



ALASKA POLLUTANT DISCHARGE ELIMINATION SYSTEM

INDIVIDUAL PERMIT – FINAL

Permit Number: AK0050571 – Modification # 2

**ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Wastewater Discharge Authorization Program
555 Cordova Street
Anchorage, AK 99501**

In compliance with the provisions of the Clean Water Act (CWA), 33 U.S.C. §1251 *et seq.*, as amended by the Water Quality Act of 1987, P.L. 100-4, this permit is issued under provisions of Alaska Statutes (AS) 46.03, Alaska Administrative Code (AAC), as amended, and other applicable State laws and regulations.

COEUR ALASKA, INC.

is authorized to discharge from the Kensington Gold Project near Juneau, Alaska at the following locations:

Outfall	Receiving Water or Body	Latitude	Longitude
001	Sherman Creek	58.867778° N	135.115278° W
002	East Fork Slate Creek	58.806611° N	135.036361° W

In accordance with the discharge point effluent limits, monitoring, requirements, and other conditions set forth herein:

This permit modification and authorization shall become effective August 1, 2019

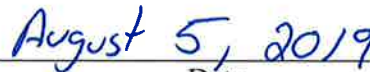
This permit and the authorization to discharge shall expire after, May 31, 2022

The Permittee shall reapply for a permit reissuance on or before December 2, 2021, 180 days before the expiration of this permit, to continue operations and discharge at the facility beyond the term of this permit.

The Permittee shall post or maintain a copy of this permit to discharge at the facility and make it available to the public, employees, and subcontractors at the facility.



Signature



Date



Printed Name

Program Manager

Title

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SCHEDULE OF SUBMISSIONS

The Schedule of Submissions summarizes some of the required submissions and activities the Permittee must complete or revise and submit to the Alaska Department of Environmental Conservation (Department or DEC) during the term of this permit. The Permittee is responsible for all submissions and activities even if they are not summarized below.

Table 1: Schedule of Submissions

Permit Part	Submittal or Completion	Frequency	Due Date	Submit to ^a
1.4.5.3	Exceedance of chronic toxicity limits	As Necessary	Within two weeks of receipt of test results	Compliance
1.4.7.1	Whole Effluent Toxicity (WET) test results	Annually	Must be submitted with the first Discharge Monitoring Report (DMR) following receipt of the test results.	Compliance
1.4.5.3	Accelerated testing results	As Necessary	Within two weeks of receipt of test results.	Compliance
1.6	Annual Water Quality Monitoring Summary (including water column, sediment and aquatic resource monitoring results)	Annually	March 1 st of the next year	Compliance
2.2.1	Written notification that the Quality Assurance Project Plan (QAPP) has been developed and implemented	1/permit cycle	Within 60 days after the effective date of the permit	Compliance
2.3.2	Written notification that the Best Management Practices (BMP) Plan has been developed and implemented	1/permit cycle	Within 60 days after the effective date of the permit	Compliance
2.3.5.2	BMP Plan Annual Review Certification	Annually	January 31 st of the next year	Compliance
2.4	Action items to be completed by completion dates outlined in Table 6.	As Scheduled	As scheduled in Table 6 beginning upon effective date of this permit	Permitting and Compliance
Appendix A, 1.3	Application for Permit Reissuance	1/permit cycle	180 days before expiration of the permit	Permitting
Appendix A, 2.4	Reports of compliance or noncompliance with a Compliance Schedule	As Required	No later than 14 days following each schedule date	Compliance

Permit Part	Submittal or Completion	Frequency	Due Date	Submit to ^a
Appendix A, 3.2	DMR	Monthly	Postmarked or submitted electronically on or before the 20 th day of the next month	Compliance
Appendix A, 3.4	Oral notification of noncompliance	As Necessary	Within 24 hours of discovering noncompliance	Compliance ^b
Appendix A, 3.4	Written documentation of noncompliance	As Necessary	Within 5 days of discovering noncompliance	Compliance

a. See Appendix A.1.1 for addresses.

b. Oral notifications must be reported to the Department's noncompliance reporting hotline: 1-907-269-4114 (from Alaska) or 1-877-569-4114 (nationwide).

1.0 LIMITATIONS AND MONITORING REQUIREMENTS

1.1 Discharge Authorization

During the effective period of this permit, the Permittee is authorized to discharge pollutants from the outfalls specified herein to Sherman Creek and East Fork Slate Creek, within the limits and subject to conditions set forth herein. This permit only authorizes the discharge of those pollutants resulting from facility processes, waste streams, and operations clearly identified in the permit application process such as inflows to Outfall 001 and Outfall 002.

1.1.1: Inflows to Outfall 001: Outfall 001 is the point of discharge for treated effluent from the Comet Mine Water Treatment Plant (MWTP). This influent water is collected from the Kensington and Jualin underground mines and is conveyed to the Comet MWTP. A portion of the surface water runoff collected from the Comet waste rock stockpile is routed to Pond 2 (optional mine water storage pond) and treated in the MWTP; the remainder is managed under the Multi Sector General Permit for Stormwater (MSGP). The Comet MWTP has two separate multimedia water treatment plants with clarifiers. One plant is older than the other plant.

1.1.2: Inflows to Outfall 002: Outfall 002 is the point of discharge for treated effluent from the Tailings Treatment Facility (TTF). Influent sources include water from the tailings, runoff into the TTF, and residual Acid Rock Drainage (ARD) seepage from the graphitic phyllite deposited on the north end of the TTF. Tailings are slurried from the mill via pipeline to the TTF. Runoff from the upper reaches of the East Fork of Slate Creek and direct precipitation over the surface add to the water in the TTF. A quantity of water equivalent to the net precipitation entering the TTF (precipitation plus runoff minus evaporation) is treated, blended with water from Upper Slate Lake, and discharged at Outfall 002. The TTF has multimedia water treatment plant with clarifier, carbon filtration, microfiltration, and reverse osmosis.

1.2 Effluent Limits and Monitoring—Outfall 001

1.2.1 The Permittee must limit and monitor discharges from Outfall 001 as specified in Table 2. Limits represent maximum effluent values, unless otherwise indicated. The Permittee must comply with effluent limits in the table at all times, unless otherwise indicated, regardless of monitoring frequency or reporting required by other provisions of this permit. Permit effluent limits are modified to reflect the change in flow from 3,500 gpd to 4,500 gpd.

Table 2: Effluent Limits and Monitoring Frequencies for Outfall 001

Parameter ^a	Maximum Daily Limit	Average Monthly Limit	Units	Minimum Sample Frequency	Sample Type
Aluminum	103	44	µg/L ^b	1/Week	24-hour Composite
Ammonia, Total	6	3	mg/L ^c as N	1/Week	24-hour Composite
Cadmium ^h	0.14	0.10	µg/L	1/Week	24-hour Composite
Chlorine	11.6	4.9	µg/L	1/day	24-hour Composite
Copper ^h	5.0	1.5	µg/L	1/Week	24-hour Composite
Iron	1,227	470	µg/L	1/Week	24-hour Composite
Lead ^h	1.5	0.73	µg/L	1/Week	24-hour Composite
Manganese	100	33	µg/L	1/Week	24-hour Composite
Mercury	0.01	0.007	µg/L	1/Week	24-hour Composite

Parameter ^a	Maximum Daily Limit	Average Monthly Limit	Units	Minimum Sample Frequency	Sample Type
Nickel ^h	---	---	µg/L	1/Week	24-hour Composite
Nitrate	---	---	µg/L	1/Week	24-hour Composite
Zinc ^h	45	15	µg/L	1/Week	24-hour Composite
Sulfate associated with Na & Mg	133	133	mg/L	1/Week	24-hour Composite
TDS	667	667	mg/L	1/Week	24-hour Composite
Turbidity, effluent	See Permit Part 1.2.4		NTU ^d	1/Week	24-hour Composite
Turbidity, background	---	---	NTU	1/Week	Grab Sample
Hardness	---	---	mg/L as CaCO ₃	1/Week	24-hour Composite
pH	See Permit Part 1.2.5		s.u. ^e	Continuous	Recorder
TSS	20	13	mg/L	1/Week	24-hour Composite
Flow	4,500	---	gpm ^f	Continuous	Recorder
Temperature	---	---	°C	1/Week	Grab Sample
Dissolved Oxygen	---	---	mg/L	1/Week	Grab Sample
Whole Effluent Toxicity (WET) ⁱ	1.6	1.1	TU _c ^g	1/Month	24-hour Composite

a. Parameters must be analyzed and reported as total recoverable.

b. Micrograms per liter

c. Milligrams per liter

d. Nephelometric turbidity units

e. Standard units

f. Gallons per minute

g. Chronic toxic units

h. Hardness-based limits using a hardness of 51 mg/L CaCO₃, the 15th percentile of background data.

i. See Permit Part 1.4 for WET testing requirements.

- 1.2.2 Discharge from Outfall 001 into Sherman Creek shall not cause a violation of Alaska Water Quality Standards (WQS) (18 AAC 70) unless allowed in this permit through exceptions to the standards or in a compliance schedule.
- 1.2.3 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.
- 1.2.4 The turbidity measured in NTUs must not be more than 5 NTUs above the natural condition. The background sample taken from at the designated receiving water location SH109, a point immediately upstream of the outfall, must be taken within an hour of the effluent sample.
- 1.2.5 During continuous pH monitoring required in Table 2, pH must not be less than 6.5 s.u. or greater than 8.5 s.u.
- 1.2.5.1 Excursions outside the range of 6.5 to 8.5 s.u. are permitted provided that the total time during which the pH values are outside 6.5 to 8.5 s.u. does not exceed 7 hours and 26 minutes in any calendar month, and no individual excursion lasts more than 60 minutes.

- 1.2.5.2 The Permittee shall monitor the total time outside the range of 6.5 to 8.5 s.u. for the month, recording the length and date of each excursion.
- 1.2.6 The Permittee must collect samples from the effluent stream after the last treatment unit prior to discharge into the receiving water.
- 1.2.7 For all effluent monitoring, the permittee must use a sufficiently sensitive Environmental Protection Agency (EPA) approved test method that quantifies the pollutants to a level lower than applicable limits or water quality standards or use the most sensitive test method available, per Title 40 Code of Federal Regulations (CFR) § 136 (Guidelines Establishing Test Procedures for the Analysis of Pollutants), adopted by reference at 18 AAC 83.010(f).
- 1.2.8 For purposes of reporting on the Discharge Monitoring Report (DMR) for this permit only, for a single sample, if a value is less than the Method Detection Level (MDL), the Permittee must report “less than {numeric value of the MDL}” and if a value is less than the minimum level of quantification (ML), the Permittee must report “less than {numeric value of the ML}.” For purposes of calculating monthly averages, zero may be assigned for values less than the MDL, the {numeric value of the MDL} may be assigned for values between the MDL and the ML. If the average value is less than the MDL, the Permittee must report “less than {numeric value of the MDL}” and if the average value is less than the ML, the Permittee must report “less than {numeric value of the ML}.” If a value is greater than the ML, the Permittee must report and use the actual value.

1.3 Effluent Limits and Monitoring—Outfall 002

- 1.3.1 The Permittee must limit and monitor discharges from Outfall 002 as specified in Table 3. Limits represent maximum effluent limits unless otherwise indicated. The Permittee must comply with effluent limits in the table at all times, unless otherwise indicated, regardless of monitoring frequency or reporting required by other provisions of this permit.

Table 3: Effluent Limits and Monitoring Frequencies for Outfall 002

Parameter ^a	Maximum Daily Limit	Average Monthly Limit	Units	Minimum Sample Frequency	Sample Type
Aluminum	160	57	µg/L	1/Week	24-hour Composite
Ammonia, Total	---	---	mg/L as N	1/Week	24-hour Composite
Cadmium ^d	0.36	0.12	µg/L	1/Week	24-hour Composite
Chlorine ^c	19	11	µg/L	Continuous	Recorder
Copper ^d	10.5	5.6	µg/L	1/Week	24-hour Composite
Iron	1,840	650	µg/L	1/Week	24-hour Composite
Lead ^d	3.6	1.8	µg/L	1/Week	24-hour Composite
Manganese	145	50	µg/L	1/Week	24-hour Composite
Mercury	0.02	0.01	µg/L	1/Week	24-hour Composite
Nickel ^d	---	---	µg/L	1/Week	24-hour Composite
Nitrate	---	---	µg/L	1/Week	24-hour Composite
Selenium	---	---	µg/L	1/Week	24-hour Composite
Silver ^d	---	---	µg/L	1/Week	24-hour Composite
Zinc ^d	93	32	µg/L	1/Week	24-hour Composite
Sulfate	250	250	mg/L	1/Week	24-hour Composite
TDS	500	500	mg/L	1/Week	24-hour Composite

Parameter ^a	Maximum Daily Limit	Average Monthly Limit	Units	Minimum Sample Frequency	Sample Type
Turbidity, effluent	See Permit Part 1.2.4		NTU	1/Week	24-hour Composite
Turbidity, background	---	---	NTU	1/Week	Grab Sample
Hardness	---	---	mg/L as CaCO ₃	1/Week	24-hour Composite
pH	See Permit Part 1.2.5		s.u.	Continuous	Recorder
TSS	30	20	mg/L	1/Week	24-hour Composite
Flow, average ^f	1,500	---	gpm ^b	Continuous	Recorder
Temperature	---	---	°C	1/Week	Grab Sample
Dissolved Oxygen	---	---	mg/L	1/Week	Grab Sample
Whole Effluent Toxicity (WET) ^e	1.6	1.1	TU _c	1/Month	24-hour Composite

a. Parameters must be analyzed and reported as total recoverable.

b. Gallons per minute

c. Limits and Monitoring for chlorine at Outfall 002 is not applicable until the installation of the breakpoint chlorination system is installed and approved for operation by the Department.

d. Hardness-based limits using a hardness of 74 mg/L CaCO₃, the 15th percentile of background data.

e. See Permit Part 1.4 for WET testing requirements.

f. Maximum daily flow is the average of instantaneous flow measurements collected during the calendar day of record.

- 1.3.2 Discharge from Outfall 002 into the East Fork Slate Creek shall not cause a violation of WQS (18 AAC 70) unless allowed in this permit through exceptions to the standards or in a compliance schedule.
- 1.3.3 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.
- 1.3.4 The turbidity measured in NTUs must not be more than 5 NTUs above the natural condition. The background sample taken from the designated receiving water location MLA, a point immediately upstream of the outfall, must be taken within an hour of the effluent sample.
- 1.3.5 During continuous pH monitoring required in Table 3, pH must not be less than 6.5 s.u. or greater than 8.5 s.u.
- 1.3.5.1 Excursions outside the range of 6.5 to 8.5 s.u. are permitted provided that the total time during which the pH values are outside 6.5 to 8.5 s.u. does not exceed 7 hours and 26 minutes in any calendar month, and no individual excursion lasts more than 60 minutes.
- 1.3.5.2 The Permittee shall monitor the total time outside the range of 6.5 to 8.5 s.u. for the month, recording the length and date of each excursion.
- 1.3.5.3 The Permittee must collect effluent samples from the effluent stream after the last treatment unit prior to discharge into the receiving waters
- 1.3.6 For all effluent monitoring, the permittee must use a sufficiently sensitive EPA approved test method as specified in Permit Section 1.2.7.

- 1.3.7 For purposes of reporting on the (DMR for this permit only, for a single sample, if a value is less than the MDL, the Permittee must report “less than {numeric value of the MDL}” and if a value is less than the ML, the Permittee must report “less than {numeric value of the ML}.” For purposes of calculating monthly averages, zero may be assigned for values less than the MDL, the {numeric value of the MDL} may be assigned for values between the MDL and the ML. If the average value is less than the MDL, the Permittee must report “less than {numeric value of the MDL}” and if the average value is less than the ML, the Permittee must report “less than {numeric value of the ML}.” If a value is greater than the ML, the Permittee must report and use the actual value.

1.4 Whole Effluent Toxicity Testing Requirements

- 1.4.1 The Permittee must conduct annual chronic whole effluent toxicity (WET) tests on effluent samples from Outfalls 001 and 002. Testing must be conducted in accordance with Permit Parts 1.4.2 through 1.4.7.
- 1.4.2 Chronic toxicity testing must be conducted on a 24-hour composite sample of the effluent. Additionally, a split of each sample collected must be analyzed for the chemical and physical parameters required in Permit Parts 1.2 and 1.3. Samples for toxicity testing should be of adequate size to accommodate the split sample. When the timing of sample collection coincides with that of the sampling required in Permit Part 1.2 or 1.3, analysis of the split sample will fulfill the requirements of these parts as well.
- 1.4.3 Chronic Test Species and Methods
- 1.4.3.1 Chronic tests must be conducted in accordance with Table 1 and Table 2 for Outfall 001 and Outfall 002, respectively. The effluent collected for toxicity testing must be collected within a reasonable time period as the receiving water monitoring that ensures comparative results (see Permit Part 1.5).
- 1.4.3.2 Tests shall be conducted using fathead minnows, *Pimephales promelas*.
- 1.4.3.3 The presence of chronic toxicity must be determined as specified in *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*, Fourth Edition (EPA/821-R-02-013, October 2002).
- 1.4.3.4 Results must be reported in chronic toxicity units (TU_c), where $TU_c = 100/IC_{25}$. See Appendix C for a definition of inhibition concentration 25% (IC_{25})
- 1.4.4 Quality Assurance
- 1.4.4.1 Toxicity testing on each organism must include the following series of five test dilutions (100%, 50%, 25%, 12.5%, and 6.25%) and a control.
- 1.4.4.2 All quality assurance criteria and statistical analyses used for chronic tests and reference toxicant tests must be according to *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms Fourth Edition* (EPA/821-R-02-013, October 2002). If logistical problems beyond the control of the Permittee prevent the timely delivery of a sample to the laboratory, the Permittee may collect only two samples for WET testing and the acceptable sample holding times can be extended from 36 to 48 hours.

1.4.4.3 In addition to those quality assurance measures specified in the methodology, the following quality assurance procedures must be followed:

- 1.4.4.3.1 If organisms are not cultured in-house, concurrent testing with reference toxicants must be conducted. If organisms are cultured in-house, quarterly reference toxicant testing is sufficient. Reference toxicant tests must be conducted using the same test conditions as the effluent toxicity tests.
- 1.4.4.3.2 If either of the reference toxicant tests or the effluent tests does not meet all test acceptability criteria, as specified in the test methods manual, the Permittee must re-sample and re-test within 14 days of receipt of the test results.
- 1.4.4.3.3 Control and dilution water must be receiving water or lab water, as appropriate, as described in the manual. If the dilution water used is different from the culture water, a second control using culture water must also be used. Receiving water may be used as control and dilution water upon notification and approval from DEC. In no case shall water that has not met test acceptability criteria be used for either dilution or control.

1.4.5 Accelerated Testing

- 1.4.5.1 If the Permittee demonstrates through an evaluation of facility operations that the cause of the exceedance is known and corrective actions have been implemented, only one accelerated test is necessary and the Permittee would return to normal WET testing frequency. If toxicity exceeding the numeric limit is detected in this test, then the TRE requirements in Permit Part 1.4.6 shall apply, or
- 1.4.5.2 If chronic toxicity is detected above the limits specified in Table 2 or Table 3 and no initial investigation is conducted or no cause is found then the Permittee must conduct four more biweekly tests over an eight week period. This accelerated testing must be initiated within two weeks of receipt of the test results that indicate an exceedance.
- 1.4.5.3 The Permittee must notify DEC of the exceedance in writing within two weeks of receipt of the test results. The notification must include the following information:
 - 1.4.5.3.1 A status report on any actions required by the permit, with a schedule for actions not yet completed.
 - 1.4.5.3.2 A description of any additional actions the Permittee has taken or will take to investigate and correct the cause(s) of the toxicity.
 - 1.4.5.3.3 Where no actions have been taken, a discussion of the reasons for not taking action.
- 1.4.5.4 If none of the four accelerated tests exceed the permit limit, the Permittee may return to the normal testing frequency. If any of the four tests exceed the limit, then the TRE requirements in Permit Part 1.4.6 shall apply.

1.4.6 Toxicity Reduction Evaluation (TRE) and Toxicity Identification Evaluation (TIE)

- 1.4.6.1 If chronic toxicity limits are exceeded during accelerated testing under Permit Part 1.4.6, the Permittee must initiate a toxicity reduction evaluation (TRE) in accordance with *Generalized Methodology for Conducting Industrial Toxicity Reduction Evaluations*

(EPA/600/2-88/070) within two weeks of the receipt of the test results showing an exceedance. At a minimum, the TRE must include:

- 1.4.6.1.1 Further actions to investigate and identify the cause of toxicity;
 - 1.4.6.1.2 Actions the Permittee will take to mitigate the impact of the discharge and to prevent the recurrence of toxicity; and
 - 1.4.6.1.3 A schedule for these actions.
- 1.4.6.2 If a TRE is initiated prior to completion of the accelerated testing, the accelerated testing schedule may be terminated, or used as necessary in performing the TRE. The Permittee may initiate a Toxicity Identification Evaluation (TIE) as part of the TRE process. Any TIE must be performed in accordance with EPA guidance manuals, *Toxicity Identification Evaluation; Characterization of Chronically Toxic Effluents, Phase I* (EPA/600/6-91/005F), *Methods for Aquatic Toxicity Identification Evaluations, Phase II: Toxicity Identification Procedures for Samples Exhibiting Acute and Chronic Toxicity* (EPA/600/R-92/080), and *Methods for Aquatic Toxicity Identification Evaluations, Phase III: Toxicity Confirmation Procedures for Samples Exhibiting Acute and Chronic Toxicity* (EPA-600/R-92/081).

1.4.7 Reporting

- 1.4.7.1 The Permittee shall submit the result of the toxicity test in TU_c with the DMR for the month in which the results are received. The full toxicity test results will be included in the Annual Report due March 1st of the following year, as required in Permit Part 1.6.
- 1.4.7.2 The Permittee must submit the results of any accelerated testing, under Permit Part 1.4.5, within two weeks of receipt of the results from the lab. The full report must be submitted within four weeks of receipt of the results from the lab. If an initial investigation indicates the source of toxicity and accelerated testing is unnecessary, the result of the investigation must be submitted with the DMR for the month following completion of the investigation.
- 1.4.7.3 The report of toxicity test results must include all relevant information outlined in Section 10, Report Preparation of *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition* (EPA/821-R-02-013, October 2002). In addition to toxicity test results, the Permittee must report: dates of sample collection and initiation of each test; outfall flow rate at the time of sample collection; the results of the monitoring required in Permit Part 1.2; and an explanation of logistical problems described in Permit Part 1.4.4.2, if encountered.

1.5 Receiving Water Monitoring

- 1.5.1 The Permittee must conduct the following receiving water monitoring program in the vicinity of the mine.
 - 1.5.1.1 Water Column Monitoring
 - 1.5.1.1.1 The Permittee must conduct monthly monitoring at the following stations (see Figure 2 and Figure 3 for maps showing sampling locations).
 - 1.5.1.1.1.1 Sherman Creek at stations SH109, SH113 and SH105;

1.5.1.1.1.2 Slate Creek at stations MLA, Site 5, SLB and SLC;

1.5.1.1.1.3 Johnson Creek at stations JS2 and JS5; and

1.5.1.1.1.4 Ophir Creek at stations SH111 and SH103.

1.5.1.2 All receiving water samples must be grab samples.

1.5.1.3 The Permittee must monitor receiving water from the stations specified in Permit Part 1.5.1.1 for the parameters and sampling frequency specified in Table 4. Analytical methods must use sufficiently sensitive EPA approved test methods as specified in Permit Sections 1.2.7. The Permittee may request different MLs. The request must be in writing and must be approved by DEC prior to implementation.

Table 4: Receiving Water Monitoring Parameters

Parameter	Units	Minimum Sample Frequency	Sample Type
Aluminum ^a	µg/L	1/Month	Grab
Ammonia, Total ^a	µg/L	1/Month	Grab
Cadmium ^a	µg/L	1/Month	Grab
Chlorine	µg/L	1/Month	Grab
Copper ^a	µg/L	1/Month	Grab
Iron ^a	µg/L	1/Month	Grab
Lead ^a	µg/L	1/Month	Grab
Manganese ^a	µg/L	1/Month	Grab
Mercury ^a	µg/L	1/Month	Grab
Nickel ^a	µg/L	1/Month	Grab
Selenium ^a	µg/L	1/Month	Grab
Zinc ^a	µg/L	1/Month	Grab
Sulfate ^b	mg/L	1/Month	Grab
Chloride	µg/L	1/Month	Grab
Turbidity	NTU	1/Month	Grab
TDS	mg/L	1/Month	Grab
TSS	mg/L	1/Month	Grab
pH	s.u.	1/Month	Grab
Dissolved Oxygen	mg/L	1/Month	Grab
Temperature	°C	1/Month	Grab
Nitrate, as N	mg/L	1/Month	Grab
Conductivity	µS/cm ^c	1/Month	Grab
Hardness, as CaCO ₃	mg/L	1/Month	Grab
Color	Color units	1/Month	Grab

Notes:

a. Must be measured as total or total recoverable. Receiving water metals analysis shall be dissolved unless otherwise specified.

b. Sulfates shall be total sulfates except for Sherman Creek which shall be sulfates associated with magnesium and sodium.

c. Microsiemens per centimeter

- 1.5.2 Quality assurance/quality control (QA/QC) plans for all monitoring must be documented in the quality assurance project plan (QAPP) required under Permit Part 2.1.
- 1.5.3 All results shall be included in the Annual Report (see Permit Part 1.6.) At a minimum, the report must include the following:
- 1.5.3.1 Dates of sample collection and analyses.
- 1.5.3.2 Results of sample analyses
- 1.5.3.3 Relevant QA/QC information.
- 1.5.4 Sediment Monitoring
- 1.5.4.1 Samples shall be taken at Lower Sherman Creek, the inlet creek to Upper Slate Lake, East Fork Slate Creek, Lower Slate Creek, and Lower Johnson Creek. Sampling shall be conducted annually in July prior to spawning and the results included in the Annual Report.

1.5.4.2 The Permittee shall monitor the parameters in Table 5 and shall achieve the listed detection levels for each sediment sample.

Table 5: Sediment Monitoring Parameters and Analytical Methods

Parameter	Units	Preparation Method	Analysis Method	Sediment MDL ^a
Aluminum	mg/Kg	PSEP ^b	—	—
Arsenic	mg/Kg	PSEP	GFAA ^c	2.5
Cadmium	mg/Kg	PSEP	GFAA	0.3
Chromium	mg/Kg	PSEP	—	—
Copper	mg/Kg	PSEP	ICP ^d	15.0
Lead	mg/Kg	PSEP	ICP	0.5
Mercury	mg/Kg	7471 ^e	7471 ^e	0.02
Nickel	mg/Kg	PSEP	ICP	2.5
Selenium	mg/Kg	PSEP	—	—
Silver	mg/Kg	PSEP	GFAA	0.2
Zinc	mg/Kg	PSEP	ICP	15.0
Total Solids	%	—	PSEP, pg 17	0.1
Total Volatile Solids	%	—	PSEP, pg 20	0.1
Total Organic Carbon	%	—	PSEP ^f , pg 23	0.1
Total Sulfides	mg/Kg	—	PSEP, pg 32	1
Grain Size	—	—	Modified ASTM with Hydrometer	NA

a. Dry weight basis

b. Recommended Protocols for Measuring Selected Environmental Variables, in Puget Sound Estuary Program, EPA 910/9-86-157, as updated by Washington Department of Ecology; Subsection: Metals in Puget Sound Water, Sediment, and Tissue Samples

c. Graphite Furnace Atomic Absorption Spectrometry, SW-846, Test Methods for Evaluating Solid Waste Physical/Chemical Methods, EPA 1986

d. Inductively Coupled Plasma Emission Spectrometry, SW-846, Test Methods for Evaluating Solid Waste Physical/Chemical Methods, EPA 1986

e. Mercury Digestion and Cold Vapor Atomic Absorption Spectrometry, SW-846, Test Methods for Evaluating Solid Waste Physical/Chemical Methods, EPA 1986. The Permittee shall sample the receiving water hardness downstream of the discharge.

f. Recommended Methods for Measuring TOC in Sediments, Kathryn Bragdon-Cook Clarification Paper, Puget Sound Dredged Disposal Authority Annual Review, May, 1993.

1.5.4.3 The Permittee shall collect sufficient sediment from each monitoring station to conduct all chemical tests identified herein. Sediment samples shall consist of the upper two (2) centimeters (cm) of sediment. The maximum depth of sample penetration shall be four (4) centimeters.

1.5.4.4 Sediment monitoring stations shall be located in areas where deposition is likely to occur (i.e. pools or moderately deep, slow-moving water with the surface not turbulent to the extent of being broken) nearest to locations in Table 6.

1.5.4.5 Sediment monitoring results shall be reported in the Annual Report and must include, at a minimum: dates of sample collection and analyses, locations of samples collected, results of the monitoring required in Permit Part 1.5.4.2 and relevant QA/QC information.

1.5.5 Aquatic Resource Monitoring

1.5.5.1 The Permittee shall monitor aquatic resources, as described in Part 1.5.5.2, and shall report results, including relevant QA/QC data, in the Annual Report.

1.5.5.2 Benthic Invertebrates

Benthic invertebrates shall be monitored in the inlet creek to Upper Slate Lake, East Fork Slate Creek, Lower Slate Creek, West Fork Slate Creek, Lower Sherman Creek (2 sites) and Upper Johnson Creek at the established sites for parameters in Table 6.

1.5.5.2.1 Each reach shall be delineated for all possible sampling sites (those areas containing stream substrate with particles less than 20 cm along the long axis). Opportunistic sampling shall occur until a total of 6 samples are obtained for each reach.

1.5.5.2.2 Samples shall be collected using a 0.093 m² Surber sampler equipped with a 300-micron mesh collection net. Collected samples shall be placed in labeled plastic containers and preserved with 70 percent ethyl alcohol. Samples shall be enumerated and identified to the lowest practicable level as follows: insects of the orders *Ephemeroptera*, *Plecoptera*, *Trichoptera*, and *Diptera* to genus, except nonbiting midges to family *Chironomidae*, and all others to class or order. For each site the following shall be calculated: density per unit area, Shannon Diversity and Evenness indices, proportion of *ephemeropterans*, *plecopterans*, and *trichopterans* (EPT), and number of EPT taxa.

1.5.5.2.3 The Permittee shall sample annually between late March and late May, after spring breakup (ice out) and before peak snowmelt.

1.5.5.3 Anadromous Fish Monitoring

1.5.5.3.1 Quality of Spawning Substrate

The quality of spawning substrate used by pink salmon shall be monitored annually in Lower Slate Creek to detect changes in composition. Sediment samples shall be collected in July prior to spawning activity. Four replicate samples shall be collected from two locations using a McNeil-type sampler at established locations for parameters in Table 6. The geometric mean particle size will be calculated for each sample.

1.5.5.4 Periphyton Biomass and Community Composition

The Permittee shall annually monitor periphyton biomass and composition at established sites Table 6. For each reach, 10 periphyton samples from stream benthos shall be collected using methods by Barbour et al (1999) or similar during the period late-June through early-August at low stream flow and not within three weeks after peak snowmelt. Estimate periphyton biomass densities and proportions of mean chlorophylls a, b, and c concentrations shall be reported for each reach sampled. An analysis of stream flow three weeks prior to sampling shall also be included using a local stream gage data. This information shall be included in the Annual Report.

1.5.6 Aquatic resource data collection is for data analysis purposes to assess the overall health of the ecosystems. This data is used to determine whether any changes are necessary during the next permit reissuance, and may be modified in the next permit if necessary.

Table 6: Sediment and Biomonitoring Sample Sites

Location	Latitude	Longitude	Sample Type
Lower Slate Creek-1	58.7905	-135.0345	Periphyton/Benthic Invertebrates
Lower Slate Creek-1	58.7905	-135.0345	Spawning Substrate
Lower Slate Creek-2	58.7920	-135.0360	Spawning Substrate
Lower Slate Creek-1	58.7905	-135.0345	Sediment metals
West Fork Slate Creek	58.7993	-135.0457	Periphyton/Benthic Invertebrates
East Fork Slate Creek	58.8045	-135.0381	Sediment metals
East Fork Slate Creek	58.8045	-135.0381	Periphyton/Benthic Invertebrates
Upper Slate Creek	58.8189	-135.0416	Sediment metals
Upper Slate Creek	58.8189	-135.0416	Periphyton/Benthic Invertebrates
Lower Johnson Creek	58.8235	-135.0024	Sediment metals
Upper Johnson Creek	58.8407	-135.0450	Benthic Invertebrates
Lower Sherman Creek-1	58.8687	-135.1413	Periphyton/Benthic Invertebrates
Lower Sherman Creek-2	58.8674	-135.1381	Periphyton/Benthic Invertebrates
Lower Sherman Creek-1	58.8687	-135.1413	Sediment metals
Coordinates in WGS84 datum			

1.6 Annual Water Quality Monitoring Summary

Annual discharge and receiving water quality monitoring results must be summarized in an Annual Water Quality Monitoring Summary (Annual Report) and submitted by March 1st of the next year. The report must include a presentation of the analytical results and an evaluation of the results. The evaluation must include an electronic spreadsheet containing all historical data for water quality, a graphical presentation of the data at each monitoring station, and a comparison of monitoring results for each station over time. The Annual Report must be certified and signed in accordance with Appendix A, Part 1.12, and it may reference the monthly reports for QA/QC information.

2.0 SPECIAL CONDITIONS

2.1 Electronic Reporting (E-Reporting) Rule

2.1.1 The Permittee is responsible for electronically submitting DMRs and other reports in accordance with 40 CFR §127. The start dates for e-reporting are provided in 40 CFR §127.16. DEC implements the E-Reporting Rule. The permittee will be further notified by DEC in the future about how to implement the conditions in 40 CFR §127.

2.2 Quality Assurance Project Plan

2.2.1 The Permittee must develop a quality assurance project plan (QAPP) for all monitoring required by this permit. Within 60 days of the effective date of this permit, the Permittee must update the QAPP and submit written notification to DEC that the updated QAPP has been implemented. An existing QAPP may be modified for submittal under this section provided that Permit Parts 2.2.2 through 2.2.5 are satisfied.

2.2.2 The QAPP must be designed to assist in planning for the collection and analysis of effluent and receiving water samples in support of the permit and to help explain data anomalies whenever they occur.

- 2.2.3 Throughout all sample collection and analysis activities, the Permittee must use DEC-approved QA/QC and chain-of-custody procedures, as described in the *Requirements for Quality Assurance Project Plans* (EPA/QA/R-5) and *Guidance for Quality Assurance Project Plans* (EPA/QA/G-5). The QAPP must be prepared in the format which is specified in these documents.
- 2.2.4 The Permittee must amend the QAPP whenever there is a modification in sample collection, sample analysis, or other procedure addressed by the QAPP.
- 2.2.5 Copies of the QAPP must be kept on site and made available to DEC upon request.

2.3 Best Management Practices Plan

- 2.3.1 Purpose. Through implementation of the BMP Plan, the Permittee must prevent or minimize the generation and the potential for release of pollutants from the facility to the lands and waters of the U.S. through normal and ancillary activities.
- 2.3.2 Development and Implementation Schedule. The Permittee must develop and implement a BMP Plan which achieves the objectives and the specific requirements listed below. The Permittee must submit written notice to DEC that the plan has been developed and implemented within 60 days of the effective date of the permit. Any existing BMP Plans may be modified for compliance with this Part. The Permittee must implement provisions of the plan as conditions of this permit within 60 days of the effective date of this permit.
- 2.3.3 Objectives. The Permittee must develop and amend the BMP Plan consistent with the following objectives for the control of pollutants.
 - 2.3.3.1 The number and quantity of pollutants and the toxicity of effluent generated, discharged, or potentially discharged at the facility must be minimized by the Permittee to the extent feasible by managing each waste stream in the most appropriate manner.
 - 2.3.3.2 Under the BMP Plan and especially within any standard operating procedures included in the BMP Plan, the Permittee must ensure proper operation and maintenance of water management and wastewater treatment systems. BMP Plan elements must be developed in accordance with good engineering practices.
 - 2.3.3.3 Each facility component or system must be examined for its waste minimization opportunities and its potential for causing a release of significant amounts of pollutants to lands and waters of the U.S. due to equipment failure, improper operation, natural phenomena such as rain or snowfall, etc. The examination must include all normal operations and ancillary activities including material storage areas, storm water, in-plant transfer, material handling and process handling areas, loading or unloading operations, spillage or leaks, sludge and waste disposal, or drainage from raw material storage.
- 2.3.4 Elements of the BMP Plan. The BMP Plan must be consistent with the objectives above and the general guidance contained in *Guidance Manual for Developing Best Management Practices* (EPA 833-B-93-004, October 1993) and *Storm Water Management for Industrial Activities, Developing Pollution Prevention Plans and Best Management Practices* (EPA 832-R-92-006) or any subsequent revision to these guidance documents. The BMP Plan must include, at a minimum, the following items:
 - 2.3.4.1.1 Statement of BMP Policy. The BMP Plan must include a statement of management commitment to provide the necessary financial, staff, equipment,

and training resources to develop and implement the BMP Plan on a continuing basis.

- 2.3.4.1.2 The BMP Plan must establish a BMP Committee responsible for developing, implementing, and maintaining the BMP Plan. Specify the structure, functions, and procedures of the BMP Committee.
 - 2.3.4.1.3 Description of potential pollutant sources.
 - 2.3.4.1.4 Risk identification and assessment.
 - 2.3.4.1.5 Standard operating procedures to achieve the objectives and specific best management practices (see below).
 - 2.3.4.1.6 Reporting of BMP incidents. The reports must include a description of the circumstances leading to the incident, corrective actions taken, and recommended changes to operating and maintenance practices to prevent recurrence.
 - 2.3.4.1.7 Materials compatibility.
 - 2.3.4.1.8 Good housekeeping.
 - 2.3.4.1.9 Inspections.
 - 2.3.4.1.10 Preventative maintenance and repair.
 - 2.3.4.1.11 Security.
 - 2.3.4.1.12 Employee training.
 - 2.3.4.1.13 Record keeping and reporting.
 - 2.3.4.1.14 Prior evaluation of any planned modifications to the facility to ensure that the requirements of the BMP Plan are considered as part of the modifications.
 - 2.3.4.1.15 Final constructed site plans, drawings, and maps (including detailed storm water outfall/culvert configuration).
- 2.3.4.2 Specific Best Management Practices. The BMP Plan must establish specific BMPs or other measures to achieve the objectives under Permit Part 2.3.3 ensuring that solids, sludge, or other pollutants removed in the course of treatment or control of water and wastewaters are disposed in a manner preventing any pollutant from such materials from entering waters of the U.S.

2.3.5 BMP Plan Annual Review and Certification.

2.3.5.1 The BMP Plan must be reviewed and updated annually to assure that the objectives of Permit Part 2.3.3 are being satisfied.

2.3.5.2 BMP Plan Annual Certification. The Permittee must prepare a certified statement that reviews (inspections and evaluations) required by Permit Part 2.3.4 have been completed and that the BMP Plan fulfills the requirements set forth in the permit. This statement must be signed in accordance with Appendix A, Part 1.12 and submitted to DEC by January 31st of the next year.

2.3.6 Documentation. The Permittee must maintain a copy of the BMP Plan at the facility and make it available to DEC upon request.

2.3.7 BMP Plan Modification

2.3.7.1 The Permittee must amend the BMP Plan whenever a change in the facility or in the operation of the facility materially increases the generation of pollutants or their release or potential release to receiving waters.

2.3.7.2 The Permittee must amend the BMP Plan whenever it is found to be ineffective in achieving the general objective of preventing and minimizing the generation and the potential for the release of pollutants from the facility to the waters of the U.S.

2.3.7.3 Any changes to the BMP Plan must be consistent with the objectives and specific requirements of Permit Part 2.3. All changes in the BMP Plan must be reported to DEC with the annual certification required under Permit Part 2.3.5.

2.4 Compliance Schedule for Outfall 001

2.4.1 Discharges to Sherman Creek from Outfall 001 have resulted in periodic exceedances of the water quality standards for residues [18 AAC 70.020(b)(8)] and toxic and deleterious substances [18 AAC 70.020(b)(11).]

2.4.2 In order to ensure consistent compliance with WQS, the permittee shall comply with the following schedule:

Table 7: Compliance Schedule for Outfall 001

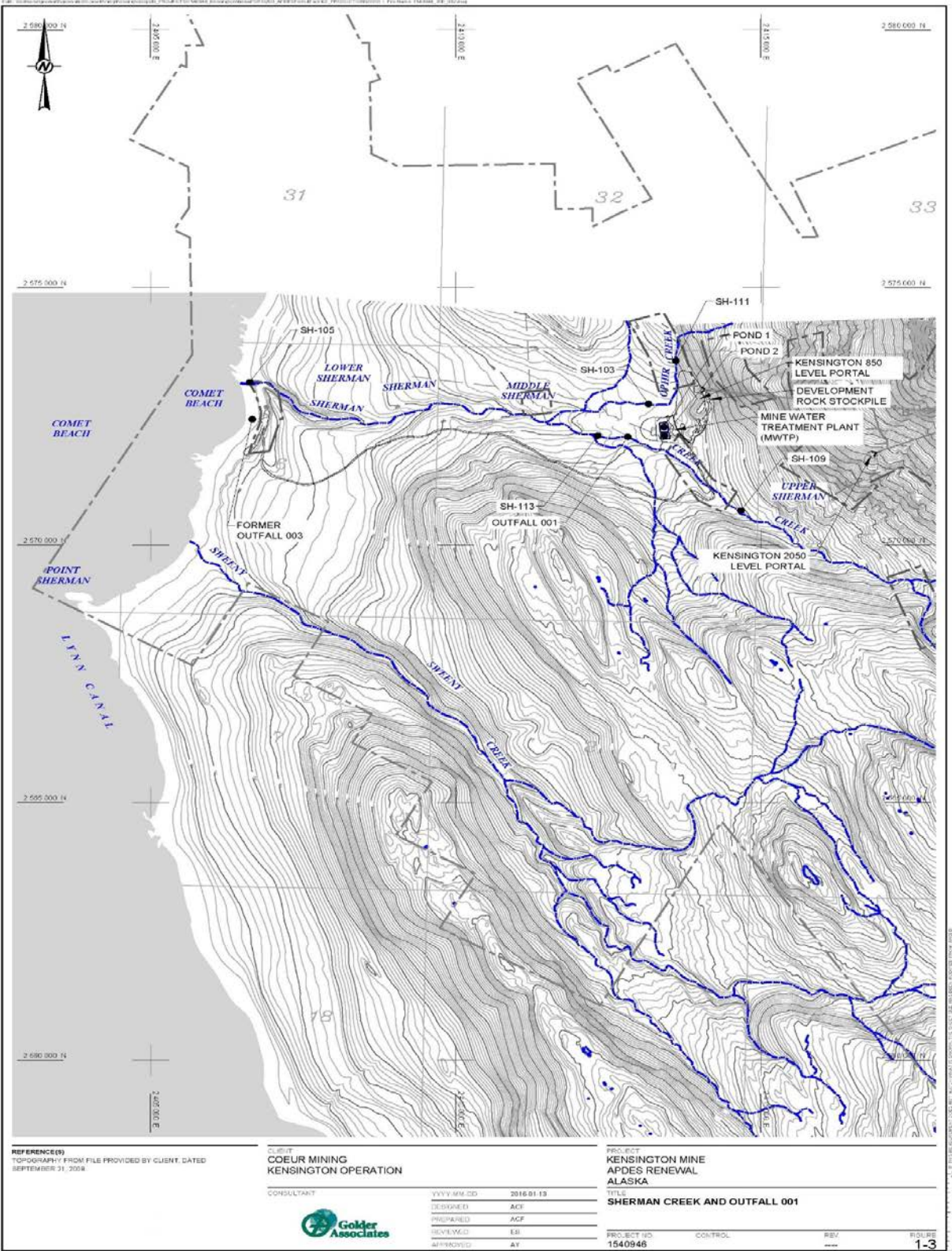
Action Number	Action	Completion Date (months after permit effective date)
1	Summary of Work Completed to Date	1 month
2	Prepare a Monitoring Plan	3 months
3	Implement the Monitoring Program	6 months
4	Conduct water treatment modification alternative analysis	10 months
5	Conduct water treatment modification bench scale testing (includes toxicity testing)	14 months
6	Preliminary water treatment modification report	17 months
7	Conduct temporary full-scale water treatment modification testing	22 months
8	Review monitoring data and evaluate results	24 months
9	Final water treatment modification report	26 months
10	Construction of water treatment modification system	31 months
11	Full implementation of system	36 months

- 2.4.3 The monitoring plan described in Table 7 must include a plan for both visual monitoring and chemical monitoring designed to detect and characterize the residue and residue formation. The visual monitoring program must be designed to detect potential sources of residue material in the influent and the formation of residue in the receiving water. The chemical monitoring program should be developed to capture chemical change to the influent from drilling and blasting events occurring in the mine. The monitoring plan must define monitoring station(s), timeframe after a specified event and frequency and the chemical parameters that will be collected to characterize potential water quality effects of the drilling and blasting event.
- 2.4.4 All plans and treatment system modification under this Compliance Schedule must be approved by the Department in writing prior to implementation or construction.

Figure 1: Kensington Mine Location Map



Figure 2: Sherman Creek - Outfall 001 Location Map



REFERENCE(S)
 TOPOGRAPHY FROM FILE PROVIDED BY CLIENT, DATED
 SEPTEMBER 21, 2008

CLIENT
 COEUR MINING
 KENSINGTON OPERATION

CONSULTANT	Golden Associates
DATE	2016.01.13
DESIGNED	ACF
PREPARED	ACF
REVIEWED	EB
APPROVED	AT

PROJECT
 KENSINGTON MINE
 APDES RENEWAL
 ALASKA
 TITLE
 SHERMAN CREEK AND OUTFALL 001

PROJECT NO	CONTROL	REV	DATE
1540946		---	1-3

Figure 3: East Fork Slate Creek – Outfall 002 Location Map

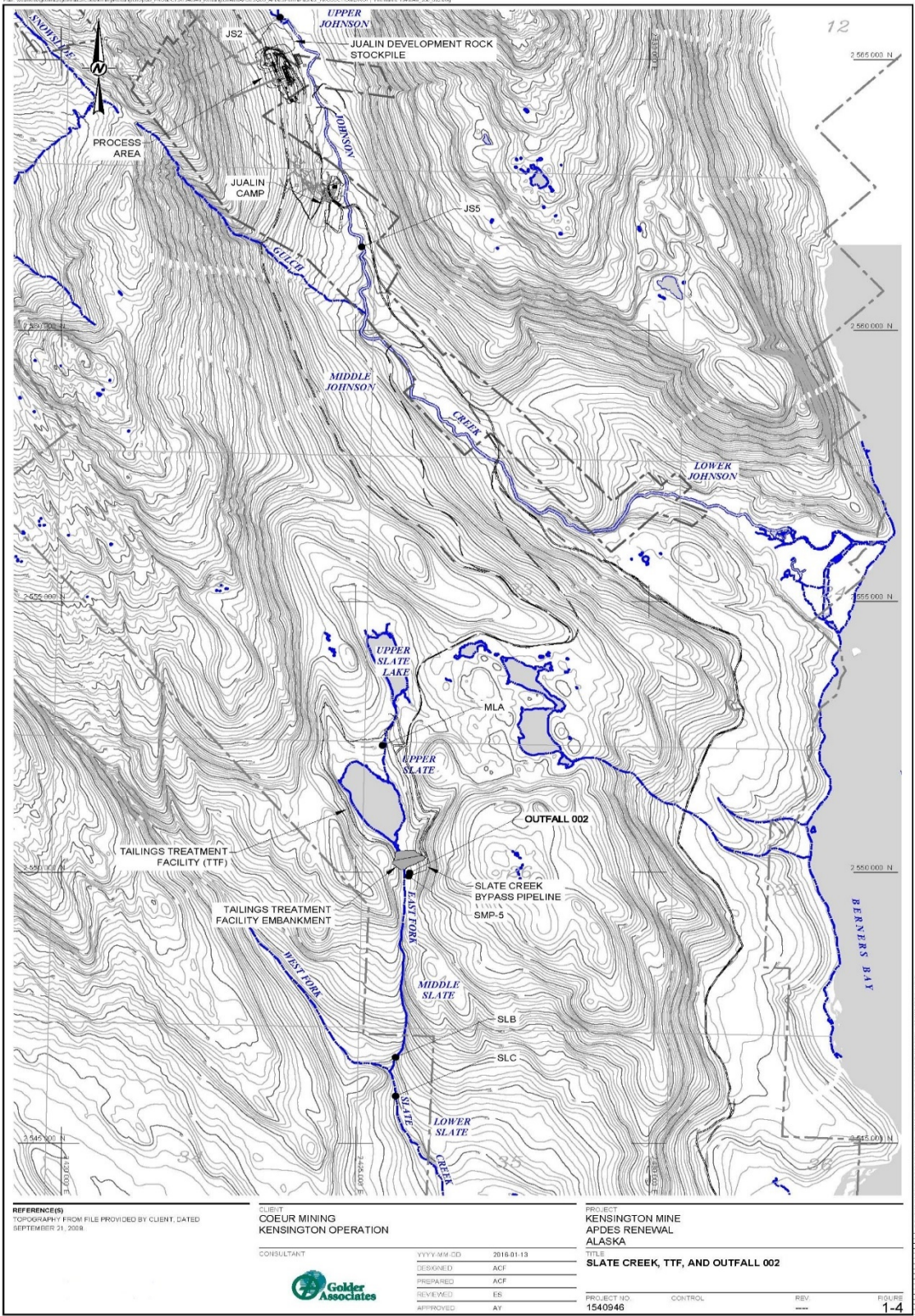
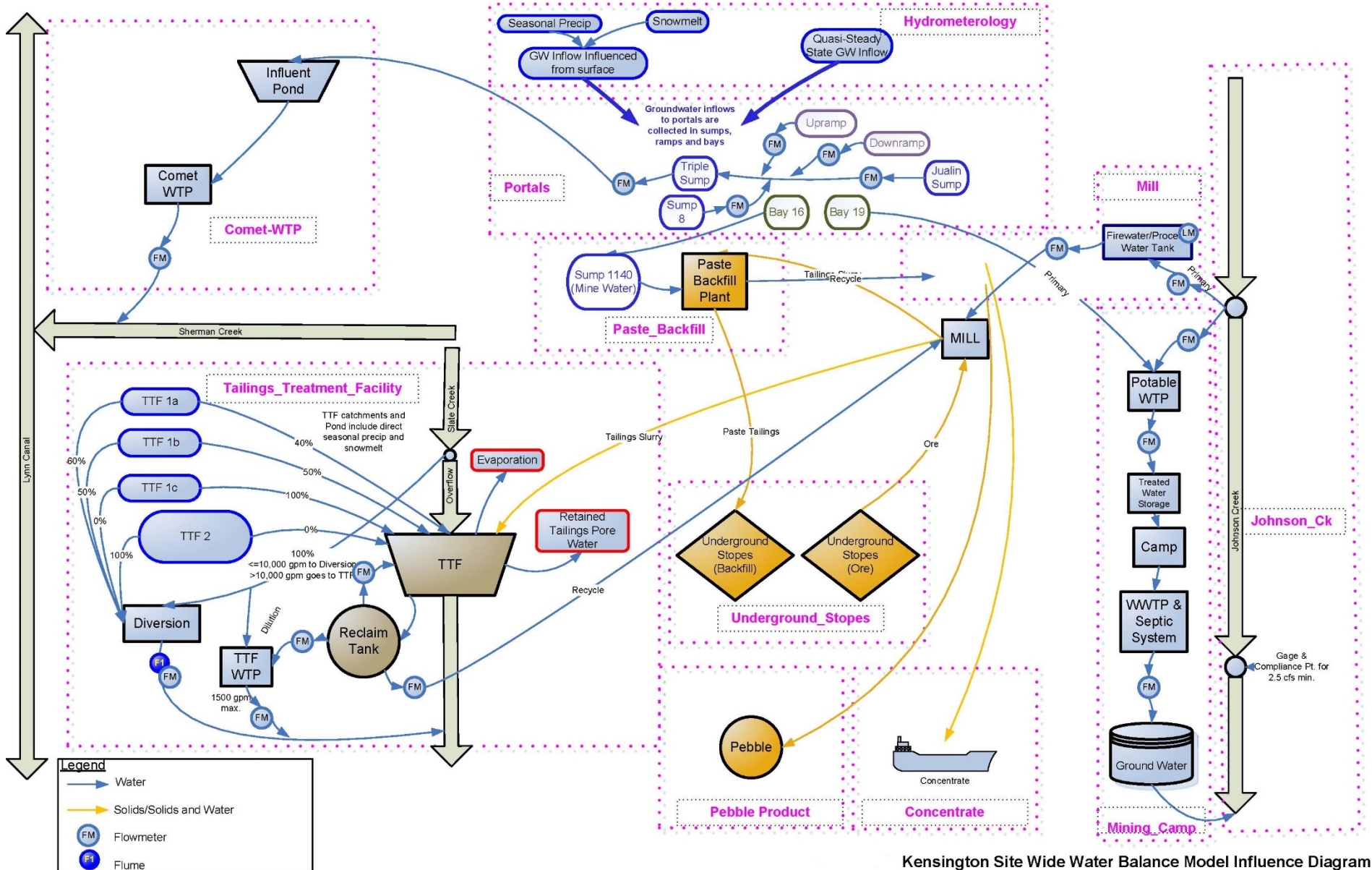


Figure 4: Water Balance Schematic Drawing



Kensington Site Wide Water Balance Model Influence Diagram