FACT SHEET

NPDES Permit Number: AK-005334-1
Date: March 14, 2003
Public Notice Expiration Date: May 13, 2003
Technical Contact: Cindi Godsey (907) 271-6561 or
1-800-781-0983 (within Alaska)
godsey.cindi@epa.gov

The U.S. Environmental Protection Agency (EPA) Plans To Issue A Wastewater Discharge Permit To:

Teck Cominco, Inc.
Pogo Mine Project

near
Delta Junction, Alaska

and the State of Alaska proposes to Certify the Permit

EPA Proposes NPDES Permit Issuance.

EPA proposes to issue a *National Pollutant Discharge Elimination System* (NPDES) permit to Teck Cominco's Pogo Mine Project (Pogo). The draft permit sets conditions on the discharges of pollutants from the mine to the Goodpaster River. In order to ensure protection of water quality and human health, the permit places limits on the types and amounts of pollutants that can be discharged.

This Fact Sheet includes:

- information on public comment, public hearing, and appeal procedures
- a description of the current discharge
- a description of the discharge location and a map and
- technical material supporting the conditions in the permit

Alaska State Certification.

EPA requests that the Alaska Department of Environmental Conservation (ADEC) certify the NPDES permit for Pogo under section 401 of the Clean Water Act. EPA may not issue the NPDES permit until the state has granted, denied, or waived certification. The state of Alaska has provided a draft certification for the permit (See Appendix B). For more information concerning this review, please contact Luke Boles at (907) 451-

2142 or 610 University Avenue, Fairbanks, Alaska 99709 or
Luke_Boles@envircon.state.ak.us

Public Comment

EPA will consider all comments before issuing the final permit. A public hearing will be held jointly on this permit, state permits and the Draft Environmental Impact Statement (DEIS) at the Community Center in Delta Junction on April 29, 2003, and at the Chena River Convention Center in Fairbanks on April 30, 2003. There will be an open house from 4 pm until 7 pm followed by a presentation. The public hearing, formal taking of comments on the record, will follow the presentation. Those wishing to comment on the draft permit may do so in writing by the expiration date of the Public Notice. All comments should include name, address, phone number, a concise statement of basis of comment and relevant facts upon which it is based. All written comments should be addressed to the Office of Water Director at U.S. EPA, Region 10, 1200 Sixth Avenue, OW-130, Seattle, WA 98101; submitted by facsimile to (206) 553-0165; or submitted via e-mail to godsey.cindi@epa.gov

After the Public Notice expires and all significant comments have been considered, EPA's regional Director for the Office of Water will make a final decision regarding permit reissuance. If no comments requesting a change in the draft permit are received, the tentative conditions in the draft permit will become final, and the permit will become effective upon issuance. If significant comments are received, EPA will address the comments and issue the permit along with a response to comments. The permit will become effective 30 days after the issuance date, unless the permit is appealed to the Environmental Appeals Board (EAB) within 30 days.

Persons wishing to comment on State Certification should submit written comments by the public notice expiration date to the Alaska Department of Environmental Conservation c/o Luke Boles, 610 University Avenue, Fairbanks, Alaska 99709 or Luke_Boles@envircon.state.ak.us

Documents are Available for Review.

The draft NPDES permit and related documents can be reviewed or obtained by visiting or contacting EPA's Regional Office in Seattle between 8:30 a.m. and 4:00 p.m., Monday through Friday (See address below). Draft permits, Fact Sheets, and other information can also be found by visiting the Region 10 website at www.epa.gov/r10earth/water.htm

United States Environmental Protection Agency
Region 10
1200 Sixth Avenue, OW-130
Seattle, Washington 98101
(206) 553-0523 or
1-800-424-4372 (within Alaska, Idaho, Oregon and Washington)

The fact sheet and draft permit are also available at:

EPA Alaska Operations Office
222 W. 7th Avenue #19
Anchorage, Alaska 99513-7588
(800) 781-0983 toll free in Alaska only

Alaska Department of Environmental Conservation
610 University Avenue
Fairbanks, Alaska 99709

The documents are also available with the DEIS on the internet. The internet address is www.pogomineeis.com This website is maintained by the third party contractor, Michael Baker, Jr., Inc., who prepared the DEIS.

For technical questions regarding the permit or fact sheet, contact Cindi Godsey at (907) 271-6561 or godsey.cindi@epa.gov. Services can be made available to persons with disabilities by contacting Audrey Washington at (206) 553-0523.

TABLE OF CONTENTS

I. **APPLICANT** 5

II. **FACILITY ACTIVITY** 5

III. **RECEIVING WATERS** 6
A. Outfall Location 6
B. Water Quality Standards 6

IV. **DESCRIPTION OF DISCHARGE** 6

V. **PERMIT REQUIREMENTS** 8
A. Applicable Laws and Regulations 8
B. Effluent Limitations 8
C. Monitoring Requirements 15
D. Best Management Practices 15
E. Quality Assurance Plan 16
F. Additional Permit Provisions 16

VI. **OTHER LEGAL REQUIREMENTS** 16
A. Endangered Species Act 16
B. Essential Fish Habitat 16
C. State Certification 17
D. Permit Expiration 17

VII. **REFERENCES** 17

APPENDIX A - Pogo Project Location A-1

APPENDIX B - Draft 401 Certification from ADEC B-1

APPENDIX C - Development of Effluent Limitations . . . . . C - 1

APPENDIX D - Example Water Quality-based Effluent Limitation Calculation . . . . D - 1

TECHNICAL INFORMATION

I. APPLICANT

Teck Pogo, Inc.
3520 International Street
Fairbanks, Alaska 99701

Facility Contact: Karl Hanneman, Alaska Regional Manager

II. FACILITY ACTIVITY

Teck Pogo, Inc. is proposing the development of the gold mine located 38 miles northeast of Delta Junction, Alaska. The Pogo project will include an underground mine designed to feed gold ore to a mill at an initial rate of approximately 2500 tons per day (tpd), increasing to 3500 tpd over time. The property will produce 350,000 to 550,000 ounces of gold annually.

The following are the major elements of the proposed project:

- ♢ An underground drift-and-fill mine with a conveyor access to transfer ore to the surface,
- ♢ surface gold mill for gold recovery through gravity concentration, flotation and cyanide leaching,
- ♢ tailings preparation facilities, including cyanide destruction and filtration, to produce paste backfill for the underground mine workings and dewatered tailings material suitable for storage in a drystack facility on the surface,
- ♢ 250 person camp with recreation and catering facilities,
- ♢ transmission line along the Shaw Creek Hillside route and on-site electrical distribution system,
- ♢ 49 mile all-season road constructed along the Shaw Creek Hillside route
- ♢ a water management system that maximizes recycling and treats all waters affected by the project in accordance with pertinent federal and state legislation.

Pogo is expected to have an operating life of 11 years based on current ore reserves.

III. RECEIVING WATERS

A. Outfall Location. The facility proposes to discharge to the Goodpaster River through two outfalls. Outfall 001, the discharge point for treated mine drainage and excess precipitation, will be located at latitude 64° 28' 12" N, and longitude 144° 55' 03" W [NAD 83 Geographic]. Outfall 002, the discharge point for treated domestic wastewater, will be located at latitude 64° 26' 36" N, and longitude 144° 56' 30" W [NAD 83 Geographic].

B. Water Quality Standards. The Alaska State Water Quality Standards (WQS) are composed of use classifications, and numeric and/or narrative water quality criteria. The use classification system designates the beneficial uses that each water body is expected to achieve (such as contact recreation, growth and propagation of fish, etc.). The numeric and/or narrative water quality criteria are the criteria deemed necessary, by the State, to support the beneficial use classification of each water body.

The Goodpaster River is protected in the WQS for freshwater Classes (1) (A), (B), and (C) for uses in water supply (drinking, culinary and food processing, agriculture, aquaculture, and industrial water supply), water recreation (contact and secondary recreation), and growth and propagation of fish, shellfish, other aquatic life and wildlife.

The water quality parameters that could be affected by the discharge from the facility include metals, solids and pH. These are common potential water quality parameters of concern when discharging treated mine water.

ADEC has proposed changes to the WQS that would result in effluent limitations different from those that would be required in the permit under current standards. If the proposed changes are adopted by the state of Alaska and approved by EPA prior to finalizing the permit, the new WQS would be used. This Fact Sheet evaluates and presents both cases in an attempt to show how effluent limitations and other permit conditions may change as a result of the changes proposed to the WQS.

IV. DESCRIPTION OF DISCHARGE

The volume of effluent to be discharged will vary with precipitation and mine drainage. Teck-Pogo has selected a design basis for water treatment plant and dam sizing that provides an annual 95% probability of staying within the design criteria. These criteria would estimate the net precipitation and mine drainage or Net Allowable Discharge (NAD) at 487 gallons per minute (gpm). Current site water balance modeling predicts that the volume of water to be treated and discharged is less than the NAD. With 107 gpm consumed in the process during operating conditions, under average conditions the water treatment plant effluent will be 154 gpm while at the 95th percentile, it would be 380 gpm. The new water

treatment plant will be designed to treat 400 gpm on a continuous basis with an ability to increase by approximately 20% (up to 480 gpm) for a few weeks at a time.

Modeling work completed for the off-river treatment works indicates that under the conservative case of a mine shutdown and maximum mine drainage, it would be necessary to discharge at up to 600 gpm in order to maintain the Recycle Tailings pond (RTP) volume at acceptable levels. This 600 gpm discharge rate would be achieved by combining effluents from both the existing and the new water treatment plants. During such a shut down period, the underground water treatment plant, which would otherwise be dedicated to treating mine drainage to return to the process plant, would be available to treat effluent for discharge. Therefore, the off-river treatment works will be designed for a maximum of 600 gpm with a mixing ratio maximum of 25:1, for a total maximum effluent rate of 15,600 gpm.

During development, mine drainage will be treated by the existing water treatment plant and injected into an injection well, INJ-3 or adjacent wells, at a monthly average of 100 gpm with a daily maximum of 150 gpm. This injection of treated water was covered during exploration under a state wastewater disposal permit with rule authorization as a Class V well under EPA's Underground Injection Control (UIC) program. When the new water treatment plant is complete approximately 6 months after project construction begins, INJ-3 or adjacent wells will be used at a daily maximum of 400 gpm until the off-river treatment works are completed which is expected to be approximately 12 months after project construction begins. Mine drainage will then be treated and discharged through the off-river treatment works until such time as the mine begins production. At this time, the treated mine drainage will be used in the process plant or be combined with treated net precipitation and discharged through the off-river treatment works.

The off-river treatment works is considered by EPA to be a type of flow augmentation. By EPA policy, flow aumentation can be used only as a supplement to adequate treatment and not as a substitute. The information provided by Pogo indicates that effluent from the treatment plant will be well within the technology-based effluent guidelines so EPA considers the requirements to consider this alternative to be met. The effluent from the water treatment plant will be sampled and monitored at regular intervals prior to entering the off-river treatment works between the first and second ponds. Samples will also be taken upstream of the intake to the off-river treatment works to determine the natural condition of the river. The final effluent will be sampled at Outfall 001, the discharge point from the second pond.

The domestic wastewater (human body wastes from toilets and urinals, as well as wastewater from sinks, showers, laundries, safety showers, eyewash stations and galleys) from the camp will be treated and discharged through a diffuser at Outfall 002. In a draft § 401 certification (See Appendix B), ADEC has authorized a mixing zone at this location because this locaction does not support salmon spawning.

The average discharge rate will be 20 gpm with a maximum of 50 gpm during construction.

V. PERMIT REQUIREMENTS

A. Applicable Laws and Regulations

In general, the Clean Water Act requires that the effluent limits for a particular pollutant be the more stringent of either technology-based effluent limits or water quality-based limits. A technology-based effluent limit requires a minimum level of treatment for industrial point sources based on currently available treatment technologies. A water quality-based effluent limit is designed to ensure that the water quality standards of a waterbody are being met. For more information on deriving water quality-based effluent limits, see Appendix C.

B. Effluent Limitations

1. Wastewater from Outfall 001

An evaluation for the discharge from Outfall 001 was done comparing the technology-limitations in 40 CFR Part 440 Subpart J plus other parameters of concern with the WQ-based limitations discussed in Appendix C. For most parameters, the WQ-based limitation is more restrictive.

a. The following summarizes the effluent limitations that are in the draft permit:

Table 1 - Outfall 001 Effluent Limitations and Monitoring Requirements

Parameter	Units	Effluent Limitations **(current standards)**		Effluent Limitations **(proposed standards)**		Monitoring Requirements	
		Maximum Daily	Average Monthly	Maximum Daily	Average Monthly	Sample Frequency	Sample Type
Cadmium[1, 3]	ug/l	0.7	0.4	0.2	0.1	weekly	grab
Copper[1, 3]	ug/l	5.7	2.8	4.5	2.2	weekly	grab
Chromium, Total	ug/l	—	—	—	—	weekly	grab
Chromium VI	ug/L	8	16	8	16	[5]	grab
Cyanide[4]	ug/l	8.5	4.3	8.5	4.3	weekly	grab
Lead[1, 3]	ug/l	1.1	0.6	1.1	0.6	weekly	grab
Manganese[1, 3]	ug/l	73	50	73	50	weekly	grab
Mercury[2, 3]	ug/l	0.02	0.01	0.02	0.01	weekly	grab
Zinc[1, 3]	ug/l	42.0	21.0	42.9	21.4	weekly	grab

Table 1 - Outfall 001 Effluent Limitations and Monitoring Requirements							
Parameter	Units	Effluent Limitations **(current standards)**		Effluent Limitations **(proposed standards)**		Monitoring Requirements	
		Maximum Daily	Average Monthly	Maximum Daily	Average Monthly	Sample Frequency	Sample Type
TDS	mg/l	820	408	820	408	weekly	grab
Turbidity, effluent	NTU	see Permit Part 1.A.4.		see Permit Part 1.A.4.		weekly	grab
Turbidity, natural condition	NTU	--	--	--	--	weekly	grab
Sulfates	mg/l	410	204	410	204	weekly	grab
pH	s.u.	see Permit Part 1.A.3.		see Permit Part 1.A.3.		daily	grab
Outfall Flow	gpm	15,600	--	15,600	--	continuous	recording
Hardness, as $CaCO_3$	mg/l	--	--	--	--	weekly	grab
Chronic Whole Effluent Toxicity[6]	TU_c	--	--	--	--	annually	grab

Footnotes:
1 - These parameters must be analyzed and reported as total recoverable.
2 - Mercury must be analyzed and reported as total.
3 - Reporting is required within 24 hours of a maximum daily limit violation. See Part III.G.
4 - The current standard will be analyzed as total cyanide and the proposed standard will be analyzed as weak acid dissociable cyanide (WAD)
5 - Chromium VI must be analyzed in the sample if total chromium exceeds 8 ug/L.
6 - See Permit Part I.D. for whole effluent toxicity testing requirements.

b. The pH shall be not be less than 6.5 standard units nor greater than 8.5 standard units.

c. There shall be no discharge of floating solids, visible foam, other than in trace amounts, or oily wastes which produce a sheen on the surface of the receiving water.

d. The turbidity measured in nephelometric turbidity units (NTU) must not be more than 5 NTUs above the natural condition measured in a sample taken from the Goodpaster River within a reasonable time of the effluent sample being made.

e. The permittee must collect effluent samples from the effluent stream after the last treatment unit prior to discharge into the receiving waters.

f. The outfall flow, while limited to a maximum of 15,600 gpm, shall not exceed 25 times the flow from the treatment plant.

2. Whole Effluent Toxicity (WET) Requirements

Chronic WET testing is included in the proposed permit on an annual basis. The testing will occur at Outfall 001 so that the full effects of the discharge into the Goodpaster River will be determined. Since data does not exist to support the development of a WET limit at this time, a target level for chronic toxicity of 2 TU_C shall apply in complying with the permit requirements for the potential of accelerated testing and the development, if need be, of a Toxicity Reduction Evaluation (TRE) or a Toxicity Identification Evaluation (TIE).

3. Outfall 011 (internal monitoring of wastestream 001)

The allowance for the use of flow augmentation results in a need for monitoring and limiting some parameters in the treatment plant effluent rather than in the discharge to the Goodpaster River. Because flow augmentation can only be used after treatment (rather than instead of treatment), the technology-based effluent must be met prior to the mixing of the wastestream with the river water in the off-river treatment works. As such, TSS and pH will be monitored weekly and limited by the technology-based effluent guidelines. Metals will be monitored quarterly and limited by the technology-based effluent guidelines. Additional monitoring for other parameters will be done to assess the characteristics of the wastestream and to determine whether the modeling, that was performed prior to the construction of the treatment plant, was correct.

a. The following table summarizes the limitations that are in the draft permit for Outfall 011.

Table 2 - Outfall 011 Effluent Limitations and Monitoring Requirements

Parameter	Units	Effluent Limitations **(current standards)**		Effluent Limitations **(proposed standards)**		Monitoring Requirements	
		Maximum Daily	Average Monthly	Maximum Daily	Average Monthly	Sample Frequency	Sample Type
Aluminum [1]	ug/L	—	—	—	—	quarterly	grab
Arsenic [1]	ug/L	—	—	—	—	quarterly	grab
Cadmium[1]	ug/l	100	50	100	50	quarterly	grab
Chromium, Total	ug/l	—	—	—	—	quarterly	grab
Copper[1]	ug/l	300	150	300	150	quarterly	grab
Cyanide[3]	ug/L	—	—	—	—	quarterly	grab
Iron[1]	mg/l	438	300	1639	817	quarterly	grab
Lead[1]	ug/l	600	300	600	300	quarterly	grab
Manganese[1]	ug/l	—	—	—	—	quarterly	grab

Table 2 - Outfall 011 Effluent Limitations and Monitoring Requirements							
Parameter	Units	Effluent Limitations **(current standards)**		Effluent Limitations **(proposed standards)**		Monitoring Requirements	
		Maximum Daily	Average Monthly	Maximum Daily	Average Monthly	Sample Frequency	Sample Type
Mercury[2]	ug/l	2	1	2	1	quarterly	grab
Nickel [1]	ug/l	—	—	—	—	quarterly	grab
Selenium [1]	ug/l	—	—	—	—	quarterly	grab
Silver [1]	ug/l	—	—	—	—	quarterly	grab
Zinc[1]	ug/l	1500	750	1500	750	quarterly	grab
TSS	mg/l	30	20	30	20	weekly	grab
TDS	mg/l	—	—	—	—	quarterly	grab
Sulfates	mg/l	—	—	—	—	quarterly	grab
Chlorides	mg/L	—	—	—	—	quarterly	grab
pH	s.u.	see b. below		see b. below		weekly	grab
Outfall Flow	gpm	600	—	600	—	continuous	recording
Hardness, as $CaCO_3$	mg/l	—	—	—	—	weekly	grab

Footnotes:
1 - These parameters must be analyzed and reported as total recoverable.
2 - Mercury must be analyzed and reported as total.
3 - The current standard will be analyzed as total cyanide and the proposed standard will be analyzed as weak acid dissociable cyanide.

b. The pH must not be less than 6.0 standard units (s.u.) nor greater than 9.0 standard units (s.u.).

c. Method Detection Limits. For all effluent monitoring, the permittee must use methods that can achieve a method detection limit (MDL) less than the effluent limitation. For parameters that do not have effluent limitations, the permittee must used methods that can achieve MDLs less than or equal to those specified in Table 5 (Permit Part I.E.3.).

4. Outfall 002

This outfall is for the discharge of domestic wastewater as defined in 18 AAC 72.990(23) as “waterborne human wastes or graywater derived from dwellings, commercial buildings, institutions or similar structures.” As such, the appropriate standards are the wastewater disposal standards found in 18 AAC 72.

Pogo has proposed using a standard treatment plant for this type of effluent and to use ultraviolet disinfection to avoid the introduction of chlorine into the Goodpaster River. The proposed discharge has been placed in an area of the river that has been identified as a non-spawning area due to steep talus slopes. Thus, ADEC has provided a draft § 401 certification (See Appendix B) for a mixing zone allowing for a 10 to 1 dilution ratio for fecal coliform and nitrates. The mixing zone will also allow dilution for pH, dissolved oxygen and chlorine (if used).

The proposed permit contains a provision to decrease monitoring frequency at Outfall 002 after a certain length of time (2 years) but only if the facility has been in compliance with its effluent limitations for 6 consecutive months. When this compliance level is achieved, the monitoring frequency will be reduced to monthly after consultation with EPA and ADEC.

a. The following table summarizes the limitations that are in the draft permit for Outfall 002

TABLE 3

Parameter	7-Day Average	30-Day Average	Daily Maximum	Units	Sampling Frequency[3]	Sample Type
Flow	---	---	50	gpm	Daily	Recording
Biochemical Oxygen Demand (BOD_5)	45	30	60	mg/L	Weekly	Grab
Total Suspended Solids (TSS)	45	30	60	mg/L	Weekly	Grab
Fecal Coliform[1,2]	---	200	400	#/100 ml	Weekly	Grab
Nitrates[1]	—	80	160	mg/L	Weekly	Grab

1 - It is expected that ADEC will certify a mixing zone with 10 to 1 dilution into the permit.
2 - The holding time for a fecal sample is 6 hours.
3 - After consultation with EPA and ADEC, the sampling frequency may decrease to monthly if, after 2 years, this discharge has been in compliance with all effluent limitations for 6 consecutive months.

b. The permittee must not discharge any floating solids, visible foam in other than trace amounts, or oily wastes that produce a sheen on the surface of the receiving water.

c. The pH must not be less than 6.0 standard units (s.u.) nor greater than 9.0 standard units (s.u.).

d. Dissolved Oxygen (DO) must be greater than 2 mg/L.

e. If chlorine is ever used for disinfection, the effluent limitation will be 0.02 mg/L but the MDL is above this level, so the compliance level on the Discharge Monitoring Report will be 0.1 mg/L. If used for disinfection, Cl shall be sampled on a weekly basis (the sampling reduction in footnote 3 of Table 3, above and in the Draft Permit, applies for Cl if used) from Outfall 002.

f. Influent (prior to treatment) measures of BOD_5 and TSS shall be conducted quarterly in January, April, July and September. From this information, percent removal shall be calculated and reported on the Discharge Monitoring Report (DMR) for that month. Percent removal shall meet or exceed 85% for both parameters.

g. The permittee must collect effluent samples from the effluent stream after the last treatment unit prior to discharge into the receiving waters.

5. Surface Water (Ambient) Monitoring

Pogo has been conducting ambient monitoring and bioassessments in the Goodpaster River as part of their baseline work. The proposed permit contains requirements to maintain two sites that have long term monitoring and to initiate monitoring at two other sites to monitor the water quality as construction and operation activities increase in the project area. The permit also proposes to continue bioassessments at an upstream site (SW01) and the historic downstream site (SW12).

Stations SW01 and SW15 are the long term monitoring stations shown on the project map in Appendix A. SW01 is the monitoring point for the background conditions that exist in the Goodpaster River. SW15 is the monitoring point downstream of all proposed activities which will indicate any overall change in the water quality due to the presence of the project.

Station SW 41 will be located downstream of the junction of Liese Creek valley with the Goodpaster River. This point is downstream of the discharge for the off-river treatment works and downstream of the drainage where most of the project's components will be located. Station SW 42 will be downstream from proposed mixing zone for the discharge at Outfall 002.

The Table below contains the parameters that have been historically monitored in the surface water.

Table 4
Surface Water Monitoring Parameters

pH	Cyanide, WAD	Manganese
DO	Cyanide, Total	Mercury

Table 4 Surface Water Monitoring Parameters		
Conductivity	Aluminum	Molybdenum
Temperature	Antimony	Nickel
Turbidity	Arsenic	Potassium
Chlorides	Barium	Selenium
Fluoride	Boron	Silver
Nitrates	Cadmium	Sodium
Sulfates	Calcium	Strontium
Alkalinity	Chromium	Thallium
TDS	Cobalt	Tin
TSS	Copper	Uranium
Settleable Solids	Iron	Vanadium
Phosphates	Lead	Zinc
Hardness	Magnesium	
Historical metals data has been collected as total recoverable and dissolved. If the new WQS are approved, the permit will require only dissolved metals.		

Table 5: MDLs		
Parameter	Units	Method Detection Limit (MDL)
Aluminum	ug/l	20
Antimony	ug/l	3
Arsenic	ug/l	8
Barium	ug/l	30
Boron	ug/l	10
Calcium	mg/L	10
Chromium, Total	ug/l	4
Cobalt	ug/l	20
Magnesium	mg/L	20
Molybdenum	ug/l	20
Potassium	ug/l	300
Selenium	ug/l	2
Silver	ug/l	0.5
Strontium	ug/l	0.3

Table 5: MDLs		
Parameter	Units	Method Detection Limit (MDL)
Thallium	ug/l	1
Tin	ug/l	7
Uranium	ug/l	0.1
Vanadium	ug/l	3

The permittee may request different MDLs. Such a request must be in writing and must be approved by EPA.

C. Monitoring Requirements

40 CFR 122.48(b) requires that the permit contain monitoring requirements. Self-monitoring of effluent parameters is necessary for the permittee to demonstrate compliance with effluent limitations, to assure that state water quality standards are met, and to provide information for future permitting actions. Monitoring frequencies are based on the Agency's determination of the minimum sampling frequency required to adequately monitor the facility's performance. Required sample types are based on the Agency's determination of the potential for effluent variability. These determinations take into consideration several factors, of which the most important are the type of pollutants of concern and the type of treatment system. The Tables above include the monitoring frequency and sample type proposed in the draft permit.

D. Best Management Practices

Section 304(e) of the CWA requires EPA to include conditions in the NPDES permit that require the permittee to develop a Best Management Practices (BMP) Plan. The BMP Plan will be used to control the discharge of toxics or hazardous pollutants by way of spillage or leaks, sludge or waste disposal, and drainage from raw material storage. Any applicable storm water requirements already included in the Storm Water Pollution Prevention Plan may be incorporated into the BMP Plan by reference.

The intent of the BMP Plan is to recognize the hazardous nature of various substances used and produced by the facility and the way such substances may be accidentally dispersed. The BMP Plan should incorporate elements of pollution prevention as set forth in the Pollution Prevention Act of 1990, 42 U.S.C. 13101.

The BMP Plan must be amended whenever there is a change in the facility or in the operation of the facility which materially increases the potential for an increased discharge of pollutants. The BMP Plan will become an enforceable condition of the permit. A violation of the BMP Plan is a violation of the permit.

E. Quality Assurance Plan

The permit requires the permittee to develop and implement a Quality Assurance Plan. The purpose of the Quality Assurance Plan is to establish appropriate sampling, handling and analytical procedures for all effluent and ambient water samples taken. This plan may be contained in an overall project monitoring plan.

F. Additional Permit Provisions

Sections II, III, and IV of the draft permit contain standard regulatory language that must be included in all NPDES permits. Because they are regulations, they cannot be challenged in the context of an NPDES permit action. The standard regulatory language covers requirements such as monitoring, recording, reporting requirements, compliance responsibilities, and other general requirements.

VI. OTHER LEGAL REQUIREMENTS

A. Endangered Species Act

Section 7 of the Endangered Species Act (ESA) requires federal agencies to request a consultation with the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) regarding potential effects an action may have on listed endangered species. EPA sent letters to the Services on August 14, 2002, soon after the initial NPDES application was received.

In a letter dated September 7, 2000, USFWS responded indicating that the project is not likely to affect any listed species and that preparation of a Biological Assessment or further consultation was not necessary at the time. A conversation between Elaine Gross of the USFWS and Cindi Godsey of EPA on January 28, 2003, confirmed that there have been no changes to the listed species in the area. Ms Gross also confirmed that the USFWS decision could be used for this permit as well as for the DEIS. It has been more than 6 months since a species list was provided, so EPA will request an updated list prior to this permit being finalized.

EPA did not receive a response from NMFS to its 2000 letter so another request for an updated species list was sent on December 2, 2002. The NMFS response, in a letter dated December 23, 2002, indicates that they do not expect any endangered species under their jurisdiction to occur in the project area.

B. Essential Fish Habitat

Section 305(b) of the Magnuson-Stevens Act [16 USC 1855(b)] requires federal agencies to consult with NMFS when any activity proposed to be

permitted, funded, or undertaken by a federal agency may have an adverse effect on designated Essential Fish Habitat (EFH) as defined by the Act. The EFH regulations define an adverse effect as any impact which reduces quality and/or quantity of EFH and may include direct (e.g. contamination or physical disruption), indirect (e.g. loss of prey, reduction in species' fecundity), site-specific, or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

EPA has determined that issuance of this permit is not likely to have an adverse effect on EFH in the vicinity of the discharge. Effluent limitations have been incorporated into the draft permit based on criteria considered to be protective of overall water quality in the Goodpaster River. Also, the facility will need to acquire Alaska Department of Fish and Game (ADF&G) permits which will be protective of the anadromous populations of aquatic life in the Goodpaster River. EPA will provide NMFS with copies of the draft permit and fact sheet during the public comment period. Any comments received from NMFS regarding EFH will be considered prior to final issuance of this permit.

C. State Certification

Section 401 of the Clean Water Act requires EPA to seek state certification before issuing a final permit. As a result of the certification, the state may require more stringent permit conditions to ensure that the permit complies with WQS. The certification may also require additional monitoring requirements and authorize a mixing zone. A draft 401 Certification is included as Appendix B.

D. Permit Expiration

This permit will expire five years from the effective date of the permit. Permits may be administratively extended under 40 CFR 122.6 if all the requirements of this regulations are met.

VII. **REFERENCES**

Application package dated January 2, 2003. This package includes references to the original application dated August 1, 2000; the February 2002 Water Management Plan as supplemented in June 2002; the February 2002 Plan of Operations as supplemented in November 2002; and the August 2002 Preliminary Draft Environmental Impact Statement (PDEIS).

EPA 1991. *Technical Support Document for Water Quality-based Toxics Control*. Office of Water Enforcement and Permits, Office of Water Regulations and Standards. Washington, DC., March 1991. EPA/505/2-90-001.

EPA, 1996a. *EPA Region 10 Guidance for WQBELs Below Analytical Detection/Quantitation Level*. NPDES Permits Unit, EPA Region 10, Seattle, Washington. March 1996.

EPA, 1996b. *The Metals Translator: Guidance for Calculation a Total Recoverable Permit Limit from a Dissolved Criterion.* EPA 823-B-96-007, June 1996.

1976 EPA Memorandum from Assistant Administrator for Enforcement, Assistant Administrator for Water and Hazardous Materials and General Counsel to the Regional Administrators and State NPDES Directors. Subject: Use of Low Flow Augmentation by Point Sources to Meet Water Quality Standards.

18 AAC 70, the Alaska Department of Environmental Conservation's Water Quality Standards.

18 AAC 72, the Alaska Department of Environmental Conservation's regulations for Wastewater Disposal.

18 AAC 80, the Alaska Department of Environmental Conservation's regulations for Drinking Water.

Proposed Revisions to the Water Quality Standards Regulations by the Alaska Department of Environmental Conservation. Published August 1, 2002.

APPENDIX A
Pogo Project Location

APPENDIX A
Pogo Project Location

APPENDIX B
Draft 401 State Certification

610 University Avenue
Fairbanks, AK 99709-3643
PHONE: (907) 451-2360
FAX: (907) 451-2187

DIVISION OF AIR AND WATER QUALITY
WASTEWATER DISCHARGE PROGRAM

DRAFT February 24, 2003 File # 121.62.002

Karl Hanneman
Alaska Regional Manager
Teck-Pogo Inc.
3520 International Street
Fairbanks, AK 99701

RE: State of Alaska, DRAFT DEC 401 Certification of DRAFT NPDES Permit No. AK-005334-1

Dear Mr. Hanneman;

In accordance with Section 401 of the Clean Water Act and provisions of the Alaska Water Quality Standards (18 AAC 70), the Dept. of Environmental Conservation is issuing the enclosed DRAFT Certificate of Reasonable Assurance for the DRAFT NPDES permit for discharges of wastewater from the Pogo mine located 38 miles northeast of Delta Junction, Alaska.

Department of Environmental Conservation regulations provide that any person, who disagrees with any portion of the final decision, may request an informal review by the Air and Water Quality Division director of the decision or an adjudicatory hearing before the department's commissioner in accordance with 18 AAC 15.185 or 18 AAC 15.195 - 18 AAC 15.340, respectively. A request for an informal review must be made within 15 days after receiving the department's decision; may be made by mail, electronic mail or facsimile; and must include the information contained in 18 AAC 15.185. A request for an adjudicatory hearing must be made within 30 days after the permit decision is issued and should be mailed to the Commissioner, Alaska Department of Environmental Conservation, 410 Willoughby Ave, Suite 303, Juneau, AK 99801. Pursuant to 18 AAC 15.200(c), a copy of the request for an adjudicatory hearing must be served on the department office that issued the decision being challenged and on the permit applicant. A copy of the request also must be provided to the department office in an electronic format. Failure to submit a hearing request within thirty days of receipt of the final determination letter shall constitute a waiver of that person's right to judicial review of this decision.

Please be advised that, pursuant to 18 AAC 15.120(c), the certification of this NPDES permit constitutes the permit required under AS 46.03.100. 18 AAC 15.120(c) also states, "Any rights or privileges inuring to the benefit of EPA in the NPDES permit, including any right to enter, inspect, sample, and have access to records, also inure to the benefit of the department. Any reports or other information filed with EPA in accordance with the NPDES permit must be contemporaneously filed with the department."

Sincerely,

William D. McGee
Technical Lead

Enclosure: Draft Certificate of Reasonable Assurance
cc:

Luke Boles, ADEC/Fairbanks
Cindi Godsey, EPA Reg. X/Anchorage
Robert Robichaud, EPA Reg. X/Seattle, WA
Jim Vohden, ADNR/Fairbanks
Ed Fogels, ADNR/Anchorage
Stan Foo, ADNR/Anchorage
Steve McGroarty, ADNR/Fairbanks
Al Ott, ADF&G/Fairbanks
Jack Winters, ADF&G/Fairbanks

STATE OF ALASKA
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DRAFT CERTIFICATE OF REASONABLE ASSURANCE

A Certificate of Reasonable Assurance, as required by Section 401 of the Clean Water Act, has been requested by Teck–Pogo Inc. for the discharge of treated domestic wastewater and treated non-domestic wastewater from the Pogo Mine.

The facility is located 38 miles northeast of Delta Junction, AK, with discharges to the Goodpaster River.

Public notice of the application for this certification was made in accordance with 18 AAC 15.140.

Water Quality Certification is required for the activity, because the activity will be authorized by an Environmental Protection Agency permit identified as DRAFT NPDES Permit No. AK-005334-1 and a discharge will result from the activity.

This NPDES permit certification covers wastewater disposal from the following discharges:

I.Outfall 001 – Discharge from the Off River Treatment Works (treated non-domestic wastewater including: mine drainage and mine site runoff). Outfall 001 is located at Latitude 64° 28' 12" N, Longitude 144° 55' 03" W.

II.Outfall 002 – Discharge from the domestic wastewater treatment plant. Outfall 002 is located at Latitude 64° 26' 36" N, Longitude 144° 56' 30" W.

After review of the public comments received in response to the public notice, the Alaska Department of Environmental Conservation certifies that there is reasonable assurance that the activity and the resulting discharge is in compliance with the requirements of Section 401 of the Clean Water Act, which includes the Alaska Water Quality Standards, 18 AAC 70, provided that the terms and conditions of this certification are adhered to.

The Department has reviewed the discharges with respect to the antidegradation policy of the Alaska Water Quality Standards and finds the reduction in water quality to be in accordance with the requirements of 18 AAC 70.015, provided that the terms and conditions of this certification are made part of the final NPDES Permit.

Through this certification, in accordance with 18 AAC 15.120 ADOPTION OF NPDES PERMITS, the final NPDES permit will constitute the permit required under AS 46.03.100 Waste Disposal Permit, provided that the terms and conditions of the final certification are made part of the final NPDES Permit. The department is specifying the following permit terms and conditions under authority of AS 46.03.110(d):

1) The ADEC authorizes a Mixing Zone (MZ) with 10:1 dilution for Fecal Coliform Bacteria, Nitrates (NO_3), pH, Dissolved Oxygen (DO) and Chlorine (Cl) contained in the discharge from Outfall 002. Modeling has shown that Fecal Coliform Bacteria is the

controlling parameter for the mixing zone size at Outfall 002. The mixing zone is defined as a trapezoid with a downstream length of five feet. The bases of the trapezoid defining the mixing zone are five feet wide at the upstream end (the diffuser width is five feet) and seven feet at the down stream end. The mixing zone includes the vertical extent of the water column from the water surface to, but not including, the riverbed.

Rationale: In accordance with State Regulations 18 AAC 70.240, the Department has authority to designate mixing zones in permits or certifications. This mixing zone will ensure that the most stringent water quality standard limitations for fecal coliform bacteria; 20 FC/100 mL, 30 day average, (not more than 10% of the samples may exceed 40 FC/100 mL.), is met at all points outside of the mixing zone.

The Department considered all aspects required in 18 AAC 70.015 (Antidegradation) and 18 AAC 70.240-270 (Mixing Zones) including, but not limited to, the potential risk to human health and ecological resources based on existing monitoring data of the Goodpaster River water quality and mixing zone modeling of the predicted effluent quality from the discharge.

The Department finds that the size of the mixing zone authorized for discharge in this certification is appropriate and provides reasonable assurance that existing uses of the Goodpaster River outside of the mixing zone are maintained and fully protected.

2) The Department authorizes the Outfall 002 effluent limitations and monitoring frequency for the parameters contained in Table 3 of the Preliminary Draft Permit.

Rationale: In accordance with State Regulations 18 AAC 70.245, the Department has authority to ensure that existing uses of the waterbody outside the mixing zone are maintained and fully protected. The specified effluent limitations and monitoring will provide evidence to the Department that the treatment and mixing zone size is adequate and also provide assurance to receiving water users that they may conduct their activities outside of the mixing zone without fear of damaging effects caused by the discharge.

3) The ADEC requires effluent limitations for pH which shall not be less than 6.0 standard units nor greater than 9.0 standard units at Outfall 002.

Rationale: In accordance with State Regulations 18 AAC 15.090, the Department may attach terms and conditions to a permit, variance, or approval, including operating, monitoring, inspection, sampling, access to records and reporting requirements, and the posting of a performance bond or other surety, that it considers necessary to ensure that all applicable criteria will be met.

4) The ADEC requires effluent limitations for dissolved oxygen (DO) which shall be greater than 2 mg/L at all times from Outfall 002.

Rationale: In accordance with State Regulations 18 AAC 15.090, the Department may attach terms and conditions to a permit, variance, or approval, including operating, monitoring, inspection, sampling, access to records and reporting

requirements, and the posting of a performance bond or other surety, that it considers necessary to ensure that all applicable criteria will be met.

5) The ADEC requires that if chlorine is ever used for disinfection, effluent limitations for chlorine (Cl) shall be 0.02 mg/L at all times from Outfall 002. Since the current MDL for Cl is 0.1 mg/L, the compliance level for Cl is 0.1 mg/L. If used for disinfection, Cl shall be sampled on a weekly basis (the sampling reduction in footnote 3 of Table 3 in the Preliminary Draft Permit applies for Cl if used) from Outfall 002.

   Rationale: In accordance with State Regulations 18 AAC 15.090, the Department may attach terms and conditions to a permit, variance, or approval, including operating, monitoring, inspection, sampling, access to records and reporting requirements, and the posting of a performance bond or other surety, that it considers necessary to ensure that all applicable criteria will be met.

6) The ADEC authorizes the monitoring for the parameters listed in Table 4 of the permit at the Goodpaster River station SW-42 to ensure that water quality standards are met at the outside edge of the mixing zone.

   Rationale: In accordance with State Regulations 18 AAC 70.245, the Department has authority to ensure that existing uses of the waterbody outside the mixing zone are maintained and fully protected. The specified monitoring will provide evidence to the Department that the treatment and mixing zone size is adequate and also provide assurance to receiving water users that they may conduct their activities outside of the mixing zone without fear of damaging effects caused by the discharge.

7) The ADEC requires that signs be placed on the riverbanks near the mixing zone and outfall line. The signs must provide the identity and telephone numbers of the discharger; must inform the public that a mixing zone exists, that treated and disinfected wastewater is being discharged, and that users of the area should exercise caution.

   Rationale: In accordance with AS 46.03.110, (d), the department may specify in a permit the terms and conditions under which waste material may be disposed of. The notification requirement is intended to inform and provide assurances to the public that the wastewater is being treated in accordance with Alaska Water Quality Standards, 18 AAC 70.

8) The ADEC requires that the following changes be made to the draft permit:

   Section I.D.6.b, the first sentence shall read: "The permittee must notify EPA and ADEC of the exceedence in writing within two weeks of receipt of the test results."

   Section I.E.3, the last sentence shall read: "Such a request must be made in writing and must be approved by EPA and ADEC."

Section II.D.3.b, the last sentence shall read: "The statement must be submitted to EPA and ADEC on or before January 31st of each year of operation under this permit after the initial BMP submittal (the initial statement must be submitted to EPA and ADEC six months after submittal of the BMP Plan)."

Section II.E shall read: "The permittee must maintain a copy of the BMP Plan at the facility and make it available to EPA, ADEC, or an authorized representative upon request."

Section II.F.3, the last sentence shall read: "All changes to the BMP Plan must be reported to EPA and ADEC with the annual certification required under Permit Part D.3 above."

Rationale: In accordance with State Regulations 18 AAC 15.090, the Department may attach terms and conditions to a permit, variance, or approval, including operating, monitoring, inspection, sampling, access to records and reporting requirements, and the posting of a performance bond or other surety, that it considers necessary to ensure that all applicable criteria will be met.

William D. McGee
Technical Lead

APPENDIX C
Development of Effluent Limitations

The section discusses the basis for and the development of cadmium, copper, cyanide, lead, manganese, mercury, zinc, pH, sulfates, and total suspended solids limitations in the proposed permit. The discussions include the development of technology-based effluent limitations (Section I.) and water quality-based effluents limitations (Section II.) and a summary of the effluent limitations developed for the draft permit.

I. Technology-based Evaluation

Section 301(b) of the CWA requires technology-based controls on effluents. Pogo is considered a new source. The term "*new source*" means any source, the construction of which is commenced after the publication of proposed regulations prescribing a standard of performance under this section (Section 306 of the CWA) which will be applicable to such source, if such standard is thereafter promulgated in accordance with this section. On December 3, 1982, EPA published effluent guidelines for the mining industry which are found in 40 CFR Part 440. Within these guidelines, Subpart J of Part 440, titled *Copper, Lead, Zinc, Gold, Silver, and Molybdenum Ores Subcategory*, applies to the mine discharges from Pogo. The New Source Performance Standards (40 CFR 440.104) are used to provide the technology-based effluent limitations for copper, zinc, lead, mercury, cadmium, pH and TSS.

40 CFR 440.104(a) states that the concentration of pollutants discharged in mine drainage from mines that produce copper, lead, zinc, gold, silver or molybdenum bearing ores or any combination of these ores from open-pit or underground operations other than placer deposits shall not exceed:

TABLE C-1
Technology-based Effluent Limitations

Parameter	Daily Maximum	Monthly Average
TSS, mg/L	30	20
Cadmium, ug/L	100	50
Copper, ug/L	300	150
Lead, ug/L	600	300
Zinc, ug/L	1500	750
Mercury, ug/L	2	1
pH, standard units	Between 6.0 and 9.0	

40 CFR 440.104(b) states that there shall be no discharge of process wastewater to navigable waters from mills that us the froth-flotation process alone or in

conjunction with other processes for the beneficiation of gold ore. In the event that the annual precipitation falling on the treatment facility and the drainage area contributing surface runoff to the treatment facility exceed the annual evaporation (net precipitation), a volume of water equal to the difference may be discharged subject to the limitations set forth in Table C-1, above.

II. Water Quality-based Evaluation

Section 301(b)(1)(C) of the CWA requires the development of limitations in permits necessary to meet water quality standards. Discharges to state waters must also comply with limitations imposed by the state as part of its certification of NPDES permits under section 401 of the CWA.

The NPDES regulation [40 CFR 122.44(d)(1)] implementing section 301 (b)(1)(C) of the CWA requires that permits include limits for all pollutants or parameters which "are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard, including state narrative criteria for water quality."

The regulations require that this evaluation be made using procedures which account for existing controls on point and non-point sources of pollution, the variability of the pollutant in the effluent, species sensitivity (for toxicity), and where appropriate, dilution in the receiving water. The limits must be stringent enough to ensure that water quality standards are met, and must be consistent with any available wasteload allocation.

When evaluating the effluent to determine if water quality-based effluent limits are needed based on chemical specific numeric criteria, a projection of the effluent water concentration (where no mixing zone is authorized) for each pollutant of concern is made. The chemical specific concentration of the effluent and ambient water and, if appropriate, the dilution available from the ambient water are factors used to project the receiving water concentration. If the projected concentration of the effluent exceeds the numeric criterion for a specific chemical, then there is a reasonable potential that the discharge may cause or contribute to an excursion above the applicable water quality standard, and a water quality-based effluent limit is required.

The water quality parameters that may be affected by the discharge are metals (cadmium, copper, lead, manganese, mercury and zinc), cyanide, pH, sulfates, and turbidity.

A. **Toxics - Metals and Cyanide**

Water quality based effluent limitations for metals were develop based upon guidance in EPA's Technical Support Document for Water Quality-based

Toxics Control (TSD). The water quality-based analysis consists of four steps:

- ☆ Determine the appropriate water quality standard,
- ☆ Determine if there is "reasonable potential" for the discharge to exceed the standard in the receiving water,
- ☆ If there is "reasonable potential", develop a wasteload allocation (WLA), and a long term average (LTA), then
- ☆ Develop effluent limitations based on the LTA.

The following sections provide a detailed discussion of each step. Appendix D provides an example calculation to illustrate how these steps are implemented.

1. Water Quality Standards

The first step in developing water quality-based limitations is to determine the applicable water quality standard. For Alaska, the current State Water Quality Standards (WQS) are found in 18 AAC 70. The applicable criteria are based on the designated uses of the receiving water. The Goodpaster River is protected for all designated uses so the most stringent standard applicable is used in determining the reasonable potential to violate water quality standards for aquatic life and calculate the effluent limitations. These standards are provided in Table C-2.

Table C-2
Water Quality Standards

Parameter, (in ug/L unless noted otherwise)	Current Standards			Proposed Standards[1]	
	Acute	Chronic	Human Health[2]	Acute	Chronic
Aluminum	750	87	---	750	87
Arsenic	360	190	50	340	150
Cadmium	1	0.44	10	0.62	0.11
Chlorides (mg/L)	860	230	250	860	230
Chromium, III	640	77	50	670	32
Chromium, VI	16	11	50	16	11
Copper	5.7	4.2	1000	4.5	3.3
Cyanide[3]	22	5.2	200	22	5.2
Iron	—	1000	300[4]	—	1000

Table C-2 Water Quality Standards					
Parameter, (in ug/L unless noted otherwise)	Current Standards			Proposed Standards[1]	
	Acute	Chronic	Human Health[2]	Acute	Chronic
Lead	18	0.7	50	17	0.68
Manganese	—	—	50	—	---
Mercury	2.4	0.012	0.14	2.4	0.012
Nickel	510	57	13	170	19
Selenium	20	5	10	20	5
Silver	0.51	—	50	0.51	---
Zinc	42	38	5000	43	43
TDS	Shall not exceed 500 mg/L		—	Shall not exceed 500 mg/L	
Sulfates	Shall not exceed 250 mg/L		—	Shall not exceed 250 mg/L	

1 Proposed Standards have already been translated from dissolved to total recoverable.
2 Human Health Standards are the same under both the current and the proposed standards except for iron - See footnote 4.
3 The current standard for free cyanide is measured as total while the proposed standard will be free cyanide measured as weak acid dissociable (WAD).
4 The human health criteria for iron is currently based on the secondary drinking water standard (MCL). The proposed standards contain provisions to remove the secondary MCL from the WQS.

Some criteria are expressed as a function of hardness (measured in mg/L of calcium carbonate - $CaCO_3$). As the hardness of the receiving water increases, the toxicity deceases and the numerical value of the criteria increases. Because a mixing zone is not allowed where it could have an adverse impact on anadromous or resident fish spawning [18 AAC 70.250(2)(A)], the 5th percentile receiving water hardness of 29.82 mg/L $CaCO_3$ was used to determine the criteria for the hardness-based metals indicated in Table C-2.

Table C-2 also contains the WQS that ADEC has proposed. A permit must be issued using the WQS in effect at the time of issuance and these standards may be adopted by ADEC and approved by EPA before the Pogo permit is finalized. Permit limitations have been calculated using the new standards as well as those currently in effect.

2. Reasonable Potential Evaluation

A reasonable potential analysis was performed to verify the need for limits. This analysis compares the maximum projected effluent

concentration (C_e) to the standard for that pollutant. If the projected effluent concentration exceeds the standard, there is "reasonable potential" (RP) and a limit must be included in the permit. EPA uses the recommendations in Chapter 3 of the TSD to conduct this analysis.

The maximum projected effluent concentration (C_e) is defined by the TSD as the 99th percentile of the effluent data. This is calculated by multiplying the maximum reported effluent concentration by a reasonable potential multiplier (RPM). Pogo is a new source and no effluent has been discharged so modeling was done to determine the probable effluent characteristics. Since the modeling was done using conservative inputs, the data used was the 95th percentile. During the reissuance of this permit, the maximum value of the actual effluent data will be used to reanalyze the RP. For parameters with technology-based effluent limitations guidelines, the maximum effluent concentration used to determine the RP is the technology-based maximum daily limitation. The technology-based limit is used since water quality-based limits are only required if discharges at the technology-based limits have the RP to exceed water quality standards in the receiving water. The RPM accounts for uncertain in the effluent data. The RPM statistically depends upon the amount of effluent data and variability of the data as measured by the coefficient of variation (CV) of the data. The RPM decreases as the number of data points increases and the variability of the data decreases. If the maximum projected effluent concentration is greater than the applicable water quality criterion then a water quality-based effluent limit is required.

Table C-3
Reasonable Potential Determination
(CV = 0.6, n =1)

Parameter (in ug/L unless otherwise noted)	Effluent Concentration	RPM	Maximum Projected Effluent Concentration	Reasonable Potential when compared with standards in Table C-2	
				Current	Proposed
Aluminum	**	13.2		**	**
Arsenic	1.54	13.2	20	No	No
Cadmium*	100	1.0	100	Yes	Yes
Chlorides, mg/L	4.15	13.2	55	No	No
Chromium, III	1.67	13.2	22	No	No
Chromium, VI	***	13.2		***	***

Table C-3
Reasonable Potential Determination
(CV = 0.6, n =1)

Parameter (in ug/L unless otherwise noted)	Effluent Concentration	RPM	Maximum Projected Effluent Concentration	Reasonable Potential when compared with standards in Table C-2	
				Current	Proposed
Copper*	300	1.0	300	Yes	Yes
Cyanide	.85	13.2	11	Yes	Yes
Iron	604	13.2	7983	Yes	Yes
Lead*	600	1.0	600	Yes	Yes
Manganese	28.2	13.2	459	Yes	Yes
Mercury*	2	1.0	2	Yes	Yes
Nickel	2.23	13.2	29	Yes	Yes
Selenium	0.08	13.2	1	No	No
Silver	0.003	13.2	0.05	No	No
Zinc*	1500	1.0	1500	Yes	Yes
TDS, mg/L	109	13.2	1433	Yes	Yes
Sulfates, mg/L	28	13.2	365	Yes	Yes

* Metals with technology-based effluent guidelines.
** There is no information to assess the reasonable potential for aluminum. This parameter will be monitored in the treatment plant effluent during the life of the permit to determine its occurrence in the discharge.
*** No speciation of chromium is indicated in the Water Management Plan. If all the chromium reported is chromium VI, there is reasonable potential to violate the WQS. The permit contains a limit for chromium VI but it is only analyzed when total chromium exceeds the average monthly limitation.

3. Water Quality-Based Permit Limitation Derivation

Once EPA has determined that a water quality-based limitation is required for a pollutant, the first step in developing the permit limitation is development of a Wasteload Allocation (WLA) for the pollutant. A WLA is the concentration (or loading) of a pollutant that the permittee may discharge without causing or contributing to an exceedence of water quality standards in the receiving water. WLAs and permit limitations are derived based on guidance in the TSD. WLAs for this permit were established based on meeting water quality standards at the end-of-pipe using the current Alaska WQS.

The acute and chronic WLAs are then converted to long term average concentrations (LTAs) and compared. The most stringent LTA concentration for each parameter is statistically converted to effluent limitations. This section describes each of these steps.

Calculations of WLAs:

Where no mixing zone is allowed, the standard becomes the WLA. Establishing the standard as the WLA ensures that the permittee does not contribute to an exceedence of the standard.

The NPDES regulations require that metals limits be expressed as total recoverable (TR) metals [40 CFR 122.45(c)]. This is because changes in water chemistry as the effluent and receiving water mix could cause some of the particulate metal in the effluent to dissolve. Because the proposed WQS are expressed in dissolved, a translator is used in the WLA equation to convert the dissolved criteria to total recoverable. Since the State has not proposed translators in the recent revision to the WQS and there are no site-specific translators, the default of 1/CF where CF is the conversion factor proposed in the WQS.

For the current WQS,

WLA (TR) = the standard (TR).

For the proposed WQS,

the WLA (TR) = the standard (diss) * the translator.

The proposed standards are expressed as a total recoverable number or equation multiplied by a conversion factor (CF). Since the default translator is 1/CF, the equation becomes:

WLA (TR) = CF* standard (TR) * 1/CF

WLA (TR) = standard (TR).

Appendix D provides an example of how the WLAs for cadmium in Outfall 001 were developed.

Calculations of Long-term Average Concentrations:

As discussed above, WLAs are calculated for each parameter for each standard (acute, chronic). Because standards are based on the different criteria which apply over different time frames, it is not possible to compare them or the WLAs directly to determine which results in the most stringent limits. For example, the acute criteria are applied as a one-hour average while the chronic criteria are applied as a four-day average.

To allow for comparison, the acute and chronic WLAs are statistically converted to LTA concentrations. The conversion is dependent upon the coefficient of variation (CV) of the effluent data and the probability basis used. The probability basis corresponds to the percentile of the estimated concentration. EPA uses a 99th percentile for calculating LTA, as recommended in the TSD. The following equation from Chapter 5 of the TSD is used to calculate the LTA concentrations (Table 5-1 of the TSD may also be used).

$LTA = WLA * \exp[0.5\sigma^2 - z\sigma]$
Where:

$\sigma^2 = \ln(CV^2 + 1)$ for acute WLA, and
$\sigma^2 = \ln(CV^2/4 + 1)$ for chronic WLA
CV = 0.6, the coefficient of variation
Z = 2.326 for the 99th percentile probability basis (TSD)

Calculation of Effluent Limitations:

The LTA concentration is calculated for each WLA and compared. The most stringent LTA concentration is then used to develop the maximum daily limitation (MDL) and the average monthly limitation (AML) to be used in the permit. The MDL is based on the CV of the data and the probability basis while the AML is dependent upon these two variables and the monitoring frequency. As recommended in the TSD, EPA used a probability basis of 95 percent for the AML calculation and 99 percent for the MDL calculation. The MDL and AML are calculated using the following equations from the TSD (Table 5-2 of the TSD may also be used).

$MDL \text{ or } AML = LTA * \exp[z\sigma - 0.5\sigma^2]$

For the MDL: $\sigma^2 = \ln(CV^2 + 1)$
z = 2.326 for the 99th percentile probability basis (TSD)

For the AML: $\sigma^2 = \ln(CV^2/4 + 1)$
z = 1.645 for the 95th percentile probability basis (TSD)

For setting water quality-based limits for protection of human health uses (Mn and Fe), the TSD recommends setting the AML equal to the WLA then calculating the MDL. The human health MDL is calculated based on the ratio of the AML and MDL as described in Table 5-3 of the TSD.

Where there is only one standard specified, it is used as the chronic WLA and the permit limitations are calculated as above except using just one LTA instead of the more stringent between an acute or a chronic LTA.

Appendix D shows an example of the permit limitation calculation for cadmium in Outfall 001.

B. **Total Dissolved Solids (TDS)**: The WQS require that the level of TDS may not exceed 500 mg/L and the level of neither chlorides nor sulfates may exceed 250 mg/L.

Where there is only one water quality standard and therefore only one WLA, the TSD recommends that the single WLA be considered the chronic WLA. A chronic LTA would then be derived using the methods above for toxics. An MDL and an AML would also be calculated using the same procedures outlined above.

C. **Turbidity:** The most protective standard for turbidity is for the water supply use for drinking, culinary and food processing. The turbidity may not exceed 5 nephelometric turbidity units (NTU) above natural conditions. Natural conditions as defined in 18 AAC 70.990(42) means any physical, chemical, biological, or radiological condition existing in a waterbody before any human- caused influence on, discharge to, or addition of material to the waterbody. The measure of the natural condition of the Goodpaster River will be upstream of the discharge at a point where the river is not influenced by the presence of the mine development. This point could be immediately upstream of the intake to the off-river treatment works if this point is not influenced by any facility disturbance that may cause increased turbidity in the Goodpaster River.

D. **pH**: The WQS require a pH range of 6.5 - 8.5 standard units for waters protected for aquaculture, water supply and contact recreation.

III. Summary of Draft Permit Effluent Limitations

As discussed in Section V.A. of the fact sheet, the draft permit contains the more stringent of technology and water quality-based effluent limitations. The water quality-based limits are more stringent than the technology-based limits for the metals of concern and have therefore been included in the permit.

APPENDIX D - Example Water Quality-based Effluent Limitation Calculation

This appendix demonstrates how the water quality-based analysis (reasonable potential determination and development of effluent limitations was performed using cadmium in Outfall 001 as an example. Because of the proposed changes to the WQS, the calculations are shown for the current standards as well as the proposed.

Step 1: *Determine the applicable water quality standard.*

The current Alaska water quality standards as well as the proposed standards for cadmium are provided below.

Table D-1 Cadmium criteria

Parameter	Acute standard	Chronic standard	Human Health Standard	Drinking Water Standard
Cadmium, ug/L	1.00	0.44	10	5
Cadmium*, ug/L	0.62	0.11	10	5

* these standards are already translated from the proposed dissolved standard to a total recoverable standard

Step 2: *Determine if there is reasonable potential for the discharge to exceed the standard.*

To determine reasonable potential, the maximum projected effluent concentration, when no mixing zone is authorized, is compared to the applicable water quality standards. If this exceeds the standard, then a reasonable potential exists and a water quality-based effluent limit is established.

Since cadmium is a technology-based effluent limit, the following equation applies:

100 * RPM (reasonable potential multiplier) = 100 * 1 = 100

If this had been based on a water quality-based limit, the following equation applies for both the current and proposed standards:

0.04 * 13.2 = 0.528

The effluent from outfall 001 has the reasonable potential to exceed the current and proposed cadmium water quality standards therefore, water quality-based limitations are required.

Step 3: *Determine the wasteload allocation.*

The wasteload allocations (WLAs) for cadmium are equal to the standards:

WLA	Current	Proposed
Acute	1.00	0.62
Chronic	0.44	0.11

Step 4: *Develop long-term average (LTA) concentrations.*

Effluent limitations are developed by converting the aquatic WLAs to LTAs. The most stringent of the acute or chronic LTA is then used to develop the effluent limitations.

$LTA = WLA * \exp[0.5 \sigma^2 - z\sigma]$

where,

z = 2.326 for 99th percentile probability basis (per the TSD)

CV = 0.6

For acute: $\sigma^2 = \ln(CV^2 + 1) = \ln[(0.6*0.6) +1] = 0.307$

For chronic: $\sigma^2 = \ln(CV^2/4 + 1) = \ln[(0.6*0.6/4) +1] = 0.086$

LTA	Current	Proposed
Acute	0.32	0.2
Chronic	0.23	0.06

The most stringent LTA concentration (chronic, in both cases) was used to derive the aquatic life effluent limitations for cadmium from outfall 001.

Step 5: *Develop effluent limitations*

The chronic LTA concentration is converted to a maximum daily limit (MDL) and an average monthly limit (AML).

$MDL, AML = LTA * \exp[z\sigma - 0.5 \sigma^2]$

where, for the MDL:

z = 2.326 for 99th percentile probability basis (per the TSD)

$\sigma^2 = \ln(CV^2 + 1) = \ln[(0.6*0.6) +1] = 0.307$

for the AML:

z = 1.645 for the 95th percentile probability basis (per the TSD)

$\sigma^2 = \ln(CV^2/n + 1) = \ln[(0.6*0.6/4) +1] = 0.086$ since n = number of samples per month = 4

$MDL = 0.23 * \exp[z\sigma - 0.5 \sigma^2] = 0.23 * \exp[2.326*0.5545 - 0.5*0.307] = 0.72$

$AML = 0.23 * \exp[z\sigma - 0.5 \sigma^2] = 0.23* \exp[1.645*0.294 - 0.5*0.086] = 0.36$

ug/L	Current	Proposed
MDL	0.72	0.22
AML	0.36	0.11