

MEMORANDUM

State of Alaska

Department of Environmental Conservation
Division of Water

TO: To File
Gene McCabe
Program Manager

DATE: April 4, 2019

THRU: Wastewater Discharge Authorization Program

FILE NO:

FROM: James Rypkema
Environmental Program Manager,
Storm Water and Wetlands Section

PHONE NO:

SUBJECT: Antidegradation Analysis – Donlin
Project, POA-1995-120 (updated)

1 Legal Basis

Antidegradation is implicit in Clean Water Act (CWA) §101(a) goals, explicitly referenced in CWA §303(d)(4)(B), and implemented through 40 C.F.R. 131.12 and a state's water quality standards (WQS). Alaska's antidegradation policy and implementation methods are presented in 18 AAC 70.015 "Antidegradation policy" (Policy) and in 18 AAC 70.016 "Antidegradation implementation methods for discharges authorized under the federal Clean Water Act" (Implementation Methods). Alaska's WQS are in Title 18 of the Alaska Administrative Code (AAC), chapter 70 (18 AAC 70). In order for these standards to apply under the CWA, they must be previously approved by the U.S. Environmental Protection Agency (EPA) pursuant to CWA §303(c)(3) and 40 C.F.R. 131.

The Policy and Implementation Methods, amended April 6, 2018, were approved by EPA on July 26, 2018 as consistent with the CWA and applicable Code of Federal Regulations (C.F.R.), 40 C.F.R. 131.12.

The following subsections document the Department's conformance with the Policy and Implementation Methods as part of the issuance of a §401 certificate for the Department of Army (DA) Permit issued under the authority of CWA §404. The project is summarized in Attachment 1 of the *Clean Water Act Section 401 Certification of Reasonable Assurance for Donlin Gold, LLC, Donlin Gold Mine, POA-1995-120, Crooked Creek* (§401 Certification).

2 Receiving Water Status, Tier Determination, and Analysis Requirements

Alaska's antidegradation policy (through 18 AAC 70.015(a)(1)–(3)) identifies three tiers of water quality and water quality protection, Tiers 1, 2, and 3 respectively. An antidegradation analysis is tier-specific. Using the Policy and corresponding Implementation Methods, the Department determines a Tier 1 or Tier 2 classification and protection level on a parameter by parameter basis. A Tier 3 protection level would apply to a designated water body or segment.

- Tier 1 requires existing water uses and the level of water quality necessary to protect existing uses be maintained and protected. Tier 1 applies to all waters of the U.S. in the state. If criteria are exceeded for a water quality parameter (and the receiving water is not a Tier 3

water), then Tier 1 is the only protection level. This can be due to naturally occurring constituents in the water or can be due to pollutants introduced by humans.

- Tier 2 applies when the water quality for a parameter does not exceed the applicable criteria, and is presumed to apply as the default protection level for all parameters in all waters in Alaska unless found otherwise.
- Tier 3 applies to designated waters and no lowering of the water quality is allowable unless temporary and limited. At this time no Tier 3 waters have been designated in Alaska.

The Department is required to make an antidegradation analysis and findings for a CWA §401 water quality certification of a CWA §404 permit. The scope of the analysis considers where the fill would be placed and impacts to the receiving water immediately surrounding the dredge or fill material.¹ A receiving water means the water, or segment of the water, to which a discharge occurs or is proposed to occur. Prior to authorizing a reduction of water quality, the Department must first analyze and confirm the findings under 18 AAC 70.015(a)(2)(A–D) are met. Tier 1 analysis must be conducted with implementation procedures in 18 AAC 70.016(b). If a Tier 2 analysis is required, it must comply with 18 AAC 70.016(c).

The finding of no significant degradation under 33 U.S.C. 1344 (Clean Water Act, sec. 404) and under 40 C.F.R. 230 fulfills Tier 1 analysis requirements for the dredge or fill material area² and may be sufficient to fulfill Tiers 1 and 2 analysis requirements with regard to water quality impacts to the receiving water immediately surrounding the dredge or fill material.³ The Department's analysis and findings are summarized below.

3 Tier 1 Analysis of Existing Use Protection

The summary below presents the Department's analyses and findings for the Tier 1 analysis of existing use protections per 18 AAC 70.016(b)(5) finding that:

(A) existing uses and the water quality necessary for protection of existing uses have been identified based on available evidence, including water quality and use related data, information submitted by the applicant, and water quality and use related data and information received during public comment;

Tier 1 applies to all water of the United States within this state and receives the protection under 18 AAC 70.015(a)(1) which states that the existing uses and the level of water quality necessary to protect existing uses must be maintained and protected.

The Department reviewed water quality data, environmental monitoring studies, and information on existing uses (including water-dependent subsistence uses) within the coverage area from the final environmental impact statement (FEIS), joint record of decision (JROD), application for a §404 permit⁴, and the EPA-approved *Alaska's Final 2010 Integrated Water Quality Monitoring and Assessment Report*.

The Department finds the information reviewed as sufficient and credible to identify existing uses and water quality necessary for Tier 1 protection under 18 AAC 70.016(b)(5)(A).

¹ [18 AAC 70.016\(a\)\(1\)\(B\)](#)

² [18 AAC 70.016\(b\)\(2\)](#)

³ [18 AAC 70.016\(a\)\(1\)\(B\)](#)

⁴ The FEIS, JROD, and §404 permit application are discussed in Attachment 1 of the §401 Certification

(B) existing uses will be maintained and protected, and

Per 18 AAC 70.020 and 18 AAC 70.050, all waterbodies directly affected by the proposed project are protected for all uses. Therefore, the most stringent water quality criteria found in 18 AAC 70.020 and in the *Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances, 2008 (Toxicity Manual)* apply and were evaluated to ensure existing uses and the water quality necessary for protection of existing uses of the receiving waterbody are fully maintained and protected. The DA permit and §401 Certification place limits and conditions on the discharge of pollutants and require the applicant to implement best management practices (BMP) and measures to meet WQS. These limits and conditions ensure that for the Project, existing and designated uses of the waterbody as a whole are being maintained and protected.

(C) the discharge will not cause water quality to be lowered further where the department finds that the parameter already exceeds applicable criteria in 18 AAC 70.020(b), 18 AAC 70.030, or 18 AAC 70.236(b).

As previously stated, no waters within the project site are listed as impaired (Category 4 or 5). Therefore, no parameters were identified as already exceeding applicable criteria in 18 AAC 70.020(b), 18 AAC 70.030 (whole effluent toxicity limit), or 18 AAC 70.236(b) (site specific criteria). In addition, as discussed in (B), the DA Permit and the 401 Certification has been developed to ensure discharges shall not cause or contribute to an exceedance of water quality criteria.

The Department concludes the terms and conditions of the DA Permit and the 401 Certificate will be adequate to fully protect and maintain the existing uses of the water and that the findings required under 18 AAC 70.016(b)(5) are met.

4 Tier 2 Analysis for Lower Water Quality

4.1 Scope of Tier 2 Analysis

Per 18 AAC 70.016(c)(2), an antidegradation analysis is required for those waterbodies needing Tier 2 protection and which have any new or existing discharges that are being expanded based on permitted increases in loading, concentration, or other changes in effluent characteristics that could result in comparative lower water quality or pose new adverse environmental impacts.

4.1.1 Need for Tier 2 Protection

Tier 2 classification is the presumed default protection level for all parameters unless there is an impaired water listing for a parameter under 33 U.S.C. 1313(d) (CWA §303(d)), based on information in the most recent state report issued under 33 U.S.C. 1315(b) (CWA §305(b)), or through a Department finding under 18 AAC 70.016(c)(1)(C).

Alaska's Integrated Water Quality Monitoring and Assessment Report (Integrated Report) combines information for CWA §303(d) and §305(b) into a single comprehensive report.⁵ The Kuskokwim River is listed as an impaired (Category 5) water body about 30 miles upriver of Crooked Creek at the mouth of Red Devil Creek because abandoned mining facilities contribute antimony, arsenic, and mercury to the water. This is outside the portion of the Kuskokwim River affected by the proposed Project. There are no water bodies listed as impaired within the Project components, and

⁵ DEC Integrated Report website <http://dec.alaska.gov/water/water-quality/integrated-report/>

no parameters have been identified where only Tier 1 protection level applies. Accordingly, this antidegradation analysis conservatively assumes that the discharge is to a Tier 2 water body.

4.1.2 Potential for Permitted Activity to Lower Water Quality

The dredge and fill activities authorized under the DA permit constitute a new discharge with the potential to lower water quality in the dredge or fill area and the immediate vicinity. This triggers the need for a Tier 2 analysis. Accordingly, this antidegradation analysis applies the Tier 2 protection level on a parameter by parameter basis to all waters affected by the proposed Project. The policy in 18 AAC 70.015(a)(2) states that the Department may allow a reduction of Tier 2 water quality only after finding that the most practicable and effective pollution prevention, control, and treatment methods are being used such that lowering of water quality is necessary. In making this determination, the specific requirements of the implementation method of 18 AAC 70.016(c)(7) must be met. The Department's findings are presented below.

4.2 Tier 2 Analysis

If after review of available evidence, the department finds that the proposed discharge will lower water quality in the receiving water, the department will not authorize a discharge unless the department finds that

18 AAC 70.016(c)(7)(A) the reduction of water quality meets the applicable criteria of 18 AAC 70.020(b), 18 AAC 70.030, or 18 AAC 70.236(b), unless allowed under 18 AAC 70.200, 18 AAC 70.210, or 18 AAC 70.240;

18 AAC 70.020(b). After review of the JROD, there is reasonable assurance the dredge and fill activities will meet 18 AAC 70.020(b) as the 401 Certification of Reasonable Assurance and conditions are incorporated into the §404 permit (which includes a stipulation that the permittee recognizes its commitment to construct and operate the mine pursuant to the Project details described in the DA permit application⁶).

Additionally, other permits outside of the 401 Certificate of Reasonable Assurance such as the APDES individual permit, APDES general permit authorizations, other permits (state permits and waste management permit), and project design features for the Donlin Project will ensure compliance with state and federal surface water pollution control statutes and regulations.

18 AAC 70.030. Whole Effluent Toxicity (WET) testing consistent with 18 AAC 70.030 is currently implemented under APDES AK0055867 which requires quarterly monitoring and reporting⁷ for the corresponding outfall to Crooked Creek.

18 AAC 70.236(b). There are no site-specific criteria associated with 18 AAC 70.236 that apply to the discharge and associated waterbodies for the DA permit.

The Department has determined the reduction of water quality meets the applicable criteria of 18 AAC 70.020(b), 18 AAC 70.030, or 18 AAC 70.236(b), and the finding is met.

18 AAC 70.016(c)(7)(B) *each requirement under (b)(5) of this section for a discharge to a Tier 1 water is met.*

⁶ POA-1995-120 DA, Special Condition 5

⁷ [AK0055867](#), Permit Part 1.4 Whole Effluent Toxicity Testing Requirements

As discussed in the preceding Tier 1 analysis, the waters within the project site are protected for all uses. Hence, this finding is met.

18 AAC 70.016(c)(7)(C) *point source and state-regulated nonpoint source discharges to the receiving water will meet requirements under 18 AAC 70.015(a)(2)(D); to make this finding the department will*

- (i) identify point sources and state-regulated nonpoint sources that discharge to, or otherwise impact, the receiving water; and*
- (ii) consider whether there are outstanding noncompliance issues with point source permits or required state-regulated nonpoint source best management practices, consider whether receiving water quality has improved or degraded over time, and, if necessary and appropriate, take actions that will achieve the requirements of 18 AAC 70.015(a)(2)(D); and*
- (iii) coordinate with other state or federal agencies as necessary to comply with (i) and (ii) of this subparagraph;*

The requirements under 18 AAC 70.015(a)(2)(D) state that all wastes and other substances discharged will be treated and controlled to achieve

- (i) for new and existing point sources, the highest statutory and regulatory requirements; and*
- (ii) for nonpoint sources, all cost-effective and reasonable best management practices;*

For new and existing point sources, the highest statutory and regulatory requirements are the applicable New Source Performance Standards (NSPS) found at 40 C.F.R. Part 440, Subpart J. EPA promulgated technology-based effluent limitation guidelines (ELGs) for the copper, lead, zinc, gold, silver, and molybdenum ores point source category at 40 C.F.R. Part 440 Subpart J (adopted by reference at 18 AAC 83.010(g)(3)). The ELGs applicable to a new source, which is a source that has commenced construction after the ELGs were established on December 3, 1982, are applicable to discharges from active mines, and these ELGs apply to Outfall 001 of the APDES Permit AK0055867.

The §404 permit does not authorize the discharge of domestic wastewater, which is regulated under a separately issued wastewater permit (APDES AK0055867).

Neither the regulations in 18 AAC 15 nor 18 AAC 72, nor another state law; the Department is not aware of any more stringent requirements than those found in 18 AAC 70 for water quality standards.

Point source discharges, dredge and fill discharges, and nonpoint source discharges can all affect compliance with Alaska WQS. Point source discharges are regulated under CWA §402 and by APDES permits issued by DEC or National Pollutant Discharge Elimination System (NPDES) permits by EPA; each of which conducts a separate antidegradation analysis and findings per the respective discharge. Dredge and fill discharges are regulated under CWA §404, and the subsequent analysis is to determine whether there is reasonable assurance that runoff or discharges from construction not covered by APDES permits will not violate Alaska WQS; while considering the authorities and requirements of different regulatory programs.

For the Donlin Gold Project, nonpoint source discharges, air pollution deposition, and water diversions are project activities that could affect Alaska WQS, including:

- Possible decrease in groundwater discharges and streamflow and resultant changes to water levels related to protection for existing uses of the water(s).

- Possible mine construction and operation which might violate numeric state water quality standards for mercury, arsenic, or temperature. Namely, mercury violations might result from atmospheric deposition, arsenic violations might result from groundwater leaching from the overburden stockpile, and temperature violations might result from dewatering processes.

The following analysis is provided.

- Possible decrease in groundwater discharges and streamflow and resultant changes to water levels are still fully protective for existing uses of the water(s).

There is a reasonable assurance the Donlin Project will meet water quality standards to support propagation of fish, shellfish, wildlife, and recreation uses even with projected effects from dewatering and stream diversion activities. Fish and aquatic resources are of a central importance to the livelihood of residents of the proposed Project area. While other chapter sections of the FEIS (Section 3.5, Surface Water Hydrology, Section 3.7 Water Quality, and Section 3.21 Subsistence) discuss topics associated with fish and aquatic resources, FEIS Section 3.13 (Fish and Aquatic Resources) specifically characterizes the aquatic habitat and the diversity, abundance, and distribution of fish in the Kuskokwim River and the drainages affected by the proposed Project. Both federal and state laws protect fish and aquatic resources that would be affected by components of the proposed Project. Key laws and regulations include: the CWA, including Sections 402 and 404, which govern discharges to waters of the U.S.; the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), which governs protection of essential fish habitat; and state regulation of mining and water use and discharge permits as well as fish habitat protection requirements.

18 AAC 70.016(a)(1)(B) states that the department will consider where the dredge and fill activity will take place and impacts to the receiving water. Under Alternative 2 – Donlin Gold’s Proposed Action, just under eight miles of streambed, (in American and Anaconda creeks and portions of Snow and Lewis gulches) would be eliminated to construct various Mine Site facilities. These and smaller tributary drainages that would be affected, represent about eight percent of the Crooked Creek watershed. Most of the segments of these tributaries that would be filled in do not support salmon. The greatest effects of flow reductions in Crooked Creek would occur upstream of Crevice Creek. Below this, tributary inflows/runoff from unaffected watersheds (e.g., Bell and Gemuna creeks) would overshadow flow reductions resulting from Construction and Operations.

The Corps is requiring compensatory mitigation for permanent loss of aquatic resources as a result of fill impacts from the proposed Project. Donlin Gold submitted a Conceptual Compensatory Mitigation Plan (CMP) in August 2015. A revised draft CMP was included in the December 2017 DA permit application (Block 23). In response to feedback from the Corps, EPA, and USFWS, Donlin Gold submitted a final CMP in July 2018 (Attachment B5 of the Joint Record of Decision (JROD) issued by the USACE and BLM) that is a condition of the Corps §404 permit. Donlin Gold researched permittee responsible options focusing first on the immediate watershed (HUC-10), and then systematically assessing larger hydrologic units for compensatory mitigation opportunities. The CMP includes two permittee-responsible mitigation (PRM) projects, as well as in-lieu fee mitigation. The two PRM (Chuitna and Upper Crooked Creek) plans and in-lieu fee mitigation are summarized

in 6.2.5.1, 6.2.5.2, and 6.2.5.3 of the JROD, respectively⁸. The Upper Crooked Creek PRM Plan includes four distinct restoration projects within the watershed: restoration of lower Quartz Gulch, restoration of lower Snow Gulch, restoration of the wash plant tailings area along Crooked Creek, between Snow and Ruby Gulches, and restoration of lower Ruby and Queen Gulches. DEC concurs these mitigation measures will be protective of existing and designated uses.

In the FEIS Section 3.13 (Fish and Aquatic Resources), flow reduction was evaluated with respect to aquatic habitat. In the FEIS, Section 5 (Mitigation) and Section 5.2 (Design Features Proposed by Donlin) flow impacts to Crooked Creek are addressed as a component of the Aquatic Resources Monitoring Plan (ARMP)⁹. The ARMP for Crooked Creek is to be developed under the provisions of Title 16 fish habitat permits administered by Alaska Department of Fish and Game, water use permits administered by Alaska Department of Natural Resources, and is listed as a design feature of the proposed Donlin Gold Project.

Subsequent to the issuance of the 401 Certificate (August 10, 2018) and DA Permit, a number (13) of Alaska Department of Fish and Game Fish Habitat Permits that were in development have been issued for the Donlin Gold Project. Fish habitat permit FH18-III-0191¹⁰ includes provision for the development of the ARMP. FH18-III-0192¹¹ and FH18-III-0193¹² have been issued for restoration of aquatic habitats in Ruby, Queen, and Snow Gulches which have been disturbed by historic placer mining. The restoration of these aquatic habitats is intended to offset habitat losses.

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

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

DEC views the CMP and ARMP¹³ measures proposed as sufficiently binding; as the USACE views the design features proposed by Donlin Gold as part of the Project, and considers Donlin Gold's

⁸ [JROD at 6-5](#)

⁹ [FEIS ID#A33 at 5-10](#)

¹⁰ [FH18-III-0191](#)

¹¹ [FH18-III-0192](#)

¹² [FH18-III-0193](#)

¹³ [FEIS ID#A33 at 5-10](#)

proposed design measures as inherent to the Donlin Gold proposed action (Alternative 2), and the ARMP is a permit requirement in ADF&G's permit FH18-III-0191.

In considering where the fill would be placed and impacts to the receiving water from the fill activity, DEC has determined there is a reasonable assurance that state WQS will be met and views the mitigation, restoration, monitoring measures, and design features proposed as further protective of the designated and existing uses for the growth and propagation of fish, anadromous and resident fish and other aquatic life, and that the findings of 18 AAC 70.016(c)(7)(C), 18 AAC 70.015(a)(2)(D) and 18 AAC 70.015(d) are satisfied.

- Possibility that mine construction and operation may violate numeric state water quality standards for mercury, arsenic, or temperature. Namely, mercury violations might result from atmospheric deposition, arsenic violations might result from groundwater leaching from the overburden stockpile, and temperature violations might result from dewatering processes.

Mercury – atmospheric deposition:

The FEIS indicates that mining operation will result in mercury emissions from numerous sources that could cause increased mercury deposition in nearby watersheds by about 40 percent.¹⁴ In combination with naturally elevated levels of mercury in surrounding waters, these emissions associated with the operation of the mine “would result in additional inputs of mercury to surface water from both atmospheric and aqueous sources, which would likely cause an increase in exceedances of the 12 ng/L chronic criterion.¹⁵ As previously stated, point-source wastewater discharges are permitted under §402 APDES permits.

The FEIS summarized¹⁶ that in terms of intensity, estimates predict that the chronic total mercury surface water quality criteria may or may not be exceeded as a result of Project-related atmospheric deposition of mercury. Impacts would depend upon sample location, season, and existing natural concentrations. The estimated levels of impacts are predicated upon several conservative assumptions with regard to phase partitioning, environmental transport, and methylation rates. Total mercury concentrations for watersheds closest to the Mine Site could rise approximately 40 percent, to an average concentration that is close to or below water quality criteria. Effects decrease to negligible within 15 to 20 miles of the Mine Site. Based on an area-weighted average over a 20-mile radius from the Mine Site, total mercury in surface water is estimated to increase about 0.2 percent. Methylmercury concentrations within the 20-mile radius are predicted to rise about 4 to 5 percent in surface water and fish tissue to levels that would be below applicable methylmercury criteria for fish consumption.

The Crooked Creek ARMP includes fish metals analysis which is to be implemented by the CMP and ADF&G fish habitat permit. The objectives of the plan are to 1) monitor for major changes to aquatic communities, 2) monitor for smaller scale and incremental changes to aquatic communities, and 3) guide results-based refinement to the monitoring program. The plan would build on the existing baseline dataset and include both biological and flow components. The ongoing data collection would be used in an adaptive management approach to refine the understanding of the dynamics surrounding Crooked Creek flow in winter as well as the open water seasons and to

¹⁴ [FEIS, 3.7-160](#)

¹⁵ [FEIS, 3.7-151](#)

¹⁶ [FEIS, 3.7-160](#)

identify the most effective measures. Additionally, point-source wastewater discharge permits (APDES AK0055867, MSGP authorization AKR06AA92) include monitoring requirements for metals (including mercury) with requirements for the discharges to meet WQS.

The pollution effects of atmospheric deposition are expressly considered and regulated under the Clean Air Act. For example, see 42 U.S.C. 7403(e)(4) which requires EPA to evaluate “the effects of air pollution on water quality” and 42 U.S.C. 7651(a)-(o) (Acid Deposition Control) where EPA sets regulations on the air pollution sources of acid rain. Courts have previously determined that air emissions are best regulated under the Clean Air Act and its accompanying regulations, and not under the Clean Water Act, despite potential impacts to water quality.¹⁷ The FEIS considered the issue of mercury via atmospheric deposition.

DEC Division of Air has issued an Air Quality Control Construction Permit.¹⁸ The air permit requires Donlin Gold to install best available control technology for its dust control and collection systems. The permit also includes specific requirements to control fugitive dust from the roads and facility operations.

DEC has determined the proposed mitigation, monitoring and project design features are sufficient at this time to conclude that there will be a reasonable assurance that mercury WQS will be met. Therefore, the findings of 18 AAC 70.016(c)(7)(C), 18 AAC 70.015(a)(2)(D) and 18 AAC 70.015(d) are satisfied.

Arsenic – groundwater leaching from the overburden stockpile.

The FEIS recognizes that water percolating through the South Overburden Stockpile (SOB) has the potential to leak into groundwater.¹⁹ The SOB would contain terrace gravel and colluvium materials excavated from the open pits which are considered potentially metal leaching. Seepage and surface runoff that comes into contact with materials stored in the SOB may require collection and treatment. Surface and seepage runoff from the stockpile will be captured by a sediment pond and pumped to the lower contact water dam.

During operations, the inactive faces of the stockpile will be progressively reclaimed to minimize the potential for surface entrainment and infiltration. All materials placed in the SOB will ultimately be returned to the waste rock facility (WRF) over the course of mine operations and placed either as the base cover layer for final reclamation of the WRF or used as internal capping materials for the potential acid-generating (PAG) cells. The sediment pond is located near the edge of the cone of depression created by pit dewatering, so that the direction of groundwater flow during at least part of the operations period is assumed to be towards Crooked Creek. The quantity of groundwater that may flow away from the sediment pond would be relatively low as a result of the small size of the facility, the limited collection of water in the sediment pond, the relatively low hydraulic conductivity of the colluvial deposits at the site, the accumulation of silty sediments in the pond, and the temporary presence of the SOB soils.

Water percolating through the SOB also has the potential to enter groundwater and flow towards Crooked Creek. The quantity of water entering groundwater through this process may also be low as

¹⁷ See *Chemical Weapons Working Group, Inc. v. U.S. Dep’t of Army*, 111 F.3d 1485 (10th Cir. 1997) (finding that stack emissions were beyond the reach of the Clean Water Act and construction would create a regulatory conflict between the Clean Water Act and Clean Air Act.

¹⁸ DEC [AQ0934CPT01P Permit](#)

¹⁹ [FEIS, 3.6-42](#)

a result of the small size of the facility, the relatively low hydraulic conductivity of the SOB soils and the underlying soils, and the temporary presence of the soils. The fate and transport of this groundwater is uncertain; however, the impacts on Crooked Creek may be minimal or nonexistent as a result of natural attenuation processes on dissolved constituents, such as sorption onto aquifer materials, chemical precipitation of dissolved constituents, dilution, and dispersion.²⁰

DEC concurs with the FEIS evaluation that the impacts on Crooked Creek may be minimal or nonexistent and the findings of 18 AAC 70.016(c)(7)(C), 18 AAC 70.015(a)(2)(D) and 18 AAC 70.015(d) are satisfied.

Temperature - influence from dewatering processes

The FEIS indicates stream diversion and dewatering may decrease groundwater discharges and streamflow in parts of Crooked Creek as well as in nearby tributaries.²¹ These changes to water levels can cause adverse impacts to availability of spawning areas and viability of incubating eggs, especially during low flow conditions, thereby degrading the water to the point of habitat loss.²² The FEIS further states that groundwater that would normally flow to Crooked Creek will be diverted as part of the pit dewatering process and that during the summer, this reduction in groundwater input “could cause stream temperatures in reaches near the mine to be close to or above the State of Alaska’s water quality temperature standard...for egg/fry incubation and spawning and...migration and rearing²³.”

The FEIS in its evaluation of discharges of treated water to Crooked Creek concluded that based on available data, stream temperature downstream of the Mine Site is anticipated to remain relatively constant during construction (ARCADIS 2013a). Existing surface water temperatures downstream of the Mine Site vary between 0° and 9.16°C depending on the time of year, and construction activities are not expected to have any substantial impacts on surface water temperatures (ARCADIS 2013a).²⁴ The FEIS additionally recognized and evaluated water temperature impacts from the Donlin Project as it relates to fish and aquatic resources, noting that “[a]lthough Crooked Creek flows would be reduced due to flow diversions from the upper and lower contact water ponds and Snow Gulch for process water, the net heat energy per unit volume of water is expected to remain relatively unchanged.²⁵

As previously stated, in FEIS Section 3.13 (Fish and Aquatic Resources) flow reduction was evaluated with respect to aquatic habitat. In the FEIS, Section 5 (Mitigation) and Section 5.2 (Design Features Proposed by Donlin) flow impacts to Crooked Creek are as a component of the Aquatic Resources Monitoring Plan (ARMP). The ARMP for Crooked Creek is to be developed under the provisions of Title 16 fish habitat permits administered by Alaska Department of Fish and Game, water use permits administered by Alaska Department of Natural Resources, and is listed as a design feature of the proposed Donlin Gold Project. The ongoing data collection from the ARMP would be used in an adaptive management approach to refine the understanding of the dynamics surrounding Crooked Creek flow in winter as well as the open water seasons and to identify the most effective measures that can be used to ensure that minimum flows in Crooked Creek are

²⁰ [Id. at 3.6-42](#)

²¹ [Id. at 3.13-78](#)

²² [Id. at 3.13-89 to 3.13-90](#)

²³ [Id. at 3.13-112](#)

²⁴ [Id. at 3.7-145](#)

²⁵ [Id. at 3.13-99](#)

maintained. If the Project results in minimal losses to Crooked Creek flows, adaptive management measures may be unnecessary. If flow losses warrant a response, a range of measures could be considered that include but would not be limited to: lining or relocating portions of the stream channel; augmenting flows from the Snow Gulch Reservoir; pumping water from the Kuskokwim River, or grouting areas of bedrock demonstrating high flow rates.²⁶

DEC views the ARMP²⁷ measure proposed as sufficiently binding; as the USACE views the design features proposed by Donlin Gold as part of the Project, and considers Donlin Gold's proposed design measures as inherent to the Donlin Gold proposed action (Alternative 2), and is a permit requirement in ADF&G's permit FH18-III-0191.

DEC has determined there is reasonable assurance that reduced flow resulting from stream diversion and pit dewatering will not adversely affect the temperature of Crooked Creek and that the findings of 18 AAC 70.016(c)(7)(C), 18 AAC 70.015(a)(2)(D) and 18 AAC 70.015(d) are satisfied.

In summary, wastewater discharges permitted separately under an APDES individual or general permit along with other permits (including the CWA §404, state permits, and waste management plans) for the Donlin Project will ensure all wastes and other substances discharged will be treated and controlled to achieve (i) for new and existing point sources, the highest statutory and regulatory requirements; and (ii) for nonpoint sources, all cost-effective and reasonable best management practices. After review of the methods of treatment and control and the applicable statutory and regulatory requirements, including 18 AAC 70, 18 AAC 72, and 18 AAC 83, the Department finds that the discharge authorized under §404 permit and §401 Certificate of Reasonable Assurance meets the highest applicable statutory and regulatory requirements; therefore, 18 AAC 70.016(c)(7)(C) finding is met.

***18 AAC 70.016(c)(7)(D)** the alternatives analysis provided under (4)(C-F) of this subsection demonstrates that*

- (i) a lowering of water quality under 18 AAC 70.015(a)(2)(A) is necessary; when one or more practicable alternatives that would prevent or lessen the degradation associated with the proposed discharge are identified, the department will select one of the alternatives for implementation; and*
- (ii) the methods of pollution prevention, control, and treatment applied to all waste and other substances to be discharged are found by the department to be the most effective and practicable;*

The Department performed an alternatives analysis and found that temporary lowering of water quality to accommodate important economic development in the area is necessary. Alternatives were evaluated based on practicability, as defined at 18 AAC 70.990(48). Alternatives evaluated included those identified in the FEIS and JROD Attachment B2 – Evaluation of the Discharge of Dredged and Fill Material in accordance with 404(B)(1) Guidelines.

The Project is highly location-dependent, as the geology of the region dictates the general location and dimension of the mine for the Project, as the ore can only be developed where the mineral sources exist. Complete avoidance of surface water impacts is not possible if the Project is to be completed. However, as proposed in selecting Alternative 2, Donlin Gold, LLC has incorporated facility siting and transportation facility construction, operations, and closure procedures to avoid

²⁶ [Id. at 3.13-159](#)

²⁷ [FEIS Section 5.2, Table 5.2-1, Design Feature #A33 Crooked Creek Aquatic Resources Monitoring Plan, 5-10](#)

and minimize adverse impacts to wetlands and has committed to provide compensation for unavoidable wetland impacts. Wetland impact minimization was incorporated into the Project design by reducing the construction footprint in areas near wetlands where avoidance was not practicable. A summary of the design features, standard permit conditions and best management practices (BMPs), and further additional measures proposed by the USACE and cooperating agencies listed as important in reducing impacts to wetlands is summarized in FEIS Chapter 3.11 Wetlands, Chapter 3.7 Water Quality, and further descriptions are provided in Chapter 5, Impact Avoidance, Minimization, and Mitigation, and the JROD Section 6 and Attachment B2.

Regulatory standards and criteria for the use of compensatory mitigation to offset unavoidable impacts to waters of the U.S., including wetlands, authorized under the CWA, were established in 2008, under 33 C.F.R. 332 (USACE) and 40 C.F.R. Part 230 (EPA). Compensatory mitigation for unavoidable impacts may be required to ensure that activities requiring a permit comply with Section 404(b)(1) Guidelines. Compensatory mitigation is the restoration (reestablishment or rehabilitation), establishment (creation), enhancement, and/or in certain circumstances preservation of aquatic resources to offset unavoidable adverse impacts. Compensatory mitigation may be achieved by purchasing credits through mitigation banks, in-lieu fee programs, or by permittee-responsible mitigation, or by a combination of the three.

The proposed activity is expected to result in a physical alteration to the surface waters in the Project area. Donlin Gold has proposed compensatory mitigation as a means to preserve existing uses. The FEIS has summarized alternatives to avoid and minimize adverse impacts to the surface waters. An Aquatic Resources Monitoring Plan (ARMP) for Crooked Creek is to be developed under the provisions of Title 16 fish habitat permits administered by Alaska Department of Fish and Game, and water use permits administered by Alaska Department of Natural Resources. The objectives of the ARMP (FEIS, Section 5.2, Design Features A33) are to: 1) monitor for the major changes to aquatic communities; 2) monitor for smaller-scale and incremental changes to aquatic communities; and 3) guide results-based refinement to the monitoring program.

Donlin Gold developed the CMP in coordination with federal, state, and local governments and landowners. The CMP explains how Donlin Gold proposes to compensate for the unavoidable losses of waters of the United States (WOUS) including wetlands, streams, ponds, and creeks in the Donlin Gold Project Area. Compensatory mitigation addressing physical alterations to surface waters will provide for preservation of existing uses and the level of water quality necessary to protect such existing uses.

Therefore, discharge under the limitations and requirements of the DA Permit is identified as the practicable alternative; therefore the 18 AAC 70.016(c)(7)(D)(i) finding is met.

The Applicant has identified numerous measures of pollution prevention, control, and treatment to minimize adverse impacts. These measures are outlined in the Chapter 5 of the FEIS (Section 5.2) as well as in Block 23 of the permit application submitted to USACE and updated in June 2018. Additionally, Donlin Gold, LLC has developed a Compensatory Mitigation Plan that identifies proposed compensatory mitigation for unavoidable wetland and stream impacts. Additionally, best management practices and permit requirements are outlined in Chapter 5 of the FEIS (Section 5.3). Appendix B2.7 of the JROD further describes actions to minimize adverse effects that relate to the discharge of fill material.

The Department finds that the most effective methods of prevention, control, and treatment are the practices and requirements set out in the permit and certification. The Department finds the 18 AAC 70.016(c)(7)(D)(ii) finding is met.

18 AAC 70.016(c)(7)(E) except if not required under (4)(F) of this subsection, the social or economic importance analysis provided under (4)(G) and (5) of this subsection demonstrates that a lowering of water quality accommodates important social or economic development under 18 AAC 70.015(a)(2)(A); and

Based on the evaluation required per 18 AAC 70.016(c)(7)(C) and (D), the Department has determined that the most reasonable and effective pollution prevention, control, and treatment methods are being used, and that the localized lowering of water quality is necessary to accommodate important economic and social development.

The Donlin Gold, LLC proposes to develop the mineral potential of lands selected by the Calista Corporation under the provisions of the Alaska Native Claims Settlement Act (ANCSA). These lands were selected specifically because of their mineral potential and Calista is mandated by ANCSA to develop the lands for the benefit of its shareholders and, as a result of the ANCSA Sections 7(i) and 7(j) revenue sharing provisions, for the benefit of the shareholders of all Alaska Native corporations. In addition to the social and economic benefits that Donlin Gold will provide to Alaska Native corporations and their shareholders, the Project also will have a major, positive social and economic impact on the Yukon-Kuskokwim (Y-K) region – one of the most economically challenged areas in the U.S. as a whole. These benefits will result from the payments made to Calista under the mining lease with Donlin Gold; the payments made to The Kuskokwim Corporation (TKC), which owns the surface estate, under the surface use agreement with Donlin Gold; the wages paid to employees who live in the Y-K region, the purchases made from businesses in the Y-K region, and the indirect social and economic effects of these direct payments.

The Project would create an estimated 3,000 jobs during the 3-4 year construction period.²⁸ During the 27-year operational period, approximately 1,000 full-time employees would be required.²⁹ Beyond direct employment benefits, for each year the Project is operational, an estimated 650 jobs and \$40 million in wages would be generated statewide through multiplier effects, while sales within the state would increase by \$150 million per year.³⁰ Both the direct and indirect economic activity would generate tax revenues for State and local governments. Section 3.18 of the Donlin Gold Project Final Environmental Impact Statement (USACE 2017) provides more detailed information on the social and economic benefits of the Donlin Gold Project.

The Department concludes that the proposed Project would accommodate important social and economic development in Alaska and the Interior region of the State and the anticipated lowering of water quality is necessary for these purposes and that the finding is met.

²⁸ [Id. at 3.18-37](#)

²⁹ [Id. at 3.18-40](#)

³⁰ [Id. at 3.18-44](#)

18 AAC 70.016(c)(7)(F) 18 AAC 70.015 and this section have been applied consistent with 33 U.S.C. 1326 (Clean Water Act, sec. 316) with regard to potential thermal discharge impairments.

Discharges authorized under the permit are not associated with a potential thermal discharge impairment; therefore, the finding is not applicable.

5 Conclusion

Based upon the review of the FEIS as well as other reliable information available concerning the proposed activity, the Department has made a determination that the Donlin Project is expected to satisfy the standards of 18 AAC 70.015 and 18 AAC 70.016.