), (SER 12), (SER 5)
Grabacki, Stephen GRAYSTAR Pacific Seafood, Ltd.	(GAS 1), (SER 1), (SER 11), (SER 2), (SER 8)
Gray, Kimberley Associated General Contractors of Alaska	(SER 2), (SUB 18)
Greater Fairbanks Chamber of Commerce Herbert, Lisa	(SER 5)
Grey, Howard	(NSB 1)
Grzenkowicz, Sophie	(NSB 1)
Hall, Alex	(SER 5)
Hall, Ken	(PUB 6), (SER 5)
Halloran, Jim	(SVE 1)

Commenter	Statements of Concern
Hamilton, Sieglinda	(NSB 1)
Hanson Industries, Inc. Boyle, Robert	(SER 19)
Hanson, Kathy	(BER 6), (FISH 6), (NSB 1), (PHL 18), (SER 16), (SER 7), (SUB 16)
Hartshorn-Anderson, Ruth	(AIQ 1), (DAM 2), (DAM 3), (HZM 8), (WAQ 8)
Hawley, William Ted	(ANIL 3), (SER 4), (SVE 1), (TWL 4)
Heath, Aaron	(IDIT 1), (LAND 1), (SER 15)
Heath, Charles	(SER 5)
Heckman, Walter	(HZM 2)
Hecla Greens Creek Mining Co. Satre, Mike	(PAA 3), (PAA 46), (SER 5)
Hedderly-Smith, Davie	(SER 2)
Hegarty Lammers, Kelley	(SER 5)
Heisler, Jean	(PAA 39)
Herman, Cindi, and Torkelson, Mark	(IDIT 2), (SER 4)
Herman, Jason	(IDIT 1), (LAND 1), (SER 15)
Hoffman, Beverly	(FISH 6), (SUB 1), (SVE 3), (TRAN 1), (TWL 1)
Holland, Michelle Holland Roofing Co., Inc	(NSB 1)
Hood, Russell	(IDIT 6), (VIS 1)
Houle, Larry	(MIT 9), (SER 11), (SVE 1), (WAQ 8)
Hubbard, Susan	(NEP 1)
Huffington, Mark	(SER 18), (SER 4)
Hughes, Richard H2T Mine Engineering Services, LLP	(SER 13), (SER 18), (SER 4), (SER 5)
Hunter, Leslie	(NSB 1)
Hupprich, Fred	(SER 12), (SER 13), (SER 18), (SER 2), (SER 4)
Iditarod Historic Trail Alliance	(IDIT 12), (IDIT 6), (IDIT 7), (IDIT 9), (NEP 1), (PAA 32)

Commenter	Statements of Concern
Larnon, Erin	
Iditarod Trail Committee Baker, Andy	(IDIT 2), (SUB 9)
Iditarod Trail Committee Hooley, Stan	(IDIT 1), (IDIT 2), (PAA 3)
Imholte, Jane	(CLIM 5)
Indian Child Welfare Organized Village of Kwethluk	(FISH 5)
Iron Dog, Inc. Beckham, Marianne	(IDIT 4)
Jaffa, Bruce	(IDIT 6), (PAA 32), (VIS 2)
Jago Contracting & Management LLC. Egger, Patrick	(GAS 1), (IDIT 2), (NEP 4), (PUB 6), (SER 4)
James, Nick	(NSB 1)
Japhet, Bobby	(PUB 6), (SER 5), (SVE 1)
Jensen, Mike	(IDIT 8), (NEP 1), (PAA 39)
Jesperson, Michael	(GAS 1), (IDIT 2), (SER 10), (SER 2)
Johansson, Ronny	(SUB 2), (SVE 1)
Joseph, Allen	(DAM 2), (MIT 30), (MON 13)
Joshua, Stephen	(NSB 1)
Kachemak Bay Conservation Society Stearns, Jim	(BER 7), (CLIM 10), (DAM 3), (FSR 2), (MIT 5), (NEP 5), (NEP 6), (PAA 1), (SER 22), (WAQ 20)
Kaiser, Mary	(NSB 1)
Kameroff, Joanne	(BER 3), (FSR 1), (SUB 15)
Kamerof, Marie	(NSB 1)
Kameroff, Nicholas	(SER 13)
Kameroff, Wassily	(PHL 3)
Kari, James Alaska Native Language Center	(CUL 2), (LAND 18), (PUB 5)
Kasayulie, Willie	(ANIL 2), (ANIL 3), (LEG 2), (PAA 4), (PAA 7), (PHL 3), (SUB 2), (SER 11), (SER 8), (SUB

Commenter	Statements of Concern
	8), (SUB 18), (SUB 23), (TWL 4), (WAQ 8)
Kasigluk, Inc. White, Moses	(CLIM 5), (DAM 7), (FSR 2), (MIT 5), (SER 17), (SVE 6)
Kavanagh, Kathleen	(FISH 4)
Khadjinova, Rada	(NSB 1)
Knik Tribal Council Charles, Bob	(MIT 21), (MIT 7), (NEP 1), (PAA 11), (WET 3), (WET 4)
Knoll, Lucy Elaine	(SER 10)
Knowles, James	(NSB 1)
Kokowski, Raymond Taiga Mining Company, Inc.	(IDIT 1), (LAND 1), (SER 15)
Kuhne, Kurt	(NSB 1)
Kuskokwim River Watershed Council Cannon, Dave	(ANIL 16), (CLA 5), (FISH 8), (FSR 1), (SER 14), (TRAN 2), (WAQ 10), (WAQ 18), (WAQ 28)
Laborers' Local 341 Merrick II, A.J.	(IDIT 2), (LAND 1), (PUB 6), (SER 12), (SER 20)
Lake, Bryce	(LAND 3), (WILD 1)
Lamborn, John	(NSB 1)
Lane, Richard	(IDIT 1), (LAND 1), (SER 15)
Lang, Billy	(WAQ 6)
Laraux, Colleen	(PHL 8), (SER 12), (SER 5)
Larimer, Dave Sumitomo Metal Mining Pogo LLC	(SER 12)
Lawrence, Frank	(SVE 2)
Leavens, Alex	(SER 6), (SER 8)
Lebegue, Jeff	(NSB 1)
Lerch, Klaus	(DAM 8), (SVE 2)
Liebing, Mike	(GAS 1), (SER 8)
Lindley, Theodore	(SER 10)

Commenter	Statements of Concern
Liu, Barbara	(SVE 4)
Logan, Rebecca Alaska Support Industry Alliance	(SER 1)
Longpre, Carrie	(SVE 6), (WAQ 11)
Lopetrone, Bob	(HAB 1), (PAA 3), (PHL 3), (SER 4)
Lucas, Joe	(SER 1), (SER 18), (SER 2), (SER 5)
Luke, Marlis	(NSB 1)
Lyman, Specer	(NSB 1)
Lynden, Inc. Stauffer, Larry	(BARG 5), (TRAN 5)
MacKinnon, Neil	(SER 18), (TRAN 5)
Manke, Kris	(SER 11), (SER 18), (SER 20), (SER 5), (SER 8)
Manning, JIm	(SER 18)
Marino, Tyson	(NSB 1)
Marquez, Jess	(IDIT 1), (LAND 1), (SER 15)
Martinez, Mary Calista Corporation	(SER 6), (SVE 1)
Mass Excavation, Inc. Erickson, Mark	(SER 12)
Mathiesen, Jaysen M-Alaska Construction, LLC	(SER 5)
McCallson, Zoey	(FISH 9), (PHL 18), (SER 27), (TWL 1)
McCargo, David	(BER 3), (BER 4), (BER 5), (CLIM 4), (FSR 5), (GAS 6), (LAND 3), (LAND 7), (NEP 1), (PAA 38), (RME 1)
Meurlott, Vince Meurlott Consulting, Inc.	(NSB 1)
Meyer, Kevin Alaska State Legislature	(SER 2)
Michaels, Paul	(IDIT 1), (LAND 1), (SER 15)

Commenter	Statements of Concern
Miller, Mike	(IDIT 2), (SER 5), (TWL 4)
Miller, Timothy Miller Construction Co.	(SER 15), (SER 5)
Milne, Clark	(IDIT 2), (PAA 3), (PAA 4), (PAA 46), (SER 2)
Moderow, Debbie	(IDIT 6), (SVE 6)
Molyneaux, Douglas	(ANIL 16), (ANIL 4), (BER 7), (CLA 32), (CLA 6), (CLIM 1), (DAM 4), (DAM 6), (DAM 8), (FISH 6), (FISH 8), (HZM 2), (SVE 2), (TRAN 2), (WAQ 8)
Monet, Leisha	(HZM 2), (SVE 2)
Morgan, James	(SVE 4)
Moses, Christopher	(IDIT 1), (LAND 1), (SER 15)
Moses, Eric	(PHL 10), (SER 5)
Mrochinski, Mary Jo	(NSB 1)
MSI Communications Fagnani, Laurie	(SER 11), (SER 18)
Munoz, Cathy	(SER 5)
Munoz, Cathy State Capitol	(NSB 1)
Myers, David STG Incorporated/Alaska Crane	(SER 11), (SER 5)
NANA Regional Corporation Westlake, Wayne	(SER 18), (SER 2)
Native Village of Napaimute Gillikin, Dan	(CLIM 10), (CLIM 8), (DAM 3), (DAM 5), (FISH 11), (FISH 2), (FISH 3), (GRD 1), (GRD 12), (GRD 16), (GRD 17), (GRD 2), (GRD 3), (GRD 4), (GRD 5), (GRD 6), (GRD 8), (GRD 9), (HYD 7), (HYD 9), (LAND 7), (LEG 5), (MIT 31), (NEP 1), (NEP 6), (PAA 14), (PAA 27), (PAA 9), (SUB 21), (WAQ 10), (WAQ 11), (WAQ 20)
Native Village of Napaimute Leary, Mark	(AIQ 1), (DAM 3), (PAA 23), (PAA 8), (SVE 1), (WAQ 8)
Native Village of Napakiak Paul, Nicholas	(NEP 1), (TWL 1)
Native Village of Nunapitchuk Pleasant, Wassilie	(PHL 16), (SUB 1), (SUB 15)

Commenter	Statements of Concern
Native Village of Tununak Hooper Jr, George	(MON 9), (PHL 4), (SER 7), (SUB 15), (SUB 17)
Negtemiut Tribal Council Tulik, Simeon	(MON 9), (PHL 4), (SER 7), (SUB 15), (SUB 17)
Nelius, Eric	(BARG 5), (MIT 15)
Nerby, Bruce	(SVE 3)
Neth, Shari	(FISH 6), (FSR 1), (FSR 2), (GAS 6)
Neth, Sharon	(CLIM 5), (GAS 6), (MIT 30)
Nieuwenhuyse, Rick Arctic Airships	(SER 1)
Noble, Steven	(SER 4)
North Star Equipment Services Vierra, Scott	(SER 12), (SER 13), (SER 18)
Northern Alaska Environmental Center Dabney, Elisabeth	(AIQ 6), (BER 2), (BER 4), (BER 6), (BER 7), (BIRD 4), (CLA 3), (CLA 32), (CLA 4), (CLIM 10), (CLIM 4), (CLIM 8), (CWA 1), (DAM 2), (DAM 3), (DAM 4), (DAM 5), (DAM 6), (DAM 8), (FISH 10), (FISH 11), (FSR 11), (FSR 13), (FSR 15), (FSR 17), (GEO 3), (GEO 5), (GRD 1), (GRD 12), (GRD 17), (GRD 2), (GRD 3), (GRD 4), (GRD 5), (GRD 6), (GRD 7), (GRD 8), (HYD 12), (HYD 7), (HYD 9), (LAND 10), (LAND 2), (MIT 16), (MIT 2), (MIT 20), (MIT 27), (MIT 28), (MIT 3), (MIT 31), (MIT 33), (MIT 4), (MON 11), (NEP 1), (NEP 6), (PAA 14), (PAA 16), (PAA 22), (PAA 27), (PAA 46), (PAA 9), (PHL 10), (PHL 11), (PHL 12), (PHL 13), (PHL 16), (PHL 17), (PHL 19), (PHL 6), (PHL 8), (SER 23), (SOL 3), (SUB 10), (SUB 19), (WAQ 10), (WAQ 11), (WAQ 20), (WAQ 21), (WAQ 25), (WAQ 27), (WAQ 28), (WAQ 29), (WAQ 9), (WILD 3), (WILD 4), (WILD 5)
NOVAGOLD RESOURCES ALASKA Inc. Deisley, David	(BARG 6), (BARG 9), (EJ 4), (FISH 6), (LAND 1), (LAND 12), (LAND 6), (NEP 3), (NEP 7), (PHL 3), (PUB 5)
Oberts, Ed	(LAND 4)
Operating Engineers, Local 302 Alward, Jason	(PAA 4), (PAA 5), (SER 5), (SVE 1)
Orutsararmiut Native Council Jim, Walter	(BARG 10), (SUB 16)
Oscar, John	(INV 1)
Oscar, John Kuskokwim River Watershed Council	(NSB 1)

Commenter	Statements of Concern
Owl Ridge Natural Resource Consultants, Inc. Ruckhaus, Glenn	(BARG 13), (GAS 1), (NEP 7), (SER 15)
Owletuck, George	(GAS 2), (PAA 38), (SER 14), (SUB 23)
Partnow, Patricia	(PUB 2), (SER 15)
Patrick, Judy Judy Patrick Photography	(SER 10)
Pebble Partnership Heatwole, Mike	(SER 1)
Peirce, Kellie	(HAB 1), (LAND 5), (PHL 14), (SUB 8), (SVE 5), (VIS 1), (WILD 1)
Peloza, Amy	(IDIT 2), (SER 1), (SER 11), (SER 2), (SER 5)
PenAir Seybert, Danny	(NSB 1)
Perrins, Steven	(PAA 28), (SER 29), (WILD 2)
Peters, Mike	(SER 5)
Pilot Station Traditional Council Kelly, Elias	(DAM 9), (G2G 2), (GEO 6), (MIT 24), (MIT 25), (MIT 29), (MIT 30), (PAA 51), (PAA 52), (PUB 4), (SOL 8)
Pipeline and Hazardous Materials Safety Administration (US Department of Transportation) Nanney, Steve	(CLA 2)
Pitchler, Ron	(BER 4), (GAS 6), (SER 3)
Podolak, Mike	(NSB 1)
Poffenberger, Dwight	(BIRD 3)
Porterfield, Ben	(NSB 1)
Post, Steve North Star Equipment Services	(SER 12), (SER 5)
Prince, Charles	(BARG 10), (DAM 7), (FISH 5), (FSR 1), (MON 3), (SUB 15)
PT Capital, LLC Lukin, Sarah	(SER 4)
Public, Jean	(HZM 2)
Puchlik, Ken	(SER 5)

Commenter	Statements of Concern
Quillman, Donald	(NSB 1), (SVE 1)
Raphael, Melissa	(TWL 1)
Rasmussen, Jack Bering Marine Corp	(NSB 1)
Rearden, Don	(SVE 4)
Renfro, Wade Renfro's Alaskan Adventures	(SER 5)
Resource Development Council Hall, Marleanna	(GAS 1), (LAND 1), (SER 1), (SER 11), (SER 15), (SER 2), (SER 8), (SVE 1)
Revet, Margie	(FISH 9), (SVE 6)
Robinson, Robert	(NEP 5), (SER 5)
Rogers, Rick	(GAS 1), (SER 1), (SER 5), (SER 6)
Ross, Victor	(NSB 1)
Ryan Air Mark, Cline	(SER 11), (SER 2)
Ryan Air Ryan, Wilfred	(SER 11)
Salazar, Tony	(SER 4)
Salley, Bruce	(DAM 2), (FISH 5), (MON 12), (SVE 2)
Sam, Darlene	(IDIT 1), (LAND 1), (SER 15)
Samson, Debra	(FISH 4), (FISH 5), (SUB 15)
Schaub, Hank	(SVE 1)
Schok Jr., Genevieve Flowline Alaska	(GAS 1), (IDIT 2), (SER 5)
Scott, Thomas STG Incorporated	(SER 10), (SER 5)
Seward Iditarod Trail Blazers Sewall, Linda	(IDIT 8)
Shelden, Alfred	(SER 5)

Commenter	Statements of Concern
Shibe, Neil Motion & Flow Control Products Inc.	(SER 12)
Shively, John	(GAS 1), (SER 5)
Siira, Daniel Latitude 61 Technologies	(SER 4)
Simeon, Gloria	(AIQ 1), (BARG 12), (BER 7), (DAM 7), (EJ 1), (HAB 1), (LAND 3), (MON 12), (PHL 16), (SUB 13), (SVE 2), (WAQ 8), (WILD 2)
Simeon, Marce	(FSR 7), (PUB 2), (SER 5), (SVE 1)
Simon, Lorali	(IDIT 2), (PAA 3), (PHL 2)
Slats, Kenlynn	(DAM 8), (FSR 1), (PHL 16), (SER 3), (SUB 15), (TWL 1)
Smith, Albert	(SVE 4)
Smith Jr., Dennis	(IDIT 1), (LAND 1), (SER 15)
Snider, Dave	(SUB 15)
Snow, Patrick	(WAQ 20)
SolstenXP Inc. Mohrbacher, Jesse	(GAS 1), (IDIT 2), (NEP 4), (PUB 6), (SER 4)
Stamps, Bill	(SER 5)
State of Alaska Bruno, Jeff; Office of Bill Walker	(AIQ 5), (AIQ 7), (BER 10), (BER 11), (CLA 11), (CLA 17), (CLA 21), (CLA 24), (CLA 25), (CLA 28), (CLA 29), (CLA 31), (CLA 7), (CLA 8), (CLA 9), (CLIM 2), (DAM 9), (EDIT 1), (EDIT 3), (EDIT 4), (EDIT 5), (EDIT 7), (EDIT 9), (FISH 1), (FISH 10), (FISH 13), (FISH 15), (FISH 2), (FISH 6), (FISH 7), (FSR 10), (GEO 12), (GEO 2), (GEO 3), (GRD 14), (HAB 1), (HYD 1), (HYD 5), (IDIT 3), (LAND 15), (MIT 19), (MIT 24), (MIT 31), (MIT 4), (MIT 9), (NEP 8), (NOI 1), (NSB 1), (PHL 12), (PHL 13), (PHL 2), (PHL 20), (PHL 21), (PHL 3), (PHL 5), (PUB 6), (SER 17), (SER 5), (SOL 1), (SOL 10), (SOL 2), (SOL 6), (SUB 19), (VEG 3), (WAQ 16), (WAQ 23), (WAQ 24), (WAQ 27), (WAQ 29), (WILD 1), (WILD 6)
State of Alaska Walker, Bill	(PUB 1), (PUB 6), (SER 2), (SER 5)
State of Alaska ADNR-SHPO Bittner, Judy	(CUL 4)
Steinacher, Sue	(DAM 2), (SVE 2)
Stevens, Carolyn	(PHL 3), (SER 10), (SER 18)

Commenter	Statements of Concern
Stevens, Robert H	(GAS 1), (GAS 4), (PAA 4)
Stewman, Janine	(SER 5)
Stewman, Raven	(SER 24)
Strickland, Aaron	(IDIT 1), (LAND 1), (SER 15)
Strickland, Gina	(IDIT 1), (LAND 1), (SER 15)
Summers, Jordan STG Incorporated	(GAS 1), (SER 5), (SER 8)
Summit Logistics Repasky, Michael	(SER 4)
Swanson, Carrie	(PHL 3), (SER 5)
Swoffer, Gary Denali Industrial Supply, Inc.	(SER 5)
Swope, Dean	(SER 15)
Szumigala, David	(SVE 1)
Taiga Resources Conservation Fithian, Robert	(CLIM 4), (DATA 1), (FISH 1), (FISH 16), (GEO 2), (HYD 10), (HYD 12), (LAND 5), (PAA 24), (PAA 37), (PUB 1), (PUB 4), (SER 29), (SOL 8), (SVE 5), (TWL 1), (TWL 2), (WILD 1)
Tanana Chiefs Conference Sattler, Robert	(BARG 8), (CUL 2), (FISH 5), (FISH 6), (G2G 1), (LAND 3), (MON 11), (PAA 24), (PUB 1), (SER 5), (SUB 8), (TWL 4)
Teller, Steve	(SER 5)
Tetoff III, Logan	(CLIM 3), (DAM 2), (FSR 1), (FSR 2), (TRAN 1), (TWL 3)
The Kuskokwim Corporation Carvey, Maver	(BARG 18), (BIRD 1), (BIRD 3), (BIRD 6), (EDIT 4), (EDIT 7), (EJ 9), (FISH 11), (FISH 15), (FISH 6), (FISH 7), (HYD 4), (LAND 8), (NEP 4), (PHL 19), (PHL 3), (PHL 7), (PHL 8), (PUB 6), (REC 2), (REC 7), (REC 8), (SER 1), (SER 11), (SER 13), (SER 14), (SER 15), (SER 2), (SER 24), (SER 28), (SER 5), (SUB 11), (SUB 19), (SUB 4), (SVE 1), (WAQ 29), (WAQ 9), (WILD 3), (WILD 4), (WILD 6), (WILD 8)
Thomsen, Garry Last Frontier Aviation Group	(NSB 1)
Tierney, William M	(IDIT 8)
Tinker, Ray	(SER 15)
Toon, Martha	(NSB 1)

Commenter	Statements of Concern
Torkelson, Mark	(IDIT 2), (SER 4)
Torrance, Keith	(SVE 1)
Tower Hill Mines, Inc. Irwin, Thomas	(SER 5)
Tuel, Charles	(SVE 1)
Tullis, Rochelle	(IDIT 8)
Tuluk, Peter Kashunamiut School District	(SER 5)
Turnagain Marine Construction Davis, Jason	(NSB 1)
Turrentine, Emma	(SUB 1)
Twitchell, Dan	(SER 5)
Unok, Garner	(DAM 2), (NSB 1), (SUB 15), (TWL 3)
US DOI Office of Environmental Policy and Compliance US Fish and Wildlife Service, BLM Johnson, Philip	(AIQ 3), (AIQ 5), (AIQ 7), (AIQ 8), (AIQ 9), (ANIL 9), (BARG 10), (BARG 11), (BARG 12), (BARG 14), (BARG 15), (BARG 16), (BARG 17), (BARG 18), (BARG 8), (BARG 9), (BIRD 1), (BIRD 10), (BIRD 11), (BIRD 12), (BIRD 2), (BIRD 3), (BIRD 5), (BIRD 6), (BIRD 7), (BIRD 8), (BIRD 9), (CLA 10), (CLA 11), (CLA 12), (CLA 13), (CLA 14), (CLA 15), (CLA 17), (CLA 18), (CLA 19), (CLA 20), (CLA 29), (CLA 3), (CLA 30), (CLA 31), (CLA 8), (CLIM 1), (CLIM 13), (CLIM 2), (CLIM 3), (CLIM 7), (CLIM 8), (CLIM 9), (CUL 3), (CUL 4), (CUL 5), (CUL 6), (DAM 1), (DAM 3), (DAM 4), (DAM 5), (DAM 6), (DAM 9), (EDIT 1), (EDIT 3), (EDIT 4), (EDIT 5), (EDIT 6), (EDIT 7), (EDIT 8), (EJ 12), (ESA 1), (ESA 2), (FISH 1), (FISH 10), (FISH 11), (FISH 13), (FISH 14), (FISH 16), (FISH 2), (FISH 3), (FISH 5), (FISH 6), (FISH 7), (FISH 9), (FSR 1), (FSR 12), (FSR 13), (FSR 14), (FSR 15), (FSR 16), (FSR 17), (FSR 18), (FSR 2), (FSR 3), (FSR 5), (FSR 6), (GEO 1), (GEO 3), (GEO 4), (GEO 5), (GEO 7), (GEO 9), (GRD 1), (GRD 10), (GRD 11), (GRD 15), (GRD 17), (GRD 2), (GRD 3), (GRD 4), (GRD 5), (GRD 6), (GRD 7), (GRD 9), (HYD 1), (HYD 11), (HYD 13), (HYD 3), (HYD 4), (HYD 5), (HYD 7), (HYD 8), (HZM 10), (HZM 11), (HZM 12), (HZM 13), (HZM 14), (HZM 16), (HZM 17), (HZM 3), (HZM 4), (HZM 8), (HZM 9), (IDIT 10), (IDIT 11), (IDIT 12), (IDIT 3), (IDIT 5), (IDIT 6), (IDIT 7), (IDIT 9), (INV 3), (INV 4), (INV 5), (LAND 14), (LAND 15), (LAND 16), (LAND 17), (LAND 8), (MIT 10), (MIT 11), (MIT 12), (MIT 13), (MIT 14), (MIT 16), (MIT 19), (MIT 2), (MIT 20), (MIT 24), (MIT 26), (MIT 27), (MIT 28), (MIT 31), (MIT 34), (MIT 4), (MIT 6), (MIT 7), (MIT 9), (MON 10), (MON 13), (MON 4), (MON 5), (NEP 10), (NEP 6), (NEP 7), (NHPA 1), (NOI 2), (PAA 10), (PAA 11), (PAA 13), (PAA 14), (PAA 16), (PAA 19), (PAA 25), (PAA 29), (PAA 31), (PAA 36), (PAA 38), (PAA 40), (PAA 41), (PAA 48), (PAA 54), (PAA 57), (PAA 59), (PAA 61), (PAA 63), (PAA 64), (PAA 9), (PHL 18), (REC 1), (SER 27), (SER 28), (SER 30), (SOL 10), (SOL 11), (SOL 12), (SOL

Commenter	Statements of Concern
	2), (SOL 4), (SOL 5), (SOL 7), (SOL 8), (SUB 11), (SUB 12), (SUB 13), (SUB 15), (SUB 16), (SUB 17), (SUB 19), (SUB 20), (SUB 21), (SUB 24), (SUB 3), (SUB 4), (SUB 8), (TRAN 1), (TRAN 3), (TRAN 5), (VEG 1), (VEG 2), (VEG 3), (VEG 4), (VEG 5), (VIS 3), (VIS 4), (VIS 5), (WAQ 10), (WAQ 11), (WAQ 12), (WAQ 13), (WAQ 14), (WAQ 15), (WAQ 18), (WAQ 2), (WAQ 20), (WAQ 21), (WAQ 22), (WAQ 26), (WAQ 27), (WAQ 28), (WAQ 29), (WAQ 30), (WAQ 4), (WAQ 5), (WAQ 6), (WAQ 7), (WAQ 8), (WAQ 9), (WET 1), (WET 2), (WET 3), (WET 4), (WET 6), (WET 7), (WILD 5), (WILD 6), (WILD 7), (WILD 8), (WILD 9)
US DOI Office of Environmental Policy and Compliance; BLM Thorpe, Laurie	(AIQ 10), (AIQ 7), (CLIM 2), (CLIM 3), (EDIT 1), (EDIT 9)
US DOI Office of Environmental Policy and Compliance; USFWS Cooper, Douglass	(AIQ 11), (BARG 11), (BARG 2), (GRD 1), (GRD 11), (GRD 17), (GRD 2), (GRD 3), (GRD 4), (GRD 6), (MIT 15), (NEP 11), (WAQ 21)
US Environmental Protection Agency Allnutt, R. David	(AIQ 2), (AIQ 3), (BARG 15), (BARG 16), (BARG 17), (BER 10), (BER 11), (BER 12), (BER 8), (CLA 16), (CLA 17), (CLA 26), (CLA 29), (CLA 3), (CLA 30), (CLA 31), (CLA 32), (CLA 33), (CLIM 11), (CLIM 3), (CLIM 4), (CLIM 6), (CLIM 7), (CWA 1), (CWA 4), (CWA 5), (DAM 2), (EDIT 2), (EDIT 3), (EDIT 4), (EDIT 5), (EDIT 6), (EDIT 7), (EJ 3), (EJ 8), (FISH 12), (FISH 15), (FISH 2), (FISH 3), (FISH 6), (FISH 7), (FISH 9), (FSR 15), (FSR 17), (GEO 13), (GEO 3), (GEO 6), (GRD 10), (GRD 12), (GRD 13), (GRD 14), (GRD 6), (HYD 1), (HYD 12), (HYD 2), (HYD 3), (HYD 4), (HYD 5), (HYD 7), (HZM 1), (HZM 8), (LAND 16), (LEG 3), (LEG 4), (MIT 1), (MIT 16), (MIT 18), (MIT 19), (MIT 2), (MIT 21), (MIT 22), (MIT 23), (MIT 24), (MIT 27), (MIT 28), (MIT 29), (MIT 3), (MIT 31), (MIT 35), (MIT 4), (MIT 7), (MIT 8), (MON 1), (MON 10), (MON 11), (MON 13), (MON 2), (MON 3), (MON 6), (MON 7), (MON 8), (MON 9), (NEP 10), (NEP 5), (NEP 6), (NEP 7), (PAA 14), (PAA 16), (PAA 17), (PAA 19), (PAA 20), (PAA 21), (PAA 22), (PAA 26), (PAA 33), (PAA 38), (PAA 55), (PAA 58), (PAA 60), (PAA 61), (PAA 62), (PAA 65), (PAA 9), (PHL 10), (PHL 12), (PHL 16), (PHL 17), (PHL 18), (PHL 19), (PHL 2), (PHL 20), (PHL 21), (PHL 3), (PHL 5), (PUB 1), (PUB 2), (SER 21), (SER 22), (SER 25), (SER 27), (SER 28), (SOL 1), (SOL 5), (SOL 6), (SOL 7), (SUB 16), (SUB 18), (SUB 19), (SUB 21), (SUB 22), (SUB 8), (TRAN 4), (WAQ 11), (WAQ 12), (WAQ 14), (WAQ 15), (WAQ 20), (WAQ 21), (WAQ 22), (WAQ 25), (WAQ 26), (WAQ 29), (WAQ 3), (WAQ 4), (WAQ 5), (WAQ 8), (WAQ 9), (WET 1), (WET 2), (WET 3), (WET 4), (WET 5), (WET 6), (WET 7), (WET 8)
Vemt, Victor	(IDIT 1), (LAND 1), (SER 15)
Venes, Jeffrey	(NEP 1)
Vezey, Allen	(NSB 1)
Wallace, John	(PAA 10), (PAA 8), (PAA 9), (SER 11), (SER 28)
Walsh, Brennan STG Inc.	(SER 5)

Commenter	Statements of Concern
Walters, Clifford	(SVE 1)
Ward, Jason Security Aviation	(SER 15)
Warden, David	(SUB 8)
Weihs, Larry ESS Support Services Worldwide	(SER 5), (SVE 1)
Western Interior Alaska Subsistence Regional Advisory Council Reakoff, Jack	(FISH 5), (HZM 2), (SUB 1)
Wharton, Merna Lomack	(EJ 7), (TWL 3)
Whitworth, Kevin & Dara	(BARG 1), (BARG 8), (CLIM 10), (CUL 2), (DAM 2), (FISH 13), (FISH 5), (FSR 3), (IDIT 8), (LAND 3), (MIT 19), (PAA 14), (PHL 16), (PHL 18), (REC 6), (SER 14), (SER 29), (SVE 4), (VIS 1), (WAQ 22), (WAQ 8), (WILD 1)
Wiley, Lisa	(NSB 1)
Wilfer, Dennis	(SER 5)
Wilkinson, Stanley	(IDIT 1), (LAND 1), (SER 15)
Williams, Clark	(SER 5)
Williams, Martin	(SVE 1)
Wilmarth, Larry	(NSB 1), (SVE 5)
Wood, John	(IDIT 2), (SER 20)
Wright, David	(IDIT 2), (LAND 1), (SER 12), (SER 18), (SER 2)
Yaska, Patricia	(BARG 1), (BARG 12), (CLIM 9), (FISH 5), (MIT 24), (NOI 2), (PHL 13), (REC 3)
Yukon-Kuskokwim Health Corporation Twitchell, Esai	(MON 9), (PHL 4), (SER 7), (SUB 15), (SUB 17)
Yukon-Kuskokwim Health Corporation Miller, Lloyd; Attorney for YKHC Ray-Hodge, Vanessa; Attorney for YKHC	(AIQ 1), (AIQ 2), (AIQ 3), (BER 7), (CLIM 1), (DAM 1), (DAM 2), (DAM 4), (EJ 10), (EJ 11), (EJ 12), (EJ 13), (EJ 6), (FISH 10), (FISH 2), (FSR 11), (GEO 3), (GRD 1), (GRD 6), (HYD 4), (HZM 9), (MIT 27), (MIT 28), (MON 9), (PHL 16), (RME 2), (WAQ 1), (WAQ 11), (WAQ 17), (WAQ 22), (WILD 5)
Young, Courtney Montana Tech	(NEP 4)
Zappa, Monica	(HZM 2), (SUB 1)

Commenter	Statements of Concern
Zaukar, Timothy	(HZM 8), (PAA 39), (PHL 16), (SUB 5)
Zimmerman, Jr., Tom	(SER 5)

4.2 STATEMENTS OF CONCERN FOR PUBLIC MEETINGS

As discussed in Section 1.0, testimonies at a public meetings and hearings are considered unique submissions. The substantive comments are not broken down by the speaker, but instead each meeting was considered a unique submission and all oral comments during the meeting were included in this submission. Table 3 below is an index of each public meeting (alphabetical by community) and all SOCs that the content of those meetings were assigned.

At most public meetings, the Corps presented the Draft EIS, and then the BLM conducted a separate hearing for the ANILCA Section 810 process. All comments received during the meetings were considered for both the Corps and the BLM permitting processes. In Table 3, the Corps Draft EIS meetings are followed by the BLM ANILCA Section 810 hearings alphabetically by community. Note that the BLM analysis area was slightly different than the Corps analysis area, and so there are some communities that did not have an ANILCA Section 810 hearing.

Table 3. Draft Corps EIS Meetings and ANILCA Section 810 Hearings by Community

Community Meeting	Statements of Concern
Akiak, DEIS Public Meeting	(ANIL 3), (BARG 10), (BARG 3), (BARG 8), (BARG 9), (CLIM 10), (DAM 2), (DAM 8), (FISH 3), (FISH 5), (GAS 6), (LAND 3), (LAND 9), (NEP 1), (PAA 1), (PAA 13), (PAA 45), (PAA 6), (PHL 16), (PHL 3), (PUB 1), (PUB 4), (SER 10), (SER 13), (SER 14), (SER 21), (SER 6), (SUB 15), (SUB 5), (SUB 8), (SVE 1), (SVE 2), (TWL 3), (WAQ 2)
Akiak, 810 Public Hearing	(ANIL 10), (ANIL 15), (ANIL 3), (BARG 12), (CLIM 7), (FISH 10), (FISH 5), (SUB 1), (SUB 15), (SUB 16), (SUB 5), (SUB 6), (SUB 8), (WILD 1)
Anchorage, DEIS Public Meeting	(AIQ 4), (ANIL 3), (BARG 1), (BARG 5), (BER 3), (BER 5), (GAS 1), (HZM 4), (HZM 5), (IDIT 2), (IDIT 4), (MIT 15), (NEP 10), (NEP 4), (PAA 2), (PAA 24), (PAA 4), (PAA 56), (PHL 16), (PHL 2), (PHL 3), (PUB 1), (PUB 2), (SER 1), (SER 10), (SER 12), (SER 15), (SER 18), (SER 2), (SER 20), (SER 21), (SER 27), (SER 29), (SER 4), (SER 5), (SER 8), (SUB 9), (SVE 1), (SVE 5), (SVE 6), (WAQ 2), (WAQ 8)
Anchorage, 810 Public Hearing	(ANIL 14), (ANIL 4), (ANIL 8), (EJ 7), (FISH 5), (FSR 2), (PAA 43), (PHL 12), (PHL 16), (PUB 3), (SER 11), (SER 16), (SER 8), (SUB 15), (SUB 18), (SUB 8), (TWL 1), (TWL 4)
Aniak, DEIS Public Meeting	(BARG 1), (BARG 12), (BARG 18), (BARG 3), (DAM 3), (DAM 7), (DAM 8), (FISH 10), (FISH 5), (FSR 1), (FSR 3), (HZM 4), (MIT 15), (MIT 21), (NEP 1), (PAA 30), (PAA 8), (PUB 5), (SER 13), (SER 14), (SOL 8), (SUB 10), (SVE 6), (WAQ 18), (WAQ 8), (WILD 2)
Aniak, 810 Public Hearing	(BARG 11), (FISH 5), (FISH 8), (FSR 5), (GAS 6), (LEG 1), (PUB 4), (SUB 10), (SUB 18)
Bethel, DEIS Public Meeting	(AIQ 1), (AIQ 2), (AIQ 6), (BARG 11), (BER 1), (BER 3), (BER 5), (BER 6), (BER 9), (BIRD 3), (DAM 7), (FISH 12), (FISH 5), (FSR 2), (FSR 5), (GAS 1), (GEO 10), (GEO 2), (HYD 7), (HZM 4), (HZM 5), (INV 1), (MIT 1), (MIT 28), (NEP 1), (PAA 1), (PAA 10), (PAA 23), (PAA 31), (PAA 8), (PHL 16), (PHL 19), (PHL 2), (PUB 4), (SER 10), (SER 13), (SER 15), (SER 2), (SER 22), (SER 23), (SER 7), (SUB 1), (SVE 1), (SVE 3), (TRAN 5), (TWL 4), (WAQ 18), (WAQ 8)

Community Meeting	Statements of Concern
Bethel, 810 Public Hearing	(BARG 1), (BER 5), (DAM 2), (NEP 1), (PUB 4), (SER 21), (SUB 1), (SVE 2), (TRAN 2), (TWL 1), (TWL 3), (WAQ 20)
Chuathbaluk, DEIS Public Meeting	(AIQ 1), (BARG 12), (BARG 16), (FISH 6), (FSR 2), (GAS 3), (HZM 4), (MIT 15), (NEP 1), (PAA 3), (PAA 8), (PUB 1), (REC 3), (SER 16), (SUB 1), (SUB 20), (SVE 1), (TRAN 1), (TRAN 5), (WILD 2)
Chuathbaluk, 810 Public Hearing	(AIQ 1), (SUB 6)
Crooked Creek, DEIS Public Meeting	(BIRD 3), (DAM 2), (DAM 7), (DAM 8), (FISH 9), (HYD 4), (MIT 22), (PAA 10), (PUB 1), (SUB 6), (TWL 3)
Crooked Creek, 810 Public Hearing	(AIQ 1), (FISH 10), (SUB 15), (SUB 18), (SVE 1), (TWL 4), (WAQ 8)
Emmonak, DEIS Public Meeting	(AIQ 1), (PAA 42), (PAA 44), (PHL 18), (PUB 1), (SER 13), (SUB 15)
Holy Cross, DEIS Public Meeting	(GRD 6), (HYD 4), (WAQ 18)
Holy Cross, 810 Public Hearing	(AIQ 1), (FISH 9), (SUB 5), (WILD 2)
Hooper Bay, DEIS Public Meeting	(FISH 10), (HZM 5), (SER 13)
Kipnuk, DEIS Public Meeting	(FISH 5), (FISH 9), (NEP 7), (PAA 13), (PHL 16), (PUB 1), (SUB 17), (WILD 2)
Lower Kalskag, DEIS Public Meeting	(BARG 12), (FISH 5), (GAS 1), (SER 14), (SUB 18)
Lower Kalskag, 810 Public Hearing	(ANIL 16)
McGrath, DEIS Public Meeting	(BARG 8), (FISH 13), (GAS 2), (HAB 1), (HZM 5), (INV 1), (MON 11), (NEP 4), (PAA 24), (PAA 6), (PUB 1), (REC 1), (SUB 5), (SVE 1), (SVE 6), (VIS 1), (WILD 1), (WILD 2)
McGrath, 810 Public Hearing	(PAA 24), (PAA 43), (WILD 1)
Nunapitchuk, DEIS Public Meeting	(ANIL 3), (FISH 10), (FISH 16), (HYD 8), (PHL 16), (SER 10), (SER 13), (SER 2), (SVE 1)
Nunapitchuk, 810 Public Hearing	(FISH 16), (MIT 24), (SUB 4)
Quinhagak, DEIS Public Meeting	(AIQ 1), (BER 1), (BER 2), (DAM 8), (FISH 12), (FISH 6), (FSR 1), (GAS 1), (HZM 5), (MIT 27), (NEP 1), (PAA 10), (PAA 34), (PHL 16), (PHL 3), (PHL 9), (PUB 1), (RME 1), (SER 21), (SER 5), (SER 6), (SUB 15), (SUB 8), (SVE 1), (SVE 2), (WILD 2)
Quinhagak, 810 Public Hearing	(FISH 10), (NEP 1), (PUB 1), (PUB 5), (SER 23)
St. Mary's, DEIS Public Meeting	(FISH 5), (FISH 6), (PUB 3), (SER 13), (SER 23)
Toksook Bay, DEIS Public Meeting	(FISH 5), (FSR 2), (PHL 3), (SER 2), (SER 5), (TWL 3)
Tyonek, DEIS Public Meeting	(AIQ 1), (FSR 1), (INV 3)
Tyonek, 810 Public Hearing	(AIQ 1), (INV 3), (LAND 3), (PHL 3), (WILD 2)

4.3 STATEMENTS OF CONCERN FOR FORM LETTERS

During the public comment period, the Corps received two petitions, or form letters. These were treated as one submission each with multiple signatories. Table 4 below is an index of each form letter, listing all signatories, and the SOCs that the content of those letters were assigned.

Table 4: Comment Index by Form Letter

Organization and Signers		Statements of Concern
Northern Alaska Center for the Environment		
Wassilie	Carl	(BER 7), (DAM 2), (DAM 3), (DAM 4), (DAM 6), (DAM 8), (EJ 7), (MIT 29), (NSB 1), (SUB 1), (SVE 3)
Carney	Doug	
Steinacher	Sue	
Diehl	Rainy	
Molyneaux	Douglas	
Waldo	Tom	
Stey	Martha	
Moodie	P	
North	Susan	
Mickley	Julia	
Lanigan	Mary	
Banks	Allison	
Johnson	Larry	
Brookman	Gerald	
Astalos	Ryan	
Sprinkle	Sue	
Zalar	Mary	
Rabener	Nancy	
Holmquist	Kirsten	
Grage	Sven	
Fairbanks	Grant	
McEachern	Diane	
Newhouse	Linda	
Fox	Andrea	
Lambeth	Cathy	
Henkin	Alice	
Mjos	Brita	
Carlson	Barbara	
Angstman	Myron	
Matthias	Mary	
Williams	Frank	
Thornton	Jessica	
Turner	Stacy	
Stagman	Robert	
Boelens	Adrian	
Booton	Eric	
Wilder	Piper	
Gatz	Lyn	

Table 4: Comment Index by Form Letter

Organization and Signers		Statements of Concern
Womble	Stephanie	
Lutz	Robin	
Brown	Mariah	
Teich	Cathy	
Meyer	Benjamin	
Murat	Carmen	
Whittaker	Kara	
McDonald	Colin	
Sorensen	Anna	
Madeco-Smith	Mary	
Hiers	Richard	
Cerretani	Janet	
Weaver	Pamela	
Molyneaux	Bruce	
Marshall	Philip	
Marshall	Janet	
Clayman	Julie	
Wassilie	Sandra	
Kameroff, Jr.	Joe	
Farquharson	Louise	
Figurski	Duncan	
Tony	Agnes	
Alaska Community Action on Toxics		
Stockwell	Rosalie	(SVE 2), (DAM 3)
Thornton	Jessica	
Braun	Susan	
Schake	Katherine	
Farrell	Jim	
John	Anna	
Booton	Eric	
Brookman	Gerald	
Hill	Brandon	
Lewis	Marc	
Tangirala	Sarada	
Jenkins	Wayne	
Judge	Judy	
DeFazio	Susanna	
Lorenz	Jennifer	
Olsen	Susan	
Clayton	Wilma	
Diehl	Rainy	
Watts	Elizabeth	
Devenport	Dael	
Fullwood	Allison	

Table 4: Comment Index by Form Letter

Organization and Signers		Statements of Concern
Obrist	Larry	
Gologergen	Barbara	
Arneson	Paul	
Thomsen	Catherine	
Diehl	Dana	
Zimmer	Heidi	
Vasquez	Michele	
Betts	Joel	
McEachern	Diane	
Simmons	Larry	
Matchett	Diane	
Evon	Jeffrey	
Goodwin	Liberty	
Burgess	Desiree	
Earnshaw	Cynthia	
Carl	Sheila	
Langford	Tressa	
Garvey	Lydia	
Cobb	Douglas	
Sakar-Sumdum	Ellen	
Greenberg	Donald	
Siebenmorgen	Karin	
Coburn	Michelle	
Watson	Vicky	
Teidh	Cathy	
Faust	Nina	
Tarrant	Margaret	
Boggess	Diana	
Steyer	Judith	
Grieve	Pam	
Gatz	Lyn	
Prince	Gloria	
L.	Josh	
Breiby	Anecia	
Demers	Greg	
Alstrom-Beans	Gail	
Nilsson	Kathryn Elizabeth	
Fairbanks	Grant	
Radano	Anja	
Crucian	Peteu	
Sankwich	Berntina	
Stewart	Chayna	

Table 4: Comment Index by Form Letter

Organization and Signers		Statements of Concern
Kiunya	Jean	
Enoch	Edward	
Barton	Janelle	
Thiessen	Gerlinde	
Evan	Kathy	
Belcastro	Joseph	
Aaron	Deborah	
Flore	Jeanneau	
Koeneman	Crystal	
Bauer	Lynda	
Johnson	Valerie	
Loeppky	Ninya	
Delaney	Chloe	
Wilson	Nenita	
Wolf	Charlene	
Petr	Paige	
Brickman	Brianne	
Koett	Karis	
Dunne	Cynthia	
Bjork	Harry	
Mjos	Brita	
Donatelli	David	
Wassilie	Winifred	
Smith	Michael	
Levin	Judy	
Bailey	Tasha	
Koenig	Matthew	
Elam	Richard	
Peterson	Kendel	
White	Kevin	
Townsend	George	
Giese	Mark	
Frankevich	Joan	
Dahl	Allison	
Parr	Crawford	
Mellick	Madison	
Himes	Ann	
Iverson	Matt	
Vaughan	Rebecca	
Filice	Heather	
McEwen	Laurel	
Horner	Jacqueline	
Nuetzel	Dave	
Armstrong	Floyd	

Table 4: Comment Index by Form Letter

Organization and Signers		Statements of Concern
Therchik	Diana	
Dorning	Fleta	
Howell	Debra	
Garrison	Katherine	
Davis	DJ	
Robinson	Sandra	
Williamson	Amy	
Nelson	Neil	
Spieth	Jessica	
Tague	Carolyn	
Carlo III	William	
Potter	Joyce	
Sloan	Anna	
Jessen	Connie	
Indelicato	Cristin	
Angstman	Dorothy	
Avugiak	Jofina	
Stout	Stephanie	
Tunde	Szalma	
Tauriainen	Carol	
Witman	Michael	
Johnson	James	
Kaningok	Fred	
Sumi	Brandon	
Richard	JoAnne	
Nasuti	Lauren	
Hunt	Dee	
Guidi	Dana	
Surma	Szymon	
Cutler	Rosemary	
Van Dommelen	Robin	
Brown	Zoya	
Alexander	Aleta	
Sommer	Shana	
Sovalik	Conrad	
Johnson	MaryAnn	
Joe	Helena	
Chan	Roxanne	
Wilcox	Christine	
Harrison	Gary	
Seater	Katrina	
Taber	Janna	
Allan	Paul	
D	Bonn	

Table 4: Comment Index by Form Letter

Organization and Signers		Statements of Concern
Mischler	Janet	
Marsh	Ken	
Millane	Laurie	
Knudeson	Shawn	
Hubbard	Susan	
Alexie	Steven	
Boster	Carl	
Fletcher	Johnnie	
Birdsall	Stephanie	
Williams	Andrew	
Zepeda	Ed	
Stubblefield	Michelle	
Hansen	Susan	
Rice	Kytela	
Bowman	Jody	
Falcone	Richard	
Fields	Rodney	
Wharton	Merna	
Weaver	Pamela	
Franklin	Anne	
Bryant	Alex	
Collins	Kristen	
Dabney	Elisabeth	
Farquharson	Louise	
Ruegg	Lara	
Saunders	Patti	
Wassilie	Carl	
Glowa	Tristan	
Clumpner	Graham	
Voli	Carlo	
Sheridan	Ruth	
Lambert	Sylvia	
Whittaker	Kara	
Stochosky	Katherine	
Gorny	Andrew	
Brown	Jeremiah	

Appendix A

SUBMISSIONS WITH DENOTED COMMENTS

This appendix contains the original submission as received with the comment bracketed to denote which Statement of Concern it was assigned. To aid viewers each coded comment is bracketed using a solid blackline or a dashed line and the Statement of Concern code is noted in the page margin.