	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	
Subpart C	**Subpart C**	**Potential Impacts on Physical and Chemical Characteristics of the Aquatic Ecosystem**			
1	230.20(a)	**Substrate:** The organic and inorganic solid materials and water and other liquids or gases in pore spaces that underlie open waters and constitute the surface of wetlands.			
2	230.20(b)	Alteration of surface elevation or contours in wetlands	Yes- total direct impacts to 2,947 acres of wetlands and other waters (2,179 acres permanent and 768 acres temporary)	Yes- fragmentation, deposition of dust, and dewatering (collectively) have the potential to impact 1,470 acres of wetlands and other waters	Yes- total direct cumulative impacts (proposed project plus expansion) to 11,760 acres of wetlands and other waters (10,987 acres permanent and 773 acres temporary); total cumulative indirect impacts to 3,438 acres of wetlands and other waters
3	230.20(b)	Alteration of surface elevation or contours in streams	Yes- total direct impacts to 111.6 miles of stream (105.4 miles permanent and 6.2 miles temporary)	Yes	Yes- total cumulative direct impacts to 442.1 miles of streams (435.9 miles permanent and 6.2 miles temporary)
4	230.20(b)	Changes in water circulation, depth, current pattern, water fluctuation and water temperature in wetlands and other waters	Yes	Yes- from direct and operations/draw downs	Yes- from direct and operations/draw downs

							STEP 1	
	N/A	No Effect	Negligible Effect	Minor Effect (Short Term)	Minor Effect (Long Term)	Significant	Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)	Reduced to below level of significance (Y/N)
Subpart C								
1								
2						X	See analysis in 230.20 Summary	
3						X	See analysis in 230.20 Summary	
4						X	See analysis in 230.20 Summary	

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Subpart C				
1				
2	Sections 4.22.9 and 4.22.10 and Table 4.22-40 Wetlands	None	no additional avoid/min/comp mit identified	N
3	Sections 4.16.4.1, 4.16.4 and 4.16.7 Surface Water Hydrology; Sections 4.22.9 and 4.22.10 and Table 4.22-40 Wetlands	None	overbuilding culverts/bridging streams as opposed to culverts	N
4	Sections 4.22.8.3 and 4.22.6.4 Wetlands	None	no additional avoid/min/comp mit identified	N

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Subpart C			
1			
2	See analysis in 230.20 Summary		
3	See analysis in 230.20 Summary		potential substrate changes in downstream waters (scour/channel degradation)
4	See analysis in 230.20 Summary		

	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	
Subpart C	**Subpart C**	**Potential Impacts on Physical and Chemical Characteristics of the Aquatic Ecosystem**			
5	230.20(b)	Changes in water circulation, depth, current pattern, water fluctuation and water temperature in streams	Yes- at the mine site and from culverts	Yes- at the mine site and from culverts	Yes- at the mine site and from culverts
6	230.20(b)	Smothering immobile organisms, displacing mobile organisms, impacting recolonization in wetlands and other waters	Yes	Yes- food chain effects	Yes
7	230.20(b)	Smothering immobile organisms, displacing mobile organisms, impacting recolonization in streams	Yes- streams would be impacted in the transportation corridor associated with installation of bridges, culverts	Yes- food chain effects	Yes
8	230.20(b)	Changing or destroying habitat outside of disposal site in wetlands	N/A	Yes- fragmentation, deposition of dust, and dewatering (collectively) have the potential to indirectly impact 1,470 acres of wetlands and other waters	Yes- total cumulative indirect impacts from fragmentation, deposition of dust, and dewatering (collectively) to 3,438 acres of wetlands and other waters
9	230.20(b)	Changing or destroying habitat outside of disposal site in streams	N/A	Yes- fragmentation, deposition of dust, and dewatering (collectively) have the potential to indirectly impact 79.7 mi streams	Yes- total cumulative indirect impacts from fragmentation, deposition of dust, and dewatering (collectively) to 96.5 miles of streams

							STEP 1	
	N/A	No Effect	Negligible Effect	Minor Effect (Short Term)	Minor Effect (Long Term)	Significant	Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)	Reduced to below level of significance (Y/N)
Subpart C								
5						X	See analysis in 230.20 Summary	
6						X	See analysis in 230.20 Summary	
7						X	See analysis in 230.20 Summary	
8						X	See analysis in 230.20 Summary	
9						X	See analysis in 230.20 Summary	

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Subpart C				
5	Section 4.18.4.1 Water and Sediment Quality; Sections 4.24.5.1, 4.24.5.2 and 4.24.8.2 Fish Values	None	no additional avoid/min/comp mit identified	N
6	Sections 4.24.5.1, 4.24.5.2, 4.24.8.2, 4.24.5.3 and 4.24.8.3 Fish Values	None	no additional avoid/min/comp mit identified	N
7	Sections 4.24.5.1, 4.24.5.2, 4.24.8.2, 4.24.5.3 and 4.24.8.3 Fish Values	None	no additional avoid/min/comp mit identified	N
8	Sections 4.24.5.1, 4.24.5.2, 4.24.8.2, 4.24.5.3- and 4.24.8.3 Fish Values; Table 4.22-40 Wetlands	None	no additional avoid/min/comp mit identified	N
9	Sections 4.24.5.1, 4.24.5.2, 4.24.8.2, 4.24.5.3 and 4.24.8.3 Fish Values; Table 4.22-40 Wetlands	None	no additional avoid/min/comp mit identified	N

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Subpart C			
5	See analysis in 230.20 Summary		Temperature impacts spatially limited near discharge locations (PLP's monitoring summary report specifies temperature monitoring).
6	See analysis in 230.20 Summary		North Fork Koktuli, South Fork Koktuli; secondary impacts from fragmentation and downstream substrate changes
7	See analysis in 230.20 Summary		
8	See analysis in 230.20 Summary		USFWS stated that secondary impacts to golden eagle habitat may occur based on future surveys
9	See analysis in 230.20 Summary		

	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	
Subpart C	**Subpart C**	**Potential Impacts on Physical and Chemical Characteristics of the Aquatic Ecosystem**			
SUMMARY - Physical and Chemical Characteristics of the Aquatic Ecosystem	230.20 Summary	**Physical substrate determinations:** Individual and cumulative changes in substrate elevation and bottom contours	Yes	Yes	Yes

							STEP 1	
	N/A	**No Effect**	**Negligible Effect**	**Minor Effect (Short Term)**	**Minor Effect (Long Term)**	**Significant**	**Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)**	**Reduced to below level of significance (Y/N)**
Subpart C								
SUMMARY - Physical and Chemical Characteristics of the Aquatic Ecosystem						X	1-3, 6-9, 14-15, 39-40, 44-46, 58-59, 68, 83, 88, 96-97, 99, 102, 118-121, 134-146, 154, 170-172, 176. PLP's monitoring summary report (PLP 2019-RFI 135). Project Design Features [DA Application Tab 23]- measures related to minimizing the project footprint Protection of Wetlands and Waters [DA Application Tab 23]- measures related to minimizing the project footprint in wetlands and implementation of erosion and sediment controls Restoration of Temporary Impacts [DA Application Tab 23]- all measures Reclamation of Permanent Impacts [DA Application Tab 23]- all measures Implementation of Environmental Plans and Controls and Adaptive Management [DA Application Tab 23]- measures related to the control of fugitive dust, erosion and sedimentation	N

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Subpart C				
SUMMARY - Physical and Chemical Characteristics of the Aquatic Ecosystem	Section 4.16 Surface Water Hydrology; Section 4.18 Water and Sediment Quality; Section 4.22 Wetlands; Section 4.24 Fish Values; Section 5.4 Mitigation	None	Overbuilding stream crossings/bridging instead of culverts Meeting USFWS basic culvert design guidelines for culverts in fish bearing streams (Note: PLP adopted this measure - see measure 138) See Attachment to JROD entitled EPA recommended Additional Minimization Measures	N

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Subpart C			
SUMMARY - Physical and Chemical Characteristics of the Aquatic Ecosystem	Mine Site - in-kind compensatory mitigation within the Koktuli River Watershed will be required to compensate for all direct and indirect impacts caused by discharges into aquatic resources at the mine site. Direct and indirect impacts at the mine site total 2,825 acres of wetlands, 132.5 acres of open waters, and 129.5 miles of streams. The District has also determined that compensatory mitigation is required for unavoidable adverse impacts to aquatic resources from discharges associated with the transportation corridor and the port site. Direct and indirect impacts associated with the transportation corridor and port site total 460 acres of wetlands, 231.7 acres of open waters, and 55.5 miles of streams.	Mine Site - N Transportation Corridor - N Port - N Natural Gas Pipeline - Y	Without Compensatory Mitigation this constitutes significant degradation. Compensatory Mitigation LOCATION is very important. Must offset these particular impacts within the affected watershed. USACE cannot enforce EPA 3-6 mitigation measures

	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	
Subpart C	**Subpart C**	**Potential Impacts on Physical and Chemical Characteristics of the Aquatic Ecosystem**			
1	230.21(a)	**Suspended particulates/turbidity:** fine-grained mineral particles and organic particles entering water bodies through land runoff, flooding, vegetative and planktonic breakdown, resuspension of bottom sediments, and dredging and filling.			
2	230.21(b)	Elevated levels of suspended particulates, possibly turbidity plumes	Yes- total direct impacts to 2,947 acres of wetlands and other waters (2,179 acres permanent and 768 acres temporary), including 111.6 miles streams (105.4 miles permanent and 6.2 miles temporary)	Yes- fragmentation, deposition of dust, and dewatering (collectively) have the potential to indirectly impact 1,470 acres of wetlands and other waters, including 79.7 miles of streams	Yes- continued maintenance dredging at Diamond Point and fugitive dust
3	230.21(b)	Reduced light penetration and photosynthesis/primary productivity	Yes- impacts likely concentrated within vegetated shallows/aquatic bed vegetation type - 4 acres permanently impacted	Yes	Yes
4	230.21(b)	Reduced feeding ability for sight-dependent species leading to limited growth and lowered disease resistance	No	No	No

							STEP 1	
	N/A	No Effect	Negligible Effect	Minor Effect (Short Term)	Minor Effect (Long Term)	Significant	Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)	Reduced to below level of significance (Y/N)
Subpart C								
1								
2						X	See analysis in 230.21 Summary	
3						X	See analysis in 230.21 Summary	
4		X					N/A	

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Subpart C				
1				
2	Sections 4.18.4, 4.18.6, and 4.18.7 Water and Sediment Quality; Table 4.22-1 Wetlands	None	no additional avoid/min/comp mit identified	N
3	Sections 3.22.6, 4.22.6.1 , and 4.22.8.3 and Table 4.22-31 Wetlands	None	no additional avoid/min/comp mit identified	N
4		None	N/A	

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Subpart C			
1			
2	See analysis in 230.21 Summary		
3	See analysis in 230.21 Summary		Increase in turbidity results in reduced light penetration.
4	N/A		Suspended sediments and turbidity are expected to be short term in duration and limited in extent. Impact will not have the intensity to lower growth rates or disease tolerance.

	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	
Subpart C	**Subpart C**	**Potential Impacts on Physical and Chemical Characteristics of the Aquatic Ecosystem**			
5	230.21(b)	Biological or chemical reactions leading to oxygen depletion	Yes	Yes	Yes
6	230.21(b)	Bioavailability of toxic metals, organics, pathogens or viruses absorbed or adsorbed to fine-grained particulates	Yes	Yes	Yes
SUMMARY - Suspended particulate/turbidity determinations.	230.21 Summary	**Suspended particulate/turbidity determinations:** Individual and cumulative changes in kinds and concentrations of suspended particulates/turbidity	Yes	Yes	Yes

							STEP 1	
	N/A	No Effect	Negligible Effect	Minor Effect (Short Term)	Minor Effect (Long Term)	Significant	Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)	Reduced to below level of significance (Y/N)
Subpart C								
5				X			See analysis in 230.21 Summary	
6						X	See analysis in 230.21 Summary	
SUMMARY - Suspended particulate/turbidity determinations.						X	3, 6-9, 14-15, 39-40, 44-46, 58-59, 86, 96-97, 102, 118-121, 134-146, 170-172, 176 Project Design Features [DA Application Tab 23]- measures related to minimizing impacts to downgradient streams Protection of Wetlands and Waters [DA Application Tab 23]- measures related to implementation of erosion and sediment controls and avoiding/minimizing impacts to streams Restoration of Temporary Impacts [DA Application Tab 23]- measure related to streambank restoration Implementation of Environmental Plans and Controls and Adaptive Management [DA Application Tab 23]- measures related to erosion and sediment control Protection of Aquatic Resources [DA Application Tab 23]- measures related to erosion control	N

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Subpart C				
5	Section 4.18 Water and Sediment Quality; Appendix K4.24 Fish Values	None	no additional avoid/min/comp mit identified	
6	Appendix K4.24 Fish Values	None	no additional avoid/min/comp mit identified	N
SUMMARY - Suspended particulate/turbidity determinations.	Sections 3.22 and 4.22 Wetlands; Section 4.18 Water and Sediment Quality; Section 4.24 Fish Values; Appendix K4.24 Fish Values	None	minimization measure related to fugitive dust (e.g., crushing and transferring) and also minimization related to how effluent effects can be reduced (EPA-1, EPA-6, in Attachment B10 of the ROD)	N

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Subpart C			
5	See analysis in 230.21 Summary		turbidity levels (if high enough) would affect ability of fish gills to transfer oxygen (secondary effect); if water temperatures increased could affect Dissolved Oxygen levels (direct effect)
6	See analysis in 230.21 Summary		Methylmercury is the form of mercury of greatest concern for wildlife health because it biomagnifies in food webs. Methylmercury effects growth and development, behavior, reproduction and other biological functions. Methylmercury occurs naturally in the project area, however whether or not sulfates discharged into receiving waters would enhance mercury methylation cannot be ruled out.
SUMMARY - Suspended particulate/turbidity determinations.	Mine Site - in-kind compensatory mitigation within the Koktuli River Watershed will be required to compensate for all direct and indirect impacts caused by discharges into aquatic resources at the mine site. Direct and indirect impacts at the mine site total 2,825 acres of wetlands, 132.5 acres of open waters, and 129.5 miles of streams. The District has also determined that compensatory mitigation is required for unavoidable adverse impacts to aquatic resources from discharges associated with the transportation corridor and the port site. Direct and indirect impacts associated with the transportation corridor and port site total 460 acres of wetlands, 231.7 acres of open waters, and 55.5 miles of streams.	Mine Site - N Transportation Corridor - N Port - N Natural Gas Pipeline - Y	Suspended sediments and turbidity are expected to be short term in duration and limited in extent. Impact will not have the intensity to lower growth rates or disease tolerance. Secondary impacts will be looked at for compensatory mitigation as well as direct impacts. USACE cannot enforce EPA 3-6 mitigation measure

	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	
Subpart C	**Subpart C**	**Potential Impacts on Physical and Chemical Characteristics of the Aquatic Ecosystem**			
1	230.22(a)	**Water:** in which organic and inorganic constituents are dissolved and suspended. Clarity, nutrients and chemical content, physical and biological content, dissolved gas levels, pH, and temperature contribute to its life-sustaining capabilities.			
2	230.22(b)	Introduction of chemical constituents in suspended or dissolved form resulting in changes to chemical and physical characteristics	Yes	Yes	Yes
3	230.22(b)	Reducing or eliminating the suitability of water bodies for populations of aquatic organisms, and for human consumption, recreation, and aesthetics by changes to clarity, color, odor, taste or the introduction of contaminants	Yes	Yes	Yes
4	230.22(b)	Reduced dissolved oxygen from high biochemical oxygen demand	No	Yes	Yes
5	230.22(b)	Increases in nutrients favoring undesirable organisms and potentially causing adverse health effects, objectionable tastes and odors or other problems	No	Yes	Yes

							STEP 1	
	N/A	No Effect	Negligible Effect	Minor Effect (Short Term)	Minor Effect (Long Term)	Significant	Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)	Reduced to below level of significance (Y/N)
Subpart C								
1								
2						X	See analysis in Summary of 230.22, 230.23, 230.24, and 230.25	
3					X		See analysis in Summary of 230.22, 230.23, 230.24, and 230.25	
4						X	See analysis in Summary of 230.22, 230.23, 230.24, and 230.25	
5						X	See analysis in Summary of 230.22, 230.23, 230.24, and 230.25	

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Subpart C				
1				
2	Section 4.18.4.1 and Appendix K4.18 Water and Sediment Quality; Appendix K4.24 Fish Values	None	no additional avoid/min/comp mit identified	N
3	Section 4.24 and Appendix K4.24 Fish Values; Section 4.18.4.1 Water and Sediment Quality	None	no additional avoid/min/comp mit identified	
4	Section 4.18.4.1 Water and Sediment Quality	None	no additional avoid/min/comp mit identified	N
5	Section 4.26.10 Vegetation; Section 4.18 Water and Sediment Quality	None	no additional avoid/min/comp mit identified	N

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Subpart C			
1			
2	See analysis in Summary of 230.22, 230.23, 230.24, and 230.25		No exceedances in water quality standards in Average water quality anticipated. Selenium and Mercury released from mining in tiny amounts. Potential for impacts to fish whether or not water quality standards are exceeded. Wetlands and streams support salmon resource.
3	See analysis in Summary of 230.22, 230.23, 230.24, and 230.25		There are potential chemical inputs from the mining, the rock, fugitive dust, tailing facilities. The operations of the mine itself is anticipated that it will change the composition around the mine site, reducing the suitability around the mine site. Existing water bodies in the fill footprint would also be eliminated (direct impact). Chemical signature of receiving waters will be changed. Higher concentrations than baseline in receiving waters. The analysis considered impacts based on water quality standards designed to protect aquatic organisms.
4	See analysis in Summary of 230.22, 230.23, 230.24, and 230.25		There is some potential for reduction in oxygen. Increases in temperatures could result in increased microbiological activity. Selenium treatment technology has not been proven.
5	See analysis in Summary of 230.22, 230.23, 230.24, and 230.25		Immediately downstream of WTPs, nutrient loading would occur, although no exceedances in water quality standards in Average water quality are expected. Input of nutrients could cause natural flora to proliferate/die off. Could also cause harmful algal bloom which could have detrimental effects.

	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	
Subpart C	**Subpart C**	**Potential Impacts on Physical and Chemical Characteristics of the Aquatic Ecosystem**			
1	230.23(a)	**Current patterns and water circulation:** Physical movements of water in the aquatic ecosystem in response to natural forces including basin shape and cover, physical and chemical characteristics or water strata and masses, and energy dissipating factors.			
2	230.23(b)	Obstructing flow, changing the direction or velocity of water flow and circulation, or changing the dimensions of the water body	Yes- permanent direct impacts to 111.6 miles streams (105.4 miles permanent and 6.2 miles temporary)	Yes- Timing and magnitude of various flows, seasonality, overbank flows, ratios of surface to groundwater inputs will change as well.	Yes- especially under the expanded mine
3	230.23(b)	Adverse changes to the location, structure, and dynamics of aquatic communities	Yes	Yes	Yes

							STEP 1	
	N/A	No Effect	Negligible Effect	Minor Effect (Short Term)	Minor Effect (Long Term)	Significant	Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)	Reduced to below level of significance (Y/N)
Subpart C								
1								
2						X	See analysis in Summary of 230.22, 230.23, 230.24, and 230.25	
3						X	See analysis in Summary of 230.22, 230.23, 230.24, and 230.25	

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Subpart C				
1				
2	Section 4.16.4.1 Surface Water Hydrology; Sections 4.22.6, 4.22.9, 4.22.3, and 4.22.3 Wetlands; Section 4.24 Fish Values; Section 4.25 Threatened and Endangered Species	None	no additional avoid/min/comp mit identified	N
3	Sections 4.24.5.1, 4.24.5.2 and 4.24.8.2 Fish Values; Sections 4.22.8.3, 4.22.6.2 and 4.22.6.4 Wetlands	None	no additional avoid/min/comp mit identified	N

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Subpart C			
1			
2	See analysis in Summary of 230.22, 230.23, 230.24, and 230.25		Anticipated annual average streamflow change in the NFK includes 100 percent loss of NFK tributary NK1.190, +9.2 percent increase in reach NFK-C, and -0.2 percent streamflow reduction in reach NFK-A near the confluence with SFK. Anticipated average annual streamflow change in SFK includes -42.8 percent change in reach SFK-E at the mine site, and -2.2 percent reduction in reach SFK-A near the confluence with NFK. Anticipated average annual streamflow change in the UTC as a result of Alternative 3 includes a +2 percent increase in reach UTC-F near the mine site and +0.2 percent increase in reach UTC-A near Iliamna Lake.
3	See analysis in Summary of 230.22, 230.23, 230.24, and 230.25		Minor adverse changes in benthic habitat would occur as a result of dredging and the placement of dredge materials. - Discharges of dredged or fill material would cause community structure changes for the salmon population by removing the spawning areas and cause elimination of aquatic habitat or connectivity to habitats. Spawning, rearing, overwintering, for salmon and resident species that are carrying over their entire life cycle. Habitats are distinct enough that loss of shallow small streams and wetlands, the aquatic community is altered. Predators use those streams and wetlands as foraging/prey habitat and they are not going to have access in the same way or be able to forage effectively. Secondary and cumulative: losing access to low volume refugia. –The scale of this 404(b)(1) analysis is smaller than the EIS analysis area. The scale of this analysis for impacts at the mine site is the 10 digit HUCs (NFK, SFK,UTC).

	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	
Subpart C	**Subpart C**	**Potential Impacts on Physical and Chemical Characteristics of the Aquatic Ecosystem**			
4	230.23(b)	Adverse changes to shoreline and substrate erosion and deposition rates [e.g., altered sediment transport, winnowed/coarsened or embedded substrates, redd scour]	Yes	Yes	Yes
5	230.23(b)	Deposition of suspended particulates	Yes	Yes	Yes
6	230.23(b)	Altered rate and extent of mixing of dissolved and suspended components and water stratification	No	Yes	Yes

							STEP 1	
	N/A	No Effect	Negligible Effect	Minor Effect (Short Term)	Minor Effect (Long Term)	Significant	Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)	Reduced to below level of significance (Y/N)
Subpart C								
4						X	See analysis in Summary of 230.22, 230.23, 230.24, and 230.25	
5						X	See analysis in Summary of 230.22, 230.23, 230.24, and 230.25	
6						X	See analysis in Summary of 230.22, 230.23, 230.24, and 230.25	

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Subpart C				
4	4.24.5.1, 4.24.5.2 , 4.24.8.2, 4.24.5.3 and 4.24.8.3 Fish Values	None	no additional avoid/min/comp mit identified	N
5	Sections 4.18.4.1, 4.18.4.2, 4.18.4.3 Water and Sediment Quality; Sections 4.16.6.4 and 4.16.6.5 Surface Water Hydrology; Sections 4.22.6.1, 4.22.6.2, 4.22.6.3, and 4.22.6.4 Wetlands	None	no additional avoid/min/comp mit identified	N
6	Section 4.18.4.1 and Appendix K4.18 Water and Sediment Quality; Appendix K4.24 Fish Values	None	no additional avoid/min/comp mit identified	N

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Subpart C			
4	See analysis in Summary of 230.22, 230.23, 230.24, and 230.25		Blockages of headwaters can change flow of headwaters and natural sediment deposition. Changes of flow in downstream waters alter sediment transport rates.
5	See analysis in Summary of 230.22, 230.23, 230.24, and 230.25		Impacts to spawning resident and anadromous fish due to particles in the area and down stream. Increase in suspended particulates and turbidity during construction, and dredging.
6	See analysis in Summary of 230.22, 230.23, 230.24, and 230.25		Not applicable within the fill footprint. The project would likely cause stratification by temperature in reach C of the North Fork Koktuli. Groundwater inputs /temperature moderation/potential buffer from changes in chemistry from changes in the effluent. Different temperatures would not mix if upwelling was strong enough. Stratification that currently exists would be potentially altered affecting spawning habitat downstream.

	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	
Subpart C	**Subpart C**	**Potential Impacts on Physical and Chemical Characteristics of the Aquatic Ecosystem**			
1	230.24(a)	**Normal water fluctuations:** consisting of daily, seasonal, and annual tidal and flood fluctuations in water level to which biological and physical components of the natural aquatic system are attuned to or characterized by.			
2	230.24(b)	Prolonged periods of inundation, exaggerated extremes of high and low water, or a static, nonfluctuating water level	Yes	Yes	Yes
3	230.24(b)	Changes to salinity patterns, erosion or sedimentation rates, water temperature extremes, or nutrient or dissolved oxygen balance	Yes	Yes	Yes
4	230.24(b)	Alter or destroy communities and populations of aquatic animals and vegetation by inducing populations of nuisance organisms, modifying habitat, reducing food supplies, restricting movement of aquatic fauna, destroying spawning areas, and changing adjacent upstream and downstream areas	Yes	Yes	Yes

							STEP 1	
	N/A	No Effect	Negligible Effect	Minor Effect (Short Term)	Minor Effect (Long Term)	Significant	Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)	Reduced to below level of significance (Y/N)
Subpart C								
1								
2						X	See analysis in Summary of 230.22, 230.23, 230.24, and 230.25	
3						X	See analysis in Summary of 230.22, 230.23, 230.24, and 230.25	
4						X	See analysis in Summary of 230.22, 230.23, 230.24, and 230.25	

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Subpart C				
1				
2	Section 4.16 Surface Water Hydrology; Section 4.24 Fish Values	None	no additional avoid/min/comp mit identified	N
3	Sections 4.18.4.1 and 4.18.4.3 Water and Sediment Quality; Section 4.16 Surface Water Hydrology; Appendix K4.24 Fish Values	None	no additional avoid/min/comp mit identified	N
4	Sections 3.22 and 4.22 Wetlands; Sections 3.24 and 4.24 Fish Values	Bristol Bay Sockeye Portfolio provided by EPA 5-14-2020; see also letter from the State of Alaska to USEPA dated June 1, 2020 regarding portfolio effect and unpublished data (see letters in Attachment B10 of the ROD)	no additional avoid/min/comp mit identified	N

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Subpart C			
1			
2	See analysis in Summary of 230.22, 230.23, 230.24, and 230.25		It is anticipated that operations at the mine site would result in static nonfluctuating levels or no water. Secondarily reduction in monthly flow predictions (% reductions) up to the confluence of Koktuli River. Project is predicted to result in measurable change in the hydrograph downstream and those flows play key roles in life history events. Those changes are known to result in ecological impacts.
3	See analysis in Summary of 230.22, 230.23, 230.24, and 230.25		Project is predicted to result in measurable change in the hydrograph downstream and those flows play key roles in life history events. Those changes are known to result in ecological impacts.
4	See analysis in Summary of 230.22, 230.23, 230.24, and 230.25		The loss of aquatic habitat will alter the community structure of aquatic organisms. –Invasive Species Plan is currently inadequate to address the potential for introduction of invasive species. Local communities of fish and aquatic animals would be altered or destroyed in the SFK, NFK, and UTC based upon the scale of the impacts in those watersheds. see also letter from the State of Alaska to USEPA dated June 1, 2020 regarding portfolio effect and unpublished data (see letters in Attachment B10 of the ROD)

	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	
Subpart C	**Subpart C**	**Potential Impacts on Physical and Chemical Characteristics of the Aquatic Ecosystem**			
1	230.25(a)	**Salinity gradients:** where salt water from the ocean meets and mixes with fresh water from land			
2	230.25(b)	Diverting or restricting flow of fresh or salt water at an estuary or river mouth, or increasing/ decreasing flow volume that results in downstream or upstream migration of salinity gradients	No	No	No
3	230.25(b)	Adjustment, displacement, or mortality of salinity-dependent biota [e.g., juvenile and adult life stages of anadromous fish]	Yes- specifically at Diamond Point Port Site	Yes	Yes
4	230.25(b)	Altered circulation patterns and sedimentation zones	Yes- at Diamond Port Site	Yes	No

							STEP 1	
	N/A	No Effect	Negligible Effect	Minor Effect (Short Term)	Minor Effect (Long Term)	Significant	Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)	Reduced to below level of significance (Y/N)
Subpart C								
1								
2		X					N/A	
3					X		See analysis in Summary of 230.22, 230.23, 230.24, and 230.25	
4					X		See analysis in Summary of 230.22, 230.23, 230.24, and 230.25	

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Subpart C				
1				
2	N/A	None	N/A	
3	Sections 4.24.7 and 4.24.8 Fish Values	None	no additional avoid/min/comp mit identified	
4	Sections 4.16.6 and 4.16.7 Surface Water Hydrology	None	no additional avoid/min/comp mit identified	

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Subpart C			
1			
2	N/A		
3	See analysis in Summary of 230.22, 230.23, 230.24, and 230.25		Diamond Port site would have minor effects: Direct, indirect and cumulative based on new activity.
4	See analysis in Summary of 230.22, 230.23, 230.24, and 230.25		

	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	
Subpart C	**Subpart C**	**Potential Impacts on Physical and Chemical Characteristics of the Aquatic Ecosystem**			
SUMMARY - Water circulation, fluctuation, and salinity determinations.	Summary of 230.22, 230.23, 230,24, and 230.25	**Water circulation, fluctuation, and salinity determinations:** Individual and cumulative effects on water, current patterns, circulation including downstream flows, and normal water fluctuations considering: water chemistry, salinity, clarity, color, odor, taste, dissolved gas levels, temperature, nutrients, and eutrophication plus other characteristics.	Yes	Yes	Yes

							STEP 1	
	N/A	No Effect	Negligible Effect	Minor Effect (Short Term)	Minor Effect (Long Term)	Significant	Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)	Reduced to below level of significance (Y/N)
Subpart C								
SUMMARY - Water circulation, fluctuation, and salinity determinations.						X	6-9, 14-15, 39-40, 44-46, 48-51, 57, 59, 62- 81, 84-115, 118-121, 128, 133, 135-137, 139, 141-143, 145, 149, 156-158, 164, 167, 172-179 PLP's monitoring summary report (PLP 2019-RFI 135) Project Design Features [DA Application Tab 23]- measures related to the management of discharges Protection of Wetlands and Waters [DA Application Tab 23]- measures related to the management of discharges and minimization measures associated with the road design. Spill Prevention and Response and Groundwater Protection [DA Application Tab 23] - measures related to water treatment, maintenance, and monitoring Implementation of Environmental Plans and Controls and Adaptive Management [DA Application Tab 23]- measures related to aquatic resource monitoring and adaptive management Protection of Aquatic Resources [DA Application Tab 23]- measures related to culvert and bridge designs and water quality monitoring	N

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Subpart C				
SUMMARY - Water circulation, fluctuation, and salinity determinations.	Sections 3.24, 4.24, and Appendix K4.24 Fish Values; Section 4.16 Surface Water Hydrology; Section 4.18 and Appendix K4.18 Water and Sediment Quality; Sections 3.22 and 4.22 Wetlands; Section 4.26 Vegetation	Bristol Bay Sockeye Portfolio provided by EPA 5-14-2020; see also letter from the State of Alaska to USEPA dated June 1, 2020 regarding portfolio effect and unpublished data (see letters in Attachment B10 of the ROD)	the same minimization measure as identified in 230.11(c) could reduce this below significant. Suggested minimization measures: with mixtures of metals have effluent toxicity testing; monitor loads for specific elements and include load limits to monitor for bioaccumulation (EPA-1, EPA-2, EPA-3, EPA-6, in Attachment B10 of the ROD)	N

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Subpart C			
SUMMARY - Water circulation, fluctuation, and salinity determinations.	Mine Site - in-kind compensatory mitigation within the Koktuli River Watershed will be required to compensate for all direct and indirect impacts caused by discharges into aquatic resources at the mine site. Direct and indirect impacts at the mine site total 2,825 acres of wetlands, 132.5 acres of open waters, and 129.5 miles of streams. The District has also determined that compensatory mitigation is required for unavoidable adverse impacts to aquatic resources from discharges associated with the transportation corridor and the port site. Direct and indirect impacts associated with the transportation corridor and port site total 460 acres of wetlands, 231.7 acres of open waters, and 55.5 miles of streams.	Mine Site - N Transportation Corridor - N Port - N Natural Gas Pipeline - Y	see also letter from the State of Alaska to USEPA dated June 1, 2020 regarding portfolio effect and unpublished data (see letters in Attachment B10 of the ROD); USACE cannot enforce EPA 3-6 mitigation measures

	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	**Cumulative**
Subpart D	**Subpart D**	**Potential Impacts on Biological Characteristics of Aquatic Ecosystem**			
1	230.30(a) & (c)	**Threatened and endangered species:** a plant or animal species listed as threatened or endangered. Conclusions of the Secretary of the Interior concerning impacts to species and habitat pursuant to Section 7 consultation shall be considered final.			
2	230.30(b)(1)	Covering or otherwise directly killing species	No	Yes	Yes
3	230.30(b)(2)	Changing the clarity, chemical content, nutrient balance, dissolved oxygen, pH, temperature, salinity, current patterns, circulation and fluctuation so as to negatively affect water quality, spawning and maturation areas, nesting areas, protective cover, adequate and reliable food supply, and resting areas for migratory species	Yes	Yes	Yes

							STEP 1	
	N/A	No Effect	Negligible Effect	Minor Effect (Short Term)	Minor Effect (Long Term)	Significant	Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)	Reduced to below level of significance (Y/N)
Subpart D								
1								
2						X	See analysis in Summary of 230.30, 230.31, and 230.32	
3						X	See analysis in Summary of 230.30, 230.31, and 230.32	

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Subpart D				
1				
2	Sections 4.25.6 and 4.25.7 and Table 4.25-1 Threatened and Endangered Species	None	no additional avoid/min/comp mit identified	N
3	Section 4.25.6 Threatened and Endangered Species	None	no additional avoid/min/comp mit identified	N

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Subpart D			
1			
2	See analysis in Summary of 230.30, 230.31, and 230.32		The likelihood of mortality to a TES species under the proposed project is low given mitigation measures and measures from the USFWS and NMFS consultations. Within the port marine environment there would be a secondary effect of vessel collision for sea otters, Steller's eiders, beluga and potentially other whale species. Displacement of sea otters can potentially lead to separation of pups and mothers/pup mortality. Effects may be mitigated through Section 7 and MMPA processes
3	See analysis in Summary of 230.30, 230.31, and 230.32		Port site due to disturbances from dredging and dock construction. Dock could change invertebrate ecology/current flow.

	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	**Cumulative**
Subpart D	**Subpart D**	**Potential Impacts on Biological Characteristics of Aquatic Ecosystem**			
4	230.30(b)(2)	Physical removal of habitat to which listed species are limited	Yes	Yes	Yes
5	230.30(b)(3)	Facilitating incompatible activities	Yes	Yes	Yes

							STEP 1	
	N/A	**No Effect**	**Negligible Effect**	**Minor Effect (Short Term)**	**Minor Effect (Long Term)**	**Significant**	**Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)**	**Reduced to below level of significance (Y/N)**
Subpart D								
4						X	See analysis in Summary of 230.30, 230.31, and 230.32	
5					X		See analysis in Summary of 230.30, 230.31, and 230.32	

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Subpart D				
4	Section 4.25.6 Threatened and Endangered Species	None	no additional avoid/min/comp mit identified	N
5	Section 4.25.6 Threatened and Endangered Species	None	no additional avoid/min/comp mit identified	N

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Subpart D			
4	See analysis in Summary of 230.30, 230.31, and 230.32		There would be short term effects to TES habitat from installation of the natural gas pipeline and fiber optic cable in Cook Inlet. There would be long-term effects from maintenance dredging at the Diamond Point Port. Increased vessel traffic affects the way habitat is used by species. The lightering location in Iliamna Bay may also deter some species from using the bay in that area. Impacts to critical habitat for northern sea otter, Cook Inlet beluga whale, and foraging and winter habitat for Steller's eider.
5	See analysis in Summary of 230.30, 230.31, and 230.32		Construction of the project would facilitate incompatible activities that include underwater noise from dredging, caisson placement, and use of thrusters to keep position in Cook Inlet by anchor handling tugboats. There would also be increased vessel traffic which poses a strike hazard and the mooring anchors have a potential for whale entanglement. Given the low likelihood of these impacts since mitigation measures from consultations with USFWS and NMFS would be implemented, incompatible activities would have a reduced impact on threatened and endangered species. Construction impacts would be minor and short-term, while vessel operations would be minor, but long-term. There is a high density of animal concentration and the applicant has entered into formal ESA consultation with the Services. Activities would be introduced that cause ongoing conflict.

	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	**Cumulative**
Subpart D	**Subpart D**	**Potential Impacts on Biological Characteristics of Aquatic Ecosystem**			
1	230.31(a)	**Fish, crustaceans, mollusks, and other aquatic organisms in the food web:** all forms and life stages of finfish, crustaceans, mollusks, insects, annelids, planktonic organisms, and the plants and animals on which they feed and depend upon for their needs, throughout their geographic range.			
2	230.31(b)	Release of contaminants adversely affecting adults, juveniles, larvae, or eggs. Exposure to chemical contaminants in dissolved or suspended form, or exposure to high levels of suspended particulates	No	Yes	Yes

							STEP 1	
	N/A	No Effect	Negligible Effect	Minor Effect (Short Term)	Minor Effect (Long Term)	Significant	Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)	Reduced to below level of significance (Y/N)
Subpart D								
1								
2						X	See analysis in Summary of 230.30, 230.31, and 230.32	

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Subpart D				
1				
2	Section 4.24.5.1, Table 4.24-1, and Appendix K4.24 Fish Values	None	no additional avoid/min/comp mit identified	N

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Subpart D			
1			
2	See analysis in Summary of 230.30, 230.31, and 230.32		The release of contaminants is not expected to cause adverse effects on aquatic organisms based on the EIS analysis area. Discharges are expected to meet state and federal water quality standards designed to protect and sustain aquatic life. The change in baseline water chemistry would alter aquatic habitats but is not expected to have adverse effects on aquatic biota. Determination is No Effect for direct effect. The EIS acknowledges potential increase rates of methylation in downstream waters. Potential use of cyanide for expanding mine scenario - extended time frame of operations and increased volume of treated water more likely to change baseline conditions. Concern about copper incidentally discharged into the fill material and making its way into the stream, which was considered to be a direct effect. Copper is understood to be highly toxic animals that ingest it. Worried about accumulation in adult resident species. Secondary pathways, eggs, prey base for other species, change the runs over the years. Cumulative effect to overall salmon population. More potential for introduced contaminants than just the effluent discharge. Contaminant introduction through fugitive dust and other minor accidental sources. For any change with regard to copper. Not matching the natural chemistry of the system. Even though you are treating the water you have to treat for ph and hardness and we don't know if they are going to do that. It could magnify the effects of metals. Note there are exceedances of water quality standards occurring naturally. The EIS addresses many of the concerns regarding these issues. It is not believed that copper being too low would be an issue. The chemical composition of the water effects fish, pH, temperature, hardness.

	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	**Cumulative**
Subpart D	**Subpart D**	**Potential Impacts on Biological Characteristics of Aquatic Ecosystem**			
3	230.31(b)	Rendering unfit for human consumption by tainting, by production and accumulation of toxins, by ingestion and retention of pathogenic organisms, viruses, heavy metals or persistent synthetic organic chemicals	No	Yes	Yes
4	230.31(b)	Establishment or proliferation of an undesirable competitive species of plant or animal	No	Yes	Yes
5	230.31(b)	Settlement of suspended particulates smothering eggs, sedentary organisms, food sources, or altering substrate upon which they are dependent [e.g., spawning gravels or benthic habitat]	Yes	Yes	Yes

							STEP 1	
	N/A	No Effect	Negligible Effect	Minor Effect (Short Term)	Minor Effect (Long Term)	Significant	Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)	Reduced to below level of significance (Y/N)
Subpart D								
3					X		See analysis in Summary of 230.30, 230.31, and 230.32	
4						X	See analysis in Summary of 230.30, 230.31, and 230.32	
5						X	See analysis in Summary of 230.30, 230.31, and 230.32	

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Subpart D				
3	Section 4.24.5.1 and Appendix K4.24 Fish Values	None	no additional avoid/min/comp mit identified	
4	Section 4.26.10 Vegetation; Section 4.23.4 Wildlife	None	no additional avoid/min/comp mit identified	N
5	Sections 3.24, 4.24, 4.24.5.1, 4.24.5.2, 4.24.8.2, 4.24.7.3 and 4.24.8.3 Fish Values; Sections 3.22 and 4.22 Wetlands	Bristol Bay Sockeye Salmon Portfolio provided by EPA 5-14-2020; see also letter from the State of Alaska to USEPA dated June 1, 2020 regarding portfolio effect and unpublished data (see letters in Attachment B10 of the ROD)	no additional avoid/min/comp mit identified	N

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Subpart D			
3	See analysis in Summary of 230.30, 230.31, and 230.32		The bioaccumulation or biomagnification of contaminants in the food web is not expected to occur under permitted operations. There is a potential for methylmercury. Potentially greater impacts to resident rainbow trout and dolly varden.
4	See analysis in Summary of 230.30, 230.31, and 230.32		The likelihood of invasive species becoming established from project development is low when considering mitigation measures. The likelihood of this effect would be greater under the expanded mine scenario. Other potential invasives include: purple loosestrife, elodea, sweet clover, giant knotweed, reed canary grass, diatom, and as an example: parasite-trout hatchery in Anchorage (Whirling).
5	See analysis in Summary of 230.30, 230.31, and 230.32		Suspended sediment would cause direct impacts during dredge and fill activities. Direct effects include the smothering of eggs, displacement of individuals, and adverse alterations to habitats. Secondary effects of suspended sediment include changes in community structure from loss of habitats and mortalities. Secondary and cumulative impacts are of greatest concern. Loss of habitat, particularly spawning habitat for salmon and the impact that could have on destabilizing the population in the area. Suspended sediments would impact spawning grounds and migratory corridors. When considered at the scale of the NFK, SFK, and UTC, the impact is significant. The proposed project is going to directly convert 21% of the HUC12 to industrial use. see also letter from the State of Alaska to USEPA dated June 1, 2020 regarding portfolio effect and unpublished data (see letters in Attachment B10 of the ROD)

	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	**Cumulative**
Subpart D	**Subpart D**	**Potential Impacts on Biological Characteristics of Aquatic Ecosystem**			
6	230.31(b)	Redirect, delay, or stop the reproductive and feeding movements of fish and crustacea, preventing their aggregation in accustomed places such as spawning or nursery grounds and potentially leading to reduced populations	Yes	Yes	Yes
7	230.31(b)	Reduction of detrital feeding species or other lower trophic levels can impair the flow of energy from primary consumers to higher trophic levels. Reduction or potential elimination of food chain organism populations decreases the overall productivity and nutrient export capability of the ecosystem.	Yes	Yes	Yes

							STEP 1	
	N/A	**No Effect**	**Negligible Effect**	**Minor Effect (Short Term)**	**Minor Effect (Long Term)**	**Significant**	**Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)**	**Reduced to below level of significance (Y/N)**
Subpart D								
6					X		See analysis in Summary of 230.30, 230.31, and 230.32	
7						X	See analysis in Summary of 230.30, 230.31, and 230.32	

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Subpart D				
6	3.24, 4.24, 4.24.5.1, 4.24.5.2 and 4.24.8.2 Fish Values, 3.22 and 4.22 wetlands	Bristol Bay Sockeye Salmon Portfolio provided by EPA 5-14-2020; see also letter from the State of Alaska to USEPA dated June 1, 2020 regarding portfolio effect and unpublished data (see letters in Attachment B10 of the ROD)	no additional avoid/min/comp mit identified	N
7	Sections 3.24, 4.24, and 4.24.5.1 Fish Values; Sections 3.22 and 4.22 Wetlands	Bristol Bay Sockeye Salmon Portfolio provided by EPA 5-14-2020; see also letter from the State of Alaska to USEPA dated June 1, 2020 regarding portfolio effect and unpublished data (see letters in Attachment B10 of the ROD)	no additional avoid/min/comp mit identified	N

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Subpart D			
6	See analysis in Summary of 230.30, 230.31, and 230.32		This impact is certain to occur with the loss and alteration of aquatic habitats. The expanded mine scenario would result in longer activity, greater likelihood of impact occurring. It is anticipated that there could be a direct loss of spawning and nursery grounds. Potential impacts to habitats that are occurring in downstream waters primarily from flow alterations but also from temperature and egg incubation, sediment transport rates and smothering, as well as altering accessibility of off-channel habitats. Adjacent habitat will be affected. Changing a natural area into an industrial area leads to cascading effects.
7	See analysis in Summary of 230.30, 230.31, and 230.32		Probable that it would lead to streams with lower productivity.

	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	**Cumulative**
Subpart D	**Subpart D**	**Potential Impacts on Biological Characteristics of Aquatic Ecosystem**			
1	230.32(a)	**Other wildlife:** resident and transient mammals, birds, reptiles, and amphibians associated with aquatic ecosystems.			
2	230.32(b)	Loss or change of breeding and nesting areas, escape cover, travel corridors, and preferred food sources for resident and transient wildlife species	Yes	Yes	Yes
3	230.32(b)	Adverse impacts to wildlife habitat from changes in water levels, water flow and circulation, salinity, chemical content, and substrate characteristics and elevation.	Yes	Yes	Yes

							STEP 1	
	N/A	No Effect	Negligible Effect	Minor Effect (Short Term)	Minor Effect (Long Term)	Significant	Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)	Reduced to below level of significance (Y/N)
Subpart D								
1								
2						X	See analysis in Summary of 230.30, 230.31, and 230.32	
3						X	See analysis in Summary of 230.30, 230.31, and 230.32	

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Subpart D				
1				
2	Sections 4.23.6 and 4.23.7 Wildlife	None	Large Mammal Mitigation Recommendations for Pebble Mine	N
3	Sections 4.23.6 and 4.23.7 Wildlife	None	no additional avoid/min/comp mit identified	N

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Subpart D			
1			
2	See analysis in Summary of 230.30, 230.31, and 230.32		The project would result in the loss of large areas of wildlife habitat that are used seasonally, and year-round by a wide variety of resident and migratory species. Several of the avian species that would experience habitat loss are species of special concern due to population declines. Caribou in the Mulchatna Caribou Herd would experience direct habitat loss and secondary habitat avoidance around the mine site and along the transportation corridor. Brown bears would also experience direct loss of foraging and denning habitat. Travel corridors between Iliamna Lake and the surrounding landscape would be bisected by the port and mine access road along the north shore of Iliamna Lake. Other wildlife species would experience direct habitat loss and may be excluded from preferred food sources, especially if they are located in close proximity to project activities (i.e. brown bears may avoid feeding in salmon streams near stream crossings). Migratory birds. Loss of habitat for amphibians. Loss of habitat and fragmentation for bears, caribou, wolves. Displaced wildlife compete for new feeding, breeding, nesting habitat after loss of preferred habitat so there could be a cascading effect. Some avian species in Cook Inlet are already under stress from population reductions due to climate change effects on their preferred forage fish in Cook Inlet.
3	See analysis in Summary of 230.30, 230.31, and 230.32		There would be adverse impacts to wildlife habitat through dewatering and filling of wetlands. Impacts would be both short and long-term. Secondary affects to hydrology downstream. Direct impacts on wood frogs. Secondary changes in the fishery which are the prey base for mammals in the area.

	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	**Cumulative**
Subpart D	**Subpart D**	**Potential Impacts on Biological Characteristics of Aquatic Ecosystem**			
4	230.32(b)	Increased turbidity that affects sight-feeding species or disrupts the respiration and feeding of aquatic wildlife and food chain organisms	Yes	Yes	Yes
5	230.32(b)	Bioaccumulation of contaminants in wildlife	Yes	Yes	Yes

							STEP 1	
	N/A	**No Effect**	**Negligible Effect**	**Minor Effect (Short Term)**	**Minor Effect (Long Term)**	**Significant**	**Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)**	**Reduced to below level of significance (Y/N)**
Subpart D								
4					X construction / maintenance dredging		See analysis in Summary of 230.30, 230.31, and 230.32	
5						X	See analysis in Summary of 230.30, 230.31, and 230.32	

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Subpart D				
4	Section 4.23.6 Wildlife	None	no additional avoid/min/comp mit identified	
5	Section 4.23.4.1 Wildlife; Section 4.27 Spill Risk	None	no additional avoid/min/comp mit identified	N

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Subpart D			
4	See analysis in Summary of 230.30, 230.31, and 230.32		During construction of the natural gas pipeline, fiber optic cable, and port, there would be disturbance to the benthic marine environment resulting in increase turbidity that makes it difficult for species such as sea otters, harbor seals, and marine birds including seabirds and waterfowl to find prey. However, impacts from increased turbidity were not considered significant given there are large areas of Cook Inlet where species can feed if they are temporarily disturbed by project vessels and activities. Direct impact at the port site on marine mammals, birds, and near shore fish. Secondary downstream effects, and cumulative. Maintenance dredging of port would cause repeated impacts to sight feeding species.
5	See analysis in Summary of 230.30, 230.31, and 230.32		While all water would be discharged back into the environment following the most stringent water quality criteria, avian species could experience bioaccumulation of contaminants from repeated exposure to water within the pit lake, water management ponds, and tailings storage facilities. In particular, water quality in the pit lake is projected to exceed water quality standards for several metals that have the potential to bioaccumulate. Wildlife species that prey upon birds that have bioaccumulated contaminants from the pit lake may also experience bioaccumulation. Apart from the pit lake, water management ponds, and tailings storage facilities, wildlife are not anticipated to experience bioaccumulation of contaminants under normal permitted operating conditions. Since large numbers of waterbirds are known to migrate through the area and may occasionally contact water that is above water quality standards, potential impacts would be expanded.

	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	**Cumulative**
Subpart D	**Subpart D**	**Potential Impacts on Biological Characteristics of Aquatic Ecosystem**			
6	230.32(b)	Physical and chemical changes that favor the introduction of undesirable plant and animal species	Yes	Yes	Yes
7	230.32(b)	Lowering plant and animal species diversity that disrupts normal ecosystem functions and leads to reduced overall biological productivity	Yes- directly within the fill footprint	Yes	Yes

							STEP 1	
	N/A	No Effect	Negligible Effect	Minor Effect (Short Term)	Minor Effect (Long Term)	Significant	Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)	Reduced to below level of significance (Y/N)
Subpart D								
6					X		See analysis in Summary of 230.30, 230.31, and 230.32	
7					X		See analysis in Summary of 230.30, 230.31, and 230.32	

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Subpart D				
6	Sections 3.24, 4.24 , 4.24.5.1, 4.24.5.2 and 4.24.8.2 Fish Values; Sections 3.22 and 4.22 Wetlands	None	no additional avoid/min/comp mit identified	
7	Sections 3.24, 4.24, 4.24.5.1, 4.24.5.2 and 4.24.8.2 Fish Values; Sections 3.22 and 4.22 Wetlands	None	no additional avoid/min/comp mit identified	N

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Subpart D			
6	See analysis in Summary of 230.30, 230.31, and 230.32		The project may cause the introduction of new invasive species. However, with the implementation of measures to avoid and minimize the spread of invasive species, the likelihood of invasive species introduction is considered low. Opportunities for invasive species to colonize would still be probable.
7	See analysis in Summary of 230.30, 230.31, and 230.32		While there would be imnpacts to wildlife from loss of habitat and reduced reproductive capacity of local populations, no loss of plant and animal species diversity is expected. Within the direct footprint of the fill vegetation, wildlife, and aquatic species would be removed. The effect is localized.

	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	**Cumulative**
Subpart D	**Subpart D**	**Potential Impacts on Biological Characteristics of Aquatic Ecosystem**			
SUMMARY - Aquatic ecosystem and organism determinations.	Summary of 230.30, 230.31, and 230.32	**Aquatic ecosystem and organism determinations:** Individual and cumulative effects on the structure and function of aquatic ecosystem and organisms considering: potential changes in substrate characteristics and elevation, water or substrate chemistry, nutrients, currents, circulation, fluctuation, and salinity on the recolonization and existence of indigenous aquatic organisms or communities.	Yes	Yes	Yes

							STEP 1	
	N/A	**No Effect**	**Negligible Effect**	**Minor Effect (Short Term)**	**Minor Effect (Long Term)**	**Significant**	**Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)**	**Reduced to below level of significance (Y/N)**
Subpart D								
SUMMARY - Aquatic ecosystem and organism determinations.						X	9, 14-32, 39-40, 44-47, 56, 59, 67-68, 82, 85-86, 96-97, 102, 106, 108, 111-113, 116-119, 129, 131-132, 135-137, 139-140, 143-143, 150, 159-161, 163, 172-173, 179, 180 **Project Design Features** [DA Application June 2020, Tab 23]- all measures **Protection of Wetlands and Waters** [DA Application June 2020, Tab 23]-all measures. **Restoration of Temporary Impacts** [DA Application June 2020, Tab 23] - all measures **Reclamation of Permanent Impacts** [DA Application June 2020, Tab 23] - all measures **Spill Prevention and Response and Groundwater Protection** [DA Application June 2020, Tab 23] - all measures **Implementation of Environmental Plans and Controls and Adaptive Management** [DA Application June 2020, Tab 23]- all measures. **Protection of Wildlife** - [DA Application June 2020, Tab 23]- all measures. **Protection of Aquatic Resources** [DA Application June 2020, Tab 23]- all measures. **Protection of Wildlife** [DA Application June 2020, Tab 23]-all measures.	N

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Subpart D				
SUMMARY - Aquatic ecosystem and organism determinations.	Section 4.23 Wildlife; Section 4.27 Spill Risk	Bristol Bay Sockeye Salmon Portfolio provided by EPA 5-14-2020; see also letter from the State of Alaska to USEPA dated June 1, 2020 regarding portfolio effect and unpublished data (see letters in Attachment B10 of the ROD)	EPA-1, EPA-2, EPA-3, EPA-4, EPA-5, EPA-6, in Attachment B10 of the ROD	N

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Subpart D			
SUMMARY - Aquatic ecosystem and organism determinations.	Mine Site - in-kind compensatory mitigation within the Koktuli River Watershed will be required to compensate for all direct and indirect impacts caused by discharges into aquatic resources at the mine site. Direct and indirect impacts at the mine site total 2,825 acres of wetlands, 132.5 acres of open waters, and 129.5 miles of streams. The District has also determined that compensatory mitigation is required for unavoidable adverse impacts to aquatic resources from discharges associated with the transportation corridor and the port site. Direct and indirect impacts associated with the transportation corridor and port site total 460 acres of wetlands, 231.7 acres of open waters, and 55.5 miles of streams.	Mine Site - N Transportation Corridor - N Port - N Natural Gas Pipeline - Y	Threatened and endangered species minimization measures would come out of consultation under Section 7 of the Endangered Species Act; can provide information for the development of an Invasive Species Plan, traffic shutdown times for wildlife crossing and the applicant has identified that they would develop an effluent management plan; the applicant should restore or maintain the hydrograph; minimization measures would not reduce below significant. USACE cannot enforce EPA 3-6 mitigation measures

	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	**Cumulative**
Subpart E	**Subpart E**	**Potential Impacts on Special Aquatic Sites**			
1	230.40(a)	**Sanctuaries and refuges:** areas designated under State and Federal laws or local ordinances to be managed principally for the preservation and use of fish and wildlife resources			
2	230.40(b)(1)	Disrupt the breeding, spawning, migratory movements or other critical life requirements of resident or transient fish and wildlife resources	Yes- construction and operation of the port has potential to disturb nesting and foraging birds in AMNWR.	Yes- food chain and habitat utilization effects	Yes- extension of port access road from Iliamna Bay to Iniskin Bay under mine expansion
3	230.40(b)(2)	Create unplanned, easy and incompatible human access to remote aquatic areas	No- road would be controlled access	Yes	Yes- Diamond Point Port and port access road would supersede freight operations at Williamsport when mine is no longer operational
4	230.40(b)(3)	Create the need for frequent maintenance activity	No	Yes- potential need for change in or additional resources to address boundary issues with the refuges	Yes- assuming long-term operation of the Diamond Point port

							STEP 1	
	N/A	No Effect	Negligible Effect	Minor Effect (Short Term)	Minor Effect (Long Term)	Significant	Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)	Reduced to below level of significance (Y/N)
Subpart E								
1								
2					X		See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45	
3					X		See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45	
4					X		See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45	

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Subpart E				
1				
2	Sections 4.24.5.1, 4.24.5.2 and 4.24.8.2 Vegetation; Sections 4.23.4 and 4.23.6 Wildlife	None	see notes	
3	Sections 4.5.5.3 and 4.5.6 and Table 4.5-1 Recreation	None	no additional avoid/min/comp mit identified	
4	Table 4.2-1 Lands	None	no additional avoid/min/comp mit identified	

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Subpart E			
1			
2	See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45		Spill potential to effect Alaska Maritime National Wildlife Refuge (AMNWR) near the port site. See Large Mammal Mitigation Recommendations for Pebble Mine for a general list of recommendations to implement to minimize traffic impacts on wildlife. Also recommend that recommendations in draft AMNWR Biosecurity Plan (see Attachment B10 of the ROD) be implemented.
3	See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45		Port and lightering activities would occur in proximity to AMNWR (activity at the port lightering and disturbance). Increased opportunities for trespass for AMNWR.
4	See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45		Boundary issues may result in modification of active management considerations.

	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	**Cumulative**
Subpart E	**Subpart E**	**Potential Impacts on Special Aquatic Sites**			
5	230.40(b)(4)	Result in the establishment of undesirable competitive species of plants and animals	No	Yes	Yes- likely to introduce invasives over time
6	230.40(b)(5)	Change the balance of water and land areas needed to provide cover, food, and other fish and wildlife habitat requirements in a way that modifies sanctuary or refuge management practices	No	No	No
7	230.40(b)(6)	Result in any of the other adverse impacts discussed in subparts C and D as they relate to a particular sanctuary or refuge	No	Yes	Yes

							STEP 1	
	N/A	No Effect	Negligible Effect	Minor Effect (Short Term)	Minor Effect (Long Term)	Significant	Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)	Reduced to below level of significance (Y/N)
Subpart E								
5					X		See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45	
6		X					N/A	
7						X	See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45	

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Subpart E				
5	Section 4.26.10 Vegetation; Section 4.23.4 Wildlife	None	see notes	N
6	N/A	None	no additional avoid/min/comp mit identified	
7	Section 4.23.6.1 Wildlife; Section 4.26.10 Vegetation; Section 4.2.5.2 Recreation; Section 4.2.6.2 Lands	None	no additional avoid/min/comp mit identified	N

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Subpart E			
5	See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45		Recommend that recommendations in draft AMNWR Biosecurity Plan (see Attachment B10 of the ROD) be implemented.
6	N/A		
7	See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45		Movement of bears between Lake Clark and Katmai and effects to sea birds in the AMNWR, and introduction of invasive species.

Preliminary Factual Determination Discussion					
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	**Cumulative**
Subpart E	**Subpart E**	**Potential Impacts on Special Aquatic Sites**			
1	230.41(a)(1)	**Wetlands:** areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.			
2	230.41(a)(2)	Where wetlands are adjacent to open water, they generally constitute the transition to upland. The margin between wetland and open water can best be established by specialists familiar with the local environment, particularly where emergent vegetation merges with submerged vegetation over a broad area in such places as the lateral margins of open water, headwaters, rainwater catch basins, and groundwater seeps. The landward margin of wetlands also can best be identified by specialists familiar with the local environment when vegetation from the two regions merges over a broad area.			
3	230.41(a)(3)	Wetland vegetation consists of plants that require saturated soils to survive (obligate wetland plants) as well as plants, including certain trees, that gain a competitive advantage over others because they can tolerate prolonged wet soil conditions and their competitors cannot. In addition to plant populations and communities, wetlands are delimited by hydrological and physical characteristics of the environment. These characteristics should be considered when information about them is needed to supplement information available about vegetation, or where wetland vegetation has been removed or is dormant.			

							STEP 1	
	N/A	No Effect	Negligible Effect	Minor Effect (Short Term)	Minor Effect (Long Term)	Significant	Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)	Reduced to below level of significance (Y/N)
Subpart E								
1								
2								
3								

	STEP 2		STEP 3	
	Where analyzed in EIS?	Additional information provided by 404q agency	Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate	Reduced to below level of significance (Y/N)
Subpart E				
1				
2				
3				

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Subpart E			
1			
2			
3			

Preliminary Factual Determination Discussion					
	40 CFR Citation	Category of Impact or Effect	Direct	Secondary and Indirect	Cumulative
Subpart E	Subpart E	Potential Impacts on Special Aquatic Sites			
4	230.41(a)(3)	Damage or destroy habitat and adversely affect the biological productivity of wetlands ecosystems by smothering, by dewatering, by permanently flooding, or by altering substrate elevation or periodicity of water movement	Yes- total direct impacts to 2,947 acres of wetlands and other waters (2,179 acres permanent and 768 acres temporary), including 111.6 miles streams (105.4 miles permanent and 6.2 miles temporary)	Yes- fragmentation, deposition of dust, and dewatering (collectively) have the potential to indirectly impact 1,470 acres, including 79.7 miles of streams	Yes- total direct cumulative impacts (proposed project plus expansion) to 11,760 acres of wetlands and other waters (10,987 acres permanent and 773 acres temporary); total cumulative indirect impacts to 3,438 acres of wetlands and other waters
5	230.41(a)(3)	Destroy wetland vegetation or result in advancement of succession to dry land species	Yes- the discharge of dredged or fill material would eliminate wetland vegetation	Yes- change to wetland hydrology due to fragmentation and dewatering has the potential to transition wetland communities to more mesic types.	Yes- mine expansion would increase the magnitude, extent, and duration of direct and secondary impacts to wetlands
6	230.41(a)(3)	Reduce or eliminate nutrient exchange by a reduction of the system's productivity, or by altering current patterns and velocities	Yes	Yes	Yes
7	230.41(a)(3)	Degrade water quality by obstructing circulation patterns that flush large expanses of wetland systems, interfering with the filtration function of wetlands, or changing the aquifer recharge capability of a wetland	Yes- total direct impacts to 2,947 acres of wetlands and other waters (2,179 acres permanent and 768 acres temporary), including 111.6 miles streams (105.4 miles permanent and 6.2 miles temporary)	Yes- where losses are hydrologically connected to downgradient wetlands, the function of those wetlands is expected to be reduced	Yes- total direct cumulative impacts (proposed project plus expansion) to 11,760 acres of wetlands and other waters (10,987 acres permanent and 773 acres temporary); total cumulative indirect impacts to 3,438 acres of wetlands and other waters

							STEP 1	
	N/A	No Effect	Negligible Effect	Minor Effect (Short Term)	Minor Effect (Long Term)	Significant	Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)	Reduced to below level of significance (Y/N)
Subpart E								
4						X	See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45	
5						X	See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45	
6						X	See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45	
7						X	See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45	

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Subpart E				
4	Sections 4.22, 4.22.3, and 4.22.10 and Table 4.22-40 Wetlands	None	no additional avoid/min/comp mit identified	N
5	Sections 4.22, 4.22.3, and 4.22.10 Wetlands	None	The greatest sources of fugitive dust emissions at the mine site during mine operations are blasting, rock crushing, transfer emissions, and vehicles on unpaved surfaces. Enclosing the primary crushers and the transfer point between the crushers and ore conveyor and including air control equipment in the crusher building would greatly reduce fugitive dust from crushing operations. (See EPA-1, in Attachment B10 of the ROD)	N
6	Sections 4.22.6.1 and 4.22.10 Wetlands	None	no additional avoid/min/comp mit identified	N
7	Sections 3.22.7, 4.22, 4.22.6.1, and 4.22.10 and Table 4.22-40 Wetlands	None	no additional avoid/min/comp mit identified	N

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Subpart E			
4	See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45		For all wetlands factors, no avoid/min measures would reduce impacts below significant. For all wetlands factors, at the mine site - the scale of the impacts were considered based on losses to the NFK, SFK, and UTC.
5	See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45		
6	See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45		
7	See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45		

	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	**Cumulative**
Subpart E	**Subpart E**	**Potential Impacts on Special Aquatic Sites**			
8	230.41(a)(3)	Change the wetland habitat value for fish and wildlife	Yes- direct loss of habitat, change in habitat due to altered wetland hydrology, and deposition of fugitive dust, temporary construction impacts of increased sedimentation and turbidity	Yes- potential mortality, displacement, and behavioral disturbance for fish and wildlife	Yes- mine expansion would increase the magnitude, extent, and duration of direct and secondary impacts to wetlands
9	230.41(a)(3)	When disruptions in flow and circulation patterns occur, apparently minor loss of wetland acreage may result in major losses through secondary impacts	No	Yes	Yes
10	230.41(a)(3)	Modify the capacity of wetlands to retain and store floodwaters and to serve as a buffer zone shielding upland areas from wave actions, storm damage and erosion	Yes- loss of wetlands fringing waterbodies across which fetch is great enough to produce waves, or coastal wetlands subject to tidal inundation would reduce function of shoreline stabilization	Yes- erosion, export of soil and organic matter from local system, reduced capacity to cycle nutrients, lower habitat value	Yes- mine expansion would increase the magnitude, extent, and duration of direct and secondary impacts to coastal, lacustrine and riparian fringe wetlands

							STEP 1	
	N/A	No Effect	Negligible Effect	Minor Effect (Short Term)	Minor Effect (Long Term)	Significant	Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)	Reduced to below level of significance (Y/N)
Subpart E								
8						X	See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45	
9						X	See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45	
10						X	See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45	

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Subpart E				
8	Section 4.22 Wetlands; Section 4.24 Fish Values	None	no additional avoid/min/comp mit identified	N
9	Sections 4.22.3 and 4.22.10 Wetlands	None	Manage treated effluent discharges to maintain the baseline hydrograph and water chemistry/temperature of receiving waters (see EPA-6, in Attachment B10 of the ROD)	N
10	Sections 3.22.7, 4.22, and 4.22.10 Wetlands	None	no additional avoid/min/comp mit identified	N

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Subpart E			
8	See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45		
9	See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45		Direct, secondary and cumulative impacts of fill on flow and circulation addressed in previous rows
10	See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45		

	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	**Cumulative**
Subpart E	**Subpart E**	**Potential Impacts on Special Aquatic Sites**			
1	230.42(a)	**Mud flats:** broad flat areas along the sea coast and in coastal rivers to the head of tidal influence and in inland lakes, ponds, and riverine systems. When mud flats are inundated, wind and wave action may resuspend bottom sediments. Coastal mud flats are exposed at extremely low tides and inundated at high tides with the water table at or near the surface of the substrate. The substrate of mud flats contains organic material and particles smaller in size than sand. They are either unvegetated or vegetated only by algal mats.			
2	230.42(b)	Changes in water circulation patterns which may permanently flood or dewater the mud flat or disrupt periodic inundation, resulting in an increase in the rate of erosion or accretion	Yes- mudflats occurring in the project area are the unconsolidated shores of ponds and coastlines. The loss or degradation of wetlands and waterbodies with hydrologic connection to these types has potential to alter water circulation patterns in the mudflat.	Yes- Increased erosion or accretion has the potential to reduce biological productivity and thus habitat value of the mudflat system	Yes- mine expansion is likely to impact additional palustrine mudflats at the mine site and estuarine mudflats in shallow Iniskin Bay
3	230.41(b)	Deplete or eliminate mud flat biota, foraging areas, and nursery areas	Yes- the proposed project would eliminate 29 acres of mud flats	Yes- mortality of sessile aquatic organisms and displacement of more mobile species. Induced accretion would expand loss greater than 29 acres.	Yes- mine expansion is likely to impact additional palustrine mudflats at the mine site and estuarine mudflats in shallow Iniskin Bay

							STEP 1	
	N/A	No Effect	Negligible Effect	Minor Effect (Short Term)	Minor Effect (Long Term)	Significant	Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)	Reduced to below level of significance (Y/N)
Subpart E								
1								
2						X	See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45	
3						X	See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45	

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Subpart E				
1				
2	Sections 3.22.6, 4.22.6.1, and 4.22.8.3 Wetlands	None	no additional avoid/min/comp mit identified	N
3	Sections 3.22.6, 4.22.6.1 , and 4.22.8.3 Wetlands.	None	no additional avoid/min/comp mit identified	N

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Subpart E			
1			
2	See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45		
3	See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45		

	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	**Cumulative**
Subpart E	**Subpart E**	**Potential Impacts on Special Aquatic Sites**			
4	230.41(b)	Changes in inundation patterns can affect the chemical and biological exchange and decomposition process occurring on the mud flat and change the deposition of suspended material affecting the productivity of the area	Yes- Elimination or degradation of wetlands and waterbodies that support the function of mudflats as well as the degradation of the actual mudflat would reduce biological productivity	Yes- reduced biological productivity of mudflats has implications for the higher trophic levels supported by mudflat habitat and/or biota	Yes- mine expansion is likely to impact additional palustrine mudflats at the mine site and estuarine mudflats in shallow Iniskin Bay
5	230.41(b)	Reduction of the mud flat's capacity to dissipate storm surge runoff	Yes- elimination of 16 acres of mudflats at Diamond Point would reduce the overall capacity of the coast line to dissipate storm surge runoff	Yes- changed patterns of erosion and sedimentation, greater turbidity, lower habitat value	Yes- mine expansion is likely to impact additional palustrine mudflats at the mine site and estuarine mudflats in shallow Iniskin Bay

							STEP 1	
	N/A	No Effect	Negligible Effect	Minor Effect (Short Term)	Minor Effect (Long Term)	Significant	Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)	Reduced to below level of significance (Y/N)
Subpart E								
4						X	See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45	
5						X	See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45	

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Subpart E				
4	Sections 3.22.6, 4.22.6.1, and 4.22.8.3 Wetlands.	None	no additional avoid/min/comp mit identified	N
5	3.22.6, 4.22.6.1, and 4.22.8.3 and Table 4.22-31 Wetlands	None	no additional avoid/min/comp mit identified	N

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Subpart E			
4	See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45		
5	See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45		

	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	**Cumulative**
Subpart E	**Subpart E**	**Potential Impacts on Special Aquatic Sites**			
1	230.43(a)	**Vegetated shallows:** permanently inundated areas that under normal circumstances support communities of rooted aquatic vegetation, such as turtle grass and eelgrass in estuarine or marine systems as well as a number of freshwater species in rivers and lakes.			
2	230.43(b)	Smother vegetation and benthic organisms	Yes- elimination of 4 acres of palustrine vegetated shallows	Yes- elimination of vegetated shallows would reduce the capacity of the greater palustrine system to stabilize bottom and shoreline sediments; loss or reduced vigor of vegetated shallows would decrease provision of algal and aquatic plant subsidy to surrounding communities	Yes- mine expansion is likely to impact additional freshwater vegetated shallows

							STEP 1	
	N/A	**No Effect**	**Negligible Effect**	**Minor Effect (Short Term)**	**Minor Effect (Long Term)**	**Significant**	**Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)**	**Reduced to below level of significance (Y/N)**
Subpart E								
1								
2						X	See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45	

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Subpart E				
1				
2	Sections 3.22.6, 4.22.6.1 and 4.22.8.3 and Table 4.22-31 Wetlands	None	no additional avoid/min/comp mit identified	N

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Subpart E			
1			
2	See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45		

Preliminary Factual Determination Discussion					
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	**Cumulative**
Subpart E	**Subpart E**	**Potential Impacts on Special Aquatic Sites**			
3	230.43(b)	Creating unsuitable conditions for vegetation vigor by: (1) changing water circulation patterns; (2) releasing nutrients that increase undesirable algal populations; (3) releasing chemicals that adversely affect plants and animals; (4) increasing turbidity levels, thereby reducing light penetration and hence photosynthesis; and (5) changing the capacity of a vegetated shallow to stabilize bottom materials and decrease channel shoaling	Yes- initial and maintenance dredging of 76 acres would increase turbidity, and sedimentation, which depending on proximity and current patterns could impact vegetated shallows in Iliamna and Cottonwood Bays; similar disturbance from the installation of the natural gas pipeline could impact vegetated shallows in Ursus Cove.	Yes- adverse impact to vegetated shallows would have decrease biological productivity and species diversity of the greater system with subsequent impacts to higher trophic levels	Yes
4	230.43(b)	Reduce the value of vegetated shallows as nesting, spawning, nursery, cover, and forage areas, or their value in protecting shorelines from erosion and wave actions	Yes- reduction of the value of freshwater vegetated shallows at the mine site expected	Yes- adverse impact to vegetated shallows would have decrease biological productivity and species diversity of the greater system with subsequent impacts to higher trophic levels	Yes- mine expansion is likely to impact additional freshwater vegetated shallows
5	230.43(b)	Encourage the growth of nuisance vegetation	No	Yes	Yes

							STEP 1	
	N/A	No Effect	Negligible Effect	Minor Effect (Short Term)	Minor Effect (Long Term)	Significant	Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)	Reduced to below level of significance (Y/N)
Subpart E								
3						X	See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45	
4						X	See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45	
5						X	See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45	

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Subpart E				
3	Sections 3.22.6, 4.22.6.1, 4.22.8.3 Wetlands	None	no additional avoid/min/comp mit identified	N
4	Sections 3.22.6, 4.22.6.1, and 4.22.8.3 Wetlands	None	no additional avoid/min/comp mit identified	N
5	Sections 3.22.6, 4.22.6.1, and 4.22.8.3 Wetlands; Section 4.26 Vegetation	None	no additional avoid/min/comp mit identified	N

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Subpart E			
3	See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45		While vegetated shallows are not documented within the analysis areas at Diamond Point or Ursus Cove, rocky reefs, supporting submerged aquatic vegetation are present in outlying intertidal to subtidal portions of Iliamna Bay, Cottonwood Bay, Ursus Cove and Kamishak Bay. The submerged aquatic vegetation characteristic of vegetated shallows provides food and habitat for species as well as maintaining water quality by absorbing nutrients, trapping sediments, reducing erosion, and producing oxygen. Algal subsidy provides food for a variety of grazing invertebrates, especially crustaceans which, in turn, become prey for numerous species of fish, mammals, and birds.
4	See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45		Vegetated Shallows in Cook Inlet: Jones, T., S. Saupe, K. Iken, B. Konar, S. Venator, M. Lindeberg, H. Coletti, B. Pister, J. Reynolds, and K. Haven. 2019. Assessment of nearshore communities of Lower Cook Inlet Nearshore Ecosystem 2015 - 2018. Anchorage (AK): US Department of the Interior, Bureau of Ocean Energy Management. OCS Study BOEM 2019-075. 221 p. Potential reductions in life stages of fish, fresh water vegetated pond habitats. Baseline marine environment near shore Iliamna Bay heavily used by juvenile salmonids. Converting natural shoreline of mudflats and vegetated shallows into armored road corridor with commensurate loss of habitat on that western shore.
5	See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45		Potential introduction of invasive aquatics. Changes documented elsewhere for flows/temperature/nutrients to potentially encourage growth if a species (elodea) became established very difficult to control. Consequences are high if invasives take off.

	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	**Cumulative**
Subpart E	**Subpart E**	**Potential Impacts on Special Aquatic Sites**			
1	230.44(a)	**Coral reefs:** consist of the skeletal deposit, usually of calcareous or silicaceous materials, produced by the vital activities of anthozoan polyps or other invertebrate organisms present in growing portions of the reef.			
2	230.44(b)	Adversely affect colonies of reef building organisms by burying them, by releasing contaminants such as hydrocarbons into the water column, by reducing light penetration through the water, and by increasing the level of suspended particulates. Coral organisms are extremely sensitive to even slight reductions in light penetration or increases in suspended particulates. These adverse effects will cause a loss of productive colonies which in turn provide habitat for many species of highly specialized aquatic organisms.	No- there are no coral reefs in the analysis area	No	No

							STEP 1	
	N/A	No Effect	Negligible Effect	Minor Effect (Short Term)	Minor Effect (Long Term)	Significant	Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)	Reduced to below level of significance (Y/N)
Subpart E								
1								
2	X						N/A	N/A

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Subpart E				
1				
2	N/A	None	N/A	N/A

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Subpart E			
1			
2	N/A	N/A	

	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	**Cumulative**
Subpart E	**Subpart E**	**Potential Impacts on Special Aquatic Sites**			
1	230.45(a)	**Riffle and pool complexes:** Steep gradient sections of streams are sometimes characterized by riffle and pool complexes. Such stream sections are recognizable by their hydraulic characteristics. The rapid movement of water over a coarse substrate in riffles results in a rough flow, a turbulent surface, and high dissolved oxygen levels in the water. Pools are deeper areas associated with riffles. Pools are characterized by a slower stream velocity, a steaming flow, a smooth surface, and a finer substrate. Riffle and pool complexes are particularly valuable habitat for fish and wildlife.			
2	230.45(b)	Eliminate riffle and pool areas by displacement, hydrologic modification, or sedimentation; or alter riffle/pool ratios	Yes- 92 acres (equivalent to 88.5 miles) of upper perennial stream habitat across all project components	Yes- loss of riffle and pool habitat is likely to cause the mortality of anadromous and resident fish as well as degrade downstream habitat through the reduced capacity for aeration and filtration, and increased scour, sedimentation, and turbidity.	Yes- mine expansion would result in additional permanent impacts to 330.5 miles of streams, some portion of which are likely to support riffle and pool habitat

							STEP 1	
	N/A	No Effect	Negligible Effect	Minor Effect (Short Term)	Minor Effect (Long Term)	Significant	Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)	Reduced to below level of significance (Y/N)
Subpart E								
1								
2						X	See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45	

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Subpart E				
1				
2	Sections 3.22.6, 4.22.6.1, and 4.22.9 and Table 4.22-31 Wetlands	None	Manage treated effluent discharges to maintain the baseline hydrograph and water chemistry/temperature of receiving waters (see EPA-6, in Attachment B10 of the ROD)	N

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Subpart E			
1			
2	See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45		Managing hydrograph may offset some but not all indirect impacts, and would not offset direct impacts

	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	**Cumulative**
Subpart E	**Subpart E**	**Potential Impacts on Special Aquatic Sites**			
3	230.45(b)	Reduce the aeration and filtration capabilities at the discharge site and downstream, reduce stream habitat diversity, or retard repopulation of the disposal site and downstream waters through sedimentation and the creation of unsuitable habitat	Yes- temporary impacts to 6.2 miles of upper perennial stream habitat across all project components; fragmentation, deposition of dust, and dewatering (collectively) have the potential to impact 79.5 miles of streams across all project components	Yes- altered hydrology and substrate condition is likely to reduce aeration and filtration capacity and overall habitat suitability	Yes- mine expansion would result in additional temporary impacts to 17.0 miles of streams, some portion of which are likely to support riffle and pool habitat
4	230.45(b)	Altered stream hydrology resulting in scouring or sedimentation of riffles and pools	Yes- loss and fragmentation of upper perennial stream habitat as well as temporary impacts due to installation of bridges and culverts could cause scour and sedimentation of downgradient riffle and pool habitat	Yes- altered hydrology and substrate condition is likely to reduce aeration and filtration capacity and overall habitat suitability	Yes- mine expansion would result in the additional loss and fragmentation of streams, some portion of which are likely to support riffle and pool habitat
5	230.45(b)	Sedimentation that clogs riffle and pool areas, destroys habitats, and creates anaerobic conditions	No- while sedimentation is expected to occur, it is not likely to clog, destroy or create anaerobic conditions in riffle and pool habitat.	No	No
6	230.45(b)	Reduce water holding capacity of streams by eliminating pools and meanders, causing rapid runoff from a watershed resulting in the destruction of natural habitat, high property loss, and the need for further hydraulic modification	Yes- direct loss at mine site	Yes- direct loss at mine site	Yes- direct loss at mine site

							STEP 1	
	N/A	No Effect	Negligible Effect	Minor Effect (Short Term)	Minor Effect (Long Term)	Significant	Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)	Reduced to below level of significance (Y/N)
Subpart E								
3						X	See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45	
4						X	See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45	
5		X					See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45	
6						X	See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45	

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Subpart E				
3	Sections 3.22.6, 4.22.3, and 4.22.6.1 and Table 4.22-40 Wetlands	None	no additional avoid/min/comp mit identified	N
4	Sections 3.22.6, 4.22.3, 4.22.6.1, 4.22.9, and 4.22.10 Wetlands	None	no additional avoid/min/comp mit identified	N
5	Sections 3.22.6, 4.22.6.1, and 4.22.9 Wetlands	None	no additional avoid/min/comp mit identified	Y
6	Sections 3.22.6, 4.22.6.1, and 4.22.9 Wetlands	None	no additional avoid/min/comp mit identified	N

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Subpart E			
3	See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45		
4	See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45		
5	See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45		Suspended sediments and turbidity are expected to be short term in duration and limited in extent. Secondary and cumulative potential to reduce habitat suitability/aeration. Spawning substrate-fine sediment can cause mortality. In the reaches proximal to the mine site groundwater discharge will be reduced and that plays an important role in preventing embeddedness.
6	See analysis in Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45		Direct impact within the fill footprint would result in elimination of streams contributes to rapid runoff for watershed. The entire footprint will generate substantial runoff. Within footprint and modification/degradation of habitat beyond fill footprint that will increase under the expansion scenario. Water-holding capacity—some streams in the mine footprint are losing reaches that contribute to aquifer recharge and the receiving streams.

	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	**Cumulative**
Subpart E	**Subpart E**	**Potential Impacts on Special Aquatic Sites**			
SUMMARY - Special Aquatic Sites	Summary of 230.40, 230.41, 230.42, 230.43, 230.44, and 230.45	**Potential Impacts on Special Aquatic Sites**	Yes	Yes	Yes

							STEP 1	
	N/A	**No Effect**	**Negligible Effect**	**Minor Effect (Short Term)**	**Minor Effect (Long Term)**	**Significant**	**Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)**	**Reduced to below level of significance (Y/N)**
Subpart E								
SUMMARY - Special Aquatic Sites						X	1, 2, 6-9, 14-15, 28-40, 44-46, 58-59, 83, 88, 97, 99, 118-119, 134-146, 154, 163, 170-171, 175 Protection of Wetlands and Waters [DA Application Tab 23]-all measures Restoration of Temporary Impacts [DA Application Tab 23]- all measures Reclamation of Permanent Impacts [DA Application Tab 23]- all measures Implementation of Environmental Plans and Controls and Adaptive Management [DA Application Tab 23]- measures related to the control of fugitive dust, erosion and sedimentation, invasive species, and aquatic resource monitoring. Spill Prevention and Response and Groundwater Protection [DA Application Tab 23] - all measures Protection of Aquatic Resources [DA Application Tab 23]- all measures.	N

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Subpart E				
SUMMARY - Special Aquatic Sites	Section 4.22 Wetlands	None	Avoid/min from 230.4(b)(4) and 230.4(b)(6) applies here as well. Recommendations to minimize traffic impacts on wildlife (traffic shut downs for certain times of day, night or season, more robust wildlife interaction plan, overpasses/underpasses, speed governors on vehicles - all measures would depend on knowing locations of high use areas). - Recommend working with Refuge to implement monitoring and other elements of Alaska Maritime Refuge draft biosecurity plan for detecting invasive species. - Enclosing the primary crushers and the transfer point between the crushers and ore conveyor and including air control equipment in the crusher building would greatly reduce fugitive dust from crushing operations (see EPA-1, in Attachment B10 of the ROD) . - Manage treated effluent discharges to maintain the baseline hydrograph and water chemistry/temperature of receiving waters (see EPA-6, in Attachment B10 of the ROD)	N

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Subpart E			
SUMMARY - Special Aquatic Sites	Mine Site - in-kind compensatory mitigation within the Koktuli River Watershed will be required to compensate for all direct and indirect impacts caused by discharges into aquatic resources at the mine site. Direct and indirect impacts at the mine site total 2,825 acres of wetlands, 132.5 acres of open waters, and 129.5 miles of streams. The District has also determined that compensatory mitigation is required for unavoidable adverse impacts to aquatic resources from discharges associated with the transportation corridor and the port site. Direct and indirect impacts associated with the transportation corridor and port site total 460 acres of wetlands, 231.7 acres of open waters, and 55.5 miles of streams.	Mine Site - N Transportation Corridor - N Port - N Natural Gas Pipeline - Y	USACE cannot enforce EPA 3-6 mitigation measures

	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	**Cumulative**
Subpart F	**Subpart F**	**Potential Effects on Human Use Characteristics**			
1	230.50(a)	**Municipal and private water supplies:** Surface water or ground water which is directed to the intake of a municipal or private water supply system.			
2	230.50(b)	Reduce the fitness of the water for consumption by altering color, taste, odor, chemical content and suspended particulate concentration	No- There are no Municipal water supplies within the vicinity of the proposed action and only one known private well (Anchor Point). Downstream impacts are not anticipated due to capture and containment of mine site water.	No	No
3	230.50(b)	Render water unpalatable or unhealthy by the addition of suspended particulates, viruses and pathogenic organisms, and dissolved materials	No- There are no Municipal water supplies within the vicinity of the proposed action and only one known private well (Anchor Point). Downstream impacts are not anticipated due capture and containment of mine site water.	No	No
4	230.50(b)	Increase treatment costs before the water is delivered for consumption	No- There are no Municipal water supplies within the vicinity of the proposed action and only one known private well (Anchor Point). Downstream impacts are not anticipated due capture and containment of mine site water.	No	No

							STEP 1	
	N/A	No Effect	Negligible Effect	Minor Effect (Short Term)	Minor Effect (Long Term)	Significant	Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)	Reduced to below level of significance (Y/N)
Subpart F								
1								
2		X					See analysis in Summary of 230.50, 230.51, 230.52, 230.23, and 230.54	
3		X					See analysis in Summary of 230.50, 230.51, 230.52, 230.23, and 230.54	
4		X					See analysis in Summary of 230.50, 230.51, 230.52, 230.23, and 230.54	

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Subpart F				
1				
2	Sections 4.17.3.1, 4.17.3.3, 4.17.3.4 Groundwater Hydrology; Sections 4.18.4.1, 4.18.4.3, and 4.18.4.4 Water and Sediment Quality	None	no additional avoid/min/comp mit identified	N/A
3	Sections 4.17.3.1, 4.17.3.3, 4.17.3.4 Groundwater Hydrology; Sections 4.18.4.1, 4.18.4.3, and 4.18.4.4 Water and Sediment Quality	None	no additional avoid/min/comp mit identified	N
4	N/A	None	no additional avoid/min/comp mit identified	

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Subpart F			
1			
2	See analysis in Summary of 230.50, 230.51, 230.52, 230.23, and 230.54		Downstream impacts are not anticipated due to capture and containment of mine site water. There are not sources of potable water within the direct footprint; use at the camp; secondary releases could affect downstream water sources; community members that directly haul water from water sources; a tailings release would potentially affect those direct sources of water.
3	See analysis in Summary of 230.50, 230.51, 230.52, 230.23, and 230.54		same comment as above; dissolved metals and tailings release
4	See analysis in Summary of 230.50, 230.51, 230.52, 230.23, and 230.54		

	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	**Cumulative**
Subpart F	**Subpart F**	**Potential Effects on Human Use Characteristics**			
5	230.50(b)	Affect the quantity of water available for municipal and private water supplies	No- There are no Municipal water supplies within the vicinity of the proposed action and only one known private well (Anchor Point). Downstream impacts are not anticipated due capture and containment of mine site water.	No	No
6	230.50(b)	Interactions between treatment chemicals and suspended or dissolved substances that form toxic products	No- There are no Municipal water supplies within the vicinity of the proposed action and only one known private well (Anchor Point). Downstream impacts are not anticipated due capture and containment of mine site water.	No	No

							STEP 1	
	N/A	No Effect	Negligible Effect	Minor Effect (Short Term)	Minor Effect (Long Term)	Significant	Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)	Reduced to below level of significance (Y/N)
Subpart F								
5		X					See analysis in Summary of 230.50, 230.51, 230.52, 230.23, and 230.54	
6		X					See analysis in Summary of 230.50, 230.51, 230.52, 230.23, and 230.54	

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Subpart F				
5	N/A	None	no additional avoid/min/comp mit identified	
6	N/A	None	no additional avoid/min/comp mit identified	

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Subpart F			
5	See analysis in Summary of 230.50, 230.51, 230.52, 230.23, and 230.54		
6	See analysis in Summary of 230.50, 230.51, 230.52, 230.23, and 230.54		

Preliminary Factual Determination Discussion					
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	**Cumulative**
Subpart F	**Subpart F**	**Potential Effects on Human Use Characteristics**			
1	230.51(a)	**Recreational and commercial fisheries:** consist of harvestable fish, crustaceans, shellfish, and other aquatic organisms used by man.			
2	230.51(b)	Affect the suitability of recreational and commercial fishing grounds as habitat for populations of consumable aquatic organisms	Yes- Mine facilities would directly impact portions of the tributaries of the NFK River watersheds. These watersheds account for a small portion of overall recreational and commercial fishing effort.	Yes- loss of habitat	Yes
3	230.51(b)	Chemical contamination of recreational or commercial fisheries	No- State of Alaska water quality standards account for fish health	Yes	Yes
4	230.51(b)	Interfere with the reproductive success of recreational and commercially important aquatic species through disruption of migration and spawning areas	Yes- Mine facilities would directly impact portions of the tributaries of the NFK River watersheds. These watersheds account for a small portion of overall recreational and commercial fishing effort.	Yes- Mine facilities would directly impact portions of the tributaries of the NFK River watersheds. These watersheds account for a small portion of overall recreational and commercial fishing effort.	Yes- Mine facilities would directly impact portions of the tributaries of the NFK River watersheds. These watersheds account for a small portion of overall recreational and commercial fishing effort.

							STEP 1	
	N/A	No Effect	Negligible Effect	Minor Effect (Short Term)	Minor Effect (Long Term)	Significant	Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)	Reduced to below level of significance (Y/N)
Subpart F								
1								
2						X	See analysis in Summary of 230.50, 230.51, 230.52, 230.23, and 230.54	
3					X		See analysis in Summary of 230.50, 230.51, 230.52, 230.23, and 230.54	
4						X	See analysis in Summary of 230.50, 230.51, 230.52, 230.23, and 230.54	

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Subpart F				
1				
2	Section 4.6.3.2 Commercial and Recreational Fisheries	None	Manage treated effluent discharges to maintain the baseline hydrograph and water chemistry/temperature of receiving waters (see EPA-6, in Attachment B10 of the ROD)	N
3	Section 4.24.5.1 and Appendix K4.24 Fish Values	Rainbow Trout in Koktuli Managed by Fish and Game Recreationally Anglers	no additional avoid/min/comp mit identified	N
4	Sections 4.24.5.1 and 4.24.8.1 Fish Values; Section 4.6.6 Commercial and Recreational Fisheries	Bristol Bay Sockeye Salmon Portfolio provided by EPA 5-14-2020; see also letter from the State of Alaska to USEPA dated June 1, 2020 regarding portfolio effect and unpublished data (see letters in Attachment B10 of the ROD)	no additional avoid/min/comp mit identified	N

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Subpart F			
1			
2	See analysis in Summary of 230.50, 230.51, 230.52, 230.23, and 230.54		Based on removal of habitat; UTC used for sport fish and recreation; secondary based on flow regime changes
3	See analysis in Summary of 230.50, 230.51, 230.52, 230.23, and 230.54		more impact to resident fish; the scale of this impact is based on impacts at the NFK, SFK, and UTC scale.
4	See analysis in Summary of 230.50, 230.51, 230.52, 230.23, and 230.54		Changes in water quality and sedimentation; additional losses from the expanded mine- flow changes, chemical and temperature changes affect spawning habitat; dissolved metals change homing behaviors; marine habitat—pipeline and potential for spills (secondary) at the port. The scale of this impact is based on impacts at the NFK, SFK, and UTC scale. Specific important recreational species (rainbow trout in the NFK, chinook in Nushagak, Upper Talarik creek sockeye)

	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	**Cumulative**
Subpart F	**Subpart F**	**Potential Effects on Human Use Characteristics**			
5	230.51(b)	Direct or indirect (by reducing food resources) reductions in populations of commercially important aquatic organisms by introduction of pollutants. Impacts can be of short duration or prolonged, depending upon the physical and chemical impacts of the discharge and the biological availability of contaminants to aquatic organisms.	No- The project would not have measurable effects on the number of adult salmon returning to the Kvichak and Nushagak river systems as a result of project operations	Yes- may contain mercury	Yes

							STEP 1	
	N/A	No Effect	Negligible Effect	Minor Effect (Short Term)	Minor Effect (Long Term)	Significant	Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)	Reduced to below level of significance (Y/N)
Subpart F								
5						X	See analysis in Summary of 230.50, 230.51, 230.52, 230.23, and 230.54	

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Subpart F				
5	Section 4.9.3.1 Subsistence	None	no additional avoid/min/comp mit identified	N

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Subpart F			
5	See analysis in Summary of 230.50, 230.51, 230.52, 230.23, and 230.54		Spills of great concern; build out would amplify the issues; potential for chemical contamination/ releases of tailings as a secondary effect/cumulative effects; even without a spill, fugitive dust may affect use; marine and fresh secondary impacts with a spill or dust

Preliminary Factual Determination Discussion					
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	**Cumulative**
Subpart F	**Subpart F**	**Potential Effects on Human Use Characteristics**			
1	230.52(a)	**Water-related recreation:** activities undertaken for amusement and relaxation, including consumptive use, e.g., harvesting resources by hunting and fishing [subsistence]; and non-consumptive use, e.g. canoeing and sight-seeing.			
2	230.52(b)	One of the more important direct impacts of dredged or fill disposal is to impair or destroy the resources which support recreation activities. Adversely modify or destroy water use for recreation by changing turbidity, suspended particulates, temperature, dissolved oxygen, dissolved materials, toxic materials, pathogenic organisms, quality of habitat, and the aesthetic qualities of sight, taste, odor, and color.	Yes- At Diamond Point, there would be some displacement of recreational boating and impacts to setting. from the construction of the mine and attendant features affect the use for hunting trapping etc.	Yes- At Diamond Point, there would be some displacement of recreational boating and impacts to setting. from the construction of the mine and attendant features affect the use for hunting trapping etc.	Yes- At Diamond Point, there would be some displacement of recreational boating and impacts to setting. from the construction of the mine and attendant features affect the use for hunting trapping etc.

							STEP 1	
	N/A	No Effect	Negligible Effect	Minor Effect (Short Term)	Minor Effect (Long Term)	Significant	Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)	Reduced to below level of significance (Y/N)
Subpart F								
1								
2						X	See analysis in Summary of 230.50, 230.51, 230.52, 230.23, and 230.54	

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Subpart F				
1				
2	Sections 4.5.3.1 and 4.5.6 Recreation; Sections 4.9.3.1 and 4.9.3.2 Subsistence; Sections 4.11.4.1 and 4.11.7.2 Aesthetics	None	no additional avoid/min/comp mit identified	N

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Subpart F			
1			
2	See analysis in Summary of 230.50, 230.51, 230.52, 230.23, and 230.54		Fugitive dust may impact float use, fishing, and hunting especially in the UTC; cumulative impacts to the Koktuli River would result in impacts to a high valued float from changes in flow regime and aesthetics; region is a international destination for sport fishing. Both NFK and SFK are managed for recreation. locals who support local recreation do not have the option to move to other locations.

	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	**Cumulative**
Subpart F	**Subpart F**	**Potential Effects on Human Use Characteristics**			
1	230.53(a)	**Aesthetics:** The perception of beauty by sight, hearing, touch, and smell that apply to the quality of life enjoyed by the general public and property owners.			
2	230.53(b)	Degrading water quality, creating distracting disposal sites, inducing inappropriate development, encouraging unplanned and incompatible human access, and destroying vital elements that contribute to the compositional harmony or unity, visual distinctiveness, or diversity of an area	Yes- The project would be highly visible to recreational fishers and subsistence users. The scenic value of overflights would be impacted.	Yes- The project would be highly visible to recreational fishers and subsistence users. The scenic value of overflights would be impacted.	Yes- The project would be highly visible to recreational fishers and subsistence users. The scenic value of overflights would be impacted.

							STEP 1	
	N/A	No Effect	Negligible Effect	Minor Effect (Short Term)	Minor Effect (Long Term)	Significant	Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)	Reduced to below level of significance (Y/N)
Subpart F								
1								
2						X	See analysis in Summary of 230.50, 230.51, 230.52, 230.23, and 230.54	

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Subpart F				
1				
2	Sections 4.11.4, 4.11.6 and 4.11.7 Aesthetics	None	no additional avoid/min/comp mit identified	N

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Subpart F			
1			
2	See analysis in Summary of 230.50, 230.51, 230.52, 230.23, and 230.54		The project would change the area visually, and also introduce noise from blasting, smell from diesel truck use, light from the mine and port. The area is currently remote and pristine. The project could affect access to areas as well—restricted access at mine, transportation corridor, and at the port. Cumulative would add greater perceived and actual aesthetics impacts.

	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	**Cumulative**
Subpart F	**Subpart F**	**Potential Effects on Human Use Characteristics**			
3	230.53(b)	Adversely affect the particular features, traits, or characteristics of an aquatic area which make it valuable to property owners	Yes- Private property along the transportation corridor would be impacted, potentially in places where recreational guiding and outfitting operations occur.	Yes- Parts of Lake Clark National Park (adjacent land owner) would be visually impacted from the project and night lighting.	Yes
4	230.53(b)	Reduce the value of an aquatic area to private property owners by degrading water quality, disrupting natural substrate and vegetational characteristics, denying access to or visibility of the resource, or changing odor, air quality, or noise levels	Yes- Private property along the transportation corridor would be impacted, potentially in places where recreational guiding and outfitting operations occur.	Yes- Private property along the transportation corridor would be impacted, potentially in places where recreational guiding and outfitting operations occur.	Yes- Private property along the transportation corridor would be impacted, potentially in places where recreational guiding and outfitting operations occur.

							STEP 1	
	N/A	No Effect	Negligible Effect	Minor Effect (Short Term)	Minor Effect (Long Term)	Significant	Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)	Reduced to below level of significance (Y/N)
Subpart F								
3						X	See analysis in Summary of 230.50, 230.51, 230.52, 230.23, and 230.54	
4						X	See analysis in Summary of 230.50, 230.51, 230.52, 230.23, and 230.54	

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Subpart F				
3	Sections 4.11.4.1, 4.11.6.1 and 4.11.7.1 Aesthetics; Sections 4.5.5.2 and 4.5.6 Recreation	None	no additional avoid/min/comp mit identified	N
4	Sections 4.11.4.1, 4.11.6.1 and 4.11.7.1 Aesthetics; Sections 4.5.5.2 and 4.5.6 Recreation; Section 4.9.6 Subsistence	None	no additional avoid/min/comp mit identified	N

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Subpart F			
3	See analysis in Summary of 230.50, 230.51, 230.52, 230.23, and 230.54		Pedro Bay and a lodge in the vicinity of the mine; could affect Iliamna and Newhalen as well. Direct elimination of pristine landscape at the mine site and transportation corridor.
4	See analysis in Summary of 230.50, 230.51, 230.52, 230.23, and 230.54		Development of the mine and transportation corridor could deny access to traditional uses; fugitive dust, blasting, lighting, etc. (see previous comments above); changing characteristics of the area and potential loss of access

	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	**Cumulative**
Subpart F	**Subpart F**	**Potential Effects on Human Use Characteristics**			
1	230.54(a)	**Parks, national and historical monuments, national seashores, wilderness areas, research sites, and similar preserves:** areas designated under Federal and State laws or local ordinances to be managed for their aesthetic, educational, historical, recreational, or scientific value.			
2	230.54(b)	Reducing or eliminating the uses for which sites are set aside and managed by modifying site characteristics	No	Yes- visual and sound impacts; potentially boundary issues- increased trespass	Yes
SUMMARY - Human Use Characteristics	Summary of 230.50, 230.51, 230.52, 230.23, and 230.54	**Potential Effects on Human Use Characteristics**	Yes- see discussions in supporting sections above	Yes- see discussions in supporting sections above	Yes- see discussions in supporting sections above

							STEP 1	
	N/A	No Effect	Negligible Effect	Minor Effect (Short Term)	Minor Effect (Long Term)	Significant	Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)	Reduced to below level of significance (Y/N)
Subpart F								
1								
2						X	See analysis in Summary of 230.50, 230.51, 230.52, 230.23, and 230.54	
SUMMARY - Human Use Characteristics						X	4, 5, 10-14, 26-32, 39-47, 52-53, 55-56, 59, 67-68, 86-87, 96-97, 102, 106, 111-112, 114, 118-119, 124, 135-140, 143-146, 150, 153, 155, 172-173, 179-180 Reclamation of Permanent Impacts [DA Application Tab 23]- measures related to creation of new wetlands areas and ponds, and blending with surrounding topography, where feasible. Implementation of Environmental Plans and Controls and Adaptive Management: measures related to invasive species management and fugitive dust. Minimization of Social Impacts [DA Application Tab 23]- all measures. Human Health and Safety Measures- all measures.	N

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Subpart F				
1				
2	Section 4.5.3.2 Recreation	None	no additional avoid/min/comp mit identified	N
SUMMARY - Human Use Characteristics	Section 4.5 Recreation; Section 4.9 Subsistence; Section 4.11 Aesthetics; Section 4.22 Wetlands	Bristol Bay Sockeye Salmon Portfolio provided by EPA 5-14-2020; see also letter from the State of Alaska to USEPA dated June 1, 2020 regarding portfolio effect and unpublished data (see letters in Attachment B10 of the ROD)	EPA-6, in Attachment B10 of the ROD	N

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Subpart F			
1			
2	See analysis in Summary of 230.50, 230.51, 230.52, 230.23, and 230.54		Change of large mammals migration patterns; Lake Clark; secondary impacts from light, noise etc. Under expanded mine scenario and potential spills could impact research sites of Fish and Game and Bristol Bay Science Inst and University of Washington's continued study of the area and fish populations.
SUMMARY - Human Use Characteristics	Mine Site - in-kind compensatory mitigation within the Koktuli River Watershed will be required to compensate for all direct and indirect impacts caused by discharges into aquatic resources at the mine site. Direct and indirect impacts at the mine site total 2,825 acres of wetlands, 132.5 acres of open waters, and 129.5 miles of streams. The District has also determined that compensatory mitigation is required for unavoidable adverse impacts to aquatic resources from discharges associated with the transportation corridor and the port site. Direct and indirect impacts associated with the transportation corridor and port site total 460 acres of wetlands, 231.7 acres of open waters, and 55.5 miles of streams.	Mine Site - N Transportation Corridor - N Port - N Natural Gas Pipeline - Y	

	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	**Cumulative**
Subpart G	**Subpart G**	**Evaluations and Testing**			
1	230.60	**General Evaluation of Dredged or Fill Material**	Yes- contaminated tailings would be placed in the unlined bulk TSF (WOUS) No for all other discharge of fill	No	Yes- expansion scenario would place additional bulk tailings in WOUS
2	230.61	**Chemical, Biological, and Physical Evaluation and Testing**	NA	NA	NA

							STEP 1	
	N/A	**No Effect**	**Negligible Effect**	**Minor Effect (Short Term)**	**Minor Effect (Long Term)**	**Significant**	**Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)**	**Reduced to below level of significance (Y/N)**
Subpart G								
1					X		69, 99, 103-105	
2	X							

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Subpart G				
1	Chapter 2 and Appendix K2 Alternatives Chapter 3, Sections 3.14 Soils, 3.18 and Appendix K3.18, Water and Sediment Quality Chapter 4, Sections 4.13, Geology; 4.14, Soils; 4.18 and Appendix K4.18, Water and Sediment Quality; and 4.27, Spill Risk.			
2				

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Subpart G			
1			The bulk tailings has been tested or otherwise characterized.
2			

	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	**Cumulative**
Subpart B	**Subpart B**	**Compliance with the Guidelines**			
Physical substrate determinations.	230.11(a)	**Physical substrate determinations:** Individual and cumulative changes in substrate elevation and bottom contours	Yes- see discussions in supporting sections above	Yes- see discussions in supporting sections above	Yes- see discussions in supporting sections above

							STEP 1	
	N/A	**No Effect**	**Negligible Effect**	**Minor Effect (Short Term)**	**Minor Effect (Long Term)**	**Significant**	**Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)**	**Reduced to below level of significance (Y/N)**
Subpart B								
Physical substrate determinations.						X	1-3, 6-9, 14-15, 39-40, 44-46, 58-59, 68, 83, 88, 96-97, 99, 102, 118-121, 134-146, 154, 170-172, 176. PLP's monitoring summary report (PLP 2019-RFI 135). Project Design Features [DA Application Tab 23]- measures related to minimizing the project footprint Protection of Wetlands and Waters [DA Application Tab 23]- measures related to minimizing the project footprint in wetlands and implementation of erosion and sediment controls Restoration of Temporary Impacts [DA Application Tab 23]- all measures Reclamation of Permanent Impacts [DA Application Tab 23]- all measures Implementation of Environmental Plans and Controls and Adaptive Management [DA Application Tab 23]- measures related to the control of fugitive dust, erosion and sedimentation	N

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Subpart B				
Physical substrate determinations.	Sections 4.16 Surface Water Hydrology; Section 4.18 Waters and Sediment Quality; Section 4.22 Wetlands; Section 4.24 Fish Values; Section 5.4 Mitigation	None	Overbuilding stream crossings/bridging instead of culverts Meeting USFWS basic culvert design guidelines for culverts in fish bearing streams (Note: PLP adopted this measure - see measure 138, Table 5-2 , in Attachment B10 of the ROD) EPA-1, EPA-2, EPA-3, EPA-4, EPA-5, EPA-6, in Attachment B10 of the ROD	N

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Subpart B			
Physical substrate determinations.	Mine Site - in-kind compensatory mitigation within the Koktuli River Watershed will be required to compensate for all direct and indirect impacts caused by discharges into aquatic resources at the mine site. Direct and indirect impacts at the mine site total 2,825 acres of wetlands, 132.5 acres of open waters, and 129.5 miles of streams. The District has also determined that compensatory mitigation is required for unavoidable adverse impacts to aquatic resources from discharges associated with the transportation corridor and the port site. Direct and indirect impacts associated with the transportation corridor and port site total 460 acres of wetlands, 231.7 acres of open waters, and 55.5 miles of streams.	Mine Site - N Transportation Corridor - N Port - N Natural Gas Pipeline - Y	USACE cannot enforce EPA 3-6 mitigation measures

	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	**Cumulative**
Water circulation, fluctuation, and salinity determinations.	230.11(b)	**Water circulation, fluctuation, and salinity determinations:** Individual and cumulative effects on water, current patterns, circulation including downstream flows, and normal water fluctuations considering: water chemistry, salinity, clarity, color, odor, taste, dissolved gas levels, temperature, nutrients, and eutrophication plus other characteristics.	Yes- see discussions in supporting sections above	Yes- see discussions in supporting sections above	Yes- see discussions in supporting sections above

							STEP 1	
	N/A	No Effect	Negligible Effect	Minor Effect (Short Term)	Minor Effect (Long Term)	Significant	Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)	Reduced to below level of significance (Y/N)
Water circulation, fluctuation, and salinity determinations.						X	6-9, 14-15, 39-40, 44-46, 48-51, 57, 59, 62- 81, 84-115, 118-121, 128, 133, 135-137, 139, 141-143, 145, 149, 156-158, 164, 167, 172-179 PLP's monitoring summary report (PLP 2019-RFI 135) Project Design Features [DA Application Tab 23]- measures related to the management of discharges Protection of Wetlands and Waters [DA Application Tab 23]- measures related to the management of discharges and minimization measures associated with the road design. Spill Prevention and Response and Groundwater Protection [DA Application Tab 23] - measures related to water treatment, maintenance, and monitoring Implementation of Environmental Plans and Controls and Adaptive Management [DA Application Tab 23]- measures related to aquatic resource monitoring and adaptive management Protection of Aquatic Resources [DA Application Tab 23]- measures related to culvert and bridge designs and water quality monitoring	N

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Water circulation, fluctuation, and salinity determinations.	Section 3.22 Wetlands; Section 3.24 Fish Values; Section 4.16 Surface Water Quality; Section 4.18 Water and Sediment Quality; Section 4.22 Wetlands; Section 4.24 Fish Values; Section 4.26 Vegetation; Section K4.18 Surface Water Hydrology; Section K4.24 Fish Values	Bristol Bay Sockeye Salmon Portfolio provided by EPA 5-14-2020; see also letter from the State of Alaska to USEPA dated June 1, 2020 regarding portfolio effect and unpublished data (see letters in Attachment B10 of the ROD)	the same minimization measure as identified in 230.11(c) could reduce this below significant. Suggested minimization measures: with mixtures of metals have effluent toxicity testing; monitor loads for specific elements and include load limits to monitor for bioaccumulation (EPA-1, EPA-2, EPA-3, EPA-6, in Attachment B10 of the ROD)	N

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Water circulation, fluctuation, and salinity determinations.	Mine Site - in-kind compensatory mitigation within the Koktuli River Watershed will be required to compensate for all direct and indirect impacts caused by discharges into aquatic resources at the mine site. Direct and indirect impacts at the mine site total 2,825 acres of wetlands, 132.5 acres of open waters, and 129.5 miles of streams. The District has also determined that compensatory mitigation is required for unavoidable adverse impacts to aquatic resources from discharges associated with the transportation corridor and the port site. Direct and indirect impacts associated with the transportation corridor and port site total 460 acres of wetlands, 231.7 acres of open waters, and 55.5 miles of streams.	Mine Site - N Transportation Corridor - N Port - N Natural Gas Pipeline - Y	USACE cannot enforce EPA 3-6 mitigation measures

	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	**Cumulative**
Suspended particulate/turbidity determinations.	230.11(c)	**Suspended particulate/turbidity determinations:** Individual and cumulative changes in kinds and concentrations of suspended particulates/turbidity	Yes- see discussions in supporting sections above	Yes- see discussions in supporting sections above	Yes- see discussions in supporting sections above

							STEP 1	
	N/A	**No Effect**	**Negligible Effect**	**Minor Effect (Short Term)**	**Minor Effect (Long Term)**	**Significant**	**Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)**	**Reduced to below level of significance (Y/N)**
Suspended particulate/turbidity determinations.						X	3, 6-9, 14-15, 39-40, 44-46, 58-59, 86, 96-97, 102, 118-121, 134-146, 170-172, 176 Project Design Features [DA Application Tab 23]- measures related to minimizing impacts to downgradient streams Protection of Wetlands and Waters [DA Application Tab 23]- measures related to implementation of erosion and sediment controls and avoiding/minimizing impacts to streams Restoration of Temporary Impacts [DA Application Tab 23]- measure related to streambank restoration Implementation of Environmental Plans and Controls and Adaptive Management [DA Application Tab 23]- measures related to erosion and sediment control Protection of Aquatic Resources [DA Application Tab 23]- measures related to erosion control	N

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Suspended particulate/turbidity determinations.	Section3.22 Wetlands; Section 4.18 Water and Sediment Quality; Section 4.22 Wetlands; Section 4.24 and Appendix K4.24 Fish Values	None	minimization measure related to fugitive dust (e.g., crushing and transferring) and also minimization related to how effluent effects can be reduced (EPA-1, EPA-6, in Attachment B10 of the ROD)	N

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Suspended particulate/turbidity determinations.	Mine Site - in-kind compensatory mitigation within the Koktuli River Watershed will be required to compensate for all direct and indirect impacts caused by discharges into aquatic resources at the mine site. Direct and indirect impacts at the mine site total 2,825 acres of wetlands, 132.5 acres of open waters, and 129.5 miles of streams. The District has also determined that compensatory mitigation is required for unavoidable adverse impacts to aquatic resources from discharges associated with the transportation corridor and the port site. Direct and indirect impacts associated with the transportation corridor and port site total 460 acres of wetlands, 231.7 acres of open waters, and 55.5 miles of streams.	Mine Site - N Transportation Corridor - N Port - N Natural Gas Pipeline - Y	Suspended sediments and turbidity are expected to be short term in duration and limited in extent. Impact will not have the intensity to lower growth rates or disease tolerance. Secondary impacts will be looked at for compensatory mitigation as well as direct impacts.

	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	**Cumulative**
Contaminant determinations.	230.11(d)	**Contaminant determinations:** Degree to which discharged material will introduce, relocate, or increase contaminants.	Yes-contaminated tailings would be placed in the unlined bulk TSF (WOUS) No for all other discharge of fill	No	Yes- expansion scenario would place additional bulk tailings in WOUS

							STEP 1	
	N/A	**No Effect**	**Negligible Effect**	**Minor Effect (Short Term)**	**Minor Effect (Long Term)**	**Significant**	**Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)**	**Reduced to below level of significance (Y/N)**
Contaminant determinations.					X		69, 99, Project Design Features [DA Application Tab 23]- measures related to the use of clean fill. Protection of Wetlands and Waters - measures related to detailed characterization of quarry materials and the use of clean non-pit quarried rock, or non-acid generating waste rock.	N

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Contaminant determinations.	Chapter 2 and Appendix K2 Alternatives Chapter 3, Sections 3.14, Soils, 3.18 and Appendix K3.18, Water and Sediment Quality Chapter 4, Sections 4.13, Geology; 4.14, Soils; 4.18 and Appendix K4.18, Water and Sediment Quality; and 4.27, Spill Risk.	None		N

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Contaminant determinations.	Mine Site - in-kind compensatory mitigation within the Koktuli River Watershed will be required to compensate for all direct and indirect impacts caused by discharges into aquatic resources at the mine site. Direct and indirect impacts at the mine site total 2,825 acres of wetlands, 132.5 acres of open waters, and 129.5 miles of streams. The District has also determined that compensatory mitigation is required for unavoidable adverse impacts to aquatic resources from discharges associated with the transportation corridor and the port site. Direct and indirect impacts associated with the transportation corridor and port site total 460 acres of wetlands, 231.7 acres of open waters, and 55.5 miles of streams.	Mine Site - N Transportation Corridor - N Port - N Natural Gas Pipeline - Y	The bulk tailings has been tested or otherwise characterized.

	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	**Cumulative**
Aquatic ecosystem and organism determinations.	230.11(e)	**Aquatic ecosystem and organism determinations:** Individual and cumulative effects on the structure and function of aquatic ecosystem and organisms considering: potential changes in substrate characteristics and elevation, water or substrate chemistry, nutrients, currents, circulation, fluctuation, and salinity on the recolonization and existence of indigenous aquatic organisms or communities.	Yes- see discussions in supporting sections above	Yes- see discussions in supporting sections above	Yes- see discussions in supporting sections above

							STEP 1	
	N/A	No Effect	Negligible Effect	Minor Effect (Short Term)	Minor Effect (Long Term)	Significant	Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)	Reduced to below level of significance (Y/N)
Aquatic ecosystem and organism determinations.						X	9, 14-32, 39-40, 44-47, 56, 59, 67-68, 82, 85-86, 96-97, 102, 106, 108, 111-113, 116-119, 129, 131-132, 135-137, 139-140, 143-143, 150, 159-161, 163, 172-173, 179, 180 Project Design Features [DA Application Tab 23]- all measures Protection of Wetlands and Waters [DA Application Tab 23]-all measures. Restoration of Temporary Impacts [DA Application Tab 23] - all measures Reclamation of Permanent Impacts [DA Application Tab 23] - all measures Spill Prevention and Response and Groundwater Protection [DA Application Tab 23] - all measures Implementation of Environmental Plans and Controls and Adaptive Management [DA Application Tab 23]- all measures. Protection of Wildlife - [DA Application Tab 23]- all measures. Protection of Aquatic Resources [DA Application Tab 23]- all measures. Protection of Wildlife [DA Application Tab 23]-all measures.	N

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Aquatic ecosystem and organism determinations.	Section 4.23 Wildlife; Section 4.27 Spill Risk	Bristol Bay Sockeye Salmon Portfolio provided by EPA 5-14-2020; see also letter from the State of Alaska to USEPA dated June 1, 2020 regarding portfolio effect and unpublished data (see letters in Attachment B10 of the ROD)	EPA-1, EPA-2, EPA-3, EPA-4, EPA-5, EPA-6, in Attachment B10 of the ROD	N

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Aquatic ecosystem and organism determinations.	Mine Site - in-kind compensatory mitigation within the Koktuli River Watershed will be required to compensate for all direct and indirect impacts caused by discharges into aquatic resources at the mine site. Direct and indirect impacts at the mine site total 2,825 acres of wetlands, 132.5 acres of open waters, and 129.5 miles of streams. The District has also determined that compensatory mitigation is required for unavoidable adverse impacts to aquatic resources from discharges associated with the transportation corridor and the port site. Direct and indirect impacts associated with the transportation corridor and port site total 460 acres of wetlands, 231.7 acres of open waters, and 55.5 miles of streams.	Mine Site - N Transportation Corridor - N Port - N Natural Gas Pipeline - Y	TES minimization measures would come out of consultation under Section 7 of the Endangered Species Act USACE cannot enforce EPA 3-6 mitigation measures

	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	**Cumulative**
Proposed disposal site determinations.	230.11(f)	**Proposed disposal site determinations:** Depth of water; current velocity, direction, and variability; degree of turbulence; stratification; rate of discharge; ambient concentrations of constituents of interest; dredged material characteristics.	Not applicable, no dredge disposal sites are proposed for this project.		
Determination of cumulative effects.	230.11(g)	**Determination of cumulative effects:** Collective effect of multiple individual discharges potentially resulting in impairment of water resources and interference with the productivity and water quality of aquatic ecosystems.	Incorporated into analysis in Subparts C-F above		

Attachment B7 Factual Determinations

							STEP 1	
	N/A	**No Effect**	**Negligible Effect**	**Minor Effect (Short Term)**	**Minor Effect (Long Term)**	**Significant**	**Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)**	**Reduced to below level of significance (Y/N)**
Proposed disposal site determinations.								
Determination of cumulative effects.								N

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Proposed disposal site determinations.		None		
Determination of cumulative effects.		None	See rows above	N

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Proposed disposal site determinations.			
Determination of cumulative effects.	Mine Site - in-kind compensatory mitigation within the Koktuli River Watershed will be required to compensate for all direct and indirect impacts caused by discharges into aquatic resources at the mine site. Direct and indirect impacts at the mine site total 2,825 acres of wetlands, 132.5 acres of open waters, and 129.5 miles of streams. The District has also determined that compensatory mitigation is required for unavoidable adverse impacts to aquatic resources from discharges associated with the transportation corridor and the port site. Direct and indirect impacts associated with the transportation corridor and port site total 460 acres of wetlands, 231.7 acres of open waters, and 55.5 miles of streams.	Mine Site - N Transportation Corridor - N Port - N Natural Gas Pipeline - Y	

	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	**Cumulative**
Determination of secondary effects.	230.11(h)	**Determination of secondary effects:** Associated with a discharge but not resulting from actual placement of the material. Examples include: fluctuating water levels in an impoundment and downstream from operation of a dam, septic tank leaching and surface runoff from residential or commercial developments on fill, and leachate and runoff from a sanitary landfill. Secondary impacts of activities conducted on fast land should be considered in evaluating the impact of creating fast lands.	Incorporated into analysis in Subparts C-F above		

							STEP 1	
	N/A	No Effect	Negligible Effect	Minor Effect (Short Term)	Minor Effect (Long Term)	Significant	Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)	Reduced to below level of significance (Y/N)
Determination of secondary effects.								N

	STEP 2		STEP 3	
	Where analyzed in EIS?	**Additional information provided by 404q agency**	**Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate**	**Reduced to below level of significance (Y/N)**
Determination of secondary effects.		None	See rows above	N

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Determination of secondary effects.	Mine Site - in-kind compensatory mitigation within the Koktuli River Watershed will be required to compensate for all direct and indirect impacts caused by discharges into aquatic resources at the mine site. Direct and indirect impacts at the mine site total 2,825 acres of wetlands, 132.5 acres of open waters, and 129.5 miles of streams. The District has also determined that compensatory mitigation is required for unavoidable adverse impacts to aquatic resources from discharges associated with the transportation corridor and the port site. Direct and indirect impacts associated with the transportation corridor and port site total 460 acres of wetlands, 231.7 acres of open waters, and 55.5 miles of streams.	Mine Site - N Transportation Corridor - N Port - N Natural Gas Pipeline - Y	

	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	**Cumulative**
	230.10(c)	Significantly adverse effects of the discharge of pollutants on:			
Human health or welfare.	230.10(c)(1)	…**human health or welfare**, including but not limited to effects on municipal water supplies, plankton, fish, shellfish, wildlife, and special aquatic sites	Supported by analysis of Subparts C, D, E, and F, above		
Life stages of aquatic life and other wildlife dependent on aquatic ecosystems.	230.10(c)(2)	…**life stages of aquatic life and other wildlife dependent on aquatic ecosystems**, including the transfer, concentration, and spread of pollutants of their byproducts outside of the disposal site through biological, physical, and chemical processes	Supported by analysis of Subparts C, D, and E above		

							STEP 1	
	N/A	No Effect	Negligible Effect	Minor Effect (Short Term)	Minor Effect (Long Term)	Significant	Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)	Reduced to below level of significance (Y/N)
Human health or welfare.								
Life stages of aquatic life and other wildlife dependent on aquatic ecosystems.								

	STEP 2		STEP 3	
	Where analyzed in EIS?	Additional information provided by 404q agency	Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate	Reduced to below level of significance (Y/N)
Human health or welfare.				N
Life stages of aquatic life and other wildlife dependent on aquatic ecosystems.				N

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Human health or welfare.	Mine Site - in-kind compensatory mitigation within the Koktuli River Watershed will be required to compensate for all direct and indirect impacts caused by discharges into aquatic resources at the mine site. Direct and indirect impacts at the mine site total 2,825 acres of wetlands, 132.5 acres of open waters, and 129.5 miles of streams. The District has also determined that compensatory mitigation is required for unavoidable adverse impacts to aquatic resources from discharges associated with the transportation corridor and the port site. Direct and indirect impacts associated with the transportation corridor and port site total 460 acres of wetlands, 231.7 acres of open waters, and 55.5 miles of streams.	Mine Site - N Transportation Corridor - N Port - N Natural Gas Pipeline - Y	
Life stages of aquatic life and other wildlife dependent on aquatic ecosystems.	Mine Site - in-kind compensatory mitigation within the Koktuli River Watershed will be required to compensate for all direct and indirect impacts caused by discharges into aquatic resources at the mine site. Direct and indirect impacts at the mine site total 2,825 acres of wetlands, 132.5 acres of open waters, and 129.5 miles of streams. The District has also determined that compensatory mitigation is required for unavoidable adverse impacts to aquatic resources from discharges associated with the transportation corridor and the port site. Direct and indirect impacts associated with the transportation corridor and port site total 460 acres of wetlands, 231.7 acres of open waters, and 55.5 miles of streams.	Mine Site - N Transportation Corridor - N Port - N Natural Gas Pipeline - Y	

	Preliminary Factual Determination Discussion				
	40 CFR Citation	**Category of Impact or Effect**	**Direct**	**Secondary and Indirect**	**Cumulative**
Aquatic ecosystem diversity, productivity, and stability.	230.10(c)(3)	…**aquatic ecosystem diversity, productivity, and stability**. Such effects may include, but are not limited to, loss of fish and wildlife habitat or loss of the capacity of a wetland to assimilate nutrients, purify water, or reduce wave energy;	Supported by analysis of Subparts C, D, and E above		
Recreational, aesthetic, and economic values.	230.10(c)(4)	…**recreational, aesthetic, and economic values**.	Supported by analysis of Subpart F above		

							STEP 1	
	N/A	No Effect	Negligible Effect	Minor Effect (Short Term)	Minor Effect (Long Term)	Significant	Applicant-Proposed Avoidance & Minimization (see separate numbered Table 5-2, in Attachment B10 of the ROD)	Reduced to below level of significance (Y/N)
Aquatic ecosystem diversity, productivity, and stability.								
Recreational, aesthetic, and economic values.								

	STEP 2		STEP 3	
	Where analyzed in EIS?	Additional information provided by 404q agency	Additional Minimization Measures identified by the group (USACE,USEPA, USFWS), as appropriate	Reduced to below level of significance (Y/N)
Aquatic ecosystem diversity, productivity, and stability.				N
Recreational, aesthetic, and economic values.				N

	STEP 4		
	Identified requirement for compensatory mitigation	**Reduced to below level of significance (Y/N)**	**Notes**
Aquatic ecosystem diversity, productivity, and stability.	Mine Site - in-kind compensatory mitigation within the Koktuli River Watershed will be required to compensate for all direct and indirect impacts caused by discharges into aquatic resources at the mine site. Direct and indirect impacts at the mine site total 2,825 acres of wetlands, 132.5 acres of open waters, and 129.5 miles of streams. The District has also determined that compensatory mitigation is required for unavoidable adverse impacts to aquatic resources from discharges associated with the transportation corridor and the port site. Direct and indirect impacts associated with the transportation corridor and port site total 460 acres of wetlands, 231.7 acres of open waters, and 55.5 miles of streams.	Mine Site - N Transportation Corridor - N Port - N Natural Gas Pipeline - Y	
Recreational, aesthetic, and economic values.	Mine Site - in-kind compensatory mitigation within the Koktuli River Watershed will be required to compensate for all direct and indirect impacts caused by discharges into aquatic resources at the mine site. Direct and indirect impacts at the mine site total 2,825 acres of wetlands, 132.5 acres of open waters, and 129.5 miles of streams. The District has also determined that compensatory mitigation is required for unavoidable adverse impacts to aquatic resources from discharges associated with the transportation corridor and the port site. Direct and indirect impacts associated with the transportation corridor and port site total 460 acres of wetlands, 231.7 acres of open waters, and 55.5 miles of streams.	Mine Site - N Transportation Corridor - N Port - N Natural Gas Pipeline - Y	