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FACT SHEET
JORDAN VALLEY WATER CONSERVANCY DISTRICT
SOUTHWEST GROUNDWATER TREATMENT PLANT
RENEWAL PERMIT: DISCHARGE
UPDES PERMIT NUMBER: UT0025836
MAJOR INDUSTRIAL

FACILITY CONTACTS

Operator Name:	Shazelle Terry
Position:	Assistant General Manager
Phone Number:	801-565-4300
Person Name:	Gordon Batt
Position:	Operations Department Manager
Phone Number:	801-446-2000
Person Name:	Jonathan N. Hilbert
Position:	Water Quality Division Manager
Phone Number:	801-446-2053

Permittee Name:	Jordan Valley Water Conservancy District
Facility Name:	Southwest Groundwater Treatment Plant
Mailing and Facility Address:	8215 S 1300 W West Jordan, Utah 84088
Telephone:	801-565-4300 (Office) 801-446-2021 (Facility)

DESCRIPTION OF FACILITY

The Southwest Groundwater Treatment Plant (Facility) is owned and operated by the Jordan Valley Water Conservancy District (JVWCD). The Facility is located near JVWCD's headquarters, adjacent to the Jordan River at 8215 South 1300 West, West Jordan, Salt Lake County, Utah. The Facility has two outfalls, which discharge into the Transitional Waters and Gilbert Bay of the Great Salt Lake (GSL) and the Jordan River.

The Southwest Jordan Valley Groundwater Project (Project) remediates deep groundwater contamination from historic mining activities in southwest Salt Lake County. The Project improves groundwater quality and prevents further contaminant migration by extracting mining impacted groundwater with elevated total dissolved solids (TDS) via a series of deep aquifer wells. The water is purified utilizing a reverse osmosis (RO) treatment process at the Facility. The project also extracts shallow groundwater with elevated TDS that has not been impacted by mining activities.

The high-quality drinking water generated is distributed by JVWCD to its member agencies for supply to their customers. RO byproduct water (i.e. concentrate) containing the extracted salts (TDS) from the treated

water, are routed via a 21-mile pipeline to Outfall 001, which flows through the Transitional Waters of Great Salt Lake's Gilbert Bay and ultimately into Gilbert Bay. The initial production capacity of the Facility is 7 million gallons per day (MGD) of treated drinking quality water with a discharge of 1.5 MGD of byproduct per day. After build out, the Facility's capacity will increase to 14 MGD of drinking water with 3 MGD of byproduct to be discharged.

OPERATING CONDITIONS

The following is a description of the various operating and discharge conditions that shall occur at the Facility:

Normal Operations

The Facility will operate three rows of membranes, two for treating water from deep aquifer wells and one for treating water from shallow aquifer wells. Each of these three sets of membranes is called a "treatment train." Under normal operating conditions, the Facility will operate all treatment trains, the byproduct water will be discharged to Gilbert Bay and drinking quality water will be delivered to JVWCD's member agencies.

On a near-continuous basis, the Facility will need to discharge excess feed water from pressure relief valves of the shallow aquifer treatment train to the Jordan River, in order to supply feed water to the Facility at a constant pressure and flow. The shallow aquifer has not been impacted by historic mining practices. It is expected that the flow will average 1 MGD most days of the year. The excess flows from the pressure relief valves for the deep aquifer (groundwater impacted by historical mining practices) treatment trains will be discharged to the Transitional Waters and Gilbert Bay via the by-product pipeline.

Pump to Waste Start-Up Conditions

The Facility includes shallow and deep aquifer wells. When these wells are initially started up, the water may contain a small amount of sediment, also known as total suspended solids (TSS). A process called "pump to waste" is used to discharge this water so that the sediment doesn't make it to the Facility where it would likely damage the membranes used in the RO process. These wells will pump to waste intermittently at start-up of the well pump, to purge the well casings of suspended solids after shut down and before pumping the water to the Facility. It is intended that the wells will pump and supply feed water to the project on a near continuous basis. The start-up conditions are expected to be limited, only occurring each time a well is started up. The wells will pump to waste at their individual locations to the respective municipal storm drain system(s) which flow to either the Utah and Salt Lake Canal or the Jordan River.

It is expected that these discharges will not cause or contribute to a violation of water quality standards and therefore will not have effluent limits associated with the discharges.

Cleaning and Maintenance Conditions for the Shallow Aquifer Wells

The Facility performs routine cleaning and maintenance. Under this maintenance condition, which will occur no more than 90 days each year, the feed water from the shallow wells will be diverted to the Jordan River and will not enter the Facility. Under these maintenance conditions, the feed water from the deep aquifer wells will be discharged to the Transitional Waters and Gilbert Bay via the byproduct pipeline. The total flow to the Jordan River of the combined discharges from cleaning, maintenance, and pressure relief conditions will not exceed a maximum of 4.2 MGD.

It is expected that these discharges will not cause or contribute to a violation of water quality standards and therefore will not have effluent limits associated with the discharges.

Upset Conditions

In the event of a power outage at the Facility, the portion of the deep well water that exceeds a concentration of 1,200 mg/L TDS will be directed to Outfall 001 and discharged to the Transitional Waters and Gilbert Bay. Shallow groundwater will be discharged to the Jordan River via Outfall 002. Deep wells that have been identified to contain TDS concentrations less than 1,200 mg/L will be discharged at the well sites to the respective municipal storm drain(s).

Discharges to the Jordan River

Discharges of shallow groundwater to the Jordan River will occur under well start-up, maintenance, upset, and normal operating conditions. Since the Jordan River is currently impaired for TDS, it is required by Utah Administrative Code (UAC) R317-8-2.2. that the discharge will not cause or contribute to a violation of water quality standards. It is expected that these discharges will not cause or contribute to a violation of Utah's water quality standards.

Other Discharges

During an inspection on March 14, 2024, DWQ observed a pond at the Facility, north of Outfall 002. The Facility representative stated that Outfall 002 occasionally discharges into the pond, rather than into the Jordan River. This has been brought to the attention of the DWQ Groundwater Section.

SUMMARY OF CHANGES FROM PREVIOUS PERMIT

Facility Changes:
There have been no changes to the Facility since the previous Permit cycle.

General Changes:
A typo in the "Description of Facility" section of the previous Fact Sheet stated that the Facility discharged 1.5 gallons per day of byproduct water (concentrate containing the extracted salts from the treated water). This statement has been corrected to 1.5 MGD in this Fact Sheet. The previous Fact Sheet contained information regarding wasteload analyses (WLA) conducted for each well. References to these WLAs have been removed from this Fact Sheet.

Monitoring and Effluent Limits:
The flow limit for Outfall 002 has been changed from a daily maximum to a maximum monthly average. This change aligns this Permit with other UPDES permits and allows for flexibility in discharges from the Facility.

The whole effluent toxicity (WET) limits for Outfall 002 have changed, including the addition of Acute Biomonitoring. These limits, based on the WLA, ensure that effluent does not cause acute or chronic toxicity within the Jordan River.

It was clarified in 2020 through a rule change that the Utah Secondary Treatment Standards, Utah Administrative Code (UAC) R317-1-3.2 for TSS and biochemical oxygen demand (BOD_5) do not apply to industrial dischargers in Utah. As a result of this rule change, the effluent limitations in the previous Permits

for these pollutants are no longer applicable and have been removed from the Permit. These effluent limits for TSS and BOD_5 may be removed from the Permit without violating the "Anti-backsliding Requirements" because the new information regarding them, change in Secondary Treatment Standards, UAC R317-1-3.2, has become available. The effluent limits for these pollutants have been removed from the Permit.

All BOD monitoring results have been non-detect (<5mg/L) so the monitoring will also be removed.
The effluent monitoring frequency for metals for Outfall 001 and 002 have changed from annually to quarterly in an effort to gather more effluent data to help DWQ conduct a Reasonable Potential (RP) Analysis during future Permit renewals.

Monitoring for *E. coli* and temperature was added to Outfall 002 in 2020 in support of Total Maximum Daily Load (TMDL) work for a downstream section of the Jordan River. An evaluation of the Facility shows they are not a probable source for *E. coli*, and do not include any heat transfer or thermal component in the treatment process. Therefore, the requirement to monitor those parameters are being eliminated from Outfall 002.

TDS monitoring has been added to Outfall 001 to bring it into line with other dischargers to the GSL.

Discharge:
The Facility has the ability to discharge to a pond north of Outfall 002. This Fact Sheet has been updated to reflect that information. This Permit does not authorize the Facility to discharge into this pond; this discharge is under the DWQ Groundwater's Section jurisdiction.

Storm Water:
Stormwater provisions have been removed as part of a DWQ programmatic separation of the previously combined UPDES Permits. JVWCD may now be required to apply for and obtain separate UPDES Industrial Storm Water Permit coverage under the UPDES General Permit No. UTR000000, or an applicable exemption, as described further in the Storm Water Section of this Fact Sheet.

DISCHARGE

DESCRIPTION OF DISCHARGE

The Permittee has been reporting self-monitoring results on Discharge Monitoring Reports (DMR) on a monthly basis. There have been no major violations from Outfall 001 since the previous Permit cycle, with the exception of elevated selenium in bird eggs collected during the 2024 sampling event. The Facility did not discharge out of Outfall 002 during the previous Permit cycle.

Outfalls	Description of Discharge Points
001	Located at latitude 40°45'37.59" N and longitude 112°10'13.32" W. This outfall conveys byproduct and excess untreated groundwater from the deep aquifer. The discharge is through a 16-inch diameter pipe directly to the Transitional Waters and Gilbert Bay of the Great Salt Lake. The compliance monitoring point is at the Facility prior to effluent entering the 21-mile byproduct pipeline, except for end of pipe monitoring as required in Part I.D. Self-Monitoring and Reporting Requirements.

002	Located at latitude 40°36'5.58" N and longitude 112°55'13.37" W. The discharge will consist only of untreated shallow aquifer groundwater that has not been impacted by historic mining activities. The discharge is through a 30-inch diameter pipe from the river discharge vault at the Facility.

RECEIVING WATERS AND STREAM CLASSIFICATION

If a discharge were to occur from Outfall 001, it would be pumped via a 21-mile pipeline to Gilbert Bay of the Great Salt Lake, which is a Class 5A and 5E according to UAC R317-2-13. If a discharge were to occur from Outfall 002, it would be discharged to the Jordan River, which is a Class 2B, 3B, and 4. A summary of the water classifications is below:

Outfall 001:

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.

Outfall 002:

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 3B Protected for warm water species of game fish and other warm water aquatic life, including the necessary aquatic organisms in their food chain.

Class 4 Protected for agricultural uses including irrigation of crops and stock watering.
Beneficial Uses -- Protected for infrequent primary and secondary contact recreation, waterfowl, shore birds and other water-oriented wildlife including their necessary food chain.

TOTAL MAXIMUM DAILY LOAD (TMDL) REQUIREMENTS

Outfall 001:

According to the Utah's Final 2024 Integrated Report on Water Quality dated April 30, 2024, the receiving water for Outfall 001 discharge, Great Salt Lake Gilbert Bay (Assessment Unit AU ID: UT-L-16020310-001-00) was listed as "No Evidence of Impairment".

Outfall 002:

According to the Utah's Final 2024 Integrated Report on Water Quality dated April 30, 2024, the receiving water for the Outfall 002 discharge, Jordan River from confluence with Little Cottonwood

Creek to Narrows Diversion (Assessment Unit Jordan River-6, AU ID: UT16020204-006_01) is listed as "Not Supporting" for Benthic Macroinvertebrates Bioassessments, *e. Coli*, and TDS. The Status is listed as "TMDL Needed" with "Low" priority.

Jordan River Segments and Impairments Downstream of Discharge.

Segment (moving downstream)	Assessment Unit	Impairment Cause
Jordan River from the confluence with Little Cottonwood Creek to 7800 South	Jordan River-5, AU UT16020204-005_00	TDS, *E. coli
Jordan River from 2100 South to the confluence with Little Cottonwood Creek	Jordan River-4, AU UT16020204-004_00	TDS, *E. coli, Benthic Macroinvertebrates Bioassessments
Jordan River from North Temple to 2100 South	Jordan River-3, AU UT16020204-003_00	*E. coli, +Min DO, Total Phosphorous, Benthic Macroinvertebrates Bioassessments, Total Dissolved Solids
Jordan River from Davis County line upstream to North Temple Street	Jordan River-2, AU UT16020204-002_00	+Min DO, E. coli, Benthic Macroinvertebrates Bioassessments
Jordan River from Farmington Bay upstream contiguous with the Davis County line	Jordan River-1, AU UT16020204-001_00	+Min DO, Benthic Macroinvertebrates Bioassessments
*A TMDL was approved (R8-UT-2023-01) for E. coli.		
+ A TMDL was approve (54322, 5432154300) for minimum dissolved oxygen.		

BASIS FOR EFFLUENT LIMITATIONS

Outfall 001:

The Facility concentrates the pollutants found in the intake (or feed) water by a factor of five. The byproduct flows through a 21-mile pipeline and is ultimately discharged to the Transitional Waters and Gilbert Bay. Limitations on pH are based on current Utah Secondary Treatment Standards, UAC R317-1-3.2. While Utah Secondary Treatment Standards no longer apply to industrial dischargers, pH limitations will remain in this Permit as this data provides useful information to determine how the Facility's effluent may impact the receiving water body. The Oil and Grease limitation is based on Best Professional Judgment (BPJ). BPJ is used on a case-by-case basis in the absence of effluent guidelines or water quality standards. In this case Oil and Grease is not anticipated to be present in the effluent due to the nature of the process, however it is precautionary to include an Oil and Grease limit in case there is an operational malfunction. The effluent limit for flow for Outfall 001 is based on the previous Permit. While the Facility's design flow is 4.23 MGD, the Facility has reported that the RO byproduct discharge from the Facility is approximately 3 MGD.

The daily maximum concentration limit and annual load limit for selenium are based on BPJ to prevent egg concentrations in affected birds from exceeding 12.5 mg/kg as there are no water column standards for selenium for Gilbert Bay or the Transitional Waters. The concentration and loading limits were calculated based on the 12.5 mg/kg tissue-based standard. The 12.5 mg/kg selenium tissue-based standard for Gilbert Bay is based upon UAC R317-2-14 and is also being applied to the Transitional Waters to demonstrate compliance with the Narrative Standards.

The annual maximum load for mercury is 0.38 kg/yr and is 1% of the total mercury load for GSL from all sources of 38 kg/yr (Mercury Inputs to Great Salt Lake, Utah: Reconnaissance-Phase Results, D. Naftz et al, 2009). The technical rationale to support these limits for Selenium and Mercury are presented in the document, Jordan Valley Water Conservancy District Southwest Groundwater Treatment Plant Outfall 001 FSSOB Supporting Information for Selenium and Mercury 2014. (DWQ-2020-002546)

As documented in the attached addendum, other pollutants do not have reasonable potential as determined by applying the methods from the *Interim Methods for Evaluating Use Support for Great Salt Lake, Utah Pollution Discharge Elimination System (UPDES) Permits, Version 1.0* (DWQ, 2016).

Outfall 002:
During Facility maintenance and to dispose of excess groundwater, the Facility will need to discharge shallow well feed water (untreated groundwater) to the Jordan River. Limitations on pH are based on current Utah Secondary Treatment Standards, UAC R317-1-3.2. While Utah Secondary Treatment Standards no longer apply to industrial dischargers, pH limitations will remain in this permit as this data provides useful information to determine how the Facility's effluent may impact the receiving water body. The Oil and Grease limitation is based upon BPJ . The TDS daily maximum effluent limit is from UAC R317-2-14, Table 2.14.1 (Class 4 Waters). The effluent limit for flow for Outfall 002 is based on the previous Permit and design flow of the Facility. The WET limits are based on the WLA.

Due to uncertainties in Facility operations, the DWQ will include a load limit for selenium based upon a continuous pressure relief bleed flow of 1.0 MGD, 270 days a year and a flow of 4.2 MGD for 95 days a year. The flow of 4.2 million gallons per day is a combination of pressure relief bleed flow and feed water discharged as a result of maintenance activities.

Attached is a WLA; it has been determined that this discharge will not cause a violation of water quality standards. An Antidegradation Level II review is not required since the Level I review shows that water quality impacts are minimal. The Permittee is expected to be able to comply with these limitations.

Reasonable Potential Analysis
Since January 1, 2016, DWQ has conducted RP analysis on all new and renewal applications received after that date. RP analysis for this Permit renewal was conducted following DWQ's September 10, 2015 Reasonable Potential Analysis Guidance (RP Guidance). There are four outcomes defined in the RP Guidance: Outcome A, B, C, or D. These Outcomes provide a frame work for what routine monitoring or effluent limitations are required.

A quantitative RP analysis could only be performed on selenium and mercury, as sufficient data for arsenic, cadmium, chromium, copper, nickel, silver, and zinc were unavailable due to the infrequent sampling.

A quantitative RP analysis was performed on selenium and mercury to determine if there was reasonable potential for the discharge to exceed the applicable water quality standards. Based on the RP analysis, the following parameters exceeded the most stringent acute and/or chronic 3D water quality standards or were determined to have a reasonable potential to exceed the standard: selenium and mercury. This outcome supports the inclusion of limitations in this permit renewal. A copy of the RP analysis is included at the end of this Fact Sheet.

The Permit limitations are:

Outfall 001					
Parameter	Effluent Limitations [1], [2]				
	Maximum Monthly Avg	Maximum Weekly Avg	Annual Average	Daily Minimum	Daily Maximum
Total Flow, MGD	3.0	-	-	-	-
Selenium, mg/L	-	-	-	-	0.054
Oil & Grease, mg/L	-	-	-	-	10.0
pH, Standard Units	-	-	-	6.5	9
Mass Loading Limits					
	Maximum Monthly Avg	Maximum Weekly Avg	Annual Loading	Daily Minimum	Daily Maximum
Selenium, kg/year	-	-	224	-	-
Mercury, kg/year	-	-	0.38	-	-
Other					
Selenium, mg/kg	Implementation of the selenium water quality standard of 12.5 mg/kg for Gilbert Bay of the GSL is outlined in Part I.D.3 of this UPDES Permit.				
1. See Definitions, Part VIII, for the definition of terms.					
2. All parameters in this table will be reported on the monthly Discharge Monitoring Report. There shall be no visible sheen or floating solids or visible foam in other than trace amounts. There shall be no discharge of sanitary wastes.					

Outfall 002					
Parameter	Effluent Limitations [1], [2]				
	Maximum Monthly Avg	Maximum Weekly Avg	Annual Average	Daily Minimum	Daily Maximum
Total Flow, MGD	4.2	-	-	-	-
Selenium, mg/L	-	-	-	-	0.027
TDS, mg/L	-	-	-	-	1,200
Oil & Grease, mg/L	-	-	-	-	10.0
pH, Standard Units	-	-	-	6.5	9
WET, Acute Biomonitoring	-	-	-	-	LC_{50} > 100% Effluent
WET, Chronic Biomonitoring					IC_{25}
Summer (Jul-Sep)	-	-	-	-	19%
Fall (Oct-Dec)	-	-	-	-	22%
Winter (Jan-Mar)	-	-	-	-	20%
Spring (Apr-Jun)	-	-	-	-	17%
Mass Loading Limits					
	Maximum Monthly Avg	Maximum Weekly Avg	Annual Loading	Daily Minimum	Daily Maximum

Outfall 002					
Parameter	Effluent Limitations [1], [2]				
	Maximum Monthly Avg	Maximum Weekly Avg	Annual Average	Daily Minimum	Daily Maximum
Selenium, kg/year	-	-	26.4	-	-
1. See Definitions, Part VIII, for the definition of terms.					
2. All parameters in this table will be reported on the monthly Discharge Monitoring Report. There shall be no visible sheen or floating solids or visible foam in other than trace amounts. There shall be no discharge of sanitary wastes.					

SELF-MONITORING AND REPORTING REQUIREMENTS

The following self-monitoring requirements are not the same as in the previous Permit and have been modified as explained above. The Permit will require reports to be submitted monthly and annually, as applicable, on DMRs forms due 28 days after the end of the monitoring period. Effective January 1, 2017, monitoring results must be submitted using NetDMR unless the permittee has successfully petitioned for an exception. Lab sheets for biomonitoring must be attached to the biomonitoring DMR. Lab sheets for metals and toxic organics must be attached to the DMRs.

Outfall 001 Self-Monitoring and Reporting Requirements [1]			
Parameter	Frequency [3]	Sample Type	Units
Total Flow [4], [5], [6]	Continuous	Recorder	MGD
TSS [7]	2 x Weekly	Composite or Grab	mg/L
Selenium [8]	2 x Weekly	Composite or Grab	mg/L
TDS	Monthly	Composite or Grab	ng/L
Mercury [8], [9]	Monthly	Grab	ng/L
Oil & Grease	When Sheen Observed [10]	Grab	mg/L
Selenium, Monthly Loading	Monthly	Calculated	kg
Selenium, Annual Loading [3]	Annually	Calculated	kg
Selenium, Bird Eggs [3], [11]	Annually	Report	kg
Mercury, Monthly Loading	Monthly	Calculated	kg
Mercury, Annual Loading [3]	Annually	Calculated	kg
pH	Monthly	Grab	SU
Whole Effluent Toxicity [12] Acute Biomonitoring *Cyprinodon variegatus*	Quarterly	Composite	Pass/Fail
Whole Effluent Toxicity [12] Chronic Biomonitoring *Cyprinodon variegatus*	Quarterly	Composite	TUc ≤ 1.6 [13]
Metals [14], [15], [16]	Quarterly	Composite/Grab	mg/L
Annual Report [17]	Annually	N/A	N/A
1. See Definitions, Part VIII, for the definition of terms.			
3. For clarification, annual and quarterly monitoring requirements and limits are based on the calendar year.			
4. Flow measurements of effluent volume shall be made in such a manner that the permittee can affirmatively demonstrate that representative values are being obtained.			
5. If the rate of discharge is controlled, the rate and duration of discharge shall be reported.			
6. The flow rates and durations of all discharges shall be reported in the Annual Project Operating Report.			

Outfall 001 Self-Monitoring and Reporting Requirements [1]			
Parameter	Frequency [3]	Sample Type	Units
7. Monitoring of this parameter is required at the end of pipe during pipeline cleaning operations. Monitoring results must be included with the Discharge Monitoring Reports for that monitoring period. If lake levels rise where monitoring at the end of pipe is not feasible, then the Permittee may petition the Director to establish an alternate sampling point.			
8. Metals results were reviewed for the last 36 months. Only selenium and mercury appeared to be close to the limits suggested in the WLA. DWQ has determined that increased monitoring and more stringent effluent limits are not appropriate at this time. Effluent limits and monitoring for selenium and mercury remain the same as the previous permit.			
9. Mercury samples must be analyzed using Method 1631 or other sufficiently sensitive method. Mercury needs to have appropriate Quality Control sampling methods established to avoid spikes.			
10. Oil & Grease sampled when sheen is present or visible. If no sheen is present or visible, report a no data indicator (NODI) code of 9 (Conditional Monitoring -Not Required This Period).			
11. Implementation of the selenium water quality standard of 12.5 mg/kg for Gilbert Bay of the GSL is outlined in Part I.D.3 of the UPDES Permit.			
12. Chronic WET tests will be considered an indicator for Class 5 waters of the Great Salt Lake because of uncertainties regarding the representativeness of the standard test species for the Great Salt Lake.			
13. 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			
14. Metals samples should be analyzed using a method that meets MDL requirements. If a test method is not available the permittee must submit documentation to the Director regarding the method that will be used. The sample type (composite or grab) should be performed according to the methods requirements.			
15. Metals are being sampled in support of the work being done for the Reasonable Potential Analysis. The Metal parameters will be monitored and reported on a Quarterly basis by the facility on the Discharge Monitoring Report, but will not have a limit associated with them. If Jordan Valley decides to sample more frequently for these parameters, the additional data shall be reported to DWQ per Part V. E of this permit.			
16. The Permittee shall monitor the following metals at the end of pipe Quarterly with the most sensitive method; Arsenic, Cadmium, Chromium, Copper, Cyanide, Iron, Lead, Nickel, Silver and Zinc. The sample type (composite or grab) should be performed according to the method's requirements.			
17. The Annual Project Operating Report shall be submitted to DWQ by February 1st of the following year.			

Outfall 002 Self-Monitoring and Reporting Requirements [1]			
Parameter	Frequency [3]	Sample Type	Units
Total Flow [4, 5]	Continuous	Recorder	MGD
TDS	2 x Weekly	Composite or Grab	mg/L
TSS	2 x Weekly	Composite or Grab	mg/L
Selenium	2 x Weekly	Composite or Grab	mg/L
Phosphorus	Monthly	Composite	mg/L
Oil & Grease	When Sheen Observed [10]	Grab	mg/L
Selenium, Monthly Loading	Monthly	Calculated	kg
Selenium, Annual Loading [3]	Annually	Calculated	kg
pH	Monthly	Grab	SU
Whole Effluent Toxicity [18]			
Fathead Minnows - Acute	2nd & 4th Quarter	Composite	Pass/Fail
Ceriodaphnia – Acute	1st & 3rd Quarter	Composite	Pass/Fail
Whole Effluent Toxicity [19]			
Ceriodaphnia - Chronic	2nd & 4th Quarter	Composite	Pass/Fail
Fathead Minnows - Chronic	1st & 3rd Quarter	Composite	Pass/Fail

Outfall 002 Self-Monitoring and Reporting Requirements [1]			
Parameter	Frequency [3]	Sample Type	Units
Metals, [20], [21], [22]	Quarterly	Composite/Grab	mg/L
1. See Definitions, Part VIII, for the definition of terms.			
3. For clarification, annual and quarterly monitoring requirements and limits are based on the calendar year.			
4. Flow measurements of effluent volume shall be made in such a manner that the permittee can affirmatively demonstrate that representative values are being obtained.			
5. If the rate of discharge is controlled, the rate and duration of discharge shall be reported.			
10. Oil & Grease sampled when sheen is present or visible. If no sheen is present or visible, report a no data indicator (NODI) code of 9 (Conditional Monitoring -Not Required This Period).			
18. The acute Ceriodaphnia will be tested during the 1st and 3rd quarters, and the chronic fathead minnows will be tested during the 2nd and 4th quarters.			
19. The chronic Ceriodaphnia will be tested during the 2nd and 4th quarters, and the chronic fathead minnows will be tested during the 1st and 3rd quarters.			
20. Metals samples should be analyzed using a method that meets MDL requirements. If a test method is not available the permittee must submit documentation to the Director regarding the method that will be used. The sample type (composite or grab) should be performed according to the methods requirements.			
21. Metals are being sampled in support of the work being done for the Reasonable Potential Analysis. The Metal parameters will be monitored and reported on a Quarterly basis by the facility on the Discharge Monitoring Report, but will not have a limit associated with them. If the Permittee decides to sample more frequently for these parameters, the additional data shall be reported to DWQ per Part V. E of this permit.			
22. The Permittee shall monitor the following metals at the Outfall 002 monitoring point on a quarterly basis with the most sensitive method; Arsenic, Cadmium, Chromium, Cyanide, Iron, Lead, Mercury, Nickel, Selenium, Silver and Zinc. The sample type (composite or grab) should be performed according to the method's requirements.			

BIOSOLIDS

The State of Utah has adopted the 40 CFR 503 federal regulations for the disposal of sewage sludge (biosolids) by reference. However, this Facility does not receive, generate, treat or dispose of biosolids. Therefore 40 CFR 503 does not apply.

STORM WATER

Separate storm water permits may be required based on the types of activities occurring on site.

Based on the Standard Industrial Classification code, this permittee does not fall within the categories of industrial dischargers that are regulated under Utah Administrative Code (UAC) R317-8-11.3. Therefore, the facility is not 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).

Permit coverage under the Construction General Storm Water Permit (CGP) is required for any construction at the facility which disturb an acre or more, or is part of a common plan of development or sale that is an acre or greater. A Notice of Intent (NOI) is required to obtain a construction storm water permit prior to the period of construction.

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

PRETREATMENT REQUIREMENTS

JVWCD does not discharge process wastewater to a Publicly Owned Treatment Works (POTW). However, any wastewater discharged to a sanitary sewer is subject to Federal, State and local regulations. Pursuant to section 307 of the Clean Water Act, JVWCD shall comply with all applicable Federal General Pretreatment Regulations promulgated, found in 40 C.F.R. § 403 and the State Pretreatment Requirements found in UAC R317-8-8.

In addition, in accordance with 40 C.F.R. § 403.12(p)(1), JVWCD must notify the POTW, the EPA Regional Waste Management Director, the DWQ Director and the State hazardous waste authorities in writing if JVWCD discharges any substance into a POTW that, if otherwise disposed of, would be considered a hazardous waste under 40 C.F.R. § 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 the Permittee is classified as a major industrial discharger, the renewal Permit will require whole effluent toxicity (WET) testing. WET testing from Outfall 001 will consist of quarterly acute and chronic toxicity using one species, *Cyprinodon variegatus,* as detailed in the permit. WET testing from Outfall 002 shall consist of chronic testing alternating testing between two species, *Ceriodaphnia dubia* and *Pimephales promelas* 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 and Toxicity Reduction Evaluation as necessary.

PERMIT DURATION

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

Drafted and Reviewed by
Jennifer Berjikian, Discharge Permit Writer
Daniel Griffin, Discharge Permit Writer, Biosolids
Jennifer Robinson, Pretreatment
Lonnie Shull, Biomonitoring
Jordan Bryant, Storm Water
Jake Vander Laan, TMDL/Watershed (Great Salt Lake)
Sandy Wingert, TMDL/Watershed (Jordan River)
Jennifer Berjikian, Reasonable Potential Analysis
Chris Shope, Wasteload Analysis
Utah Division of Water Quality, (801) 536-4300

PUBLIC NOTICE

Began: August Day, 2025
Ended: September Day, 2025

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 the DWQ Webpage.

During the public comment period provided under R317-8-6.5, any interested person may submit written comments on the draft permit and may request a public hearing, if no hearing has already been scheduled. A request for a public hearing shall be in writing and shall state the nature of the issues proposed to be raised in the hearing. All comments will be considered in making the final decision and shall be answered as provided in R317-8-6.12.

ADDENDUM TO FSSOB

During finalization of the Permit certain dates, spelling edits and minor language corrections 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

(Explain any comments received and response sent. Actual letters can be referenced, but not required to be included).

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ATTACHMENT 1

Effluent Monitoring Data

Outfall 001

	BOD	pH	TSS	Oil and Grease (Visual)
	Quarterly Max	Quarterly Max	Quarterly Max	Quarterly Max
3/31/2020	0	7.6	0	N
12/31/2020	0	7.52	0	N
6/30/2021	0	7.6	0	N
12/31/2021	0	7.5	0	N
6/30/2022	0	7.2	0	N
12/31/2022	0	7.8	0	N
6/30/2023	0	7.6	4	N
12/31/2023	0	7.6	5	N
6/30/2024	0	7.6	8	N
12/31/2024	0	7.6	0	N

	WET
3/31/2020	PASS
6/30/2020	PASS
9/30/2020	PASS
12/31/2020	PASS
3/31/2021	PASS
6/30/2021	PASS
9/30/2021	PASS
12/31/2021	PASS
3/31/2022	PASS
6/30/2022	
9/30/2022	PASS
12/31/2022	PASS
3/31/2023	PASS
6/30/2023	
9/30/2023	PASS
12/31/2023	PASS
3/31/2024	PASS
6/30/2024	
9/30/2024	PASS
12/31/2024	PASS

	Flow	Oil and Grease	pH	pH	TSS	TSS	TSS
	Daily Max	Daily Max	Min	Max	Daily Max	Monthly Max	Weekly Max
1/31/2020	1.24	0	6.93	7.66	0	0	0
2/29/2020	1.06	0	7.25	7.51	0	0	0
3/31/2020	1	0	7.28	7.58	4	0.44	2
4/30/2020	1.06	0	7.26	7.44	0	0	0
5/31/2020	2.65	0	7.18	7.39	8	1	4
6/30/2020	2.03	0	6.99	7.9	0	0	0
7/31/2020	1.63	0	6.91	8.3	5	0.625	2.5
8/31/2020	1.11	0	7.24	7.67	0	0	0
9/30/2020	1.48	0	7.27	7.71	0	0	0
10/31/2020	1.27	0	7.51	7.75	0	0	0
11/30/2020	1.12	0	7.52	7.72	6	0.67	3
12/31/2020	1.19	0	7.05	7.56	0	0	0
1/31/2021	1.17	0	7.41	7.8	0	0	0
2/28/2021	1.13	0	7.49	7.7	0	0	0
3/31/2021	1.85	0	7.41	7.68	0	0	0
4/30/2021	2.14	0	7.61	7.69	0	0	0
5/31/2021	1.99	0	7.47	7.54	0	0	0
6/30/2021	2.02	0	7.51	7.6	0	0	0
7/31/2021	1.31	0	7.44	7.76	6	0.67	3
8/31/2021	0.86	0	7.66	7.77	4	0.44	2
9/30/2021	0.62	0	7.71	7.82	0	0	0
10/31/2021	0.58	0	7.75	7.83	0	0	0
11/30/2021	0.58	0	7.76	7.83	0	0	0
12/31/2021	0.75	0	7.71	7.83	4	0.4	2
1/31/2022	0.65	0	7.69	7.83	0	0	0
2/28/2022	0.58	0	7.78	7.83	0	0	0
3/31/2022	0.58	0	7.8	7.83	5	1.5	2.5
4/30/2022	1.48	0	7.57	7.81	4	0.5	2
5/31/2022	2.05	0	7.54	7.64	0	0	0
6/30/2022	2.08	0	7.48	7.6	0	0	0
7/31/2022	0.881	0	7.48	7.89	0	0	0
8/31/2022	0.652	0	7.77	7.9	5	0.625	2.5
9/30/2022	0.651	0	7.77	7.83	0	0	0
10/31/2022	0.738	0	7.79	7.83	4	0.44	2
11/30/2022	0.885	0	7.28	7.57	13	8.5	10.5
12/31/2022	0.683	0	7.34	7.53	11	5.86	8
1/31/2023	1.04	0	7.35	7.61	11	7.3	8.5
2/28/2023	0.962	0	7.24	7.55	15	5.55	9.5
3/31/2023	0.947	0	7.24	7.63	9	6.8	9
4/30/2023	1.63	0	7.05	7.42	0	0	0
5/31/2023	2.3	0	6.82	7.21	0	0	0
6/30/2023	2.51	0	6.51	7.12	4	0.5	2
7/31/2023	1.51	0	7.38	7.7	7	2.78	6.5
8/31/2023	0.843	0	7.32	7.85	8	5.5	7
9/30/2023	0.924	0	7.2	7.66	8	3.78	6.5
10/31/2023	0.934	0	7.29	7.61	8	3.6	6.5
11/30/2023	0.967	0	7.1	7.61	7	1.33	3.5
12/31/2023	1.19	0	7.3	7.52	5	1.67	2.5
1/31/2024	1.293	0	7.34	7.71	6	1.1	3
2/29/2024	1.17	0	7.42	7.58	8	2.6	4
3/31/2024	1.66	0	7.31	7.47	5	1.44	2.5
4/30/2024	2.22	0	7.15	7.52	4	0.44	2
5/31/2024	2.67	0	7.31	7.42	0	0	0
6/30/2024	2.55	0	7.31	7.43	0	0	0
7/31/2024	1.44	0	7.32	7.78	4	0.89	2
8/31/2024	1.03	0	7.12	7.59	8	2.1	6.5
9/30/2024	1.001	0	7.28	7.44	6	1.6	5.5
10/31/2024	1.01	0	7.31	7.5	8	1.9	5.5
11/30/2024	0.958	0	7.41	7.5	7	2.56	3.5
12/31/2024	1.14	0	7.33	7.51	7	2.3	6.5

Outfall 001 - JVWCD

	Arsenic	Cadmium	Chromium	Copper	Mercury	Nickel	Selenium	Silver	Zinc
	Annual Avg	*Annual Avg*	*Annual Avg*	*Annual Avg*	*Qrt Max*	*Annual Avg*	*Qrt Max*	*Annual Avg*	*Annual Avg*
12/31/2020	0.01165	440.07	0.0148	0.0004	0.0000026	0.00142	0.018	0	0
6/30/2021					0.0000008		0.0112		
12/31/2021	0.0125	0	0.0136	0	0.0000017	0.00385	0.0304	0	0.00154
6/30/2022					0.0000013		0.0045		
12/31/2022	0.01325	0	0.01075	0	0.0000016	0.003	0.0257	0	0.0075
6/30/2023					0.0000031		0.0188		
12/31/2023	0.01285	0	0.0122	0	0.0000045	0.001	0.0264	0	0
6/30/2024					0.0000051		0.0238		

Outfall 001 - JVWCD

	Mercury	Selenium	Selenium
	Daily Max	*Daily Max*	*Annual Max*
12/31/2019	0.00395	0.0275	31.76
1/31/2020	0.00451	0.0202	32.51
2/29/2020	0.00401	0.0169	26.91
3/31/2020	0.0041	0.0237	23.99
4/30/2020	0.0044	0.0253	25.29
5/31/2020	0.0075	0.0113	60.64
6/30/2020	0.0075	0.0061	43.64
7/31/2020	0.0051	0.0328	26.41
8/31/2020	0.0343	0.032	17.91
9/30/2020	0.00484	0.0271	19.17
10/31/2020	0.00398	0.0219	30.86
11/30/2020	0.00337	0.021	
12/31/2020	0.0055	0.0195	
1/31/2021	0.0061	0.019	
2/28/2021	0.0058	0.0213	
3/31/2021	0.0092	0.0216	
4/30/2021	0.0099	0.0123	
5/31/2021	0.0088	0.0109	
6/30/2021	0.0089	0.006	
7/31/2021	0.00594	0.0152	
8/31/2021	0.004	0.0188	
9/30/2021	0.0027	0.0209	
10/31/2021	0.0026	0.03	
11/30/2021	0.0026	0.0335	
12/31/2021	0.00226	0.03	
1/31/2022	0.0014	0.0277	
2/28/2022	0.00123	0.0283	
3/31/2022	0.00124	0.0293	
4/30/2022	0.00326	0.03	
5/31/2022	0.0045	0.0046	
6/30/2022	0.0046	0.0045	
7/31/2022	0.00192	0.0321	
8/31/2022	0.00154	0.0273	
9/30/2022	0.00156	0.0288	
10/31/2022	0.00235	0.0286	
11/30/2022	0.00237	0.0246	
12/31/2022	0.002	0.0293	
1/31/2023	0.0032	0.022	
2/28/2023	0.00324	0.026	
3/31/2023	0.0039	0.0242	
4/30/2023	0.00696	0.0181	
5/31/2023	0.0098	0.0076	
6/30/2023	0.0107	0.0056	
7/31/2023	0.007	0.0288	
8/31/2023	0.004	0.0285	
9/30/2023	0.0046	0.0277	
10/31/2023	0.005	0.0441	
11/30/2023	0.0048	0.0366	
12/31/2023	0.0059	0.0219	
1/31/2024	0.0067	0.0335	
2/29/2024	0.0058	0.0313	
3/31/2024	0.0077	0.0203	
4/30/2024	0.0094	0.0098	
5/31/2024	0.0107	0.007	
6/30/2024	0.0097	0.0069	
7/31/2024	0.0053	0.0259	
8/31/2024	0.0038	0.0263	
9/30/2024	0.00358	0.0184	
10/31/2024	0.0033	0.0243	

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WET Results

Outfall 001

Month	WET Test	Pass / Fail
Jun 20	Acute/Chronic Cyprinodon Variega	Pass
Sep 20	Acute/Chronic Cyprinodon Variega	Pass
Dec 20	Acute/Chronic Cyprinodon Variega	Pass
Mar 21	Acute/Chronic Cyprinodon Variega	Pass
Jun 21	Acute/Chronic Cyprinodon Variega	Pass
Sep 21	Acute/Chronic Cyprinodon Variega	Pass
Dec 21	Acute/Chronic Cyprinodon Variega	Pass
Mar 22	Acute/Chronic Cyprinodon Variega	Pass
Jun 22	No Discharge	N/A
Sep 22	Acute/Chronic Cyprinodon Variega	Pass
Dec 22	Acute/Chronic Cyprinodon Variega	Pass
Mar 23	Acute/Chronic Cyprinodon Variega	Pass
Jun 23	No Discharge	
Sep 23	Acute/Chronic Cyprinodon Variega	Pass
Dec 23	Acute/Chronic Cyprinodon Variega	Pass
Mar 24	Acute/Chronic Cyprinodon Variega	Pass
Jun 24	No Discharge	
Sep 24	Acute/Chronic Cyprinodon Variega	Pass
Dec 24	Acute/Chronic Cyprinodon Variega	Pass

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ATTACHMENT 2

Wasteload Analysis

State of Utah

SPENCER J. COX
Governor

DEIDRE HENDERSON
Lieutenant Governor

Department of
Environmental Quality

Tim Davis
Executive Director

DIVISION OF WATER QUALITY
John K. Mackey, P.E.
Director

MEMORANDUM

TO: Jennifer Berjikian, UPDES Permit Writer

FROM: Christopher L. Shope, PhD
Wasteload Analyst, Standards and Technical Services Section

DATE: April 17, 2025

SUBJECT: Wasteload Analysis and Antidegradation Reviews for
Jordan Valley Water Conservancy District Southwest Groundwater
UDPES Permit UT0025836

EFFLUENT DISCHARGE

There are two effluent discharge points listed in the permit renewal application (Figure 1).

- Outfall 001 will discharge reverse osmosis byproduct effluent via a 21-mile pipeline to Gilbert Bay of the Great Salt Lake at design flow of 3.0 MGD,
- Outfall 002 will discharge excess feed water and effluent during maintenance to the Jordan River at design flow of 3.0 MGD (Not included in this memorandum).

The combined effluent flow to both outfalls cannot exceed 4.23 MGD.

RECEIVING WATERS AND STREAM CLASSIFICATION

Outfall 001 to Transitional Waters of Great Salt Lake, Gilbert Bay of Great Salt Lake uses 5A,5E per *Utah Administrative Code (UAC) R317-2-13-11*.

At current and anticipated Lake elevations for the duration of this permit, the discharge is to the *Great Salt Lake Gilbert Bay, Transitional Waters approximately 4,208 ft. to Open Water*. According to the *UAC R317-2-6-5.e*, the designated beneficial uses for the Transitional Waters are:

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

Per *UAC R317-2-6-5.a*, the designated beneficial uses for *Gilbert Bay Open Water below approximately 4,208 ft* are:

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

FLOW AND WATER QUALITY EVALUATION

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). Outfall 001 discharges to the mud flats (Transitional Waters) of Great Salt Lake which then flows to Gilbert Bay. Water is present in the discharge channel even when no discharge is occurring but the flows are low and have not been reliably measured. As a result, the annual critical low flow was determined to be zero for the wasteload. Therefore, water quality concentrations must meet the numeric criteria at the end-of-pipe (EOP).

With the exception of the selenium standard for Gilbert Bay (*UAC R317-2-14-2)*, Great Salt Lake has no other numeric criteria. Like other discharges to Great Salt Lake, the wasteload is based on freshwater Class 3D criteria as recommended in the *Interim Methods for Evaluating Use Support for Great Salt Lake Utah Pollution Discharge Elimination System (UPDES) Permits* (DWQ, 2016). Ackerman et al. (2015) reported the selenium and mercury concentrations for over 1,000 eggs collected from Great Salt Lake. The approximately 150 eggs collected from Gilbert Bay support that the selenium standard continues to be met.

The selenium standard for Gilbert Bay is based on bird egg concentration and a water to egg translator is unavailable. In the absence of translator, the wasteload does not directly assess compliance with the selenium criterion. The selenium effluent limits, unchanged from the last permit, are based on the weight of evidence analysis presented in the Fact Sheet/Statement of Basis for the 2011 permit. Selenium continues to be annually measured in bird eggs and other biota as part of the annual Transitional Waters Monitoring Program. As required by the existing permit, JVWCD provided the Jacobs (2024) Operating Report presenting the results of routine bird surveys; environmental sample collection; and analyses of selenium and mercury concentrations in water, macroinvertebrate, and 2024 nesting season bird egg samples.

The 2024 effort provided successful collection of 5 eggs with a geometric mean of 10.32 mg Se/kg dw, with a range of 8.6 to 16.5 mg Se/kg dw. This annual geometric mean selenium concentration in bird eggs exceeds the UPDES 9.8 mg Se/kg dw threshold but does not exceed the higher tissue-based selenium criterion of 12.5 mg Se/kg dw for bird eggs at GSL *(UAC R317-2-14-2, Footnote 14)*. Because 5 eggs were available and the geometric mean was elevated relative to previous permit renewals, additional evaluation and operational changes are required. Per *(UAC R317-2-14-2, Footnote 14)* a geometric mean greater than 6.4 mg/kg but less than 9.8 mg/kg requires initiation of a Level II Antidegradation review for all discharge permit renewals or new discharge permits to Great Salt Lake. The review should include an analysis of loading reductions. For geometric mean concentrations of 9.8 mg/kg but less than 12.5 mg/kg, the initiation of preliminary TMDL studies to evaluate selenium loading sources is required.

The permittee has implemented an exposure reduction plan, including altering discharging well sources to reduce selenium concentrations during the bird nesting season and extending the time period of altered discharge to include six weeks prior to nesting season. The exposure reduction plan effectively provides a Level II Antidegradation alternatives assessment and implementation. If the 2024 egg concentrations are an indication that selenium concentrations are increasing in the

food web, additional actions may be required in the future, including an alternative monitoring approach. If geometric mean concentrations meet or exceed 12.5 mg/kg, an impairment is determined, which requires formalization and implementation of a TMDL.

TOTAL MAXIMUM DAILY LOAD (TMDL)

According to the Utah's Final 2024 Integrated Report on Water Quality dated April 30, 2024 (UDWQ, 2024), the receiving water for Outfall 001 discharge, Great Salt Lake Gilbert Bay (Assessment Unit AU ID: UT-L-16020310-001-00) was listed as "No Evidence of Impairment".

MIXING ZONE

Per *UAC R317-2-5*, the size of the chronic mixing zone in lakes and reservoirs shall not exceed 200 feet and the size of an acute mixing zone shall not exceed 35 feet. Water quality standards must be met at the end of the regulatory mixing zone.

For Outfall 001 into the Gilbert Bay Transitional Waters, no dilution is available in the effluent channel. Because the critical low flow for the receiving water is subject to no-flow conditions, the effluent is considered instantaneously fully mixed and no mixing zone is considered.

PARAMETERS OF CONCERN

The potential parameter of concern identified for the discharge/receiving water was selenium based on the previous permits and ongoing monitoring. During the last permit cycle, twenty effluent samples at Outfall 001 were characterized for all potentially present pollutants as part of a WET investigation on Sheepshead Minnow (*Cyprinodon variagatus*) and routine monitoring was conducted by the permittee. The similarity in results to previous effluent characterizations support that no other pollutants have reasonable potential. In the future, Other pollutants of concern may become apparent as a result of technology-based standards, or other factors as determined by the UPDES Permit Writer. Reported concentrations of cyanide and copper indicated maximum concentrations greater than the numeric criteria. Reasonable potential analysis should be completed to further evaluate parameters of concern.

WET LIMITS

WET requirements for Great Salt Lake discharges are based on the *Utah Pollution Discharge Elimination System Permit and Enforcement Guidance Document for Whole Effluent Toxicity* (DWQ, 2018). 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_{50} (lethal concentration, 50%) percent effluent for acute toxicity and the IC_{25} (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_{50} is typically 100% effluent and does not need to be determined by the WLA.

Because the critical low flow of the receiving water was determined to be zero, WET testing for Outfall 001 for IC_{25} should be based on 100% effluent. As documented in the Utah WET guidance (DWQ, 2018), the chronic testing results are interpreted as an indicator.

ANTIDEGRADATION LEVEL I AND II 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. Currently, no existing uses were identified that deviate from the designated beneficial uses for the receiving water. Therefore, both existing and designated beneficial uses will be protected if the discharge remains below the WQBELs presented in this wasteload.

LOCATION MAP

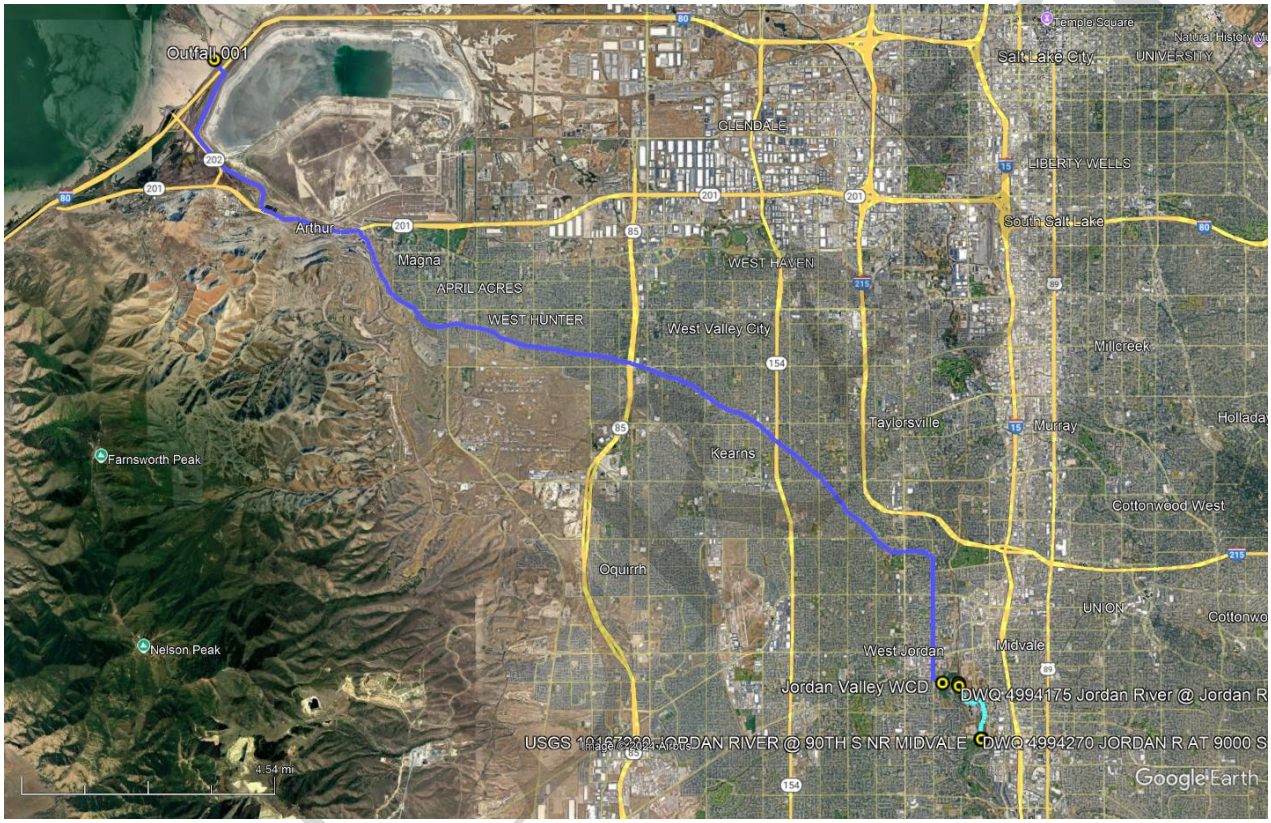

Figure 1: Location map of outfalls, monitoring locations, and surface water channels.

DOCUMENTS

WLA Document: *250417-Jordan_Valley_WCD_GW_WLA_001_2025.docx*
Wasteload Analysis: *250130-Jordan_Valley_WCD_GW_WLA_001_2025.xlsm*

REFERENCES

Ackerman, J.T., Herzog, M.P., Hartman, C.A., Isanhart, J., Herring, G., Vaughn, S., Cavitt, J.F., Eagles-Smith, C.A., Browers, H., Cline, C., and Vest, J., 2015, Mercury and selenium contamination in waterbird eggs and risk to avian reproduction at Great Salt Lake, Utah: U.S. Geological Survey Open-File Report 2015-1020, 164 p., http://dx.doi.org/10.3133/ofr20151020.

Jacobs Engineering Group Inc. 2024. 2024 Annual Project Operating Report, Draft Revision. December 2024. Document 240129114659_2a79f862.

Utah Division of Water Quality. 2015. Great Salt Lake Aquatic Life Use Resident Taxa White Paper. https://lf-public.deq.utah.gov/WebLink/DocView.aspx?id=15421&dbid=0&repo=Public&searchid=a1aa99d2-6549-4bde-829e-95a0b117362a

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Utah Division of Water Quality. 2024. Final 2024 Integrated Report on Water Quality. https://lf-public.deq.utah.gov/WebLink/DocView.aspx?id=87957&repo=Public&searchid=fcd9ea4c-51e1-4227-aa29-fb1921c2cc19&cr=1

Utah Division of Water Quality
Salt Lake City, Utah

WASTELOAD ANALYSIS [WLA] = not included in the WLA
Addendum: Statement of Basis

1/30/2025
4:00 PM

Facilities: **Jordan Valley WCD SW GW Treatment Plant 001** **UPDES No: UT-7JVGWTREAT**
Discharging to: **001 21-mi pipeline to Gilbert Bay GSL**

I. Introduction

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 [R317-2-8, UAC]. Projected concentrations are compared to numeric water quality standards to determine acceptability. The anti-degradation policy and procedures are also considered. The primary in-stream parameters of concern may include metals (as a function of hardness), total dissolved solids (TDS), total residual chlorine (TRC), un-ionized ammonia (as a function of pH and temperature, measured and evaluated interms of total ammonia), and dissolved oxygen.

Mathematical water quality modeling is employed to determine stream quality response to point source discharges. Models aid in the effort of anticipating stream quality at future effluent flows at critical environmental conditions (e.g., low stream flow, high temperature, high pH, etc).

The numeric criteria in this wasteload analysis may always be modified by narrative criteria and other conditions determined by staff of the Division of Water Quality.

II. Receiving Water and Stream Classification

001 21-mi pipeline to Gilbert Bay GSL: 3D,5A,5E
Antidegradation Review: Level I review completed. Level II review is not required.

III. Numeric Stream Standards for Protection of Aquatic Wildlife

Total Ammonia (TNH3)	Varies as a function of Temperature and pH Rebound. See Water Quality Standards		
Chronic Total Residual Chlorine (TRC)	0.011	mg/l (4 Day Average)	
	0.019	mg/l (1 Hour Average)	
Chronic Dissolved Oxygen (DO)	5.0	mg/l (30 Day Average)	
	N/A	mg/l (7Day Average)	
	3.0	mg/l (1 Day Average)	
Maximum Total Dissolved Solids	N/A	mg/l	Background

Acute and Chronic Heavy Metals (Dissolved)

Parameter	4 Day Average (Chronic) Standard Concentration		Load*		1 Hour Average (Acute) Standard Concentration		Load*	
Aluminum	87.00	ug/l**	2.177	lbs/day	750.00	ug/l	18.764	lbs/day
Arsenic	150.00	ug/l	3.753	lbs/day	340.00	ug/l	8.506	lbs/day
Cadmium	3.02	ug/l	0.076	lbs/day	9.85	ug/l	0.247	lbs/day
Chromium III	341.55	ug/l	8.545	lbs/day	7145.83	ug/l	178.776	lbs/day
ChromiumVI	11.00	ug/l	0.275	lbs/day	16.00	ug/l	0.400	lbs/day
Copper	39.25	ug/l	0.982	lbs/day	68.25	ug/l	1.708	lbs/day
Iron					1000.00	ug/l	25.018	lbs/day
Lead	27.05	ug/l	0.677	lbs/day	694.22	ug/l	17.368	lbs/day
Mercury	0.0120	ug/l	0.000	lbs/day	2.40	ug/l	0.060	lbs/day
Nickel	216.33	ug/l	5.412	lbs/day	1945.79	ug/l	48.680	lbs/day
Selenium	4.60	ug/l	0.115	lbs/day	20.00	ug/l	0.500	lbs/day
Silver	N/A	ug/l	N/A	lbs/day	68.23	ug/l	1.707	lbs/day
Zinc	498.00	ug/l	12.459	lbs/day	498.00	ug/l	12.459	lbs/day

* Allowed below discharge
**Chronic Aluminum standard applies only to waters with a pH < 7.0 and a Hardness < 50 mg/l as CaCO3

Metals Standards Based upon a Hardness of 537.3 mg/l as CaCO3

IV. Numeric Stream Standards for Protection of Agriculture

	4 Day Average (Chronic) Standard		1 Hour Average (Acute) Standard	
	Concentration	**Load***	**Concentration**	**Load***
Arsenic			ug/l	lbs/day
Boron			ug/l	lbs/day
Cadmium			ug/l	#VALUE! lbs/day
Chromium			ug/l	lbs/day
Copper			ug/l	lbs/day
Lead			ug/l	lbs/day
Selenium			ug/l	lbs/day
TDS, Summer			mg/l	tons/day

V. Numeric Stream Standards for Protection of Human Health (Class 1C Waters)

	4 Day Average (Chronic) Standard		1 Hour Average (Acute) Standard	
Metals	**Concentration**	**Load***	**Concentration**	**Load***
Arsenic			ug/l	lbs/day
Barium			ug/l	lbs/day
Cadmium			ug/l	lbs/day
Chromium			ug/l	lbs/day
Lead			ug/l	lbs/day
Mercury			ug/l	lbs/day
Selenium			ug/l	lbs/day
Silver			ug/l	lbs/day
Fluoride (3)			ug/l	lbs/day
to			ug/l	lbs/day
Nitrates as N			ug/l	lbs/day

VI. Numeric Stream Standards the Protection of Human Health from Water & Fish Consumption [Toxics]

	Maximum Conc., ug/l - Acute Standards					
	Class 1C			**Class 3A, 3B**		
Metals						
Antimony	ug/l	lbs/day				
Arsenic	ug/l	lbs/day	4300.00	ug/l	107.56	lbs/day
Asbestos	ug/l	lbs/day				
Beryllium						
Cadmium						
Chromium (III)						
Chromium (VI)						
Copper						
Cyanide	ug/l	lbs/day	2.2E+05	ug/l	5503.31	lbs/day
Lead	ug/l	lbs/day				
Mercury			0.15	ug/l	0.00	lbs/day
Nickel			4600.00	ug/l	115.07	lbs/day
Selenium	ug/l	lbs/day				
Silver	ug/l	lbs/day				
Thallium			6.30	ug/l	0.16	lbs/day
Zinc						

There are additional standards that apply to this receiving water, but were not considered in this modeling/waste load allocation analysis.

VII. Mathematical Modeling of Stream Quality

Model configuration was accomplished utilizing standard modeling procedures. Data points were plotted and coefficients adjusted as required to match observed data as closely as possible.

The modeling approach used in this analysis included one or a combination of the following models.

(1) The Utah River Model, Utah Division of Water Quality, 1992. Based upon STREAMDO IV (Region VIII) and Supplemental Ammonia Toxicity Models; EPA Region VIII, Sept. 1990 and QUAL2E (EPA, Athens, GA).

(2) Utah Ammonia/Chlorine Model, Utah Division of Water Quality, 1992.

(3) AMMTOX Model, University of Colorado, Center of Limnology, and EPA Region 8

(4) Principles of Surface Water Quality Modeling and Control. Robert V. Thomann, et.al. Harper Collins Publisher, Inc. 1987, pp. 644.

Coefficients used in the model were based, in part, upon the following references:

(1) Rates, Constants, and Kinetics Formulations in Surface Water Quality Modeling. Environmental Research Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, Athens Georgia. EPA/600/3-85/040 June 1985.

(2) Principles of Surface Water Quality Modeling and Control. Robert V. Thomann, et.al. Harper Collins Publisher, Inc. 1987, pp. 644.

VIII. Modeling Information

The required information for the model may include the following information for both the upstream conditions at low flow and the effluent conditions:

Flow, Q, (cfs or MGD)	D.O. mg/l
Temperature, Deg. C.	Total Residual Chlorine (TRC), mg/l
pH	Total NH3-N, mg/l
BOD5, mg/l	Total Dissolved Solids (TDS), mg/l
Metals, ug/l	Toxic Organics of Concern, ug/l

Other Conditions

In addition to the upstream and effluent conditions, the models require a variety of physical and biological coefficients and other technical information. In the process of actually establishing the permit limits for an effluent, values are used based upon the available data, model calibration, literature values, site visits and best professional judgement.

Model Inputs

The following is upstream and discharge information that was utilized as inputs for the analysis. Dry washes are considered to have an upstream flow equal to the flow of the discharge.

Current Upstream Information

	Stream Critical Low Flow cfs	Temp. Deg. C	pH	T-NH3 mg/l as N	BOD5 mg/l	DO mg/l	TRC mg/l	TDS mg/l
Summer (Irrig. Season)	0.0	18.1	8.0	0.15	4.04	11.33	0.09	1198.5
Fall	0.0	10.0	8.0	0.13	2.57	---	0.00	1258.5
Winter	0.0	6.4	9.2	0.19	3.39	---	0.05	1258.5
Spring	0.0	15.1	9.3	0.13	2.04	---	0.05	1258.5

	Dissolved Metals	Al ug/l	As ug/l	Cd ug/l	CrIII ug/l	CrVI ug/l	Copper ug/l	Fe ug/l	Pb ug/l
All Seasons		5.00	11.70	0.05	1.66	2.40	4.34	15.0	0.16

Dissolved Metals	Hg	Ni	Se	Ag	Zn	Boron	
	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	
All Seasons	0.0000	2.50	1.90	0.25	17.60	10.0	* 1/2 MDL

Projected Discharge Information

Season	Flow, MGD	Temp.	TDS mg/l	TDS tons/day
Summer	3.00000	15.0	250.00	3.12687
Fall	3.00000	15.0		
Winter	3.00000	15.0		
Spring	3.00000	15.0		

All model numerical inputs, intermediate calculations, outputs and graphs are available for discussion, inspection and copy at the Division of Water Quality.

IX. Effluent Limitations

Current State water quality standards are required to be met under a variety of conditions including in-stream flows targeted to the 7-day, 10-year low flow (R317-2-9).

Other conditions used in the modeling effort coincide with the environmental conditions expected at low stream flows.

Effluent Limitation for Flow based upon Water Quality Standards

In-stream criteria of downstream segments will be met with an effluent flow maximum value as follows:

Season	Daily Average	
Summer	3.000 MGD	4.641 cfs
Fall	3.000 MGD	4.641 cfs
Winter	3.000 MGD	4.641 cfs
Spring	3.000 MGD	4.641 cfs

Flow Requirement or Loading Requirement

The calculations in this wasteload analysis utilize the maximum effluent discharge flow of 3 MGD. If the discharger is allowed to have a flow greater than 3 MGD during 7Q10 conditions, and effluent limit concentrations as indicated, then water quality standards will be violated. In order to prevent this from occuring, the permit writers must include the discharge flow limititation as indicated above; or, include loading effluent limits in the permit.

Effluent Limitation for Whole Effluent Toxicity (WET) based upon WET Policy

Effluent Toxicity will not occur in downstream segements if the values below are met.

WET Requirements LC50 > EOP Effluent [Acute]
IC25 > 100.0% Effluent [Chronic]

Season	Receiving Water Flow (cfs)	Effluent Flow (MGD)	Effluent Flow (cfs)	Combined Flow (cfs)	Totally Mixed	Chronic IC25 % Effluent	Acute LC50 % Effluent
Summer	0.00	3.0	4.6	4.6	YES	100.0%	EOP
Fall	0.00	3.0	4.6	4.6	YES	100.0%	EOP
Winter	0.00	3.0	4.6	4.6	YES	100.0%	EOP
Spring	0.00	3.0	4.6	4.6	YES	100.0%	EOP

Effluent Limitation for Biological Oxygen Demand (BOD) based upon Water Quality Standards or Regulations

In-stream criteria of downstream segments for Dissolved Oxygen will be met with an effluent BOD limitation as follows:

Season	Concentration	
Summer	25.0 mg/l as BOD5	625.4 lbs/day
Fall	25.0 mg/l as BOD5	625.4 lbs/day
Winter	25.0 mg/l as BOD5	625.4 lbs/day
Spring	25.0 mg/l as BOD5	625.4 lbs/day

Effluent Limitation for Dissolved Oxygen (DO) based upon Water Quality Standards

In-stream criteria of downstream segments for Dissolved Oxygen will be met with an effluent D.O. limitation as follows:

Season	**Concentration**
Summer	5.00
Fall	5.00
Winter	5.00
Spring	5.00

Effluent Limitation for Total Ammonia based upon Water Quality Standards

In-stream criteria of downstream segments for Total Ammonia will be met with an effluent limitation (expressed as Total Ammonia as N) as follows:

Season		**Concentration**		**Load**	
Summer	4 Day Avg. - Chronic	3.7	mg/l as N	93.4	lbs/day
	1 Hour Avg. - Acute	12.9	mg/l as N	323.3	lbs/day
Fall	4 Day Avg. - Chronic	3.8	mg/l as N	96.1	lbs/day
	1 Hour Avg. - Acute	13.5	mg/l as N	338.2	lbs/day
Winter	4 Day Avg. - Chronic	2.4	mg/l as N	61.1	lbs/day
	1 Hour Avg. - Acute	13.3	mg/l as N	332.2	lbs/day
Spring	4 Day Avg. - Chronic	3.8	mg/l as N	96.1	lbs/day
	1 Hour Avg. - Acute	13.5	mg/l as N	338.2	lbs/day

Acute limit calculated with an Acute Zone of Initial Dilution (ZID) to be equal to 100.%.

Effluent Limitation for Total Residual Chlorine based upon Water Quality Standards

In-stream criteria of downstream segments for Total Residual Chlorine will be met with an effluent limitation as follows:

Season		**Concentration**		**Load**	
Summer	4 Day Avg. - Chronic	0.011	mg/l	0.28	lbs/day
	1 Hour Avg. - Acute	0.019	mg/l	0.48	lbs/day
Fall	4 Day Avg. - Chronic	0.011	mg/l	0.28	lbs/day
	1 Hour Avg. - Acute	0.019	mg/l	0.48	lbs/day
Winter	4 Day Avg. - Chronic	0.011	mg/l	0.28	lbs/day
	1 Hour Avg. - Acute	0.019	mg/l	0.48	lbs/day
Spring	4 Day Avg. - Chronic	0.011	mg/l	0.28	lbs/day
	1 Hour Avg. - Acute	0.019	mg/l	0.48	lbs/day

Effluent Limitations for Total Dissolved Solids based upon Water Quality Standards

Season		Concentration		Load	
Summer	Maximum, Acute		mg/l	#VALUE!	tons/day
Fall	Maximum, Acute		mg/l	#VALUE!	tons/day
Winter	Maximum, Acute		mg/l	#VALUE!	tons/day
Spring	4 Day Avg. - Chronic		mg/l	#VALUE!	tons/day
Colorado Salinity Forum Limits		Determined by Permitting Section			

Effluent Limitations for Total Recoverable Metals based upon Water Quality Standards

In-stream criteria of downstream segments for Dissolved Metals will be met with an effluent limitation as follows (based upon a hardness of 537.3 mg/l):

	4 Day Average Concentration		Load		1 Hour Average Concentration		Load	
Aluminum	N/A		N/A		750.0	ug/l	18.8	lbs/day
Arsenic	150.00	ug/l	2.4	lbs/day	340.0	ug/l	8.5	lbs/day
Cadmium	3.02	ug/l	0.0	lbs/day	9.9	ug/l	0.2	lbs/day
Chromium III	341.55	ug/l	5.5	lbs/day	7,145.8	ug/l	178.8	lbs/day
Chromium VI	11.00	ug/l	0.2	lbs/day	16.0	ug/l	0.4	lbs/day
Copper	39.25	ug/l	0.6	lbs/day	68.3	ug/l	1.7	lbs/day
Iron	N/A		N/A		1,000.0	ug/l	25.0	lbs/day
Lead	27.05	ug/l	0.4	lbs/day	694.2	ug/l	17.4	lbs/day
Mercury	0.01	ug/l	0.0	lbs/day	2.4	ug/l	0.1	lbs/day
Nickel	216.33	ug/l	3.5	lbs/day	1,945.8	ug/l	48.7	lbs/day
Selenium	4.60	ug/l	0.1	lbs/day	20.0	ug/l	0.5	lbs/day
Silver	N/A	ug/l	N/A	lbs/day	68.2	ug/l	1.7	lbs/day
Zinc	498.00	ug/l	8.1	lbs/day	498.0	ug/l	12.5	lbs/day
Cyanide (free)	5.20	ug/l	0.1	lbs/day	22.0	ug/l	0.6	lbs/day

Effluent Limitations for Heat/Temperature based upon Water Quality Standards

Summer	22.1 Deg. C.	71.8 Deg. F
Fall	14.0 Deg. C.	57.2 Deg. F
Winter	10.4 Deg. C.	50.6 Deg. F
Spring	19.1 Deg. C.	66.4 Deg. F

Effluent Limitations for Organics [Pesticides] Based upon Water Quality Standards

In-stream criteria of downstream segments for Organics [Pesticides] will be met with an effluent limit as follows:

	4 Day Average Concentration		Load		1 Hour Average Concentration		Load	
Aldrin					1.5E+00	ug/l	5.81E-02	lbs/day
Chlordane	4.30E-03	ug/l	1.08E-01	lbs/day	1.2E+00	ug/l	4.64E-02	lbs/day
DDT, DDE	1.00E-03	ug/l	2.50E-02	lbs/day	5.5E-01	ug/l	2.13E-02	lbs/day
Dieldrin	1.90E-03	ug/l	4.75E-02	lbs/day	1.3E+00	ug/l	4.84E-02	lbs/day
Endosulfan	5.60E-02	ug/l	1.40E+00	lbs/day	1.1E-01	ug/l	4.26E-03	lbs/day
Endrin	2.30E-03	ug/l	5.75E-02	lbs/day	9.0E-02	ug/l	3.48E-03	lbs/day

Guthion	0.00E+00	ug/l	0.00E+00	lbs/day	1.0E-02	ug/l	3.87E-04 lbs/day
Heptachlor	3.80E-03	ug/l	9.51E-02	lbs/day	2.6E-01	ug/l	1.01E-02 lbs/day
Lindane	8.00E-02	ug/l	2.00E+00	lbs/day	1.0E+00	ug/l	3.87E-02 lbs/day
Methoxychlor	0.00E+00	ug/l	0.00E+00	lbs/day	3.0E-02	ug/l	1.16E-03 lbs/day
Mirex	0.00E+00	ug/l	0.00E+00	lbs/day	1.0E-02	ug/l	3.87E-04 lbs/day
Parathion	0.00E+00	ug/l	0.00E+00	lbs/day	4.0E-02	ug/l	1.55E-03 lbs/day
PCB's	1.40E-02	ug/l	3.50E-01	lbs/day	2.0E+00	ug/l	7.74E-02 lbs/day
Pentachlorophenol	1.30E+01	ug/l	3.25E+02	lbs/day	2.0E+01	ug/l	7.74E-01 lbs/day
Toxephene	2.00E-04	ug/l	5.00E-03	lbs/day	7.3E-01	ug/l	2.83E-02 lbs/day

Effluent Targets for Pollution Indicators
Based upon Water Quality Standards

In-stream criteria of downstream segments for Pollution Indicators will be met with an effluent limit as follows:

		1 Hour Average	
	Concentration		Loading
Gross Beta (pCi/l)	50.0 pCi/L		
BOD (mg/l)	5.0 mg/l	125.1	lbs/day
Nitrates as N	4.0 mg/l	100.1	lbs/day
Total Phosphorus as P	0.05 mg/l	1.3	lbs/day
Total Suspended Solids	90.0 mg/l	2251.6	lbs/day

Note: Pollution indicator targets are for information purposes only.

Effluent Limitations for Protection of Human Health [Toxics Rule]
Based upon Water Quality Standards (Most stringent of 1C or 3A & 3B as appropriate.)

In-stream criteria of downstream segments for Protection of Human Health [Toxics] will be met with an effluent limit as follows:

	Maximum Concentration	
	Concentration	**Load**
Metals		
Antimony	ug/l	lbs/day
Arsenic	ug/l	lbs/day
Asbestos	ug/l	lbs/day
Beryllium		
Cadmium		
Chromium (III)		
Chromium (VI)		
Copper	ug/l	lbs/day
Cyanide	ug/l	lbs/day
Lead		
Mercury	ug/l	lbs/day
Nickel	ug/l	lbs/day
Selenium		
Silver		
Thallium	ug/l	lbs/day
Zinc		

Metals Effluent Limitations for Protection of All Beneficial Uses
Based upon Water Quality Standards and Toxics Rule

Class 4 Acute Agricultural	**Class 3 Acute Aquatic Wildlife**	**Acute Toxics Drinking Water Source**	**Acute Toxics Wildlife**	**1C Acute Health Criteria**	**Acute Most Stringent**	**Class 3 Chronic Aquatic Wildlife**

	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
Aluminum		750.0				750.0	N/A
Antimony				4300.0		4300.0	
Arsenic		340.0			0.0	340.0	150.0
Asbestos						0.00E+00	
Barium						0.0	
Beryllium						0.0	
Cadmium		9.9			0.0	9.9	3.0
Chromium (III)		7145.8			0.0	7145.8	341.5
Chromium (VI)		16.0			0.0	16.00	11.00
Copper		68.3				68.3	39.2
Cyanide		22.0	220000.5			22.0	5.2
Iron		1000.0				1000.0	
Lead		694.2			0.0	694.2	27.1
Mercury		2.40		0.15	0.0	0.15	0.012
Nickel		1945.8		4600.0		1945.8	216.3
Selenium		20.0			0.0	20.0	4.6
Silver		68.2			0.0	68.2	
Thallium				6.3		6.3	
Zinc		498.0				498.0	498.0
Boron	750.0					750.0	

Summary Effluent Limitations for Metals [Wasteload Allocation, TMDL]
[If Acute is more stringent than Chronic, then the Chronic takes on the Acute value.]

	WLA Acute ug/l	WLA Chronic ug/l
Aluminum	750.0	N/A
Antimony	4300.01	
Arsenic	340.0	150.0
Asbestos	0.00E+00	
Barium		
Beryllium		
Cadmium	9.9	3.0
Chromium (III)	7145.8	342
Chromium (VI)	16.0	11.0
Copper	68.3	39.2
Cyanide	22.0	5.2
Iron	1000.0	
Lead	694.2	27.1
Mercury	0.150	0.012
Nickel	1945.8	216
Selenium	20.0	4.6
Silver	68.2	N/A
Thallium	6.3	
Zinc	498.0	498.0
Boron	750.00	

Other Effluent Limitations are based upon R317-1.
E. coli 126.0 organisms per 100 ml

X. Antidegradation Considerations

The Utah Antidegradation Policy allows for degradation of existing quality where it is determined that such lowering of water quality is necessary to accommodate important economic or social development in the area in which the waters are protected [R317-2-3]. It has been determined that certain chemical parameters introduced by this discharge will cause an increase of the concentration of said parameters in the receiving waters. Under no conditions will the increase in concentration be allowed to interfere with existing instream water uses.

The antidegradation rules and procedures allow for modification of effluent limits less than those based strictly upon mass balance equations utilizing 100% of the assimilative capacity of the receiving water. Additional factors include considerations for "Blue-ribbon" fisheries, special recreational areas, threatened and endangered species, and drinking water sources.

An Antidegradation Level I Review was conducted on this discharge and its effect on the receiving water. Based upon that review, it has been determined that an Antidegradation Level II Review is not required because it is a standard renewal.

XI. Colorado River Salinity Forum Considerations

Discharges in the Colorado River Basin are required to have their discharge at a TDS loading of less than 1.00 tons/day unless certain exemptions apply. Refer to the Forum's Guidelines for additional information allowing for an exceedence of this value.
This doesn't apply to facilities that do not discharge to the Colorado River Basin.

XII. Summary Comments

The mathematical modeling and best professional judgement indicate that violations of receiving water beneficial uses with their associated water quality standards, including important down-stream segments, will not occur for the evaluated parameters of concern as discussed above if the effluent limitations indicated above are met.

XIII. Notice of UPDES Requirement

This Addendum to the Statement of Basis does not authorize any entity or party to discharge to the waters of the State of Utah. That authority is granted through a UPDES permit issued by the Utah Division of Water Quality. The numbers presented here may be changed as a function of other factors. Dischargers are strongly urged to contact the Permits Section for further information. Permit writers may utilize other information to adjust these limits and/or to determine other limits based upon best available technology and other considerations provided that the values in this wasteload analysis [TMDL] are not compromised. See special provisions in Utah Water Quality Standards for adjustments in the Total Dissolved Solids values based upon background concentration.

Utah Division of Water Quality
801-538-6052
File Name: 250130-Jordan_Valley_WCD_GW_WLA_001_2025.xlsm

APPENDIX - Coefficients and Other Model Information

CBOD Coeff. (Kd)20 1/day	CBOD Coeff. FORCED (Kd)/day	CBOD Coeff. (Ka)T 1/day	REAER. Coeff. (Ka)20 (Ka)/day	REAER. Coeff. FORCED 1/day	REAER. (Ka)T 1/day	NBOD Coeff. (Kn)20 1/day	NBOD Coeff. (Kn)T 1/day
2.000	0.000	0.798	11830.662	0.000	7362.555	0.400	0.086

Open Coeff. (K4)20 1/day	Open Coeff. (K4)T 1/day	NH3 LOSS (K5)20 1/day	NH3 (K5)T 1/day	NO2+NO3 LOSS (K6)20 1/day	NO2+NO3 (K6)T 1/day	TRC Decay K(Cl)20 1/day	TRC K(Cl)(T) 1/day
0.000	0.000	4.000	1.596	0.000	0.000	32.000	9.979

BENTHIC DEMAND (SOD)20 gm/m2/day	BENTHIC DEMAND (SOD)T gm/m2/day
1.000	0.284

K1	K2	K3	K4	K5	K6	K(Cl)	S
CBOD	Reaer.	NH3	Open	NH3 Loss	NO2+3	TRC	Benthic
{theta}	{theta}	{theta}	{theta}	{theta}	{theta}	{theta}	{theta}
1.0	1.0	1.1	1.0	1.0	1.0	1.1	1.1

Antidegredation Review

An antidegradation review (ADR) was conducted to determine whether the proposed activity complies with the applicable antidegradation requirements for receiving waters that may be affected. The Level I ADR evaluated the criteria of R317-2-3.5(b) and determined that a Level II antidegradation Review is not required because this is a permit renewal with no change in discharge.

Freshwater total ammonia criteria based on Title R317-2-14 Utah Administrative Code
Acute

INPUT	Summer	Fall	Winter	Spring
pH:	8.00	8.00	9.18	9.29
Beneficial use classification:	3B	3B	3B	3B

OUTPUT				
Total ammonia nitrogen criteria (mg N/L):				
Acute (Class 3A):	5.667	5.657	0.680	0.594
Acute (Class 3B, 3C, 3D):	**8.486**	**8.470**	**1.017**	**0.888**

Freshwater total ammonia criteria based on Title R317-2-14 Utah Administrative Code
Chronic

INPUT	Summer	Fall	Winter	Spring
Temperature (deg C):	15.00	15.00	15.00	15.00
pH:	8.00	8.00	9.18	9.29
Are fish early life stages present?	No	No	No	No

OUTPUT				
Total ammonia nitrogen criteria (mg N/L):				
Chronic - Fish Early Life Stages Present:	2.376	2.373	0.369	0.325
Chronic - Fish Early Life Stages Absent:	**2.376**	**2.373**	**0.369**	**0.325**

State of Utah
SPENCER J. COX
Governor

DEIDRE HENDERSON
Lieutenant Governor

Department of
Environmental Quality

Kimberly D. Shelley
Executive Director

DIVISION OF WATER QUALITY
John K. Mackey, P.E.
Director

M E M O R A N D U M

TO: Jennifer Berjikian, UPDES Permit Writer

FROM: Christopher L. Shope, PhD
Wasteload Analyst, Standards and Technical Services Section

DATE: May 12, 2025

SUBJECT: Wasteload Analysis and Antidegradation Reviews for
Jordan Valley Water Conservancy District Southwest Groundwater
UDPES Permit UT0025836

This addendum summarizes the wasteload analysis that was performed to determine water quality based effluent limits (WQBELs) 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 considers downstream designated uses *Utah Administrative Code (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.

EFFLUENT DISCHARGE

There are two effluent discharge points listed in the permit renewal application (Figure 1).

- Outfall 001 will discharge reverse osmosis byproduct effluent via a 21-mile pipeline to Gilbert Bay of the Great Salt Lake at design flow of 3.0 MGD (Not included in this memorandum),
- Outfall 002 will discharge excess feed water and effluent during maintenance to the Jordan River at design flow of 4.23 MGD.

RECEIVING WATERS AND STREAM CLASSIFICATION

According to the *Utah Administrative Code (UAC) R317-2-13.5(a)* the beneficial uses of the *Jordan River from confluence with Little Cottonwood Creek to Narrows Diversion* are: *2B, 3B, 4.* As per *R317-2-12.9,* the beneficial uses of *irrigation canals and ditches statewide, except as otherwise designated* are: *2B, 3E, 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 3B - Protected for warm water species of game fish and other warm water aquatic life, 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.

Outfall 001 to Transitional Waters of Great Salt Lake, Gilbert Bay of Great Salt Lake uses 5A,5E per *Utah Administrative Code (UAC) R317-2-13-11*.

At current and anticipated Lake elevations for the duration of this permit, the discharge is to the *Great Salt Lake Gilbert Bay, Transitional Waters approximately 4,208 ft. to Open Water*. According to the *UAC R317-2-6-5.e*, the designated beneficial uses for the Transitional Waters are:

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

Per *UAC R317-2-6-5.a*, the designated beneficial uses for *Gilbert Bay Open Water below approximately 4,208 ft* are:

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

RECEIVING WATER FLOW AND WATER QUALITY

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). The 7Q10 flow for each season was calculated using data obtained from SLCO 150 JORDAN RIVER @ 9000 SOUTH for the period 2013-2023. The 20th percentile flow rate for each season was calculated from monitoring site DWQ 4994270 JORDAN R AT 9000 S XING for more recent data. The final critical flows are provided from the Jordan River Low Flow Analysis. (HAL 2021). The calculated seasonal 7Q10 values are presented in Table 1.

Table 1. Seasonal critical low flow values from HAL Jordan River Low Flow Analysis

	Jordan River
Season	**7Q10 (cfs)**
Summer (Jul-Sep)	28
Fall (Oct-Dec)	23
Winter (Jan-Mar)	27

Spring (Apr-Jun)	32

Receiving water chemistry was characterized using data obtained from DWQ monitoring site DWQ 4994270 JORDAN R AT 9000 S XING for the period 1980-2024.

TOTAL MAXIMUM DAILY LOAD (TMDL) AND ASSESSMENT CONCERNS

According to the Utah's Final 2024 Integrated Report on Water Quality dated April 30, 2024, the receiving water for the Outfall 002 discharge, *Jordan River from confluence with Little Cottonwood Creek to Narrows Diversion* (Assessment Unit *Jordan River-6, AU ID: UT16020204-006_01*) is listed as "Not Supporting" for Benthic Macroinvertebrates Bioassessments, E. Coli, and Total Dissolved Solids. The Status is listed as "TMDL Needed" with "Low" priority.

Table 2. Jordan River Segments and Impairments Downstream of Discharge.

Segment (moving downstream)	**Assessment Unit**	**Impairment Cause**
Jordan River from the confluence with Little Cottonwood Creek to 7800 South	Jordan River-5, AU UT16020204-005_00	TDS, *E. coli
Jordan River from 2100 South to the confluence with Little Cottonwood Creek	Jordan River-4, AU UT16020204-004_00	TDS, *E. coli, Benthic Macroinvertebrates Bioassessments
Jordan River from North Temple to 2100 South	Jordan River-3, AU UT16020204-003_00	*E. coli, +Min DO, Total Phosphorous, Total Dissolved Solids, Benthic Macroinvertebrates Bioassessments
Jordan River from Davis County line upstream to North Temple Street	Jordan River-2, AU UT16020204-002_00	+Min DO, E. coli, Benthic Macroinvertebrates Bioassessments
Jordan River from Farmington Bay upstream contiguous with the Davis County line	Jordan River-1, AU UT16020204-001_00	+Min DO, Benthic Macroinvertebrates Bioassessments

*A TMDL was approved (R8-UT-2023-01) for E. coli.
+ A TMDL was approve (54322, 5432154300) for minimum dissolved oxygen.

The receiving water for the Outfall 001 discharge, *Gilbert Bay* (Assessment Unit *Great Salt Lake Gilbert Bay, AU ID: UT-L-16020310-001_00*) is listed as "No Evidence of Impairment".

Although the WLA may show higher allowed effluent limits for these impaired parameters, the following constituents from Table 2 should be evaluated in the effluent against the end-of-pipe (EOP) numeric criteria Water Quality Standards in Table 3 to determine whether or not they have reasonable potential to cause or contribute to the existing impairments.

Table 3. Numeric Criteria per UAC R317-2-14.1 and R317-2-14.2

Constituent	Criteria
DO	5.5 mg/l (30-day)
E. coli	206/100 ml (30-day)
TDS	1200 mg/l
Temperature	27 Degrees C
Selenium	4.6 ug/l (chronic)
Copper*	9.0 ug/l (chronic)

* based on a hardness of 100.0 mg/L CaCO3 per UAC R317-2-14-2, Footnote 7

PERMITTED MIXING ZONE CONDITIONS

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, per *UAC R317-2-5*. Water quality standards must be met at the end of the mixing zone. Acute limits were calculated using 50% of the seasonal critical low flow.

As per DEQ mixing zone policy at *UAC R317-2-5*, the effluent was considered to be totally mixed as the ratio of river flow (7Q10) to effluent discharge flow was less than twice effluent discharge. Both acute and chronic effluent limits were calculated using 100% of the critical low flow value in the receiving water.

PARAMETERS OF CONCERN

The potential parameters of concern identified for the discharge/receiving water were determined in consultation with the UPDES Permit Writer, the Watershed Coordinator, the Utah Water Quality Assessment Reports, and the industry SIC codes from https://www.osha.gov/data/sic-search. The potential parameters of concern for this facility are identified and include: Total Dissolved Solids, Temperature, Selenium, E. coli, and Copper.

WHOLE EFFLUENT TOXICITY (WET) TESTING AND 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_{50} (lethal concentration, 50%) percent effluent for acute toxicity and the IC_{25} (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_{50} is typically 100% effluent and does not need to be determined by the WLA.

IC25 WET limits should be based on the percentages presented in Table 4.

Table 4. IC25 WET limit dilution percentages

Season	Percent Effluent
Summer	18.9%
Fall	22.2%
Winter	19.5%
Spring	17.0%

WASTELOAD ALLOCATION METHODS

Effluent limits were determined for conservative constituents using a simple mass balance mixing analysis (UDWQ, 2021). The mass balance analysis is summarized in the Wasteload Addendums.

The Utah Rivers Model was used to evaluate the DO sag and implications on nutrients and BOD. The analysis is summarized in the Wasteload Addendum.

The water quality standard for chronic ammonia toxicity is dependent on temperature and pH, and the water quality standard for acute ammonia toxicity is dependent on pH. The AMMTOX Model developed by University of Colorado and adapted by Utah DWQ and EPA Region VIII was used to determine ammonia effluent limits (Lewis et al. 2002).

The effluent limits for DO and BOD_5 in order to meet minimum DO criteria in the receiving water was evaluated using the Utah River Model.

Models and supporting documentation are available for review upon request.

ANTIDEGRADATION LEVEL I REVIEW

The objective of the Level I Antidegradation Review (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 water quality-based effluent limits (WQBELs) presented in this wasteload.

A Level II Antidegradation Review is not required because the permit is being renewed with no changes and water quality will not be further lowered by the proposed activity, *UAC R317-2-3.5.b.1.(b).*

DOCUMENTS

WLA Document: *250512-Jordan_Valley_WCD_GW_WLA_002_2025.docx*
Wasteload Analysis and Addendums: *250125-Jordan_Valley_WCD_GW_WLA_002_2025.xlsm*

REFERENCES

Hanson, Allen, Luce. 2021. Wasatch Front Water Quality Council, and South Davis Sewer District. Jordan River Low Flow Analysis. (HAL Project No.: 447.01.100). Table 4-1, p 26. Final Flows for the Jordan River.

Utah Division of Water Quality. 2024. 2024 Integrated Report on Water Quality. https://lf-public.deq.utah.gov/WebLink/DocView.aspx?id=87957&repo=Public&searchid=fcd9ea4c-51e1-4227-aa29-fb1921c2cc19&cr=1

Utah Division of Water Quality. 2021. Utah Wasteload Analysis Procedures Version 2.0. https://documents.deq.utah.gov/water-quality/standards-technical-services/DWQ-2021-000684.pdf

Utah Division of Water Quality
Salt Lake City, Utah

WASTELOAD ANALYSIS [WLA] = not included in the WLA
Addendum: Statement of Basis

1/30/2025
4:00 PM

Facilities: **Jordan Valley WCD SW GW Treatment Plant 002** **UPDES No: UT-7JVGWTREAT**
Discharging to: **002 Jordan River**

I. Introduction

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 [R317-2-8, UAC]. Projected concentrations are compared to numeric water quality standards to determine acceptability. The anti-degradation policy and procedures are also considered. The primary in-stream parameters of concern may include metals (as a function of hardness), total dissolved solids (TDS), total residual chlorine (TRC), un-ionized ammonia (as a function of pH and temperature, measured and evaluated interms of total ammonia), and dissolved oxygen.

Mathematical water quality modeling is employed to determine stream quality response to point source discharges. Models aid in the effort of anticipating stream quality at future effluent flows at critical environmental conditions (e.g., low stream flow, high temperature, high pH, etc).

The numeric criteria in this wasteload analysis may always be modified by narrative criteria and other conditions determined by staff of the Division of Water Quality.

II. Receiving Water and Stream Classification

002 Jordan River:	2B,3B,4
Antidegradation Review:	Level I review completed. Level II review is not required.

III. Numeric Stream Standards for Protection of Aquatic Wildlife

Total Ammonia (TNH3)		Varies as a function of Temperature and pH Rebound. See Water Quality Standards
Chronic Total Residual Chlorine (TRC)	0.011	mg/l (4 Day Average)
	0.019	mg/l (1 Hour Average)
Chronic Dissolved Oxygen (DO)	5.5	mg/l (30 Day Average)
	6.0	mg/l (7Day Average)
	3.0	mg/l (1 Day Average)
Maximum Total Dissolved Solids	1200.0	mg/l

Acute and Chronic Heavy Metals (Dissolved)

	4 Day Average (Chronic) Standard			1 Hour Average (Acute) Standard		
Parameter	**Concentration**		**Load***	**Concentration**		**Load***
Aluminum	87.00	ug/l**	3.069 lbs/day	750.00	ug/l	26.457 lbs/day
Arsenic	150.00	ug/l	5.291 lbs/day	340.00	ug/l	11.994 lbs/day
Cadmium	3.02	ug/l	0.107 lbs/day	9.85	ug/l	0.348 lbs/day
Chromium III	341.55	ug/l	12.048 lbs/day	7145.80	ug/l	252.073 lbs/day
ChromiumVI	11.00	ug/l	0.388 lbs/day	16.00	ug/l	0.564 lbs/day
Copper	39.25	ug/l	1.384 lbs/day	68.25	ug/l	2.408 lbs/day
Iron				1000.00	ug/l	35.276 lbs/day
Lead	27.05	ug/l	0.954 lbs/day	694.21	ug/l	24.489 lbs/day
Mercury	0.0120	ug/l	0.000 lbs/day	2.40	ug/l	0.085 lbs/day
Nickel	216.33	ug/l	7.631 lbs/day	1945.78	ug/l	68.639 lbs/day
Selenium	4.60	ug/l	0.162 lbs/day	20.00	ug/l	0.706 lbs/day
Silver	N/A	ug/l	N/A lbs/day	68.23	ug/l	2.407 lbs/day
Zinc	498.00	ug/l	17.567 lbs/day	498.00	ug/l	17.567 lbs/day

* Allowed below discharge
**Chronic Aluminum standard applies only to waters with a pH < 7.0 and a Hardness < 50 mg/l as CaCO3

Metals Standards Based upon a Hardness of 537.3 mg/l as CaCO3

IV. Numeric Stream Standards for Protection of Agriculture

	4 Day Average (Chronic) Standard		1 Hour Average (Acute) Standard	
	Concentration	**Load***	**Concentration**	**Load***
Arsenic			100.0 ug/l	lbs/day
Boron			750.0 ug/l	lbs/day
Cadmium			10.0 ug/l	0.18 lbs/day
Chromium			100.0 ug/l	lbs/day
Copper			200.0 ug/l	lbs/day
Lead			100.0 ug/l	lbs/day
Selenium			50.0 ug/l	lbs/day
TDS, Summer			1200.0 mg/l	21.17 tons/day

V. Numeric Stream Standards for Protection of Human Health (Class 1C Waters)

	4 Day Average (Chronic) Standard		1 Hour Average (Acute) Standard	
Metals	**Concentration**	**Load***	**Concentration**	**Load***
Arsenic			ug/l	lbs/day
Barium			ug/l	lbs/day
Cadmium			ug/l	lbs/day
Chromium			ug/l	lbs/day
Lead			ug/l	lbs/day
Mercury			ug/l	lbs/day
Selenium			ug/l	lbs/day
Silver			ug/l	lbs/day
Fluoride (3)			ug/l	lbs/day
to			ug/l	lbs/day
Nitrates as N			ug/l	lbs/day

VI. Numeric Stream Standards the Protection of Human Health from Water & Fish Consumption [Toxics]

	Maximum Conc., ug/l - Acute Standards			
	Class 1C		**Class 3A, 3B**	
Metals				
Antimony	ug/l	lbs/day		
Arsenic	ug/l	lbs/day	4300.00 ug/l	800.62 lbs/day
Asbestos	ug/l	lbs/day		
Beryllium				
Cadmium				
Chromium (III)				
Chromium (VI)				
Copper				
Cyanide	ug/l	lbs/day	2.2E+05 ug/l	40962.05 lbs/day
Lead	ug/l	lbs/day		
Mercury			0.15 ug/l	0.03 lbs/day
Nickel			4600.00 ug/l	856.48 lbs/day
Selenium	ug/l	lbs/day		
Silver	ug/l	lbs/day		
Thallium			6.30 ug/l	1.17 lbs/day
Zinc				

There are additional standards that apply to this receiving water, but were not considered in this modeling/waste load allocation analysis.

VII. Mathematical Modeling of Stream Quality

Model configuration was accomplished utilizing standard modeling procedures. Data points were plotted and coefficients adjusted as required to match observed data as closely as possible.

The modeling approach used in this analysis included one or a combination of the following models.

(1) The Utah River Model, Utah Division of Water Quality, 1992. Based upon STREAMDO IV (Region VIII) and Supplemental Ammonia Toxicity Models; EPA Region VIII, Sept. 1990 and QUAL2E (EPA, Athens, GA).

(2) Utah Ammonia/Chlorine Model, Utah Division of Water Quality, 1992.

(3) AMMTOX Model, University of Colorado, Center of Limnology, and EPA Region 8

(4) Principles of Surface Water Quality Modeling and Control. Robert V. Thomann, et.al. Harper Collins Publisher, Inc. 1987, pp. 644.

Coefficients used in the model were based, in part, upon the following references:

(1) Rates, Constants, and Kinetics Formulations in Surface Water Quality Modeling. Environmental Research Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, Athens Georgia. EPA/600/3-85/040 June 1985.

(2) Principles of Surface Water Quality Modeling and Control. Robert V. Thomann, et.al. Harper Collins Publisher, Inc. 1987, pp. 644.

VIII. Modeling Information

The required information for the model may include the following information for both the upstream conditions at low flow and the effluent conditions:

Flow, Q, (cfs or MGD)	D.O. mg/l
Temperature, Deg. C.	Total Residual Chlorine (TRC), mg/l
pH	Total NH3-N, mg/l
BOD5, mg/l	Total Dissolved Solids (TDS), mg/l
Metals, ug/l	Toxic Organics of Concern, ug/l

Other Conditions

In addition to the upstream and effluent conditions, the models require a variety of physical and biological coefficients and other technical information. In the process of actually establishing the permit limits for an effluent, values are used based upon the available data, model calibration, literature values, site visits and best professional judgement.

Model Inputs

The following is upstream and discharge information that was utilized as inputs for the analysis. Dry washes are considered to have an upstream flow equal to the flow of the discharge.

Current Upstream Information

	Stream Critical Low Flow cfs	**Temp. Deg. C**	**pH**	**T-NH3 mg/l as N**	**BOD5 mg/l**	**DO mg/l**	**TRC mg/l**	**TDS mg/l**
Summer (Irrig. Season)	28.0	18.1	8.0	0.15	4.04	7.25	0.09	1198.5
Fall	23.0	10.0	8.0	0.13	2.57	---	0.00	1258.5
Winter	27.0	6.4	9.2	0.19	3.39	---	0.05	1258.5
Spring	32.0	15.1	9.3	0.13	2.04	---	0.05	1258.5

Dissolved Metals	Al ug/l	As ug/l	Cd ug/l	CrIII ug/l	CrVI ug/l	Copper ug/l	Fe ug/l	Pb ug/l
All Seasons	5.00	11.70	0.05	1.66	2.40	4.34	15.0	0.16

Dissolved Metals	Hg ug/l	Ni ug/l	Se ug/l	Ag ug/l	Zn ug/l	Boron ug/l	
All Seasons	0.0000	2.50	1.90	0.25	17.60	10.0	* 1/2 MDL

Projected Discharge Information

Season	Flow, MGD	Temp.	TDS mg/l	TDS tons/day
Summer	4.23000	15.0	250.00	4.40889
Fall	4.23000	15.0		
Winter	4.23000	15.0		
Spring	4.23000	15.0		

All model numerical inputs, intermediate calculations, outputs and graphs are available for discussion, inspection and copy at the Division of Water Quality.

IX. Effluent Limitations

Current State water quality standards are required to be met under a variety of conditions including in-stream flows targeted to the 7-day, 10-year low flow (R317-2-9).

Other conditions used in the modeling effort coincide with the environmental conditions expected at low stream flows.

Effluent Limitation for Flow based upon Water Quality Standards

In-stream criteria of downstream segments will be met with an effluent flow maximum value as follows:

Season	Daily Average	
Summer	4.230 MGD	6.544 cfs
Fall	4.230 MGD	6.544 cfs
Winter	4.230 MGD	6.544 cfs
Spring	4.230 MGD	6.544 cfs

Flow Requirement or Loading Requirement

The calculations in this wasteload analysis utilize the maximum effluent discharge flow of 4.23 MGD. If the discharger is allowed to have a flow greater than 4.23 MGD during 7Q10 conditions, and effluent limit concentrations as indicated, then water quality standards will be violated. In order to prevent this from occuring, the permit writers must include the discharge flow limititation as indicated above; or, include loading effluent limits in the permit.

Effluent Limitation for Whole Effluent Toxicity (WET) based upon WET Policy

Effluent Toxicity will not occur in downstream segements if the values below are met.

WET Requirements LC50 > 77.9% Effluent [Acute]
IC25 > 18.9% Effluent [Chronic]

Season	Receiving Water Flow (cfs)	Effluent Flow (MGD)	Effluent Flow (cfs)	Combined Flow (cfs)	Totally Mixed	Chronic IC25 % Effluent	Acute LC50 % Effluent
Summer	28.00	4.2	6.5	34.5	NO	18.9%	1.1%
Fall	23.00	4.2	6.5	29.5	NO	22.2%	1.2%
Winter	27.00	4.2	6.5	33.5	NO	19.5%	1.1%
Spring	32.00	4.2	6.5	38.5	NO	17.0%	1.0%

Effluent Limitation for Biological Oxygen Demand (BOD) based upon Water Quality Standards or Regulations

In-stream criteria of downstream segments for Dissolved Oxygen will be met with an effluent BOD limitation as follows:

Season	Concentration	
Summer	25.0 mg/l as BOD5	881.8 lbs/day
Fall	25.0 mg/l as BOD5	881.8 lbs/day
Winter	25.0 mg/l as BOD5	881.8 lbs/day
Spring	25.0 mg/l as BOD5	881.8 lbs/day

Effluent Limitation for Dissolved Oxygen (DO) based upon Water Quality Standards

In-stream criteria of downstream segments for Dissolved Oxygen will be met with an effluent D.O. limitation as follows:

Season	**Concentration**
Summer	5.00
Fall	5.00
Winter	5.00
Spring	5.00

Effluent Limitation for Total Ammonia based upon Water Quality Standards

In-stream criteria of downstream segments for Total Ammonia will be met with an effluent limitation (expressed as Total Ammonia as N) as follows:

Season		**Concentration**		**Load**	
Summer	4 Day Avg. - Chronic	9.9	mg/l as N	348.3	lbs/day
	1 Hour Avg. - Acute	21.5	mg/l as N	756.8	lbs/day
Fall	4 Day Avg. - Chronic	11.6	mg/l as N	408.7	lbs/day
	1 Hour Avg. - Acute	23.5	mg/l as N	829.7	lbs/day
Winter	4 Day Avg. - Chronic	2.8	mg/l as N	98.7	lbs/day
	1 Hour Avg. - Acute	20.8	mg/l as N	734.0	lbs/day
Spring	4 Day Avg. - Chronic	9.4	mg/l as N	333.0	lbs/day
	1 Hour Avg. - Acute	20.4	mg/l as N	718.5	lbs/day

Acute limit calculated with an Acute Zone of Initial Dilution (ZID) to be equal to 50.%.

Effluent Limitation for Total Residual Chlorine based upon Water Quality Standards

In-stream criteria of downstream segments for Total Residual Chlorine will be met with an effluent limitation as follows:

Season		**Concentration**		**Load**	
Summer	4 Day Avg. - Chronic	-0.327	mg/l	-11.53	lbs/day
	1 Hour Avg. - Acute	-0.133	mg/l	-4.69	lbs/day
Fall	4 Day Avg. - Chronic	0.050	mg/l	1.75	lbs/day
	1 Hour Avg. - Acute	0.052	mg/l	1.85	lbs/day
Winter	4 Day Avg. - Chronic	-0.150	mg/l	-5.29	lbs/day
	1 Hour Avg. - Acute	0.058	mg/l	2.05	lbs/day
Spring	4 Day Avg. - Chronic	-0.163	mg/l	-5.76	lbs/day
	1 Hour Avg. - Acute	0.065	mg/l	2.31	lbs/day

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Effluent Limitations for Total Dissolved Solids based upon Water Quality Standards

Season		Concentration		Load	
Summer	Maximum, Acute	1206.5	mg/l	21.28	tons/day
Fall	Maximum, Acute	949.8	mg/l	16.75	tons/day
Winter	Maximum, Acute	1191.3	mg/l	21.01	tons/day
Spring	4 Day Avg. - Chronic	1910.3	mg/l	33.69	tons/day

Colorado Salinity Forum Limits — Determined by Permitting Section

Effluent Limitations for Total Recoverable Metals based upon Water Quality Standards

In-stream criteria of downstream segments for Dissolved Metals will be met with an effluent limitation as follows (based upon a hardness of 537.3 mg/l):

	4 Day Average Concentration		Load		1 Hour Average Concentration		Load	
Aluminum	N/A		N/A		2,343.9	ug/l	82.7	lbs/day
Arsenic	741.77	ug/l	16.9	lbs/day	1,042.4	ug/l	36.8	lbs/day
Cadmium	15.74	ug/l	0.4	lbs/day	30.8	ug/l	1.1	lbs/day
Chromium III	1,795.87	ug/l	40.9	lbs/day	22,430.2	ug/l	791.2	lbs/day
Chromium VI	47.80	ug/l	1.1	lbs/day	45.1	ug/l	1.6	lbs/day
Copper	188.61	ug/l	4.3	lbs/day	205.0	ug/l	7.2	lbs/day
Iron	N/A		N/A		3,107.3	ug/l	109.6	lbs/day
Lead	142.14	ug/l	3.2	lbs/day	2,179.1	ug/l	76.9	lbs/day
Mercury	0.06	ug/l	0.0	lbs/day	7.5	ug/l	0.3	lbs/day
Nickel	1,131.29	ug/l	25.8	lbs/day	6,103.3	ug/l	215.3	lbs/day
Selenium	16.15	ug/l	0.4	lbs/day	58.7	ug/l	2.1	lbs/day
Silver	N/A	ug/l	N/A	lbs/day	213.7	ug/l	7.5	lbs/day
Zinc	2,553.54	ug/l	58.2	lbs/day	1,525.8	ug/l	53.8	lbs/day
Cyanide (free)	27.45	ug/l	0.6	lbs/day	69.1	ug/l	2.4	lbs/day

Effluent Limitations for Heat/Temperature based upon Water Quality Standards

Summer	29.3 Deg. C.	84.7 Deg. F
Fall	19.8 Deg. C.	67.7 Deg. F
Winter	17.2 Deg. C.	63.0 Deg. F
Spring	27.2 Deg. C.	81.0 Deg. F

Effluent Limitations for Organics [Pesticides] Based upon Water Quality Standards

In-stream criteria of downstream segments for Organics [Pesticides] will be met with an effluent limit as follows:

	4 Day Average Concentration		Load		1 Hour Average Concentration		Load	
Aldrin					1.5E+00	ug/l	8.19E-02	lbs/day
Chlordane	4.30E-03	ug/l	1.52E-01	lbs/day	1.2E+00	ug/l	6.55E-02	lbs/day
DDT, DDE	1.00E-03	ug/l	3.53E-02	lbs/day	5.5E-01	ug/l	3.00E-02	lbs/day
Dieldrin	1.90E-03	ug/l	6.70E-02	lbs/day	1.3E+00	ug/l	6.82E-02	lbs/day
Endosulfan	5.60E-02	ug/l	1.98E+00	lbs/day	1.1E-01	ug/l	6.00E-03	lbs/day
Endrin	2.30E-03	ug/l	8.11E-02	lbs/day	9.0E-02	ug/l	4.91E-03	lbs/day

Guthion	0.00E+00 ug/l	0.00E+00 lbs/day	1.0E-02	ug/l	5.46E-04 lbs/day
Heptachlor	3.80E-03 ug/l	1.34E-01 lbs/day	2.6E-01	ug/l	1.42E-02 lbs/day
Lindane	8.00E-02 ug/l	2.82E+00 lbs/day	1.0E+00	ug/l	5.46E-02 lbs/day
Methoxychlor	0.00E+00 ug/l	0.00E+00 lbs/day	3.0E-02	ug/l	1.64E-03 lbs/day
Mirex	0.00E+00 ug/l	0.00E+00 lbs/day	1.0E-02	ug/l	5.46E-04 lbs/day
Parathion	0.00E+00 ug/l	0.00E+00 lbs/day	4.0E-02	ug/l	2.18E-03 lbs/day
PCB's	1.40E-02 ug/l	4.94E-01 lbs/day	2.0E+00	ug/l	1.09E-01 lbs/day
Pentachlorophenol	1.30E+01 ug/l	4.59E+02 lbs/day	2.0E+01	ug/l	1.09E+00 lbs/day
Toxephene	2.00E-04 ug/l	7.05E-03 lbs/day	7.3E-01	ug/l	3.98E-02 lbs/day

Effluent Targets for Pollution Indicators
Based upon Water Quality Standards

In-stream criteria of downstream segments for Pollution Indicators will be met with an effluent limit as follows:

	1 Hour Average	
	Concentration	Loading
Gross Beta (pCi/l)	50.0 pCi/L	
BOD (mg/l)	5.0 mg/l	176.4 lbs/day
Nitrates as N	4.0 mg/l	141.1 lbs/day
Total Phosphorus as P	0.05 mg/l	1.8 lbs/day
Total Suspended Solids	90.0 mg/l	3174.8 lbs/day

Note: Pollution indicator targets are for information purposes only.

Effluent Limitations for Protection of Human Health [Toxics Rule]
Based upon Water Quality Standards (Most stringent of 1C or 3A & 3B as appropriate.)

In-stream criteria of downstream segments for Protection of Human Health [Toxics] will be met with an effluent limit as follows:

	Maximum Concentration	
	Concentration	**Load**
Metals		
Antimony	ug/l	lbs/day
Arsenic	ug/l	lbs/day
Asbestos	ug/l	lbs/day
Beryllium		
Cadmium		
Chromium (III)		
Chromium (VI)		
Copper	ug/l	lbs/day
Cyanide	ug/l	lbs/day
Lead		
Mercury	ug/l	lbs/day
Nickel	ug/l	lbs/day
Selenium		
Silver		
Thallium	ug/l	lbs/day
Zinc		

Metals Effluent Limitations for Protection of All Beneficial Uses
Based upon Water Quality Standards and Toxics Rule

Class 4 Acute Agricultural	**Class 3 Acute Aquatic Wildlife**	**Acute Toxics Drinking Water Source**	**Acute Toxics Wildlife**	**1C Acute Health Criteria**	**Acute Most Stringent**	**Class 3 Chronic Aquatic Wildlife**

Utah Division of Water Quality
Salt Lake City, Utah

	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
Aluminum		2343.9				2343.9	N/A
Antimony				22699.1		22699.1	
Arsenic	527.9	1042.4			0.0	527.9	741.8
Asbestos						0.00E+00	
Barium						0.0	
Beryllium						0.0	
Cadmium	52.6	30.8			0.0	30.8	15.7
Chromium (III)		22430.2			0.0	22430.2	1795.9
Chromium (VI)	520.8	45.1			0.0	45.10	47.80
Copper	1037.2	205.0				205.0	188.6
Cyanide		69.1	1161347.6			69.1	27.5
Iron		3107.3				3107.3	
Lead	527.2	2179.1			0.0	527.2	142.1
Mercury		7.53		0.79	0.0	0.79	0.063
Nickel		6103.3		24282.7		6103.3	1131.3
Selenium	255.8	58.7			0.0	58.7	16.2
Silver		213.7			0.0	213.7	
Thallium				33.3		33.3	
Zinc		1525.8				1525.8	2553.5
Boron	2405.9					2405.9	

Summary Effluent Limitations for Metals [Wasteload Allocation, TMDL]
[If Acute is more stringent than Chronic, then the Chronic takes on the Acute value.]

	WLA Acute ug/l	WLA Chronic ug/l	
Aluminum	2343.9	N/A	
Antimony	22699.07		
Arsenic	527.9	741.8	Acute Controls
Asbestos	0.00E+00		
Barium			
Beryllium			
Cadmium	30.8	15.7	
Chromium (III)	22430.2	1796	
Chromium (VI)	45.1	47.8	Acute Controls
Copper	205.0	188.6	
Cyanide	69.1	27.5	
Iron	3107.3		
Lead	527.2	142.1	
Mercury	0.792	0.063	
Nickel	6103.3	1131	
Selenium	58.7	16.2	
Silver	213.7	N/A	
Thallium	33.3		
Zinc	1525.8	2553.5	Acute Controls
Boron	2405.92		

Other Effluent Limitations are based upon R317-1.

E. coli	126.0	organisms per 100 ml

X. Antidegradation Considerations

The Utah Antidegradation Policy allows for degradation of existing quality where it is determined that such lowering of water quality is necessary to accommodate important economic or social development in the area in which the waters are protected [R317-2-3]. It has been determined that certain chemical parameters introduced by this discharge will cause an increase of the concentration of said parameters in the receiving waters. Under no conditions will the increase in concentration be allowed to interfere with existing instream water uses.

The antidegradation rules and procedures allow for modification of effluent limits less than those based strictly upon mass balance equations utilizing 100% of the assimilative capacity of the receiving water. Additional factors include considerations for "Blue-ribbon" fisheries, special recreational areas, threatened and endangered species, and drinking water sources.

An Antidegradation Level I Review was conducted on this discharge and its effect on the receiving water. Based upon that review, it has been determined that an Antidegradation Level II Review is not required because it is a standard renewal.

XI. Colorado River Salinity Forum Considerations

Discharges in the Colorado River Basin are required to have their discharge at a TDS loading of less than 1.00 tons/day unless certain exemptions apply. Refer to the Forum's Guidelines for additional information allowing for an exceedence of this value.
This doesn't apply to facilities that do not discharge to the Colorado River Basin.

XII. Summary Comments

The mathematical modeling and best professional judgement indicate that violations of receiving water beneficial uses with their associated water quality standards, including important down-stream segments, will not occur for the evaluated parameters of concern as discussed above if the effluent limitations indicated above are met.

XIII. Notice of UPDES Requirement

This Addendum to the Statement of Basis does not authorize any entity or party to discharge to the waters of the State of Utah. That authority is granted through a UPDES permit issued by the Utah Division of Water Quality. The numbers presented here may be changed as a function of other factors. Dischargers are strongly urged to contact the Permits Section for further information. Permit writers may utilize other information to adjust these limits and/or to determine other limits based upon best available technology and other considerations provided that the values in this wasteload analysis [TMDL] are not compromised. See special provisions in Utah Water Quality Standards for adjustments in the Total Dissolved Solids values based upon background concentration.

Utah Division of Water Quality
801-538-6052
File Name: 250106-Jordan_Valley_WCD_GW_WLA_2025.xlsm

APPENDIX - Coefficients and Other Model Information

CBOD Coeff. (Kd)20 1/day	CBOD Coeff. FORCED (Kd)/day	CBOD Coeff. (Ka)T 1/day	REAER. Coeff. (Ka)20 (Ka)/day	REAER. Coeff. FORCED 1/day	REAER. Coeff. (Ka)T 1/day	NBOD Coeff. (Kn)20 1/day	NBOD Coeff. (Kn)T 1/day
0.830	0.000	0.762	4.052	0.000	3.876	0.400	0.346

Open Coeff. (K4)20 1/day	Open Coeff. (K4)T 1/day	NH3 LOSS (K5)20 1/day	NH3 (K5)T 1/day	NO2+NO3 LOSS (K6)20 1/day	NO2+NO3 (K6)T 1/day	TRC Decay K(Cl)20 1/day	TRC K(Cl)(T) 1/day
0.000	0.000	4.000	3.671	0.000	0.000	32.000	28.703

BENTHIC DEMAND (SOD)20 gm/m2/day	BENTHIC DEMAND (SOD)T gm/m2/day
1.000	0.889

K1	K2	K3	K4	K5	K6	K(Cl)	S
CBOD	Reaer.	NH3	Open	NH3 Loss	NO2+3	TRC	Benthic
{theta}	{theta}	{theta}	{theta}	{theta}	{theta}	{theta}	{theta}
1.0	1.0	1.1	1.0	1.0	1.0	1.1	1.1

Antidegredation Review

An antidegradation review (ADR) was conducted to determine whether the proposed activity complies with the applicable antidegradation requirements for receiving waters that may be affected. The Level I ADR evaluated the criteria of R317-2-3.5(b) and determined that a Level II antidegradation Review is not required because this is a permit renewal with no change in discharge.

Freshwater total ammonia criteria based on Title R317-2-14 Utah Administrative Code
Acute

INPUT	Summer	Fall	Winter	Spring
pH:	8.00	8.00	9.18	9.29
Beneficial use classification:	3B	3B	3B	3B

OUTPUT				
Total ammonia nitrogen criteria (mg N/L):				
Acute (Class 3A):	5.667	5.657	0.680	0.594
Acute (Class 3B, 3C, 3D):	**8.486**	**8.470**	**1.017**	**0.888**

Freshwater total ammonia criteria based on Title R317-2-14 Utah Administrative Code
Chronic

INPUT	Summer	Fall	Winter	Spring
Temperature (deg C):	15.00	15.00	15.00	15.00
pH:	8.00	8.00	9.18	9.29
Are fish early life stages present?	No	No	No	No

OUTPUT				
Total ammonia nitrogen criteria (mg N/L):				
Chronic - Fish Early Life Stages Present:	2.376	2.373	0.369	0.325
Chronic - Fish Early Life Stages Absent:	**2.376**	**2.373**	**0.369**	**0.325**

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ATTACHMENT 4

Reasonable Potential Analysis

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	Outfall 001 - JVWCD								
	Arsenic	**Cadmium**	**Chromium**	**Copper**	**Mercury**	**Nickel**	**Selenium**	**Silver**	**Zinc**
	Annual Avg	*Annual Avg*	*Annual Avg*	*Annual Avg*	*Qrt Max*	*Annual Avg*	*Qrt Max*	*Annual Avg*	*Annual Avg*
12/31/2020	0.01165	440.07	0.0148	0.0004	0.0000026	0.00142	0.018	0	0
6/30/2021					0.0000008		0.0112		
12/31/2021	0.0125	0	0.0136	0	0.0000017	0.00385	0.0304	0	0.00154
6/30/2022					0.0000013		0.0045		
12/31/2022	0.01325	0	0.01075	0	0.0000016	0.003	0.0257	0	0.0075
6/30/2023					0.0000031		0.0188		
12/31/2023	0.01285	0	0.0122	0	0.0000045	0.001	0.0264	0	0
6/30/2024					0.0000051		0.0238		

	Outfall 001 - JVWCD		
	Mercury	**Selenium**	**Selenium**
	Daily Max	*Daily Max*	*Annual Max*
12/31/2019	0.00395	0.0275	31.76
1/31/2020	0.00451	0.0202	32.51
2/29/2020	0.00401	0.0169	26.91
3/31/2020	0.0041	0.0237	23.99
4/30/2020	0.0044	0.0253	25.29
5/31/2020	0.0075	0.0113	60.64
6/30/2020	0.0075	0.0061	43.64
7/31/2020	0.0051	0.0328	26.41
8/31/2020	0.0343	0.032	17.91
9/30/2020	0.00484	0.0271	19.17
10/31/2020	0.00398	0.0219	30.86
11/30/2020	0.00337	0.021	
12/31/2020	0.0055	0.0195	
1/31/2021	0.0061	0.019	
2/28/2021	0.0058	0.0213	
3/31/2021	0.0092	0.0216	
4/30/2021	0.0099	0.0123	
5/31/2021	0.0088	0.0109	
6/30/2021	0.0089	0.006	
7/31/2021	0.00594	0.0152	
8/31/2021	0.004	0.0188	
9/30/2021	0.0027	0.0209	
10/31/2021	0.0026	0.03	
11/30/2021	0.0026	0.0335	
12/31/2021	0.00226	0.03	
1/31/2022	0.0014	0.0277	
2/28/2022	0.00123	0.0283	
3/31/2022	0.00124	0.0293	
4/30/2022	0.00326	0.03	
5/31/2022	0.0045	0.0046	
6/30/2022	0.0046	0.0045	
7/31/2022	0.00192	0.0321	
8/31/2022	0.00154	0.0273	
9/30/2022	0.00156	0.0288	
10/31/2022	0.00235	0.0286	
11/30/2022	0.00237	0.0246	
12/31/2022	0.002	0.0293	
1/31/2023	0.0032	0.022	
2/28/2023	0.00324	0.026	
3/31/2023	0.0039	0.0242	
4/30/2023	0.00696	0.0181	
5/31/2023	0.0098	0.0076	
6/30/2023	0.0107	0.0056	
7/31/2023	0.007	0.0288	
8/31/2023	0.004	0.0285	
9/30/2023	0.0046	0.0277	
10/31/2023	0.005	0.0441	
11/30/2023	0.0048	0.0366	
12/31/2023	0.0059	0.0219	
1/31/2024	0.0067	0.0335	
2/29/2024	0.0058	0.0313	
3/31/2024	0.0077	0.0203	
4/30/2024	0.0094	0.0098	
5/31/2024	0.0107	0.007	
6/30/2024	0.0097	0.0069	
7/31/2024	0.0053	0.0259	
8/31/2024	0.0038	0.0263	
9/30/2024	0.00358	0.0184	
10/31/2024	0.0033	0.0243	

95% - Hg

RP Procedure Output

Facility Name:	JVWCD - SWGWTP
Permit Number:	UT0025836
Outfall Number:	1
Parameter	Mercury
Distribution	Lognormal
Data Units	mg/L
Reporting Limit	0.000001
Significant Figures	2
Confidence Interval	95

Maximum Reported Effluent Conc.	0.0343	mg/L
Coefficient of Variation (CV)	0.69	
RP Multiplier	1.00	
Projected Maximum Effluent Conc. (MEC)	0.034	mg/L
Acute Criterion	0	0
Chronic Criterion	0.000012	mg/L
Human Health Criterion	0	0

RP for Acute?	N/A
RP for Chronic?	YES
RP for Human Health?	N/A

Effluent Data

#		#		#	
1	0.00395	41	0.00696	81	0
2	0.00451	42	0.0098	82	0
3	0.00401	43	0.0107	83	0
4	0.0041	44	0.007	84	0
5	0.0044	45	0.004	85	0
6	0.0075	46	0.0046	86	0
7	0.0075	47	0.005	87	0
8	0.0051	48	0.0048	88	0
9	0.0343	49	0.0059	89	0
10	0.00484	50	0.0067	90	0
11	0.00398	51	0.0058	91	0
12	0.00337	52	0.0077	92	0
13	0.0055	53	0.0094	93	0
14	0.0061	54	0.0107	94	0
15	0.0058	55	0.0097	95	0
16	0.0092	56	0.0053	96	0
17	0.0099	57	0.0038	97	0
18	0.0088	58	0.00358	98	0
19	0.0089	59	0.0033	99	0
20	0.00594	60	0	100	0
21	0.004	61	0	101	0
22	0.0027	62	0	102	0
23	0.0026	63	0	103	0
24	0.0026	64	0	104	0
25	0.00226	65	0	105	0
26	0.0014	66	0	106	0
27	0.00123	67	0	107	0
28	0.00124	68	0	108	0
29	0.00326	69	0	109	0
30	0.0045	70	0	110	0
31	0.0046	71	0	111	0
32	0.00192	72	0	112	0
33	0.00154	73	0	113	0
34	0.00156	74	0	114	0
35	0.00235	75	0	115	0
36	0.00237	76	0	116	0
37	0.002	77	0	117	0
38	0.0032	78	0	118	0
39	0.00324	79	0	119	0
40	0.0039	80	0	120	0

99% Hg

RP Procedure Output

Facility Name:	JVWCD - SWGWTP
Permit Number:	UT0025836
Outfall Number:	1
Parameter	Mercury
Distribution	Lognormal
Data Units	mg/L
Reporting Limit	0.000001
Significant Figures	2
Confidence Interval	99

Maximum Reported Effluent Conc.	0.0343	mg/L
Coefficient of Variation (CV)	0.69	
RP Multiplier	1.7	
Projected Maximum Effluent Conc. (MEC)	0.06	mg/L
Acute Criterion	0	0
Chronic Criterion	0.000012	mg/L
Human Health Criterion	0	0

RP for Acute?	N/A
RP for Chronic?	YES
RP for Human Health?	N/A

Effluent Data

#		#		#	
1	0.00395	41	0.00696	81	0
2	0.00451	42	0.0098	82	0
3	0.00401	43	0.0107	83	0
4	0.0041	44	0.007	84	0
5	0.0044	45	0.004	85	0
6	0.0075	46	0.0046	86	0
7	0.0075	47	0.005	87	0
8	0.0051	48	0.0048	88	0
9	0.0343	49	0.0059	89	0
10	0.00484	50	0.0067	90	0
11	0.00398	51	0.0058	91	0
12	0.00337	52	0.0077	92	0
13	0.0055	53	0.0094	93	0
14	0.0061	54	0.0107	94	0
15	0.0058	55	0.0097	95	0
16	0.0092	56	0.0053	96	0
17	0.0099	57	0.0038	97	0
18	0.0088	58	0.00358	98	0
19	0.0089	59	0.0033	99	0
20	0.00594	60	0	100	0
21	0.004	61	0	101	0
22	0.0027	62	0	102	0
23	0.0026	63	0	103	0
24	0.0026	64	0	104	0
25	0.00226	65	0	105	0
26	0.0014	66	0	106	0
27	0.00123	67	0	107	0
28	0.00124	68	0	108	0
29	0.00326	69	0	109	0
30	0.0045	70	0	110	0
31	0.0046	71	0	111	0
32	0.00192	72	0	112	0
33	0.00154	73	0	113	0
34	0.00156	74	0	114	0
35	0.00235	75	0	115	0
36	0.00237	76	0	116	0
37	0.002	77	0	117	0
38	0.0032	78	0	118	0
39	0.00324	79	0	119	0
40	0.0039	80	0	120	0

95% Hg - Outliers Removed

RP Procedure Output

Facility Name:	JVWCD - SWGWTP
Permit Number:	UT0025836
Outfall Number:	1
Parameter	Mercury
Distribution	Lognormal
Data Units	mg/L
Reporting Limit	0.000001
Significant Figures	2
Confidence Interval	95

Maximum Reported Effluent Conc.	0.0107	mg/L
Coefficient of Variation (CV)	0.62	
RP Multiplier	1.0	
Projected Maximum Effluent Conc. (MEC)	0.011	mg/L

Acute Criterion	0	0
Chronic Criterion	0.000012	mg/L
Human Health Criterion	0	0

RP for Acute?	N/A
RP for Chronic?	YES
RP for Human Health?	N/A

Effluent Data

#		#		#	
1	0.00395	41	0.00696	81	0
2	0.00451	42	0.0098	82	0
3	0.00401	43	0.0107	83	0
4	0.0041	44	0.007	84	0
5	0.0044	45	0.004	85	0
6	0.0075	46	0.0046	86	0
7	0.0075	47	0.005	87	0
8	0.0051	48	0.0048	88	0
9	0	49	0.0059	89	0
10	0.00484	50	0.0067	90	0
11	0.00398	51	0.0058	91	0
12	0.00337	52	0.0077	92	0
13	0.0055	53	0.0094	93	0
14	0.0061	54	0.0107	94	0
15	0.0058	55	0.0097	95	0
16	0.0092	56	0.0053	96	0
17	0.0099	57	0.0038	97	0
18	0.0088	58	0.00358	98	0
19	0.0089	59	0.0033	99	0
20	0.00594	60	0	100	0
21	0.004	61	0	101	0
22	0.0027	62	0	102	0
23	0.0026	63	0	103	0
24	0.0026	64	0	104	0
25	0.00226	65	0	105	0
26	0.0014	66	0	106	0
27	0.00123	67	0	107	0
28	0.00124	68	0	108	0
29	0.00326	69	0	109	0
30	0.0045	70	0	110	0
31	0.0046	71	0	111	0
32	0.00192	72	0	112	0
33	0.00154	73	0	113	0
34	0.00156	74	0	114	0
35	0.00235	75	0	115	0
36	0.00237	76	0	116	0
37	0.002	77	0	117	0
38	0.0032	78	0	118	0
39	0.00324	79	0	119	0
40	0.0039	80	0	120	0

99% Hg - Outliers Removed

RP Procedure Output

Facility Name:	JVWCD - SWGWTP
Permit Number:	UT0025836
Outfall Number:	1
Parameter	Mercury
Distribution	Lognormal
Data Units	mg/L
Reporting Limit	0.000001
Significant Figures	2
Confidence Interval	99

Maximum Reported Effluent Conc.	0.0107	mg/L
Coefficient of Variation (CV)	0.62	
RP Multiplier	1.7	
Projected Maximum Effluent Conc. (MEC)	0.018	mg/L

Acute Criterion	0	0
Chronic Criterion	0.000012	mg/L
Human Health Criterion	0	0

RP for Acute?	N/A
RP for Chronic?	YES
RP for Human Health?	N/A

Effluent Data

#		#		#	
1	0.00395	41	0.00696	81	0
2	0.00451	42	0.0098	82	0
3	0.00401	43	0.0107	83	0
4	0.0041	44	0.007	84	0
5	0.0044	45	0.004	85	0
6	0.0075	46	0.0046	86	0
7	0.0075	47	0.005	87	0
8	0.0051	48	0.0048	88	0
9	0	49	0.0059	89	0
10	0.00484	50	0.0067	90	0
11	0.00398	51	0.0058	91	0
12	0.00337	52	0.0077	92	0
13	0.0055	53	0.0094	93	0
14	0.0061	54	0.0107	94	0
15	0.0058	55	0.0097	95	0
16	0.0092	56	0.0053	96	0
17	0.0099	57	0.0038	97	0
18	0.0088	58	0.00358	98	0
19	0.0089	59	0.0033	99	0
20	0.00594	60	0	100	0
21	0.004	61	0	101	0
22	0.0027	62	0	102	0
23	0.0026	63	0	103	0
24	0.0026	64	0	104	0
25	0.00226	65	0	105	0
26	0.0014	66	0	106	0
27	0.00123	67	0	107	0
28	0.00124	68	0	108	0
29	0.00326	69	0	109	0
30	0.0045	70	0	110	0
31	0.0046	71	0	111	0
32	0.00192	72	0	112	0
33	0.00154	73	0	113	0
34	0.00156	74	0	114	0
35	0.00235	75	0	115	0
36	0.00237	76	0	116	0
37	0.002	77	0	117	0
38	0.0032	78	0	118	0
39	0.00324	79	0	119	0
40	0.0039	80	0	120	0

95% Se

RP Procedure Output

Facility Name:	JVWCD - SWGWTP
Permit Number:	UT0025836
Outfall Number:	1
Parameter	Selenium
Distribution	Lognormal
Data Units	mg/L
Reporting Limit	0.0007
Significant Figures	2
Confidence Interval	95

Maximum Reported Effluent Conc.	0.0441	mg/L
Coefficient of Variation (CV)	0.61	
RP Multiplier	1.00	
Projected Maximum Effluent Conc. (MEC)	0.044	mg/L
Acute Criterion	0.0184	mg/L
Chronic Criterion	0.0046	mg/L
Human Health Criterion	0	0

RP for Acute?	YES
RP for Chronic?	YES
RP for Human Health?	N/A

Effluent Data

#		#		#	
1	0.0275	41	0.0181	81	0
2	0.0202	42	0.0076	82	0
3	0.0169	43	0.0056	83	0
4	0.0237	44	0.0288	84	0
5	0.0253	45	0.0285	85	0
6	0.0113	46	0.0277	86	0
7	0.0061	47	0.0441	87	0
8	0.0328	48	0.0366	88	0
9	0.032	49	0.0219	89	0
10	0.0271	50	0.0335	90	0
11	0.0219	51	0.0313	91	0
12	0.021	52	0.0203	92	0
13	0.0195	53	0.0098	93	0
14	0.019	54	0.007	94	0
15	0.0213	55	0.0069	95	0
16	0.0216	56	0.0259	96	0
17	0.0123	57	0.0263	97	0
18	0.0109	58	0.0184	98	0
19	0.006	59	0.0243	99	0
20	0.0152	60	0	100	0
21	0.0188	61	0	101	0
22	0.0209	62	0	102	0
23	0.03	63	0	103	0
24	0.0335	64	0	104	0
25	0.03	65	0	105	0
26	0.0277	66	0	106	0
27	0.0283	67	0	107	0
28	0.0293	68	0	108	0
29	0.03	69	0	109	0
30	0.0046	70	0	110	0
31	0.0045	71	0	111	0
32	0.0321	72	0	112	0
33	0.0273	73	0	113	0
34	0.0288	74	0	114	0
35	0.0286	75	0	115	0
36	0.0246	76	0	116	0
37	0.0293	77	0	117	0
38	0.022	78	0	118	0
39	0.026	79	0	119	0
40	0.0242	80	0	120	0

99% Se

RP Procedure Output

Facility Name:	JVWCD - SWGWTP
Permit Number:	UT0025836
Outfall Number:	1
Parameter	Selenium
Distribution	Lognormal
Data Units	mg/L
Reporting Limit	0.0007
Significant Figures	2
Confidence Interval	99

Maximum Reported Effluent Conc.	0.0441	mg/L
Coefficient of Variation (CV)	0.61	
RP Multiplier	1.7	
Projected Maximum Effluent Conc. (MEC)	0.073	mg/L
Acute Criterion	0.0184	mg/L
Chronic Criterion	0.0046	mg/L
Human Health Criterion	0	0

RP for Acute?	YES
RP for Chronic?	YES
RP for Human Health?	N/A

Effluent Data

#		#		#	
1	0.0275	41	0.0181	81	0
2	0.0202	42	0.0076	82	0
3	0.0169	43	0.0056	83	0
4	0.0237	44	0.0288	84	0
5	0.0253	45	0.0285	85	0
6	0.0113	46	0.0277	86	0
7	0.0061	47	0.0441	87	0
8	0.0328	48	0.0366	88	0
9	0.032	49	0.0219	89	0
10	0.0271	50	0.0335	90	0
11	0.0219	51	0.0313	91	0
12	0.021	52	0.0203	92	0
13	0.0195	53	0.0098	93	0
14	0.019	54	0.007	94	0
15	0.0213	55	0.0069	95	0
16	0.0216	56	0.0259	96	0
17	0.0123	57	0.0263	97	0
18	0.0109	58	0.0184	98	0
19	0.006	59	0.0243	99	0
20	0.0152	60	0	100	0
21	0.0188	61	0	101	0
22	0.0209	62	0	102	0
23	0.03	63	0	103	0
24	0.0335	64	0	104	0
25	0.03	65	0	105	0
26	0.0277	66	0	106	0
27	0.0283	67	0	107	0
28	0.0293	68	0	108	0
29	0.03	69	0	109	0
30	0.0046	70	0	110	0
31	0.0045	71	0	111	0
32	0.0321	72	0	112	0
33	0.0273	73	0	113	0
34	0.0288	74	0	114	0
35	0.0286	75	0	115	0
36	0.0246	76	0	116	0
37	0.0293	77	0	117	0
38	0.022	78	0	118	0
39	0.026	79	0	119	0
40	0.0242	80	0	120	0

95% Se - Outliers Removed

RP Procedure Output

Facility Name:	JVWCD - SWGWTP
Permit Number:	UT0025836
Outfall Number:	1
Parameter	Selenium
Distribution	Lognormal
Data Units	mg/L
Reporting Limit	0.0007
Significant Figures	2
Confidence Interval	95

Maximum Reported Effluent Conc.	0.0366	mg/L
Coefficient of Variation (CV)	0.60	
RP Multiplier	1.0	
Projected Maximum Effluent Conc. (MEC)	0.037	mg/L
Acute Criterion	0.0184	mg/L
Chronic Criterion	0.0046	mg/L
Human Health Criterion	0	0

RP for Acute?	YES
RP for Chronic?	YES
RP for Human Health?	N/A

Effluent Data

#		#		#	
1	0.0275	41	0.0181	81	0
2	0.0202	42	0.0076	82	0
3	0.0169	43	0.0056	83	0
4	0.0237	44	0.0288	84	0
5	0.0253	45	0.0285	85	0
6	0.0113	46	0.0277	86	0
7	0.0061	47	0	87	0
8	0.0328	48	0.0366	88	0
9	0.032	49	0.0219	89	0
10	0.0271	50	0.0335	90	0
11	0.0219	51	0.0313	91	0
12	0.021	52	0.0203	92	0
13	0.0195	53	0.0098	93	0
14	0.019	54	0.007	94	0
15	0.0213	55	0.0069	95	0
16	0.0216	56	0.0259	96	0
17	0.0123	57	0.0263	97	0
18	0.0109	58	0.0184	98	0
19	0.006	59	0.0243	99	0
20	0.0152	60	0	100	0
21	0.0188	61	0	101	0
22	0.0209	62	0	102	0
23	0.03	63	0	103	0
24	0.0335	64	0	104	0
25	0.03	65	0	105	0
26	0.0277	66	0	106	0
27	0.0283	67	0	107	0
28	0.0293	68	0	108	0
29	0.03	69	0	109	0
30	0.0046	70	0	110	0
31	0.0045	71	0	111	0
32	0.0321	72	0	112	0
33	0.0273	73	0	113	0
34	0.0288	74	0	114	0
35	0.0286	75	0	115	0
36	0.0246	76	0	116	0
37	0.0293	77	0	117	0
38	0.022	78	0	118	0
39	0.026	79	0	119	0
40	0.0242	80	0	120	0

99% Se - Outliers Removed

RP Procedure Output

Facility Name:	JVWCD - SWGWTP
Permit Number:	UT0025836
Outfall Number:	1
Parameter	Selenium
Distribution	Lognormal
Data Units	mg/L
Reporting Limit	0.0007
Significant Figures	2
Confidence Interval	99

Maximum Reported Effluent Conc.	0.0366	mg/L
Coefficient of Variation (CV)	0.60	
RP Multiplier	1.7	
Projected Maximum Effluent Conc. (MEC)	0.06	mg/L
Acute Criterion	0.0184	mg/L
Chronic Criterion	0.0046	mg/L
Human Health Criterion	0	0

RP for Acute?	YES
RP for Chronic?	YES
RP for Human Health?	N/A

Effluent Data

#		#		#	
1	0.0275	41	0.0181	81	0
2	0.0202	42	0.0076	82	0
3	0.0169	43	0.0056	83	0
4	0.0237	44	0.0288	84	0
5	0.0253	45	0.0285	85	0
6	0.0113	46	0.0277	86	0
7	0.0061	47	0	87	0
8	0.0328	48	0.0366	88	0
9	0.032	49	0.0219	89	0
10	0.0271	50	0.0335	90	0
11	0.0219	51	0.0313	91	0
12	0.021	52	0.0203	92	0
13	0.0195	53	0.0098	93	0
14	0.019	54	0.007	94	0
15	0.0213	55	0.0069	95	0
16	0.0216	56	0.0259	96	0
17	0.0123	57	0.0263	97	0
18	0.0109	58	0.0184	98	0
19	0.006	59	0.0243	99	0
20	0.0152	60	0	100	0
21	0.0188	61	0	101	0
22	0.0209	62	0	102	0
23	0.03	63	0	103	0
24	0.0335	64	0	104	0
25	0.03	65	0	105	0
26	0.0277	66	0	106	0
27	0.0283	67	0	107	0
28	0.0293	68	0	108	0
29	0.03	69	0	109	0
30	0.0046	70	0	110	0
31	0.0045	71	0	111	0
32	0.0321	72	0	112	0
33	0.0273	73	0	113	0
34	0.0288	74	0	114	0
35	0.0286	75	0	115	0
36	0.0246	76	0	116	0
37	0.0293	77	0	117	0
38	0.022	78	0	118	0
39	0.026	79	0	119	0
40	0.0242	80	0	120	0

REASONABLE POTENTIAL ANALYSIS

DWQ has worked to improve our RP analysis 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[1]. 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.

Initial screening on arsenic, cadmium, chromium, copper, nickel, silver, and zinc could not be completed, as sufficient data were unavailable. Increased monitoring will be added in this Permit renewal to allow DWQ to run an RP analysis during the next permit renewal.

Initial screening for metals values that were submitted through the DMRs showed that a closer look at some of the metals is needed. A copy of the initial screening is included in the "Effluent Metals and RP Screening Results" table in this attachment. The initial screening check for metals showed that the full model needed to be run on selenium and mercury.

Selenium:

The RP model was run on selenium using the most recent data back through 2019. This resulted in 59 data points and that there is a RP for exceedance of an acute water quality standard for selenium. Reviewing the data showed that there could be at least one outlier in the data. The EPA ProUCL model was used to evaluate the data. This produced the same outlier for the 0.0441 mg/L (October 2023) data point.

The value was excluded from the data set and RP was rerun at both the 95% and 99% confidence levels. The results of the model are that there is reasonable potential to cause acute and chronic toxicity at both 95% and 99% confidence. This result indicates that the inclusion of an effluent limit for selenium will remain in this Permit. Monitoring for selenium will remain the same as the previous permit (2 x weekly). (Outcome C from Reasonable Potential Guide)

Mercury:

The RP model was run on mercury using the most recent data back through 2019. This resulted in 59 data points and that there is a RP for exceedance of a chronic water quality standard for mercury. Reviewing the data showed that there could be at least one outlier in the data. The EPA ProUCL model was used to evaluate the data. This produced the same outlier for the 0.0343 mg/L (August 2020) data point.

The value was excluded from the data set and RP was rerun at both the 95% and 99% confidence levels. The results of the model are that there is reasonable potential for chronic toxicity at 95% and 99% confidence. There is no acute standard for mercury, thus DWQ was unable to evaluate the RP for an acute limit. This result

[1] See Reasonable Potential Analysis Guidance for definitions of terms

indicates that the inclusion of an effluent limit for mercury will remain the same as the previous Permit. Monitoring for mercury will remain the same as the previous permit (Monthly). (Outcome C from Reasonable Potential Guide)

A Summary of the RP Model inputs and outputs are included in the table below.

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

RP input/output summary

RP Procedure Output	Outfall Number: 001	
Parameter	Selenium	
Distribution	Lognormal	
Reporting Limit	0.0007 mg/L	
Significant Figures	2	
Maximum Reported Effluent Conc.	0.0441 mg/L	
Coefficient of Variation (CV)	0.61 mg/L	
Acute Criterion	0.0184 mg/L	
Chronic Criterion	0.0046 mg/L	
Confidence Interval	95	99
Projected Maximum Effluent Conc. (MEC)	0.044 mg/L	0.073 mg/L
RP Multiplier	1.0	1.7
RP for Acute?	YES	YES
RP for Chronic?	YES	YES
Outcome	C	

RP Procedure Output	Outfall Number: 001	
Parameter	Selenium – Outliers Removed	
Distribution	Lognormal	
Reporting Limit	0.0007 mg/L	
Significant Figures	2	
Maximum Reported Effluent Conc.	0.0366 mg/L	
Coefficient of Variation (CV)	0.61 mg/L	
Acute Criterion	0.0184 mg/L	
Chronic Criterion	0.0046 mg/L	
Confidence Interval	95	99
Projected Maximum Effluent Conc. (MEC)	0.037 mg/L	0.06 mg/L
RP Multiplier	1.0	1.7
RP for Acute?	YES	YES
RP for Chronic?	YES	YES
Outcome	C	

RP Procedure Output	Outfall Number: 001	
Parameter	Mercury	
Distribution	Lognormal	
Reporting Limit	0.000001	
Significant Figures	3	
Maximum Reported Effluent Conc.	0.0343 mg/L	
Coefficient of Variation (CV)	0.69	
Acute Criterion	N/A	
Chronic Criterion	0.000012 mg/L	
Confidence Interval	95	99
Projected Maximum Effluent Conc. (MEC)	0.034 mg/L	0.06 mg/L
RP Multiplier	1.0	1.7
RP for Acute?	N/A	N/A
RP for Chronic?	YES	YES
Outcome	C	

RP Procedure Output	Outfall Number: 001	
Parameter	Mercury – Outlier Removed	
Distribution	Lognormal	
Reporting Limit	0.000001	
Significant Figures	x	
Maximum Reported Effluent Conc.	0.0107 mg/L	
Coefficient of Variation (CV)	0.62	
Acute Criterion	N/A	
Chronic Criterion	0.000012 mg/L	
Confidence Interval	95	99
Projected Maximum Effluent Conc. (MEC)	0.011 mg/L	0.018 mg/L
RP Multiplier	12.0	1.7
RP for Acute?	N/A	N/A
RP for Chronic?	YES	YES
Outcome	C	