

STATE OF UTAH  
DIVISION OF WATER QUALITY  
DEPARTMENT OF ENVIRONMENTAL QUALITY  
SALT LAKE CITY, UTAH

UTAH POLLUTANT DISCHARGE ELIMINATION SYSTEM (UPDES) PERMITS

Major Industrial Permit No. **UT0000051**  
Biosolids Permit No. **UTL000051**

In compliance with provisions of the Utah *Water Quality Act, Title 19, Chapter 5, Utah Code, as amended* (the "*Act*"),

**KENNECOTT UTAH COPPER LLC**

is hereby authorized to discharge from its facility located near Magna and in western Salt Lake County, Utah, with the outfalls located at the following:

**C-7 DITCH,  
I-80 CULVERT TO GREAT SALT LAKE,  
GREAT SALT LAKE,  
PINE CANYON CREEK, TOOELE COUNTY,  
BUTTERFIELD CREEK,  
RITER-UTAH SALT LAKE CANALS,  
GREAT SALT LAKE,  
INTERNAL DISCHARGE, HYDROMETALLURGICAL PLANT,**

to dispose biosolids,

in accordance with specific limitations, outfalls, and other conditions set forth herein.

**This permit shall become effective on July 1, 2022.**

**This permit expires at midnight on June 30, 2027.**

**Signed this 10<sup>th</sup> day of June, 2022.**



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John K. Mackey, P.E.  
Interim Director

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**I. DISCHARGE LIMITATIONS AND REPORTING REQUIREMENTS**

A. Description of Discharge Points. The authorization to discharge wastewater provided under this part is limited to those outfalls specifically designated below as discharge locations. Discharges at any location not authorized under a UPDES permit are violations of the *Act* and may be subject to penalties under the *Act*. Knowingly discharging from an unauthorized location or failing to report an unauthorized discharge may be subject to criminal penalties as provided under the *Act*.

<b>Outfall</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Description of Discharge Point</b>	<b>Receiving Waters</b>
002	40° 44'30"	112° 05'15"	C-7 Ditch	Tailing pond outfall to C-7 ditch
004	40° 44'06"	112° 11'49"	I-80 culvert to Great Salt Lake	I-80 Culvert to Great Salt Lake
007	40° 46'15"	112° 07'00"	C-7 Ditch	Toe Ditch Pond to C-7 Ditch
008	40° 44'12"	112° 10'25"	Great Salt Lake	Artesian well water, refinery storm water to the Great Salt Lake
009	40° 32'07"	112° 11'39"	Pine Canyon Creek, Tooele County	Pine Canyon Tunnel, Tooele County
010	40° 29'33"	112° 07'20"	Butterfield Creek	Butterfield Tunnel to Butterfield Creek
011	40° 42'52"	112° 06'57"	Ritter-Utah Salt Lake Canals	Adamson Spring to the Ritter-Utah Salt Lake Canals
012	40° 45'20"	112° 10'02"	Great Salt Lake	Tailing discharge to the Great Salt Lake
104	40° 43'27"	112° 11'50"	Internal discharge, Hydrometallurgical Plant	Internal discharge from Hydrometallurgical Plant

B. Narrative Standard. It shall be unlawful, and a violation of this permit, for the permittee to discharge or place any waste or other substance in such a way as will be or may become offensive such as unnatural deposits, floating debris, oil, scum, or other nuisances such as color, odor or taste, or cause conditions which produce undesirable aquatic life or which produce objectionable tastes in edible aquatic organisms; or result in concentrations or combinations of substances which produce undesirable physiological responses in desirable resident fish, or other desirable aquatic life, or undesirable human health effects, as determined by a bioassay or other tests performed in accordance with standard procedures.

C. Specific Limitations and Self-Monitoring Requirements.

1. Effective immediately, and lasting through the life of this permit, there shall be no acute or chronic toxicity in Outfalls 002, 004, 007, 008, 009, 010, 011, 012, and 104 as defined in *Part VIII*, and determined by test procedures described in *Part I. C.7.a & b* of this permit.
2.
  - a. Effective immediately and lasting the duration of this permit, the permittee is authorized to discharge from Outfall 002 and 007. Such discharges shall be limited and monitored by the permittee as specified in Table 2 and 3.

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<b>Table 2</b>						
<b>Outfall 002</b>						
<b>Effluent Limitations</b>						
<b>Self-Monitoring and Reporting Requirements <sup>a</sup></b>						
<b>Parameter</b>	<b>Maximum Monthly Average</b>	<b>Daily Maximum</b>	<b>Daily Minimum</b>	<b>Frequency</b>	<b>Sample Type</b>	<b>Units</b>
Flow	50.0	-	-	Continuous	Recorder	MGD
Total Suspended Solids (TSS)	20	30	-	3 x weekly	Composite	mg/L
Total Arsenic (As)	0.172	0.366	-	3 x weekly	Composite	mg/L
Total Cadmium (Cd)	0.00079	0.008	-	3 x weekly	Composite	mg/L
Total Copper (Cu)	0.0351	0.0557	-	3 x weekly	Composite	mg/L
Total Lead (Pb)	0.0215	0.515	-	3 x weekly	Composite	mg/L
Total Mercury (Hg)	0.000013	0.002	-	3 x weekly	Grab	mg/L
Total Zinc (Zn)	0.224	0.419	-	3 x weekly	Composite	mg/L
Total Selenium (Se) <sup>b, c</sup>	0.012	-	-	Monthly	Grab	mg/L
Total Cyanide	0.0056	0.0241	-	Monthly	Composite	mg/L
Oil & Grease	-	10	-	<sup>d</sup>	Grab	mg/L
Total Dissolved Solids (TDS)	-	-	-	Monthly	Composite	mg/L
pH	-	9.0	6.5	3 x weekly	Grab	SU

**Table 2 References**

- <sup>a.</sup> Samples collected in compliance with the monitoring requirements specified above shall be collected at the outfall to the C-7 ditch prior to mixing with the receiving water.
- <sup>b.</sup> Selenium will be analyzed by EPA Method 200.8 or alternative method approved by the State of Utah Bureau of Laboratory Improvement.
- <sup>c.</sup> 0.012 mg/L is consistent with the requirements of the U.S. Army Corps of Engineers 404 Permit #199450301 and shall not be exceeded at the Lower Lee Creek location north of Interstate 80 during a discharge from outfalls 002 and 007.
- <sup>d.</sup> Oil & Grease will be sampled when sheen is observed.

**End Table 2 References**

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<b>Table 3</b>						
<b>Outfall 007</b>						
<b>Effluent Limitations</b>						
<b>Self-Monitoring and Reporting Requirements <sup>a</sup></b>						
<b>Parameter</b>	<b>Maximum Monthly Average</b>	<b>Daily Maximum</b>	<b>Daily Minimum</b>	<b>Frequency</b>	<b>Sample Type</b>	<b>Units</b>
Flow	15.0	-	-	Continuous	Recorder	MGD
Total Suspended Solids (TSS)	20	30	-	3 x weekly	Composite	mg/L
Total Arsenic (As)	0.222	0.427	-	3 x weekly	Composite	mg/L
Total Cadmium (Cd)	0.00089	0.0093	-	3 x weekly	Composite	mg/L
Total Copper (Cu)	0.0458	0.065	-	3 x weekly	Composite	mg/L
Total Lead (Pb)	0.0284	0.605	-	3 x weekly	Composite	mg/L
Total Mercury (Hg)	0.000015	0.002	-	3 x weekly	Grab	mg/L
Total Zinc (Zn)	0.224	0.5	-	3 x weekly	Composite	mg/L
Total Selenium (Se) <sup>b, c</sup>	0.012	-	-	Monthly	Grab	mg/L
Total Cyanide	0.0056	0.0291	-	Monthly	Composite	mg/L
Oil & Grease	-	10	-	<sup>d</sup>	Grab	mg/L
Total Dissolved Solids (TDS)	-	-	-	Monthly	Composite	mg/L
pH	-	9.0	6.5	3 x weekly	Grab	SU

**Table 3 References**

- <sup>a.</sup> Samples collected in compliance with the monitoring requirements specified above shall be collected at the outfall to the C-7 ditch prior to mixing with the receiving water.
- <sup>b.</sup> Selenium will be analyzed by EPA Method 200.8 or alternative method approved by the State of Utah Bureau of Laboratory Improvement.
- <sup>c.</sup> 0.012 mg/L is consistent with the requirements of the U.S. Army Corps of Engineers 404 Permit #199450301 and shall not be exceeded at the Lower Lee Creek location north of Interstate 80 during a discharge from outfalls 002 and 007.
- <sup>d.</sup> Oil & Grease will be sampled when sheen is observed.

**End Table 3 References**

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- b. Effective immediately and lasting the duration of this permit, the permittee is authorized to discharge from Outfall 012. Such discharges shall be limited and monitored by the permittee as specified in Table 4.

<b>Table 4</b>							
<b>Outfall 012</b>							
<b>Effluent Limitations</b>							
<b>Self-Monitoring and Reporting Requirements <sup>a, b, c, d</sup></b>							
<b>Parameter</b>	<b>Maximum Monthly Average</b>	<b>Daily Maximum</b>	<b>Daily Minimum</b>	<b>Annual Max</b>	<b>Frequency</b>	<b>Sample Type</b>	<b>Units</b>
Flow	-	-	-	6468	Continuous	Recorder	MGY <sup>e</sup>
Total Suspended Solids (TSS)	20	30	-	-	Monthly	Composite	mg/L
Total Arsenic (As)	0.25	0.5	-	-	Daily	Composite	mg/L
Total Cadmium (Cd)	0.05	0.10	-	-	Daily	Composite	mg/L
Total Copper (Cu)	0.15	0.3	-	-	Daily	Composite	mg/L
Total Lead (Pb)	0.30	0.6	-	-	Daily	Composite	mg/L
Total Mercury (Hg) <sup>f</sup>	0.001	0.002	-	-	Monthly	Grab	mg/L
Total Zinc (Zn)	0.224	0.5	-	-	Daily	Composite	mg/L
Total Cyanide	0.1	0.2	-	-	Monthly	Grab	mg/L
Total Selenium (Se) <sup>g</sup>	-	0.054	-	-	Monthly	Composite	mg/L
Total Selenium (Se), load	-	-	-	900 <sup>h</sup>	Monthly	Calculated	Kg
Selenium	-	-	-	-	Annually	See Section I.C.4. of permit UT0000051	
Total Dissolved Solids (TDS)	-	-	-	-	Monthly	Composite	mg/L
Oil & Grease	-	10	-	-	<sup>i</sup>	Grab	mg/L
pH	-	9.0	6.5	-	Daily	Grab	SU
WET Acute Biomonitoring	-	LC <sub>50</sub> > 100% Effluent	-	-	Quarterly	Composite	-
WET Chronic Biomonitoring	-	TU <sub>c</sub> ≤ 1.6 <sup>j</sup>	-	-	Quarterly	Composite	-

**Table 4 References**

- a. See Definitions, *Part VIII* for definition of terms.
- b. Samples taken in compliance with the monitoring requirements specified above shall be taken at the outfall to the Great Salt Lake prior to mixing with the receiving water.
- c. There shall be no untreated sanitary wastewater discharged into the tailings impoundment.
- d. There shall be no floating solids or visible foam in other than trace amounts.
- e. Annual discharge will be limited annually to 6468 million gallons a year (19,850-acre feet/year)
- f. The mercury analytical method must be EPA Method 1631 used on grab samples collected from the tailings impoundment barge.

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- g. Selenium will be analyzed by EPA Method 200.8 or alternative method approved by the State of Utah Bureau of Laboratory Improvement.
- h. To ensure continued protection for Gilbert Bay, the contributions of selenium from Outfall 004 and 008 are included in the annual loading limit of 900 kg/yr the previous permit the limit was applicable to Outfall 012 only.
- i. Oil & Grease will be sampled when sheen is observed.
- j. TUC is calculated by dividing the receiving water effluent concentration determined in accordance with R317-2-5 by the chronic test IC<sub>25</sub>. The TUC is an indicator and an exceedance is not used for determining compliance.

**End Table 4 References**

- c. Effective immediately and lasting the duration of this permit, the permittee is authorized to discharge from Outfall 104. Such discharges shall be limited and monitored by the permittee as specified in Table 5 (this is Table 10 in the FSSOB).

<b>Table 5</b>					
<b>Outfall 104</b>					
<b>Effluent Limitations</b>					
<b>Self-Monitoring and Reporting Requirements <sup>a</sup></b>					
<b>Parameter</b>	<b>Maximum Monthly Average</b>	<b>Daily Maximum</b>	<b>Frequency</b>	<b>Sample Type</b>	<b>Units</b>
Flow	-	-	Continuous	Recorder	MGD
Total Suspended Solids (TSS)	237	296	Weekly	Composite	lb/day
Total Arsenic (As)	11.3	27.4	Weekly	Composite	lb/day
Total Cadmium (Cd)	1.57	3.93	Weekly	Composite	lb/day
Total Copper (Cu)	12.1	25.3	Weekly	Composite	lb/day
Total Lead (Pb)	2.56	5.51	Weekly	Composite	lb/day
Total Zinc (Zn)	8.26	20.1	Weekly	Composite	lb/day

**Table 5 References**

- <sup>a</sup> See Definitions, *Part VIII* for definition of terms.

**End Table 5 References**



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- d. Effective immediately and lasting the duration of this permit, the permittee is authorized to discharge from Outfall 004. Such discharges shall be limited and monitored by the permittee as specified in Table 6 (this is Table 11 in the FSSOB).

<b>Table 6</b>							
<b>Outfall 004</b>							
<b>Effluent Limitations</b>							
<b>Self-Monitoring and Reporting Requirements <sup>a, b, c</sup></b>							
<b>Parameter</b>	<b>Maximum Monthly Average</b>	<b>Daily Maximum</b>	<b>Daily Minimum</b>	<b>Annual Max</b>	<b>Frequency</b>	<b>Sample Type</b>	<b>Units</b>
Flow	-	-	-	-	Quarterly	Measured	MGD
Total Suspended Solids (TSS)	-	-	-	-	Quarterly	Grab	mg/L
Total Arsenic (As)	-	-	-	-	Quarterly	Grab	mg/L
Total Cadmium (Cd)	-	-	-	-	Quarterly	Grab	mg/L
Total Copper (Cu)	-	-	-	-	Quarterly	Grab	mg/L
Total Lead (Pb)	-	-	-	-	Quarterly	Grab	mg/L
Total Mercury (Hg) <sup>d</sup>	-	-	-	-	Quarterly	Grab	mg/L
Total Zinc (Zn)	-	-	-	-	Quarterly	Grab	mg/L
Total Selenium (Se)	-	-	-	-	Quarterly	Grab	mg/L
Total Dissolved Solids (TDS)	-	-	-	-	Quarterly	Grab	mg/L
Total Selenium (Se), load	-	-	-	900 <sup>e</sup>	Monthly	Calculated	Kg
Oil & Grease	-	-	-	-	<sup>f</sup>	Grab	mg/L
pH	-	-	-	-	Quarterly	Grab	SU

**Table 6 References**

- a. See Definitions, *Part VIII* for definition of terms.
- b. There shall be no floating solids or visible foam in other than trace amounts.
- c. Discharges from outfall 004 are not limited on flow, but will be monitored and reported if a discharge occurs.
- d. The mercury analytical method must be EPA Method 1631 used on grab samples collected from the tailings impoundment barge.
- e. To ensure continued protection for Gilbert Bay, the contributions of selenium from Outfall 004 and 008 are included in the annual loading limit of 900 kg/yr in the previous permit the limit was applicable to Outfall 012 only.
- f. Oil & Grease will be sampled when sheen is observed.

**End Table 6 References**

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- e. Effective immediately and lasting the duration of this permit, the permittee is authorized to discharge from Outfall 008. Such discharges shall be limited and monitored by the permittee as specified in Table 7 (this is Table 12 in the FSSOB).

<b>Table 7</b>							
<b>Outfall 008</b>							
<b>Effluent Limitations</b>							
<b>Self-Monitoring and Reporting Requirements <sup>a, b</sup></b>							
<b>Parameter</b>	<b>Maximum Monthly Average</b>	<b>Daily Maximum</b>	<b>Daily Minimum</b>	<b>Annual Max</b>	<b>Frequency</b>	<b>Sample Type</b>	<b>Units</b>
Flow	5.5	-	-	-	Quarterly	Measured	MGD
Total Suspended Solids (TSS)	20	30	-	-	Quarterly	Grab	mg/L
Total Arsenic (As)	0.25	0.50	-	-	Quarterly	Grab	mg/L
Total Cadmium (Cd)	0.05	0.10	-	-	Quarterly	Grab	mg/L
Total Copper (Cu)	0.15	0.30	-	-	Quarterly	Grab	mg/L
Total Lead (Pb)	0.30	0.60	-	-	Quarterly	Grab	mg/L
Total Mercury (Hg) <sup>c</sup>	0.001	0.002	-	-	Quarterly	Grab	mg/L
Total Zinc (Zn)	0.224	0.50	-	-	Quarterly	Grab	mg/L
Total Selenium (Se)	-	0.054	-	-	Quarterly	Grab	mg/L
Total Dissolved Solids (TDS)	-	-	-	-	Quarterly	Grab	mg/L
Total Selenium (Se), load	-	-	-	900 <sup>d</sup>	Monthly	Calculated	Kg
Oil & Grease	-	10	-		<sup>e</sup>	Grab	mg/L
pH	-	9.0	6.5		Quarterly	Grab	SU

**Table 7 References**

- a. See Definitions, Part VIII for definition of terms.
- b. There shall be no floating solids or visible foam in other than trace amounts.
- c. The mercury analytical method must be EPA Method 1631 used on grab samples collected from the tailings impoundment barge.
- d. To ensure continued protection for Gilbert Bay, the contributions of selenium from Outfall 004 and 008 are included in the annual loading limit of 900 kg/yr in the previous permit the limit was applicable to Outfall 012 only.
- e. Oil & Grease will be sampled when sheen is observed.

**End Table 7 References**

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- f. Effective immediately and lasting the duration of this permit, the permittee is authorized to discharge from Outfall 009. Such discharges shall be limited and monitored by the permittee as specified in Table 8 (this is Table 13 in the FSSOB).

<b>Table 8</b>						
<b>Outfall 009</b>						
<b>Effluent Limitations</b>						
<b>Self-Monitoring and Reporting Requirements <sup>a, b</sup></b>						
<b>Parameter</b>	<b>Maximum Monthly Average</b>	<b>Daily Maximum</b>	<b>Daily Minimum</b>	<b>Frequency</b>	<b>Sample Type</b>	<b>Units</b>
Flow	0.086	-	-	2 x Yearly	Measured	MGD
Total Suspended Solids (TSS)	20	30	-	2 x Yearly	Grab	mg/L
Total Arsenic (As)	0.25	0.5	-	2 x Yearly	Grab	mg/L
Total Cadmium (Cd)	0.00158	0.0021	-	2 x Yearly	Grab	mg/L
Total Copper (Cu)	0.0172	0.0155	-	2 x Yearly	Grab	mg/L
Total Lead (Pb)	0.0012	0.0716	-	2 x Yearly	Grab	mg/L
Total Mercury (Hg)	0.001	0.002	-	2 x Yearly	Grab	mg/L
Total Zinc (Zn)	0.228	0.144	-	2 x Yearly	Grab	mg/L
Total Selenium (Se) <sup>c</sup>	0.012	-	-	2 x Yearly	Grab	mg/L
Total Dissolved Solids (TDS)	-	-	-	2 x Yearly	Grab	mg/L
Oil & Grease	-	10	-	<sup>d</sup>	Grab	mg/L
pH	-	9.0	6.5	2 x Yearly	Grab	SU

**Table 8 References**

- <sup>a.</sup> See Definitions, *Part VIII* for definition of terms.
- <sup>b.</sup> There shall be no floating solids or visible foam in other than trace amounts.
- <sup>c.</sup> Selenium will be analyzed by Method 200.8 or alternative method approved by the State of Utah Bureau of Laboratory Improvement.
- <sup>d.</sup> Oil & Grease will be sampled when sheen is observed.

**End Table 8 References**

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- g. Effective immediately and lasting the duration of this permit, the permittee is authorized to discharge from Outfall 010. Such discharges shall be limited and monitored by the permittee as specified in Table 9 (this is Table 14 in the FSSOB).

<b>Table 9</b>						
<b>Outfall 010</b>						
<b>Effluent Limitations</b>						
<b>Self-Monitoring and Reporting Requirements <sup>a, b</sup></b>						
<b>Parameter</b>	<b>Maximum Monthly Average</b>	<b>Daily Maximum</b>	<b>Daily Minimum</b>	<b>Frequency</b>	<b>Sample Type</b>	<b>Units</b>
Flow	0.65	-	-	Quarterly	Measured	MGD
Total Suspended Solids (TSS)	20	30	-	Quarterly	Grab	mg/L
Total Arsenic (As)	-	0.10	-	Quarterly	Grab	mg/L
Total Cadmium (Cd)	0.0013	0.0066	-	Quarterly	Grab	mg/L
Total Copper (Cu)	-	0.038	-	Quarterly	Grab	mg/L
Iron (Fe)	-	1.09				
Total Lead (Pb)	0.023	0.100	-	Quarterly	Grab	mg/L
Total Mercury (Hg) <sup>c</sup>	0.00002	0.00023	-	Quarterly	Grab	mg/L
Total Zinc (Zn)	0.323	0.493	-	Quarterly	Grab	mg/L
Total Selenium (Se) <sup>d</sup>	0.005	0.0184	-	Quarterly	Grab	mg/L
Total Dissolved Solids (TDS)	-	1200	-	Quarterly	Grab	mg/L
Oil & Grease	-	10	-	<sup>e</sup>	Grab	mg/L
pH	-	9.0	6.5	Quarterly	Grab	SU

**Table 9 References**

- a. See Definitions, *Part VIII* for definition of terms.
- b. There shall be no floating solids or visible foam in other than trace amounts.
- c. Kennecott will voluntarily analyze mercury using a low-level total mercury analysis.
- d. Selenium will be analyzed by Method 200.8 or alternative method approved by the State of Utah Bureau of Laboratory Improvement.
- e. Oil & Grease will be sampled when sheen is observed.

**End Table 9 References**

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- h. Effective immediately and lasting the duration of this permit, the permittee is authorized to discharge from Outfall 011. Such discharges shall be limited and monitored by the permittee as specified in Table 10 (this is Table 15 in the FSSOB).

<b>Table 10</b>						
<b>Outfall 011</b>						
<b>Effluent Limitations</b>						
<b>Self-Monitoring and Reporting Requirements <sup>a, b, c</sup></b>						
<b>Parameter</b>	<b>Maximum Monthly Average</b>	<b>Daily Maximum</b>	<b>Daily Minimum</b>	<b>Frequency</b>	<b>Sample Type</b>	<b>Units</b>
Flow	3.9	-	-	Quarterly	Measured	MGD
Total Suspended Solids (TSS)	20	30	-	Quarterly	Grab	mg/L
Total Arsenic (As)	-	0.013	-	Quarterly	Grab	mg/L
Total Cadmium (Cd)	0.0013	0.010	-	Quarterly	Grab	mg/L
Total Copper (Cu)	0.102	0.119	-	Quarterly	Grab	mg/L
Total Lead (Pb)	0.0662	0.010	-	Quarterly	Grab	mg/L
Total Zinc (Zn)	0.224	0.50	-	Quarterly	Grab	mg/L
Total Selenium (Se) <sup>d</sup>	0.0058	0.013	-	Quarterly	Grab	mg/L
Total Dissolved Solids (TDS)	-	-	-	Quarterly	Grab	mg/L
Oil & Grease	-	10	-	<sup>e</sup>	Grab	mg/L
pH	-	9.0	6.5	Quarterly	Grab	SU

**Table 10 References**

- a. See Definitions, *Part VIII* for definition of terms.
- b. For intermittent discharges, the duration of the discharge shall be reported.
- c. There shall be no floating solids or visible foam in other than trace amounts.
- d. Selenium will be analyzed by Method 200.8 or alternative method approved by the State of Utah Bureau of Laboratory Improvement.
- e. Oil & Grease will be sampled when sheen is observed.

**End Table 10 References**

3. ***Joint Discharge Area Transitional Waters Monitoring Program:*** Kennecott is required to annually sample eight (8) bird eggs, if available, but not exceed 20% of available eggs, during the nesting season, April 15 through June 30, for the current permit cycle. The eggs will be collected from bird nests in the joint Jordan Valley Outfall 001 and Kennecott Outfall 012 affected outfall area. The geometric mean selenium concentration of all of the eggs but at least 5 eggs from a single season will be compared to the tissue-based selenium water quality standard of 12.5 mg/kg dry weight for Gilbert Bay of Great Salt Lake to demonstrate compliance with the Narrative Standards in the Class 5E Transitional Waters affected by the discharge. Kennecott must notify the Director within 7 business days of becoming aware of any egg concentrations that exceed 9.8 mg/kg. In addition, total mercury concentrations in the egg tissue samples must also be evaluated and reported by Kennecott.

Kennecott will conduct annual bird surveys approximately every two weeks between April 15 and June 30 (at least four times per season) to document bird abundance, diversity, and use of the Outfall 012 mud flat habitat, particularly for evidence of feeding and nesting. This data will be submitted in the Annual Project Operating Report.

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Kennecott is required to annually collect co-located macro-invertebrate and water samples once between April 15 and June 30 and as close in time as practical to the bird egg collection. These samples will be analyzed for selenium. Water samples will be analyzed for methyl and total mercury and biota samples will be analyzed for total mercury. The co-located macro-invertebrates and water samples will be collected at up to six (6) evenly spaced locations along the discharge watercourse from the discharge point to the water's edge from where Outfall 012 enters the standing waters of Great Salt Lake.

Kennecott is required to biannually collect co-located brine shrimp and water samples twice per year from the open waters of Gilbert Bay in the vicinity of the outfall. Sample collection is constrained by brine shrimp dynamics in the sampling area as brine shrimp may not always be present when sampling is attempted. The intent is to collect brine shrimp samples as close as available to where the effluent waters enter Gilbert Bay between April 15 and June 30 and in October. The water sample will be analyzed for total and methyl mercury and selenium. The brine shrimp sample will be analyzed for total mercury and selenium.

DWQ strongly recommends that Kennecott coordinate with other facilities that discharge in the same delta to avoid needless duplication and further impact to avian wildlife in the delta area. Other monitoring requirements may be shared if appropriate. The Director shall be notified as soon as possible, but no later than April 1, if the efforts to coordinate monitoring with other dischargers to the delta area are unsuccessful. The sampling and analyses will be completed in accordance a sampling plan approved by the Director. The sampling plan may be modified with Director approval. The detailed field and laboratory data, analysis and a summary of the results from the bird surveys, egg samples and co-located water, sediment and macro-invertebrates monitoring must be submitted to the DWQ by February 1, or another agreed upon date, following the end of the calendar year for which the results were obtained as a part of the Annual Project Operating Report.

4. ***Implementation of the 12.5 mg/kg Se Tissue Based Standard:*** Kennecott is subject to the following actions when the annual geometric mean dry weight concentrations of all the eggs but a minimum of 5 are measured in bird eggs collected for the Joint Discharge Area Transitional Waters Monitoring Program:

9.8 to 12.4 mg/kg Se and above: Kennecott will prepare and if necessary, implement a plan to decrease bird exposures to Se from the effluent unless Kennecott can demonstrate to the Director's satisfaction that the discharge is not the cause of the increasing Se concentrations in eggs. The plan, including an implementation schedule, must be approved by the Director within 180 days of notice that this condition exists.

12.5 mg/kg Se and above: The reopener provision for this permit will be exercised and Kennecott will be subject to additional Se reductions unless Kennecott can demonstrate to the Director's satisfaction that the discharge is not the cause of the Se exceedances in eggs. If these waters are determined to be impaired, Kennecott may be subject to additional Se reductions under the TMDL process.

5. ***Storm Exemptions***
  - a. If, as a result of precipitation or snowmelt Outfalls 002, 007, and/or 012 has an overflow or excess discharge of effluent which does not meet the limitations contained in Part I.D, pursuant to 40 CFR 440.131(b), Outfalls 002 and/or 012 may qualify for an exemption from such limitations if the permittee notifies the Director of the event in writing within thirty days of the event and the following conditions are met:

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- i. The facility is designed, constructed, and maintained to contain 6053-acre feet at the North expansion impoundment. This is the volume which would be generated by the permittee in a 24-hour period without an increase in volume from precipitation plus the maximum volume of wastewater resulting from a 10-year, 24-hour precipitation event. The facility must be capable of storing the above volumes or be capable of treating the maximum flow associated with these volumes.
  - ii. The permittee takes all reasonable steps to maintain treatment of the wastewater such as adding lime to maintain pH in the range of 6.5 to 9.0 in the effluent and minimizes the amount of overflow such as not discharging leach water to the tailings pond except for storm runoff at the mine exceeding the 10-year 24-hour storm volume and the conditions of Part I.C.
  - iii. The discharge is analyzed for the parameters listed in Part I.C.
  - iv. The discharge is reported pursuant to Part V.
  - v. The storm exemption is designed to provide an affirmative defense to an enforcement action. Therefore, the permittee has the burden of demonstrating to the Director that the above conditions have been met.
- 2) If, as a result of precipitation or snowmelt, other areas of the mine operations have an overflow or discharge which does not meet the limitations established pursuant to 40 CFR 440.131 (b), as deemed applicable, the permittee may qualify for an exemption from such limitations with respect to such discharge if the permittee notifies the Director of the event in writing within thirty days of the event and the following conditions are met:
- i. The facility is designed, constructed, and maintained to contain the maximum volume of wastewater stored by the facility during normal operating conditions (without an increase in volume from precipitation) plus the maximum volume of wastewater resulting from 10-year, 24-hour precipitation event. In computing the maximum volume of wastewater which would result from a 10-year, 24-hour precipitation event, the permittee must include the volume which would result from all areas contributing runoff to the facility, i.e., all runoff that is not diverted from the area, or process subject to zero discharge, and other runoff that is allowed to commingle with the influent to the treatment system.
  - ii. The permittee takes all reasonable steps to minimize the overflow or excess discharge such as containment and reuse where practical.
  - iii. The permittee complies with the notification requirements of the permit. The storm exemption is designed to provide an affirmative defense to an enforcement action. Therefore, the operator has the burden of demonstrating to the appropriate authority that the above conditions have been met.

**6. *Compliance Schedule***

There is no Compliance Schedule included in this renewal permit.

7. Acute/Chronic Whole Effluent Toxicity (WET) Testing.

- a. *Whole Effluent Testing – Acute Toxicity.* Effective immediately, the permittee shall quarterly conduct acute static renewal toxicity tests on a composite sample of the final effluent at Outfall 012. The sample shall be collected at the point of compliance before mixing with the receiving water.

Effective immediately, the permittee will sample monthly the calcium concentration of the 012 outfall. If the calcium concentration drops below 350 mg/L, a 96-hour acute toxicity test using *Mysidopsis bahia* (mysid shrimp) will be conducted to determine the appropriateness of this species for the 012 outfall.

The monitoring frequency for acute tests shall be quarterly unless a sample is found to be acutely toxic during a routine test. If that occurs, the monitoring frequency shall become weekly (See Part I.C.7.c., Accelerated Testing). Unless otherwise approved by the Director, samples shall be collected on a two-day progression; i.e., if the first sample is on a Monday, during the next sampling period, the sampling shall begin on a Wednesday, etc.

The static-renewal acute toxicity tests shall be conducted in general accordance with the procedures set out in the latest revision of Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition, October 2002, EPA-821-R-02-012 as per 40 CFR 136.3(a) TABLE IA-LIST OF APPROVED BIOLOGICAL METHODS. For Outfall 012, the permittee shall conduct the 96-hour static renewal toxicity test and a 7-day chronic static renewal toxicity test using *Cyprinodon variegatus*. Based on the Test Acceptability Criteria included in Utah Pollutant Discharge Elimination System (UPDES) Permit and Enforcement Guidance Document for Whole Effluent Toxicity Control (Biomonitoring) February, 2018, the Director may require acceptable variations in the test, i.e. temperature, carbon dioxide atmosphere, or any other acceptable variations in the testing procedure, as documented in the Fact Sheet Statement of Basis. If possible, dilution water should be taken from the receiving stream. A valid replacement test is required within the specified sampling period to remain in compliance.

Acute toxicity occurs when 50 percent or more mortality is observed for either species at any effluent concentration. Mortality in the control must simultaneously be 10 percent or less for the results to be considered valid. If more than 10 percent control mortality occurs, the test shall be repeated until satisfactory control mortality is achieved. The permittee shall meet all QA/QC requirements of the acute WET testing method listed in this Section of the permit.

If the permit contains a total residual chlorine limitation such that it may interfere with WET testing (>0.20 mg/L), the permittee may dechlorinate the sample in accordance with approved USEPA methods for WET testing the sample. If dechlorination is affecting the test, the permittee may collect the sample just before chlorination with Director approval.

Quarterly test results shall be reported along with the Discharge Monitoring Report (DMR) submitted for the end of the required reporting period (month, quarter or semi-annual) e.g., biomonitoring results for the calendar quarter ending March 31 shall be reported with the DMR due April 28, with the remaining biomonitoring reports submitted with DMRs due each July 28, October 28, and January 28. Monthly test



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results shall be reported along with the DMR submitted for that month. The format for the report shall be consistent with Appendix C of “Utah Pollutant Discharge Elimination System (UPDES) Permitting and Enforcement Guidance Document for Whole Effluent Toxicity (Biomonitoring), Utah Division of Water Quality, February 2018.

b. *Whole Effluent Testing – Chronic Toxicity.*

Chronic WET tests are considered an indicator for Class 5 waters (Great Salt Lake) because of uncertainties regarding the representativeness of the standard test species for Great Salt Lake. If a separate acute test is not conducted, the results of the acute duration portion of a chronic test are reported as specified in Part I.C.7.a. Whole Effluent Testing – Acute Toxicity. As an indicator, the chronic test results can demonstrate compliance with portions of the Narrative Standards (R317-2-7.2). However, the chronic WET test results alone do not demonstrate noncompliance with the Narrative Standards. As indicators, the chronic WET test results alone are not used for determining reasonable potential for toxicity or noncompliance with the permit.)

Effectively immediately, the permittee shall quarterly, conduct chronic static renewal toxicity tests on a composite sample of the final effluent at Outfall 012. The sample shall be collected at the point of compliance before mixing with the receiving water.

Three samples are required and samples shall be collected on Monday, Wednesday and Friday of each sampling period or collected on a two-day progression for each sampling period. This may be changed with Director approval. The chronic toxicity tests shall be conducted in general accordance with the procedures set out in the latest revision of *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Marine and Estuarine Organisms, Third Edition*, October 2002 EPA-821-R-02-014 as per 40 CFR 136.3(a) TABLE IA-LIST OF APPROVED BIOLOGICAL METHODS.

A multi dilution test consisting of at least five concentrations and a control is required at two dilutions below and two above the Receiving Water Concentration (RWC), if possible. If test acceptability criteria are not met for control survival, growth, or reproduction, the test shall be considered invalid. A valid replacement test is required within the specified sampling period to remain in compliance with this permit. For Outfall 012, chronic toxicity occurs when, during a chronic toxicity test, the  $TU_c$  is greater than 1.6. Toxic unit chronic ( $TU_c$ ) is the reciprocal of the effluent concentration that causes no observable effect on the test organisms by the end of the chronic exposure period and is calculated as  $100/LC_{25}$ . If a sample is found to be chronically toxic during a routine test, the monitoring frequency shall become biweekly (see *Part I.C.7.c. Accelerated Testing*).

If the permit contains a total residual chlorine limitation such that it may interfere with WET testing ( $>0.20$  mg/L), the permittee may dechlorinate the sample in accordance with the standard method. If dechlorination is negatively affecting the test, the permittee may collect the sample just before chlorination with Director approval.

Quarterly test results shall be reported along with the Discharge Monitoring Report (DMR) submitted for the end of the required reporting period (e.g., biomonitoring results for the calendar quarter ending March 31 shall be reported with the DMR due April 28, with the remaining biomonitoring reports submitted with DMRs due each July 28, October 28, and January 28). Monthly test results shall be reported along with the DMR submitted for that month. The format for the report shall be consistent with

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Appendix C of “Utah Pollutant Discharge Elimination System (UPDES) Permitting and Enforcement Guidance Document for Whole Effluent Toxicity, Utah Division of Water Quality, February, 2018.

- c. *Accelerated Testing.* When whole effluent toxicity is indicated during routine WET testing as specified in this permit, the permittee shall notify the Director in writing within 5 days after becoming aware of the test result. The permittee shall perform an accelerated schedule of WET testing to establish whether a pattern of toxicity exists unless the permittee notifies the Director and commences a Preliminary Toxicity Investigation (PTI), Toxicity Identification Evaluation (TIE), or a Toxicity Reduction Evaluation (TRE). Accelerated testing or the PTI, TIE, or TRE will begin within fourteen days after the permittee becomes aware of the test result. Accelerated testing shall be conducted as specified under Part I.C.7.d. Pattern of Toxicity. If the accelerated testing demonstrates no pattern of toxicity, routine monitoring shall be resumed.
- d. *Pattern of Toxicity.* A pattern of toxicity is defined by the results of a series of up to five biomonitoring tests pursuant to the accelerated testing requirements using a full set of dilutions for acute (five plus the control) and five effluent dilutions for chronic (five plus the control), on the species found to be more sensitive, once every week for up to five consecutive weeks for acute and once every two weeks up to ten consecutive weeks for chronic.

If two (2) consecutive tests (not including the scheduled test which triggered the search for a pattern of toxicity) do not result in an exceedance of the acute or chronic toxicity criteria, no further accelerated testing will be required and no pattern of toxicity will be found to exist. The permittee will provide written verification to the Director within 5 days of determining no pattern of toxicity exists, and resume routine monitoring.

A pattern of toxicity may or may not be established based on the following:

WET tests should be run at least weekly (acute) or every two weeks (chronic) (note that only one test should be run at a time), for up to 5 tests, until either:

- 1) 2 consecutive tests fail, or 3 out of 5 tests fail, at which point a pattern of toxicity will have been identified, or
- 2) 2 consecutive tests pass, or 3 out of 5 tests pass, in which case no pattern of toxicity is identified.

- e. *Preliminary Toxicity Investigation. (PTI)*

- 1) When a pattern of toxicity is detected the permittee will notify the Director in writing within 5 days and begin an evaluation of the possible causes of the toxicity. The permittee will have 15 working days from demonstration of the pattern of toxicity to complete an optional PTI and submit a written report of the results to the Director. The PTI may include, but is not limited to: additional chemical and biological monitoring, examination of pretreatment program records, examination of discharge monitoring reports, a thorough review of the testing protocol, evaluation of treatment processes and chemical use, inspection of material storage and transfer areas to determine if any spill may have occurred.
- 2) If the PTI identifies a probable toxicant and/or a probable source of toxicity, the permittee shall submit, as part of its final results, written notification of that effect to the Director. Within thirty days of completing the PTI the permittee shall

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submit to the Director for approval a control program to control effluent toxicity and shall proceed to implement such plan in accordance with the Director's approval. The control program, as submitted to or revised by the Director, will be incorporated into the permit. After final implementation, the permittee must demonstrate successful removal of toxicity by passing a two species WET test as outlined in this permit. With adequate justification, the Director may extend these deadlines.

- 3) If no probable explanation for toxicity is identified in the PTI, the permittee shall notify the Director as part of its final report, along with a schedule for conducting a Phase I TRE (see Part I.C.7.f. TRE)
  - 4) If toxicity spontaneously disappears during the PTI, the permittee shall submit written notification to that effect to the Director, with supporting testing evidence.
- f. *Toxicity Reduction Evaluation (TRE)*. If a pattern of toxicity is detected the permittee shall initiate a TIE/TRE within 7 days unless the Director has accepted the decision to complete a PTI. With adequate justification, the Director may extend the 7-day deadline. The purpose of the TIE portion of a TRE will be to establish the cause of the toxicity, locate the source(s) of the toxicity, and the TRE will control or provide treatment for the toxicity.

A TRE may include but is not limited to one, all, or a combination of the following:

- 1) Phase I – Toxicity Characterization
- 2) Phase II – Toxicity Identification Procedures
- 3) Phase III – Toxicity Control Procedures
- 4) Any other appropriate procedures for toxicity source elimination and control.

If the TRE establishes that the toxicity cannot be immediately eliminated, the permittee shall submit a proposed compliance plan to the Director. The plan shall include the proposed approach to control toxicity and a proposed compliance schedule for achieving control. If the approach and schedule are acceptable to the Director, this permit may be reopened and modified.

If toxicity spontaneously disappears during the TIE/TRE, the permittee shall submit written notification to that effect to the Director.

If the TRE shows that the toxicity is caused by a toxicant(s) that may be controlled with specific numerical limitations, the permittee shall submit the following:

- i. An alternative control program for compliance with the numerical requirements.
- ii. If necessary, as determined by the Director, provide a modified biomonitoring protocol which compensates for the pollutant(s) being controlled numerically.

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This permit may be reopened and modified to incorporate any additional numerical limitations, a modified compliance schedule if judged necessary by the Director, and/or modified WET testing requirements without public notice.

Failure to conduct an adequate TIE/TRE plan or program as described above, or the submittal of a plan or program judged inadequate by the Director, shall be considered a violation of this permit. After implementation of TIE/TRE plan, the permittee must demonstrate successful removal of toxicity by passing a two species WET test as outlined in this permit.

**D. Reporting of Monitoring Results.**

**1. Reporting of Wastewater Monitoring Results**

Monitoring results obtained during the previous month shall be summarized for each month and reported on NetDMR no later than the 28<sup>th</sup> day of the month following the completed reporting period. If no discharge occurs during the reporting period, "no discharge" shall be reported. Legible copies of these, and all other reports including whole effluent toxicity (WET) test reports required herein, shall be signed and certified in accordance with the requirements of *Signatory Requirements (see Part VII.G)*, and submitted by NetDMR.

2. The Annual Project Operating Report is due by February 1st of the following year to the Division of Water Quality.

3. The Selenium loading for Outfall 004, 008, and 012 will be reported in NetDMR with a combined total.

## II. PRETREATMENT REQUIREMENTS

- A. Discharge to POTW. Any wastewaters discharged to the sanitary sewer, either as a direct discharge or as a hauled waste, are subject to Federal, State and local pretreatment regulations. Pursuant to Section 307 of The Water Quality Act of 1987, the permittee shall comply with all applicable federal General Pretreatment Regulations promulgated at 40 CFR 403, the State Pretreatment Requirements at *UAC R317-8-8*, and any specific local discharge limitations developed by the Publicly Owned Treatment Works (POTW) accepting the wastewaters. At a minimum the discharge, into a POTW, must meet the requirements of Part II of the permit.
- B. Hazardous Waste Notification. The permittee must notify the POTW, the EPA Regional Waste Management Director, and the State hazardous waste authorities, in writing, if they discharge any substance into a POTW which if otherwise disposed of would be considered a hazardous waste under 40 CFR 261. This notification must include the name of the hazardous waste, the EPA hazardous waste number, and the type of discharge (continuous or batch).
- C. General and Specific Prohibitions.
1. General Prohibitions. The permittee may not introduce into a POTW any pollutant(s) which cause Pass Through or Interference. These general prohibitions and the specific prohibitions in paragraph 2. of this section apply to the introducing pollutants into a POTW whether or not the permittee is subject to other National Pretreatment Standards or any national, State, or local Pretreatment Requirements.
  2. Specific Prohibitions. The following pollutants shall not be introduced into a POTW:
    - a. Pollutants which create a fire or explosion hazard in the publicly owned treatment works (POTW), including, but not limited to, wastestreams with a closed cup flashpoint of less than 140°F (60°C);
    - b. Pollutants, which will cause corrosive structural damage to the POTW, but in no case, discharges with a pH lower than 5.0;
    - c. Solid or viscous pollutants in amounts which will cause obstruction to the flow in the POTW resulting in interference;
    - d. Any pollutant, including oxygen demanding pollutants (BOD, etc.), released in a discharge at such volume or strength as to cause interference in the POTW;
    - e. Heat in amounts, which will inhibit biological activity in the POTW, resulting in interference, but in no case, heat in such quantities that the influent to the sewage treatment works exceeds 104°F (40°C));
    - f. Petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass through;
    - g. Pollutants, which result in the presence of toxic gases, vapor, or fumes within the POTW in a quantity that may cause worker health or safety problems;
    - h. Any trucked or hauled pollutants, except at discharge points designated by the POTW;  
or
    - i. Any pollutant that causes pass through or interference at the POTW.
    - j. Any specific pollutant which exceeds any local limitation established by the POTW.

**PART II**  
**DISCHARGE PERMIT NO. UT0000051**  
**PRETREATMENT**

- D. Categorical Standards. In addition to the general and specific limitations expressed in *Part II. C.* of this section, applicable National Categorical Pretreatment Standards must be met by all industrial users discharging into a POTW. These standards are published in the federal regulations at *40 CFR 405 through 471*.
- E. Definitions. For this section the following definitions shall apply:
1. *Indirect Discharge* means the introduction of pollutants into a publicly-owned treatment works (POTW) from any non-domestic source regulated under section 307 (b), (c) or (d) of the CWA.
  2. *Interference* means a discharge which, alone or in conjunction with a discharge or discharges from other sources, both:
    - a. Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal; and
    - b. Therefore is a cause of a violation of any requirement of the POTW's NPBES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to subtitle D of the SWDA), the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act.
  3. *Pass Through* means a Discharge which exits the POTW into waters of the United States in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPBES permit (including an increase in the magnitude or duration of a violation).
  4. *Publicly Owned Treatment Works* or *POTW* means a treatment works as defined by section 212 of the CWA, which is owned by a State or municipality (as defined by section 502(4) of the CWA). This definition includes any devices and systems used in the storage, treatment, recycling and reclamation of municipal sewage or industrial wastes of a liquid nature. It also includes sewers, pipes and other conveyances only if they convey wastewater to a POTW Treatment Plant. The term also means the municipality as defined in section 502(4) of the CWA, which has jurisdiction over the Indirect Discharges to and the discharges from such a treatment works.
  5. *Significant industrial user (SIU)* is defined as an industrial user discharging to a POTW that satisfies any of the following:
    - a. Has a process wastewater flow of 25,000 gallons or more per average work day;
    - b. Has a flow greater than five percent of the flow carried by the municipal system receiving the waste;
    - c. Is subject to Categorical Pretreatment Standards, or
    - d. Has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement.
  6. *User or Industrial User (IU)* means a source of Indirect Discharge.

**III. BIOSOLIDS REQUIREMENTS**

A. Biosolids Treatment and Disposal. The authorization to dispose biosolids provided under this permit is limited to those biosolids produced from the treatment works owned and operated by the permittee. The treatment methods and disposal practices are designated below.

1. Treatment

a. Biosolids are dewatered then transferred to a collocated landfill at the facility.

2. Description of Biosolids Disposal Method

a. Class A biosolids may be sold or given away to the public for lawn and garden use or land application.

b. Class B biosolids may be land applied for agriculture use or at reclamation sites at agronomic rates.

c. Biosolids may be disposed of in a landfill or transferred to another facility for treatment and/or disposal.

3. Changes in Treatment Systems and Disposal Practices.

a. Should the permittee change their disposal methods or the biosolids generation and handling processes of the plant, the permittee must notify the Director at least 30 days in advance if the process/method is specified in 40 CFR 503. This includes, but is not limited to, the permanent addition or removal of any biosolids treatment units (i.e., digesters, drying beds, belt presses, etc.) and/or any other change.

b. Should the permittee change their disposal methods or the biosolids generation and handling processes of the plant, the permittee must notify the Director at least 180 days in advance if the process/method is not specified in 40 CFR 503. This includes, but is not limited to, the permanent addition or removal of any biosolids treatment units (i.e., digesters, drying beds, belt presses, etc.) and/or any other change.

For any biosolids that are land filled, the requirements in *Section 2.12* of the latest version of the *EPA Region VIII Biosolids Management Handbook* must be followed

B. Specific Limitations and Monitoring Requirements. All biosolids generated by this facility to be sold or given away to the public shall meet the requirements of *Part III.B.1, 2, 3 and 4* listed below.

1. Metals Limitations. All biosolids sold or given away in a bag or similar container for application to lawns and home gardens must meet the metals limitations as described below. If these metals limitations are not met, the biosolids must be landfilled.

Pollutant Limits, (40 CFR Part 503.13(b)) Dry Mass Basis				
Heavy Metals	Table 1	Table 2	Table 3	Table 4
	Ceiling Conc. Limits <sup>1, 2</sup> , (mg/kg)	CPLR <sup>3</sup> , (mg/ha)	Pollutant Conc. Limits <sup>1, 2</sup> , (mg/kg)	APLR <sup>4</sup> , (mg/ha-yr)
Total Arsenic	75	41	41	2.0
Total Cadmium	85	39	39	1.9

**PART III**  
**DISCHARGE PERMIT NO. UT0000051**  
**BIOSOLIDS PERMIT NO. UTL-000051**

Pollutant Limits, (40 CFR Part 503.13(b)) Dry Mass Basis				
Heavy Metals	Table 1	Table 2	Table 3	Table 4
	Ceiling Conc. Limits <sup>1, 2</sup> (mg/kg)	CPLR <sup>3</sup> (mg/ha)	Pollutant Conc. Limits <sup>1, 2</sup> (mg/kg)	APLR <sup>4</sup> (mg/ha-yr)
Total Copper	4300	1500	1500	75
Total Lead	840	300	300	15
Total Mercury	57	17	17	0.85
Total Molybdenum	75	N/A	N/A	N/A
Total Nickel	420	420	420	21
Total Selenium	100	100	100	5.0
Total Zinc	7500	2800	2800	140
1, The limitations represent the maximum allowable levels of heavy metals in any biosolids intended for land application.				
2, These limitations represent the maximum allowable levels of heavy metals based on an average of all samples taken during a 30-day period.				
3, CPLR - Cumulative Pollutant Loading Rate				
4, APLR – Annual Pollutant Loading Rate				

2. Pathogen Limitations. All biosolids sold or given away in a bag or a similar container for application to lawns and home gardens must meet the pathogen limitations for Class A. Land applied biosolids must meet the pathogen limitations for Class B as described below. If the pathogen limitations are not met, the biosolids must be landfilled.

a. Class A biosolids shall meet one of the pathogen measurement requirements in the following Pathogen Control Class table or shall meet the requirements for a Process to Further Reduce Pathogens as defined in *40 CFR Part 503.32(a) Sewage Sludge – Class A*.

(1) Kennecott does not intend to give away biosolids for land application on home lawns or gardens, and will therefore not be required to meet PFRP.

b. Class B biosolids shall meet the pathogen measurement requirements in the following Pathogen Control Class table or shall meet the requirements for a Process to Significantly Reduce Pathogens as defined in *40 CFR Part 503.32(b) Sewage Sludge – Class B*. Kennecott does not intend to land apply the biosolids and will therefore not be required to meet PSRP.

In addition, the permittee shall comply with all applicable site restrictions listed below (*40 CFR Part 503.32, (b), (5)*):

(1) Food crops with harvested parts that touch the biosolids/soil mixture and are totally above the land surface shall not be harvested for 14 months after application.

(2) Food crops with harvested parts below the land surface shall not be harvested for 20 months after application if the biosolids remains on the land surface for four months or more prior to incorporation into the soil.

(3) Food crops with harvested parts below the surface of the land shall not be harvested for 38 months after application of sewage sludge when the sewage



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sludge remains on the land surface for less than four months prior to incorporation into the soil.

- (4) Food crops, feed crops, and fiber crops shall not be harvested from the land for 30 days after application.
- (5) Animals shall not be allowed to graze on the land for 30 days after application.
- (6) Turf grown on land where biosolids is applied shall not be harvested for one year after application if the harvested turf is placed on either land with a high potential for public exposure or a lawn.
- (7) Public access to land with a high potential for public exposure shall be restricted for one year after application.
- (8) Public access to land with a low potential for public exposure shall be restricted for 30 days after application.
- (9) The sludge or the application of the sludge shall not cause or contribute to the harm of a threatened or endangered species or result in the destruction or adverse modification of critical habitat of a threatened or endangered species after application.

Pathogen Control Class	
503.32 (a)(1) - (5), (7), -(8), Class A	503.32 (b)(1) - (5), Class B
B Salmonella species –less than three (3) MPN per four (4) grams total solids (DWB) or Fecal Coliforms – less than 1,000 MPN per gram total solids (DWB).	Fecal Coliforms – less than 2,000,000 MPN or CFU per gram total solids (DWB).
503.32 (a)(6) Class A—Alternative 4	
B Salmonella species –less than three (3) MPN per four (4) grams total solids (DWB) or less than 1,000 MPN Fecal Coliforms per gram total solids (DWB), And - Enteric viruses –less than one (1) plaque forming unit per four (4) grams total solids (DWB) And - Viable helminth ova –less than one (1) per four (4) grams total solids (DWB)	
MPN – Most Probable Number	
DWB – Dry Weight Basis.	
CFU – Colony Forming Units	

3. Vector Attraction Reduction Requirements.

- a. The permittee will meet vector attraction reduction through use of one of the methods listed in 40 CFR 503.33. Facility is meeting the requirements though the following methods.
  - (1) Kennecott dewateres the biosolids and bags them, then transfers them to the onsite landfill for disposal

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If the permittee intends to use another one of the alternatives, the Director and the EPA must be informed at least thirty (30) days prior to its use. This change may be made without additional public comment.

4. Self-Monitoring Requirements.

- a. At a minimum, upon the effective date of this permit, all chemical pollutants, pathogens and applicable vector attraction reduction requirements shall be monitored according to *40 CFR 503.16(1)(a)*.

Minimum Frequency of Monitoring (40 CFR Part 503.16, 503.26. and 503.46)		
Amount of Biosolids Disposed Per Year		Monitoring Frequency
Dry US Tons	Dry Metric Tons	Per Year or Batch
> 0 to < 320	> 0 to < 290 <sup>*1</sup>	Once Per Year or Batch
> 320 to < 1650	> 290 to < 1,500	Once a Quarter or Four Times
> 1,650 to < 16,500	> 1,500 to < 15,000	Bi-Monthly or Six Times
> 16,500	> 15,000	Monthly or Twelve Times
*1. Kennecott has produced on average 1 DMT of biosolids per year, therefore they would sample once a year. Kennecott disposes of all biosolids they produce in a landfill, and is not required to sample for biosolids requirements.		

- b. Sample collection, preservation and analysis shall be performed in a manner consistent with the requirements of *40 CRF 503* and/or other criteria specific to this permit. A metals analysis is to be performed using *Method SW 846* with *Method 3050* used for digestion. For the digestion procedure, an amount of biosolids equivalent to a dry weight of one gram shall be used. The methods are also described in the latest version of the *Region VIII Biosolids Management Handbook*.
- c. The Director may request additional monitoring for specific pollutants derived from biosolids if the data shows a potential for concern.
- d. After two (2) years of monitoring at the frequency specified, the permittee may request that the Director reduce the sampling frequency for the heavy metals. The frequency cannot be reduced to less than once per year for biosolids that are sold or given away to the public for any parameter. The frequency also cannot be reduced for any of the pathogen or vector attraction reduction requirements listed in this permit.

C. Management Practices of Biosolids.

1. Biosolids Distribution Information

- a. For biosolids that are sold or given away, an information sheet shall be provided to the person who receives the biosolids. The label or information sheet shall contain:
- (1) The name and address of the person who prepared the biosolids for a sale or to be given away.
  - (2) A statement that prohibits the application of the biosolids to the land except in accordance with the instructions on the label or information sheet.

2. Biosolids Application Site Storage

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- a. For biosolids or material derived from biosolids that are stored in piles for one year or longer, measures shall be taken to ensure that erosion (whether by wind or water) does not occur. However, best management practices should also be used for piles used for biosolids treatment. If a treatment pile is considered to have caused a problem, best management practices could be added as a requirement in the next permit renewal

3. Land Application Practices

- a. The permittee shall operate and maintain the land application site operations in accordance with the following requirements:
  - (1) The permittee shall provide to the Director and the EPA within 90 days of the effective date of this permit a land application plan.
  - (2) Application of biosolids shall be conducted in a manner that will not contaminate the groundwater or impair the use classification for that water underlying the sites.
  - (3) Application of biosolids shall be conducted in a manner that will not cause a violation of any receiving water quality standard from discharges of surface runoff from the land application sites. Biosolids shall not be applied to land 10 meters or less from waters of the United States (as defined in 40 CFR 122.2).
  - (4) No person shall apply biosolids for beneficial use to frozen, ice-covered, or snow-covered land where the slope of such land is greater than three percent and is less than or equal to six percent unless one of the following requirements is met:
    - (a) there is 80 percent vegetative ground cover; or,
    - (b) approval has been obtained based upon a plan demonstrating adequate runoff containment measures.
  - (5) Application of biosolids is prohibited to frozen, ice-covered, or snow-covered sites where the slope of the site exceeds six percent.
  - (6) Agronomic Rate
    - (a) Application of biosolids shall be conducted in a manner that does not exceed the agronomic rate for available nitrogen of the crops grown on the site. At a minimum, the permittee is required to follow the methods for calculating agronomic rate outlined in the latest version of the *Region VIII Biosolids Management Handbook* (other methods may be approved by the Director). The treatment plant shall provide written notification to the applier of the biosolids of the concentration of total nitrogen (as N on a dry weight basis) in the biosolids. Written permission from the Director is required to exceed the agronomic rate.
    - (b) The permittee may request the limits of *Part III, C, 6* be modified if different limits would be justified based on local conditions. The limits are required to be developed in cooperation with the local agricultural extension office or university.
    - (c) Deep soil monitoring for nitrate-nitrogen is required for all land application sites (does not apply to sites where biosolids are applied less than once every

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five years). A minimum of six samples for each 320 (or less) acre area is to be collected. These samples are to be collected down to either a 5-foot depth, or the confining layer, whichever is shallower (sample at 1 foot, 2-foot, 3-foot, 4 foot and 5-foot intervals). Each of these one-foot interval samples shall be analyzed for nitrate-nitrogen. In addition to the one-foot interval samples, a composite sample of the 5-foot intervals shall be taken, and analyzed for nitrate-nitrogen as well. Samples are required to be taken once every five years for non-irrigated sites that receive more than 18 inches of precipitation annually or for irrigated sites

- (7) Biosolids shall not be applied to any site area with standing surface water. If the annual high groundwater level is known or suspected to be within five feet of the surface, additional deep soil monitoring for nitrate-nitrogen as described in *Part III.C.3.* is to be performed. At a minimum, this additional monitoring will involve a collection of more samples in the affected area and possibly more frequent sampling. The exact number of samples to be collected will be outlined in a deep soil monitoring plan to be submitted to the Director and the EPA within 90 days of the effective date of this permit. The plan is subject to approval by the Director.
- (8) The specified cover crop shall be planted during the next available planting season. If this does not occur, the permittee shall notify the Director in writing. Additional restrictions may be placed on the application of the biosolids on that site on a case-by-case basis to control nitrate movement. Deep soil monitoring may be increased under the discretion of the Director.
- (9) When weather and or soil conditions prevent adherence to the biosolids application procedure, biosolids shall not be applied on the site.
- (10) For biosolids that are sold or given away, an information sheet shall be provided to the person who receives the biosolids. The label or information sheet shall contain:
  - (a) The name and address of the person who prepared the biosolids for sale or give away for application to the land.
  - (b) A statement that prohibits the application of the biosolids to the land except in accordance with the instructions on the label or information sheet.
  - (c) The annual whole biosolids application rate for the biosolids that do not cause the metals loading rates in Tables 1, 2, and 3 (*Part III.B.1.*) to be exceeded.
- (11) Biosolids subject to the cumulative pollutant loading rates in Table 2 (*Part III.B.1.*) shall not be applied to agricultural land, forest, a public contact site, or a reclamation site if any of the cumulative pollutant loading rates in Table 2 have been reached.
- (12) If the treatment plant applies the biosolids, it shall provide the owner or leaseholder of the land on which the biosolids are applied notice and necessary information to comply with the requirements in this permit.
- (13) The permittee shall inspect the application of the biosolids to active sites to prevent malfunctions and deterioration, operator errors and discharges, which

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may cause or lead to the release of biosolids to the environment or a threat to human health. The permittee must conduct these inspections often enough to identify problems in time to correct them before they harm human health or the environment. The permittee shall keep an inspection log or summary including at least the date and time of inspection, the printed name and the handwritten signature of the inspector, a notation of observations made and the date and nature of any repairs or corrective action.

- D. Special Conditions on Biosolids Storage. Permanent storage of biosolids is prohibited. Biosolids shall not be temporarily stored for more than two (2) years. Written permission to store biosolids for more than two years must be obtained from the Director. Storage of biosolids for more than two years will be allowed only if it is determined that significant treatment is occurring.
- E. Representative Sampling. Biosolids samples used to measure compliance with *Part III* of this Permit shall be collected at locations representative of the quality of biosolids generated at the treatment works and immediately prior to land application.
- F. Reporting of Monitoring Results.
1. Biosolids. The permittee shall provide the results of all monitoring performed in accordance with Part III.B, and information on management practices, biosolids treatment, site restrictions and certifications shall be provided no later than February 19 of each year. Each report is for the previous calendar year. If no biosolids were sold or given away during the reporting period, "no biosolids were sold or given away" shall be reported. Legible copies of these, and all other reports required herein, shall be signed and certified in accordance with the Signatory Requirements (see Part VII.G), and submitted to the Utah Division of Water Quality and the EPA by the NeT-Biosolids system through the EPA Central Data Exchange (CDX) System
- G. Additional Record Keeping Requirements Specific to Biosolids.
1. Unless otherwise required by the Director, **the permittee is not required to keep records** on compost products if the permittee prepared them from biosolids that meet the limits in Table 3 (*Part III.B.1*), the Class A pathogen requirements in *Part III.B.2* and the vector attraction reduction requirements in *Part III.B.3*. The Director may notify the permittee that additional record keeping is required if it is determined to be significant to protecting public health and the environment.
  2. **The permittee is required** to keep the following information for at least 5 years:
    - a. Concentration of each heavy metal in Table 3 (*Part III.B.1*).
    - b. A description of how the pathogen reduction requirements in *Part III.B.2* were met.
    - c. A description of how the vector attraction reduction requirements in *Part III.B.3* were met.
    - d. A description of how the management practices in *Part III.C* were met (if necessary).
    - e. The following certification statement:  
"I certify under the penalty of law, that the heavy metals requirements in *Part III.B.1*, the pathogen requirements in *Part III.B.2*, the vector attraction requirements in *Part*

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*III.B.3*, the management practices in *Part III.C*. This determination has been made under my direction and supervision in accordance with the system designed to assure that qualified personnel properly gather and evaluate the information used to determine that the pathogen requirements, the vector attraction reduction requirements and the management practices have been met. I am aware that there are significant penalties for false certification including the possibility of imprisonment."

3. The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit and records of all data used to complete the application for this permit for the life of the permit. Data collected on site, copies of Biosolids Report forms, and a copy of this UPDES biosolids-only permit must be maintained on site during the duration of activity at the permitted location.

**IV. STORM WATER REQUIREMENTS.**

- A. Industrial Storm Water Permit. Based on the type of industrial activities occurring at the facility, the permittee is required to maintain separate coverage or an appropriate exclusion under the Multi-Sector General Permit (MSGP) for Storm Water Discharges Associated with Industrial Activities (UTR000000). If the facility is not already covered, the permittee has 30 days from when this permit is issued to submit the appropriate Notice of Intent (NOI) for the MSGP or exclusion documentation.

Permit coverage under the Multi Sector General Permit (MSGP) for Storm Water Discharges from Industrial Activities is required based on the Standard Industrial Classification (SIC) code for the facility and the types of industrial activities occurring. Previously storm water discharge requirements and coverage were combined in this individual permit. These have been separated to provide consistency among permittees, electronic reporting for storm water discharge monitoring reports, and increase flexibility to changing site conditions.

MSGP coverage applies to construction activities within active mining areas including all support facilities. Storm water discharges from earth-disturbing activities conducted prior to active mining activities are considered construction activities and must be covered under the Storm Water Construction General Permit. The current 2021 EPA MSGP (Part 8.G.1.3) includes coverage for these discharges; DWQ may modify Utah's MSGP to include this provision when the permit is renewed in 2024. Mine-related facilities upgradient and within the collection zone of the storm water capture systems do not require separate storm water permit coverage and are subject to the discharge requirements of this permit.

- B. Construction Storm Water Permit. Any construction at the facility that disturbs an acre or more of land, including less than an acre if it is part of a common plan of development or sale, is required to obtain coverage under the UPDES Construction General Storm Water Permit (UTRC00000). Permit coverage must be obtained prior to land disturbance. If the site qualifies, a Low Erosivity Waiver (LEW) Certification may be submitted instead of permit coverage.

**V. MONITORING, RECORDING & GENERAL REPORTING REQUIREMENTS**

- A. Representative Sampling. Samples taken in compliance with the monitoring requirements established under *Part I* shall be collected from the effluent stream prior to discharge into the receiving waters. Samples and measurements shall be representative of the volume and nature of the monitored discharge. Samples of biosolids shall be collected at a location representative of the quality of biosolids immediately prior to the use-disposal practice.
- B. Monitoring Procedures. Monitoring must be conducted according to test procedures approved under *UAC R317-2-10 and 40CFR Part 503*, utilizing sufficiently sensitive test methods 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. 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.
- E. Additional Monitoring by the Permittee. If the permittee monitors any parameter more frequently than required by this permit, using test procedures approved under *UAC R317-2-10 and 40 CFR 503* or as specified in this permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR or the Biosolids Report Form. Such increased frequency shall also be indicated. Only those parameters required by the permit need to be reported.
- F. 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.
- G. Retention of Records. The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, 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 five years from the date of the sample, measurement, report or application. This period may be extended by request of the Director at any time. A copy of this UPDES permit must be maintained on site during the duration of activity at the permitted location
- H. Twenty-four Hour Notice of Noncompliance Reporting.
1. The permittee shall (orally) report any noncompliance including transportation accidents, spills, and uncontrolled runoff from biosolids transfer or land application sites which may seriously endanger health or environment, as soon as possible, but no later than twenty-four (24) hours from the time the permittee first became aware of circumstances. The report shall be made to the Division of Water Quality, (801) 536-4300, or 24-hour answering service (801) 536-4123.



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2. The following occurrences of noncompliance shall be reported by telephone (801) 536-4300 as soon as possible but no later than 24 hours from the time the permittee becomes aware of the circumstances:
  - a. Any noncompliance which may endanger health or the environment;
  - b. Any unanticipated bypass, which exceeds any effluent limitation in the permit (See *Part VI.G, Bypass of Treatment Facilities.*);
  - c. Any upset which exceeds any effluent limitation in the permit (See *Part VI.H, Upset Conditions.*);
  - d. Violation of a daily discharge limitation for any of the pollutants listed in the permit; or,
  - e. Violation of any of the Table 3 metals limits, the pathogen limits, the vector attraction reduction limits or the management practices for biosolids that have been sold or given away.
3. A written submission shall also be provided 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;
  - d. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance; and,
  - e. Steps taken, if any, to mitigate the adverse impacts on the environment and human health during the noncompliance period.
4. The Director may waive the written report on a case-by-case basis if the oral report has been received within 24 hours by the Division of Water Quality, (801) 536-4300.
5. Reports shall be submitted according to *Part I, Reporting of Monitoring Results.*
- I. 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 I* are submitted. The reports shall contain the information listed in *Part V.H.3*
- J. 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, including but

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not limited to, biosolids treatment, collection, storage facilities or area, transport vehicles and containers, and land application sites;

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, including, but not limited to, digested biosolids before dewatering, dewatered biosolids, biosolids transfer or staging areas, any ground or surface waters at the land application sites or biosolids, soils, or vegetation on the land application sites; and,
5. The permittee shall make the necessary arrangements with the landowner or leaseholder to obtain permission or clearance, the Director, or authorized representative, upon the presentation of credentials and other documents as may be required by law, will be permitted to enter without delay for the purposes of performing their responsibilities.

**VI. 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 reissuance, 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 or the Act is subject to a fine not exceeding \$25,000 per day of violation. Any person convicted under *UCA 19-5-115(2)* a second time shall be punished by a fine not exceeding \$50,000 per day. Except as provided at *Part VI.G, Bypass of Treatment Facilities* and *Part VI.H, Upset Conditions*, 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. The permittee shall also take all reasonable steps to minimize or prevent any land application in violation of this permit.
- 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 include 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.
- F. Removed Substances. Collected screening, grit, solids, sludge, or other pollutants removed in the course of treatment shall be disposed of in such a manner so as to prevent any pollutant from entering any waters of the state or creating a health hazard. Sludge/digester supernatant and filter backwash shall not directly enter either the final effluent or waters of the state by any other direct route.
- G. Bypass of Treatment Facilities.
  - 1. Bypass Not Exceeding Limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to paragraph 2 and 3 of this section.
  - 2. Prohibition of Bypass.
    - a. Bypass is prohibited, and the Director may take enforcement action against a permittee for bypass, unless:

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- (1) Bypass was unavoidable to prevent loss of human life, personal injury, or severe property damage;
  - (2) There were no feasible alternatives to bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgement to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance, and
  - (3) The permittee submitted notices as required under *Part VI.G.3*.
- b. The Director may approve an anticipated bypass, after considering its adverse effects, if the Director determines that it will meet the three conditions listed in *Parts VI.G.2.a (1), (2) and (3)*.
3. Notice.
- a. *Anticipated bypass*. Except as provided above in *Part VI.G.2* and below in *Part VI.G.3.b*, if the permittee knows in advance of the need for a bypass, it shall submit prior notice, at least ninety days before the date of bypass. The prior notice shall include the following unless otherwise waived by the Director:
    - (1) Evaluation of alternative to bypass, including cost-benefit analysis containing an assessment of anticipated resource damages;
    - (2) A specific bypass plan describing the work to be performed including scheduled dates and times. The permittee must notify the Director in advance of any changes to the bypass schedule;
    - (3) Description of specific measures to be taken to minimize environmental and public health impacts;
    - (4) A notification plan sufficient to alert all downstream users, the public and others reasonably expected to be impacted by the bypass;
    - (5) A water quality assessment plan to include sufficient monitoring of the receiving water before, during and following the bypass to enable evaluation of public health risks and environmental impacts; and,
    - (6) Any additional information requested by the Director.
  - b. *Emergency Bypass*. Where ninety days advance notice is not possible, the permittee must notify the Director, and the Director of the Department of Natural Resources, as soon as it becomes aware of the need to bypass and provide to the Director the information in *Part VI.G.3.a.(1) through (6)* to the extent practicable.
  - c. *Unanticipated bypass*. The permittee shall submit notice of an unanticipated bypass to the Director as required under *Part V.H*, Twenty-Four Hour Reporting. The permittee shall also immediately notify the Director of the Department of Natural Resources, the public and downstream users and shall implement measures to minimize impacts to public health and environment to the extent practicable.

H. Upset Conditions.

1. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with technology-based permit effluent limitations if the requirements of paragraph 2 of this section are met. Director's administrative determination regarding a claim of upset cannot be judiciously challenged by the permittee until such time as an action is initiated for noncompliance.
2. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
  - a. An upset occurred and that the permittee can identify the cause(s) of the upset;
  - b. The permitted facility was at the time being properly operated;
  - c. The permittee submitted notice of the upset as required under *Part V.H, Twenty-four Hour Notice of Noncompliance Reporting*; and,
  - d. The permittee complied with any remedial measures required under *Part VI.D, Duty to Mitigate*.
3. Burden of proof. In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.

I. Toxic Pollutants. The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of *The Water Quality Act of 1987* for toxic pollutants within the time provided in the regulations that establish those standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.

J. Changes in Discharge of Toxic Substances. Notification shall be provided to the Director as soon as the permittee knows of, or has reason to believe:

1. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
  - a. One hundred micrograms per liter (100 ug/L);
  - b. Two hundred micrograms per liter (200 ug/L) for acrolein and acrylonitrile; five hundred micrograms per liter (500 ug/L) for 2,4-dinitrophenol and for 2-methyl-4, 6-dinitrophenol; and one milligram per liter (1 mg/L) for antimony;
  - c. Five (5) times the maximum concentration value reported for that pollutant in the permit application in accordance with *UAC R317-8-3.4(7)* or (10); or,
  - d. The level established by the Director in accordance with *UAC R317-8-4.2(6)*.
2. That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
  - a. Five hundred micrograms per liter (500 ug/L);

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- b. One milligram per liter (1 mg/L) for antimony:
- c. Ten (10) times the maximum concentration value reported for that pollutant in the permit application in accordance with *UAC R317-8-3.4(9)*; or,
- d. The level established by the Director in accordance with *UAC R317-8-4.2(6)*.

**VII. 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 only when the alteration or addition could significantly change the nature or increase the quantity of parameters discharged or pollutant sold or given away. This notification applies to pollutants, which are not subject to effluent limitations in the permit. In addition, if there are any planned substantial changes to the permittee's existing sludge facilities or their manner of operation or to current sludge management practices of storage and disposal, the permittee shall give notice to the Director of any planned changes at least 30 days prior to their implementation.
- B. Anticipated Noncompliance. 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.
- 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 reissuance, 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 shall apply for and obtain a new permit. The application shall 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 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 specifies either an individual or a position having responsibility for the overall operation of the regulated facility, such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters. A duly authorized

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representative may thus be either a named individual or any individual occupying a named position.

3. Changes to authorization. If an authorization under *Part VII.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 VII.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 \$10,000.00 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 under *UAC R317-8-3.2*, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the office of Director. As required by the *Act*, permit applications, permits and effluent data shall not be considered confidential.
- J. Oil and Hazardous Substance Liability. Nothing in this permit shall be construed to preclude the permittee of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under the *Act*.
- K. 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.
- L. Severability. The provisions of this permit are severable, and if any provisions 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.
- M. Transfers. This permit may be automatically transferred to a new permittee if:
  1. The current permittee notifies the Director at least 20 days in advance of the proposed transfer date;



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2. The notice includes a written agreement between the existing and new permittee's 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.
- N. State or Federal Laws. Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authority preserved by *UCA 19-5-117* and *Section 510* of the *Act* or any applicable Federal or State transportation regulations, such as but not limited to the Department of Transportation regulations.
- O. Water Quality - Reopener Provision. This permit may be reopened and modified (following proper administrative procedures) to include the appropriate effluent limitations and compliance schedule, if necessary, if one or more of the following events occurs:
1. Water Quality Standards for the receiving water(s) to which the permittee discharges are modified in such a manner as to require different effluent limits than contained in this permit.
  2. A final wasteload allocation is developed and approved by the State and/or EPA for incorporation in this permit.
  3. Revisions to the current CWA § 208 areawide treatment management plans or promulgations/revisions to TMDLs (40 CFR 130.7) approved by the EPA and adopted by DWQ which calls for different effluent limitations than contained in this permit.
- P. Biosolids – Reopener Provision. This permit may be reopened and modified (following proper administrative procedures) to include the appropriate biosolids limitations (and compliance schedule, if necessary), management practices, other appropriate requirements to protect public health and the environment, or if there have been substantial changes (or such changes are planned) in biosolids use or disposal practices; applicable management practices or numerical limitations for pollutants in biosolids have been promulgated which are more stringent than the requirements in this permit; and/or it has been determined that the permittees biosolids use or land application practices do not comply with existing applicable state or federal regulations.
- Q. Toxicity Limitation - Reopener Provision. This permit may be reopened and modified (following proper administrative procedures) to include, whole effluent toxicity (WET) limitations, a compliance date, a compliance schedule, a change in the whole effluent toxicity (biomonitoring) protocol, additional or modified numerical limitations, or any other conditions related to the control of toxicants if one or more of the following events occur;
1. Toxicity is detected, as per *Part I*. of this permit, during the duration of this permit.
  2. The TRE results indicate that the toxicant(s) represent pollutant(s) or pollutant parameter(s) that may be controlled with specific numerical limits, and the Director concludes that numerical controls are appropriate.

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3. Following the implementation of numerical control(s) of toxicant(s), the Director agrees that a modified biomonitoring protocol is necessary to compensate for those toxicants that are controlled numerically.
4. The TRE reveals other unique conditions or characteristics, which in the opinion of the permit issuing authority justify the incorporation of unanticipated special conditions in the permit.

**VIII. DEFINITIONS**

A. Wastewater.

1. The “7-day (and weekly) average”, other than for *E. coli* bacteria, fecal coliform bacteria, and total coliform bacteria, is the arithmetic average of all samples collected during a consecutive 7-day period or calendar week, whichever is applicable. Geometric means shall be calculated for *E. coli* bacteria, fecal coliform bacteria, and total coliform bacteria. The 7-day and weekly averages are applicable only to those effluent characteristics for which there are 7-day average effluent limitations. The calendar week, which begins on Sunday and ends on Saturday, shall be used for purposes of reporting self-monitoring data on discharge monitoring report forms. Weekly averages shall be calculated for all calendar weeks with Saturdays in the month. If a calendar week overlaps two months (i.e., the Sunday is in one month and the Saturday in the following month), the weekly average calculated for that calendar week shall be included in the data for the month that contains Saturday.
2. The "30-day (and monthly) average," other than for *E. coli* bacteria, fecal coliform bacteria and total coliform bacteria, is the arithmetic average of all samples collected during a consecutive 30-day period or calendar month, whichever is applicable. Geometric means shall be calculated for *E. coli* bacteria, fecal coliform bacteria and total coliform bacteria. The calendar month shall be used for purposes of reporting self-monitoring data on discharge monitoring report forms.
3. “Act,” means the *Utah Water Quality Act*.
4. “Acute toxicity” occurs when 50 percent or more mortality is observed for either test species at any effluent concentration (lethal concentration or “LC<sub>50</sub>”).
5. “Bypass,” means the diversion of waste streams from any portion of a treatment facility.
6. “Chronic toxicity” occurs when the IC<sub>25</sub>< XX% effluent. The XX% effluent is the concentration of the effluent in the receiving water, at the end of the mixing zone expressed as per cent effluent.
7. "IC<sub>25</sub>" is the concentration of toxicant (given in % effluent) that would cause a 25% reduction in mean young per female, or a 25% reduction in overall growth for the test population.
8. “Composite Samples” shall be flow proportioned. The composite sample shall, as a minimum, contain at least four (4) samples collected over the compositing period. Unless otherwise specified, the time between the collection of the first sample and the last sample shall not be less than six (6) hours nor more than 24 hours. Acceptable methods for preparation of composite samples are as follows:
  - a. Constant time interval between samples, sample volume proportional to flow rate at time of sampling;
  - b. Constant time interval between samples, sample volume proportional to total flow (volume) since last sample. For the first sample, the flow rate at the time the sample was collected may be used;

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- c. Constant sample volume, time interval between samples proportional to flow (i.e., sample taken every “X” gallons of flow); and,
  - d. Continuous sample volume, with sample collection rate proportional to flow rate.
9. “CWA” means *The Federal Water Pollution Control Act*, as amended, by *The Clean Water Act of 1987*.
  10. “Daily Maximum” (Daily Max.) is the maximum value allowable in any single sample or instantaneous measurement.
  11. “EPA,” means the United States Environmental Protection Agency.
  12. “Director,” means Director of the Division of Water Quality.
  13. A “grab” sample, for monitoring requirements, is defined as a single “dip and take” sample collected at a representative point in the discharge stream.
  14. An “instantaneous” measurement, for monitoring requirements, is defined as a single reading, observation, or measurement.
  15. “Severe Property Damage,” means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
  16. “Upset,” means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation.

**B. Biosolids.**

1. “Biosolids,” means any material or material derived from sewage solids that have been biologically treated.
2. “Dry Weight-Basis,” means 100 percent solids (i.e. zero percent moisture).
3. “Land Application” is the spraying or spreading of biosolids onto the land surface; the injection of biosolids below the land surface; or the incorporation of biosolids into the land so that the biosolids can either condition the soil or fertilize crops or vegetation grown in the soil. Land application includes distribution and marketing (i.e. the selling or giving away of the biosolids).
4. “Pathogen,” means an organism that is capable of producing an infection or disease in a susceptible host.

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5. "Pollutant" for the purposes of this permit is an organic substance, an inorganic substance, a combination of organic and inorganic substances, or pathogenic organisms that after discharge and upon exposure, ingestion, inhalation, or assimilation into an organism either directly from the environment or indirectly by ingestion through the food-chain, could on the basis of information available to the Administrator of EPA, cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunction in reproduction), or physical deformations in either organisms or offspring of the organisms.
6. "Runoff" is rainwater, leachate, or other liquid that drains over any part of a land surface and runs off the land surface.
7. "Similar Container" is either an open or closed receptacle. This includes, but is not limited to, a bucket, a box, a carton, and a vehicle or trailer with a load capacity of one metric ton or less.
8. "Total Solids" are the materials in the biosolids that remain as a residue if the biosolids are dried at 103° or 105° Celsius.
9. "Treatment Works" are either Federally owned, publicly owned, or privately-owned devices or systems used to treat (including recycling and reclamation) either domestic sewage or a combination of domestic sewage and industrial waste or liquid manure.
10. "Vector Attraction" is the characteristic of biosolids that attracts rodents, flies mosquito's or other organisms capable of transporting infectious agents.
11. "Animals" for the purpose of this permit are domestic livestock.
12. "Annual Whole Sludge Application Rate" is the amount of sewage sludge (dry-weight basis) that can be applied to a unit area of land during a cropping cycle.
13. "Agronomic Rate" is the whole sludge application rate (dry-weight basis) designed to: (1) provide the amount of nitrogen needed by the crop or vegetation grown on the land; and (2) minimize the amount of nitrogen in the sewage sludge that passes below the root zone of the crop or vegetation grown on the land to the ground water.
14. "Annual Pollutant Loading Rate" is the maximum amount of a pollutant (dry-weight basis) that can be applied to a unit area of land during a 365-day period.
15. "Application Site or Land Application Site" means all contiguous areas of a users' property intended for sludge application.
16. "Cumulative Pollutant Loading Rate" is the maximum amount of an inorganic pollutant (dry-weight basis) that can be applied to a unit area of land.
17. "Grit and Screenings" are sand, gravel, cinders, other materials with a high specific gravity and relatively large materials such as rags generated during preliminary treatment of domestic sewage at a treatment works and shall be disposed of according to 40 CFR 258.

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18. “High Potential for Public Contact Site” is land with a high potential for contact by the public. This includes, but is not limited to, public parks, ball fields, cemeteries, plant nurseries, turf farms, and golf courses.
19. “Low Potential for Public Contact Site” is the land with a low potential for contact by the public. This includes, but is not limited to, farms, ranches, reclamation areas, and other lands which are private lands, restricted public lands, or lands which are not generally accessible to or used by the public.
20. “Monthly Average” is the arithmetic mean of all measurements taken during the month.
21. “Volatile Solids” is the amount of the total solids in sewage sludge lost when the sludge is combusted at 550 degrees Celsius for 15-20 minutes in the presence of excess air.

**FACT SHEET AND STATEMENT OF BASIS  
KENNECOTT UTAH COPPER LLC  
RENEWAL PERMIT: DISCHARGE, BIOSOLIDS  
UPDES PERMIT NUMBER: UT0000051  
UPDES BIOSOLIDS PERMIT NUMBER: UTL-000051  
MAJOR INDUSTRIAL**

**FACILITY CONTACTS**

<b>Person Name:</b>	Paula H Doughty	<b>Person Name:</b>	Jay Quintanilla
<b>Position:</b>	Manager, Tailings & Water Services	<b>Position:</b>	Senior Advisor, Environment
<b>Phone Number:</b>	801.204.3501	<b>Phone Number:</b>	801.569.6260
<b>Person Name:</b>	Cassady Kristensen	<b>Person Name:</b>	Trevor Paulson
<b>Position:</b>	Senior Environmental Business Partner	<b>Position:</b>	Advisor, Water Quality
<b>Phone Number:</b>	801.204.2129	<b>Phone Number:</b>	801.304.1256

**Facility Name:** Kennecott Utah Copper LLC  
**Mailing Address:** 4700 Daybreak Parkway  
South Jordan, UT 84009

**DESCRIPTION OF FACILITY**

Kennecott Utah Copper LLC (Kennecott) operates an integrated mining and mineral processing facility that includes an open pit copper mine with some underground development, waste rock disposal areas, water collection system, copper Scavenger Cells, concentrator, smelter, refinery, reverse osmosis (RO) groundwater treatment plant, sewage treatment plant, and a tailings impoundment. In addition, Kennecott also provides post-closure management of heap leach rinsing and meteoric infiltration water from Barneys Canyon, an open pit gold mine and processing facility. This Permit covers all of Kennecott's outfalls discharging to surface water, excluding storm water discharges, as described herein.

The Bingham Canyon Mine open pit has been in operation since about 1904 and typically mines approximately 450,000 to 600,000 tons of ore and waste rock per day. The ore is sent to the Copperton Concentrator and could include up to 200,000 tons of ore per day. Production includes a froth flotation process to produce copper and molybdenum concentrates. Correspondingly, up to 200,000 tons of tailings from the concentrator could be conveyed, at design, to the tailings impoundment per day.

The smelter processes copper concentrate that originates primarily from the Copperton Concentrator and periodically from other mine and mineral processing facilities, along with flux, coolants, and other reagents in order to produce anode copper, sulfuric acid, and rhenium. In the refinery, the anode copper is electrolytically refined to cathode copper. Gold, silver, selenium, lead carbonate, rhenium, platinum, tellurium, and palladium are also produced at the refinery.

The primary discharge from the tailings impoundment reports directly to the Transitional Waters and Gilbert Bay of Great Salt Lake via Outfall 012. The sediment pond and Outfall 002 remain in place for the discharge of tailings water to the C-7 Ditch as needed. Outfall 007 for the discharge of seepage and dike runoff water from the tailings impoundment to the C-7 Ditch also remains in place.

Waste rock contact water continues to be collected in the water collection system at the base of the waste rock areas. Kennecott recovers copper from certain waste rock contact waters at a facility in Bingham Canyon that currently uses copper ion exchange technology. De-copperized water and waste rock contact

water that bypasses the copper recovery circuit is introduced into the tailings line for management and is then discharged to the tailings impoundment.

Groundwater in the alluvial aquifer in the southwest portion of the Salt Lake Valley has been contaminated by historic leach-water management practices. Groundwater cleanup of the Zone A plume is being conducted under a Consent Decree between EPA, State of Utah, and Kennecott, and involves extraction of low pH groundwater from wells and introduction of this water to the tailings line along with waste rock contact water. Under normal operations, excess neutralizing capacity in the tailings line resulting from lime and/or sodium cyanide added as milling reagents and the intrinsic neutralization capacity of the tailings provides adequate treatment of all acidic flows routed to the tailings line. During upsets or other disruptions of normal operation, such as planned or unplanned shutdowns, Kennecott may add lime directly to the tailings line to neutralize the acidic flows.

Kennecott also extracts neutral water with elevated sulfate concentrations from the leading edge of the Zone A plume and treats this water using RO membrane treatment to produce drinking water. Drinking water is provided to the public through the Jordan Valley Water Conservancy District (JVWCD) in partial fulfillment of a settlement with the State of Utah under a Natural Resource Damage claim. RO treatment produces a concentrate wastewater which reports to the tailings line. JVWCD has constructed a separate RO treatment plant to treat other historic mine contaminated groundwater (Zone B plume). This facility is permitted to discharge to the Transitional Waters and Gilbert Bay of Great Salt Lake via a 21-mile pipeline under UPDES Permit No. UT0025836.

Near the smelter and refinery, Kennecott captures spring water and artesian groundwater flows and pumps groundwater wells where groundwater is impacted by historic releases of selenium and arsenic. This groundwater is utilized in Kennecott's process water system. Kennecott undertakes these groundwater management activities pursuant to a Record of Decision issued by EPA and the State of Utah and a pending Consent Decree.

Effluent from the sewage treatment plant (STP) adjacent to the Refinery is piped directly to Pump Station No. 4 and is incorporated into the process water circuit. Pump Station No. 4 directs flow to the Magna Reservoir where it is mixed with recycle water from the tailings impoundment and smelter. Water from the Magna Reservoir is pumped to the Copperton Concentrator where it is used for mineral beneficiation. UPDES effluent limitations for the STP are not required because Kennecott is not authorized to discharge the effluent to waters of the state. Instead, effluent is directly recycled into the process water system.

The Barneys Canyon Mine is located approximately 4 miles north of the Bingham Canyon Pit and about 1.5 miles northwest of the Copperton Concentrator. Five open pits were constructed between 1989 and 2001. Waste rock disposal area reclamation was completed in 2002. Operations included gold extraction by cyanide heap-leach methods with a closed loop process water system. Five leach pads were constructed and operated through 2013. Meteoric water drainage from the heaps is now directed to Kennecott's process water system. Flows from the Barneys Canyon Water Tunnel, located adjacent to one of the mine pits, are piped to the Copperton Concentrator and used in the beneficiation circuit or directed to the tailings lines. Seep and spring water adjacent to waste rock and the leach pads are also routed directly to the tailings lines.

## **FACILITY**

The Bingham Canyon Mine and Water Collection System, Copperton Concentrator, Barneys Canyon Mine, Tailings Impoundment, Copper Scavenger Cells, RO plant, Sewage Treatment Plant, Smelter, Refinery, and associated facilities for each of these operational units.



## **FACILITY LOCATION**

The company's active facilities are located in western Salt Lake County. The Bingham Canyon Mine, Water Collection System, Copper Cementation Plant, RO Plant, Barneys Canyon, and Copperton Concentrator are located near Copperton, Utah. The Tailings Impoundment, Sewage Treatment Plant, Smelter, and Refinery are located near Magna, Utah. A combination of concentrate, tailing pipelines, and process water return pipeline connect the Copperton Concentrator with the Tailings Impoundment and the Smelter.

## **STANDARD INDUSTRIAL CLASSIFICATION (SIC) CODE**

The SIC codes are 1021 copper ore mining and milling and 3331 smelting and refining of copper.

## **DESCRIPTION OF THE PROCESS AND WASTEWATER SYSTEMS**

Mine and waste rock contact waters at the Bingham Canyon Mine are collected and managed through a water collection system, the Large Bingham Reservoirs, and various groundwater extraction wells from remediation activities.

The Bingham Canyon Mine water collection system consists of a series of cutoff walls, collection basins, pipes, toe drains, French drains, and lined canals that collect and transport storm water runoff from waste rock. Contact waters from certain sections of the waste rock piles are piped to the copper scavenger cells for copper recovery. Tailwater from the copper scavenger cells plant and other waste rock contact waters are typically delivered directly to the tailings line; these waters can also be diverted into the three compartment Large Bingham Reservoirs for temporary storage and later pumped to the tailings line. These reservoirs may also be used to store low-pH mine and waste rock contact waters, certain mine tunnel flows and water from various extraction wells, including the Bingham Canyon Alluvial well, Lark Shaft, Bingham Creek cutoff wall, Curtis Spring, the acid plume wells and the Copperton channel well.

Kennecott has permanently discontinued the use of Outfall 005, originally approved in 1984 for storm water and mine drainage discharge to the Jordan River.

Water is collected and used at the Copperton Concentrator and consists of water collected from tunnels, storm water runoff, extraction well water, and meteoric flows from the mine. Sources of water collected and used at the Copperton Concentrator include:

- 1) Tailings return water (including smelter process water)
- 2) Bingham Canyon mine pit water
- 3) Carr Fork Well
- 4) Storm water from the Upper Bingham Canyon drainages surrounding the pit
- 5) Water from the North Ore Shoot (NOS) Shaft
- 6) Water pumped from the Carr Fork underground workings
- 7) Bingham Tunnel water
- 8) Water from deep wells B2G1193, BFG1200, BSG2828 and LTG1 147
- 9) Water from the Lark Clean Water Well
- 10) Water from the Lark Shaft and Wells
- 11) Water from the upper Dry Fork clean water well and Mid-Valley clean water well
- 12) Treated sewage effluent water
- 13) Barneys Canyon mine pit drainage water, heap leach drain-down water, and some meteoric contact water
- 14) Permeate and/or concentrate streams from membrane treatment (RO) facilities, associated with the treatment of contaminated groundwater
- 15) Leachate collection system water (if present) from Arthur Stepback Repository (CERCLA CAMU)
- 16) Mine and waste rock contact waters
- 17) Canal water (e.g., Utah and Salt Lake Canal or Jordan Canal) for use in processing
- 18) Other mine impacted surface waters or ground waters

Water from the NOS, Carr Fork Well, upper Dry Fork clean water well, Mid-Valley clean water well, Bingham Tunnel, Lark Well, and Lark Shaft can be routed into the process water reservoir or into the Moly filter water tank. Other waters that are routed into the process water reservoir include overflow from the tailings thickeners and overflow from the clarifier. Mine water is commingled with Copperton Concentrator tailings and piped 13 miles to the tailings impoundment.

Deep wells provide feed water to the Zone A RO plant. Treated water from this plant is delivered to a municipal drinking water purveyor for distribution to the public; RO concentrate reports to the tailings pipeline. On occasion, treated or untreated water from these wells may be directed to the process water system.

The volume of water that may be discharged from the impoundment is consistent with the volume that could have been discharged prior to commingling with any zero-discharge water and includes that volume of water incorporated into Kennecott's process system that is not necessary for process and could have been discharged prior to its integrated management.

Flows to the tailings impoundment include water associated with the Copperton tailings, Smelter Slag Concentrator, and Smelter Hydrometallurgical Plant. Each of these facilities uses reagents specific for the process requirements. In addition, surface water drainage, flows from the Garfield Wells, Well #10, Adamson Springs, and the Riter-North Jordan Canal or the Utah-Salt Lake canal may be diverted into the Tailings water management system as needed to provide freshening or make-up water.

Under normal operating conditions, water is pumped from the tailings impoundment decant pond to a clarification canal and recycled back to the Copperton Concentrator via the Magna Reservoir. Excess tailings decant water is discharged in accordance with UPDES conditions at the primary discharge point Outfall 012. Water reporting to Outfall 012 is pumped from the tailings impoundment via the floating decant barge pumps. The intake to these pumps has been designed to skim water from just below the surface in order to reduce the potential to suspend solids from the bottom of the decant pond.

A toe ditch has been constructed along the outer north perimeter of the tailings impoundment embankment with a central toe ditch retention pond. Outfall 007 can be used to discharge from the toe ditch retention pond to the C-7 Ditch when Kennecott does not recycle this water for reuse at the Copperton Concentrator.

Leachate and storm water collected from the Arthur Step-back Repository is occasionally pumped to Pump Station No. 4. Located on the southwest corner of the tailings impoundment, this lined repository provides permanent storage for soil and debris cleaned up during remediation activities.

The smelter has implemented a water management system that incorporates separate systems for smelter process water, acid plant blow-down, slag mill effluent, hydrometallurgical plant effluent, storm water associated with industrial activity, and storm water not associated with industrial areas.

Smelter process waters, such as granulation, anode casting, furnace jacket cooling, acid plant cooling, slag pot cooling, and powerhouse are cooled using onsite cooling towers or heat exchangers or air cooled before returning to the process within the smelter for reuse or sent to the lined East and West Process Ponds before pumping to the Copperton Concentrator via Pump Station No. 4 for recycling. Additional process water includes contact waters used to move process materials within the smelter process. Operations at the smelter are designed to reuse process water within the smelter, or recycle to Copperton Concentrator, thereby meeting the zero-discharge effluent limitation.

A hydrometallurgical plant uses the acid plant blow down and related acidic water from the smelter gas cleaning area to process solids from the flash smelter furnace electrostatic precipitator to recover copper

and precious metals. In addition, refinery bleed electrolyte, precious metals plant blow-down, and miscellaneous bleed streams are directed to the hydrometallurgical plant for use as a reagent. Gypsum/water slurry from this plant is routed through internal Outfall 104 to the tailings impoundment via the slag concentrator tailings pump system. This flow, from the hydrometallurgical plant, is regulated under the effluent guidelines applicable to acid plant blow down and refinery spent electrolyte with appropriate mass-based limitations. The volume of effluent from the hydrometallurgical plant is monitored using an inline flow meter. Flow data is used both to calculate the mass effluent limitations using concentration data from Outfalls 002, 007, and/or 012 to account for the discharge of an equivalent volume of treated tailings water through Outfalls 002, 007, and/or 012.

The STP was constructed to treat sewage from the north end facilities, which now include the smelter, refinery, Praxair, railroad support, and tailings impoundment support facilities as well as neutralized laboratory wastes from the process and environmental laboratories. The plant includes flow equalization, chlorination, and aerobic digestion of sludge. Discharges from the STP consist of a clarified and chlorinated effluent, which reports directly to Pump Station No. 4 and from there to the Copperton Concentrators for use as process water. Biosolids produced at the Kennecott STP are transported to a bagging and drying facility on site. The solids are dried and analyzed for heavy metals, to be disposed of annually at the permitted Kennecott solid waste facility on site.

Water from the Tooele, Section 17, Japanese Springs, and noncontact storm water can be discharged at Outfall 004, Outfall 008 or report to the process water return system via the Hazelton Pump and Smelter Return Canal. Surface water flows from wetlands, Jones, Spitz, No-name, and other natural springs and other artesian groundwater flows can be discharged directly through Outfall 008 consistent with applicable discharge limitations or report to the process water return system via the Smelter Return Canal.

### **SUMMARY OF CHANGES FROM PREVIOUS PERMIT**

The Utah Power Plant was decommissioned in 2019 and no longer discharges to the tailings pipeline.

Selenium discharges from Outfall 004 and 008 are added to the annual limit of 900 kg/yr previously applicable to Outfall 012 only. Selenium and flow monitoring frequency for Outfalls 004 and 008 were increased to support the annual load estimates.

The requirement that the geometric mean of selenium in eggs is based on 5 to 8 eggs was clarified.

The Storm Water requirements will be removed from the UPDES Individual Permit. Kennecott will be required to apply for coverage under the Multi Sector Storm Water permit within 30 days of the effective date of this permit.

The MSGP coverage applies to construction activities within active mining areas including all support facilities. Storm water discharges from earth-disturbing activities conducted prior to active mining activities are considered construction activities and must be covered under the Storm Water Construction General Permit. The current 2021 EPA MSGP (Part 8.G.1.3) includes coverage for these discharges; DWQ may modify Utah's MSGP to include this provision when the permit is renewed in 2024. Mine-related facilities upgradient and within the collection zone of the storm water capture systems do not require separate storm water permit coverage and are subject to the discharge requirements of this permit.

**DISCHARGE**

**DESCRIPTION OF DISCHARGE**

Kennecott has been reporting self-monitoring results on Discharge Monitoring Reports on a monthly basis and has maintained a good compliance record with its UPDES permit requirements. Additional information on the compliance record for the facility can be found here: <https://echo.epa.gov/effluent-charts#UT0000051>.

Outfall	Latitude	Longitude	Description of Discharge Point	Receiving Waters and/or Description
002	40° 44' 30"	112° 05' 15"	C-7 Ditch	Tailing pond outfall to C-7 ditch
004	40° 44' 06"	112° 11' 49"	I-80 culvert to Great Salt Lake	I-80 Culvert to Great Salt Lake
007	40° 46' 15"	112° 07' 00"	C-7 Ditch	Toe Ditch Pond to C-7 Ditch
008	40° 44' 12"	112° 10' 25"	Great Salt Lake	Artesian well water, refinery storm water to the Great Salt Lake
009	40° 32' 07"	112° 11' 39"	Pine Canyon Creek, Tooele County	Pine Canyon Tunnel, Tooele County
010	40° 29' 33"	112° 07' 20"	Butterfield Creek	Butterfield Tunnel to Butterfield Creek
011	40° 42' 52"	112° 06' 57"	Ritter-Utah Salt Lake Canals	Adamson Spring to the Ritter-Utah Salt Lake Canals
012	40° 45' 20"	112° 10' 02"	Great Salt Lake	Tailing discharge to the Great Salt Lake
104	40° 43' 27"	112° 11' 50"	Internal discharge, Hydrometallurgical Plant	Internal discharge from Hydrometallurgical Plant

**RECEIVING WATERS AND STREAM CLASSIFICATION**

The primary receiving water for the tailings impoundment discharge is the Transitional Waters and Gilbert Bay of Great Salt Lake. Collected spring water, and occasional tailings impoundment discharges, flow into the C-7 Ditch which flows into the Lee Creek drainage and from there to Great Salt Lake. Inactive mine tunnels discharge to Butterfield Creek and an ephemeral drainage in Pine Canyon.

Gilbert Bay of Great Salt Lake is classified a Class 5A. The Transitional Waters along the Shoreline of Great Salt Lake are classified as 5E. The C-7 Ditch is classified a Class 3E. Butterfield Creek is classified a Class 2B, 3D and 4. Pine Canyon Creek and Lee Creek are not specifically classified and are presumptively classified as Class 2B and 3D (*Utah Administrative Code (UAC) R317-2-6*). According to *UAC R317-2-6*:

- Class 2B Protected for infrequent primary contact recreation. Also protected for secondary contact recreation where there is a low likelihood of ingestion of water or a low degree of bodily contact with the water. Examples include, but are not limited to, wading, hunting, and fishing.
- Class 3D Protected for waterfowl, shore birds and other water-oriented wildlife not included in Classes 3A, 3B, or 3C, including the necessary aquatic organisms in their food chain.
- Class 3E Severely habitat-limited waters. Narrative standards will be applied to protect these waters for aquatic wildlife.

Class 4	Protected for agricultural uses including irrigation of crops and stock watering.
Class 5A	Gilbert Bay Geographical Boundary -- All open waters at or below approximately 4,208-foot elevation south of the Union Pacific Causeway, excluding all of the Farmington Bay south of the Antelope Island Causeway and salt evaporation ponds. Beneficial Uses -- Protected for frequent primary and secondary contact recreation, waterfowl, shore birds and other water-oriented wildlife including their necessary food chain.
Class 5E	Transitional Waters along the Shoreline of the Great Salt Lake Geographical Boundary – Geographical Boundary -- All waters below approximately 4,208-foot elevation to the current lake elevation of the open water of the Great Salt Lake receiving their source water from naturally occurring springs and streams, impounded wetlands, or facilities requiring a UPDES permit. The geographical areas of these transitional waters change corresponding to the fluctuation of open water elevation. Beneficial Uses -- Protected for infrequent primary and secondary contact recreation, waterfowl, shore birds and other water-oriented wildlife including their necessary food chain.

#### **BASIS FOR EFFLUENT LIMITATIONS**

Kennecott operations are covered by USEPA Effluent Guidelines for the Ore Mining and Dressing Point Source Category, the Nonferrous Metals Manufacturing Point Source Category, Utah Secondary Treatment Standards, and Utah Water Quality Standards.

#### **Outfall 004, 008 and 012**

Kennecott has several outfalls. Great Salt Lake is the ultimate or immediate receiving water for three of these outfalls: 004, 008, and 012. The Level I anti-degradation reviews (protection of existing uses) for these outfalls were conducted in accordance with the Utah Division of Water Quality (DWQ) Interim Methods for Evaluating Use Support for Great Salt Lake Utah Pollution Discharge Elimination System (UPDES) Permits (v. 1.0 January 4, 2016). These methods apply to discharges that are not required to meet Class 3 freshwater numeric aquatic life use criteria prior to discharging to Great Salt Lake. The Level II anti-degradation review is based on the requirements of *UAC R317-2-3*. The whole effluent toxicity (WET) requirements are based on the Utah Pollutant Discharge Elimination System Permit and Enforcement Guidance Document for Whole Effluent Toxicity (DWQ, February, 2018).

**Outfall 004.** Outfall 004 discharges to the Class 5E Transitional Waters and thence to Great Salt Lake via a culvert beneath I-80.

*Class 5E Transitional Waters→Class 5A Gilbert Bay, Great Salt Lake*

**Outfall 008.** Outfall 008 discharges to the C-7 Ditch to the Class 5E Transitional Waters thence to Great Salt Lake. Outfall 008 did not discharge during the last permit cycle.

*Class 3E C-7 Ditch→Class 5E Transitional Waters→Class 5A Gilbert Bay, Great Salt Lake*

**Outfall 012.** Outfall 012 discharges to the Class 5E Transitional Waters and thence to Great Salt Lake via a culvert beneath I-80.

*Class 5E Transitional Waters→Class 5A Gilbert Bay, Great Salt Lake*

The Transitional Waters are mudflats where the discharges create a channel to Gilbert Bay. For Outfall 012, the channel appears to discharge some groundwater as well based on the presence of flow when outfall

discharges were absent. The Transitional Waters only exist when GSL is below an elevation of 4208 feet and Lake elevations are currently less than 4192 feet. The Outfall 012 delta in the Transitional Waters currently exceeds one mile.

Outfall 001 from the Jordan Valley Water Conservancy District Southwest Groundwater Treatment Plant (Jordan Valley, [UT0025836](#)) discharges next to Kennecott Outfall 012. The effluents from the two outfalls coming in the Transitional Waters when both are discharging. In general, the Jordan Valley outfall is a continuous discharge whereas the Kennecott discharge is intermittent and seasonal.

### WET (Whole Effluent Toxicity) Testing

The requirements for acute WET and chronic WET monitoring are consistent with the Utah 2018 WET Guidance and are unchanged from the previous permit. The permit provision that allows for a reduction from a frequency of quarterly was removed because quarterly is the minimum frequency for major industrial dischargers.

### Outfall 002, 007 and 012 Tailing Impoundment

The flow from the mines and concentrator are usually greater than 90 percent of the flow to the tailings impoundment. Federal Ore Mining Guidelines for these categories of wastewaters have concentrations-based limitations. The State has concluded and EPA Region VIII has concurred that concentrations limits are appropriate for the discharge of this water from the tailings impoundment because the applicable standards and limitations are expressed in terms of concentration or other units of measurements (with the exception of selenium, limited as further described below). A small amount of discharge to the tailings impoundment is from the hydrometallurgical plant. The flow to the hydrometallurgical plant is from the smelter acid plant, refinery bleed electrolyte, precious metals plant blowdown, and related refinery minor bleed streams. Federal Nonferrous Metals Manufacturing Guidelines for these categories of wastewaters have mass-based limitations. The effluent from the hydrometallurgical plant to the tailings impoundment is mass based and calculated using the flow of this stream to the tailings impoundment and the concentration of applicable constituents in the discharge from the tailings impoundment.

The appropriate Ore Mining Effluent Guideline limitations in 40 CFR 440.102, best practicable technology (BPT), and 40 CFR 440.103, best available technology (BAT), for copper, lead, gold, silver, and molybdenum ores for copper or molybdenum froth flotation are listed in Table 1.

<b>Table 1</b>				
<b>Ore Mining Effluent Guidelines</b>				
<b>Effluent Limitations</b>				
<b>Parameter</b>	<b>Monthly Average</b>	<b>Daily Minimum</b>	<b>Daily Maximum</b>	<b>Units</b>
Total Suspended Solids (TSS)	20	-	30	mg/L
Copper (Cu)	0.15	-	0.3	mg/L
Zinc (Zn)	0.5	-	1.0	mg/L
Lead (Pb)	0.3	-	0.6	mg/L
Mercury (Hg)	0.001	-	0.002	mg/L
Cadmium (Cd)	0.05	-	0.1	mg/L
pH	-	6.0	9.0	SU

**Table 2**  
**Outfall 002**

For Outfall 002, the effluent flow limit is based upon operational history, or estimated by the permittee, utilizing the structural capacities, coupled with operational knowledge. Limitations for TSS and the daily maximum for Hg are based on the Ore Mining Effluent Guidelines. The limitations for monthly average Cd, Hg, Zn, Se, and Cyanide, and the daily max for Cyanide and the monthly average for Hg are based upon the value in the previous permit, as it is more stringent. The limitations for monthly average As, Cu, and Pb, and the daily max for As, Cd, Cu, Pb, and Zn are based on the Wasteload. The pH is limited by the Utah Secondary Standards, *UAC R317-1-3.2* to a range of 6.5-9.0 standard units. The oil and grease limitation of 10 mg/L maximum is based on Best Professional Judgment (BPJ).

The US Army Corps of Engineers 404 Permit for the North Expansion contained a selenium limit of 12 ug/L in lower Lee Creek water north of I-80 that is protective of wildlife at the Inland Sea Shorebird Reserve (ISSR). Accordingly, Kennecott has been required to manage discharge from Outfalls 002 and 007 consistent with meeting the historic 404 permit limit for selenium in this water; that requirement has been retained. From the point of discharge to Lee Creek the additional dilutions provided from other sources prior to discharging into Lee Creek were modeled using the available data. Kennecott may elect to conduct additional hydrologic studies to further refine future WLAs.

**Parameters of Concern**

The potential parameters of concern for the discharge/receiving water identified were dissolved metals, total suspended solids, and pH, as determined in consultation with the UPDES Permit Writer. WQBELs were determined for metals.

**Total Maximum Daily Load (TMDL)**

According to the Utah Combined 2018/2020 303(d) [Water Quality Assessment Report](#), the receiving water for the Outfall 002 and 007 discharge, Lee Creek from Great Salt Lake to headwaters near 2100 South (UT16020204-036\_00), was listed as fully supporting.

**Reasonable Potential Analysis**

Since January 1, 2016, DWQ has conducted reasonable potential analysis (RP) on all new and renewal applications received after that date. RP for this permit renewal was conducted following DWQ's September 10, 2015 Reasonable Potential Analysis Guidance (RP Guidance). A discharge from Outfall 002 did not occur during the previous permit cycle. Therefore, a full RP was not able to be conducted.

<b>Table 2</b>						
<b>Outfall 002</b>						
<b>Effluent Limitations Self-Monitoring and Reporting Requirements <sup>a</sup></b>						
<b>Parameter</b>	<b>Maximum Monthly Average</b>	<b>Daily Maximum</b>	<b>Daily Minimum</b>	<b>Frequency</b>	<b>Sample Type</b>	<b>Units</b>
Flow	50.0	-	-	Continuous	Recorder	MGD
Total Suspended Solids (TSS)	20	30	-	3 x weekly	Composite	mg/L
Total Arsenic (As)	0.172	0.366	-	3 x weekly	Composite	mg/L
Total Cadmium (Cd)	0.00079	0.008	-	3 x weekly	Composite	mg/L
Total Copper (Cu)	0.0351	0.0557	-	3 x weekly	Composite	mg/L
Total Lead (Pb)	0.0215	0.515	-	3 x weekly	Composite	mg/L
Total Mercury (Hg)	0.000013	0.002	-	3 x weekly	Grab	mg/L
Total Zinc (Zn)	0.224	0.419	-	3 x weekly	Composite	mg/L
Total Selenium (Se) <sup>b, c</sup>	0.012	-	-	Monthly	Grab	mg/L
Total Cyanide	0.0056	0.0241	-	Monthly	Composite	mg/L
Oil & Grease	-	10	-	<sup>d</sup>	Grab	mg/L
Total Dissolved Solids (TDS)	-	-	-	Monthly	Composite	mg/L
pH	-	9.0	6.5	3 x weekly	Grab	SU

**Table 2 References**

- <sup>a</sup> Samples collected in compliance with the monitoring requirements specified above shall be collected at the outfall to the C-7 ditch prior to mixing with the receiving water.
- <sup>b</sup> Selenium will be analyzed by EPA Method 200.8 or alternative method approved by the State of Utah Bureau of Laboratory Improvement.
- <sup>c</sup> 0.012 mg/L is consistent with the requirements of the U.S. Army Corps of Engineers 404 Permit #199450301 and shall not be exceeded at the Lower Lee Creek location north of Interstate 80 during a discharge from outfalls 002 and 007.
- <sup>d</sup> Oil & Grease will be sampled when sheen is observed.

**End Table 2 References**

**Table 3**

For Outfall 007, the effluent flow limit is based upon operational history, or estimated by the permittee, utilizing the structural capacities, coupled with operational knowledge. Limitations for TSS are based on the Ore Mining Effluent Guidelines. The limitations for monthly average for Cd, Hg, Zn, and Se, and daily max for Hg, Zn, and Cyanide are based upon the value in the previous permit, as it is more stringent. The limitations for monthly average As, Cu, Pb, and Cyanide, and the daily max for As, Cd, Cu, and Pb are based on the Wasteload. The pH is limited by the Utah Secondary Standards, *UAC R317-1-3.2* to a range of 6.5-9.0 standard units. The oil and grease limitation of 10 mg/L maximum is based on Best Professional Judgment (BPJ).

The US Army Corps of Engineers 404 Permit for the North Expansion contained a selenium limit of 12 ug/L in lower Lee Creek water north of I-80 that is protective of wildlife at the Inland Sea Shorebird Reserve



(ISSR). Accordingly, Kennecott has been required to manage discharge from Outfalls 002 and 007 consistent with meeting the historic 404 permit limit for selenium in this water; that requirement has been retained. From the point of discharge to Lee Creek the additional dilutions provided from other sources prior to discharging into Lee Creek were modeled using the available data. Kennecott may elect to conduct additional hydrologic studies to further refine future WLAs.

**Parameters of Concern**

The potential parameters of concern for the discharge/receiving water identified were dissolved metals, total suspended solids, and pH, as determined in consultation with the UPDES Permit Writer. WQBELs were determined for metals.

**Total Maximum Daily Load (TMDL)**

According to the Utah Combined 2018/2020 303(d) [Water Quality Assessment Report](#), the receiving water for the Outfall 002 and 007 discharge, Lee Creek from Great Salt Lake to headwaters near 2100 South (UT16020204-036\_00), was listed as fully supporting.

**Reasonable Potential Analysis**

A discharge from Outfall 007 did not occur during the previous permit cycle. Therefore, a full RP was not able to be conducted.

<b>Table 3</b>						
<b>Outfall 007</b>						
<b>Effluent Limitations</b>						
<b>Self-Monitoring and Reporting Requirements <sup>a</sup></b>						
<b>Parameter</b>	<b>Maximum Monthly Average</b>	<b>Daily Maximum</b>	<b>Daily Minimum</b>	<b>Frequency</b>	<b>Sample Type</b>	<b>Units</b>
Flow	15.0	-	-	Continuous	Recorder	MGD
Total Suspended Solids (TSS)	20	30	-	3 x weekly	Composite	mg/L
Total Arsenic (As)	0.222	0.427	-	3 x weekly	Composite	mg/L
Total Cadmium (Cd)	0.00089	0.0093	-	3 x weekly	Composite	mg/L
Total Copper (Cu)	0.0458	0.065	-	3 x weekly	Composite	mg/L
Total Lead (Pb)	0.0284	0.605	-	3 x weekly	Composite	mg/L
Total Mercury (Hg)	0.000015	0.002	-	3 x weekly	Grab	mg/L
Total Zinc (Zn)	0.224	0.5	-	3 x weekly	Composite	mg/L
Total Selenium (Se) <sup>b, c</sup>	0.012	-	-	Monthly	Grab	mg/L
Total Cyanide	0.0056	0.0291	-	Monthly	Composite	mg/L
Oil & Grease	-	10	-	<sup>d</sup>	Grab	mg/L
Total Dissolved Solids (TDS)	-	-	-	Monthly	Composite	mg/L
pH	-	9.0	6.5	3 x weekly	Grab	SU

**Table 3 References**

- <sup>a</sup> Samples collected in compliance with the monitoring requirements specified above shall be collected at the outfall to the C-7 ditch prior to mixing with the receiving water.
- <sup>b</sup> Selenium will be analyzed by EPA Method 200.8 or alternative method approved by the State of Utah Bureau of Laboratory Improvement.

- c. 0.012 mg/L is consistent with the requirements of the U.S. Army Corps of Engineers 404 Permit #199450301 and shall not be exceeded at the Lower Lee Creek location north of Interstate 80 during a discharge from outfalls 002 and 007.
- d. Oil & Grease will be sampled when sheen is observed.

### **End Table 3 References**

#### **Table 4**

##### **Outfall 012**

For Outfall 012, the effluent flow limit is based upon operational history, or estimated by the permittee, utilizing the structural capacities, coupled with operational knowledge. Limitations for TSS are based on the Ore Mining Effluent Guidelines. The limitations for monthly average and daily max for As, Cd, Pd, Cu, Hg, Se, Cyanide, Zn, and annual monitoring for Se are based upon the value in the previous permit. The pH is limited by the Utah Secondary Standards, *UAC R317-1-3.2* to a range of 6.5-9.0 standard units. The oil and grease limitation of 10 mg/L maximum is based on Best Professional Judgment (BPJ).

TSS monitoring has been reduced from daily monitoring to monthly monitoring is based on BPJ to ensure consistent WET monitoring activities even during high wind events.

##### **Reasonable Potential Analysis**

Outfall 012 does not have reasonable potential for arsenic. The maximum expected effluent concentration is less than the Class 3D comparison value of 0.15 mg/l and ambient concentrations in Gilbert Bay.

Outfall 012 does not have reasonable potential for cadmium. The maximum expected effluent concentration did not indicate reasonable potential and concentrations were lower than previously concluded to not have reasonable potential based on comparisons of effluent concentrations to the results of toxicity tests (Brix et al. 2006). The EC<sub>50</sub> concentration of 11.7 mg/l reported by Brix et al. (2006) is orders of magnitude higher than the effluent concentrations.

Outfall 012 does not have reasonable potential for copper. Copper concentrations initially indicate reasonable potential because the effluent concentrations exceed the Class 3D comparison value of 0.030 mg/l and were higher than observed for the previous permit. The maximum 30-day concentration was 0.059 mg/l. As documented in April 29, 2014 Kennecott submittal (DWQ-2014-006141), Brix et al. (2006) reported that the median effective concentration<sup>1</sup> (EC<sub>50</sub>) for effects on brine shrimp reproduction was 0.068 mg/l (dissolved)<sup>2</sup>. To protect against chronic effects on reproduction, an estimate of the no-observed-effects concentration or EC<sub>20</sub> as opposed to an EC<sub>50</sub> was derived by Kennecott. Kennecott obtained the raw data from Brix and calculated an EC<sub>20</sub> of 0.059 mg/l (dissolved).

Applying the default conversion factor from dissolved to total copper specified in *UAC R317-2-14*, the no-effects concentration for total recoverable copper concentration is 0.061 mg/l. This conversion factor appears to be conservative based on the data reported in Adams et al. (2015). Adams et al. (2015) reported a median Cu translator of 0.79, based on dissolved and total recoverable Cu concentrations in Great Salt Lake water samples. The median is assumed to be a reasonable estimate of the geometric mean recommended for translators by EPA. Applying the translator of 0.79 results in a total recoverable copper concentration of 0.079 mg/l before mixing.

Brine shrimp are not expected to inhabit the Class 5E Transitional Waters, so a dilution of 1.5 was calculated

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<sup>1</sup> Concentration at which 50% of the test population was affected

<sup>2</sup> Kennecott reports the copper EC<sub>50</sub> as 69 µg/l in the April 29, 2014 Kennecott Submittal but Brix et al. (2006) reports 68 µg/l.

based on discharging to Class 5A Gilbert Bay in accordance with the mixing zone requirements of *UAC R317-2-5* (May 5, 2015 Mixing Analysis Outfall Ditch to Great Salt Lake DWQ-2015-016387). Applying the dilution to the 0.079 mg/l results in a maximum allowable average effluent concentration of 0.118 mg/l (total recoverable). The maximum 30-day average copper concentration was 0.059 mg/l and copper concentrations are concluded to not have reasonable potential. These findings are further supported by recent chronic testing conducted by TRE on brine shrimp. TRE (2020b) report that the IC<sub>20</sub> for growth was 0.74 mg/l total recoverable copper.

Outfall 012 does not have reasonable potential for mercury. Mercury concentrations in the effluent were measured using a more sensitive analytical method during this permit cycle. The maximum expected concentration was less than the Class 3D screening criteria. With one exception, mercury concentrations were less than the comparison value of 0.000012 mg/l (*UAC R317-2-14*) used to screen for reasonable potential.

Selenium and mercury are potentially bioaccumulative pollutants in Kennecott's effluent and are also expected to be in the effluent from Jordan Valley. The two outfalls comeingle in a common drainage in the Class 5E Transitional Waters when both are discharging. The potential impacts of the combined effluents were considered for these two potentially bioaccumulative pollutants.

An organic form of mercury, methylmercury (MeHg), is present in Gilbert Bay's water and biota. MeHg has the greater potential for impairing the uses compared to other forms of Hg found in the environment because of greater toxicity and biotransfer potential. The reader is cautioned to discern between MeHg and mercury in the following discussions.

Translators are necessary to determine reasonable potential for bioaccumulative compounds. Translators are simple mathematical models of complex processes. Translators are used to estimate the concentration of a pollutant in one media, for instance, brine shrimp, from the concentration in a different media, for instance, water. When mercury is released to the receiving waters, a portion of the mercury is expected to be methylated by indigenous bacteria (mercury to MeHg translator). A portion of this MeHg is taken up by the lower life forms such as invertebrates and a portion of this MeHg is transferred higher in the food web to other biota (MeHg in water to the lower and higher food web receptors).

Beginning in 2011, monitoring of invertebrates, bird eggs, water and sediment in the transitional and open waters. The results of this monitoring are available in the annual Joint Discharge Area Transitional Monitoring Program reports required by the permit. The organism concentrations reported remain relatively low and based on these data, mercury is concluded to not have reasonable potential.

Outfall 012 does have reasonable potential for selenium relative to the Gilbert Bay and the Transitional Waters and the water quality-based effluent is 0.054 mg/l and an annual loading limit of 900 kg/yr. Selenium concentrations in the effluent exceed the Class 3D comparison value of 0.046 mg/l. The water quality standard for Gilbert Bay for selenium standard is 12.5 mg/kg dry weight (dw) in bird eggs. However, no translator is available to reliably predict the water concentrations that correspond to a bird egg concentration of 12.5 mg/kg dw. Hence the continued reliance on monitoring and other comparison values. Ackerman et al. (2015) reported the selenium and mercury concentrations for over 1,000 eggs collected from Great Salt Lake. These results in addition to the annual egg samples collected by DWQ support that the selenium standard continues to be met in the open waters of Gilbert Bay. Figure 1 shows the selenium concentrations by DWQ for eggs collected from Gilbert Bay. DWQ's data show that egg concentrations and water concentrations (data not shown, <0.001mg/l) remain stable.

As required by the Transitional Waters Monitoring Program in the permit, Kennecott collected and analyzed samples of bird eggs, invertebrates, fish, and water from the outfall delta and Great Salt Lake. Monitoring data are available for every year since 2011. The results are annually submitted to DWQ.

The permit includes required actions (triggers) based on the geometric mean selenium concentration of selenium from at least 5 eggs. Requirements for calculating the geometric mean of egg concentrations from at least 5 eggs were clarified for this permit. As shown on Figure 2, the 5-egg minimum was met only in 2017. One to 4 eggs were collected in 2015, 2016, 2019, and 2020 and no eggs in other years.

Birds were observed in the delta every year. Bird use appears to be correlated with the availability of water from effluent discharges in the delta. Jordan Valley is typically a continuous discharge and commenced discharging to the delta in 2017. Kennecott discharged continuously during the 2015 monitoring period and intermittently or not at all for the other years. Although birds were present every year, nesting was not always observed. Eggs could not be collected the years that no nesting was observed. Other factors preventing eggs from being collected include predation and seiche events resulting in flooding.

The requirements of the Transitional Waters Monitoring Program are unchanged from the previous permit. The permit continues to allow changes to Sampling and Analysis Plan during the permit cycle with Director approval. This flexibility is intended to allow modifications to the monitoring based if warranted based on changes observed.

The annual reports submitted document an increase in vegetation cover since Kennecott began continuously discharging to the Transitional Waters approximately 3 years ago. These changes to the habitat are expected to affect bird use in this area and could also affect nesting success by reducing predation by increasing vegetation cover. These habitat changes may also affect selenium exposures by affecting bird access to the water or causing shifts in the macroinvertebrate community. An increase in phragmites may also cause the habitat to be less desirable for shorebirds.

The 5 to 8 egg requirement is unchanged. Selenium concentrations in eggs collected often exhibit a high degree of variability as do the eggs from the outfall delta. This is one of the reasons that geometric mean, which is less sensitive to variability than the e.g., an arithmetic mean, is used to characterize egg concentrations. When variability is high, a larger number of samples are needed to achieve a similar level of certainty compared to when variability is low. However, the maximum number of eggs is limited to 8 avoid adversely impacting bird populations. Similar to the selenium standard for Gilbert Bay, a minimum of 5 eggs are required. Requiring a minimum of 5 eggs balances having sufficient confidence in the results to take actions and having a performance standard that can be implemented.

<b>Table 4</b>							
<b>Outfall 012</b>							
<b>Effluent Limitations</b>							
<b>Self-Monitoring and Reporting Requirements <sup>a, b, c, d</sup></b>							
<b>Parameter</b>	<b>Maximum Monthly Average</b>	<b>Daily Maximum</b>	<b>Daily Minimum</b>	<b>Annual Max</b>	<b>Frequency</b>	<b>Sample Type</b>	<b>Units</b>
Flow	-	-	-	6468	Continuous	Recorder	MGY <sup>e</sup>
Total Suspended Solids (TSS)	20	30	-	-	Monthly	Composite	mg/L
Total Arsenic (As)	0.25	0.5	-	-	Daily	Composite	mg/L
Total Cadmium (Cd)	0.05	0.10	-	-	Daily	Composite	mg/L
Total Copper (Cu)	0.15	0.30	-	-	Daily	Composite	mg/L
Total Lead (Pb)	0.30	0.60	-	-	Daily	Composite	mg/L
Total Mercury (Hg) <sup>f</sup>	0.001	0.002	-	-	Monthly	Grab	mg/L
Total Zinc (Zn)	0.224	0.50	-	-	Daily	Composite	mg/L
Total Cyanide	0.1	0.2	-	-	Monthly	Grab	mg/L
Total Selenium (Se) <sup>g</sup>	-	0.054	-	-	Monthly	Composite	mg/L
Total Selenium (Se), load	-	-	-	900 <sup>h</sup>	Monthly	Calculated	Kg
Selenium	-	-	-	-	Annually	See Section I.C.4. of permit UT0000051	
Total Dissolved Solids (TDS)	-	-	-	-	Monthly	Composite	mg/L
Oil & Grease <sup>i</sup>	-	10	-	-	<sup>i</sup>	Grab	mg/L
pH	-	9.0	6.5	-	Daily	Grab	SU
WET Acute Biomonitoring	-	LC <sub>50</sub> > 100% Effluent	-	-	Quarterly	Composite	-
WET Chronic Biomonitoring	-	TU <sub>c</sub> ≤ 1.6 <sup>j</sup>	-	-	Quarterly	Composite	-

**Table 4 References**

- a. See Definitions, *Part VIII* for definition of terms.
- b. Samples taken in compliance with the monitoring requirements specified above shall be taken at the outfall to the Great Salt Lake prior to mixing with the receiving water.
- c. There shall be no untreated sanitary wastewater discharged into the tailings impoundment.
- d. There shall be no floating solids or visible foam in other than trace amounts.
- e. Annual discharge will be limited annually to 6468 million gallons a year (19,850-acre feet/year)
- f. The mercury analytical method must be EPA Method 1631 used on grab samples collected from the tailings impoundment barge.

- g. Selenium will be analyzed by EPA Method 200.8 or alternative method approved by the State of Utah Bureau of Laboratory Improvement.
- h. To ensure continued protection for Gilbert Bay, the contributions of selenium from Outfall 004 and 008 are included in the annual loading limit of 900 kg/yr in the previous permit the limit was applicable to Outfall 012 only. To demonstrate the loading, an annual loading report will be required to be submitted annually.
- i. Oil & Grease will be sampled when sheen is observed.
- j. TUC is calculated by dividing the receiving water effluent concentration determined in accordance with *UAC R317-2-5* by the chronic test IC<sub>25</sub>. The TUC is an indicator and an exceedance is not used for determining compliance.

#### **End Table 4 References**

#### **Joint Discharge Area Transitional Waters Monitoring Program**

One of the outcomes of the analyses presented in the *Kennecott Utah Copper 2022 Permit Renewal Fact Sheet Statement of Basis, Level I and II antidegradation reviews for Outfalls 004, 008, and 012* was the recommendation to implement a monitoring program to decrease uncertainty. To confirm compliance with the Narrative Standards, a comprehensive sampling and analysis plan for egg, water, sediment and macro-invertebrates including field and laboratory standard operating procedures and methods was developed in 2011 and approved by the Director. This plan was made available for public review and comment as part of the Director's review process in March 2011. The current Field Sampling Plan (ch2m, 2017) is included as a supporting document for this renewal.

Kennecott is required to annually sample eight (8) bird eggs, if available, but not to exceed 20% of available eggs, during the nesting season, April 15 through June 30, for the current permit cycle. The eggs will be collected from bird nests in the joint Jordan Valley outfall 001 and Kennecott 012 affected area. These samples will be subject to the tissue-based selenium water quality standard of 12.5 mg/kg dry weight for Gilbert Bay of Great Salt Lake to demonstrate compliance with the Narrative Standard. Kennecott must notify the Director within 7 business days of becoming aware of any egg concentrations that exceed 9.8 mg/kg. The requirements for calculating the geometric mean selenium concentrations in eggs were clarified but not changed. The permit was clarified that geometric mean selenium concentrations will be based on at all eggs collected but at minimum, 5 eggs. In addition, total mercury concentrations in the egg tissue samples must also be evaluated and reported by Kennecott.

Kennecott is required to annually collect co-located macro-invertebrate and water samples once between April 15 and June 30 and as close in time as practical to the bird egg collection. All samples will be analyzed for selenium. Biota will also be analyzed for total mercury. Water samples will be analyzed for methyl and total mercury. The co-located macro-invertebrates and water samples will be collected at up to six (6) evenly spaced locations along the discharge watercourse from the discharge point to the water's edge from where Outfall 001 enters standing waters of the Great Salt Lake. Sediment sampling was removed from the Field Sampling Plan and the permit because these data were not informative for evaluating bird exposures.

Kennecott is required to biannually collect co-located brine shrimp and water samples twice per year from the open waters of Gilbert Bay in the vicinity of the outfall. Sample collection is constrained by brine shrimp dynamics in the sampling area as brine shrimp may not always be present when sampling is attempted. The intent is to collect brine shrimp samples as close as available to where the effluent waters enter Gilbert Bay between April 15 and June 30 and in October. The water sample will be analyzed for total and methyl mercury and selenium. The brine shrimp sample will be analyzed for total mercury and selenium.

Kennecott will conduct annual bird surveys approximately every two weeks between April 15 and June 30 (four times per season) to document bird abundance, diversity, and use of the Outfall 001 mud flat habitat, particularly for evidence of feeding and nesting using methodology approved by the Director. These data will be submitted in the Annual Project Operating Report.

DWQ strongly recommends that Kennecott coordinate with other facilities that discharge in the same delta to avoid needless duplication and further impact to avian wildlife in the delta area. Other monitoring requirements may be shared if appropriate. The Director shall be notified as soon as possible, but no later than April 1, if the efforts to coordinate monitoring with other dischargers to the delta area are unsuccessful. The detailed field and laboratory data, analysis and a summary of the results from the bird surveys, egg samples and co-located water, sediment and macro-invertebrates' monitoring must be submitted to the DWQ by February 1, or another agreed upon date, following the end of the calendar year for which the results were obtained as a part of the Annual Project Operating Report.

Annually during the previous permit cycle, representatives of DWQ, JWCD, Rio Tinto Kennecott Utah Copper and Western Resource Advocates meet to review the monitoring results. Since annual monitoring was begun in 2011, the collection of bird egg samples was only successful in three of the 8 years and 5 eggs were never available. Prior to the 2019 nesting season, the selenium concentrations measured in the limited eggs collected support that the effluent limitations are protective of the bird populations. In 2019, the selenium concentrations in eggs increased compared to previous results. Three eggs were collected and all 3 eggs exceed 9.8 mg/kg Se dw (Jacobs, 2020. UPDES Compliance Monitoring at Great Salt Lake Outfalls 001 and 012. Final January). No additional actions were required by the permit because the 5-egg minimum was not met.

No changes to the Joint Discharge Area Transitional Waters Monitoring Program or the sampling plan were made. The annual reports submitted by Kennecott document an increase in vegetation cover since Kennecott began continuously discharging to the Transitional Waters approximately 3 years ago. This increase in vegetative cover is expected to affect bird use of the delta and may also increase nesting success by reducing predation. These habitat changes may also affect selenium exposures by altering the composition of the bird and macro-invertebrate communities present.

Similar to the selenium standard for Gilbert Bay, a minimum of 5 eggs are required for calculating the geometric mean concentration. The requirement for 5 to 8 eggs for the Transitional Waters Monitoring Program continues to appropriately balance having a sufficient number of eggs to implement the triggers without adversely impacting bird populations by collecting more than 8 eggs. Although 5 eggs were never previously available, the vegetation cover is rapidly changing at the delta and 5 eggs are anticipated to be available during the upcoming permit cycle.

Ackerman et al. (Mercury and selenium contamination in water bird eggs and risk to avian reproduction at Great Salt Lake, Utah, Open File Report 2015-1020) reported the selenium and mercury concentrations for over 1,000 eggs collected from Great Salt Lake. These results, in addition to eggs collected annually by DWQ, support that the selenium standard continues to be met in the open waters of Gilbert Bay.

#### **Basis for Table 10**

##### **Outfall 104 Smelter and Refinery Discharge**

The discharge from the refinery and smelter are regulated by USEPA Nonferrous Metals Manufacturing Metallurgical Acid Plant, and Spent Refinery Electrolyte point source categories. USEPA regulations require no direct discharge of smelter process wastewater but discharge is allowed from the acid plant. The acid plant is designed to product  $7.7 \times 10^6$  lbs/day of  $H_2SO_4$ . The Refinery is designed to produce  $2.0 \times 10^6$  lbs/day average cathode production. The limitations for the smelter acid plant and refinery are mass limitations.

The gypsum/water slurry effluent from the hydrometallurgical plant is regulated by the mass limitations for metallurgical acid plants and spent refinery electrolyte. Refinery casting is not included in the determination of applicable effluent limits after completion of the 1995 smelter, because the refinery casting has been moved to the smelter casting area and there is zero discharge from this area.

The smelter is regulated under new source performance standards (NSPS). Table 5 contains NSPS for the smelter acid plant and hydrometallurgical plant effluents and Table 6 contains the smelter acid plant and hydrometallurgical plant mass discharge limits.

<b>Table 5</b>		
<b>Smelter Acid Plant and Hydrometallurgical Plant Mass Discharge Guidelines 40 CFR 421.94</b>		
<b>Effluent Limitations</b>		
<b>Parameter</b>	<b>Monthly Maximum lbs/10<sup>6</sup> lbs/day of H<sub>2</sub>SO<sub>4</sub></b>	<b>Daily Maximum lbs/ 10<sup>6</sup> lbs/day of H<sub>2</sub>SO<sub>4</sub></b>
Total Suspended Solids	30.650	38.310
Arsenic	1.456	3.550
Cadmium	0.204	0.511
Copper	1.558	3.269
Lead	0.332	0.715
Zinc	1.073	2.605
pH	a	a

<b>Table 6</b>		
<b>Smelter Acid Plant and Hydrometallurgical Plant Mass Discharge Guidelines 40 CFR 421.94</b>		
<b>Effluent Limitations based on H<sub>2</sub>SO<sub>4</sub> production of 7.7 x 10<sup>6</sup> lbs/day</b>		
<b>Parameter</b>	<b>Monthly Maximum lbs/day</b>	<b>Daily Maximum lbs/day</b>
Total Suspended Solids	236	295
Arsenic	11.2	27.3
Cadmium	1.57	3.93
Copper	12	25.2
Lead	2.56	5.51
Zinc	8.26	20.1
pH	a	a

**Table 5 & 6 References**

- a. The pH is limited by the Utah Secondary Standards, *UAC R317-1-3.2* to a range of 6.5-9.0 standard units.

**End Table 5 & 6 References**

Small flows of spent refinery electrolyte are subject to the Spent Refinery Electrolyte effluent limitation guidelines. Table 7 contains the effluent limitation guidelines for the refinery spent electrolyte effluent and Table 8 contains the refinery mass discharge limits.



<b>Table 7</b>		
<b>Refinery Spent Electrolyte Guidelines 40 CFR 421.54</b>		
<b>Effluent Limitations</b>		
<b>Parameter</b>	<b>Monthly Maximum lbs/10<sup>6</sup> lbs Cu produced</b>	<b>Daily Maximum lbs/10<sup>6</sup> lbs H<sub>2</sub>SO<sub>4</sub></b>
Total Suspended Solids	0.588	0.735
Arsenic	0.0281 <sup>b</sup>	0.068
Copper	0.03	0.063
Nickel	0.018	0.027
pH	a	a

<b>Table 8</b>		
<b>Refinery Spent Electrolyte Mass Discharge Limits</b>		
<b>Effluent Limitations based on Cu cathode production of 2.0 x 10<sup>6</sup> lbs/day</b>		
<b>Parameter</b>	<b>Monthly Maximum lbs/day</b>	<b>Daily Maximum lbs/day</b>
Total Suspended Solids	1.18	1.47
Arsenic	0.06	0.14
Copper	0.06	0.13
Nickel	0.04	0.054
pH	a	a

**Table 7 & 8 References**

- a. The pH is limited by the Utah Secondary Standards, *UAC R317-1-3.2* to a range of 6.5-9.0 standard units.
- b. The arsenic number differs from the effluent limitation guidelines in that it is more stringent and is continued from a previous permit.

**End Table 7 & 8 References**

In order to calculate the allowable discharge limits from Outfall 104, DWQ added the values in Table 6 and 8 to produce total mass limits in Table 9 applicable to the smelter acid plant, hydrometallurgical plant, and refinery discharge. The discharge is directed to the tailings impoundment where further treatment through precipitation, sedimentations, and clarification occurs in the tailings impoundment decant pond to meet the mass limitations, especially for total suspended solids. Compliance with mass limitations is calculated by first multiplying the flow from the hydrometallurgical plant by the ratio of tailings impoundment wastewater discharge rate divided by the total wastewater inflow to the tailings impoundment to determine the portion attributable to the hydrometallurgical plant. Finally, this discharge flow rate is multiplied by the tailings impoundment discharge concentrations to determine the mass discharged.

<b>Table 9</b>		
<b>Smelter Acid Plant/Hydrometallurgical Plant/Refinery Mass Discharge Limits Outfall 104</b>		
<b>Effluent Limitations</b>		
<b>Parameter</b>	<b>Monthly Maximum lbs/day</b>	<b>Daily Maximum lbs/day</b>
Total Suspended Solids	237	296
Arsenic	11.3	27.4
Cadmium	1.57	3.93
Copper	12.1	25.3
Lead	2.56	5.51
Zinc	8.26	20.1

**Parameters of Concern**

The potential parameters of concern for the discharge/receiving water identified were dissolved metals, total suspended solids, and pH, as determined in consultation with the UPDES Permit Writer. WQBELs were determined for metals.

**Reasonable Potential Analysis**

RP Analysis for Outfall 104 was conducted on arsenic, zinc, cadmium, lead, and copper. The results indicated RP for each parameter. The limitations in Table 10 satisfy the monitoring requirements.

<b>Table 10</b>					
<b>Outfall 104</b>					
<b>Effluent Limitations</b>					
<b>Self-Monitoring and Reporting Requirements <sup>a</sup></b>					
<b>Parameter</b>	<b>Maximum Monthly Average</b>	<b>Daily Maximum</b>	<b>Frequency</b>	<b>Sample Type</b>	<b>Units</b>
Flow	-	-	Continuous	Recorder	MGD
Total Suspended Solids (TSS)	237	296	Weekly	Composite	lb/day
Total Arsenic (As)	11.3	27.4	Weekly	Composite	lb/day
Total Cadmium (Cd)	1.57	3.93	Weekly	Composite	lb/day
Total Copper (Cu)	12.1	25.3	Weekly	Composite	lb/day
Total Lead (Pb)	2.56	5.51	Weekly	Composite	lb/day
Total Zinc (Zn)	8.26	20.1	Weekly	Composite	lb/day

**Table 10 References**

<sup>a</sup> See Definitions, *Part VIII* for definition of terms.

**End Table 10 References**

**Outfall 004 Runoff and Artesian Water**

Storm water runoff from the drainage behind the smelter through the Kessler drainage channel, the flow from Japanese Springs, excess water from Tooele Spring, surface flows, natural springs and excess Section 17 water which has not been used for process can be discharged at relocated Outfall 004. The discharge will be sampled and reported for the same parameters as Outfall 008. Discharges from outfall 004 are not limited on flow, but will be monitored and reported if a discharge occurs.

### **Reasonable Potential Analysis**

Outfall 004 does not have reasonable potential for arsenic. Arsenic effluent concentrations initially indicate reasonable potential because the concentrations exceed the Class 3D comparison value of 0.15 mg/l and ambient concentrations in Gilbert Bay. The maximum 30-day average effluent concentration was 0.073 mg/l. The no-effects concentration of 8 mg/l reported by Brix et al. (2003) for arsenic is substantially higher than the effluent concentrations and arsenic is concluded to not have reasonable potential. These findings are further supported by recent chronic toxicity testing conducted by TRE Environmental Solutions (TRE). TRE (2020a) reports an IC20 (inhibitory concentration for 20 percent of the tested organisms) for growth was 19.4 mg/l.

Outfall 004 does not have reasonable potential for cadmium. Cadmium concentrations initially indicate reasonable potential because the maximum expected effluent concentration could exceed the Class 3D comparison. However, effluent cadmium concentrations were lower than previously evaluated and lower than the EC<sub>50</sub> concentrations for brine shrimp reported by Brix et al. (2006). The EC<sub>50</sub> is higher than a no-effects concentration but there are over 4 orders of magnitude between the effluent concentrations and the EC<sub>50</sub> of 11.7 mg/l. Effluent cadmium concentrations were below detectable concentrations in most of the effluent samples collected during the last permit cycle.

Outfall 004 does not have reasonable potential for copper. Copper concentrations initially indicate reasonable potential because the effluent concentrations exceed the Class 3D comparison value of 0.030 mg/l. Copper concentrations were similar to the concentrations concluded to not have reasonable potential for the previous permit. No reasonable potential is concluded because effluent concentrations are lower than the effects levels for brine shrimp reproduction toxicity tests conducted by Brix et al. (2006).

Outfall 004 does not have reasonable potential for mercury. Mercury was not detected in the effluent.

Outfall 004 does not have reasonable potential for selenium in the Transitional Waters. Effluent concentrations of 0.007 mg/l did not exceed the comparison value of 0.046 mg/l. The higher effluent concentrations evaluated by the Transitional Waters Monitoring Program for Outfall 012 collected prior to Jordan Valley discharging in 2017 (only Kennecott discharged) support that the concentrations and frequency of discharges from Outfall 004 are unlikely to adversely affect the aquatic life. To ensure continued protection for Gilbert Bay, the contributions of selenium from Outfall 004 are included in the annual loading limit of 900 kg/yr currently applicable to Outfall 012 only.

### **TABLE 11**

#### **OUTFALL 008**

Outfall 008 consists of water from the Garfield Wells, Section 17, surface flows, Tooele Spring, Jones Spring, Spitz Spring, No-name Spring and other natural springs. Surface water and artesian groundwater with elevated selenium levels with continue to be contained and routed to the process water circuit for treatment and use at the Copperton Concentrator. However, surface water or artesian groundwater meeting discharge limitations can also be discharged through Outfall 008. The discharge is monitored quarterly for the same parameters as Outfall 012 except for cyanide and biomonitoring.

### **Reasonable Potential Analysis**

Outfall 008 does not have reasonable potential for selenium in the Transitional Waters because the maximum expected concentration was less than the Class 3D screening criteria. To ensure continued protection for Gilbert Bay, the contributions of selenium from Outfall 008 are included in the annual loading limit of 900 kg/yr currently applicable to Outfall 012 only.

<b>Table 11</b>							
<b>Outfall 004</b>							
<b>Effluent Limitations</b>							
<b>Self-Monitoring and Reporting Requirements <sup>a, b, c</sup></b>							
<b>Parameter</b>	<b>Maximum Monthly Average</b>	<b>Daily Maximum</b>	<b>Daily Minimum</b>	<b>Annual Max</b>	<b>Frequency</b>	<b>Sample Type</b>	<b>Units</b>
Flow	-	-	-	-	Quarterly	Measured	MGD
Total Suspended Solids (TSS)	-	-	-	-	Quarterly	Grab	mg/L
Total Arsenic (As)	-	-	-	-	Quarterly	Grab	mg/L
Total Cadmium (Cd)	-	-	-	-	Quarterly	Grab	mg/L
Total Copper (Cu)	-	-	-	-	Quarterly	Grab	mg/L
Total Lead (Pb)	-	-	-	-	Quarterly	Grab	mg/L
Total Mercury (Hg) <sup>d</sup>	-	-	-	-	Quarterly	Grab	mg/L
Total Zinc (Zn)	-	-	-	-	Quarterly	Grab	mg/L
Total Selenium (Se)	-	-	-	-	Quarterly	Grab	mg/L
Total Dissolved Solids (TDS)	-	-	-	-	Quarterly	Grab	mg/L
Total Selenium (Se), load	-	-	-	900 <sup>e</sup>	Monthly	Calculated	Kg
Oil & Grease	-	-	-	-	<sup>f</sup>	Grab	mg/L
pH	-	-	-	-	Quarterly	Grab	SU

**Table 11 References**

- a. See Definitions, *Part VIII* for definition of terms.
- b. There shall be no floating solids or visible foam in other than trace amounts.
- c. Discharges from outfall 004 are not limited on flow, but will be monitored and reported if a discharge occurs.
- d. The mercury analytical method must be EPA Method 1631 used on grab samples collected from the tailings impoundment barge.
- e. To ensure continued protection for Gilbert Bay, the contributions of selenium from Outfall 004 and 008 are included in the annual loading limit of 900 kg/yr in the previous permit the limit was applicable to Outfall 012 only.
- f. Oil & Grease will be sampled when sheen is observed.

**End Table 11 References**

<b>Table 12</b>							
<b>Outfall 008</b>							
<b>Effluent Limitations</b>							
<b>Self-Monitoring and Reporting Requirements <sup>a, b</sup></b>							
<b>Parameter</b>	<b>Maximum Monthly Average</b>	<b>Daily Maximum</b>	<b>Daily Minimum</b>	<b>Annual Max</b>	<b>Frequency</b>	<b>Sample Type</b>	<b>Units</b>
Flow	5.5	-	-	-	Quarterly	Measured	MGD
Total Suspended Solids (TSS)	20	30	-	-	Quarterly	Grab	mg/L
Total Arsenic (As)	0.25	0.50	-	-	Quarterly	Grab	mg/L
Total Cadmium (Cd)	0.05	0.10	-	-	Quarterly	Grab	mg/L
Total Copper (Cu)	0.15	0.30	-	-	Quarterly	Grab	mg/L
Total Lead (Pb)	0.30	0.60	-	-	Quarterly	Grab	mg/L
Total Mercury (Hg) <sup>c</sup>	0.001	0.002	-	-	Quarterly	Grab	mg/L
Total Zinc (Zn)	0.224	0.50	-	-	Quarterly	Grab	mg/L
Total Selenium (Se)	-	0.054	-	-	Quarterly	Grab	mg/L
Total Dissolved Solids (TDS)	-	-	-	-	Quarterly	Grab	mg/L
Total Selenium (Se), load	-	-	-	900 <sup>d</sup>	Monthly	Calculated	Kg
Oil & Grease	-	10	-	-	<sup>e</sup>	Grab	mg/L
pH	-	9.0	6.5	-	Quarterly	Grab	SU

**Table 12 References**

- <sup>a.</sup> See Definitions, *Part VIII* for definition of terms.
- <sup>b.</sup> There shall be no floating solids or visible foam in other than trace amounts.
- <sup>c.</sup> The mercury analytical method must be EPA Method 1631 used on grab samples collected from the tailings impoundment barge.
- <sup>d.</sup> To ensure continued protection for Gilbert Bay, the contributions of selenium from Outfall 004 and 008 are included in the annual loading limit of 900 kg/yr the previous permit the limit was applicable to Outfall 012 only.
- <sup>e.</sup> Oil & Grease will be sampled when sheen is observed.

**End Table 12 References**

**TABLE 13**

**OUTFALL 009 PINE CANYON TUNNEL**

Outfall 009 consists of up to 0.086 MGD of water from the Pine Canyon Tunnel, a former mine tunnel still in use by Kennecott for water conveyance. The majority of this water seeps into the ground before it reaches the intermittent stream channel. The discharge will be monitored at the portal of the Pine Canyon Tunnel. The permit limits for daily and monthly Cd, Cu, Pb, and Zn are from the WLA. The permit limits for As, Hg, and Se are the same as in the previous permit. Data from the facility indicate that dissolved solids concentrations after mixing with the intermittent stream are characterized by lower consistent concentrations than documented in storm water in this drainage. Kennecott may elect to conduct additional hydrologic studies to further refine future WLAs.

**Parameters of Concern**

The potential parameters of concern for the discharge/receiving water identified were dissolved metals, total suspended solids, and pH, as determined in consultation with the UPDES Permit Writer. WQBELs were determined for metals.

**Reasonable Potential Analysis**

RP was conducted on Outfall 009 for mercury. Outfall 009 does not have reasonable potential for mercury.

<b>Table 13</b>						
<b>Outfall 009</b>						
<b>Effluent Limitations</b>						
<b>Self-Monitoring and Reporting Requirements <sup>a, b</sup></b>						
<b>Parameter</b>	<b>Maximum Monthly Average</b>	<b>Daily Maximum</b>	<b>Daily Minimum</b>	<b>Frequency</b>	<b>Sample Type</b>	<b>Units</b>
Flow	0.086	-	-	2 x Yearly	Measured	MGD
Total Suspended Solids (TSS)	20	30	-	2 x Yearly	Grab	mg/L
Total Arsenic (As)	0.25	0.5	-	2 x Yearly	Grab	mg/L
Total Cadmium (Cd)	0.00158	0.0021	-	2 x Yearly	Grab	mg/L
Total Copper (Cu)	0.0172	0.0155	-	2 x Yearly	Grab	mg/L
Total Lead (Pb)	0.0012	0.0716	-	2 x Yearly	Grab	mg/L
Total Mercury (Hg)	0.001	0.002	-	2 x Yearly	Grab	mg/L
Total Zinc (Zn)	0.228	0.144	-	2 x Yearly	Grab	mg/L
Total Selenium (Se) <sup>c</sup>	0.012	-	-	2 x Yearly	Grab	mg/L
Total Dissolved Solids (TDS)	-	-	-	2 x Yearly	Grab	mg/L
Oil & Grease	-	10	-	<sup>d</sup>	Grab	mg/L
pH	-	9.0	6.5	2 x Yearly	Grab	SU

**Table 13 References**

- a. See Definitions, *Part VIII* for definition of terms.
- b. There shall be no floating solids or visible foam in other than trace amounts.
- c. Selenium will be analyzed by Method 200.8 or alternative method approved by the State of Utah Bureau of Laboratory Improvement.
- d. Oil & Grease will be sampled when sheen is observed.

**End Table 13 References**

**TABLE 14  
 OUTFALL 010 BUTTERFIELD TUNNEL**

Outfall 010 consist of water from the Butterfield Tunnel, a former mine. The discharge will be sampled and reported for the same parameters as the tailings impoundment except for cyanide. The discharge limits are the same as the previous permit limits and have been developed to comply with the most restrictive standard from the Ore Mining guidelines 40 CFR 440.103, Class 3D aquatic life, Class 4 agricultural water quality standards, and the waste load analysis developed water quality based effluent limit listed in Table 13. The agricultural standard is used as a maximum for total dissolved solids, arsenic and lead because the existing quality is significantly better than the calculated effluent limitations.

**Parameters of Concern**

The parameters of concern identified for the discharge/receiving water were dissolved metals, selenium, TDS, and pH as determined in consultation with the UPDES Permit Writer.

**TMDL**

Butterfield Creek (UT16020204-024\_02) is listed as impaired for total dissolved solids (TDS), Selenium, and *E. coli* according to Utah’s Combined 2018/2020 Integrated Report. A TMDL has not been completed for these constituents and this time. Water quality based effluent limits (WQBELs) for these constituents will be set at the applicable water quality standards with no allowance for mixing.

**Reasonable Potential Analysis**

RP Analysis for Outfall 010 was conducted on arsenic, cadmium, copper, mercury, lead, selenium, and zinc. The results indicated RP for zinc. The limitations in Table 13 satisfy the monitoring requirements.

<b>Table 14</b>						
<b>Outfall 010</b>						
<b>Effluent Limitations</b>						
<b>Self-Monitoring and Reporting Requirements <sup>a, b</sup></b>						
<b>Parameter</b>	<b>Maximum Monthly Average</b>	<b>Daily Maximum</b>	<b>Daily Minimum</b>	<b>Frequency</b>	<b>Sample Type</b>	<b>Units</b>
Flow	0.65	-	-	Quarterly	Measured	MGD
Total Suspended Solids (TSS)	20	30	-	Quarterly	Grab	mg/L
Total Arsenic (As)	-	0.10	-	Quarterly	Grab	mg/L
Total Cadmium (Cd)	0.0013	0.0066	-	Quarterly	Grab	mg/L
Total Copper (Cu)	-	0.038	-	Quarterly	Grab	mg/L
Iron (Fe)	-	1.09				
Total Lead (Pb)	0.023	0.100	-	Quarterly	Grab	mg/L
Total Mercury (Hg) <sup>c</sup>	0.00002	0.00023	-	Quarterly	Grab	mg/L
Total Zinc (Zn)	0.323	0.493	-	Quarterly	Grab	mg/L
Total Selenium (Se) <sup>d</sup>	0.005	0.0184	-	Quarterly	Grab	mg/L
Total Dissolved Solids (TDS)	-	1200	-	Quarterly	Grab	mg/L
Oil & Grease	-	10	-	<sup>e</sup>	Grab	mg/L
pH	-	9.0	6.5	Quarterly	Grab	SU

**Table 14 References**

- <sup>a</sup> See Definitions, *Part VIII* for definition of terms.
- <sup>b</sup> There shall be no floating solids or visible foam in other than trace amounts.
- <sup>c</sup> Kennecott will voluntarily analyze mercury using a low-level total mercury analysis.
- <sup>d</sup> Selenium will be analyzed by Method 200.8 or alternative method approved by the State of Utah Bureau of Laboratory Improvement.
- <sup>e</sup> Oil & Grease will be sampled when sheen is observed.

**End Table 14 References**

**TABLE 15**  
**OUTFALL 011 ADAMSON SPRING**

This discharge is a natural spring. However, there is the potential for relatively small amounts of process water to commingle with the spring water. The discharge will be limited for total suspended solids (TSS), and zinc as listed in the Ore Mining Effluent Guideline limitations in 40 CFR 440.102, best practicable technology (BPT), and 40 CFR 440.103, best available technology (BAT). These limitations are more restrictive than the WLA developed for this permit renewal. The pH is limited by the Utah Secondary Standards, *UAC R317-1-3.2* to a range of 6.5-9.0 standard units. Oil and Grease is limited by Best Professional Judgement to 10 mg/L/

A maximum limitation for arsenic is based upon the ground water permit for this spring. This limit has been included in previous permits, and is more restrictive than the 2021 WLA WQBEL developed for arsenic. Daily maximum limits for cadmium and lead were retained as they are more restrictive than 2021 WLA for outfall 011. WQBELs for copper and selenium, are based on the 2021 WLA, which was developed for this discharge point, and are also considered protective of downstream uses (*UAC R317-2-8*) in Lee Creek. From the point of discharge to Lee Creek the additional dilutions provided from other sources prior to discharging into Lee Creek were modeled using the available data. Kennecott may elect to conduct additional hydrologic studies to further refine future WLAs.

Total dissolved Solids (TDS) are to be monitored but not limited because the receiving waters are not classified as Class 4 and the salinity influences from the proximity to Great Salt Lake.

**Parameters of Concern**

The parameters of concern identified for the discharge/receiving water were dissolved metals, total suspended solids, and pH as determined in consultation with the UPDES Permit Writer.

**TMDL**

Lee Creek (UT16020204-036\_00, Lee Creek from Great Salt Lake to headwaters near 2100 South) is fully supporting all parameters according to Utah's 2018/2020 Combined Integrated Report.

**Reasonable Potential Analysis**

RP Analysis for Outfall 011 was conducted on arsenic, cadmium, copper, lead, selenium, and zinc. The results indicated Outfall 011 does not have reasonable potential for the above parameters.



<b>Table 15</b>						
<b>Outfall 011</b>						
<b>Effluent Limitations</b>						
<b>Self-Monitoring and Reporting Requirements <sup>a, b, c</sup></b>						
<b>Parameter</b>	<b>Maximum Monthly Average</b>	<b>Daily Maximum</b>	<b>Daily Minimum</b>	<b>Frequency</b>	<b>Sample Type</b>	<b>Units</b>
Flow	3.9	-	-	Quarterly	Measured	MGD
Total Suspended Solids (TSS)	20	30	-	Quarterly	Grab	mg/L
Total Arsenic (As)	-	0.013	-	Quarterly	Grab	mg/L
Total Cadmium (Cd)	0.0013	0.010	-	Quarterly	Grab	mg/L
Total Copper (Cu)	0.102	0.119	-	Quarterly	Grab	mg/L
Total Lead (Pd)	0.0662	0.010	-	Quarterly	Grab	mg/L
Total Zinc (Zn)	0.224	0.50	-	Quarterly	Grab	mg/L
Total Selenium (Se) <sup>d</sup>	0.0058	0.013	-	Quarterly	Grab	mg/L
Total Dissolved Solids (TDS)	-	-	-	Quarterly	Grab	mg/L
Oil & Grease	-	10	-	<sup>e</sup>	Grab	mg/L
pH	-	9.0	6.5	Quarterly	Grab	SU

**Table 15 References**

- a. See Definitions, *Part VIII* for definition of terms.
- b. For intermittent discharges, the duration of the discharge shall be reported.
- c. There shall be no floating solids or visible foam in other than trace amounts.
- d. Selenium will be analyzed by Method 200.8 or alternative method approved by the State of Utah Bureau of Laboratory Improvement.
- e. Oil & Grease will be sampled when sheen is observed.

**End Table 15 References**

**Leach System**

The Ore Mining and Dressing Point Source Category, 40 CFR 440.103 (c), requires that there be no discharge of process wastewater to navigable waters from leach operations except under defined circumstances. The zero discharge provisions do not apply to drain down of water from the inactive waste rock leaching operations or other inactive facilities in the process of being closed. In that regard, Kennecott is treating drain down from inactive waste rock leaching operations with the neutralization capacity contained in copper tailings, and discharging the treated drain down to the tailings impoundment. In addition, drain down rinse water from Barneys Canyon historic heap leaching operation will be conveyed to the tailings impoundment.

Treatment of waste rock drain down is expected to continue during the term of this permit. Section 40 CFR 440.131(c) authorizes a discharge of process water if the facility is designed, constructed and maintained

to contain the maximum volume from a 10-year 24-hour precipitation event. The capacity of the Zone 1 and 2 Large Bingham Reservoir is 1770 acre-feet.

**SELF-MONITORING AND REPORTING REQUIREMENTS**

The permit will require reports to be submitted monthly, quarterly, and yearly as applicable, on the NetDMR system due 28 days after the end of the monitoring period. Lab sheets for biomonitoring must be attached to the biomonitoring NetDMR submittal.

The Annual Project Operating Report is due by February 1<sup>st</sup> of the following year.

The Selenium loading for Outfall 004, 008, and 012 will be reported in NetDMR with a combined total.

**BIOSOLIDS**

For clarification purposes, sewage sludge is considered solids, until treatment or testing shows that the solids are safe, and meet beneficial use standards. After the solids are tested or treated, the solids are then known as biosolids. Class A biosolids, may be used for high public contact sites, such as home lawns and gardens, parks, or playing fields, etc. Class B biosolids may be used for low public contact sites, such as farms, rangeland, or reclamation sites, etc.

**DESCRIPTION OF TREATMENT AND DISPOSAL**

Biosolids produced at the Kennecott STP are separated from effluent via a screw press and are then transported to a bagging and drying facility on site. The solids are dried and analyzed for heavy metals, to be disposed of annually on site at the Kennecott permitted solid waste facility

**SELF-MONITORING REQUIREMENTS**

Under *40 CFR 503.16(a)(1)*, the self-monitoring requirements are based upon the amount of biosolids disposed per year and shall be monitored according to the chart below.

Minimum Frequency of Monitoring (40 CFR Part 503.16, 503.26. and 503.46)		
Amount of Biosolids Disposed Per Year		Monitoring Frequency
Dry US Tons	Dry Metric Tons	Per Year or Batch
> 0 to < 320	> 0 to < 290	Once Per Year or Batch
> 320 to < 1650	> 290 to < 1,500	Once a Quarter or Four Times
> 1,650 to < 16,500	> 1,500 to < 15,000	Bi-Monthly or Six Times
> 16,500	> 15,000	Monthly or Twelve Times

Kennecott has produced on average 1 DMT of biosolids per year, therefore they would sample once a year. Kennecott disposes of all biosolids they produce in a landfill, and is not required to sample for biosolids requirements.

**Landfill Monitoring**

Under *40 CFR 258*, the landfill monitoring requirements include a paint filter test. If the biosolids do not pass a paint filter test, the biosolids cannot be disposed in the sanitary landfill (*40 CFR 258.28(c)(1)*).

## **BIOSOLIDS LIMITATIONS**

### Heavy Metals

#### Class A Biosolids for Home Lawn and Garden Use

The intent of the heavy metals regulations of Table 3, *40 CFR 503.13* is to ensure the heavy metals do not build up in the soil in home lawn and gardens to the point where the heavy metals become phytotoxic to plants. The permittee will be required to produce an information sheet (see *Part III. C.* of the permit) to made available to all people who are receiving and land applying Class A biosolids to their lawns and gardens. If the instructions of the information sheet are followed to any reasonable degree, the Class A biosolids will be able to be land applied year after year, to the same lawns and garden plots without any deleterious effects to the environment. The information sheet must be provided to the public, because the permittee is not required, nor able to track the quantity of Class A biosolids that are land applied to home lawns and gardens.

#### Class A Requirements with Regards to Heavy Metals

If the biosolids are to be applied to a lawn or home garden, the biosolids shall not exceed the maximum heavy metals in Table 1 and the monthly average pollutant concentrations in Table 3 (see Table 1 and Table 3 below). If the biosolids do not meet these requirements, the biosolids cannot be sold or given away for applications to home lawns and gardens.

#### Class B Requirements for Agriculture and Reclamation Sites

The intent of the heavy metals regulations of Tables 1, 2 and 3, of *40 CFR 503.13* is to ensure that heavy metals do not build up in the soil at farms, forest land, and land reclamation sites to the point where the heavy metals become phytotoxic to plants. The permittee will be required to produce an information sheet (see *Part III. C.* of the permit) to be handed out to all people who are receiving and land applying Class B biosolids to farms, ranches, and land reclamation sites (if biosolids are only applied to land owned by the permittee, the information sheet requirements are waived). If the biosolids are land applied according to the regulations of *40 CFR 503.13*, to any reasonable degree, the Class B biosolids will be able to be land applied year after year, to the same farms, ranches, and land reclamation sites without any deleterious effects to the environment.

#### Class B Requirements with Regards to Heavy Metals

If the biosolids are to be land applied to agricultural land, forest land, a public contact site or a reclamation site it must meet at all times:

The maximum heavy metals listed in 40 CFR Part 503.13(b) Table 1 and the heavy metals loading rates in 40 CFR Part 503.13(b) Table 2; or

The maximum heavy metals in 40 CFR Part 503.13(b) Table 1 and the monthly heavy metals concentrations in 40 CFR Part 503.13(b) Table 3.

Tables 1, 2, and 3 of Heavy Metal Limitations

Pollutant Limits, (40 CFR Part 503.13(b)) Dry Mass Basis				
Heavy Metals	Table 1	Table 2	Table 3	Table 4
	Ceiling Conc. Limits <sup>1, 2</sup> , (mg/kg)	CPLR <sup>3</sup> , (mg/ha)	Pollutant Conc. Limits <sup>1, 2</sup> , (mg/kg)	APLR <sup>4</sup> , (mg/ha-yr)
Total Arsenic	75	41	41	2.0
Total Cadmium	85	39	39	1.9
Total Copper	4300	1500	1500	75
Total Lead	840	300	300	15
Total Mercury	57	17	17	0.85
Total Molybdenum	75	N/A	N/A	N/A
Total Nickel	420	420	420	21
Total Selenium	100	100	100	5.0
Total Zinc	7500	2800	2800	140
1, The limitations represent the maximum allowable levels of heavy metals in any biosolids intended for land application.				
2, These limitations represent the maximum allowable levels of heavy metals based on an average of all samples taken during a 30-day period.				
3, CPLR - Cumulative Pollutant Loading Rate				
4, APLR – Annual Pollutant Loading Rate				

Any violation of these limitations shall be reported in accordance with the requirements of Part III.F.1. of the permit. If the biosolids do not meet these requirements they cannot be land applied.

Pathogens

The Pathogen Control class listed in the table below must be met;

Pathogen Control Class	
503.32 (a)(1) - (5), (7), -(8), Class A	503.32 (b)(1) - (5), Class B
B Salmonella species –less than three (3) MPN per four (4) grams total solids (DWB) or Fecal Coliforms – less than 1,000 MPN per gram total solids (DWB).	Fecal Coliforms – less than 2,000,000 MPN or CFU per gram total solids (DWB).
503.32 (a)(6) Class A—Alternative 4	
B Salmonella species –less than three (3) MPN per four (4) grams total solids (DWB) or less than 1,000 MPN Fecal Coliforms per gram total solids (DWB), And - Enteric viruses –less than one (1) plaque forming unit per four (4) grams total solids (DWB) And - Viable helminth ova –less than one (1) per four (4) grams total solids (DWB)	

Pathogen Control Class	
503.32 (a)(1) - (5), (7), -(8), Class A	503.32 (b)(1) - (5), Class B
MPN – Most Probable Number	
DWB – Dry Weight Basis.	
CFU – Colony Forming Units	

Class A Requirements for Home Lawn and Garden Use

If biosolids are land applied to home lawns and gardens, the biosolids need to be treated by a specific process to further reduce pathogens (PFRP), and meet a microbiological limit of less than less than 3 most probable number (MPN) of *Salmonella* per 4 grams of total solids (or less than 1,000 most probable number (MPN/g) of fecal coliform per gram of total solids) to be considered Class A biosolids.

Kennecott does not intend to give away biosolids for land application on home lawns or gardens, and will therefore not be required to meet PFRP. If the permittee changes their intentions in the future, they will need to meet a specific PFRP, the Director and the EPA must be informed at least thirty (30) days prior to its use. This change may be made without additional public notice.

The practice of sale or giveaway to the public is an acceptable use of biosolids of this quality as long as the biosolids continue to meet Class A standards with respect to pathogens. If the biosolids do not meet Class A pathogen standards the biosolids cannot be sold or given away to the public, and the permittee will need find another method of beneficial use or disposal.

Pathogens Class B

If biosolids are to be land applied for agriculture or land reclamation the solids need to be treated by a specific process to significantly reduce pathogens (PSRP). Kennecott does not intend to land apply the biosolids and will therefore not be required to meet PSRP. If the permittee intends to land apply in the future, they will need to meet a specific PSRP, the Director and the EPA must be informed at least thirty (30) days prior to its use. This change may be made without additional public notice.

Vector Attraction Reduction (VAR)

If the biosolids are land applied Kennecott will be required to meet VAR through the use of a method of listed under 40 CFR 503.33. Kennecott does not intend to land apply the biosolids and will therefore not be required to meet VAR. If the permittee intends to land apply in the future, they need to meet one of the listed alternatives in 40 CFR 503.33, the Director and the EPA must be informed at least thirty (30) days prior to its use. This change may be made without additional public notice.

Landfill Monitoring

Under 40 CFR 258, the landfill monitoring requirements include a paint filter test to determine if the biosolids exhibit free liquid. If the biosolids do not pass a paint filter test, the biosolids cannot be disposed in the sanitary landfill (40 CFR 258.28(c)(1)).

Record Keeping

The record keeping requirements from 40 CFR 503.17 are included under Part III.G. of the permit. The amount of time the records must be maintained are dependent on the quality of the biosolids in regards to the metals concentrations. If the biosolids continue to meet the metals limits of Table 3 of 40 CFR 503.13, and are sold or given away the records must be retained for a minimum of five years. If the biosolids are disposed in a landfill the records must retained for a minimum of five years.

### Reporting

Kennecott must report annually as required in *40 CFR 503.18*. This report is to include the results of all monitoring performed in accordance with *Part III.B* of the permit, information on management practices, biosolids treatment, and certifications. This report is due no later than February 19 of each year. Each report is for the previous calendar year.

### **MONITORING DATA**

Kennecott landfills the biosolids generated at the facility. As a result, they do not conduct regular monitoring of metals or pathogens. They have reported the results of paint filter testing conducted by the facility. They have passed all paint filter tests conducted.

### **STORM WATER**

Separate storm water permit(s) are be required based on the types of activities occurring on site.

Permit coverage under the Multi Sector General Permit (MSGP) for Storm Water Discharges from Industrial Activities is required based on the Standard Industrial Classification (SIC) code for the facility and the types of industrial activities occurring. If the facility is not already covered, it has 30 days from when this permit is issued to submit the appropriate Notice of Intent (NOI) for the MSGP or exclusion documentation. Previously storm water discharge requirements and coverage were combined in this individual permit. These have been separated to provide consistency among permittees, electronic reporting for storm water discharge monitoring reports, and increase flexibility to changing site conditions.

MSGP coverage applies to construction activities within active mining areas including all support facilities. Storm water discharges from earth-disturbing activities conducted prior to active mining activities are considered construction activities and must be covered under the Storm Water Construction General Permit. Mine-related facilities upgradient and within the collection zone of the storm water capture systems do not require separate storm water permit coverage and are subject to the discharge requirements of this permit.

Information on storm water permit requirements can be found at <http://stormwater.utah.gov>

### **PRETREATMENT REQUIREMENTS**

This facility does not discharge process wastewater to a sanitary sewer system. Any process wastewater that the facility may discharge to the sanitary sewer, either as a direct discharge or as a hauled waste, is subject to federal, state, and local pretreatment regulations. Pursuant to section 307 of the Clean Water Act, the permittee shall comply with all applicable federal general pretreatment regulations promulgated, found in 40 CFR 403, the state's pretreatment requirements found in *UAC R317-8-8*, and any specific local discharge limitations developed by the Publicly Owned Treatment Works (POTW) accepting the waste.

In addition, in accordance with 40 CFR 403.12(p)(1), the permittee must notify the POTW, the EPA Regional Waste Management Director, and the State hazardous waste authorities, in writing, if they discharge any substance into a POTW which if otherwise disposed of would be considered a hazardous waste under 40 CFR 261. This notification must include the name of the hazardous waste, the EPA hazardous waste number, and the type of discharge (continuous or batch).

## **BIOMONITORING REQUIREMENTS**

A nationwide effort to control toxic discharges where effluent toxicity is an existing or potential concern is regulated in accordance with the Utah Pollutant Discharge Elimination System Permit and Enforcement Guidance Document for Whole Effluent Toxicity Control (biomonitoring), dated February 2018. Authority to require effluent biomonitoring is provided in Permit Conditions, *UAC R317-8-4.2*, Permit Provisions, *UAC R317-8-5.3* and Water Quality Standards, *UAC R317-2-5* and *R317-2-7.2*.

Since Kennecott is classified as a major industrial discharger, the renewal permit will require both acute and chronic whole effluent toxicity (WET) testing. Whole Effluent Toxicity Testing from Outfall 012 will use *Cryprinodon variegatus* (sheepshead minnow) as detailed in the permit. The permit will contain the standard requirements for accelerated testing upon failure of a WET test, and a Preliminary Toxicity Investigation (PTI) and Toxicity Reduction Evaluation (TRE) as necessary. The permit will contain a toxicity limitation re-opener provision that allows for modification of the permit should additional information indicate the presence of toxicity in the discharge.

### **PERMIT DURATION**

It is recommended that this permit be effective for a duration of five (5) years.

Drafted and Reviewed by  
Sarah Ward, Discharge Permit Writer  
Daniel Griffin, Biosolids  
Jennifer Robinson, Pretreatment  
Lonnie Shull, Biomonitoring  
Carl Adams, Storm Water  
Sandy Wingert, TMDL/Watershed  
Chris Bittner, Chris Shope, and Suzan Tahir, Wasteload Analysis  
Utah Division of Water Quality, (801) 536-4300

### **PUBLIC NOTICE**

Began: February 15, 2022  
Ended: March 16, 2022

Comments will be received at:           195 North 1950 West  
  PO Box 144870  
  Salt Lake City, UT 84114-4870

The Public Notice of the draft permit was published on Division of Water Quality public notice website.

### **ADDENDUM TO FSSOB**

As per R317-8-5.6(3), during finalization of the Permit certain dates, spelling edits, minor language corrections, and typographical errors were completed. Due to the nature of these changes they were not considered Major and the permit is not required to be re Public Noticed.

### **RESPONSIVENESS SUMMARY**

The first 30-day public notice period ran from February 15, 2022, to March 16, 2022, with one comment received. As a result of the comment received, the WLA for Outfall 009 was modified. As a result of the modification, some limits became less stringent, therefore the permit needed to go to Public Notice once again.

The draft permit was modified and sent to public notice on May 5, 2022. The second 30-day public notice period ended June 6, 2022, with no comments received.

Comment available upon request.



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# **ATTACHMENT 1**

## *Effluent Monitoring Data*

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## **ATTACHMENT 2**

### *Wasteload Analysis*

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State of Utah

**Subject:** Kennecott Utah Copper 2021 Permit Renewal Fact Sheet Statement of Basis, Level I and II antidegradation reviews for Outfalls 004, 008, and 012.

**Prepared By:** Chris Bittner, Standards Coordinator

*Summary: The primary purposes of this evaluation is to protect the uses of the receiving water and to determine if the permit must include water quality-based effluent limits for Outfalls 004, 008, and 012. Based on the information provided by Kennecott Utah Copper (KUC) regarding pollutant concentrations in the effluents in the application, the uses designated in R317-2-12 and existing and designated uses of the receiving waters (Class 5E Transitional Waters→Class 5A Gilbert Bay, Great Salt Lake) will be protected.*

*Receiving Waters and Designated Uses (UAC R317-2-6):*

*C-7 Ditch*

*Class 3E severely habitat-limited waters. Narrative standards will be applied to protect these waters for aquatic life.*

*Transitional Waters*

*Class 5E protected for infrequent primary and secondary contact recreation, waterfowl, shore birds and other water-oriented wildlife including their necessary food chain*

*Gilbert Bay, Great Salt Lake*

*Class 5A protected for frequent primary and secondary contact recreation, waterfowl, shore birds and other water-oriented wildlife including their necessary food chain*

## **Introduction**

KUC has several outfalls. Great Salt Lake is the ultimate or immediate receiving water for three of these outfalls: 004, 008, and 012. The Level I anti-degradation reviews (protection of existing uses) for these outfalls were conducted in accordance with the Utah Division of Water Quality (DWQ) *Interim Methods for Evaluating Use Support for Great Salt Lake Utah Pollution Discharge Elimination System (UPDES) Permits* (v. 1.0 January 4, 2016). These methods apply to discharges that are not required to meet Class 3 freshwater numeric aquatic life use criteria prior to discharging to Great Salt Lake. The Level II anti-degradation review is based on the requirements of UAC R317-2-3. The whole effluent toxicity (WET) requirements are based on the *Utah Pollutant Discharge Elimination System Permit and Enforcement Guidance Document for Whole Effluent Toxicity* (DWQ, February, 2018).

4/24/2015

**Outfall 004.** Outfall 004 discharges to the Class 5E Transitional Waters and thence to Great Salt Lake via a culvert beneath I-80.

*Class 5E Transitional Waters→Class 5A Gilbert Bay, Great Salt Lake*

**Outfall 008.** Outfall 008 discharges to the C-7 Ditch to the Class 5E Transitional Waters thence to Great Salt Lake. Outfall 008 did not discharge during the last permit cycle.

*Class 3E C-7 Ditch→Class 5E Transitional Waters→Class 5A Gilbert Bay, Great Salt Lake*

**Outfall 012.** Outfall 012 discharges to the Class 5E Transitional Waters and thence to Great Salt Lake via a culvert beneath I-80.

*Class 5E Transitional Waters→Class 5A Gilbert Bay, Great Salt Lake*

The Transitional Waters are mudflats where the discharges create a channel to Gilbert Bay. For Outfall 012, the channel appears to discharge some groundwater as well based on the presence of flow when outfall discharges were absent. The Transitional Waters only exist when GSL is below an elevation of 4208 feet and Lake elevations are currently less than 4192 feet. The Outfall 012 delta in the Transitional Waters currently exceeds one mile.

Outfall 001 from the Jordan Valley Water Conservancy District Southwest Groundwater Treatment Plant (Jordan Valley, [UT0025836](#)) discharges next to KUC outfall 012. The effluents from the two outfalls comeingle in the Transitional Waters when both are discharging. In general, the Jordan Valley outfall is a continuous discharge whereas the RTKC discharge is intermittent and seasonal.

### **Level I Antidegradation Review and Use Support Evaluation**

KUC provided supplemental information in support of the previous permit renewal application dated April 29, 2014 [DWQ-2014-006141] and October 31, 2014 [DWQ-2014-014376]. The information was used to determine if water quality-based effluent limits were required. Water quality-based effluent limits are required when the effluent has “reasonable potential” to cause or contribute to a violation of a water quality standard. The standard may be a numeric criterion or the Narrative Standards (UAC R317-2-7.2). Final permit limits are the lower of water quality-based effluent limits or technology-based effluent limits such as secondary treatment standards or categorical limits.

For this renewal, the effluent concentrations measured over the current permit cycle were evaluated. Outfall 008 did not discharge during the previous permit cycle.

The effluent concentrations for Outfalls 004 and 012 were initially compared to Class 3D numeric criteria using DWQ’s reasonable potential process and then compared to the effluent concentrations previously evaluated. The reasonable potential process calculates a maximum expected effluent concentration which is screened against Class 3D criteria. Table 1 summarizes

the comparisons of effluent concentrations to the previous permit. As shown in Table 1, effluent concentrations remain similar to the previously evaluated concentrations. New toxicity information for brine shrimp for arsenic, copper, lead, and zinc was added to evaluations. In short term toxicity tests, brine shrimp were demonstrated to be more sensitive to these metals than brine flies. Therefore, if brine shrimp are protected, brine flies will be protected. The data collected for the Class 5E Joint Discharge Area Transitional Waters Monitoring Program are also evaluated.

*Table 1. Comparisons of effluent concentrations evaluated for 2017 Permit and 2021 Renewals*

Pollutant	2017 Permit		Outfall 012 2021		Outfall 004 2021	
	Maximum	Average	Maximum	Maximum 30-day average	Maximum	Maximum 30-day average
Arsenic	0.056	0.030	0.079	0.022	0.2	0.2
Cadmium	0.007	0.005	0.004	0.003	0.001	0.001
Copper	0.055	0.032	0.096	0.059	0.03	0.03
Lead	<0.005	<0.005	0.006	<0.005	0.005	0.005
Mercury	<0.0002	<0.0002	0.000025	0.0000035 <sup>1</sup>	<0.001	<0.001
Zinc	0.030	0.017	0.069	0.023	0.025	0.025
Selenium			0.018		0.007	0.007

All units mg/l  
<sup>1</sup>The 2021 averages were calculated using the analytical reporting limit for concentrations less than the reporting limit (nondetect)

**Arsenic**

Outfall 004 does not have reasonable potential for arsenic. Arsenic effluent concentrations initially indicate reasonable potential because the concentrations exceed the Class 3D comparison value of 0.15 mg/l and ambient concentrations in Gilbert Bay. The maximum 30-day average effluent concentration was 0.073 mg/l. The no-effects concentration of 8 mg/l reported by Brix et al. (2003) for arsenic is substantially higher than the effluent concentrations and arsenic is concluded to not have reasonable potential. These findings are further supported by recent chronic toxicity testing conducted by TRE Environmental Solutions (TRE). TRE (2020a) reports an IC20 (inhibitory concentration for 20 percent of the tested organisms) for growth was 19.4 mg/l.

Outfall 012 does not have reasonable potential for arsenic. The maximum expected effluent concentration is less than the Class 3D comparison value of 0.15 mg/l and ambient concentrations in Gilbert Bay.

**Cadmium**

Outfall 004 does not have reasonable potential for cadmium. Cadmium concentrations initially indicate reasonable potential because the maximum expected effluent concentration could exceed the Class 3D comparison. However, effluent cadmium concentrations were lower than previously evaluated and lower than the EC<sub>50</sub> concentrations for brine shrimp reported by Brix et al. (2006). The EC<sub>50</sub> is higher than a no-effects concentration but there are over 4 orders of magnitude between the effluent concentrations and the EC<sub>50</sub> of 11.7 mg/l. Effluent cadmium concentrations were below detectable concentrations in most of the effluent samples collected during the last permit cycle.



Outfall 012 does not have reasonable potential for cadmium. The maximum expected effluent concentration did not indicate reasonable potential and concentrations were lower than previously concluded to not have reasonable potential based on comparisons of effluent concentrations to the results of toxicity tests (Brix et al. 2006). The EC<sub>50</sub> concentration of 11.7 mg/l reported by Brix et al. (2006) is orders of magnitude higher than the effluent concentrations.

### **Copper**

Outfall 004 does not have reasonable potential for copper. Copper concentrations initially indicate reasonable potential because the effluent concentrations exceed the Class 3D comparison value of 0.030 mg/l. Copper concentrations were similar to the concentrations concluded to not have reasonable potential for the previous permit. No reasonable potential is concluded because effluent concentrations are lower than the effects levels for brine shrimp reproduction toxicity tests conducted by Brix et al. (2006).

Outfall 012 does not have reasonable potential for copper. Copper concentrations initially indicate reasonable potential because the effluent concentrations exceed the Class 3D comparison value of 0.030 mg/l and were higher than observed for the previous permit. The maximum 30-day concentration was 0.059 mg/l (Table 1). As documented in April 29, 2014 KUC submittal (DWQ-2014-006141), Brix et al. (2006) reported that the median effective concentration<sup>1</sup> (EC<sub>50</sub>) for effects on brine shrimp reproduction was 0.068 mg/l (dissolved)<sup>2</sup>. To protect against chronic effects on reproduction, an estimate of the no-observed-effects concentration or EC<sub>20</sub> as opposed to an EC<sub>50</sub> was derived by KUC. KUC obtained the raw data from Brix and calculated an EC<sub>20</sub> of 0.059 mg/l (dissolved).

Applying the default conversion factor from dissolved to total copper specified in UAC R317-2-14, the no-effects concentration for total recoverable copper concentration is 0.061 mg/l. This conversion factor appears to be conservative based on the data reported in Adams et al. (2015). Adams et al. (2015) reported a median Cu translator of 0.79, based on dissolved and total recoverable Cu concentrations in Great Salt Lake water samples. The median is assumed to be a reasonable estimate of the geometric mean recommended for translators by EPA. Applying the translator of 0.79 results in a total recoverable copper concentration of 0.079 mg/l before mixing.

Brine shrimp are not expected to inhabit the Class 5E Transitional Waters, so a dilution of 1.5 was calculated based on discharging to Class 5A Gilbert Bay in accordance with the mixing zone requirements of UAC R317-2-5 (May 5, 2015 Mixing Analysis Outfall Ditch to Great Salt Lake DWQ-2015-016387). Applying the dilution to the 0.079 mg/l results in a maximum allowable average effluent concentration of 0.118 mg/l (total recoverable). The maximum 30-day average copper concentration was 0.059 mg/l and copper concentrations are concluded to not have reasonable potential. These findings are further supported by recent chronic testing conducted by TRE on brine shrimp. TRE (2020b) report that the IC<sub>20</sub> for growth was 0.74 mg/l total recoverable copper.

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<sup>1</sup> Concentration at which 50% of the test population was affected

<sup>2</sup> RTKC reports the copper EC<sub>50</sub> as 69 µg/l in the April 29, 2014 RTKC Submittal but Brix et al. (2006) reports 68 µg/l.

### **Mercury**

Outfall 004 does not have reasonable potential for mercury. Mercury was not detected in the effluent.

Outfall 012 does not have reasonable potential for mercury. Mercury concentrations in the effluent were measured using a more sensitive analytical method during this permit cycle. The maximum expected concentration was less than the Class 3D screening criteria. With one exception, mercury concentrations were less than the comparison value of 0.000012 mg/l (UAC R317-2-14) used to screen for reasonable potential.

Selenium and mercury are potentially bioaccumulative pollutants in RTKC's effluent and are also expected to be in the effluent from Jordan Valley. The two outfalls come in a common drainage in the Class 5E Transitional Waters when both are discharging. The potential impacts of the combined effluents were considered for these two potentially bioaccumulative pollutants.

An organic form of mercury, methylmercury (MeHg), is present in Gilbert Bay's water and biota. MeHg has the greater potential for impairing the uses compared to other forms of Hg found in the environment because of greater toxicity and biotransfer potential. The reader is cautioned to discern between MeHg and mercury in the following discussions.

Translators are necessary to determine reasonable potential for bioaccumulative compounds. Translators are simple mathematical models of complex processes. Translators are used to estimate the concentration of a pollutant in one media, for instance, brine shrimp, from the concentration in a different media, for instance, water. When mercury is released to the receiving waters, a portion of the mercury is expected to be methylated by indigenous bacteria (mercury to MeHg translator). A portion of this MeHg is taken up by the lower life forms such as invertebrates and a portion of this MeHg is transferred higher in the food web to other biota (MeHg in water to the lower and higher food web receptors).

Beginning in 2011, monitoring of invertebrates, bird eggs, water and sediment in the transitional and open waters. The results of this monitoring are available in the annual Joint Discharge Area Transitional Monitoring Program reports required by the permit. The organism concentrations reported remain relatively low and based on these data, mercury is concluded to not have reasonable potential.

### **Selenium**

Outfall 004 does not have reasonable potential for selenium in the Transitional Waters. Effluent concentrations of 0.007 mg/l exceed the comparison value of 0.0046 mg/l. The higher effluent concentrations evaluated by the Transitional Waters Monitoring Program for Outfall 012 collected prior to Jordan Valley discharging in 2017 (only KUC discharged) support that the concentrations and frequency of discharges from Outfall 004 are unlikely to adversely affect the aquatic life. To ensure continued protection for Gilbert Bay, the contributions of selenium from Outfall 004 are included in the annual loading limit of 900 kg/yr currently applicable to Outfall 012 only.

Outfall 008 does not have reasonable potential for selenium in the Transitional Waters because the maximum expected concentration was less than the Class 3D screening criteria. To ensure

continued protection for Gilbert Bay, the contributions of selenium from Outfall 008 are included in the annual loading limit of 900 kg/yr currently applicable to Outfall 012 only.

Outfall 012 does have reasonable potential for the Gilbert Bay and the Transitional Waters and the water quality-based effluent is 0.054 mg/l and an annual loading limit of 900 kg/yr. Selenium concentrations in the effluent exceed the Class 3D comparison value of 0.0046 mg/l. The water quality standard for Gilbert Bay for selenium standard is 12.5 mg/kg dw in bird eggs. However, no translator is available to reliably predict the water concentrations that correspond to a bird egg concentration of 12.5 mg/kg dw. Hence the continued reliance on monitoring and other comparison values. Ackerman et al. (2015) reported the selenium and mercury concentrations for over 1,000 eggs collected from Great Salt Lake. These results in addition to the annual egg samples collected by DWQ support that the selenium standard continues to be met in the open waters of Gilbert Bay. Figure 1 shows the selenium concentrations by DWQ for eggs collected from Gilbert Bay. DWQ's data show that egg concentrations and water concentrations (data not shown, <0.001mg/l) remain stable.

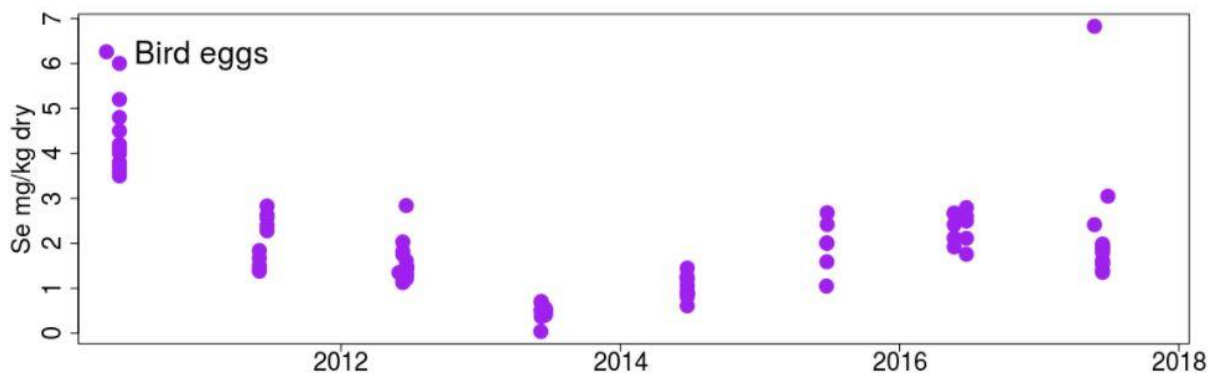


Figure 1. Gilbert Bay egg concentrations of selenium measured by DWQ

As required by the Transitional Waters Monitoring Program in the permit, KUC collected and analyzed samples of bird eggs, invertebrates, fish, and water from the outfall delta and Great Salt Lake. Monitoring data are available for every year since 2011. The results are annually submitted to DWQ.

The permit includes required actions (triggers) based on the geometric mean selenium concentration of selenium from at least 5 eggs. Requirements for calculating the geometric mean of egg concentrations from at least 5 eggs were clarified for this permit. As shown on Figure 2, the 5-egg minimum was met only in 2017. One to 4 eggs were collected in 2015, 2016, 2019, and 2020 and no eggs in other years.

Birds were observed in the delta every year. Figure 3 shows the number of birds observed each year and the days of discharge. Bird use appears to be correlated with the availability of water from effluent discharges in the delta. Jordan Valley is typically a continuous discharge and commenced discharging to the delta in 2017. KUC discharged continuously during the 2015 monitoring period and intermittently or not at all for the other years. Although birds were present every year, nesting was not always observed. Eggs could not be collected the years that no nesting

was observed. Other factors preventing eggs from being collected include predation and seiche events resulting in flooding.

In 2019 and 2020, individual eggs exceeded 9.8 mg/kg dw. The permit requires that any results that exceed 9.8 mg/kg be reported to DWQ immediately. In 2020 and 2021, Jordan Valley voluntarily implemented operational changes to reduce bird exposures to selenium in the Delta. Preliminary reports by Jordan Valley for 2021 were that no eggs were available.

Figure 4 shows the geomean concentrations for invertebrates, fish and eggs for each year when more than one egg could be collected. The observed correlations between selenium concentrations in bird forage (e.g., invertebrates) and bird eggs are expected if sampled food items are representative of the bird diets. The other measurements of biota, water, and sediment are intended to help interpret the egg observations. Figure 5 shows the geometric mean concentrations of selenium measured in invertebrates. As the relationships between selenium concentrations and eggs are developed, the invertebrate concentrations may be useful for inferring egg concentrations for years when eggs could not be collected.

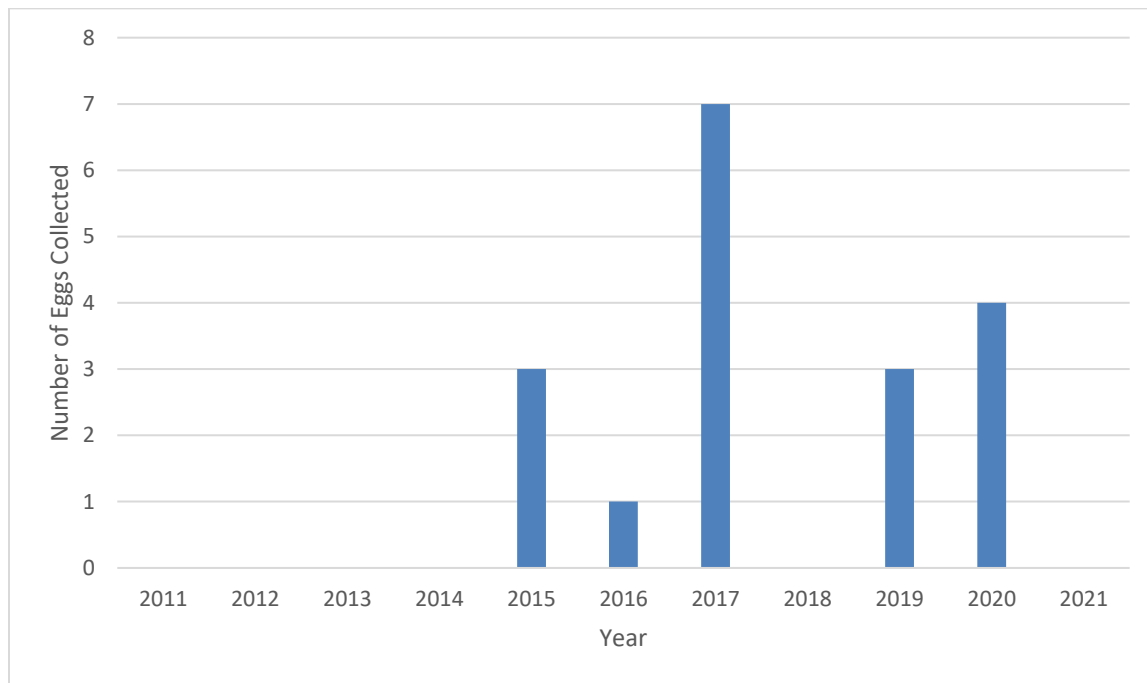


Figure 2. Number of eggs collected each year from the Outfall 012 delta

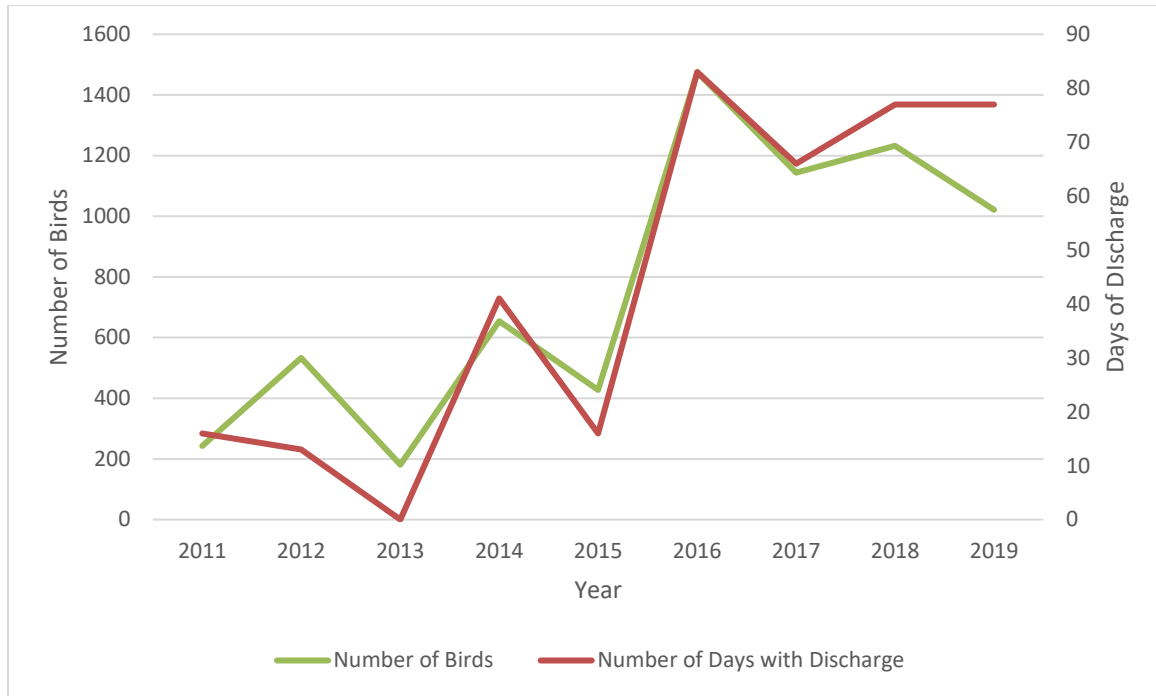


Figure 3. Number of birds observed in the Outfall 012 delta and days of discharge by either KUC or Jordan Valley

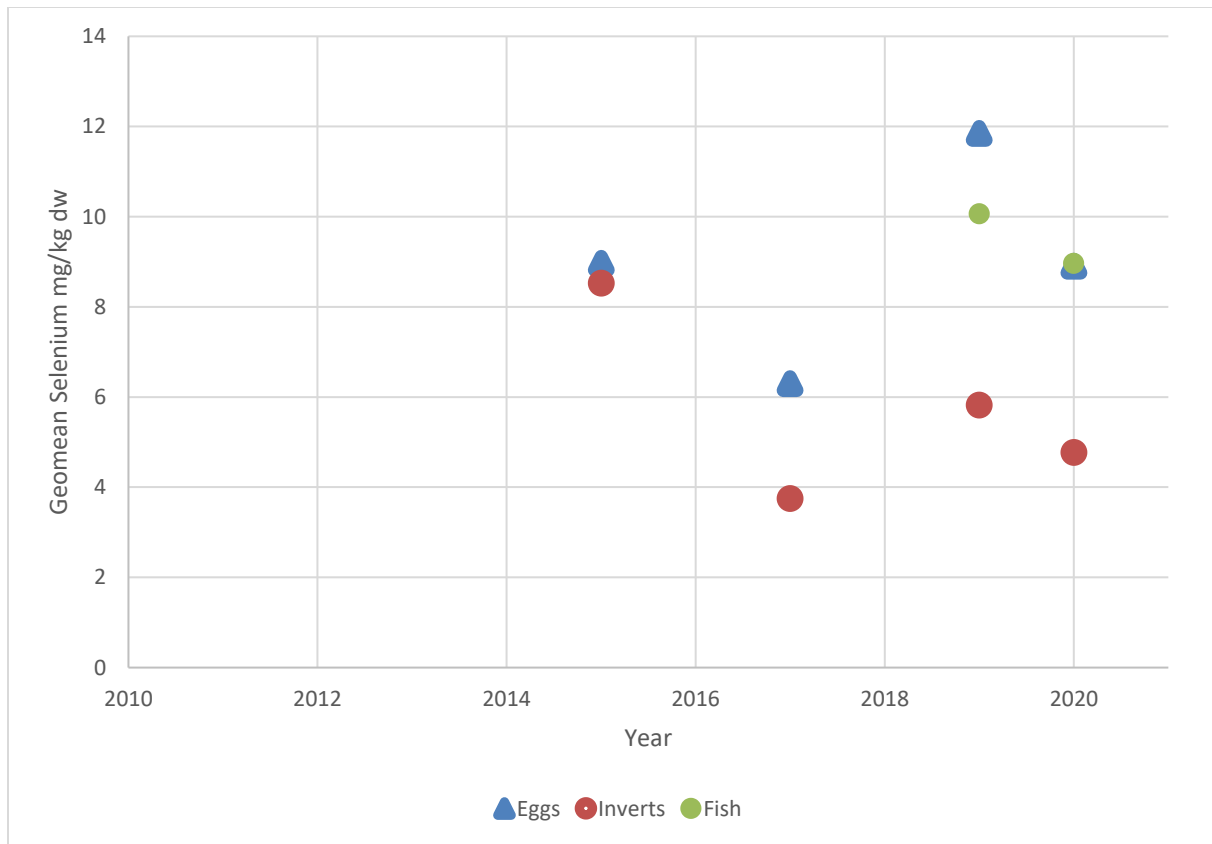
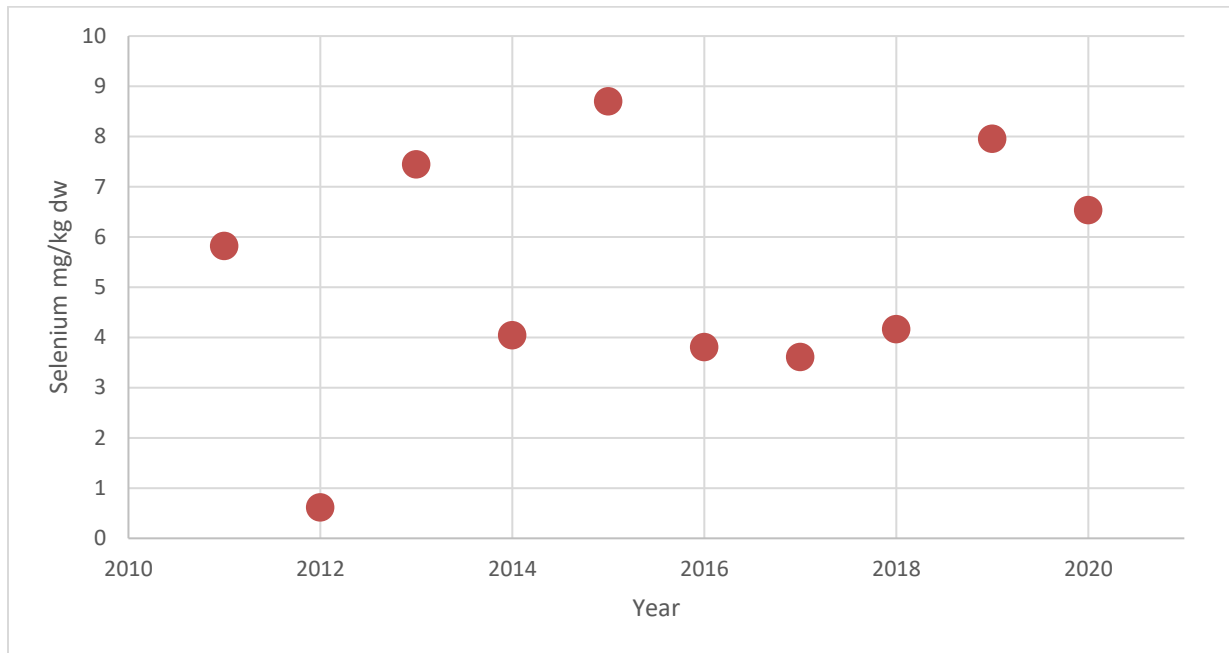


Figure 4. Geometric mean concentrations of selenium measured in bird eggs, invertebrates, and fish from the outfalls delta when more than one egg was collected.



*Figure 5. Geometric mean concentrations of selenium measured in invertebrates from the outfalls delta exclusive of brine shrimp and brine flies.*

The requirements of the Transitional Waters Monitoring Program are unchanged from the previous permit. The permit continues to allow changes to Sampling and Analysis Plan during the permit cycle with Director approval. This flexibility is intended to allow modifications to the monitoring based if warranted based on changes observed.

The annual reports submitted document an increase in vegetation cover since Jordan Valley began continuously discharging to the Transitional Waters approximately 3 years ago. These changes to the habitat are expected to affect bird use in this area and could also affect nesting success by reducing predation by increasing vegetation cover. These habitat changes may also affect selenium exposures by affecting bird access to the water or causing shifts in the macroinvertebrate community. An increase in phragmites may also cause the habitat to be less desirable for shorebirds.

The 5 to 8 egg requirement is unchanged. Selenium concentrations in eggs collected often exhibit a high degree of variability as do the eggs from the outfall delta. This is one of the reasons that geometric mean, which is less sensitive to variability than the e.g., an arithmetic mean, is used to characterize egg concentrations. When variability is high, a larger number of samples are needed to achieve a similar level of certainty compared to when variability is low. However, the maximum number of eggs is limited to 8 avoid adversely impacting bird populations. Similar to the selenium standard for Gilbert Bay, a minimum of 5 eggs are required. Requiring a minimum of 5 eggs balances having sufficient confidence in the results to take actions and having a performance standard that can be implemented.

### **Level II Antidegradation Review**

In accordance with UAC R317-2-3.5.b.1.(b), a Level II antidegradation review is not required because there are no changes to effluent concentrations or loading compared to the previous permit.

### **WET (Whole Effluent Toxicity) Testing**

The requirements for acute WET and chronic WET monitoring are consistent with the Utah 2018 WET Guidance and are unchanged from the previous permit. The permit provision that allows for a reduction from a frequency of quarterly was removed because quarterly is the minimum frequency for major industrial dischargers.

### **Recommended Changes to Permit**

Selenium discharges from Outfall 004 and 008 are added to the annual limit of 900 kg/yr previously applicable to Outfall 012 only. Selenium and flow monitoring frequency for Outfalls 004 and 008 were increased to support the annual load estimates.

The requirement that the geometric mean of selenium in eggs is based on 5 to 8 eggs was clarified.

In accordance with 2018 DWQ WET policy, the provision that allows for a reduction in the frequency of WET testing to less than quarterly was deleted. Quarterly monitoring is the minimum for major industrial permits.

### **REFERENCES**

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Brix, K.V., R.D. Cardwell, and W.J. Adams. 2003. Chronic Toxicity of arsenic to the Great Salt Lake brine shrimp, *Artemia franciscana*. *Ecotoxicology and Environmental Safety.* 54(2):169-175

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TRE Environmental Solutions (TRE), 2020a. Results of Analytical Data for Experiment #10. DWQ-2020-015755

TRE Environmental Solutions (TRE), 2020b. Results of Analytical Data for Experiment #18. DWQ-2020-015753

**Utah Division of Water Quality  
Statement of Basis  
ADDENDUM  
Wasteload Analysis and Antidegradation Level I Review**

**Date:** March 21, 2022

**Prepared by:** Christopher L. Shope  
Standards and Technical Services

**Facility:** Rio Tinto Kennecott Copper  
UPDES Permit No. UT-0000051

**Outfalls:** 002, 007, 009, and 104

**Receiving water:** Lee Creek, Pine Creek, and Great Salt Lake

This addendum summarizes the wasteload analysis that was performed to determine water quality based effluent limits (WQBEL) for this discharge. Wasteload analyses are performed to determine point source effluent limitations necessary to maintain designated beneficial uses by evaluating projected effects of discharge concentrations on in-stream water quality. The wasteload analysis also takes into account downstream designated uses (UAC R317-2-8). Projected concentrations are compared to numeric water quality standards to determine acceptability. The numeric criteria in this wasteload analysis may be modified by narrative criteria and other conditions determined by staff of the Division of Water Quality (DWQ).

Discharge

Outfall 002: C-7 Ditch → Lee Creek → Great Salt Lake

The maximum daily discharge for Outfall 002 is 72.0 MGD (111.4 cfs), as estimated by the permittee.

Outfall 007: C-7 Ditch → Lee Creek → Great Salt Lake

The maximum daily discharge for Outfall 007 is 21.6 MGD (55.0 cfs), as estimated by the permittee.

Outfall 009: Pine Creek → Middle Canyon Creek → Great Salt Lake

The maximum daily discharge for Outfall 009 is 0.03 MGD (0.046 cfs), as estimated by the permittee.

Outfall 104: Internal Outfall → Great Salt Lake

The maximum daily discharge for Outfall 104 is 4.46 MGD (6.9 cfs), as estimated by the permittee.

Receiving Water



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The receiving water for Outfall 002 and 007 is the C-7 Ditch, which does not have designated beneficial uses. The C-7 Ditch was determined to be a drainage ditch that does not have downstream agricultural users of the water. Therefore, per UAC R317-2-13.10, the presumptive beneficial uses for all drainage canals and ditches statewide are 2B and 3E.

The C-7 Ditch is tributary to Lee Creek, which does not have designated beneficial uses. Therefore, per UAC R317-2-13.13, the presumptive beneficial uses for all waters not specifically classified are 2B and 3D.

Per UAC R317-2-13.7.a, Middle Canyon Creek and tributaries in Tooele County is composed of beneficial uses 2B, 3A, and 4.

- *Class 2B: Protected for infrequent primary contact recreation. Also protected for secondary contact recreation where there is a low likelihood of ingestion of water or a low degree of bodily contact with the water. Examples include, but are not limited to, wading, hunting, and fishing.*
- *Class 3A: Protected for cold water species of game fish and other cold water aquatic life, including the necessary aquatic organisms in their food chain.*
- *Class 3D: Protected for waterfowl, shore birds and other water-oriented wildlife not included in Classes 3A, 3B, or 3C, including the necessary aquatic organisms in their food chain.*
- *Class 3E: Severely habitat-limited waters. Narrative standards will be applied to protect these waters for aquatic wildlife.*
- *Class 4: Protected for agricultural uses including irrigation of crops and stock watering.*

Protection of Downstream Uses

Per UAC R317-2-8, *all actions to control waste discharges under these rules shall be modified as necessary to protect downstream designated uses.* For this discharge, numeric aquatic life use criteria do not apply to the immediate receiving water (C-7 Ditch), but do apply to downstream receiving waters (Lee Creek). Therefore, Lee Creek is considered the limiting condition in this wasteload allocation to ensure protection of aquatic life uses.

Receiving Water Critical Flow

Typically, the critical flow for the wasteload analysis is considered as the lowest stream flow for seven consecutive days with a ten year return frequency (7Q10).

For Outfalls 002 and 007, sporadic flow records are available at several monitoring locations; however, robust flow records from USGS stream gage # 10172640 LEE CREEK NEAR MAGNA, UT, for the period 1971 – 1982 and 2006 – 2008 were obtained. The 7Q10 was estimated as the lowest seven-day average from 5/24/2006 to 4/10/2008. This more recent period of record of the gage is more representative of the expected current flow regime in the creek.

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Since no discharge occurred from Outfalls 002 and 007 during this period, the gage represents the flow available for dilution.

For Outfall 009, there were no upstream monitoring locations and downstream gage USGS 403258112123201 (C- 3- 3)20bad-S1 BIG SPRING (PINE CYN),NR TOOELE was used with monitoring data from 4/21/06 through 10/7/16. The 20<sup>th</sup> percentile of flow was calculated to represent flow under critical conditions.

Finally, Outfall 104 is an internal outfall without measure flow or background water quality conditions. Therefore, background flow was assumed to be non-existent and water quality parameters were calculated from beneficial use criterion as end of pipe limits.

Outfalls 002 and 007: 7Q10 Flow (Annual) = 17.9 cfs  
Outfall 009: Critical Flow (Annual) = 0.4 cfs  
Outfall 104: Critical Flow (Annual) = 0.0 cfs (end of pipe criteria)

Total Maximum Daily Load (TMDL)

According to the Utah Combined 2018/2020 303(d) [Water Quality Assessment Report](#), the receiving water for the Outfall 002 and 007 discharge, Lee Creek from Great Salt Lake to headwaters near 2100 South (UT16020204-036\_00), was listed as fully supporting.

Pine Creek in the Middle Canyon assessment unit Middle Canyon Creek and tributaries, Tooele County (UT16020304-007\_00) is described as Insufficient Data.

Mixing Zone

The maximum allowable mixing zone is 15 minutes of travel time for acute conditions, not to exceed 50% of stream width, and for chronic conditions is 2500 ft, per UAC R317-2-5. Water quality standards must be met at the end of the mixing zone.

The actual length of the mixing zone was not determined; however, it was presumed to remain within the maximum allowable mixing zone dimensions. Acute limits were calculated using 50% of the annual critical low flow.

Dilution Factor

The dilution factors were calculated assuming full mix with the receiving water at the end of the mixing zone (Table 1).

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**Table 1: Summary of dilution factor at end of mixing zone.**

Outfall	Criteria	Flow (cfs)			Dilution Factor	Dilution Ratio
		Background	Effluent	Mixed		
002	Chronic	17.9	77.4	95.3	0.81	0.23:1
	Acute	9.0	77.4	86.3	0.90	0.12:1
007	Chronic	17.9	23.2	41.1	0.56	0.77:1
	Acute	9.0	23.2	32.2	0.72	0.39:1
009	Chronic	0.4	0.133	0.533	0.25	3.01:1
	Acute	0.2	0.133	0.333	0.40	1.50:1
104	Chronic	0.0	6.9	6.9	1.00	0.00:1
	Acute	0.0	6.9	6.9	1.00	0.00:1

Parameters of Concern

The potential parameters of concern for the discharge/receiving water identified were dissolved metals, total suspended solids, and pH, as determined in consultation with the UPDES Permit Writer. WQBELs were determined for metals.

WET Limits

The percent of effluent in the receiving water in a fully mixed condition, and acute and chronic dilution in a not fully mixed condition are calculated in the WLA in order to generate WET limits. The LC<sub>50</sub> (lethal concentration, 50%) percent effluent for acute toxicity and the IC<sub>25</sub> (inhibition concentration, 25%) percent effluent for chronic toxicity, as determined by the WET test, needs to be below the WET limits, as determined by the WLA. The WET limit for LC<sub>50</sub> is typically 100% effluent and does not need to be determined by the WLA.

**Table 2: WET Limits for IC<sub>25</sub>**

Outfall	Percent Effluent
002	81%
007	56%
009	25%
104	100%

Wasteload Allocation Methods

Receiving Water Quality and Standards

The water quality standards for dissolved metals are dependent on hardness (total as CaCO<sub>3</sub>). Based on DWQ monitoring data from C-7 Ditch and Lee Creek, the average hardness for receiving waters at Outfalls 002 and 007 exceeds 400 mg/L. Per Utah R317-2-14, a maximum hardness of 400 mg/L was used for determining the dissolved metals criteria. Ambient conditions were estimated using monitoring data from DWQ 4991594 C-7 Ditch at 2100 S and from DWQ 4991430 LEE CREEK AT I80 CROSSING. The average of observed data was calculated, with one-half the reporting limit assumed for non-detects.

The monitoring data from downstream location USGS 403258112123201 (C- 3- 3)20bad-S1 BIG SPRING (PINE CYN),NR TOOELE was used for Outfall 009, where hardness was 44 mg/L. The average of observed data was calculated, with one-half the reporting limit assumed for non-detects.

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**Table 3: Water quality standards for Outfalls 002 and 007**

Dissolved Metal	Outfall 002 <sup>c</sup>			Outfall 007 <sup>c</sup>		
	Ambient Dissolved (µg/L)	Acute Standard (µg/L)	Chronic Standard (µg/L)	Ambient Dissolved (µg/L)	Acute Standard (µg/L)	Chronic Standard (µg/L)
Aluminum	5.0	750	N/A <sup>b</sup>	5.0	750	N/A <sup>b</sup>
Arsenic	12.9	340	150	15.3	340	150
Cadmium	0.05	6.5	2.03	0.07	6.5	2.03
Chromium VI	7.3 <sup>a</sup>	16.0	11.0	7.3 <sup>a</sup>	16.0	11.0
Chromium III	154 <sup>a</sup>	1,773	231	154 <sup>a</sup>	1,773	231
Copper	1.8	49.6	29.3	1.8	49.6	29.3
Cyanide	3.5 <sup>a</sup>	22.0	5.2	3.5 <sup>a</sup>	22.0	5.2
Iron	15.0	1,000	NONE	15.0	1,000	NONE
Lead	0.2	281	10.9	0.2	281	10.9
Mercury	0.008 <sup>a</sup>	2.4	0.012	0.100	2.4	0.012
Nickel	2.5	1,513	168	2.5	1,513	168
Selenium	0.4	18.4	4.6	0.4	18.4	4.6
Silver	0.25	34.9	NONE	0.25	34.9	NONE
Zinc	5.1	379	382	6.0	379	382

a Ambient concentration assumed 2/3 of water quality criteria.  
b The criterion for aluminum is implemented as follows:  
Where the pH is equal to or greater than 7.0 and the hardness is equal to or greater than 50 ppm as CaCO<sub>3</sub> in the receiving water after mixing, the 87 µg/L chronic criterion (expressed as total recoverable) will not apply, and aluminum will be regulated based on compliance with the 750 µg/L acute aluminum criterion (expressed as total recoverable).  
c Per R317-2.14.2(7), for hardness > 400 mg/l as CaCO<sub>3</sub>, calculations will assume a hardness of 400 mg/l as CaCO<sub>3</sub>.

**Table 4: Water quality standards for Outfalls 009 and 104**

Dissolved Metal	Outfall 009			Outfall 104		
	Ambient Dissolved (µg/L)	Acute Standard (µg/L)	Chronic Standard (µg/L)	Ambient Dissolved (µg/L)	Acute Standard (µg/L)	Chronic Standard (µg/L)
Aluminum	58.0 <sup>a</sup>	750	N/A <sup>b</sup>	58.0 <sup>a</sup>	750	N/A <sup>b</sup>
Arsenic	1.7	340	150	100 <sup>a</sup>	340	150
Cadmium	0.02	0.8	0.39	0.48 <sup>a</sup>	1.8	0.72
Chromium VI	7.3 <sup>a</sup>	16.0	11.0	7.3 <sup>a</sup>	16.0	11.0
Chromium III	25.2 <sup>a</sup>	291	38	49 <sup>a</sup>	570	74
Copper	0.4	6.2	4.4	6.0 <sup>a</sup>	13.4	9.0
Cyanide	3.5 <sup>a</sup>	22.0	5.2	3.5 <sup>a</sup>	22.0	5.2
Iron	5.3	1,000	NONE	667 <sup>a</sup>	1,000	NONE
Lead	0.2	26	1.0	1.7 <sup>a</sup>	65	2.5
Mercury	0.004	2.4	0.012	0.008 <sup>a</sup>	2.4	0.012
Nickel	0.4	234	26	34.7 <sup>a</sup>	468	52
Selenium	3.1 <sup>a</sup>	18.4	4.6	3.1 <sup>a</sup>	18.4	4.6
Silver	0.5 <sup>a</sup>	0.8	NONE	2.1 <sup>a</sup>	3.2	NONE
Zinc	3.8 <sup>a</sup>	58	59	79 <sup>a</sup>	117	118

a Ambient concentration assumed 2/3 of water quality criteria.  
b The criterion for aluminum is implemented as follows:  
Where the pH is equal to or greater than 7.0 and the hardness is equal to or greater than 50 ppm as CaCO<sub>3</sub> in the receiving water after mixing, the 87 µg/L chronic criterion (expressed as total recoverable) will not apply, and aluminum will be regulated based on compliance with the 750 µg/L acute aluminum criterion (expressed as total recoverable).

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Effluent Limits

Effluent limits for conservative pollutants were determined using a mass balance mixing analysis (UDWQ 2021). The hardness dependent conversion factors (CF) per UAC R317-2-14 Table 2.14.3a and Table 2.14.3b were used to translate the dissolved metals effluent limits to total recoverable metals effluent limits. Effluent limits for total recoverable metals are presented in Table 5.

**Table 5: WQBELs for Total Recoverable Metals (µg/L)**

Metal	Outfall 002		Outfall 007		Outfall 009		Outfall 104	
	Acute 1-hr Ave	Chronic 4-day Ave	Acute 1-hr Ave	Chronic 4-day Ave	Acute 1-hr Ave	Chronic 4-day Ave	Acute 1-hr Ave	Chronic 4-day Ave
Aluminum	836	N/A	1,038	N/A	1790	174	750	N/A
Arsenic	378	182	465	254	849	596	340	150
Cadmium	8.2	2.9	10.2	4.2	2.10	1.58	1.9	0.79
Chromium VI	17.0	11.8	19.3	13.8	29.0	22.0	16.0	11.0
Chromium III	6,206	289	7,592	337	2184	88	1,803	86.0
Copper	57.5	37.1	70.9	52.6	15.5	17.2	14.0	9.3
Cyanide	24.1	5.6	29.2	6.5	49.9	10.4	22.0	5.2
Iron	1,114	NONE	1381	NONE	2495	NONE	1,000	NONE
Lead	532	22.8	660.9	32.7	71.6	1.2	81.6	3.2
Mercury	2.6	0.013	3.289	0.012	6.002	0.012	2,400	0.012
Nickel	1,691	207	2101	297	586	103	469	52
Selenium	20.5	5.6	25.3	7.8	41.5	9.2	18.4	4.6
Silver	45.8	NONE	56.8	NONE	1.4	NONE	3.8	NONE
Zinc	432	477	535	683	144	228	120	120

All models and supporting documentation are available for review upon request.

Antidegradation Level I Review

The objective of the Level I ADR is to ensure the protection of existing uses, defined as the beneficial uses attained in the receiving water on or after November 28, 1975. No evidence is known that the existing uses deviate from the designated beneficial uses for the receiving water. Therefore, the beneficial uses will be protected if the discharge remains below the WQBELs presented in this wasteload.

A Level II Antidegradation Review (ADR) is not required for this facility because the upgraded and expanded facility discharge has previously been permitted.

Documents:

WLA Document: *Kennecott\_WLA\_2022.docx*  
Wasteload Analysis and Addendums: *Kennecott\_WLA\_2022.xlsx*

References:

Utah Division of Water Quality. 2021. *Utah Wasteload Analysis Procedures Version 2.0.*

**Utah Division of Water Quality  
ADDENDUM  
Statement of Basis  
Wasteload Analysis**

**Date:** October 18, 2021

**Prepared by:** Suzan Tahir  
Standards and Technical Services

**Facility:** Rio Tinto Kennecott Copper  
UPDES No. UT-0000051  
Outfall 010; Butterfield Tunnel

**Receiving water:** Butterfield Creek (2B, 3D, 4)

This addendum summarizes the wasteload analysis that was performed to determine water quality based effluent limits (WQBEL) for this discharge. Wasteload analyses are performed to determine point source effluent limitations necessary to maintain designated beneficial uses by evaluating projected effects of discharge concentrations on in-stream water quality. The wasteload analysis also takes into account downstream designated uses (UAC R317-2-8). Projected concentrations are compared to numeric water quality standards to determine acceptability. The numeric criteria in this wasteload analysis may be modified by narrative criteria and other conditions determined by staff of the Division of Water Quality.

**Discharge**

Outfall 010: Butterfield Tunnel

The maximum daily discharge for the facility is 0.12 MGD (0.2 cfs) as estimated by the permittee.

**Receiving Water**

The receiving water for Outfall 010 is Butterfield Creek which is tributary to the Jordan River.

Butterfield Creek's designated beneficial uses, as per UAC R317-2-13.5, uses are 2B, 3D, 4.

- *Class 2B - Protected for infrequent primary contact recreation. Also protected for secondary contact recreation where there is a low likelihood of ingestion of water or a low degree of bodily contact with the water. Examples include, but are not limited to, wading, hunting, and fishing.*

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- *Class 3D - Protected for waterfowl, shore birds and other water-oriented wildlife not included in Classes 3A, 3B, or 3C, including the necessary aquatic organisms in their food chain.*
- *Class 4 -- Protected for agricultural uses including irrigation of crops and stock watering.*

Typically, the critical flow for the wasteload analysis is considered the lowest stream flow for seven consecutive days with a ten year return frequency (7Q10). Due to a lack of flow records for Butterfield Creek, the 20<sup>th</sup> percentile of available flow measurements was calculated for the period of record to approximate the 7Q10 low flow condition. The source of flow data was DWQ sampling station #4994450; BUTTERFIELD CANYON CK AB KCC 010 (2000-2020).

The critical low flow condition for Butterfield Creek is 0.50 cfs.

Ambient Butterfield Creek water quality was characterized based on samples collected from DWQ sampling station #4994450; BUTTERFIELD CANYON CK AB KCC 010 (2000-2020)

### **TMDL**

Butterfield Creek (UT16020204-024\_02) is listed as impaired for total dissolved solids (TDS), Selenium, and *E. coli* according to Utah's Combined 2018/2020 Integrated Report. A TMDL has not been completed for these constituents and this time. Water quality based effluent limits (WQBELs) for these constituents will be set at the applicable water quality standards with no allowance for mixing.

### **Mixing Zone**

The maximum allowable mixing zone is 15 minutes of travel time for acute conditions, not to exceed 50% of stream width, and 2,500 feet for chronic conditions, per UAC R317-2-5. Water quality standards must be met at the end of the mixing zone.

The actual length of the mixing zone was not determined; however, it was presumed to remain within the maximum allowable mixing zone dimensions. Acute limits were calculated using 50% of the annual critical low flow.

### **Parameters of Concern**

The parameters of concern identified for the discharge/receiving water were dissolved metals, TDS, and pH as determined in consultation with the UPDES Permit Writer.

### **WET Limits**

The percent of effluent in the receiving water in a fully mixed condition, and acute and chronic dilution in a not fully mixed condition are calculated in the WLA in order to generate WET limits.

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The LC<sub>50</sub> (lethal concentration, 50%) percent effluent for acute toxicity and the IC<sub>25</sub> (inhibition concentration, 25%) percent effluent for chronic toxicity, as determined by the WET test, needs to be below the WET limits, as determined by the WLA. The WET limit for LC<sub>50</sub> is typically 100% effluent and does not need to be determined by the WLA.

IC<sub>25</sub> WET limits for Outfall 011 should be based on 27% effluent.

**Receiving Water Quality and Standards**

The water quality standards for dissolved metals are dependent on hardness (total as CaCO<sub>3</sub>). Based on DWQ monitoring data from Butterfield Creek an average hardness of 246 mg/L was used for determining the dissolved metals criteria. Ambient conditions were estimated using monitoring data from 4994450; BUTTERFIELD CANYON CK AB KCC 010 (2000-2020). The 80th percentile of observed data was calculated, with one-half the reporting limit assumed for non-detects.

**Table 1: Water quality standards for dissolved metals for a hardness of 400 mg/L and ambient conditions for #4994450; BUTTERFIELD CANYON CK AB KCC 010 (2000-2020).**

Dissolved Metal	Ambient 80th Percentile (µg/L)	Acute Standard (µg/L)	Chronic Standard (µg/L)
Aluminum	15.0	750	87
Arsenic	2.5	340	150
Boron	38.45	750	None
Cadmium	0.50	4.1	1.4
Chromium VI	2.50	16.00	11.0
Chromium III	2.50	1184	231
Copper	6.00	31.2	29.3
Cyanide	3.47 <sup>a</sup>	22.00	5.20
Iron	15.68	1000.00	None
Lead	1.50	168	10.9
Mercury	0.01 <sup>a</sup>	2.40	0.012
Nickle	5.00	997	168
Selenium	0.88	18.40	4.60
Silver	1.00	14.9	None
Zinc	15.00	25	382

<sup>a</sup> Ambient concentration assumed 2/3 of water quality criteria.

<sup>b</sup> The criterion for aluminum is implemented as follows:  
Where the pH is equal to or greater than 7.0 and the hardness is equal to or greater than 50 ppm as CaCO<sub>3</sub> in the receiving water after mixing, the 87 µg/L chronic criterion (expressed as total recoverable) will not apply, and aluminum will be regulated based on compliance with the 750 µg/L acute aluminum criterion (expressed as total recoverable).

**Effluent Limits**

Effluent limits for conservative pollutants were determined using a mass balance mixing analysis (UDWQ 2012). The hardness dependent conversion factors (CF) per UAC R317-2-14 Table 2.14.3a and Table 2.14.3b were used to translate the dissolved metals effluent limits to total



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recoverable metals effluent limits, assuming a hardness of 244 mg/L. Effluent limits for total recoverable metals are presented in Table 2

**Table 2: WQBELs for Total Recoverable Metals (ug/l), Outfall 010**

<b>Metal</b>	<b>Acute 1-hr Average</b>	<b>Chronic 4-day Average</b>
Aluminum	1739.8	280.9
Arsenic	794.5	547.3
Cadmium	9.94	4.40
Boron	1708.2	None
Chromium VI	34.2	33.9
Chromium III	8780.72	653.51
Copper	67.78	57.06
Cyanide	47.0 <sup>a</sup>	9.9
Iron	2325.6	None
Lead	594	30.5
Mercury	5.6 <sup>a</sup>	0.02
Nickel	2336.69	396.56
Selenium	42.0	14.6
Silver	39.67	None
Zinc	578.50	902.02
<sup>a</sup> Receiving water is 303(d) listed for constituent. WQBELs equal the standard.		

The receiving water is 303(d) listed for TDS, therefore, an acute limit of 1200 mg/l applies. The receiving water is 303(d) listed for *E. coli*, therefore, a 30-day geometric mean of 206 (No./100 ML) and a maximum of 668 (No./100 ML) apply.

**Antidegradation Level I Review**

The objective of the Level I ADR is to ensure the protection of existing uses, defined as the beneficial uses attained in the receiving water on or after November 28, 1975. No evidence is known that the existing uses deviate from the designated beneficial uses for the receiving water. Therefore, the beneficial uses will be protected if the discharge remains below the WQBELs presented in this wasteload. A Level II Antidegradation Review (ADR) is not required for this discharge since the pollutant concentration and load is not increasing under this permit renewal.

**Documents:**

WLA Document: *Kennecott\_WLADoc\_010\_2021.docx*  
Wasteload Analysis and Addendum: *Kennecott\_WLA\_010\_2021.xlsm*

**References:**

Utah Division of Water Quality. 2012. *Utah Wasteload Analysis Procedures Version 1.0.*  
Utah Division of Water Quality. 2021. *Utah's Combined 2018/2020 Integrated Report.*

## **ATTACHMENT 3**

### *Reasonable Potential Analysis*

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## **REASONABLE POTENTIAL ANALYSIS**

Water Quality has worked to improve our reasonable potential analysis (RP) for the inclusion of limits for parameters in the permit by using an EPA provided model. As a result of the model, more parameters may be included in the renewal permit. A Copy of the Reasonable Potential Analysis Guidance (RP Guide) is available at water Quality. There are four outcomes for the RP Analysis<sup>3</sup>. They are;

- Outcome A: A new effluent limitation will be placed in the permit.
- Outcome B: No new effluent limitation. Routine monitoring requirements will be placed or increased from what they are in the permit,
- Outcome C: No new effluent limitation. Routine monitoring requirements maintained as they are in the permit,
- Outcome D: No limitation or routine monitoring requirements are in the permit.

The Metals Initial Screening Table and RP Outputs Table are included in this attachment.

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<sup>3</sup> See Reasonable Potential Analysis Guidance for definitions of terms

<b>RP Procedure Output</b>			
Facility Name:	Kennecott		
Permit Number:	UT0000051		
Outfall Number:	Outfall 004		
Parameter	Arsenic		
Distribution	Lognormal		
Data Units	mg/L		
Reporting Limit	0.005		
Significant Figures	3		
Confidence Interval	99		
Maximum Reported Effluent Conc.	0.073	mg/L	
Coefficient of Variation (CV)	0.867		
RP Multiplier	3.16		
Projected Maximum Effluent Conc. (MEC)	0.632	mg/L	
Acute Criterion	0.1	mg/L	
Chronic Criterion	0.19	mg/L	
Human Health Criterion	0	mg/L	
RP for Acute?	YES		
RP for Chronic?	YES		
RP for Human Health?	N/A		
Effluent Data			
#		#	
1	0.018	11	0.049
2	0.026	12	0.023
3	0.026	13	0.035
4	0.025	14	0.063
5	0.026	15	0.058
6	0.056	16	0.019
7	0.035	17	0.022
8	0.073	18	0.073
9	0.025	19	0.021
10	0.005		

<b>RP Procedure Output</b>			
Facility Name:	Kennecott		
Permit Number:	UT0000051		
Outfall Number:	Outfall 004		
Parameter	Zinc		
Distribution	Lognormal		
Data Units	mg/L		
Reporting Limit	0.01		
Significant Figures	3		
Confidence Interval	99		
Maximum Reported Effluent Conc.	0.025	mg/L	
Coefficient of Variation (CV)	0.338		
RP Multiplier	1.66		
Projected Maximum Effluent Conc. (MEC)	0.0414	mg/L	
Acute Criterion	0.388	mg/L	
Chronic Criterion	0.388	mg/L	
Human Health Criterion	0	mg/L	
RP for Acute?	NO		
RP for Chronic?	NO		
RP for Human Health?	N/A		
Effluent Data			
#		#	
1	0.01	11	0.01
2	0.019	12	0.025
3	0.01	13	0.02
4	0.01	14	0.01
5	0.01	15	0.012
6	0.01	16	0.023
7	0.01	17	0.01
8	0.01	18	0.01
9	0.01	19	0.016
10	0.01		

<b>RP Procedure Output</b>			
Facility Name:	Kennecott		
Permit Number:	UT0000051		
Outfall Number:	Outfall 004		
Parameter	Cadmium		
Distribution	Lognormal		
Data Units	mg/L		
Reporting Limit	0.001		
Significant Figures	2		
Confidence Interval	99		
Maximum Reported Effluent Conc.	0.001	mg/L	
Coefficient of Variation (CV)	0.024		
RP Multiplier	1.0		
Projected Maximum Effluent Conc. (MEC)	0.001	mg/L	
Acute Criterion	0.007	mg/L	
Chronic Criterion	0.003	mg/L	
Human Health Criterion	0	mg/L	
RP for Acute?	NO		
RP for Chronic?	NO		
RP for Human Health?	N/A		
Effluent Data			
#		#	
1	0.001	11	0.001
2	0.001	12	0.001
3	0.001	13	0.001
4	0.001	14	0.001
5	0.001	15	0.001
6	0.001	16	0.001
7	0.001	17	0.001
8	0.001	18	0.001
9	0.001	19	0.0009
10	0.001		

<b>RP Procedure Output</b>			
Facility Name:	Kennecott		
Permit Number:	UT0000051		
Outfall Number:	Outfall 004		
Parameter	Copper		
Distribution	Lognormal		
Data Units	mg/L		
Reporting Limit	0.01		
Significant Figures	2		
Confidence Interval	99		
Maximum Reported Effluent Conc.	0.03	mg/L	
Coefficient of Variation (CV)	0.31		
RP Multiplier	1.6		
Projected Maximum Effluent Conc. (MEC)	0.048	mg/L	
Acute Criterion	0.0517	mg/L	
Chronic Criterion	0.305	mg/L	
Human Health Criterion	0	mg/L	
RP for Acute?	NO		
RP for Chronic?	NO		
RP for Human Health?	N/A		
Effluent Data			
#		#	
1	0.012	11	0.01
2	0.013	12	0.017
3	0.01	13	0.01
4	0.01	14	0.03
5	0.013	15	0.02
6	0.01	16	0.014
7	0.01	17	0.01
8	0.01	18	0.015
9	0.013	19	0.01
10	0.01		



<b>RP Procedure Output</b>			
Facility Name:	Kennecott		
Permit Number:	UT0000051		
Outfall Number:	Outfall 004		
Parameter	Lead		
Distribution	Lognormal		
Data Units	mg/L		
Reporting Limit	0.005		
Significant Figures	3		
Confidence Interval	99		
Maximum Reported Effluent Conc.	0.006	mg/L	
Coefficient of Variation (CV)	0.0389		
RP Multiplier	1.06		
Projected Maximum Effluent Conc. (MEC)	0.00635	mg/L	
Acute Criterion	0.1	mg/L	
Chronic Criterion	0.019	mg/L	
Human Health Criterion	0	mg/L	
RP for Acute?	NO		
RP for Chronic?	NO		
RP for Human Health?	N/A		
Effluent Data			
#		#	
1	0.005	12	0.005
2	0.005	13	0.005
3	0.005	14	0.005
4	0.005	15	0.005
5	0.005	16	0.005
6	0.005	17	0.005
7	0.005	18	0.005
8	0.005	19	0.005
9	0.005	20	0.005
10	0.005	21	0.005
11	0.005	22	0.006

<b>RP Procedure Output</b>			
Facility Name:	Kennecott		
Permit Number:	UT0000051		
Outfall Number:	Outfall 004		
Parameter	Selenium		
Distribution	Lognormal		
Data Units	mg/L		
Reporting Limit	0.002		
Significant Figures	3		
Confidence Interval	99		
Maximum Reported Effluent Conc.	0.007	mg/L	
Coefficient of Variation (CV)	0.277		
RP Multiplier	1.52		
Projected Maximum Effluent Conc. (MEC)	0.0106	mg/L	
Acute Criterion	0.02	mg/L	
Chronic Criterion	0.005	mg/L	
Human Health Criterion	0	mg/L	
RP for Acute?	NO		
RP for Chronic?	YES		
RP for Human Health?	N/A		
Effluent Data			
#		#	
1	0.006	11	0.005
2	0.006	12	0.006
3	0.005	13	0.005
4	0.006	14	0.005
5	0.006	15	0.004
6	0.004	16	0.006
7	0.005	17	0.006
8	0.007	18	0.005
9	0.005	19	0.004
10	0.002		

RP Procedure Output		
Facility Name:	Kennecott	
Permit Number:	UT0000051	
Outfall Number:	Outfall 009	
Parameter	Mercury	
Distribution	Lognormal	
Data Units	mg/L	
Reporting Limit	0.0002	
Significant Figures	3	
Confidence Interval	99	
Maximum Reported Effluent Conc.	0.0002	mg/L
Coefficient of Variation (CV)	0.0000158	
RP Multiplier	1.00	
Projected Maximum Effluent Conc. (MEC)	0.0002	mg/L
Acute Criterion	0.0124	mg/L
Chronic Criterion	0	mg/L
Human Health Criterion	0	mg/L
RP for Acute?	NO	
RP for Chronic?	N/A	
RP for Human Health?	N/A	
Effluent Data		
#		
1	0.0002	
2	0.0002	
3	0.0002	
4	0.0002	
5	0.0002	
6	0.0002	
7	0.0002	
8	0.0002	
9	0.0002	
10	0.00019999	

RP Procedure Output			
Facility Name:	Kennecott		
Permit Number:	UT0000051		
Outfall Number:	Outfall 010		
Parameter	Arsenic		
Distribution	Lognormal		
Data Units	mg/L		
Reporting Limit	0.005		
Significant Figures	2		
Confidence Interval	99		
Maximum Reported Effluent Conc.	0.015	mg/L	
Coefficient of Variation (CV)	0.29		
RP Multiplier	1.5		
Projected Maximum Effluent Conc. (MEC)	0.023	mg/L	
Acute Criterion	0.795	mg/L	
Chronic Criterion	0.547	mg/L	
Human Health Criterion	0	mg/L	
RP for Acute?	NO		
RP for Chronic?	NO		
RP for Human Health?	N/A		
Effluent Data			
#		#	
1	0.007	11	0.005
2	0.007	12	0.006
3	0.006	13	0.007
4	0.007	14	0.005
5	0.007	15	0.009
6	0.005	16	0.012
7	0.005	17	0.015
8	0.006	18	0.005
9	0.007	19	0.007
10	0.006	20	0.006

RP Procedure Output			
Facility Name:	Kennecott		
Permit Number:	UT0000051		
Outfall Number:	Outfall 010		
Parameter	Zinc		
Distribution	Lognormal		
Data Units	mg/L		
Reporting Limit	0.1		
Significant Figures	3		
Confidence Interval	99		
Maximum Reported Effluent Conc.	0.481	mg/L	
Coefficient of Variation (CV)	0.203		
RP Multiplier	1.35		
Projected Maximum Effluent Conc. (MEC)	0.651	mg/L	
Acute Criterion	0.579	mg/L	
Chronic Criterion	0.902	mg/L	
Human Health Criterion	0	mg/L	
RP for Acute?	YES		
RP for Chronic?	NO		
RP for Human Health?	N/A		
Effluent Data			
#		#	
1	0.229	11	0.224
2	0.263	12	0.212
3	0.209	13	0.231
4	0.21	14	0.228
5	0.22	15	0.32
6	0.235	16	0.303
7	0.221	17	0.481
8	0.218	18	0.283
9	0.219	19	0.28
10	0.263	20	0.277

RP Procedure Output			
Facility Name:	Kennecott		
Permit Number:	UT0000051		
Outfall Number:	Outfall 010		
Parameter	Cadmium		
Distribution	Lognormal		
Data Units	mg/L		
Reporting Limit	0.0005		
Significant Figures	3		
Confidence Interval	99		
Maximum Reported Effluent Conc.	0.001	mg/L	
Coefficient of Variation (CV)	0.257		
RP Multiplier	1.46		
Projected Maximum Effluent Conc. (MEC)	0.00146	mg/L	
Acute Criterion	0.00994	mg/L	
Chronic Criterion	0.0044	mg/L	
Human Health Criterion	0	mg/L	
RP for Acute?	NO		
RP for Chronic?	NO		
RP for Human Health?	N/A		
Effluent Data			
#		#	
1	0.001	11	0.0005
2	0.001	12	0.0005
3	0.001	13	0.0005
4	0.0005	14	0.0005
5	0.0005	15	0.0005
6	0.0005	16	0.0006
7	0.0005	17	0.0005
8	0.0005	18	0.0005
9	0.0005	19	0.0005
10	0.0005	20	0.0005

RP Procedure Output			
Facility Name:	Kennecott		
Permit Number:	UT0000051		
Outfall Number:	Outfall 010		
Parameter	Copper		
Distribution	Lognormal		
Data Units	mg/L		
Reporting Limit	0.01		
Significant Figures	2		
Confidence Interval	99		
Maximum Reported Effluent Conc.	0.01	mg/L	
Coefficient of Variation (CV)			
RP Multiplier	1.0		
Projected Maximum Effluent Conc. (MEC)	0.01	mg/L	
Acute Criterion	0.068	mg/L	
Chronic Criterion	0.571	mg/L	
Human Health Criterion	0	mg/L	
RP for Acute?	NO		
RP for Chronic?	NO		
RP for Human Health?	N/A		
Effluent Data			
#		#	
1	0.01	11	0.01
2	0.01	12	0.01
3	0.01	13	0.01
4	0.01	14	0.01
5	0.01	15	0.01
6	0.01	16	0.01
7	0.01	17	0.01
8	0.01	18	0.01
9	0.01	19	0.01
10	0.01	20	0.01

RP Procedure Output			
Facility Name:	Kennecott		
Permit Number:	UT0000051		
Outfall Number:	Outfall 010		
Parameter	Mercury		
Distribution	Lognormal		
Data Units	mg/L		
Reporting Limit	0.000005		
Significant Figures	3		
Confidence Interval	99		
Maximum Reported Effluent Conc.	0.000005	mg/L	
Coefficient of Variation (CV)	0.679		
RP Multiplier	2.84		
Projected Maximum Effluent Conc. (MEC)	0.0000142	mg/L	
Acute Criterion	0.0056	mg/L	
Chronic Criterion	0.00002	mg/L	
Human Health Criterion	0	mg/L	
RP for Acute?			NO
RP for Chronic?			NO
RP for Human Health?			N/A
Effluent Data			
#		#	
1	ND	11	ND
2	0.0000011	12	0.0000021
3	0.000001	13	0.0000008
4	ND	14	0.000001
5	0.0000008	15	0.000002
6	0.0000011	16	0.0000035
7	ND	17	0.000005
8	ND	18	0.0000015
9	0.000001	19	0.0000046
10	0.0000012	20	0.000001



RP Procedure Output			
Facility Name:	Kennecott		
Permit Number:	UT0000051		
Outfall Number:	Outfall 010		
Parameter	Lead		
Distribution	Lognormal		
Data Units	mg/L		
Reporting Limit	0.005		
Significant Figures	3		
Confidence Interval	99		
Maximum Reported Effluent Conc.	0.009	mg/L	
Coefficient of Variation (CV)	0.132		
RP Multiplier	1.22		
Projected Maximum Effluent Conc. (MEC)	0.011	mg/L	
Acute Criterion	0.594	mg/L	
Chronic Criterion	0.031	mg/L	
Human Health Criterion	0	mg/L	
RP for Acute?	NO		
RP for Chronic?	NO		
RP for Human Health?	N/A		
Effluent Data			
#		#	
0	0.005	11	0.005
2	0.005	12	0.005
3	0.005	13	0.005
4	0.005	14	0.005
5	0.005	15	0.005
6	0.005	16	0.005
7	0.005	17	0.009
8	0.005	18	0.005
9	0.005	19	0.005
10	0.005	20	0.005

RP Procedure Output			
Facility Name:	Kennecott		
Permit Number:	UT0000051		
Outfall Number:	Outfall 010		
Parameter	Selenium		
Distribution	Lognormal		
Data Units	mg/L		
Reporting Limit	0.002		
Significant Figures	3		
Confidence Interval	99		
Maximum Reported Effluent Conc.	0.003	mg/L	
Coefficient of Variation (CV)	0.185		
RP Multiplier	1.32		
Projected Maximum Effluent Conc. (MEC)	0.00395	mg/L	
Acute Criterion	0.042	mg/L	
Chronic Criterion	0.0146	mg/L	
Human Health Criterion	0	mg/L	
RP for Acute?	NO		
RP for Chronic?	NO		
RP for Human Health?	N/A		
Effluent Data			
#		#	
1	0.002	11	0.002
2	0.002	12	0.002
3	0.002	13	0.002
4	0.002	14	0.002
5	0.002	15	0.002
6	0.002	16	0.002
7	0.002	17	0.002
8	0.002	18	0.001
9	0.002	19	0.003
10	0.002	20	0.002

Outfall 011

RP Procedure Output			
Facility Name:	Kennecott		
Permit Number:	UT0000051		
Outfall Number:	Outfall 011		
Parameter	Arsenic		
Distribution	Lognormal		
Data Units	mg/L		
Reporting Limit	0.005		
Significant Figures	3		
Confidence Interval	99		
Maximum Reported Effluent Conc.	0.008	mg/L	
Coefficient of Variation (CV)	0.133		
RP Multiplier	1.23		
Projected Maximum Effluent Conc. (MEC)	0.00981	mg/L	
Acute Criterion	0.861	mg/L	
Chronic Criterion	0.581	mg/L	
Human Health Criterion	0	mg/L	
RP for Acute?	NO		
RP for Chronic?	NO		
RP for Human Health?	N/A		
Effluent Data			
#		#	
1	0.005	11	0.005
2	0.005	12	0.005
3	0.005	13	0.005
4	0.005	14	0.005
5	0.007	15	0.005
6	0.005	16	0.005
7	0.005	17	0.005
8	0.005	18	0.008
9	0.005	19	0.006
10	0.005		

RP Procedure Output			
Facility Name:	Kennecott		
Permit Number:	UT0000051		
Outfall Number:	Outfall 011		
Parameter	Zinc		
Distribution	Lognormal		
Data Units	mg/L		
Reporting Limit	0.01		
Significant Figures	2		
Confidence Interval	99		
Maximum Reported Effluent Conc.	0.026	mg/L	
Coefficient of Variation (CV)	0.35		
RP Multiplier	1.7		
Projected Maximum Effluent Conc. (MEC)	0.044	mg/L	
Acute Criterion	0.986	mg/L	
Chronic Criterion	1.585	mg/L	
Human Health Criterion	0	mg/L	
RP for Acute?	NO		
RP for Chronic?	NO		
RP for Human Health?	N/A		
Effluent Data			
#		#	
1	0.026	11	0.011
2	0.01	12	0.01
3	0.01	13	0.01
4	0.01	14	0.01
5	0.01	15	0.01
6	0.01	16	0.018
7	0.01	17	0.01
8	0.022	18	0.01
9	0.01	19	0.026
10	0.01	20	0.01

RP Procedure Output			
Facility Name:	Kennecott		
Permit Number:	UT0000051		
Outfall Number:	Outfall 011		
Parameter	Cadmium		
Distribution	Lognormal		
Data Units	mg/L		
Reporting Limit	0.0005		
Significant Figures	3		
Confidence Interval	99		
Maximum Reported Effluent Conc.	0.001	mg/L	
Coefficient of Variation (CV)	0.258		
RP Multiplier	1.47		
Projected Maximum Effluent Conc. (MEC)	0.00147	mg/L	
Acute Criterion	0.0183	mg/L	
Chronic Criterion	0.0082	mg/L	
Human Health Criterion	0	mg/L	
RP for Acute?	NO		
RP for Chronic?	NO		
RP for Human Health?	N/A		
Effluent Data			
#		#	
1	0.001	11	0.0005
2	0.001	12	0.0005
3	0.001	13	0.0005
4	0.0005	14	0.0005
5	0.0005	15	0.0005
6	0.0005	16	0.0005
7	0.0005	17	0.0005
8	0.0005	18	0.0005
9	0.0005	19	0.0005
10	0.0005	20	0.0005

RP Procedure Output			
Facility Name:	Kennecott		
Permit Number:	UT0000051		
Outfall Number:	Outfall 011		
Parameter	Copper		
Distribution	Lognormal		
Data Units	mg/L		
Reporting Limit	0.01		
Significant Figures	3		
Confidence Interval	99		
Maximum Reported Effluent Conc.	0.013	mg/L	
Coefficient of Variation (CV)	0.0636		
RP Multiplier	1.10		
Projected Maximum Effluent Conc. (MEC)	0.0143	mg/L	
Acute Criterion	0.125	mg/L	
Chronic Criterion	0.108	mg/L	
Human Health Criterion	0	mg/L	
RP for Acute?	NO		
RP for Chronic?	NO		
RP for Human Health?	N/A		
Effluent Data			
#		#	
1	0.01	11	0.01
2	0.01	12	0.01
3	0.01	13	0.01
4	0.01	14	0.01
5	0.01	15	0.01
6	0.013	16	0.01
7	0.01	17	0.01
8	0.01	18	0.01
9	0.01	19	0.011
10	0.01	20	0.011

RP Procedure Output			
Facility Name:	Kennecott		
Permit Number:	UT0000051		
Outfall Number:	Outfall 011		
Parameter	Lead		
Distribution	Lognormal		
Data Units	mg/L		
Reporting Limit	0.005		
Significant Figures	3		
Confidence Interval	99		
Maximum Reported Effluent Conc.	0.005	mg/L	
Coefficient of Variation (CV)			
RP Multiplier	1.00		
Projected Maximum Effluent Conc. (MEC)	0.005	mg/L	
Acute Criterion	0.124	mg/L	
Chronic Criterion	0.07	mg/L	
Human Health Criterion	0	mg/L	
RP for Acute?	NO		
RP for Chronic?	NO		
RP for Human Health?	N/A		
Effluent Data			
#		#	
1	0.005	11	0.005
2	0.005	12	0.005
3	0.005	13	0.005
4	0.005	14	0.005
5	0.005	15	0.005
6	0.005	16	0.005
7	0.005	17	0.005
8	0.005	18	0.005
9	0.005	19	0.005
10	0.005	20	0.005

RP Procedure Output			
Facility Name:	Kennecott		
Permit Number:	UT0000051		
Outfall Number:	Outfall 011		
Parameter	Selenium		
Distribution	Lognormal		
Data Units	mg/L		
Reporting Limit	0.002		
Significant Figures	3		
Confidence Interval	99		
Maximum Reported Effluent Conc.	0.003	mg/L	
Coefficient of Variation (CV)	0.182		
RP Multiplier	1.31		
Projected Maximum Effluent Conc. (MEC)	0.00393	mg/L	
Acute Criterion	0.042	mg/L	
Chronic Criterion	0.00724	mg/L	
Human Health Criterion	0	mg/L	
RP for Acute?	NO		
RP for Chronic?	NO		
RP for Human Health?	N/A		
Effluent Data			
#		#	
1	0.002	11	0.003
2	0.003	12	0.003
3	0.003	13	0.002
4	0.003	14	0.003
5	0.002	15	0.003
6	0.003	16	0.003
7	0.003	17	0.003
8	0.003	18	0.002
9	0.003	19	0.002
10	0.003	20	0.003



RP Procedure Output					
Facility Name:	Kennecott				
Permit Number:	UT0000051				
Outfall Number:	Outfall 012				
Parameter	Arsenic				
Distribution	Lognormal				
Data Units	mg/L				
Reporting Limit	0.007				
Significant Figures	3				
Confidence Interval	99				
Maximum Reported Effluent Conc.	0.038	mg/L			
Coefficient of Variation (CV)	0.486				
RP Multiplier	1.65				
Projected Maximum Effluent Conc. (MEC)	0.0628	mg/L			
Acute Criterion	0.1	mg/L			
Chronic Criterion	0.19	mg/L			
Human Health Criterion	0	mg/L			
RP for Acute?	NO				
RP for Chronic?	NO				
RP for Human Health?	N/A				
Effluent Data					
#		#		#	
1	0.007	16	0.006	31	0.022
2	0.01	17	0.008	32	0.017
3	0.011	18	0.007	33	0.038
4	0.011	19	0.009	34	0.023
5	0.019	20	0.012	35	0.024
6	0.021	21	0.023	36	0.018
7	0.015	22	0.017	37	0.021
8	0.022	23	0.01	38	0.022
9	0.017	24	0.006	39	0.008
10	0.01	25	0.01	40	0.015
11	0.009	26	0.008		
12	0.012	27	0.014		
13	0.016	28	0.015		
14	0.017	29	0.018		
15	0.01	30	0.032		



RP Procedure Output					
Facility Name:	Kennecott				
Permit Number:	UT0000051				
Outfall Number:	Outfall 012				
Parameter	Zinc				
Distribution	Lognormal				
Data Units	mg/L				
Reporting Limit	0.014				
Significant Figures	2				
Confidence Interval	99				
Maximum Reported Effluent Conc.	0.065	mg/L			
Coefficient of Variation (CV)	0.42				
RP Multiplier	1.6				
Projected Maximum Effluent Conc. (MEC)	0.1	mg/L			
Acute Criterion	0.388	mg/L			
Chronic Criterion	0.388	mg/L			
Human Health Criterion	0	mg/L			
RP for Acute?	NO				
RP for Chronic?	NO				
RP for Human Health?	N/A				
Effluent Data					
#		#		#	
1	0.014	16	0.013	31	0.012
2	0.013	17	0.012	32	0.017
3	0.019	18	0.021	33	0.014
4	0.065	19	0.025	34	0.018
5	0.045	20	0.028	35	0.014
6	0.022	21	0.015	36	0.011
7	0.016	22	0.012	37	0.011
8	0.023	23	0.01	38	0.022
9	0.02	24	0.013	39	0.013
10	0.028	25	0.014	40	0.016
11	0.02	26	0.012		
12	0.011	27	0.012		
13	0.012	28	0.011		
14	0.012	29	0.014		
15	0.01	30	0.012		

RP Procedure Output					
Facility Name:	Kennecott				
Permit Number:	UT0000051				
Outfall Number:	Outfall 012				
Parameter	Cadmium				
Distribution	Lognormal				
Data Units	mg/L				
Reporting Limit	0.004				
Significant Figures	2				
Confidence Interval	99				
Maximum Reported Effluent Conc.	0.004	mg/L			
Coefficient of Variation (CV)	0.43				
RP Multiplier	1.6				
Projected Maximum Effluent Conc. (MEC)	0.0063	mg/L			
Acute Criterion	0.007	mg/L			
Chronic Criterion	0.003	mg/L			
Human Health Criterion	0	mg/L			
RP for Acute?	NO				
RP for Chronic?	YES				
RP for Human Health?	N/A				
Effluent Data					
#		#		#	
1	0.002	15	0.001	29	0.001
2	0.002	16	0.001	30	0.001
3	0.002	17	0.001	31	0.001
4	0.004	18	0.001	32	0.001
5	0.004	19	0.001	33	0.001
6	0.001	20	0.001	34	0.001
7	0.002	21	0.001	35	0.001
8	0.003	22	0.001	36	0.001
9	0.002	23	0.001	37	0.001
10	0.002	24	0.001	38	0.001
11	0.002	25	0.001	39	0.001
12	0.001	26	0.001	40	0.001
13	0.001	27	0.001		
14	0.001	28	0.001		

RP Procedure Output					
Facility Name:	Kennecott				
Permit Number:	UT0000051				
Outfall Number:	Outfall 012				
Parameter	Copper				
Distribution	Lognormal				
Data Units	mg/L				
Reporting Limit	0.01				
Significant Figures	2				
Confidence Interval	99				
Maximum Reported Effluent Conc.	0.059	mg/L			
Coefficient of Variation (CV)	0.44				
RP Multiplier	1.6				
Projected Maximum Effluent Conc. (MEC)	0.093	mg/L			
Acute Criterion	0.0517	mg/L			
Chronic Criterion	0.0305	mg/L			
Human Health Criterion	0	mg/L			
RP for Acute?	YES				
RP for Chronic?	YES				
RP for Human Health?	N/A				
Effluent Data					
#		#		#	
1	0.013	15	0.013	29	0.021
2	0.019	16	0.016	30	0.036
3	0.022	17	0.014	31	0.031
4	0.019	18	0.016	32	0.034
5	0.016	19	0.019	33	0.051
6	0.014	20	0.014	34	0.026
7	0.025	21	0.013	35	0.025
8	0.059	22	0.019	36	0.028
9	0.053	23	0.013	37	0.017
10	0.044	24	0.016	38	0.021
11	0.028	25	0.011	39	0.016
12	0.024	26	0.019	40	0.015
13	0.015	27	0.026		
14	0.019	28	0.026		

RP Procedure Output					
Facility Name:	Kennecott				
Permit Number:	UT0000051				
Outfall Number:	Outfall 012				
Parameter	Lead				
Distribution	Lognormal				
Data Units	mg/L				
Reporting Limit	0.005				
Significant Figures	3				
Confidence Interval	99				
Maximum Reported Effluent Conc.	0.006	mg/L			
Coefficient of Variation (CV)	0.0288				
RP Multiplier	1.03				
Projected Maximum Effluent Conc. (MEC)	0.00619	mg/L			
Acute Criterion	0.1	mg/L			
Chronic Criterion	0.019	mg/L			
Human Health Criterion	0	mg/L			
RP for Acute?			NO		
RP for Chronic?			NO		
RP for Human Health?			N/A		
Effluent Data					
#		#		#	
1	0.005	15	0.005	29	0.005
2	0.005	16	0.005	30	0.005
3	0.005	17	0.005	31	0.005
4	0.005	18	0.005	32	0.005
5	0.005	19	0.005	33	0.005
6	0.005	20	0.005	34	0.005
7	0.005	21	0.005	35	0.005
8	0.005	22	0.005	36	0.005
9	0.005	23	0.005	37	0.005
10	0.005	24	0.005	38	0.005
11	0.005	25	0.005	39	0.005
12	0.005	26	0.005	40	0.006
13	0.005	27	0.005		
14	0.005	28	0.005		

RP Procedure Output					
Facility Name:	Kennecott				
Permit Number:	UT0000051				
Outfall Number:	Outfall 104				
Parameter	Arsenic				
Distribution	Lognormal				
Data Units	mg/L				
Reporting Limit	0.002				
Significant Figures	2				
Confidence Interval	99				
Maximum Reported Effluent Conc.	0.108	mg/L			
Coefficient of Variation (CV)	0.65				
RP Multiplier	1.9				
Projected Maximum Effluent Conc. (MEC)	0.21	mg/L			
Acute Criterion	0.34	mg/L			
Chronic Criterion	0.015	mg/L			
Human Health Criterion	0	mg/L			
RP for Acute?	NO				
RP for Chronic?	YES				
RP for Human Health?	N/A				
Effluent Data					
#		#		#	
1	0.022	15	0.013	29	0.045
2	0.021	16	0.013	30	0.026
3	0.036	17	0.009	31	0.015
4	0.029	18	0.013	32	0.057
5	0.104	19	0.011	33	0.023
6	0.025	20	0.013	34	0.013
7	0.02	21	0.036	35	0.015
8	0.108	22	0.044	36	0.015
9	0.033	23	0.019	37	0.027
10	0.016	24	0.013	38	0.013
11	0.021	25	0.009	39	0.029
12	0.019	26	0.023		
13	0.01	27	0.017		
14	0.027	28	0.013		

RP Procedure Output					
Facility Name:	Kennecott				
Permit Number:	UT0000051				
Outfall Number:	Outfall 104				
Parameter	Zinc				
Distribution	Lognormal				
Data Units	mg/L				
Reporting Limit	0.002				
Significant Figures	2				
Confidence Interval	99				
Maximum Reported Effluent Conc.	0.346	mg/L			
Coefficient of Variation (CV)	1.1				
RP Multiplier	2.7				
Projected Maximum Effluent Conc. (MEC)	0.94	mg/L			
Acute Criterion	0.12	mg/L			
Chronic Criterion	0.12	mg/L			
Human Health Criterion	0	mg/L			
RP for Acute?	YES				
RP for Chronic?	YES				
RP for Human Health?	N/A				
Effluent Data					
#		#		#	
1	0.051	15	0.033	29	0.014
2	0.031	16	0.012	30	0.023
3	0.058	17	0.029	31	0.064
4	0.181	18	0.016	32	0.013
5	0.346	19	0.018	33	0.006
6	0.027	20	0.013	34	0.006
7	0.025	21	0.017	35	0.008
8	0.121	22	0.036	36	0.017
9	0.044	23	0.021	37	0.017
10	0.041	24	0.016	38	0.044
11	0.045	25	0.013		
12	0.017	26	0.013		
13	0.006	27	0.009		
14	0.019	28	0.014		



RP Procedure Output					
Facility Name:	Kennecott				
Permit Number:	UT0000051				
Outfall Number:	Outfall 104				
Parameter	Cadmium				
Distribution	Lognormal				
Data Units	mg/L				
Reporting Limit	0.005				
Significant Figures	2				
Confidence Interval	99				
Maximum Reported Effluent Conc.	0.031	mg/L			
Coefficient of Variation (CV)	1.1				
RP Multiplier	2.7				
Projected Maximum Effluent Conc. (MEC)	0.083	mg/L			
Acute Criterion	0.0019	mg/L			
Chronic Criterion	0.00079	mg/L			
Human Health Criterion	0	mg/L			
RP for Acute?	YES				
RP for Chronic?	YES				
RP for Human Health?	N/A				
Effluent Data					
#		#		#	
1	0.008	15	0.002	29	0.001
2	0.004	16	0.002	30	0.001
3	0.005	17	0.001	31	0.001
4	0.01	18	0.001	32	0.002
5	0.031	19	0.001	33	0.001
6	0.002	20	0.001	34	0.001
7	0.003	21	0.001	35	0.001
8	0.016	22	0.002	36	0.001
9	0.005	23	0.001	37	0.001
10	0.004	24	0.001	38	0.001
11	0.005	25	0.001	39	0.002
12	0.002	26	0.001		
13	0.001	27	0.001		
14	0.002	28	0.001		

RP Procedure Output					
Facility Name:	Kennecott				
Permit Number:	UT0000051				
Outfall Number:	Outfall 104				
Parameter	Lead				
Distribution	Lognormal				
Data Units	mg/L				
Reporting Limit	0.002				
Significant Figures	2				
Confidence Interval	99				
Maximum Reported Effluent Conc.	0.035	mg/L			
Coefficient of Variation (CV)	0.71				
RP Multiplier	2.0				
Projected Maximum Effluent Conc. (MEC)	0.071	mg/L			
Acute Criterion	0.0816	mg/L			
Chronic Criterion	0.0032	mg/L			
Human Health Criterion	0	mg/L			
RP for Acute?	NO				
RP for Chronic?	YES				
RP for Human Health?	N/A				
Effluent Data					
#		#		#	
1	0.019	15	0.011	29	0.006
2	0.011	16	0.013	30	0.006
3	0.017	17	0.006	31	0.004
4	0.013	18	0.007	32	0.012
5	0.035	19	0.004	33	0.005
6	0.006	20	0.003	34	0.003
7	0.007	21	0.006	35	0.003
8	0.029	22	0.006	36	0.035
9	0.01	23	0.007	37	0.005
10	0.009	24	0.006	38	0.007
11	0.012	25	0.006	39	0.01
12	0.008	26	0.005		
13	0.003	27	0.006		
14	0.008	28	0.003		

RP Procedure Output					
Facility Name:	Kennecott				
Permit Number:	UT0000051				
Outfall Number:	Outfall 104				
Parameter	Copper				
Distribution	Lognormal				
Data Units	mg/L				
Reporting Limit	0.005				
Significant Figures	2				
Confidence Interval	99				
Maximum Reported Effluent Conc.	0.035	mg/L			
Coefficient of Variation (CV)	0.71				
RP Multiplier	2.0				
Projected Maximum Effluent Conc. (MEC)	0.071	mg/L			
Acute Criterion	0.014	mg/L			
Chronic Criterion	0.0093	mg/L			
Human Health Criterion	0	mg/L			
RP for Acute?	YES				
RP for Chronic?	YES				
RP for Human Health?	N/A				
Effluent Data					
#		#		#	
1	0.019	15	0.011	29	0.006
2	0.011	16	0.013	30	0.006
3	0.017	17	0.006	31	0.004
4	0.013	18	0.007	32	0.012
5	0.035	19	0.004	33	0.005
6	0.006	20	0.003	34	0.003
7	0.007	21	0.006	35	0.003
8	0.029	22	0.006	36	0.035
9	0.01	23	0.007	37	0.005
10	0.009	24	0.006	38	0.007
11	0.012	25	0.006	39	0.01
12	0.008	26	0.005		
13	0.003	27	0.006		
14	0.008	28	0.003		