Official Draft Public Notice Version **September 19, 2016**
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FACT SHEET STATEMENT OF BASIS
KENNECOTT UTAH COPPER LLC
RENEWAL PERMIT: DISCHARGE, BIOSOLIDS & STORM WATER
UPDES PERMIT NUMBER: UT0000051
UPDES BIOSOLIDS PERMIT NUMBER: UTL-000051
UPDES MULTI-SECTOR STORM WATER GENERAL PERMIT NUMBER: UTR0000000
MAJOR INDUSTRIAL

FACILITY CONTACTS

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Facility Name: Kennecott Utah Copper LLC
Mailing Address: 4700 Daybreak Parkway
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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 cementation plant, concentrator, smelter, refinery, power plant, 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 drain down water from Barneys Canyon, an open pit gold mine and processing facility.

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, 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 cementation 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 added as a milling reagent 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.

Kennecott's Utah Power Plant discharges approximately 300 gpm from the ash-sluicing system to the tailings line discharging to the tailings impoundment.

FACILITY

The Bingham Canyon Mine and Water Collection System, Copperton Concentrator, Barneys Canyon Mine, Utah Power Plant, Tailings Impoundment, Copper Cementation Plant, 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, Power Plant, 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 Reservoir, the Small Bingham Reservoir, 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 cementation plant for copper recovery. Tailwater from the copper cementation 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 or Small Bingham Reservoir 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 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:

- Tailings return water (including smelter process water)
- Bingham Canyon mine pit water
- Carr Fork Shaft (Tooele County)
- Storm water from the Upper Bingham Canyon drainages surrounding the pit
- Water from the North Ore Shoot (NOS) Shaft
- Water pumped from the Carr Fork underground workings
- Bingham Tunnel water
- Water from deep wells B2G1193, BSG1200, BSG2828 and LTG1147
- Water from the Lark Clean Water Well
- Water from the Lark Shaft
- Water from the upper Dry Fork clean water well and Mid-Valley clean water well
- Treated sewage effluent water
- Barneys Canyon mine pit drainage water, heap leach drain down water and some meteoric contact water
- Permeate and/or concentrate streams from membrane treatment (RO) facilities, associated with the treatment of contaminated groundwater
- Leachate collection system water (if present) from Arthur Stepback Repository (CERCLA CAMU)
- Mine and waste rock contact waters
- Canal water (e.g., Utah and Salt Lake Canal or Jordan Canal) for use in processing
- Other mine impacted surface waters or ground waters

Water from the NOS, Carr Fork Shaft, 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, Smelter Hydrometallurgical Plant, and the Utah Power 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 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 in the concentrator.

Leachate and stormwater 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 water, 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 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 include the smelter, refinery, Praxair, Power Plant, 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 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 Kennecott permitted 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

Outfall 005 has been removed from service and is not included in this renewal permit.

The renewal permit includes a Se load limit, chronic WET testing, and various Biota Se analysis to be used as an indicator of compliance with the Narrative Standards for Outfall 012.

Effluent flow limits have been included for all outfalls in the renewal permit. The previous permit did not include effluent flow limits.

Effluent limits for Outfalls 002, 007, 010, and 011 have changed due to the WLA's developed to protect downstream beneficial uses and the implementation of effluent flow limits.

Biosolids permitting requirements have been added to cover the disposal of solids from Kennecott's STP.

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: http://echo.epa.gov/effluent-charts#UT0000051

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 (R317-2-13.13).

Class 2B	Protected for secondary contact recreation such as boating, wading, or similar uses.
Class 3D	Protected for waterfowl, shore birds and other water oriented wildlife not included in Class 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	Great Salt Lake – Gilbert Bay. Protected for frequent primary and secondary contact recreation, waterfowl, shore birds and other water oriented wildlife including their necessary food chain.
Class 5E	Great Salt Lake – Transitional Waters. 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

The 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 002, 007, AND 012 TAILINGS IMPOUNDMENT

The flows 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 concentration based limitations. The State has concluded and EPA Region VIII has concurred that concentration 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.

TABLE 1 – ORE MINING EFFLUENT GUIDELINES

Parameter	Effluent Limitations			Units
	Monthly Average	Daily Minimum	Daily Maximum	
Total Suspended Solids (TSS)	20	NA	30	mg/L
Copper (Cu)	0.15	NA	0.30	mg/L
Zinc (Zn)	0.5	NA	1.0	mg/L
Lead (Pb)	0.3	NA	0.6	mg/L
Mercury (Hg)	0.001	NA	0.002	mg/L
Cadmium (Cd)	0.05	NA	0.10	mg/L
pH	NA	6.5	9.0	SU

NA – Not Applicable

For Outfalls 002 and 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 and the daily max for Hg are based on the Ore Mining Effluent Guidelines. The limitations for As, Cd, Cu, Cyanide, Pb, the max monthly average for Hg, and the Zn daily max are based on the Wasteload Analysis (WLA). The Zn max monthly average limitation is based upon the value in the previous permit, as it is more stringent. 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.

The pH is limited by the Utah Secondary Standards, Utah Administrative Code (UAC) Section 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).

Effluent Limitations, Self-Monitoring and Reporting Requirements Outfall 002 a/						
Parameter	Maximum Monthly Average	Daily Maximum	Daily Minimum	Frequency	Sample Type	Units
Flow	50.0	NA	NA	Continuous	Recorder	MGD
TSS	20	30	NA	3 X Weekly	Composite	mg/L
Total As	0.181	0.378	NA	3 X Weekly	Composite	mg/L
Total Cd	0.00079	0.0097	NA	3 X Weekly	Composite	mg/L
Total Cu	0.036	0.057	NA	3 X Weekly	Composite	mg/L
Total Pb	0.0223	0.532	NA	3 X Weekly	Composite	mg/L
Total Hg	0.000013	0.0027	NA	3 X Weekly	Composite	mg/L
Total Zn	0.224	0.431	NA	3 X Weekly	Composite	mg/L
Total Se b/c/	0.012	NA	NA	Monthly	Grab	mg/L
Total Cyanide	0.0056	0.0241	NA	Monthly	Composite	mg/L
Total Dissolved Solids (TDS)	NA	NA	NA	Monthly	Composite	mg/L
Oil and Grease	NA	10	NA	d/	Grab	mg/L
pH	NA	9.0	6.5	3 X Weekly	Grab	SU

Effluent Limitations, Self-Monitoring and Reporting Requirements Outfall 007 a/						
Parameter	Maximum Monthly Average	Daily Maximum	Daily Minimum	Frequency	Sample Type	Units
Flow	15.0	NA	NA	Continuous	Recorder	MGD
TSS	20	30	NA	3 X Weekly	Composite	mg/L
Total As	0.25	0.465	NA	3 X Weekly	Composite	mg/L
Total Cd	0.00089	0.0119	NA	3 X Weekly	Composite	mg/L
Total Cu	0.0492	0.0692	NA	3 X Weekly	Composite	mg/L
Total Pb	0.031	0.660	NA	3 X Weekly	Composite	mg/L
Total Hg	0.000015	0.002	NA	3 X Weekly	Composite	mg/L
Total Zn	0.224	0.675	NA	3 X Weekly	Composite	mg/L
Total Se b/c/	0.012	NA	NA	Monthly	Grab	mg/L
Total Cyanide	0.0065	0.0291	NA	Monthly	Composite	mg/L
Total Dissolved Solids (TDS)	NA	NA	NA	Monthly	Composite	mg/L
Oil and Grease	NA	10	NA	d/	Grab	mg/L
pH	NA	9.0	6.5	3 X Weekly	Grab	SU

a/ 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.

b/ 0.012 mg/L is consistent with the requirements of the former U.S. Army Corps of Engineers 404 Permit #199450301 and applies at the Lower Lee Creek location north of Interstate 80 during a discharge from outfalls 002 and 007.

c/ Selenium will be analyzed by EPA Method 200.8 or alternative method approved by the State of Utah Bureau of Laboratory Improvement.

d/ Oil and grease will be sampled when sheen is observed.

For Outfall 012, at the Division's request, Kennecott provided supplemental information in support of its permit renewal application. The information was evaluated to: 1) document that the effluent will not violate water quality standards, and 2) determine if water quality-based effluent limits are required for the permit. 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. A detailed analysis of this screening process is included in FSSOB as an appendix titled "*Memorandum for Rio Tinto Kennecott Copper 2015 Permit Renewal Fact Sheet Statement of Basis, Use support evaluation for Outfall 012-A to Gilbert Bay, Great Salt Lake",* May 17, 2016.

The effluent flow limit is based upon the maximum annual volume discharged historically from Outfall 012, of 19,850 acre-feet per year or 6468 Million Gallons a year.

The pH is limited by the Utah Secondary Standards, Utah Administrative Code (UAC) Section 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 limitations for As, Zn and total Cyanide are the same as the values in the previous permit. The limitations for Cd, Cu, Pb, and Hg are based upon 40 CFR 440. The concentration and load limits for Se are based upon BPJ to prevent egg concentrations in affected birds from exceeding 12.5 mg/kg because there are no water column standards for selenium for Gilbert Bay or the Transitional Waters. The 12.5 mg/kg selenium tissue-based standard for Gilbert Bay is based upon R317-2-14 and is also being applied to the Transitional Waters to demonstrate compliance with the Narrative Standards.

	Effluent Limitations, Self-Monitoring and Reporting Requirements Outfall 012 a/						
Parameter	Maximum Monthly Average	Daily Maximum	Daily Minimum	Annual Max	Frequency	Sample Type	Units
Flow	NA	NA	NA	6468	Continuous	Recorder	MG b/
TSS	20	30	NA	NA	Daily	Composite	mg/L
Total As	0.25	0.50	NA	NA	Daily	Composite	mg/L
Total Cd	0.05	0.10	NA	NA	Daily	Composite	mg/L
Total Cu	0.15	0.30	NA	NA	Daily	Composite	mg/L
Total Pb	0.30	0.60	NA	NA	Daily	Composite	mg/L
Total Hg e/	0.001	0.002	NA	NA	Monthly	Composite	mg/L
Total Zn	0.224	0.50	NA	NA	Daily	Composite	mg/L
Total Se c/	NA	0.054	NA	NA	Daily	Composite	mg/L
Total Se, load	NA	NA	NA	900	Monthly	Calculated	Kg
Total Cyanide	0.1	0.2	NA	NA	Monthly	Composite	mg/L
Selenium	NA	NA	NA	NA	Annually	See Section I.D.10. Of permit UT0000051	
TDS	NA	NA	NA	NA	Monthly	Composite	mg/L
Oil and Grease	NA	10	NA	NA	d/	Grab	mg/L
pH	NA	9.0	6.5	NA	Daily	Grab	SU
WET Acute Biomonitoring	NA	LC_{50} > 100% Effluent	NA	NA	Quarterly	Composite	NA
WET Chronic Biomonitoring	NA	$TU_c \leq 1.6$ /f	NA	NA	Quarterly	Composite	NA

There shall be no untreated sanitary wastewater discharged into the tailings impoundment.

There shall be no floating solids or visible foam in other than trace amounts.

N.A. - Not Applicable.

See Definitions, *Part I.A* for definition of terms.

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.

a/ Annual Discharge will be limited annually to 6468 Million Gallons a year (19,850 acre feet/year).

b/ Million Gallons

c/ Selenium in effluent will be analyzed by EPA Method 200.8 or alternative method approved by the State of Utah Bureau of Laboratory Improvement.

d/ Oil and grease will be sampled when sheen is observed.

e/ The mercury analytical method must be EPA Method 1631 used on grab samples collected from the tailings impoundment barge

f/ TUc is calculated by dividing the receiving water effluent concentration determined in accordance with R317-2-5 by the chronic test IC_{25}. The TUc is an indicator and an exceedance is not used for determining compliance.

Tailings Impoundment Storm Exemption

The current permit allows a storm exemption for the tailings impoundment when there is a pool volume equal to the 10-year, 24-hour storm plus a volume equal to the 24-hour accumulation of process water. Recycle of tailings water to the concentrator, maintaining treatment, and minimizing the amount of overflow is required. For storm events, the USEPA storm exemption requirements of 40 CFR 440.131(b) for facilities allowed to discharge will apply. Since issuance of the 2001 permit renewal, Kennecott completed its active operational transition from the South to the North Tailings Impoundment. The updated pool volume required for storm exemption is calculated below:

North Impoundment

Source	Acre Feet
Normal Pool Volume	5500-9000
Mine Storm Water at 10,000 gpm	44
Mine Water at 2,000 gpm	9
Concentrator process water discharge at 45,000 gpm	133
Hydrometallurgical Plant, Slag Tailings water at 2,000 gpm	9
Power Plant Ash Sluice at 300 gpm	2
Direct precipitation (1017 acres) x (2 inches) x (1 foot/12 inches)	170
Tailings Impoundment/Embankment surface area 3294 acres	
Runoff from 10-year, 24-hour storm (2.0 inches), Runoff Coefficient (0.3)	
Runoff (3666 acres) x (2 inches) x (1 foot/12 inches) (.3)	183
Total Capacity in acre-feet to Qualify for Storm Exemption	6050-9550*

*Dependent on Actual Pool Volume prior to storm event

Information that must be submitted as part of the storm exemption includes the appropriate tailings impoundment/embankment surface area and pool area, amount of precipitation or snowmelt at the tailings impoundment and/or mine, decant pool volume prior to the discharge, effluent concentrations, concentrator flow rate to the tailings impoundment, return flow from the tailings impoundment to the concentrators via Pump Station No. 1, and other steps taken to maintain treatment and minimize the amount of overflow such as maintaining the pH in the range of 6.5 to 9.0 in the tailings impoundment to minimize metals in the discharge.

Transitional Waters Monitoring Program

As specified in the *Memorandum for Kennecott Utah Copper LLC 2015 Permit Renewal Fact Sheet Statement of Basis, Use Support Evaluation for Outfall 012 to Gilbert Bay, Great Salt Lake*, this permit includes a new monitoring requirement for water, sediment, invertebrates, and bird eggs (if available) in the vicinity of the outfall delta and collocated water and brine shrimp (if available) in the open waters to address the uncertainties regarding reasonable potential for Se. As the data gaps and geographical locations are the same as identified for JVWCD, this permit includes the same Joint Discharge Area Transitional Monitoring Program requirements and implementation triggers for interpreting the egg data.

Kennecott is required to annually sample eight (8) bird eggs, if available, but not to exceed 20% of available eggs, during the nesting season, April15 through June 30, for the current permit cycle. The eggs will be collected from bird nests in the Jordan Valley 001 and Kennecott 012 affected outfall area. These samples will be subject to the tissue based selenium water quality standard of a geometric mean of at least 5 eggs of 12.5 mg/kg dry weight over the nesting season for Gilbert Bay of Great Salt Lake to demonstrate compliance with the Narrative Standards. 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 is required to annually collect co-located macroinvertebrate, water, and sediment samples once between April 15 and June 30 and as close in time as practical to the bird egg collection. The requirement to sample and analyze sediment may be excluded if the sampling plan is modified and approved by the Director. Reasons for not sampling sediment include that the data does not provide information for evaluating the support of the uses in the Transitional Waters or that these resources are being reallocated to collect higher priority data. The sampling plan will document the rationale. All samples will be analyzed for selenium. Biota and sediment will also be analyzed for total mercury. Water samples will be analyzed for methyl and total mercury and total dissolved solids or salinity. The co-located macroinvertebrates, sediment 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 standing waters of the Great Salt Lake. This monitoring will be consistent with the February, 2011 Field Sampling Plan Outfall 001 at Great Salt Lake, Southwest Groundwater Treatment Plant, unless modifications are approved in writing by the Director.

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. The open water monitoring will be consistent with the methods described in the 2015 Bi-annual Sampling Results prepared for Jordan Valley Water Conservancy District by CH2M unless modifications are approved in writing by the Director.

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 012 mud flat habitat, particularly for evidence of feeding and nesting using methodology approved by the Director. This data will be submitted in the Annual Report.

DWQ strongly recommends that Kennecott coordinate monitoring efforts 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 macroinvertibrates' 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.

OUTFALL 104 SMELTER AND REFINERY DISCHARGE

The discharges 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 produce 7.7 x 10^6 lbs/day of H_2SO_4. The Refinery is designed to produce 2.0 x 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 2 contains NSPS for the smelter acid plant and hydrometallurgical plant effluents and Table 3 contains the smelter acid plant and hydrometallurgical plant mass discharge limits.

TABLE 2
Smelter Acid Plant and Hydrometallurgical Plant Mass Discharge Guidelines 40 CFR 421.94

Parameter	Effluent Limitations	
	Monthly Maximum lbs/10^6 lbs H_2SO_4	Daily Maximum lbs/10^6 lbs H_2SO_4
TSS	30.650	38.310
As	1.456	3.550
Cd	0.204	0.511
Cu	1.558	3.269
Pb	0.332	0.715
Zn	1.073	2.605
pH	(1)	(1)

TABLE 3
Smelter Acid Plant and Hydrometallurgical Plant Mass Discharge Guidelines 40 CFR 421.94

Parameter	Effluent Limitations (Based on H_2SO_4 production of 7.7 X 10^6 lbs/day)	
	Monthly Maximum lbs/day	Daily Maximum lbs/day
TSS	236	295
As	11.2	27.3
Cd	1.57	3.93
Cu	12.0	25.2
Pb	2.56	5.51
Zn	8.26	20.1
pH	(1)	(1)

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

Small flows of spent refinery electrolyte are subject to the Spent Refinery Electrolyte effluent limitation guidelines. Table 4 contains the effluent limitation guidelines for the refinery spent electrolyte effluent and Table 5 contains the refinery mass discharge limits.

TABLE 4
Refinery Spent Electrolyte Guidelines 40 CFR 421.54

Parameter	Effluent Limitations	
	Monthly Maximum lbs/10^6 lbs Cu produced	Daily Maximum lbs/10^6 lbs H_2SO_4
TSS	0.588	0.735
As	0.0281 (2)	0.068
Cu	0.030	0.063
Ni	0.018	0.027
pH	(1)	(1)

TABLE 5
Refinery spent Electrolyte Mass Discharge Limits

Parameter	Effluent Limitations (Based on Cu cathode production of 2.0 X 10^6 lbs/day)	
	Monthly Maximum lbs/day	Daily Maximum lbs/day
TSS	1.18	1.47
As	0.06	0.14
Cu	0.060	0.13
Ni	0.04	0.054
pH	(1)	(1)

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

(2) The Arsenic number differs from the effluent limitation guidelines in that it is more stringent and is continued from a previous permit consistent with the anti-backsliding provision of the CWA.

In order to calculate the allowable discharge limits from Outfall 104, DWQ added the values in Tables 3 and 5 to produce total mass limits in Table 6 applicable to the smelter acid plant, hydrometallurgical plant, and refinery discharge. The discharge is directed to the tailings impoundment where further treatment through precipitation, sedimentation, 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.

TABLE 6 Smelter Acid Plant/Hydrometallurgical Plant/Refinery Mass Discharge Limits Outfall 104		
Parameter	Effluent Limitations	
	Monthly Maximum lbs/day	Daily Maximum lbs/day
TSS	237	296
As	11.3	27.4
Cd	1.57	3.93
Cu	12.1	25.3
Pb	2.56	5.51
Zn	8.26	20.1

Effluent Limitations, Self-Monitoring and Reporting Requirements Outfall 104					
Parameter	Discharge Limitations a/		Monitoring Requirements		Units
	Maximum Monthly Average	Daily Maximum	Frequency	Sample Type	
Flow	NA	NA	Continuous	Recorder	MGD
TSS	237	296	Weekly	Composite	lb/day
Total As	11.3	27.4	Weekly	Composite	lb/day
Total Cd	1.57	3.93	Weekly	Composite	lb/day
Total Cu	12.1	25.3	Weekly	Composite	lb/day
Total Pb	2.56	5.51	Weekly	Composite	lb/day
Total Zn	8.26	20.1	Weekly	Composite	lb/day

a/ See definitions Part I.A. for definition of terms

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.

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 will 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.

Effluent Limitations, Self-Monitoring and Reporting Requirements Outfall 008						
Parameter	Maximum Monthly Average	Daily Maximum	Daily Minimum	Frequency	Sample Type	Units
Flow	5.5	NA	NA	Quarterly	Measured	MGD
TSS	20	30	NA	Quarterly	Grab	mg/L
Total As	0.25	0.50	NA	Quarterly	Grab	mg/L
Total Cd	0.05	0.10	NA	Quarterly	Grab	mg/L
Total Cu	0.15	0.30	NA	Quarterly	Grab	mg/L
Total Pb	0.30	0.60	NA	Quarterly	Grab	mg/L
Total Hg	0.001	0.002	NA	Quarterly	Grab	mg/L
Total Zn	0.224	0.50	NA	Quarterly	Grab	mg/L
Selenium	NA	0.054	NA	Quarterly	Grab	mg/L
Total Dissolved Solids (TDS)	NA	NA	NA	Quarterly	Grab	mg/L
Oil and Grease	NA	10	NA	a/	Grab	mg/L
pH	NA	9.0	6.5	Quarterly	Grab	SU

a/ When sheen is observed

NA – Not Applicable.

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 are the same as in the previous permit. Data from the facility indicate that dissolved solid concentrations after mixing with the intermittent stream are characterized by lower constituent concentrations than documented in storm water in this drainage.

Effluent Limitations, Self-Monitoring and Reporting Requirements Outfall 009						
Parameter	Maximum Monthly Average	Daily Maximum	Daily Minimum	Frequency	Sample Type	Units
Flow	0.086	NA	NA	2 X Yearly	Measured	MGD
TSS	20	30	NA	2 X Yearly	Grab	mg/L
Total As	0.25	0.50	NA	2 X Yearly	Grab	mg/L
Total Cd	0.05	0.10	NA	2 X Yearly	Grab	mg/L
Total Cu	0.15	0.30	NA	2 X Yearly	Grab	mg/L
Total Pb	0.30	0.60	NA	2 X Yearly	Grab	mg/L
Total Hg	0.001	0.002	NA	2 X Yearly	Grab	mg/L
Total Zn	0.224	0.50	NA	2 X Yearly	Grab	mg/L
Selenium b/	0.012	NA	NA	2 X Yearly	Grab	mg/L
Total Dissolved Solids (TDS)	NA	NA	NA	2 X Yearly	Grab	mg/L
Oil and Grease	NA	10	NA	a/	Grab	mg/L
pH	NA	9.0	6.5	2 X Yearly	Grab	SU

a/ Oil and grease will be sampled when sheen is observed.

b/ Selenium will be analyzed by Method 200.8 or alternative method approved by the State of Utah Bureau of Laboratory Improvement.

NA – Not Applicable.

OUTFALL 010 BUTTERFIELD TUNNEL

Outfall 010 consists 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 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 the following table. 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.

Effluent Limitations, Self-Monitoring and Reporting Requirements Outfall 010						
Parameter	Maximum Monthly Average	Daily Maximum	Daily Minimum	Frequency	Sample Type	Units
Flow	0.65	NA	NA	Quarterly	Measured	MGD
TSS	20	30	NA	Quarterly	Grab	mg/L
Total As	NA	0.10	NA	Quarterly	Grab	mg/L
Total Cd	0.0013	0.0066	NA	Quarterly	Grab	mg/L
Total Cu	NA	0.038	NA	Quarterly	Grab	mg/L
Total Fe	NA	1.09	NA	Quarterly	Grab	mg/L
Total Pb	0.023	0.100	NA	Quarterly	Grab	mg/L
Total Hg	0.00002 a/	0.00023	NA	Quarterly	Grab	mg/L
Total Zn	0.323	0.493	NA	Quarterly	Grab	mg/L
Selenium b/	0.005	0.0184	NA	Quarterly	Grab	mg/L
Total Dissolved Solids (TDS)	NA	1200	NA	Quarterly	Grab	mg/L
Oil and Grease	NA	10	NA	c/	Grab	mg/L
pH	NA	9.0	6.5	Quarterly	Grab	SU

a/ Kennecott will voluntarily analyze mercury using a low level total mercury analysis.

b/ Selenium will be analyzed by EPA Method 200.8 or alternative method approved by the State of Utah Bureau of Laboratory Improvement.

c/ When sheen is observed

NA – Not Applicable.

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, Utah Administrative Code (UAC) Section R317-1-3.2 to a range of 6.5-9.0 standard units. Oil and Grease is limited by Best Professional Judgment 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 2016 WLA WQBEL developed for arsenic. WQBELs for cadmium, copper, lead and selenium, are based on the 2016 WLA, which was developed for this discharge point, and are also considered protective of downstream uses (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. The same modeling process for protection of downstream Lee Creek was used for outfalls.

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.

Effluent Limitations, Self-Monitoring and Reporting Requirements Outfall 011 a/						
Parameter	Maximum Monthly Average	Daily Maximum	Daily Minimum	Frequency	Sample Type	Units
Flow	3.9	NA	NA	Quarterly	Measured	MGD
TSS	20	30	NA	Quarterly	Grab	mg/L
Total As	NA	0.013	NA	Quarterly	Grab	mg/L
Total Cd	0.0013	0.021	NA	Quarterly	Grab	mg/L
Total Cu	0.102	0.119	NA	Quarterly	Grab	mg/L
Total Pb	0.0662	1.18	NA	Quarterly	Grab	mg/L
Total Zn	0.224	0.50	NA	Quarterly	Grab	mg/L
Selenium b/	0.0058	0.013	NA	Quarterly	Grab	mg/L
Oil and Grease	NA	10	NA	c/	Grab	mg/L
pH	NA	9.0	6.5	Quarterly	Grab	SU

a/ For intermittent discharges, the duration of the discharge shall be reported.

b/ Selenium will be analyzed by EPA Method 200.8 or alternative method approved by the State of Utah Bureau of Laboratory Improvement.

c/ Oil and grease will be sampled when sheen is observed.

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 Small Bingham Reservoir is 79.3 acre-feet and the total combined 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.

STORMWATER

STORMWATER REQUIREMENTS

The discharge and management of all storm water throughout the Kennecott site shall be covered under this UPDES permit. The permit includes provisions relevant to the development of a Storm Water Pollution Prevention Plan (SWPPP). The Kennecott SWPPP includes different obligations depending on stormwater containment capacity (e.g., requirements relative to new facilities with containment of the 25-year, 24-hour storm runoff as compared with existing facilities with containment of the 10-year, 24-hour storm runoff).

Kennecott (or the activity contractor at the direction of Kennecott) shall complete site/project-specific SWPPPs for construction activities (all of which are associated with mining activities and covered by this permit). These site/project specific SWPPPs would then be integrated into the Kennecott UT0000051 SWPPP for operations when those construction activities are complete. Municipal Separate Storm Sewer Systems (MS4) requirements are applicable to Kennecott in isolated, unique cases relative to portions of Copperton and Magna where SL County has specific authority (including inspection obligations) over construction sites that actually or reasonably could be expected to discharge to a MS4 system. When construction activities have the potential to impact permitted MS4 communities, a separate, stand-alone Construction Stormwater permit (NOI) shall be obtained and SWPPP developed as required.

Smelter Area Storm Water Runoff Management in Process Water System

Kennecott has developed a comprehensive storm water management system for the smelter, which includes containment of the 25-year 24-hour storm at the smelter. The following briefly describes the system.

Storm water discharges are collected and channeled through the smelter area utilizing a series of engineered channels and piping to convey storm water to a pair of storm water ponds not designed to discharge. Runoff from the operating facilities is routed to either the West Storm Water Pond, with a 3.5 million gallon storage capacity; or the East Storm Water Pond, with a 6.5 million-gallon storage capacity. A 40-acre area drains to the West Storm Water Pond. Of this, approximately 37 acres consists of impervious asphalt surfaces and building roofs. Facilities draining to this pond primarily consist of the west parking area, office areas and the asphalted area once occupied by the former Acid Plant 7 and 8. An area of 90 acres drains to the East Storm Water Pond. Of this, approximately 58 acres consists of impervious asphalt surfaces and building roofs. Primary facility areas draining to this pond include the repair and machine shop area, the smelter and reclaimed areas.

When storm water collects in the HDPE-lined West and East Storm Water Ponds, up to 350 gpm and 600 gpm respectively are pumped to the smelter West and East Process Water Ponds. In response to a significant storm event, any overflow from the West or East Storm Water Ponds will flow to the process water system through the Smelter Return Canal. The West and East Storm Water Ponds accept overflow from the West Process Water and East Process Water Ponds, respectively, during plant upset conditions such as power failures. When normal operations are restored, the water in the Storm Water Ponds is pumped back to the Process Water Ponds.

Non-operational areas will have storm water runoff routed to three different locations. Approximately 127 acres of native and reclaimed areas on the west side of the facility will drain to Japanese Springs via diversion channels reporting to the newly reconfigured Hazleton Fresh Water Pond or used for process makeup water with eventual discharge to the tailings impoundment or Great Salt Lake. Approximately 79 acres of east side native and reclaimed areas will drain to operational wetlands northeast of Praxair via diversion channels. An additional 3500 acres of land including both native and reclaimed areas, the smelter landfill, and Kessler Canyon will drain to the Kessler drainage channel which flows to the Smelter Return Canal for recycle back to the concentrator or to the Great Salt Lake via Outfall 008. The majority of this acreage is attributable to Kessler Canyon at 3450 acres.

Outfall SW3, Little Valley Storm Water

Storm water runoff from the area southeast of the historic North Concentrator complex may flow to the Little Valley Wash in the event of a significant storm. Outfall SW3 will be the monitoring point for this flow. Discharge from Outfall SW3 will only occur in response to a storm larger than a 10-year 24-hour event. Best Management Practices required for this discharge are that the discharge will occur only in response to a storm event and the discharge will be sampled as soon as practicable after flow is observed by personnel in the area. Test results will be reported for the same parameters as the tailings impoundment except for cyanide and biomonitoring.

Outfall SW4, Pine Canyon Storm Water

Outfall SW4 consists of storm water runoff from the Pine Canyon drainage area to Pine Canyon creek. The discharge will be monitored and sampled, if present, as soon as practicable after a major storm event. Monitoring and/or sampling (if discharge is present) shall occur at least twice per year. Test results will be reported for the same parameters as Outfall 009.

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.

SUBSTANTIAL BIOSOLIDS TREATMENT CHANGES

This is the first time Biosolids requirements have been included in the Kennecott permit.

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

In 2015, Kennecott disposed of approximately 1200 pounds (< 1 DMT) of biosolids, therefore they need to sample at least once a year.

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 Table 1 and the heavy metals loading rates in Table 2; or

The maximum heavy metals in Table 1 and the monthly heavy metals concentrations in 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, (mg/kg)	CPLR1, (mg/ha)	Pollutant Conc. Limits, (mg/kg)	APLR2, (mg/ha-yr)
Total Arsenic	75	41	41	41
Total Cadmium	85	39	39	39
Total Copper	4300	1500	1500	1500
Total Lead	840	300	300	300
Total Mercury	57	17	17	17
Total Molybdenum	75	N/A	N/A	N/A
Total Nickel	420	420	420	420
Total Selenium	100	100	100	100
Total Zinc	7500	2800	2800	2800

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

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1 CPLR -- Cumulative Pollutant Loading Rate

2 APLR – Annual Pollutant Loading Rate

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

Pathogen Control Class	
Class A	Class B
B Salmonella species –less than three (3) MPN3 per four (4) grams total solids (or less than 1,000 fecal coliforms per gram total solids)	Fecal Coliforms –less than 2,000,000 colony forming units (CFU) per gram total solids
Enteric viruses –less than one (1) MPN (or plaque forming unit) per four (4) grams total solids	
Viable helminth ova –less than one (1) MPN per four (4) grams total solids	

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

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3 MPN –Most Probable Number

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.

PRETREATMENT REQUIREMENTS

There is currently no discharge of process wastewater to the community of Magna sanitary sewer system. Any process wastewater that the facility may want to discharge to the public sanitary sewer in the future, either as direct discharge or as a hauled waste, would be 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 section 403, the State 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.

BIOMONITORING REQUIREMENTS

As part of a nationwide effort to control toxics, biomonitoring requirements are being included in all major permits and in minor permits for facilities where effluent toxicity is an existing or potential concern. Authorization for requiring effluent biomonitoring is provided for in *UAC R317-8-4.2* and *R317-8-5.3. The Whole Effluent Toxicity (WET) Control Guidance Document*, February 15, 1991, outlines guidance to be used by Utah Division of Water Quality staff and by permittees for implementation of WET control through the UPDES discharge permit program.

Outfall 012, which discharges to the Great Salt Lake, will conduct chronic and acute WET testing using the species *Cryprinodon variegatus* (sheepshead minnow) on a quarterly basis when the flow is greater than 1 MGD. Testing of *Mysidopsis bahia* (mysid shrimp) indicated that calcium concentrations above 350 mg/L affected *Mysidopsis bahia.* Monitoring of the calcium concentration will be performed and if the concentration drops below 350 mg/L, additional testing of the mysid shrimp is required to determine the appropriateness of this species.

WET is one of the tools used by the Division to evaluate compliance with the Narrative Standards. As in the previous permit, Kennecott is required to conduct acute WET monitoring. Chronic WET monitoring is required in this renewal permit because the dilution in the initial receiving water is less than 20:1. The results of the chronic testing will be used as an indicator of toxicity as recommended by the *Utah Division of Water Quality Interim Methods for Evaluating Use Support For Great Salt Lake, Utah Pollution Discharge Elimination System (UDPES) Permits, Review Draft Permitting Implementation Guidance for Great Salt Lake (May 17, 2016).*

If Kennecott discharges from Outfall 002, it must conduct WET tests using *Ceriodaphnia dubia.* Those tests should be performed monthly if the monthly average flow exceeds 10 MGD. Monitoring is only required quarterly when

the monthly average flow is less than 10 MGD. Because Outfall 002 discharges to a class 3E stream, only acute toxicity testing has been required.

If Kennecott discharges from Outfall 007, it must conduct WET tests quarterly using Cyprinodon variegatus if the quarterly average flow exceeds 1 MGD.

A limitation of no acute toxicity (LC 50) has been required to be effective since June 1, 1993 and will continue upon the re-issuance of the permit for Outfall 002. Provisions are in the permit for additional testing in the event 50 percent toxicity occurs and for conducting a toxicity reduction evaluation (TRE) in the event it becomes necessary at Outfall 002.

Only a yearly biomonitoring test using *Ceriodaphnia dubia* is required for Outfall 010 because it is not an active mine portal.

ANTIDEGRADATION

In accordance with UAC R317-2-3.5.b.1.(b), a Level II Antidegredation Review is not required during this permit renewal because there are no changes to effluent concentrations or loading from the previous permit.

PERMIT DURATION

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

DRAFTED BY

Kim Shelley and Nate Nichols, Discharge
Mike George and Harry Campbell, Storm Water
Dan Griffin, Biosolids
Chris Bittner and Mike Herkimer, Whole Effluent Toxicity
Nick von Stackelberg and Dave Wham, Wasteload Analysis
Chris Bittner, Use Supporting Evaluation for Outfall 012
Utah Division of Water Quality

PUBLIC NOTICE

Began:
Ended:
Public noticed in

Attachment 1

Wasteload Analysis and supporting documentation