

Appendix B

Small Reservoir Water Quality Sampling Plan (Revised June 2015)

**RIO TINTO KENNECOTT
SMALL BINGHAM RESERVOIR
WATER QUALITY SAMPLING PLAN
(Revised June 2015)**

1.0 INTRODUCTION

The Small Reservoir is located 18 miles southwest of Salt Lake City in Salt Lake County, Utah on a tract of land within the northeast quarter of Section 17, Township 3 South, Range 2 West. It is situated immediately north of the Large Bingham Reservoir near the mouth of Bingham Canyon.

Water quality samples will be collected, handled, and analyzed in conformance with quality assurance guidelines described in the current Rio Tinto Kennecott (RTKC) Ground Water Characterization and Monitoring Plan (GWCMP).

2.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

The RTKC Manager, Environmental Operational Support will have overall responsibility for direction of the sampling and compliance program, quality control, notifications, and reporting.

RTKC Superintendent of South Area Water Services (SAWS) will be responsible for monitoring and recording daily flows reporting to the Small Reservoir leak detection sumps. The same personnel will also be responsible for maintaining the flow quantity recording equipment and ensuring that it is fully operational on a daily basis.

RTKC Sampling Technicians will have the responsibility of collecting all water quality samples required by the permit in accordance with this sampling plan.

RTKC Laboratory Manager will ensure all water quality samples are analyzed using the appropriate methods and within the specified holding times in accordance with this sampling plan.

3.0 WATER QUALITY SAMPLING LOCATIONS

3.1 Small Reservoir

Samples from the Small Reservoir water will be collected from a sample tap located on the pump access platform tapping into the line which routes effluent water pumped from the Small Reservoir.

3.2 Leak Collection Sump

The leak detection sump, located on the south side of the Small Reservoir, can be accessed by lifting the cover to the sump and climbing down the enclosed metal ladder. Before the sump is entered confined space entry procedures must be followed and a confined space entry permit completed.

At the bottom of the vertical access shaft, there are three chambers within the sump: 1) the lower leak detection sump (LLDS) located to the east; 2) the pressure relief sump (PRS) located to the west; and 3) the pump sump located to the south. As outlined in this plan, water quality samples will be collected from the LLDS and the PRS. The pump sump collects water from the two sumps; that water can then be pumped into the Small Reservoir.

4.0 ANALYTICAL PARAMETERS

All water quality samples will be analyzed for the field measurements (pH, specific conductance, and temperature), major ions (alkalinity, chloride, sulfate, potassium, sodium, magnesium, and calcium), trace metals (arsenic, barium, cadmium, chromium, copper, lead, mercury, selenium, silver, and zinc), and TDS. All samples will be analyzed using EPA approved methods as specified in Utah Regulation R317-6-6.3. The analytical methods, procedures, target detection limits, sample preservation, holding times and sample containers used will be specified for these constituents in the most recently Department of Water Quality (DWQ) approved Ground Water Characterization and Monitoring Plan.

5.0 SCHEDULE FOR WATER QUALITY MONITORING, SAMPLING, AND REPORTING

5.1 Small Reservoir

Water quality samples from the Small Reservoir (SRP850) will be collected semi-annually. Water quality sampling results will be submitted to the Director of the Utah Division of Water Quality in the form of semi-annual reports of the corresponding semi-annual sampling period.

5.2 Leak Detection Sump

Flow quantities will be recorded daily from the Lower Leak Detection Layer and the Pressure Relief Layer. The volume of liquid in the Lower Leak Detection Sump (LLDS) and the Pressure Relief Sump (PRS) will also be recorded daily. Daily flow data of each of the sumps will be submitted to the Director in the semi-annual reports.

If the Maximum Allowable Head (MAH) in the PRS sump exceeds 20 inches (33% full) and/or the LLD sump exceeds 6 inches (12% full) the LLD and PRS sumps will be visually inspected to confirm the liquid water level. Upon visual confirmation that the MAH has been exceeded, the sump will be inspected to verify that the water in the sump is, or is not, flowing from the lower leak detection layer or the pressure relief layer. This will be done by inspection the lower leak detection layer and pressure relief layer discharge pipes.

Field measurements for pH and conductivity will be conducted and recorded and records of this inspection will be maintained by the RTKC Environmental Department.

RTKC Environmental Department will verbally notify the DWQ within 72 hours of the discovery that the LLD sump contains 6 inches (12% full) or more of liquid that has been flowing from the lower leak detection layer.

If the MAH has been exceeded and the pH is less than 6.0 and/or the conductivity is greater than 8,000 umhos/cm, the sump(s) will be sampled for permit requirements and a written report will be submitted to the Director within 21 days or along with the semi-annual report.

If the MAH has been exceeded and the pH is greater than 6.0 and the conductivity is less than 8,000 umhos/cm, the results of the field measurements will be reported in the semi-annual reports (no water quality samples will be collected or analyzed).

After field measurements and/or laboratory samples have been collected, if the sumps have exceeded the MAH and water was flowing from the lower leak detection layer or pressure relief layer, the sumps will be pumped down to less than 5 percent full (3 inches). Water removed from the sump system shall either be placed back into the Small Reservoir or into another impoundment permitted for such use (Zone 1 and 2 Large Reservoir). If necessary, the water level will be lowered to make appropriate repairs to the liner and rectify the leak. Any repair work will be reported in the semi-annual report.

6.0 WATER QUALITY SAMPLING PROCEDURES

All field measurements and water quality sampling will be collected in accordance with the GWCMP.

7.0 SAMPLE CUSTODY

7.1 Field Operations

The following records and actions will be conducted as part of the water quality sampling of the Small Reservoir.

- **Field Logs:** A complete record of all field sampling activities will be kept by the sampler. The field logs will document the date, time, and location of sampling and the name of the person(s) performing the sampling, as well as any other pertinent information.
- **Sample Labels:** Each sample container will clearly be labeled with the information necessary to prevent misidentification of samples. Each sample container will be clearly labeled with the sample location, date and time of collection, preservative(s), filtered or unfiltered, and name of person performing the sampling.
- **Chain-of-Custody Record:** To establish the documentation necessary to trace sample possession from the time of collection, the attached chain-of-custody record will be filled out to accompany every sample shipment from the time of collection through receipt by the analytical laboratory. The samples will be delivered to the laboratory for analysis as soon as possible, usually within one day after sampling.

7.2 Laboratory Operations

The primary laboratory to be used for analysis of the water quality samples will be the Kennecott Environmental Laboratory (KEL). The KEL is certified by the State of Utah (Certification No. KCC). Any other laboratories used, if necessary, will be State of Utah certified. The laboratories will maintain internal chain-of-custody control in accordance with their own standard quality assurance program.

The laboratory will document the date and time of analyses, name of person(s) performing the analyses, and methods used.

8.0 INTERNAL QUALITY CONTROL CHECKS

8.1 Overview

All internal quality control checks will be conducted in accordance with the current GCMP.

8.2 Field Operations

Blind field duplicates will be prepared and submitted to the laboratory by the sampler. One out of every 20 samples or at least one sample per year will be a blind field duplicate. Sample splitting for duplications will be conducted as specified in the GCPM. The results of these duplicate analyses will be reported as required by the GCMP.

8.3 Laboratory Operations

The certified laboratory will conduct its own internal quality control checks in accordance with its own quality assurance program as part of State of Utah certification. This will include running at least 5 percent duplicate, spike, and control samples.

Laboratory equipment maintenance will be in accordance with the Laboratory QA Plan.