

STATE OF UTAH
DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WATER QUALITY
UTAH WATER QUALITY BOARD
SALT LAKE CITY, UTAH 84114-4870

Ground Water Discharge Permit
Permit No. UGW350015

In compliance with the provisions of the Utah Water Quality Act, Title 19, Chapter 5, Utah Code Annotated 1953, as amended, the Act,

Kennecott Utah Copper LLC
4700 Daybreak Parkway
South Jordan, UT 84009

is granted a ground water discharge permit for the operation of the Magna Process Water Reservoir Facility in Magna, Salt Lake County, Utah.

The Magna Process Water Reservoirs are located on the following tracts of land (Salt Lake Base and Meridian):

Township 1 South, Range 2 West - SW 1/4 of Section 19
Township 1 South, Range 2 West - NW 1/4 of Section 30
Township 1 South, Range 3 West – SE 1/4 of Section 24
Township 1 South, Range 3 West – NE 1/4 of Section 25

The permit is based on representations made by the permittee and other information contained in the administrative record. It is the responsibility of the permittee to read and understand all provisions of this permit.

The facility shall be maintained and operated in accordance with conditions set forth in the permit and the Utah Ground Water Quality Protection Rules (UAC R317-6).

This Ground Water Quality Discharge Permit for the Magna Process Water Reservoir supersedes all other Ground Water Discharge Permits for the North Concentrator facility previously issued.

This modified permit shall become effective on August 14, 2020.

This permit and the authorization to operate shall expire at midnight on August 14, 2025.

Signed this fourteenth day of August 2020.



Erica Brown Gaddis, PhD
Director

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I. SPECIFIC PERMIT CONDITIONS

A. GROUND WATER CLASSIFICATION

The ground water classification for the uppermost aquifer in the area of the Magna Process Water Reservoir is generally Class II Drinking Water Quality ground water. Ground water at each compliance monitoring well has been classified based on historical monitoring data.

B. GROUND WATER COMPLIANCE LIMITS

Ground Water compliance limits for monitoring wells for this permit are represented in Table 1.

C. BEST AVAILABLE TECHNOLOGY PERFORMANCE STANDARD

The enforceable performance standard for this permit to achieve protection of ground water quality will be discharge minimization of process fluids to ground water from the permitted facilities listed in Table 2. The permittee is responsible for implementing and maintaining the best available technology (BAT) noted in Table 2 to minimize discharge of process fluids from the permitted facilities to ground water. Maintenance of this performance standard will be demonstrated by:

1. Adherence to the performance criteria in Table 2.
2. No ground water degradation beyond permit limits established in Table 1 and measured by compliance monitoring wells.
3. Implementation of the Best Management Practices Plan (Appendix A) to ensure prompt cleanup of any spills and proper handling of process waters as well as an ongoing inspection and maintenance program for facilities included in this permit.
4. Closure - The Magna Process Water Reservoirs shall undergo closure in accordance with the closure plan submitted in Section 7 of the permit application.

D. PERMITTED FACILITIES

The Facilities authorized under this permit (UGW350015) are listed in Table 2. These facilities constitute those, not permitted by rule, where there is potential for release of fluids to ground water. The facilities listed in Table 3 under the "Permit By Rule" heading are for unit processes not specifically addressed by this permit. However, no discharge of pollutants from these sites to ground water is allowed. Operational Monitoring Points are listed in Table 4.

Kennecott Utah Copper LLC (Kennecott) formerly included the Utah Power Plant (UPP) as part of this permit. For the current 2020 permit renewal, Kennecott has removed reference to the UPP Plant as this former power plant is in various stages of demolition.

E. MONITORING

1. General Provisions

- a) *Future Modification of the Monitoring Network* - If at any time the Director determines the monitoring program to be inadequate for determining compliance with BAT, applicable permit limits or ground water protection levels, Kennecott shall submit within 30 days of receipt of written notice from the Director a modified monitoring plan that addresses the inadequacies noted by the Director.
- b) *Compliance Monitoring Period* - Monitoring shall continue throughout the life of this permit. For compliance monitoring wells that are installed during the term of this permit, monitoring shall commence upon completion of the well installation and development.
- c) *Laboratory Approval* - All water quality analyses shall be performed by a laboratory certified by the State of Utah to perform such analysis.
- d) *Water Level Measurement* - In association with each well sampling event, water level shall be measured in each monitoring well prior to removal of any water from the well bore. These measurements will be made from a permanent single reference point clearly marked on the top of the well or surface casing. Measurements will be made to the nearest 0.01 foot.
- e) *Sampling Protocol* - Water quality samples will be collected and handled in conformance with the currently approved version of the Kennecott Ground Water Characterization and Monitoring Plan.
- f) *Constituents Sampled* - The following analysis shall be performed on all water quality samples collected:
 - i) Field Measurements: pH, specific conductance, temperature
 - ii) Laboratory Analysis:
 - o Major Ions: alkalinity, chloride, sulfate, sodium, potassium, magnesium, and calcium
 - o TDS total dissolved solids
 - o Metals (dissolved): arsenic, boron, lead, barium, cadmium, chromium, copper, selenium, and zinc
- g) *Analytical Procedures* - Water sample analysis will be conducted according to test procedures specified under UAC R317-6-6.3L.

2. Operational Monitoring

- a) Kennecott shall characterize the fluids utilized in the Magna Process Water Reservoirs and Pumping Facilities with grab samples for the unit process sites listed in Table 4.
- b) Monitoring Frequency - Operational monitoring shall occur monthly for the Magna Water Reservoirs.

3. Monitoring Frequency

Well Monitoring Frequency - All existing compliance monitoring wells will be sampled semiannually throughout the term of this permit. For any new compliance monitoring wells that are installed, the permittee shall collect at least eight independent samples (quarterly) at equal time intervals over a two-year period from each well. The samples shall be analyzed for major ions and the parameters listed in Part I.E.1.f.

4. Post-Closure Monitoring

Kennecott shall conduct post-closure monitoring in accordance with the post closure monitoring program that is included in the closure plan in Section 7 of the permit application.

F. DEMONSTRATION OF COMPLIANCE

1. Probable Out of Compliance for Ground Water Compliance Limits

If the concentration of a pollutant from any compliance monitoring well sample exceeds the protection level (Table 1) Kennecott shall:

- a) Notify the Director in writing within 30 days of receipt of the data;
- b) Initiate quarterly sampling for the compliance monitoring well(s) that has exceeded the protection level (Table 1), unless the Director determines that other periodic sampling is appropriate, for a period of two quarters or until the compliance status of the facility can be determined.

2. Out of Compliance Status for Ground Water Compliance Wells Limits

Out of compliance status shall be defined as follows:

- a) Two or more consecutive samples from a compliance monitoring well exceed the protection level for a pollutant (Table 1);

3. Upon determining that an out of compliance situation exists, Kennecott shall:

- a) Notify the Director of the out of compliance status within 24 hours of detection, followed by a written notice within 5 days of the detection.
- b) Initiate quarterly sampling unless the Director determines that other periodic sampling is appropriate until the facility is brought into compliance.
- c) Submit a Source Assessment and Compliance Schedule to the Director within 30 days of detection of the out of compliance status that outlines

the following:

- Steps of action that will assess the source, extent, and potential dispersion of the contamination.
- Evaluation of potential remedial actions to restore and maintain ground water quality and ensure the compliance limits will not be exceeded at that compliance monitoring point.
- Measures to ensure best available technology will be re-established.

d) Implement the Source Assessment and Compliance Schedule as directed by the Director.

4. Out of Compliance for Allowable Leakage Rate

a. If the leakage rate is in excess of the Allowable Leakage Rate (ALR), stated in Appendix B, Kennecott shall:

- i. Sample the effluent from the sump for water quality field and lab constituents noted in Part I.C.5 and report analytical results in the corresponding quarterly report.
- ii. Notify the Director within 24 hours of the discovery that the leak detection system has exceeded the Tier II ALR. This notification shall be followed up with a written statement confirming the oral report within five days of the failure along with a proposed schedule for implementing the Leak Detection and Repair Program.
- iii. Submit for Director approval, a schedule to implement the approved Leak Detection and Repair Program (approved under Part I.G) or proceed otherwise as directed by the Director.
- iv. Remove water affected on a continuous basis from the sump.

5. Unit Processes with Best Management Practices

Kennecott shall operate the Magna Process Water Reservoir Containment and Pumping facilities in accordance with the Best Management Practices specified in Appendix A.

G. NON- COMPLIANCE FOR BEST AVAILABLE TECHNOLOGY

1. Kennecott is required to maintain the Best Available Technology in accordance with the approved design and practice for this permit. Failure to maintain BAT or maintain the approved design and practice shall be a violation of this permit. In the event a compliance action is initiated against the permittee for violation of permit conditions relating to best available technology, Kennecott may affirmatively defend against that action by demonstrating the following:
 - a. Kennecott submitted notification in accordance with R317-6-6.13;
 - b. The failure was not intentional or caused by Kennecott's negligence, either in action or in failure to act;
 - c. Kennecott has taken adequate measures to meet permit conditions in a timely manner or has submitted for the Director 's approval, an adequate plan and schedule for meeting permit conditions; and
 - d. The provisions of UCA 19-5-107 have not been violated.

H. REPORTING REQUIREMENTS

1. Reporting

- a. Monitoring Reports - Water quality sampling results with any supporting data for compliance monitoring wells shall be submitted two times per year to the Director as follows:

<u>Quarter Sampled In</u>	<u>Results Due On</u>
January through June	August 15
July through December	February 15

- b. Failure to submit reports within the time frame due shall be deemed as noncompliance and may result in enforcement action.
- c. Electronic Filing Requirements - The Permittee will submit the required ground water monitoring data as follows.
 1. Interpretation and laboratory analytical reports are to be submitted in pdf format.
 2. Historical and new well construction logs and documents are to be submitted in pdf format.
 3. All data collected from monitoring wells, piezometers, sumps, and operational monitoring locations are to be submitted in xlsx format. These data points need to include well identification, latitude, longitude, sample date, and all analyte data.
 4. Submission of Data – All reports and data files are required to be submitted through the DWQ web submission portal at: <https://deq.utah.gov/water-quality/water-quality-electronic->

submissions.

I. COMPLIANCE SCHEDULE

1. Kennecott shall notify the Division of Water Quality (DWQ) of any changes in operational status of the Magna Process Water Reservoir facilities.
2. Corrective Action - Within 45 days of notification by the Director that corrective action is not proceeding in a timely fashion, Kennecott shall submit for approval a Contamination Investigation and Corrective Action Plan. The characterization of pollution shall include a description of the amount, form, concentration, toxicity, environmental fate and transport and other significant characteristics of pollutants present. The Corrective Action Plan shall describe the measures that will be taken to contain, remove or eliminate contamination.
3. If any construction should result in the abandonment of monitoring wells listed in Part I.E.2., or make them unsafe to sample, Kennecott shall pursue one of the following alternatives: replace the wells in a suitable location, recommend existing wells as replacements, or present an alternative plan for monitoring that will assess best management practices for the protection of ground water throughout the term of the permit.
4. Within 180 days of permit issuance Kennecott shall submit to the Director for review and approval a map or maps of the facility area including the location of specific facilities, monitoring wells and locations described in the permit and contained in Tables 1, 2, 3, and 4 as well as in Appendices A, B, and C.
5. Within 180 days of permit issuance Kennecott shall submit to the Director for review and approval a series of contour maps of the site-wide facility area that display selenium, arsenic, and chloride concentrations and groundwater elevations. The contour maps provided will include 2010, 2015, 2020, which coincide with previous permit renewal years so that changes over time can be depicted and as a basis for future groundwater permit renewal packages.

II. MONITORING, RECORDING AND REPORTING REQUIREMENTS

A. REPRESENTATIVE SAMPLING

Samples collected in compliance with the monitoring requirements established under Part I shall be representative of the monitored activity.

B. ANALYTICAL PROCEDURES

Water sample analysis must be conducted according to test procedures specified under UAC R317-6-6.12, unless other test procedures have been specified in this permit.

C. PENALTIES FOR TAMPERING

The Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate, any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than six months per violation, or by both.

D. REPORTING OF MONITORING RESULTS

Monitoring results obtained for each monitoring period specified in the permit, shall be submitted to the Director, Utah Division of Water Quality at the following address no later than 45 days after the end of the monitoring period (unless specified otherwise in this permit):

Utah Division of Water Quality
P.O. Box 144870
Salt Lake City, Utah 84114-4870
Attention: Ground Water Protection Section

E. COMPLIANCE SCHEDULES

Reports of compliance or noncompliance with, or any progress reports on interim and final requirements contained in any Compliance Schedule of this permit shall be submitted no later than 14 days following each schedule date.

F. ADDITIONAL MONITORING BY THE PERMITTEE

If the permittee monitors any pollutant more frequently than required by this permit, using approved test procedures as specified in this permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted. Such increased frequency shall also be indicated.

G. RECORDS CONTENTS

Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements;
2. The individual(s) who performed the sampling or measurements;
3. The date(s) and time(s) analyses were performed;
4. The individual(s) who performed the analyses;
5. The analytical techniques or methods used; and,
6. The results of such analyses.

H. RETENTION OF RECORDS

The permittee shall retain records of all monitoring information, including all calibration and maintenance records and copies of all reports required by this permit, and records of

all data used to complete the application for this permit, for a period of at least three years from the date of the sample, measurement, report or application. This period may be extended by request of the Director at any time.

I. TWENTY-FOUR HOUR NOTICE OF NONCOMPLIANCE AND SPILL REPORTING

1. The permittee shall verbally report any noncompliance, or spills subject to the provisions of UCA 19-5-114, which may endanger public health or the environment as soon as possible, but no later than twenty-four (24) hours from the time the permittee first became aware of the circumstances. The report shall be made to the Utah Department of Environmental Quality 24-hour number, (801) 536-4123, AND to the Division of Water Quality, Ground Water Protection Section at (801) 536-4300, during normal business hours (8:00 am - 5:00 pm Mountain Time).
6. A written submission shall also be provided to the Director within five days of the time that the permittee becomes aware of the circumstances. The written submission shall contain:
 - a. A description of the noncompliance and its cause;
 - b. The period of noncompliance, including exact dates and times;
 - c. The estimated time noncompliance is expected to continue if it has not been corrected; and,
 - d. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.
3. Reports shall be submitted to the addresses in Part II D, Reporting of Monitoring Results.

J. OTHER NONCOMPLIANCE REPORTING

Instances of noncompliance not required to be reported within 24 hours, shall be reported at the time that monitoring reports for Part II D are submitted.

K. INSPECTION AND ENTRY

The permittee shall allow the Director, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of the permit;
 2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
 3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and,
 4. Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the Act, any substances or parameters at any location.
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III. COMPLIANCE RESPONSIBILITIES

A. DUTY TO COMPLY

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action; for permit termination, revocation and re-issuance, or modification; or for denial of a permit renewal application. The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

B. PENALTIES FOR VIOLATIONS OF PERMIT CONDITIONS

The Act provides that any person who violates a permit condition implementing provisions of the Act is subject to a civil penalty not to exceed \$10,000 per day of such violation. Any person who willfully or negligently violates permit conditions is subject to a fine not exceeding \$25,000 per day of violation. Any person convicted under Section 19-5-115(2) of the Act a second time shall be punished by a fine not exceeding \$50,000 per day. Nothing in this permit shall be construed to relieve the permittee of the civil or criminal penalties for noncompliance.

C. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

D. DUTY TO MITIGATE

The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

E. PROPER OPERATION AND MAINTENANCE

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

IV. GENERAL REQUIREMENTS

- A. PLANNED CHANGES The permittee shall give notice to the Director as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required when the alteration or addition could significantly change the nature of the facility or increase the quantity of pollutants discharged.
- B. ANTICIPATED NONCOMPLIANCE The permittee shall give advance notice of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
- C. PERMIT ACTIONS This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and re-issuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.
- D. DUTY TO REAPPLY If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit; the permittee must apply for and obtain a permit renewal or extension. The application should be submitted at least 180 days before the expiration date of this permit.
- E. DUTY TO PROVIDE INFORMATION The permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.
- F. OTHER INFORMATION When the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or any report to the Director, it shall promptly submit such facts or information.
- G. SIGNATORY REQUIREMENTS All applications, reports or information submitted to the Director shall be signed and certified.
1. All permit applications shall be signed as follows:
 - a. For a corporation: by a responsible corporate officer;
 - b. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively.
 - c. For a municipality, State, Federal, or other public agency: by either a principal executive officer or ranking elected official.

2. All reports required by the permit and other information requested by the Director shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:
 - a. The authorization is made in writing by a person described above and submitted to the Director, and,
 - b. The authorization specified either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.)
3. Changes to Authorization. If an authorization under Part IV G 2. is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Part IV G 2. must be submitted to the Director prior to or together with any reports, information, or applications to be signed by an authorized representative.
4. Certification. Any person signing a document under this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

- H. PENALTIES FOR FALSIFICATION OF REPORTS The Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than six months per violation, or by both.
 - I. AVAILABILITY OF REPORTS Except for data determined to be confidential by the permittee, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Director. As required by the Act, permit applications, permits, effluent data, and ground water quality data shall not be considered confidential.
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- J. PROPERTY RIGHTS The issuance of this permit does not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.
- K. SEVERABILITY The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.
- L. TRANSFERS This permit may be automatically transferred to a new permittee if:
1. The current permittee notifies the Director at least 30 days in advance of the proposed transfer date;
 2. The notice includes a written agreement between the existing and new permittee containing a specific date for transfer of permit responsibility, coverage, and liability between them; and,
 3. The Director does not notify the existing permittee and the proposed new permittee of his or her intent to modify, or revoke and reissue the permit. If this notice is not received, the transfer is effective on the date specified in the agreement mentioned in paragraph 2 above.
- M. STATE LAWS Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, penalties established pursuant to any applicable state law or regulation under authority preserved by Section 19-5-117 of the Act.
- N. REOPENER PROVISION This permit may be reopened and modified (following proper administrative procedures) to include the appropriate limitations and compliance schedule, if necessary, if one or more of the following events occurs:
1. If new ground water standards are adopted by the Board, the permit may be reopened and modified to extend the terms of the permit or to include pollutants covered by new standards. The permittee may apply for a variance under the conditions outlined in R317-6-6.4(D)
 2. If alternate compliance mechanisms are required
 3. If water quality of the facility is significantly worse than represented in the original permit application.

FIGURE 1

KENNECOTT MAGNA RESERVOIRS MONITORING WELLS AND PERMITTED OR PERMIT BY RULE FACILITY LOCATIONS

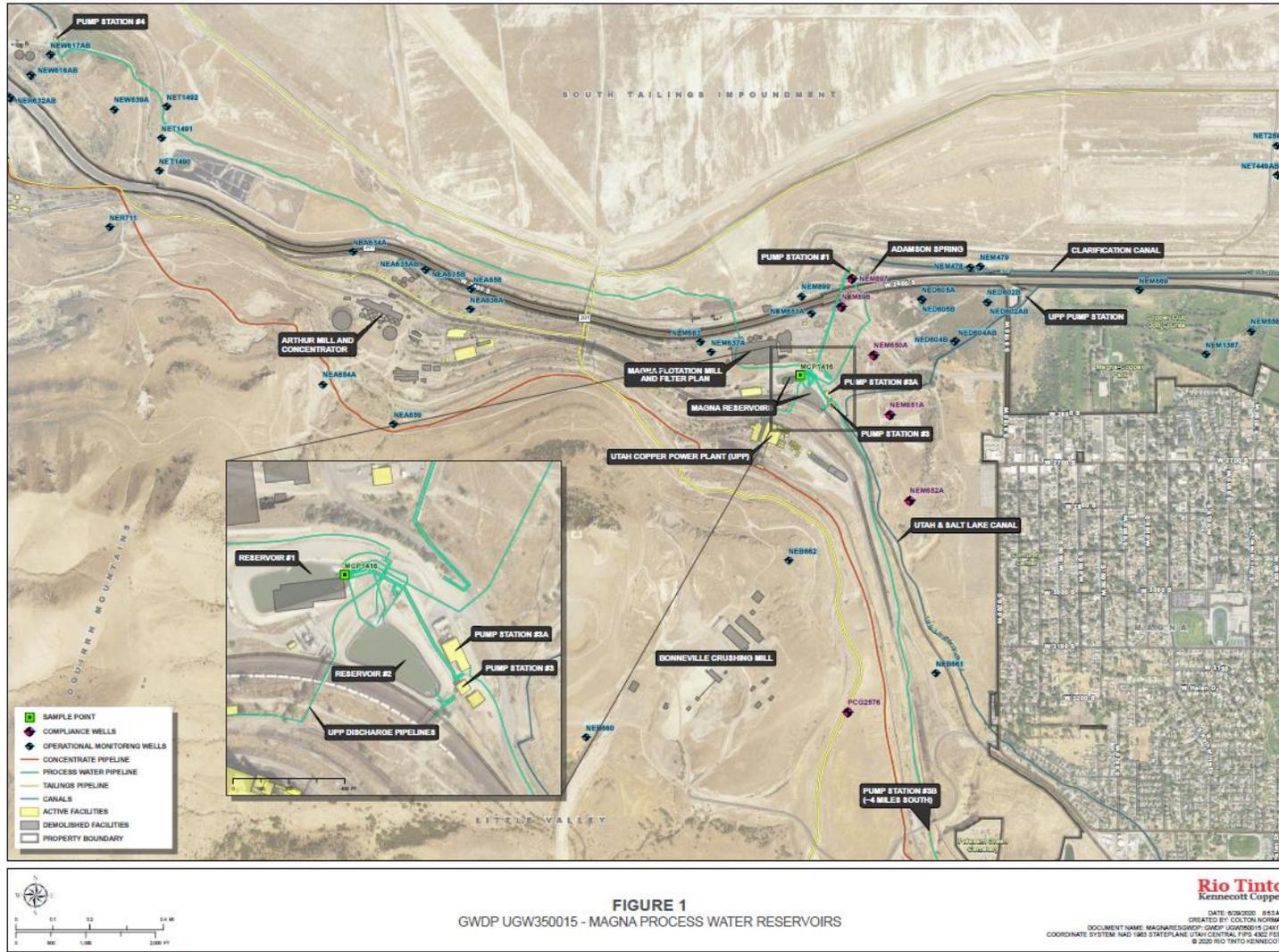


TABLE 1**KENNECOTT MAGNA PERMIT COMPLIANCE LIMITS**

Well	Permit Limit	pH	TDS	Sulfate	Arsenic	Boron	Cadmium	Chromium	Copper	Lead	Selenium	Zinc
NEM650A	Protection Level	6.5 - 8.5	1364	231	0.013	0.16	0.0025	0.025	0.325	0.005	0.013	1.250
NEM651A	Protection Level	6.5 - 8.5	1626	540	0.013	0.2	0.0025	0.025	0.325	0.005	0.026	1.250
NEM652A	Protection Level	6.5 - 8.5	1597	585	0.022	0.5	0.0025	0.025	0.325	0.005	0.025	1.250
NEM897	Protection Level	6.5 - 8.5	2468	400	0.019	0.23	0.0025	0.025	0.325	0.005	0.013	1.250
NEM898	Protection Level	6.5 - 8.5	2095	300	0.02	0.24	0.0025	0.025	0.325	0.005	0.013	1.250
PCG2576	Protection Level	6.5 - 8.5	1057	228	0.013	0.078	0.0025	0.025	0.325	0.005	0.013	1.250
Ground Water Quality Standards		6.5 - 8.5	3000	n/a	0.05	n/a	0.005	0.10	1.30	0.015	0.05	5.00

NOTES:units: **milligrams per liter (mg/L)**, except for pH;

Ground water protection levels and compliance limits are established in accordance with R317-6-4.

Only the highest allowable value is shown in Table 1.

Last Revision date: June 2020

TABLE 2

MAGNA PROCESS WATER RESERVOIR POINT SOURCE COMPONENTS

Facility	Fluids Handled	BAT Description	Operation and Maintenance	Performance Criteria
Magna Process Water Reservoir	Process water <ul style="list-style-type: none"> • No. 1 pump station • No. 4 pump station 	Double HDPE liner with leak detection	<ul style="list-style-type: none"> • Process water recycled • Inspections as per BMP plan 	<ul style="list-style-type: none"> • Prompt repair of leaks • Adherence to Appendix B
No. 3 Pump Station	Process water	Concrete basin	<ul style="list-style-type: none"> • Inspections as per BMP plan 	<ul style="list-style-type: none"> • Prompt repair of leaks • Adherence to BMP plan (Appendix A)
No. 3A and 3B Pump Station	Process water Water pumped from the Magna Process Water Reservoir via Pump Station No. 3A to the Copperton Process Water Reservoir	Concrete basin	<ul style="list-style-type: none"> • Daily inspection 	<ul style="list-style-type: none"> • Weekly inspection
UPP Pump Station	Potable Water <ul style="list-style-type: none"> • Section 21 	Concrete basin	<ul style="list-style-type: none"> • Inspections as per BMP plan 	<ul style="list-style-type: none"> • Prompt repair of leaks • Adherence to BMP plan

TABLE 3

MAGNA PROCESS WATER RESERVOIR FEATURES PERMITTED BY RULE

Facility	Fluids Handled	BAT Description	Regulatory Status	Operation and Maintenance	Performance Criteria
UPP discharge pipelines to Magna Reservoir	UPP Process water	12" HDPE pipeline, non-vented	De Minimis	Weekly Inspection	None

TABLE 4

MAGNA PROCESS WATER RESERVOIR OPERATIONAL MONITORING POINTS

Operational Monitoring Site	Sample ID	Sampling Location
Magna Process Water Reservoir	MCP1416	Grab sample of reservoir water

APPENDIX A

BEST MANAGEMENT PRACTICES PLAN

FOR

MAGNA RESERVOIRS GROUND WATER DISCHARGE PERMIT Permit No. UGW350015

INTRODUCTION

The Kennecott Utah Copper LLC (Kennecott) has been issued Ground Water Discharge Permit #UGW350015 for the Magna Reservoirs. The Magna Reservoirs physical permit boundaries includes the Power Plant and the Magna Process Water Containment and Pumping Facilities that route process water for Kennecott operations. Based on topographical maps the permit area covers approximately 65 acres. The permit specifies monitoring conditions, performance criteria, Best Available Technology (BAT) and development and implementation of a Best Management Practices (BMP) plan to reduce or eliminate the loss of process fluids to ground water.

As directed in the permit, the BMP plan forms Appendix A of the Magna Reservoirs Ground Water Discharge Permit and is intended to ensure prompt cleanup of any spills and proper handling of process fluids and materials as well as an ongoing inspection and maintenance program for permitted facilities.

INSPECTION AND MAINTENANCE PROCEDURES

OPERATIONS

Operations at the Magna Reservoir facilities are controlled and monitored 24 hours a day via a combination of distributed control systems, video imagery, alarms, and operator visual inspections. Every section of both facilities is assigned operators that are responsible for inspecting areas at least once a day to verify systems integrity and operations. Operators are also responsible for rectifying any deficiencies found in system components or equipment in a timely manner. The maximum allowable leakage rate (ALR) is described below.

MAINTENANCE

Each operational area at the Magna Reservoirs has been assigned personnel responsible for repair and maintenance of all equipment. Scheduling of maintenance activities is part of a comprehensive preventive maintenance program (PM). The overall maintenance program utilizes computer assisted preventive maintenance scheduling. A PM schedule has been developed for each key piece of equipment.

Tracking of the PM schedule, as well as the PM procedures, is done via a computerized maintenance program called SAP. SAP is utilized as an information management system for scheduling maintenance tasks and compiling equipment, material and supply data. Based on information from the control system, feedback from operator inspections, and preset schedule inputs, SAP assists maintenance planners in tracking and scheduling PMs. When a PM is due, the computer system triggers the PM process for a specific piece of equipment. Equipment associated with the storage and transfer of process fluids is included in the SAP program.

Pre-established job procedures are printed out for the PM. Maintenance schedulers then assign an employee the responsibility of completing the work.

After PM work is completed, the employee returns a signed PM checklist to the maintenance scheduler. Items noted during inspections that require additional repairs are noted by the maintenance planner. A work order is then written for any additional repair work and the work will be scheduled. The work order tracking system is intended to ensure that proper and complete implementation of required repairs occurs. The SAP system will continue to remind maintenance planners weekly until the job work order is completed and closed out.

Systems that store, transfer or otherwise handle process solutions including pumping systems are included in the PM program. Pumping system components are inspected at a minimum of once every three months. Many system components are inspected more frequently. PM procedures for process fluid pumping systems include lubrication fluid check, inspecting foundations and mounting assemblies, pump vibrations, noise, etc., and inspection of associated piping and fittings.

Process fluid storage systems are included in the PM program and are tracked through SAP. Process fluid storage reservoirs are visually inspected when facility downtime periods allow drainage. Tank containment and sumps and associated piping are inspected monthly.

The following table specifies inspection frequency for both point and area sources listed in the Magna Reservoirs Ground Water Discharge Permit:

Magna Reservoirs Point Source Inspection Schedule

Inspection Area	Fluids Handled	Performance Criteria
21st South Pumps	Section 21 potable water via section 21 pump station	Prompt Repair of leaks
Station Service Pumps	Process Water	Prompt Repair of leaks

HOUSEKEEPING

All operational Kennecott facilities at the Magna Reservoirs adhere to strict Housekeeping standards. Housekeeping standards are enforced by area supervisors via employee training and housekeeping inspections. Kennecott housekeeping standards require prompt cleanup of spilled materials, and areas are to be kept reasonably free of excess dirt, grease and oil. Kennecott personnel are trained annually on environmental aspects of proper housekeeping.

SPILL PREVENTION / SPILL CLEANUP / SPILL REPORTING

The Magna Reservoirs areas have site specific cleanup procedures. The plans specify procedures to be followed for spill response and spill prevention. Spills are contained and cleaned up as quickly as possible.

A verbal report of any noncompliance, or spills subject to the provisions of UCA 19-5-114 **which may endanger public health or the environment** are made as soon as possible, but no later than twenty-four hours from the time Kennecott first became aware of the incident. The verbal report will be made to the Utah Department of Environmental Quality 24-HOUR response NUMBER, (801) 536-4123 or to the Division of Water Quality, Ground Water Protection Section at (801) 536-4300, during normal business hours. A written report containing specific details of the incident will be submitted

to the Director within five days of the time Kennecott becomes aware of the incident.

MATERIALS HANDLING

Kennecott enforces the Occupational Safety and Health Administration (OSHA) requirements for Hazard Communications at all facilities including the former Power Plant and Magna Process Water Reservoirs.

The following is a list of key OSHA standards enforced:

- Labels and/or appropriate warning concerning chemicals are in place
- MSDSs are maintained and readily available for all chemicals on site.
- Employees are informed and trained regarding chemicals and Hazardous Communications
- Contractor employees are informed concerning chemicals at RTKC

EMPLOYEE TRAINING

All new employees are given an overview of Kennecott's Health, Safety, and Environmental (HSE) policy and procedures. Plant personnel receive annual standards training covering key elements of Kennecott's safety and environmental standards including SPCC, RCRA, Housekeeping, MSHA and OSHA Hazardous Communications. Represented employees receive the standards training from SAP online training. Kennecott encourages employees to actively participate in employee suggestion and improvement programs in an effort to enhance corporate environmental and safety performance.

RECORD KEEPING

Records that document compliance with the elements required in the BMP will be maintained for a minimum of three years. Copies of records are kept at the Tailings and Water Services record keeping centers.

APPENDIX B

Magna Reservoir
Leak Detection & Water Quality Sampling Plan
(Revised March 2014)**1.0 Introduction**

The Magna Reservoir System, located in the Magna Process Water Reservoirs facilities area, acts as a central hub for industrial process waters. Flows from the No. 1 and No. 4 Pump Stations are discharged into the reservoir (approximately 35,000 gpm) where the combined flows are routed to the Copperton Concentrator via Pump Station 3A and 3B, and or to the Tailing Lines via Pump Station 3.

This plan presents the sampling, analysis and quality assurance guidelines to be performed by Kennecott for water quality sampling of the groundwater protection features of the Magna Reservoir System.

1.1 System Description

The Magna Reservoir system consists of two reservoirs located adjacent to each other. The reservoirs were designed to be operated primarily in series with flow typically first entering Reservoir No. 1, flowing to Reservoir No. 2, and then to Pump Stations 3, 3A, and 3B. However, each reservoir has an inlet, outlet, and overflow that can be isolated from the other reservoir so that the reservoirs can be operated independently during periods of maintenance, modification or repair. A common overflow system, linked to both reservoirs, allows excess flows to passively flow over a weir and into a pipeline conveying excess flows to the Clarification Canal located influent from Kennecott Pump Station 1 within the Tailings Impoundment.

The reservoirs have identical leak detection and seepage barrier construction.

1.1.1 Construction

The reservoirs include an identical, double containment liner system as the seepage barrier:

- A primary liner consisting of an 80-mil HDPE geomembrane with micro spikes for surface traction is located on top.
- A secondary liner consisting of a 60-mil HDPE geomembrane with drainage nubs is located beneath the primary liner.

The drainage nubs provide separation between the two liners and allow for leakage through the primary liner to be collected in the leak detection system.

Reservoir No. 1 is constructed with engineered fill at 2:1 side slopes. Under normal operating conditions, water is first conveyed to Reservoir No. 1 which includes a concrete floor at the bottom of the reservoir to facilitate removal of any sediment that may accumulate. This concrete floor is located above and is independent of the HDPE liner system. Reservoir No. 2 is also constructed with engineered fill at 2:1 side slopes but does not include a concrete floor.

If leakage occurs through the primary liner, it is collected at a single point for each reservoir – at the east end of Reservoir No. 1 and in the northwest corner for Reservoir No. 2. See Figure 1.

Leakage flow from each reservoir is conveyed by gravity through a 6-inch diameter HDPE pipeline to independent meter vaults where the continuous flow is measured using an area velocity type flow metering system and V-notch weir. Tail water from the individual reservoir meter vaults is conveyed to the Clarification Canal located influent from Kennecott Pump Station 1 through the existing area drainage

system to be circulated back to the Magna Reservoir System for use.

The continuous quantity of leakage flow rate (GPM) from each reservoir is measured in the meter stations and, via electronic 4 to 20 ma and fiber optics signals, remotely monitored and recorded in the Kennecott plant SCADA system at the Tailings Control room.

In addition to the continuous flow being recorded, the volume of leakage (in total gallons) is determined each day by logic programmed into the dedicated PLC. If the total daily volume exceeds the allowable leakage rate an alarm will be activated and Tailings Operations will conduct a site investigation to determine the source of the increased leakage rate. The initial response will be to confirm leakage flow rates and initiate inspections and repairs as required. In addition to the total daily volume alarm being activated for excess leakage, the SCADA logic system shall be programmed for early warning alert. During a variable time period (typically shorter than 24 hours) flows can be monitored and a projected 24-hour total volume determined. On this occurrence an alert can be monitored at the control room. If it is determined that a flow meter is not operating correctly, Tailings personnel will measure the leakage flow manually and record the value in the Tailings control room.

Kennecott maintains an Operations and Maintenance Manual for Magna Reservoir that includes specifications for equipment, recommended inspections, and operations and maintenance recommendations.

1.1.2 Allowable Leakage Rate

Liner leakage flow from reservoir No. 1 or No. 2, if present, will report to a respective flow meter station where it can be read remotely or in the field by Tailings personnel.

Kennecott utilizes a two tier approach with respect to allowable leakage rate for the Magna Reservoir System. Tier I leaks are based upon liner manufacturer specifications and are designed to alert Kennecott personnel to an escalation in leakage rate, possible minor liner separation or flow meter station malfunction. Tier II leaks are based upon EPA guidance for allowable leakage rates for double lined surface impoundments (Bonaparte & Gross, 1993) and are designed to trigger UDWQ notification that the allowable leakage rate for the respective reservoir has been exceeded. The Tier I and II leakage rates were further developed using total liner surface area for each respective reservoir and are consistent with US EPA methodology. Allowable leakage rates are summarized in Table 1.

Table 1: Tier I and Tier II Allowable Leakage Rates (ALR)

Reservoir	Liner surface area (acres)	Tier I ¹ (gallons/day)	Tier II ² (gallons/day)
No. 1	1.38	720	1380
No. 2	1.49	720	1490

¹ Based upon guarantee by installer and manufacturer stating maximum leakage through primary geomembrane liner not to exceed 50 gallons per acre, per day (gpd/ac).

² Based upon US EPA recommended ALR requirements for surface impoundments of 10,000 liters per acre, per day or approximately 1000 gallons per acre, per day.

Repair requirements and a leak investigation are triggered if the allowable leakage rate for the respective reservoir exceeds Tier I over a 24-hour period. Immediate action will be required if the ALR continues past the Tier II leakage rate which will include isolating the reservoir, lowering the water level below the leak, notifying the environmental department and subsequent notification of the DWQ within 24-hours Kennecott first became aware of the incident.

2.0 Facility Organization and Responsibilities

The Kennecott Manager – Environment or designee will serve as the Compliance Project Manager and will have overall responsibility for direction of the sampling and compliance program, quality control, notifications and reporting. The Kennecott Sampling Supervisor will serve as technical director and will be responsible for execution of all activities in accordance with this sampling plan.

The Kennecott Tailings Superintendent - Operations or designee is responsible for monitoring and recording daily flows reporting to the Magna Reservoir leak detection sump. The same personnel will also be responsible for maintaining the leak detection monitoring equipment and ensuring it is fully functional on a daily basis. In the event a leak detection sump exceeds compliance limits as outlined in Section 4.2. The same personnel are responsible for notification to the Manager, Environment or designee and coordinating efforts to maintain compliance and subsequent repairs as necessary.

The Kennecott Sampling Technicians have the responsibility of collecting all water quality samples required by the permit in accordance with this sampling plan and the GCMP.

The Kennecott Manager – Tailings and Water Services will report results of water quality sampling and volume pumped from leak detection sumps in the event compliance limits are exceeded to the Director of the Utah Water Quality Board. Maintenance, repair and monthly inspections will be the responsibility of the RTKC Tailings staff.

Kennecott 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 and GCMP.

3.0 Analytical Parameters

All water quality samples from the monitoring sump and reservoir will be analysed for the field measurements (pH, specific conductance, and temperature), major ions (alkalinity, chloride, sulfate, potassium, sodium, magnesium, and calcium), dissolved metals (arsenic, barium, boron, cadmium, chromium, copper, lead, mercury, selenium, and zinc) and TDS. All samples will be analysed using EPA approved methods as specified in Utah Regulation R317-6-6.3.

4.0 Schedule for Water Quality Monitoring and Reporting

4.1 Reservoirs

Water quality samples representing both zones of the Magna Reservoir System are collected on a monthly basis. The sample ID is MCP1416 and is collected from pump station 3A which is the Magna Reservoir System discharge point under normal operation. Water quality sampling results will be submitted to the Director in the form of semi-annual reports of the corresponding half year in which the sampling was conducted.

4.2 Leak Detection Sumps

Piping from respective Reservoirs No.1 and No.2 of the Magna Reservoir System report to respective flow meter stations. The flow meter stations are monitored through a control room on a continuous basis and alarms are programmed to sound in the event threshold allowable leakage rates are exceeded

- The control room will receive an alarm if allowable leakage rates outlined in Table 1 are exceeded.
- Reporting requirements are triggered as outlined in Section I Part F of the permit if the Tier II allowable leakage rate for a respective reservoir is exceeded.

4.3 Monitoring Wells

A series of groundwater monitoring wells listed in Table 1 of the permit are located adjacent to the Magna Reservoir System. These wells monitor groundwater quality and will aid in detection of reservoir failure

should in the unlikely occurrence the early detection system fail in detection. All sampling will be in compliance with the current Kennecott Ground Water Characterization and Monitoring Plan (GCMP).

5.0 Water Quality Sampling Procedures

5.1 Reservoirs

Water quality representing both Reservoir No. 1 and Reservoir No. 2 of the Magna Reservoir System is collected from a sample port from within pump station 3A (MCP1416). Water quality sampling results will be submitted to the Director in the form of semi-annual reports of the corresponding month in which the sampling was conducted.

5.2 Leak Detection Sumps

Kennecott will collect a sample from the corresponding leak detection sump in the event the allowable leakage rate is exceeded.

- Magna Reservoir No.1 flow meter station – MCP2817
- Magna Reservoir No.2 flow meter station – MCP2818

All field measurements and water quality sampling will be collected in accordance with the GCMP. Results will be reported in the corresponding semi-annual report.

5.3 Monitoring Wells

All sampling will be compliant with the current Kennecott GCMP.

6.0 Sample Custody

6.1 Field Operations

The following records and actions will be taken as part of the water quality sampling of the Magna Reservoir System.

- 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- Sample containers will 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 the name of the person(s) performing the sampling.
- Chain-of-Custody Record: In order to establish the documentation necessary to trace sample possession, a 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.
- All sampling will be noted and recorded as required in the GCMP.

6.2 Laboratory Operations

The primary laboratory to be used for analysis of the water quality samples will be the Kennecott Environmental Laboratory (KEL). KEL is certified by the State of Utah (certification No. E-21). Any other laboratories used, if necessary, will be certified by the State of Utah. The laboratories will maintain internal chain-of-custody control in accordance with their own standard quality assurance program. The date and time of analysis, name of person(s) performing the analysis, and methods used, will be documented by the laboratory.

7.0 Internal Quality Control Checks

7.1 Overview

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

7.2 Field Operations

The following description refers to all sampling incorporated into the GCMP and may or may not include a sample specific to this permit or Appendices based upon the random nature of the sampling. 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 GCMP. The results of these duplicate analyses will be reported as required by the GCMP.

7.3 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 for all samples collected within the GCMP. Laboratory equipment maintenance will be in accordance with the Laboratory QA Plan.

8.0 References

Bonaparte, R. and Gross, B.A. 1993. US EPA Project Summary, LDCRS Flow from Double-Lined Landfills and Surface Impoundments.

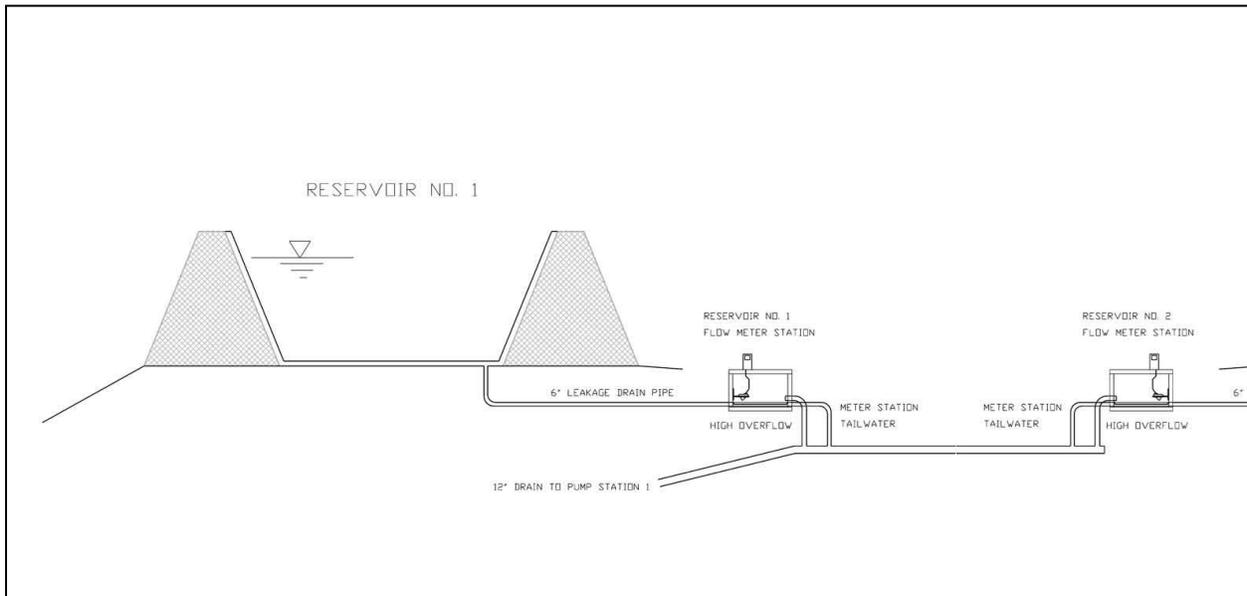


Figure 1
Schematic of Magna Reservoir Leak Detection System

APPENDIX C

Pipeline Inspection and Maintenance Program

FOR

MAGNA RESERVOIRS
GROUND WATER DISCHARGE PERMIT
Permit No. UGW350015**INTRODUCTION**

The Kennecott Utah Copper LLC (Kennecott) has been issued Ground Water Discharge Permit #UGW350015 for the Magna Reservoirs. The Magna Reservoirs physical permit boundaries includes the Magna Process Water Containment and Pumping Facilities that route process water for Kennecott operations. Based on topographical maps the permit area covers approximately 65 acres. The permit specifies monitoring conditions, performance criteria, Best Available Technology (BAT) and development and implementation of a Best Management Practices (BMP) plan to reduce or eliminate the loss of process fluids to ground water.

The pipeline inspection and maintenance plan forms Appendix C of the Magna Reservoirs Ground Water Discharge Permit and is intended to ensure prompt response and cleanup of any spills including proper handling of process fluids and materials as well as an ongoing and robust inspection and maintenance program for permitted facilities. The majority of the pipelines in this permit are located in the subsurface. However, there are areas where the pipelines are above ground:

- The process water pipelines from pump station #1 and pump station #4 are above ground when they enter the permit footprint;

INSPECTION AND MAINTENANCE PROCEDURES**OPERATIONS**

Pipelines at the Magna Reservoirs are controlled and monitored 24 hours a day via a combination of distributed control systems, video imagery, alarms and operator visual inspections. Every section of both facilities pipelines have assigned operators that are responsible for inspecting areas at least once a day to verify systems integrity and operations. Operators are also responsible for rectifying any deficiencies found in piping components or equipment in a timely manner.

MAINTENANCE

Each operational area in the permit area has been assigned personnel responsible for repair and maintenance of all equipment including pipelines. Scheduling of maintenance activities is part of a comprehensive preventive maintenance program (PM). The overall maintenance program utilizes computer assisted preventive maintenance scheduling. A Standard Operating Procedure has been developed for specific pipelines and processes for times of repair and inspection.

INSPECTIONS

The pipelines which are above ground are visually inspected twice per day by operational personnel.

Pipelines located in the subsurface are monitored by pressure switches and/or flow meters which have differential alarm settings in the control room of Tailings. If there is an emergency the operational control room at Tailings is immediately notified. Otherwise a maintenance notification is entered into Kennecott's system as explained in Appendix A of this permit.

Standard Operating Procedures exist for:

- Drain down and Startup of Process Water 3A and 3B (TASOP300-211) which is a guideline for process startup of the pump stations to fill the Copperton Concentrator Reservoir.
- Planned/Unplanned Plant Shutdown Process Water Management (TASOP300-234) which describes the water management plan for shutdowns.
- Magna Reservoir System including pipeline and proper process water valve operation and settings (TASOP300-232) which describes normal operating alignment of water entering the Magna Reservoirs.
- 21st South Pumps (KEJSAUX33) describes the operation and startup of the pump station.