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

UTAH POLLUTANT DISCHARGE ELIMINATION SYSTEM (UPDES) PERMITS

Major Industrial Permit No. **UT0025836**

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

JORDAN VALLEY SOUTHWEST GROUNDWATER TREATMENT PLANT

is hereby authorized to discharge from its wastewater treatment facility to receiving waters named **TRANSITIONAL WATERS AND GILBERT BAY OF THE GREAT SALT LAKE AND JORDAN RIVER**,

and to discharge storm water,

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

This permit shall become effective on July 1, 2020

This permit expires at midnight on June 30, 2025.

Signed this 11th day of June, 2020.

Erica Brown Gaddis, PhD
Director

DWQ-2019-012806

Table of Contents

Outline Page Number

I. DISCHARGE LIMITATIONS AND REPORTING REQUIREMENTS

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

Outfall	Description of Discharge Point
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 Southwest Groundwater Treatment Plant 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, Footnotes b and e* of the UPDES permit.)
002	Located at latitude 40°36'5.58"N and longitude 111°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 Southwest Groundwater Treatment Plant to Jordan River.

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

C. Specific Limitations and Self-Monitoring Requirements.

1. Effective immediately, and lasting through the life of this permit, there shall be no acute or chronic toxicity in Outfall(s) 001 and 002 as defined in *Part VIII*, and determined by test procedures described in *Part I. C.7.a & b* of this permit.

2. Effective immediately and lasting the duration of this permit, the permittee is authorized to discharge from Outfalls 001 and 002. Such discharges shall be limited and monitored by the permittee as specified below:

Table 1					
Outfall 001					
Parameter	**Effluent Limitations [a, b, c, d, e]**				
	Maximum Monthly Avg	**Maximum Weekly Avg**	**Annual Max**	**Daily Minimum**	**Daily Maximum**
Total Flow [f, g]	3.0	--	--	--	--
TSS, mg/L	25	35	--	--	70
Selenium, total, mg/L	--	--	--	--	0.054
Selenium, kg/year	--	--	224	--	--
Selenium [h]	--	--	--	--	--
Mercury, kg [i, j]	--	--	0.38	--	--
Oil & Grease, mg/L	--	--	--	--	10
pH, Standard Units	--	--	--	6.5	9

Table 2					
Outfall 002					
Parameter	**Effluent Limitations [a, b, c, d, e]**				
	Maximum Monthly Avg	**Maximum Weekly Avg**	**Annual Max**	**Daily Minimum**	**Daily Maximum**
Flow, MGD					3
TDS, mg/L	--	--	--	--	1,200
TSS, mg/L	25	35	--	--	70
Selenium, total, mg/L	--	--	--	--	0.027
Selenium, kg/year	--	--	26.4	--	--
Oil & Grease, mg/L	--	--	--	--	10
pH, Standard Units	--	--	--	6.5	9
WET, Chronic Biomonitoring ***Ceriodaphnia dubia*** ***Pimephales promelas*** **(Fathead Minnow)**	--	--	--	--	IC_{25}> 26.1% effluent

Table 3			
Outfall 001			
Parameter	**Self-Monitoring and Reporting Requirements** [a, b, c, d, e]		
	Frequency	**Sample Type**	**Units**
Total Flow [f, g]	Daily or Continuous	Measured	MGD
BOD_5 [k]	2 x annual	Composite or Grab	mg/L
TSS [o]	2 x weekly	Composite or Grab	mg/L
Selenium, total	2 x weekly	Composite or Grab	mg/L
Selenium [n]	Monthly	Calculated	kg/yr
Selenium [h]	Annually	Bird eggs	mg/kg
Mercury, total [i]	Monthly	Composite or Grab	ng/L
Mercury [m]	Monthly	Calculated	kg/yr
Oil & Grease, mg/L	Monthly if sheen is observed	Grab	mg/L
pH, Standard Units	Monthly	Grab	SU
WET, Acute Biomonitoring *Cyprinodon variegatus only*	Quarterly	Composite	Pass/Fail
WET, Chronic Biomonitoring [k, l] *Cyprinodon variegatus only*	Quarterly	Composite	TUc ≤ 1.6
Metals [m, p]	Annually	Composite or Grab	mg/L

Table 4			
Outfall 002			
Parameter	**Self-Monitoring and Reporting Requirements** [a, b, c, d, e]		
	Frequency	**Sample Type**	**Units**
Total Flow [f, g]	Daily or Continuous	Measured	MGD
TDS, mg/L	2 x weekly	Composite or Grab	mg/L
TSS, mg/L	2 x weekly	Composite or Grab	mg/L
Selenium, total, mg/L	2 x weekly	Composite or Grab	mg/L
Selenium, kg/year [n]	Annually	Calculated	kg/yr
Copper, mg/L	2 x weekly	Composite or Grab	mg/L
Oil & Grease, mg/L	2 x weekly, *if sheen is observed*	Grab	mg/L
pH, Standard Units	2 x weekly	Grab	SU
E.coli	2 x weekly	Grab	No./100mL
Phosphorus	2 x weekly	Composite or Grab	mg/L
Temperature	Continuous	Measured	Fahrenheit
WET, Chronic Biomonitoring			
Ceriodaphnia dubia	2nd & 4th Quarter	Composite	Pass/Fail
Pimephales promelas (Fathead Minnow)	1st & 3rd Quarter	Composite	Pass/Fail
Metals [m, p]	Annually	Composite or Grab	mg/L

Table References

a. See Definitions, ***Part VIII***, for definition of terms.

b. All parameters in this table will be reported on the monthly Discharge Monitoring Report.

c. 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.

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

e. There shall be no discharge of sanitary wastes.

f. Flow measurements of effluent volume shall be made in such a manner that the permittee can affirmatively demonstrate that representative values are being obtained.

g. The flow rates and durations of all discharges shall be reported in the Annual Project Operating Report.

h. Implementation of the selenium water quality standard of 12.5 mg/kg for Gilbert Bay of the GSL is outlined in ***Part I.D.5*** of this UPDES Permit.

i. Mercury samples must be analyzed using Method 1631 or other sufficiently sensitive method. The sample type (composite or grab) should be performed according to the method's requirements. Mercury needs to have appropriate Quality Control sampling methods established to avoid spikes.

j. Jordan Valley shall monitor BOD_5 at the end of pipe bi-annually. If lake levels rise where monitoring at end of the pipe is not feasible, then Jordan Valley may petition the Director to establish an alternate sampling point.

k. 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.

l. 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.

m. Jordan Valley shall monitor the following metals at the end of pipe annually with the most sensitive method; Arsenic, Cadmium, Chromium, Copper (Outfall 001), Cyanide, Iron, Lead, Mercury (Outfall 002), Nickel, Silver and Zinc. The sample type (composite or grab) should be performed according to the method's requirements.

n. Cumulative totals for these parameters shall be reported on the monthly Discharge Monitoring Reports.

o. Monitoring of this parameter is required at end of pipe during pipeline cleaning operations. Monitoring results must be included with the DMR for that monitoring period. If lake levels rise where monitoring at the end of pipe is not feasible, then Jordan Valley may petition the Director to establish an alternate sampling point.

p. 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 an annual basis by the facility on 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.

Table References end

1. Samples taken in compliance with the monitoring requirements specified above shall be taken at the following locations: Outfall 001 shall be monitored at the Southwest Groundwater Treatment Plant prior to the effluent entering the byproduct pipeline and Outfall 002 shall be monitored prior to mixing with any receiving water.

2. ***Annual Project Operating Report for Pump to Waste, Upset Discharges and Cleaning and Maintenance Conditions for the Shallow Wells:*** On an annual basis, Jordan Valley will summarize the duration and frequency of all pump to waste discharges, discharges associated with cleaning and maintenance of the RO unit and any discharges resulting from facility upset conditions that occurred during that calendar year. This summary will be submitted to the DWQ by February 1st of the following year.

3. ***Joint Discharge Area Transitional Waters Monitoring Program:*** Jordan Valley is required to annually sample eight (8) bird eggs, if available, but not exceed 20% of available eggs, during the nesting season, April 15 through June 30, for the current permit cycle. The eggs will be collected from bird nests in the joint Jordan Valley Outfall 001 and Kennecott Outfall 002 affected outfall area. The geometric mean selenium concentration of all of the eggs but at least 5 eggs from a single season will be compared to the tissue based selenium water quality standard of 12.5 mg/kg dry weight for Gilbert Bay of Great Salt Lake to demonstrate compliance with the Narrative Standards in the Class 5E Transitional Waters affected by the discharge. Jordan Valley must notify the Director within 7 business days of becoming aware of any egg concentrations that exceed 9.8 mg/kg. In addition, total mercury concentrations in the egg tissue samples must also be evaluated and reported by Jordan Valley.

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

   Jordan Valley is required to annually collect co-located macro-invertebrate and water samples once between April 15 and June 30 and as close in time as practical to the bird egg collection. These samples will be analyzed for selenium. Water samples will be analyzed for methyl and total mercury and biota samples will be analyzed for total mercury. The co-located macro-invertebrates and water samples will be collected at up to six (6) evenly spaced locations along the discharge watercourse from the discharge point to the water's edge from where Outfall 001 enters the standing waters of Great Salt Lake.

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

October. The water sample will be analyzed for total and methyl mercury and selenium. The brine shrimp sample will be analyzed for total mercury and selenium.

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

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

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

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

6. Compliance Schedule

   There is no Compliance Schedule included in this renewal permit.

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

   a. *Whole Effluent Testing – Acute Toxicity*. Starting immediately, the permittee shall quarterly conduct acute static renewal toxicity tests on a composite sample of the final effluent at Outfalls 001 and 002. The sample shall be collected at the point of compliance before mixing with the receiving water.

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

the first sample is on a Monday, during the next sampling period, the sampling shall begin on a Wednesday, etc.

The static-renewal acute toxicity tests shall be conducted in general accordance with the procedures set out in the latest revision of *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition, October 2002, EPA-821-R-02-012 as per 40 CFR 136.3(a) TABLE IA-LIST OF APPROVED BIOLOGICAL METHODS.* For Outfall 001, the permittee shall conduct acute 96-hour static renewal toxicity test and a 7-day chronic static renewal toxicity test using *Cyprinodon variegatus* (sheepshead minnow). Based on the Test Acceptability Criteria included in Utah Pollutant Discharge Elimination System (UPDES) Permit and Enforcement Guidance Document for Whole Effluent Toxicity Control (Biomonitoring) January, 2017, the Director may require acceptable variations in the test, i.e. temperature, carbon dioxide atmosphere, or any other acceptable variations in the testing procedure, as documented in the Fact Sheet Statement of Basis. If possible dilution water should be taken from the receiving stream. A valid replacement test is required within the specified sampling period to remain in compliance.

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

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

Quarterly test results shall be reported along with the Discharge Monitoring Report (DMR) submitted for the end of the required reporting period (month, quarter or semi-annual) e.g., biomonitoring results for the calendar quarter ending March 31 shall be reported with the DMR due April 28, with the remaining biomonitoring reports submitted with DMRs due each July 28, October 28, and January 28. Monthly test results shall be reported along with the DMR submitted for that month. The format for the report shall be consistent with Appendix C of "Utah Pollutant Discharge Elimination System (UPDES) Permitting and Enforcement Guidance Document for Whole Effluent Toxicity (Biomonitoring), Utah Division of Water Quality, January 2017.

If the results for ten consecutive tests indicate no acute toxicity, the permittee may request a reduction in acute toxicity testing by a reduction in monitoring frequency, alternating species, or using only the most sensitive species. The Director may approve or deny the request. If the request is approved, the test procedures are to be the same as specified above for the test species. Under no circumstances shall monitoring for WET at major facilities be reduced less than quarterly. Minor facilities may be less than quarterly at the discretion of the Director.

b. *Whole Effluent Testing – Chronic Toxicity*.

For discharges from Outfall 001 to Class 5 waters (Great Salt Lake), chronic WET tests are considered an indicator because of uncertainties regarding the representativeness of the standard test species for Great Salt Lake. If a separate acute test is not conducted, the results of the acute duration portion of a chronic test are reported as specified in Part a. Whole Effluent Testing – Acute Toxicity. As an indicator, the chronic test results can demonstrate compliance with portions of the Narrative Standards (R317-2-7.2). However, the chronic WET test results alone do not demonstrate noncompliance with the Narrative Standards. As indicators, the chronic WET test results alone are not used for determining reasonable potential for toxicity or noncompliance with the permit.)

Starting immediately, the permittee shall quarterly, conduct chronic static renewal toxicity tests on a composite sample of the final effluent at Outfall 001. Samples taken in compliance with the monitoring requirements specified above shall be taken at the following locations: 001 shall be monitored at the Southwest Groundwater Treatment Plant prior to the effluent entering the byproduct pipeline and 002 shall be monitored prior to mixing with any receiving water."

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

A multi dilution test consisting of at least five concentrations and a control is required at two dilutions below and two above the RWC, if possible. If test acceptability criteria are not met for control survival, growth, or reproduction, the test shall be considered invalid. A valid replacement test is required within the specified sampling period to remain in compliance with this permit. For Outfall 001, Chronic toxicity occurs when, during a chronic toxicity test, the TUc $\geq$ 1.6. Toxic unit chronic (TUc) is the reciprocal of the effluent concentration that causes no observable effect on the test organisms by the end of the chronic exposure period and is calculated as $100/IC_{25}$. For Outfall 002 Chronic toxicity occurs when, during a chronic toxicity test, the 25% inhibition concentration (IC_{25}) calculated on the basis of test organism survival and growth or survival and reproduction, is less than or equal to 26.1% Effluent concentration. If a sample is found to be chronically toxic during a routine test, the monitoring frequency shall become biweekly (see *Part I.C.4.b Accelerated Testing*). If possible, dilution water should be obtained from the receiving stream.

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

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

shall be consistent with Appendix C of "Utah Pollutant Discharge Elimination System (UPDES) Permitting and Enforcement Guidance Document for Whole Effluent Toxicity, Utah Division of Water Quality, January, 2017.

If the results for ten consecutive tests indicate no chronic toxicity, the permittee may submit a request to the Director to allow a reduction in chronic toxicity testing by alternating species, or using only the most sensitive species. The permit issuing authority may approve or deny the request based on the results and other available information without public notice. If the request is approved, the test procedures are to be the same as specified above for the test species. Under no circumstances shall monitoring for WET at major facilities be reduced less than quarterly. Minor facilities may be less than quarterly at the discretion of the Director.

c. *Accelerated Testing*. When whole effluent toxicity is indicated during routine WET testing as specified in this permit, the permittee shall notify the Director in writing within 5 days after becoming aware of the test result. The permittee shall perform an accelerated schedule of WET testing to establish whether a pattern of toxicity exists unless the permittee notifies the Director and commences a PTI, TIE, or a TRE. Accelerated testing or the PTI, TIE, or TRE will begin within fourteen days after the permittee becomes aware of the test result. Accelerated testing shall be conducted as specified under Part I. Pattern of Toxicity. If the accelerated testing demonstrates no pattern of toxicity, routine monitoring shall be resumed.

d. *Pattern of Toxicity*. A pattern of toxicity is defined by the results of a series of up to five biomonitoring tests pursuant to the accelerated testing requirements using a full set of dilutions for acute (five plus the control) and five effluent dilutions for chronic (five plus the control), on the species found to be more sensitive, once every week for up to five consecutive weeks for acute and once every two weeks up to ten consecutive weeks for chronic.

If two (2) consecutive tests (not including the scheduled test which triggered the search for a pattern of toxicity) do not result in an exceedance of the acute or chronic toxicity criteria (TUc $\geq$ 1.6), no further accelerated testing will be required and no pattern of toxicity will be found to exist. The permittee will provide written verification to the Director within 5 days of determining no pattern of toxicity exists, and resume routine monitoring.

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

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

1) 2 consecutive tests fail, or 3 out of 5 tests fail, at which point a pattern of toxicity will have been identified, or

2) 2 consecutive tests pass, or 3 out of 5 tests pass, in which case no pattern of toxicity is identified.

e. *Preliminary Toxicity Investigation.*

(1) When a pattern of toxicity is detected the permittee will notify the Director in writing within 5 days and begin an evaluation of the possible causes of the toxicity. The permittee will have 15 working days from demonstration of the

pattern of toxicity to complete an optional Preliminary Toxicity Investigation (PTI) and submit a written report of the results to the Director. The PTI may include, but is not limited to: additional chemical and biological monitoring, examination of pretreatment program records, examination of discharge monitoring reports, a thorough review of the testing protocol, evaluation of treatment processes and chemical use, inspection of material storage and transfer areas to determine if any spill may have occurred.

(2) If the PTI identifies a probable toxicant and/or a probable source of toxicity, the permittee shall submit, as part of its final results, written notification of that effect to the Director. Within thirty days of completing the PTI the permittee shall submit to the Director for approval a control program to control effluent toxicity and shall proceed to implement such plan in accordance with the Director's approval. The control program, as submitted to or revised by the Director, will be incorporated into the permit. After final implementation, the permittee must demonstrate successful removal of toxicity by passing a two species WET test as outlined in this permit. With adequate justification, the Director may extend these deadlines.

(3) If no probable explanation for toxicity is identified in the PTI, the permittee shall notify the Director as part of its final report, along with a schedule for conducting a Phase I Toxicity Reduction Evaluation (TRE) (see Part I.C.7.fToxicity Reduction Evaluation

(4) If toxicity spontaneously disappears during the PTI, the permittee shall submit written notification to that effect to the Director, with supporting testing evidence.

f. *Toxicity Reduction Evaluation (TRE).* If a pattern of toxicity is detected the permittee shall initiate a TIE/TRE within 7 days unless the Director has accepted the decision to complete a PTI. With adequate justification, the Director may extend the 7-day deadline. The purpose of the TIE portion of a TRE will be to establish the cause of the toxicity, locate the source(s) of the toxicity, and the TRE will control or provide treatment for the toxicity.

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

(1) Phase I – Toxicity Characterization

(2) Phase II – Toxicity Identification Procedures

(3) Phase III – Toxicity Control Procedures

(4) Any other appropriate procedures for toxicity source elimination and control.

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

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

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

(a) An alternative control program for compliance with the numerical requirements.

(b) If necessary, as determined by the Director, provide a modified biomonitoring protocol which compensates for the pollutant(s) being controlled numerically.

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

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

D. Reporting of Monitoring Results.

Reporting of Wastewater Monitoring Results Monitoring results obtained during the previous month shall be summarized for each month and reported in NetDMR no later than the 28th day of the month following the completed reporting period. If no discharge occurs during the reporting period, "no discharge" shall be reported. Legible copies of these, and all other reports including whole effluent toxicity (WET) test reports required herein, shall be signed and certified in accordance with the requirements of Signatory Requirements (see Part VII.G), and submitted by NetDMR, or to the Division of Water Quality at the following address:

Department of Environmental Quality
Division of Water Quality
PO Box 144870
Salt Lake City, Utah 84114-4870

E. Annual Metal Characterization Report

To establish accurate characterization of the effluent concentrations and source for Copper, Lead and Mercury, JVWCD will be required to submit an annual report, due February 28th each year, with details for sampling protocols, sampling ports, source of contaminants, and any other information that will help accurately characterize the effluent parameters in question. As per Part V.E. of the UPDES permit, all data is required to be reported to DWQ. The report shall be signed and certified in accordance with the requirements of Signatory Requirements (see Part VII.G), and submitted to the Division of Water Quality at the following address:

Department of Environmental Quality
Division of Water Quality
PO Box 144870
Salt Lake City, Utah 84114-4870

II. INDUSTRIAL PRETREATMENT REQUIREMENTS

A. Definitions.

1. POTW or publicly owned treatment works means a treatment works as defined by section 212 of the Act, which is owned by a State or municipality (as defined by section 502(4) of the Act). This definition includes any devices and systems used in the storage, treatment, recycling and reclamation of municipal sewage or industrial wastes of a liquid nature. It also includes sewers, pipes and other conveyances only if they convey wastewater to a POTW Treatment Plant. The term also means the municipality as defined in section 502(4) of the Act, which has jurisdiction over the Indirect Discharges to and the discharges from such a treatment works.

B. Discharges to a POTW. Any process wastewater that the facility may discharge to the sanitary sewer, either as direct discharge or as a hauled waste, is subject to federal, state and local pretreatment regulations. Pursuant to Section 307 of the Clean Water Act, the permittee shall comply with all applicable Federal General Pretreatment Regulations promulgated, found in *40 CFR Part 403*, the State Pretreatment Requirements found in *UAC R317-8-8*, and any specific local discharge limitations developed by the Publicly Owned Treatment Works (POTW) accepting the waste.

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

D. Hauled Hazardous Waste. Hauled hazardous waste shall not be discharged to a POTW without notification to the Division of Water Quality.

III. BIOSOLIDS REQUIREMENTS

The State of Utah has adopted the 40 CFR 503 federal regulations for the disposal of sewage sludge (biosolids) by reference. However, since this facility is a lagoon, there is not any regular sludge production. Therefore 40 CFR 503 does not apply at this time. In the future, if the sludge needs to be removed from the lagoons and is disposed in some way, the Division of Water Quality must be contacted prior to the removal of the sludge to ensure that all applicable state and federal regulations are met.

IV. STORM WATER REQUIREMENTS.

A. No Exposure Conditions. The presence of No Exposure conditions exempts this site from the typical requirements of the UPDES Multi-Sector General Permit for Storm Water Discharges Associated with Industrial Activity, General Permit No. UTR000000 (MSGP). If conditions at the site change and No Exposure requirements can no longer be met, the facility must notify DWQ. At that time the storm water re-opener clause may be used to require protective measures for storm water that align with the MSGP. No Exposure conditions are met if contact of the following items with storm water or precipitation is prevented:

1. Using, storing or cleaning industrial machinery or equipment, and areas where residuals from using, storing or cleaning industrial machinery or equipment are exposed to storm water.

2. Materials or residuals on the ground or in storm water inlets from spills/leaks.

3. Materials or products from past industrial activity.

4. Material handling equipment (except adequately maintained vehicles).

5. Materials or products during loading/unloading or transporting activities.

6. Material or products stored outdoors (except final products intended for outside use where exposure to storm water does not result in the discharge of pollutants).

7. Materials contained in open, deteriorated or leaking storage drums, barrels, tanks and similar containers.

8. Materials or products handled/stored on roads or railways owned or maintained by the discharger.

9. Waste material (except waste in covered non leaking containers).

10. Application or disposal of process wastewater (unless other permitted in this or a separate permit).

11. Particulate matter or visible deposits of residuals from roof stacks and/or vents not otherwise regulated and evident in the storm water outflow.

V. MONITORING, RECORDING & GENERAL REPORTING REQUIREMENTS

A. Representative Sampling. Samples taken in compliance with the monitoring requirements established under *Part I* shall be collected from the effluent stream prior to discharge into the receiving waters. Samples and measurements shall be representative of the volume and nature of the monitored discharge. Samples of biosolids shall be collected at a location representative of the quality of biosolids immediately prior to the use-disposal practice.

B. Monitoring Procedures. Monitoring must be conducted according to test procedures approved under *Utah Administrative Code ("UAC") R317-2-10 and 40CFR Part 503*, unless other test procedures have been specified in this permit.

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

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

E. Additional Monitoring by the Permittee. If the permittee monitors any parameter more frequently than required by this permit, using test procedures approved under *UAC R317-2-10* and *40 CFR 503* or as specified in this permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR or the Biosolids Report Form. Such increased frequency shall also be indicated. Only those parameters required by the permit need to be reported.

F. Records Contents. Records of monitoring information shall include:

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

G. Retention of Records. The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five years from the date of the sample, measurement, report or application. This period may be extended by request of the Director at any time. A copy of this UPDES permit must be maintained on site during the duration of activity at the permitted location

H. Twenty-four Hour Notice of Noncompliance Reporting.

1. The permittee shall (orally) report any noncompliance including transportation accidents, spills, and uncontrolled runoff from biosolids transfer or land application sites which may seriously endanger health or environment, as soon as possible, but no later than twenty-four (24) hours from the time the permittee first became aware of circumstances. The report shall be made to the Division of Water Quality, (801) 231-1769, or 24-hour +answering service (801) 536-4123.

2. The following occurrences of noncompliance shall be reported by telephone (801) 536-4300 as soon as possible but no later than 24 hours from the time the permittee becomes aware of the circumstances:

   a. Any noncompliance which may endanger health or the environment;

   b. Any unanticipated bypass, which exceeds any effluent limitation in the permit (See *Part VI.G, Bypass of Treatment Facilities.)*;

   c. Any upset which exceeds any effluent limitation in the permit (See *Part VI.H, Upset Conditions*.);

   d. Violation of a maximum daily discharge limitation for any of the pollutants listed in the permit; or,

   e. Violation of any of the Table 3 metals limits, the pathogen limits, the vector attraction reduction limits or the management practices for biosolids that have been sold or given away.

3. A written submission shall also be provided within five days of the time that the permittee becomes aware of the circumstances. The written submission shall contain:

   a. A description of the noncompliance and its cause;

   b. The period of noncompliance, including exact dates and times;

   c. The estimated time noncompliance is expected to continue if it has not been corrected;

   d. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance; and,

   e. Steps taken, if any, to mitigate the adverse impacts on the environment and human health during the noncompliance period.

4. The Director may waive the written report on a case-by-case basis if the oral report has been received within 24 hours by the Division of Water Quality, (801) 536-4300.

5. Reports shall be submitted to the addresses in *Part I.D, Reporting of Monitoring Results*.

I. Other Noncompliance Reporting. Instances of noncompliance not required to be reported within 24 hours shall be reported at the time that monitoring reports for *Part I.D* are submitted. The reports shall contain the information listed in *Part V.H.3*

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

1. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of the permit;

2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit, including but not limited to, biosolids treatment, collection, storage facilities or area, transport vehicles and containers, and land application sites;

4. Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the *Act*, any substances or parameters at any location, including, but not limited to, digested biosolids before dewatering, dewatered biosolids, biosolids transfer or staging areas, any ground or surface waters at the land application sites or biosolids, soils, or vegetation on the land application sites; and,

5. The permittee shall make the necessary arrangements with the landowner or leaseholder to obtain permission or clearance, the Director, or authorized representative, upon the presentation of credentials and other documents as may be required by law will be permitted to enter without delay for the purposes of performing their responsibilities.

VI. COMPLIANCE RESPONSIBILITIES

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

B. Penalties for Violations of Permit Conditions. The *Act* provides that any person who violates a permit condition implementing provisions of the *Act* is subject to a civil penalty not to exceed $10,000 per day of such violation. Any person who willfully or negligently violates permit conditions or the Act is subject to a fine not exceeding $25,000 per day of violation. Any person convicted under *UCA 19-5-115(2)* a second time shall be punished by a fine not exceeding $50,000 per day. Except as provided at *Part VI.G, Bypass of Treatment Facilities* and *Part VI.H, Upset Conditions*, nothing in this permit shall be construed to relieve the permittee of the civil or criminal penalties for noncompliance.

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

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

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

F. Removed Substances. Collected screening, grit, solids, sludge, or other pollutants removed in the course of treatment shall be disposed of in such a manner so as to prevent any pollutant from entering any waters of the state or creating a health hazard. Sludge/digester supernatant and filter backwash shall not directly enter either the final effluent or waters of the state by any other direct route.

G. Bypass of Treatment Facilities.

1. Bypass Not Exceeding Limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to paragraph 2 and 3 of this section.

2. Prohibition of Bypass.

   a. Bypass is prohibited, and the Director may take enforcement action against a permittee for bypass, unless:

(1) Bypass was unavoidable to prevent loss of human life, personal injury, or severe property damage;

(2) There were no feasible alternatives to bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance, and

(3) The permittee submitted notices as required under *section VI.G.3*.

b. The Director may approve an anticipated bypass, after considering its adverse effects, if the Director determines that it will meet the three conditions listed in *sections VI.G.2.a (1), (2) and (3).*

3. Notice.

a. *Anticipated bypass*. Except as provided above in *section VI.G.2* and below in *section VI.G.3.b*, if the permittee knows in advance of the need for a bypass, it shall submit prior notice, at least ninety days before the date of bypass. The prior notice shall include the following unless otherwise waived by the Director:

(1) Evaluation of alternative to bypass, including cost-benefit analysis containing an assessment of anticipated resource damages:

(2) A specific bypass plan describing the work to be performed including scheduled dates and times. The permittee must notify the Director in advance of any changes to the bypass schedule;

(3) Description of specific measures to be taken to minimize environmental and public health impacts;

(4) A notification plan sufficient to alert all downstream users, the public and others reasonably expected to be impacted by the bypass;

(5) A water quality assessment plan to include sufficient monitoring of the receiving water before, during and following the bypass to enable evaluation of public health risks and environmental impacts; and,

(6) Any additional information requested by the Director.

b. *Emergency Bypass*. Where ninety days advance notice is not possible, the permittee must notify the Director, and the Director of the Department of Natural Resources, as soon as it becomes aware of the need to bypass and provide to the Director the information in *section VI.G.3.a.(1) through (6)* to the extent practicable.

c. *Unanticipated bypass*. The permittee shall submit notice of an unanticipated bypass to the Director as required under *Part V.H*, Twenty Four Hour Reporting. The permittee shall also immediately notify the Director of the Department of Natural

Resources, the public and downstream users and shall implement measures to minimize impacts to public health and environment to the extent practicable.

H. Upset Conditions.

1. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with technology based permit effluent limitations if the requirements of paragraph 2 of this section are met. Director's administrative determination regarding a claim of upset cannot be judiciously challenged by the permittee until such time as an action is initiated for noncompliance.

2. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

   a. An upset occurred and that the permittee can identify the cause(s) of the upset;

   b. The permitted facility was at the time being properly operated;

   c. The permittee submitted notice of the upset as required under *Part V.H, Twenty-four Hour Notice of Noncompliance Reporting*; and,

   d. The permittee complied with any remedial measures required under *Part IV.D, Duty to Mitigate*.

3. Burden of proof. In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.

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

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

1. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":

   a. One hundred micrograms per liter (100 ug/L);

   b. Two hundred micrograms per liter (200 ug/L) for acrolein and acrylonitrile; five hundred micrograms per liter (500 ug/L) for 2,4-dinitrophenol and for 2-methyl-4, 6-dinitrophenol; and one milligram per liter (1 mg/L) for antimony;

   c. Five (5) times the maximum concentration value reported for that pollutant in the permit application in accordance with *UAC R317-8-3.4(7)* or (10); or,

   d. The level established by the Executive Secretary in accordance with *UAC R317-8-4.2(6)*.

2. That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":

   a. Five hundred micrograms per liter (500 ug/L);

   b. One milligram per liter (1 mg/L) for antimony:

   c. Ten (10) times the maximum concentration value reported for that pollutant in the permit application in accordance with *UAC R317-8-3.4(9)*; or,

   d. The level established by the Executive Secretary in accordance with *UAC R317-8-4.2(6)*.

VII. GENERAL REQUIREMENTS

A. Planned Changes. The permittee shall give notice to the Director as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when the alteration or addition could significantly change the nature or increase the quantity of parameters discharged or pollutant sold or given away. This notification applies to pollutants, which are not subject to effluent limitations in the permit. In addition, if there are any planned substantial changes to the permittee's existing sludge facilities or their manner of operation or to current sludge management practices of storage and disposal, the permittee shall give notice to the Director of any planned changes at least 30 days prior to their implementation.

B. Anticipated Noncompliance. The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity, which may result in noncompliance with permit requirements.

C. Permit Actions. This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

D. Duty to Reapply. If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee shall apply for and obtain a new permit. The application shall be submitted at least 180 days before the expiration date of this permit.

E. Duty to Provide Information. The permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.

F. Other Information. When the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or any report to the Director, it shall promptly submit such facts or information.

G. Signatory Requirements. All applications, reports or information submitted to the Director shall be signed and certified.

1. All permit applications shall be signed by either a principal executive officer or ranking elected official.

2. All reports required by the permit and other information requested by the Director shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

   a. The authorization is made in writing by a person described above and submitted to the Director, and,

   b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility, such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position

having overall responsibility for environmental matters. A duly authorized representative may thus be either a named individual or any individual occupying a named position.

3. Changes to authorization. If an authorization under *paragraph VII.G.2* is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of *paragraph VII.G.2.* must be submitted to the Director prior to or together with any reports, information, or applications to be signed by an authorized representative.

4. Certification. Any person signing a document under this section shall make the following certification:

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

H. Penalties for Falsification of Reports. The *Act* provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction be punished by a fine of not more than $10,000.00 per violation, or by imprisonment for not more than six months per violation, or by both.

I. Availability of Reports. Except for data determined to be confidential under *UAC R317-8-3.2*, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the office of Director. As required by the *Act*, permit applications, permits and effluent data shall not be considered confidential.

J. Oil and Hazardous Substance Liability. Nothing in this permit shall be construed to preclude the permittee of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under the *Act*.

K. Property Rights. The issuance of this permit does not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.

L. Severability. The provisions of this permit are severable, and if any provisions of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

M. Transfers. This permit may be automatically transferred to a new permittee if:

1. The current permittee notifies the Director at least 20 days in advance of the proposed transfer date;

2. The notice includes a written agreement between the existing and new permittee's containing a specific date for transfer of permit responsibility, coverage, and liability between them; and,

3. The Director does not notify the existing permittee and the proposed new permittee of his or her intent to modify, or revoke and reissue the permit. If this notice is not received, the transfer is effective on the date specified in the agreement mentioned in paragraph *2* above.

N. State or Federal Laws. Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authority preserved by *UCA 19-5-117* and *Section 510* of the *Act* or any applicable Federal or State transportation regulations, such as but not limited to the Department of Transportation regulations.

O. Water Quality - Reopener Provision. This permit may be reopened and modified (following proper administrative procedures) to include the appropriate effluent limitations and compliance schedule, if necessary, if one or more of the following events occurs:

1. Water Quality Standards for the receiving water(s) to which the permittee discharges are modified in such a manner as to require different effluent limits than contained in this permit.

2. A final wasteload allocation is developed and approved by the State and/or EPA for incorporation in this permit.

3. Revisions to the current CWA § 208 area wide treatment management plans or promulgations/revisions to TMDLs (40 CFR 130.7) approved by the EPA and adopted by DWQ which calls for different effluent limitations than contained in this permit.

P. Biosolids – Reopener Provision. This permit may be reopened and modified (following proper administrative procedures) to include the appropriate biosolids limitations (and compliance schedule, if necessary), management practices, other appropriate requirements to protect public health and the environment, or if there have been substantial changes (or such changes are planned) in biosolids use or disposal practices; applicable management practices or numerical limitations for pollutants in biosolids have been promulgated which are more stringent than the requirements in this permit; and/or it has been determined that the permittees biosolids use or land application practices do not comply with existing applicable state of federal regulations.

Q. Toxicity Limitation - Reopener Provision.

This permit may be reopened and modified (following proper administrative procedures) to include, whole effluent toxicity (WET) limitations, a compliance date, a compliance schedule, a change in the whole effluent toxicity (biomonitoring) protocol, additional or modified numerical limitations, or any other conditions related to the control of toxicants if one or more of the following events occur;

1. Toxicity is detected, as per *Part I.C.4.a* or *b* of this permit, during the duration of this permit.

2. The TRE results indicate that the toxicant(s) represent pollutant(s) or pollutant parameter(s) that may be controlled with specific numerical limits and the Director concludes that numerical controls are appropriate.

3. Following the implementation of numerical control(s) of toxicant(s), the Director agrees that a modified biomonitoring protocol is necessary to compensate for those toxicants that are controlled numerically.

4. The TRE reveals other unique conditions or characteristics, which in the opinion of the permit issuing authority justify the incorporation of unanticipated special conditions in the permit.

R. Storm Water-Reopener Provision. At any time during the duration (life) of this permit, this permit may be reopened and modified (following proper administrative procedures) as per *UAC R317.8*, to include, any applicable storm water provisions and requirements, a storm water pollution prevention plan, a compliance schedule, a compliance date, monitoring and/or reporting requirements, or any other conditions related to the control of storm water discharges to "waters-of-State".

VIII. DEFINITIONS

A. Wastewater.

1. The "7-day (and weekly) average", other than for *E. coli* bacteria, fecal coliform bacteria, and total coliform bacteria, is the arithmetic average of all samples collected during a consecutive 7-day period or calendar week, whichever is applicable. Geometric means shall be calculated for *E. coli* bacteria, fecal coliform bacteria, and total coliform bacteria. The 7-day and weekly averages are applicable only to those effluent characteristics for which there are 7-day average effluent limitations. The calendar week, which begins on Sunday and ends on Saturday, shall be used for purposes of reporting self-monitoring data on discharge monitoring report forms. Weekly averages shall be calculated for all calendar weeks with Saturdays in the month. If a calendar week overlaps two months (i.e., the Sunday is in one month and the Saturday in the following month), the weekly average calculated for that calendar week shall be included in the data for the month that contains Saturday.

2. The "30-day (and monthly) average," other than for *E. coli* bacteria, fecal coliform bacteria and total coliform bacteria, is the arithmetic average of all samples collected during a consecutive 30-day period or calendar month, whichever is applicable. Geometric means shall be calculated for *E. coli* bacteria, fecal coliform bacteria and total coliform bacteria. The calendar month shall be used for purposes of reporting self-monitoring data on discharge monitoring report forms.

3. "Act," means the *Utah Water Quality Act*.

4. "Acute toxicity" occurs when 50 percent or more mortality is observed for either test species at any effluent concentration (lethal concentration or "LC_{50}").

5. "Bypass," means the diversion of waste streams from any portion of a treatment facility.

6. "Chronic toxicity" occurs when the IC_{25}< XX% effluent. The XX% effluent is the concentration of the effluent in the receiving water, at the end of the mixing zone expressed as per cent effluent.

7. "IC_{25}" is the concentration of toxicant (given in % effluent) that would cause a 25% reduction in mean young per female, or a 25% reduction in overall growth for the test population.

8. "Composite Samples" shall be flow proportioned. The composite sample shall, as a minimum, contain at least four (4) samples collected over the compositing period. Unless otherwise specified, the time between the collection of the first sample and the last sample shall not be less than six (6) hours nor more than 24 hours. Acceptable methods for preparation of composite samples are as follows:

   a. Constant time interval between samples, sample volume proportional to flow rate at time of sampling;

   b. Constant time interval between samples, sample volume proportional to total flow (volume) since last sample. For the first sample, the flow rate at the time the sample was collected may be used;

c. Constant sample volume, time interval between samples proportional to flow (i.e., sample taken every "X" gallons of flow); and,

d. Continuous sample volume, with sample collection rate proportional to flow rate.

9. "CWA," means *The Federal Water Pollution Control Act*, as amended, by *The Clean Water Act of 1987*.

10. "Daily Maximum" (Daily Max.) is the maximum value allowable in any single sample or instantaneous measurement.

11. "EPA," means the United States Environmental Protection Agency.

12. "Director," means Director of the Division of Water Quality.

13. A "grab" sample, for monitoring requirements, is defined as a single "dip and take" sample collected at a representative point in the discharge stream.

14. An "instantaneous" measurement, for monitoring requirements, is defined as a single reading, observation, or measurement.

15. "Severe Property Damage," means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

16. "Upset," means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation.

B. Storm Water.

1. "Best Management Practices" ("BMPs") means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the State. BMPs also include treatment requirements, operating procedures, and practices to control facility site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

2. "Coal pile runoff" means the rainfall runoff from or through any coal storage pile.

3. "Co-located industrial activity" means when a facility has industrial activities being conducted onsite that are described under more than one of the coverage sections of *Appendix I* in the General Multi-Sector Permit for Storm Water Discharges Associated with Industrial Activity. Facilities with co-located industrial activities shall comply with all applicable monitoring and pollution prevention plan requirements of each section in which a co-located industrial activity is described.

4. "Commercial Treatment and Disposal Facilities" means facilities that receive, on a commercial basis, any produced hazardous waste (not their own) and treat or dispose of those wastes as a service to the generators. Such facilities treating and/or disposing exclusively residential hazardous wastes are not included in this definition.

5. "Landfill" means an area of land or an excavation in which wastes are placed for permanent disposal and that is not a land application unit, surface impoundment, injection well, or waste pile.

6. "Land application unit" means an area where wastes are applied onto or incorporated into the soil surface (excluding manure spreading operations) for treatment or disposal.

7. "Municipal separate storm sewer system" (large and/or medium) means all municipal separate storm sewers that are either:

    a. Located in an incorporated place (city) with a population of 100,000 or more as determined by the latest Decennial Census by the Bureau of Census (at the issuance date of this permit, Salt Lake City is the only city in Utah that falls in this category); or

    b. Located in the counties with unincorporated urbanized populations of 100,000 or more, except municipal separate storm sewers that are located in the incorporated places, townships or towns within such counties (at the issuance date of this permit Salt Lake County is the only county that falls in this category); or

    c. Owned or operated by a municipality other than those described in paragraph *a.* or *b.* (above) and that are designated by the *Director* as part of the large or medium municipal separate storm sewer system.

8. "NOI" means notice of intent; it is an application form that is used to obtain coverage under the General Multi-Sector Permit for Storm Water Discharges Associated with Industrial Activity.

9. "NOT" means "notice of termination", it is a form used to terminate coverage under the General Multi-Sector Permit for Storm Water Discharges Associated with Industrial Activity.

10. "Point source" means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

11. "Section 313 water priority chemical" means a chemical or chemical categories that:

    a. Are listed at *40 CFR 372.65* pursuant to *Section 313* of the *Emergency Planning and Community Right-to-Know Act* (*EPCRA*) (also known as *Title III of the Superfund Amendments and Reauthorization Act* (*SARA*) of 1986);

b. Are present at or above threshold levels at a facility subject to *EPCRA Section 313* reporting requirements; and

c. Meet at least one of the following criteria:

(1) Are listed in *Appendix D* of *40 CFR Part 122* on either Table II (organic priority pollutants), Table III (certain metals, cyanides, and phenols) or Table V (certain toxic pollutants and hazardous substances);

(2) Are listed as a hazardous substance pursuant to *Section 311(b)(2)(A)* of the *CWA* at *40 CFR 116.4*; or

(3) Are pollutants for which EPA has published acute or chronic water quality criteria. See *Appendix III* of this permit. This appendix was revised based on final rulemaking EPA published in the *Federal Register* November 30, 1994.

12. "Significant materials" includes, but is not limited to: raw materials; fuels; materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances designated under *Section 101(14)* of *CERCLA*; any chemical the facility is required to report pursuant to *EPCRA Section 313*; fertilizers; pesticides; and waste products such as ashes, slag and sludge that have the potential to be released with storm water discharges.

13. "Significant spills" includes, but is not limited to: releases of oil or hazardous substances in excess of reportable quantities under *Section 311 of the Clean Water Act* (see *40 CFR 110.10* and *CFR 117.21*) or *Section 102* of *CERCLA* (see *40 CFR 302.4*).

14. "Storm water" means storm water runoff, snowmelt runoff, and surface runoff and drainage.

15. "SWDMR" means "storm water discharge monitoring report", a report of the results of storm water monitoring required by the permit. The Division of Water Quality provides the storm water discharge monitoring report form.

16. "Storm water associated with industrial activity" (*UAC R317-8-3.8(6)(c) & (d)*) means the discharge from any conveyance that is used for collecting and conveying storm water and that is directly related to manufacturing, processing or raw materials storage areas at an industrial plant. The term does not include discharges from facilities or activities excluded from the *UPDES* program. For the categories of industries identified in paragraphs *(a)* through *(j)* of this definition, the term includes, but is not limited to, storm water discharges from industrial plant yards; immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility; material handling sites; refuse sites; sites used for the application or disposal of process waste waters (as defined in *40 CFR Part 401*); sites used for the storage and maintenance of material handling equipment; sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas (including tank farms) for raw materials, and intermediate and finished products; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to storm water. For the categories of industries identified in paragraph *(k)* of this definition, the term includes only storm water discharges from all areas (except access roads and rail lines) listed in the previous

sentence where material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, or industrial machinery are exposed to storm water. For the purposes of this paragraph, material handling activities include the storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, finished product, by-product or waste product. The term excludes areas located on plant lands separate from the plant's industrial activities, such as office buildings and accompanying parking lots as long as the drainage from the excluded areas is not mixed with storm water drained from the above described areas. Industrial facilities (including industrial facilities that are Federally, State, or municipally owned or operated that meet the description of the facilities listed in paragraphs *(a)* to *(k)* of this definition) include those facilities designated under *UAC R317-8-3.8(1)(a)5.* The following categories of facilities are considered to be engaging in "industrial activity" for purposes of this subsection:

a. Facilities subject to storm water effluent limitations guidelines, new source performance standards, or toxic pollutant effluent standards under *40 CFR Subchapter N* (except facilities with toxic pollutant effluent standards that are exempted under category (k) of this definition);

b. Facilities classified as Standard Industrial Classifications 24 (except 2434), 26 (except 265 and 267), 28 (except 283 and 285), 29, 311, 32 (except 323), 33, 3441, 373;

c. Facilities classified as Standard Industrial Classifications 10 through 14 (mineral industry) including active or inactive mining operations (except for areas of coal mining operations no longer meeting the definition of a reclamation area under *40 CFR 434.11(l)* because the performance bond issued to the facility by the appropriate SMCRA authority has been released, or except for areas of non-coal mining operations that have been released from applicable State or Federal reclamation requirements after December 17, 1990) and oil and gas exploration, production, processing, or treatment operations, or transmission facilities that discharge storm water contaminated by contact with or that has come into contact with, any overburden, raw material, intermediate products, finished products, byproducts or waste products located on the site of such operations; inactive mining operations are mining sites that are not being actively mined, but that have an identifiable owner/operator;

d. Hazardous waste treatment, storage, or disposal facilities, including those that are operating under interim status or a permit under Subtitle C of RCRA;

e. Landfills, land application sites, and open dumps that have received any industrial wastes (waste that is received from any of the facilities described under this subsection) including those that are subject to regulation under *Subtitle D* of *RCRA;*

f. Facilities involved in the recycling of materials, including metal scrapyards, battery reclaimers, salvage yards, and automobile junkyards, including but limited to those classified as Standard Industrial Classification 5015 and 5093;

g. Steam electric power generating facilities, including coal handling sites;

h. Transportation facilities classified as Standard Industrial Classifications 40, 41, 42 (except 4221-25), 43, 44, 45 and 5171 that have vehicle maintenance shops, equipment cleaning operations, or airport deicing operations. Only those portions of the facility that are either involved in vehicle maintenance (including vehicle rehabilitation, mechanical repairs, painting, fueling, and lubrication), equipment cleaning operations, airport deicing operations, or that are otherwise identified under paragraphs (a) to (g) or (I) to (k) of this subsection are associated with industrial activity;

i. Treatment works treating domestic sewage or any other sewage sludge or wastewater treatment device or system, used in the storage treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated to the disposal of sewage sludge that are located within the confines of the facility, with a design flow of 1.0 mgd or more, or required to have an approved pretreatment program under *40 CFR Part 403*. Not included are farm lands, domestic gardens or lands used for sludge management where sludge is beneficially reused and that are not physically located in the confines of the facility, or areas that are in compliance with *40 CFR Part 503*;

j. Construction activity including clearing, grading and excavation activities except: operations that result in the disturbance of less than 1 acre of total land area that are not part of a larger common plan of development or sale;

k. Facilities under Standard Industrial Classifications 20, 21, 22, 23, 2434, 25, 265, 267, 27, 283, 285, 30, 31 (except 311), 323, 34 (except 3441), 35, 36, 37 (except 373), 38, 39, 4221-25, (and that are not otherwise included within categories (a) to (j))

17. "Waste pile" means any non-containerized accumulation of solid, non-flowing waste that is used for treatment or storage.

FACT SHEET AND STATEMENT OF BASIS
JORDAN VALLEY WATER CONSERVANCY DISTRICT
SOUTHWEST GROUNDWATER TREATMENT PLANT
RENEWAL PERMIT: DISCHARGE & STORM WATER
UPDES PERMIT NUMBER: UT0025836
MAJOR INDUSTRIAL

FACILITY CONTACTS

Person 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

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

DESCRIPTION OF FACILITY

The Southwest Groundwater Treatment Plant is owned and operated by the Jordan Valley Water Conservancy District (Jordan Valley). The plant is located near Jordan Valley's headquarters, adjacent to the Jordan River at 8215 South 1300 West, West Jordan, Salt Lake County, Utah with two outfalls. Outfall 001 is located at latitude 40°45'37.59"N and longitude 112°10'13.32"W and discharges to Transitional Waters and Gilbert Bay of the Great Salt Lake. Outfall 002 is located at latitude 40°36'5.58"N and longitude 111°55'13.37"W and discharges to the Jordan River.

The Southwest Jordan Valley Groundwater Project remediates deep groundwater contaminated 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 (salts) via a series of deep aquifer wells. The water is purified utilizing a reverse osmosis treatment process at the Southwest Groundwater Treatment Plant. The project also extracts shallow groundwater with elevated total dissolved solids that has not been impacted by mining activities.

The high-quality drinking water generated is distributed by Jordan Valley to its member agencies for supply to their customers. Reverse osmosis byproduct water (i.e. concentrate), containing the extracted salts 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 Southwest Groundwater Treatment is 7 million gallons per day of treated drinking quality water with a discharge of 1.5 gallons per day of byproduct. After build out, the treatment plant capacity will increase to 14 million gallons per day of drinking water with 3 million gallons per day of byproduct to be discharged.

The Southwest Groundwater Treatment Plant was designed to operate three rows of membranes, two treating water from the deep aquifer wells, and one treating water from shallow aquifer wells. Each of these sets of membranes is called a "treatment train." Under normal operating conditions, the Southwest Groundwater Treatment Plant will operate all treatment trains. Normal discharges under this permit will be reverse osmosis byproduct via Outfall 001 to Transitional Waters and Gilbert Bay and excess feed water to the Jordan River via Outfall 002.

On a near continuous basis, the Southwest Groundwater Treatment Plant 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 plant 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 million gallons per day 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 byproduct pipeline.

The project facilities include shallow and deep aquifer wells. When these wells start up, the water may contain a small amount of sediment. A process called "pump to waste" is used to discharge this water so that the sediment doesn't make it to the Southwest Groundwater Treatment Plant where it would likely damage the membranes used in the reverse osmosis process. These wells 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 Southwest Groundwater Treatment Plant. It is intended that the wells will pump and supply feed water to the project on a near continuous basis. 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. Based on wasteload analysis completed for each well location, 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. Reporting of duration and frequency of each discharge will be required. The reporting of these discharges will be provided to the Division of Water Quality (DWQ) in an annual project operating report.

The Southwest Groundwater Treatment Plant requires 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 may be diverted to the Jordan River and will not enter the Southwest Groundwater Treatment Plant. Under these maintenance conditions, the feed water from the deep aquifer wells may 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 4.6 million gallons per day. A wasteload calculated for the shallow well discharges to the Jordan River under these conditions show that the effluent will not cause or contribute to a violation of water quality standards.

In the event of a short-term power outage at the Southwest Groundwater Treatment Plant, the deep well water will be directed to Outfall 001 and discharged to the Transitional Waters and Gilbert Bay and the shallow groundwater will be discharged to the Jordan River via Outfall 002. In the event of a long-term shut down the wells will be shut down and taken off line.

SUMMARY OF CHANGES FROM PREVIOUS PERMIT

Jordan Valley has had no changes to the facility since the last permit was issued.

Yearly sampling of metals has been added to the permit monitoring section for Outfall 001 and 002. BOD is required from Outfall 001. E.coli, phosphorus, temperature and copper have been added to Outfall 002.

Storm water language has been added to the permit to maintain No Exposure conditions.

ANTIDEGRADATION LEVEL II REVIEW

Antidegradation Reviews are intended to ensure that waters that have better quality than required by the standards are not degraded unless the degradation is necessary for important social or economic reasons.

A Level II Antidegradation Review (ADR) is not required for this permit. The proposed permit is a simple renewal, with no increase in flow or concentration over that which was approved in the existing permit.

OPERATING CONDITIONS

The following is a description of the various operating and discharge conditions that will occur at the facility.

Normal Operations

The Southwest Groundwater Treatment Plant 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 Southwest Groundwater Treatment Plant will operate all treatment trains, the byproduct water will be discharged to Gilbert Bay and drinking quality water will be delivered to Jordan Valley's member agencies.

On a near continuous basis, the Southwest Groundwater Treatment Plant 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 plant 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 million gallons per day 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 Condition

The Southwest Groundwater Project 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 suspended solids. A process called "pump to waste" is used to discharge this water so that the sediment doesn't make it to the Southwest Groundwater Treatment Plant where it would likely damage the membranes used in the reverse osmosis 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 Southwest Groundwater Treatment Plant. 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.

Based on wasteload analysis completed for each well location, 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. Reporting of duration and frequency of each discharge will be required. The reporting of these discharges will be provided to the Division of Water Quality (DWQ) in an annual project operating report.

Cleaning and Maintenance Conditions for the Shallow Aquifer Wells

The Southwest Groundwater Treatment Plant requires 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 Southwest Groundwater Treatment Plant. 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 4.6 million gallons per day. A wasteload calculated for the shallow well discharges to the Jordan River under these conditions show that the effluent will not cause or contribute to a violation of water quality standards.

Upset Conditions

In the event of a power outage at the Southwest Groundwater Treatment Plant, 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 which 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 *UAC R317-8-2.2* that the discharge will not cause or contribute to a violation of water quality standards. Based on wasteload analysis conducted for each well, these discharges will not cause or contribute to a violation of Utah's water quality standards.

DISCHARGE

DESCRIPTION OF DISCHARGE

JVSWGW has been reporting self-monitoring results on Discharge Monitoring Reports through NetDMR on a monthly basis. There have been no violations the past five years.

Outfall	Description of Discharge Point
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 Southwest Groundwater Treatment Plant 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, Footnotes b and e* of the UPDES permit.)
002	Located at latitude 40°36'5.58"N and longitude 111°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 Southwest Groundwater Treatment Plant to Jordan River.

RECEIVING WATERS AND STREAM CLASSIFICATION

The final discharge is of reverse osmosis byproduct and excess deep aquifer feed water to the Transitional Waters and Gilbert Bay via Outfall 001. Discharges of untreated shallow groundwater will occur to the Jordan River via Outfall 002 based upon plant operations.

Gilbert Bay of Great Salt Lake, the ultimate receiving water for Outfall 001, is classified as Class 5A. The Transitional Waters along the Shoreline of Great Salt Lake are classified as 5A and 5E. In the *Utah Administrative Code (UAC) R317-2-13* these classifications are defined:

Class 5A — Gilbert Bay of GSL. 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 GSL geographical boundary. Protected for infrequent primary and secondary contact recreation, waterfowl, shore birds and other water-oriented wildlife including their necessary food chain.

The Jordan River, the receiving water for Outfall 002, is classified as Class 2B, 3A and 4. Jordan River from confluence with Little Cottonwood Creek to Narrows Diversion are.

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

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

Class 4 Protected for agricultural uses including irrigation of crops and stock watering.

BASIS FOR EFFLUENT LIMITATIONS

Effluent limits for the Southwest Groundwater Treatment Plant are based on the most stringent of Utah Secondary Treatment Standards, Utah Water Quality Standards, and best professional judgment (BPJ) (see explanation of BPJ in section 5.3.1). Concentration and loading limitation and monitoring requirements for Outfall 001 and Outfall 002 remain the same as the previous permit. Yearly sampling of metals has been added to the permit monitoring section for Outfall 001 and 002. BOD is required from Outfall 001. E.coli, phosphorus, temperature and copper have been added to Outfall 002. Whole Effluent Toxicity (WET) monitoring requirements are based from the WET policy adopted January 2018.

The evaluation summarized in the following paragraphs, are based on the rationale presented in attached June 6, 2019 Wasteload Analysis and Antidegradation Level I and II Review for Outfall 001. Both selenium and mercury have the potential to adversely affect aquatic and aquatic-dependent wildlife in both Gilbert Bay and the Transitional Waters (mudflat wetlands). In addition to Narrative Standards, a tissue based selenium water quality standard exists for Gilbert Bay. No numeric mercury water quality standard exists for Gilbert Bay, only Narrative Standards. In addition, no numeric water quality standards exist for the Transitional Waters, only Narrative Standards.

Outfall 001, RO Byproduct and Excess Deep Aquifer Feed Water

The Southwest Groundwater Treatment Plant 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 total suspended solids (TSS) and pH are based on current Utah Secondary Treatment Standards, UAC R317-1-3.2. 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 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 because there are no water column standards for selenium for Gilbert Bay or the Transitional Waters. The 12.5 mg/kg selenium tissue-based standard for Gilbert Bay is based upon R317-2-14 and is also being applied to the Transitional Waters to demonstrate compliance with the Narrative Standards.

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, Shallow Aquifer Discharges to the Jordan River

During times of plant maintenance and to dispose of excess groundwater, the facility will need to discharge shallow well feed water (untreated groundwater) to the Jordan River. The limitations on TSS and pH are based on current Utah Secondary Treatment Standards, *UAC R317-1-3.2*. The Oil and Grease limitation is based upon BPJ (see 5.3.1 for explanation of BPJ). Due to uncertainties in plant operations, the DWQ will include a load limit for selenium based upon a continuous pressure relief bleed flow of 1.0 million gallons per day 270 days a year and a flow of 4.6 million gallons per day for 95 days a year. The flow of 4.6 million gallons per day is a combination of pressure relief bleed flow and feed water discharged as a result of maintenance activities. The calculations for the wasteload analysis utilize the maximum effluent discharge for of 3 MGD. If the discharge is greater than 3 MGD the water quality standards will be violated. The selenium concentration used to calculate the load is based upon the anticipated effluent concentration of 0.0079 mg/L plus a 30% safety factor. The resulting concentration is 0.0103 mg/L. A wasteload calculated based upon an Acute Effluent Flow of 4.6 million gallons per day and a Chronic Effluent Flow of 1.0 million gallons per day resulted in allowable selenium concentrations of 0.089 mg/L and 0.027 mg/L respectively. Based on this, the use of 0.0103 mg/L in the load calculation is sufficiently protective. The selenium concentration effluent limit is based upon the most restrictive wasteload analysis. The limitation on TDS is based on Utah Water Quality Standards.

The WLA for Outfall 002, Jordan River, may show high allowed effluent limits for the impaired parameters of TDS, Temperature, *E.coli*, O/E bio-assessment, Selenium, Phosphorus and Copper, they should be evaluated in the effluent against the end of pipe to determine whether or not they have reasonable potential to cause or contribute to the existing impairments.

Reasonable Potential Analysis
Since January 1, 2016, DWQ has conducted reasonable potential analysis (RP) on all new and renewal applications received after that date. RP for this permit renewal was conducted following DWQ's September 10, 2015 Reasonable Potential Analysis Guidance (RP Guidance). 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.

The DWQ uses the 1996 EPA Guidance manual "The Metal Translator: Guidance For Calculating A Total Recoverable Permit Limit From A Dissolved Criterion" to translate the dissolved metal Water Quality Standards to total recoverable concentrations. This process is performed during the wasteload analysis using the important factors of water temperature, pH, hardness and concentrations of metal binding sites. A quantitative RP analysis was performed on all metals, using the translated numbers, to determine if there was reasonable potential for the discharge to exceed the applicable water quality standards.

For Outfall 001, Copper, Lead, Mercury and Selenium were parameters which flagged RP. Mercury monitoring will increase to quarterly and Selenium limits and monitoring requirements will remain the same. Copper and Lead will be included in the annual metal monitoring along with Arsenic, Cadmium, Chromium, Cyanide, Iron, Nickel, Silver and Zinc. To establish accurate characterization of the effluent concentrations and source for Copper, Lead and Mercury, JVWCD will be required to submit an annual report with details for sampling protocols, sampling ports, source of contaminants, and any other information that will help accurately characterize the effluent parameters in question. Mercury needs to have appropriate Quality Control sampling methods established to avoid future spikes and as per Part V.E. of the UPDES permit, all data is required to be reported to DWQ.

Based on the Outfall 002 RP analysis, Selenium limitations and monitoring will remain the same. The remaining metals, Arsenic, Cadmium, Chromium, Copper, Cyanide, Iron, Lead, Mercury, Nickel, Silver and Zinc, will be added to yearly monitoring. A copy of the RP analysis is included at the end of this Fact Sheet.

The permit limitations are:

Table 1					
Outfall 001					
Parameter	**Effluent Limitations [a, b, c, d, e]**				
	Maximum Monthly Avg	**Maximum Weekly Avg**	**Annual Max**	**Daily Minimum**	**Daily Maximum**
Total Flow [f, g]	3.0	--	--	--	--
TSS, mg/L	25	35	--	--	70
Selenium, total, mg/L	--	--	--	--	0.054
Selenium, kg/year	--	--	224	--	--
Selenium [h]	--	--	--	--	--
Mercury, kg [i, j]	--	--	0.38	--	--
Oil & Grease, mg/L	--	--	--	--	10
pH, Standard Units	--	--	--	6.5	9

Table 2					
Outfall 002					
Parameter	**Effluent Limitations [a, b, c, d, e]**				
	Maximum Monthly Avg	**Maximum Weekly Avg**	**Annual Max**	**Daily Minimum**	**Daily Maximum**
Flow, MGD					3
TDS, mg/L	--	--	--	--	1,200
TSS, mg/L	25	35	--	--	70
Selenium, total, mg/L	--	--	--	--	0.027
Selenium, kg/year	--	--	26.4	--	--
Oil & Grease, mg/L	--	--	--	--	10
pH, Standard Units	--	--	--	6.5	9
WET, Chronic Biomonitoring *Ceriodaphnia dubia* ***Pimephales promelas*** **(Fathead Minnow)**	--	--	--	--	IC_{25}> 26.1% effluent

SELF-MONITORING AND REPORTING REQUIREMENTS

The following self-monitoring requirements are the same as in the previous permit with the addition on annual monitoring for metals. The permit will require reports to be submitted monthly and annually, as applicable, on Discharge Monitoring Report (DMR) 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.

Table 3			
Outfall 001			
Parameter	**Self-Monitoring and Reporting Requirements [a, b, c, d, e]**		
	Frequency	**Sample Type**	**Units**
Total Flow [f, g]	Daily or Continuous	Measured	MGD
BOD_5 [k]	2 x annual	Composite or Grab	mg/L
TSS [o]	2 x weekly	Composite or Grab	mg/L
Selenium, total	2 x weekly	Composite or Grab	mg/L
Selenium [n]	Monthly	Calculated	kg/yr
Selenium [h]	Annually	Bird eggs	mg/kg
Mercury, total [i]	Monthly	Composite or Grab	ng/L
Mercury [m]	Monthly	Calculated	kg/yr
Oil & Grease, mg/L	Monthly if sheen is observed	Grab	mg/L
pH, Standard Units	Monthly	Grab	SU
WET, Acute Biomonitoring *Cyprinodon variegatus only*	Quarterly	Composite	Pass/Fail
WET, Chronic Biomonitoring [k, l] *Cyprinodon variegatus only*	Quarterly	Composite	TUc ≤ 1.6
Metals [m, p]	Annually	Composite or Grab	mg/L

Table 4			
Outfall 002			
Parameter	**Self-Monitoring and Reporting Requirements** [a, b, c, d, e]		
	Frequency	**Sample Type**	**Units**
Total Flow [f, g]	Daily or Continuous	Measured	MGD
TDS, mg/L	2 x weekly	Composite or Grab	mg/L
TSS, mg/L	2 x weekly	Composite or Grab	mg/L
Selenium, total, mg/L	2 x weekly	Composite or Grab	mg/L
Selenium, kg/year [n]	Annually	Calculated	kg/yr
Copper, mg/L	2 x weekly	Composite or Grab	mg/L
Oil & Grease, mg/L	2 x weekly, *if sheen is observed*	Grab	mg/L
pH, Standard Units	2 x weekly	Grab	SU
E.coli	2 x weekly	Grab	No./100mL
Phosphorus	2 x weekly	Composite or Grab	mg/L
Temperature	Continuous	Measured	Fahrenheit
WET, Chronic Biomonitoring *Ceriodaphnia dubia* *Pimephales promelas (Fathead Minnow)*	Quarterly 2nd & 4th Quarter 1st & 3rd Quarter	Composite	Pass/Fail
Metals [m, p]	Annually	Composite or Grab	mg/L

Table References

a. See Definitions, ***Part VIII***, for definition of terms.

b. All parameters in this table will be reported on the monthly Discharge Monitoring Report.

c. 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.

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

e. There shall be no discharge of sanitary wastes.

f. Flow measurements of effluent volume shall be made in such a manner that the permittee can affirmatively demonstrate that representative values are being obtained.

g. The flow rates and durations of all discharges shall be reported in the Annual Project Operating Report.

h. Implementation of the selenium water quality standard of 12.5 mg/kg for Gilbert Bay of the GSL is outlined in ***Part I.D.5*** of this UPDES Permit.

i. Mercury samples must be analyzed using Method 1631 or other sufficiently sensitive method. The sample type (composite or grab) should be performed according to the method's requirements. Mercury needs to have appropriate Quality Control sampling methods established to avoid spikes.

j. Jordan Valley shall monitor BOD_5 at the end of pipe bi-annually. If lake levels rise where monitoring at end of the pipe is not feasible, then Jordan Valley may petition the Director to establish an alternate sampling point.

k. 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.

l. 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.

m. Jordan Valley shall monitor the following metals at the end of pipe annually with the most sensitive method; Arsenic, Cadmium, Chromium, Copper (Outfall 001), Cyanide, Iron, Lead, Mercury (Outfall 002), Nickel, Silver and Zinc. The sample type (composite or grab) should be performed according to the method's requirements.

n. Cumulative totals for these parameters shall be reported on the monthly Discharge Monitoring Reports.

o. Monitoring of this parameter is required at end of pipe during pipeline cleaning operations. Monitoring results must be included with the DMR for that monitoring period. If lake levels rise where monitoring at the end of pipe is not feasible, then Jordan Valley may petition the Director to establish an alternate sampling point.

p. 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 an annual basis by the facility on 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.

Table References End

Joint Discharge Area Transitional Waters Monitoring Program

One of the outcomes of the analyses presented in the *Jordan Valley Water Conservancy District Southwest Groundwater Treatment Plant Outfall 001 FSSOB Supporting Information for Selenium and Mercury 2014* (DWQ-2020-002546) was the recommendation to implement a monitoring program to decrease uncertainty. To confirm compliance with the Narrative Standards, a comprehensive sampling and analysis plan for egg, water, sediment and macro-invertebrates including field and laboratory standard operating procedures and methods was developed in 2011 and approved by the Director. This plan was made available for public review and comment as part of the Director's review process in March 2011. The current Field Sampling Plan (ch2m, 2017) is included as a supporting document for this renewal.

Jordan Valley is required to annually sample eight (8) bird eggs, if available, but not to exceed 20% of available eggs, during the nesting season, April15 through June 30, for the current permit cycle. The eggs will be collected from bird nests in the joint Jordan Valley outfall 001 and Kennecott 012 affected outfall area. These samples will be subject to the tissue based selenium water quality standard of 12.5 mg/kg dry weight for Gilbert Bay of Great Salt Lake to demonstrate compliance with the Narrative Standard. Jordan Valley must notify the Director within 7 business days of becoming aware of any egg concentrations that exceed 9.8 mg/kg. The requirements for calculating the geometric mean selenium concentrations in eggs were clarified but not changed. The permit was clarified that geometric mean selenium concentrations will be based on at all eggs collected but at minimum, 5 eggs. In addition, total mercury concentrations in the egg tissue samples must also be evaluated and reported by Jordan Valley.

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

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

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

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

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

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

Similar to the selenium standard for Gilbert Bay, a minimum of 5 eggs are required for calculating the geometric mean concentration. The requirement for 5 to 8 eggs for the Transitional Waters Monitoring Program continues to appropriately balance having a sufficient number of eggs to implement the triggers without adversely impacting bird populations by collecting more than 8 eggs. Although 5 eggs were never

previously available, the vegetation cover is rapidly changing at the delta and 5 eggs are anticipated to be available during the upcoming permit cycle.

JVWCD has proposed operational changes to reduce selenium exposures during the nesting season in the 2020 UPDES Compliance Monitoring at Great Salt Lake Outfalls 001 and 012 (Jacobs, 2020) report. The effectiveness of these changes will continue to be monitored during the upcoming permit cycle.

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

BIOSOLIDS

The State of Utah has adopted the 40 CFR 503 federal regulations for the disposal of sewage sludge (biosolids) by reference. However, since this facility is a lagoon, there is not any regular sludge production. Therefore 40 CFR 503 does not apply at this time. In the future, if the sludge needs to be removed from the lagoons and is disposed in some way, the Division of Water Quality must be contacted prior to the removal of the sludge to ensure that all applicable state and federal regulations are met.

STORM WATER

STORM WATER REQUIREMENTS

Storm water provisions are included in this combined UPDES permit and require that No Exposure requirements be met. An industrial facility is considered to have No Exposure status when all industrial materials and activities are protected from precipitation and storm water.

No Exposure conditions for storm water were verified during an April 11, 2018 Compliance Evaluation Inspection of the facility. A No Exposure status exempts the facility from additional storm water requirements based on the UPDES Multi-Sector General Permit for Storm Water Discharges for Industrial Activity, General Permit No. UTR000000 (MSGP).

If practices change and No Exposure conditions are no longer met, the permit may be reopened to require items typical to the MSGP. This includes the preparation and implementation of a storm water pollution prevention plan for all areas within the confines of the plant. Elements of this plan usually include:

1. The development of a pollution prevention team:
2. Development of drainage maps and materials stockpiles:
3. An inventory of exposed materials:
4. Spill reporting and response procedures:
5. A preventative maintenance program:
6. Employee training:
7. Certification that storm water discharges are not mixed with non-storm water discharges:
8. Compliance site evaluations and potential pollutant source identification, and:
9. Visual examinations of storm water discharges.

PRETREATMENT REQUIREMENTS

The permittee does not discharge to a publicly owned treatment works (POTW); the permittee treats and discharges all of the facility's process wastewater. If the permittee were to haul wastewater to a POTW then the permittee must notify the DWQ and meet the requirement stated in Part II of the UPDES Permit.
Any wastewater, discharged to a public sanitary sewer is subject to Federal, State, and local pretreatment regulations. Pursuant to Section 307 of the Clean Water Act, the permittee shall comply with all applicable Federal pretreatment regulations promulgated in *40 CFR Section 403*, the State pretreatment requirements found in *UAC R317-8-8*, and any specific local discharge limitations developed by the wastewater treatment plant accepting any process wastewater from the permittee.

BIOMONITORING REQUIREMENTS

A nationwide effort to control toxic discharges where effluent toxicity is an existing or potential concern is regulated in accordance with the State of Utah Permitting and Enforcement Guidance Document for Whole Effluent Toxicity Control (biomonitoring). 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 Jordan Valley Southwest Groundwater Treatment Plant is classified as a major industrial discharger, the renewal permit will require whole effluent toxicity (WET) testing. Whole Effluent Toxicity Testing from Outfall 001 will consist of quarterly acute and chronic toxicity testing using one species, *Cyprinodon variegatus*, as detailed in the permit. Whole Effluent Toxicity Testing from Outfall 002 shall consist of 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 (PTI) and Toxicity Reduction Evaluation (TRE) as necessary.

PERMIT DURATION

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

Drafted by
Sarah Leavitt Ward, Discharge
Jennifer Robinson, Pretreatment
Daniel Griffin, Biosolids
Lisa Stevens, Storm Water
Sarah Leavitt Ward, Reasonable Potential Analysis
Chris Bittner/Dave Wham, Wasteload Analysis
Utah Division of Water Quality, (801) 536-4300

PUBLIC NOTICE

Began: March 14, 2020
Ended: May 30, 2020

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

The Public Noticed of the draft permit was published in THE DESERET NEWS AND SALT LAKE TRIBUNE.

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
No comments were received.

ATTACHMENT 1

Wasteload Analysis

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

Date: **October 15, 2019**

Prepared by: **Chris Bittner**
Standards and Technical Services Section

Facility: **Jordan Valley Water Conservancy District Southwest Groundwater Treatment Plant**
UPDES No. UT0025836

Receiving water: **Outfall 001 Transitional Waters of Great Salt Lake, Gilbert Bay of Great Salt Lake (5E, 5A)**

This addendum summarizes the wasteload analyses that were performed to determine water quality based effluent limits (WQBEL) for Outfall 001 discharge. Wasteload analyses are performed to determine point source effluent limitations necessary to maintain designated beneficial uses by evaluating projected effects of discharge concentrations on in-stream water quality. The wasteload analysis also takes into account downstream designated uses (UAC R317-2-8). Projected concentrations are compared to numeric water quality standards to determine acceptability. The numeric criteria in this wasteload analysis may be modified by narrative criteria and other conditions determined by staff of the Division of Water Quality.

Discharge

Outfall 001: 3.0 MGD

Receiving Waters Outfall 001
The receiving waters for Outfalls 001 are the Transitional Waters to Great Salt Lake and Gilbert Bay, Great Salt Lake

Per 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 are:

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

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 Gilbert Bay and 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 be reliably measured. As a result, the annual critical low flow was determined to be zero for the wasteload.

With the exception of the selenium standard for Gilbert Bay, 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 (UPDES) Permits*, Version 1.0 (DWQ, 2016).

The selenium standard for Gilbert Bay is based on bird egg concentration and no 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. The limited number of birds nesting in the area combined with high predation rates has prevented successful collection of at least 5 eggs and in the majority of years, no eggs could be collected. At least 5 eggs are required by the permit to calculate the geometric mean.

As required by the existing permit, JVWCD recently notified DWQ that the selenium concentrations in 3 eggs collected during the 2019 nesting season exceeded 9.8 mg/kg. No additional actions are required at this time because less than 5 eggs are available. However, if the 2019 egg concentrations are an indication that selenium concentrations are increasing in the food web, additional actions may be required in the future. Pictures from the Annual Monitoring Reports suggest that the habitat is evolving with the establishment of vegetation, including phragmites because of the continuous discharge from the JVWCD Outfall 001. If these habitat changes result in an increased usage by birds, a sufficient number of eggs should be available in the future. If less than 5 eggs annually are available during the upcoming permit cycle and concentrations in the available eggs support that selenium concentrations are increasing in the food web, i.e., greater than 9.8 mg/kg, an alternative monitoring approach may be considered.

Selenium concentrations were annually monitored in water and biota in Gilbert Bay. No exceedances were observed or increasing trends observed. 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.

TMDL

The water quality of the Transitional Waters and Great Salt Lake are not currently impaired for any pollutant.

Mixing Zone

Because the critical low flow for the receiving water is zero, no mixing zone was 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, 7 effluent samples were characterized for all potentially present pollutants as part of a WET investigation and routine monitoring was conducted by the permittee. After identifying and removing some non-representative measurements, the similarity in results to previous effluent characterizations support that no other pollutants have reasonable potential. Other pollutants of concern may become apparent as a result of technology based standards, or other factors as determined by the UPDES Permit Writer.

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 (2018) WET guidance, the chronic testing results are interpreted as an indicator.

Antidegradation Level I and II Reviews

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, know 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.

A Level II Antidegradation Review (ADR) is not required for this facility. The proposed permit is a simple renewal, with no increase in flow or concentration over that which was approved in the existing permit.

Documents:

WLA Document:
Wasteload Analysis: *JVWCD_WLADoc01232019.xlsm*

References:

Ackerman, J. T., et al. 2015. Mercury and selenium contamination in water bird eggs and risk to avian reproduction at Great Salt Lake, Utah, USGS Open File Report 2015-1020 https://pubs.er.usgs.gov/publication/ofr20151020

Utah Division of Water Quality. 2012. *Utah Wasteload Analysis Procedures Version 1.0*.

Utah Division of Water Quality. 2016. *Interim Methods for Evaluating Use Support for Great Salt Lake, Utah Pollution Discharge Elimination (UPDES) Permits*, Version 1.0

Utah Division of Water Quality. 2018. *Utah Pollution Discharge Elimination System Permit and Enforcement Guidance Document for Whole Effluent Toxicity*.

DWQ-2019-012808

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

Date: **January 29, 2019**

Prepared by: **Dave Wham**
Standards and Technical Services

Facility: **JVWCD 002 Discharge**
UPDES No. UT0025836

Receiving water: **Jordan River (2B, 3A, 4)**

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

Discharge

002 untreated shallow groundwater aquifer bypass water discharge 3.0 MGD

Receiving Water

Per UAC R317-2-13.5(a), the designated beneficial uses of Jordan River from confluence with Little Cottonwood Creek to Narrows Diversion are 2B, 3A, 4.

- *Class 2B - Protected for infrequent primary contact recreation. Also protected for secondary contact recreation where there is a low likelihood of ingestion of water or a low degree of bodily contact with the water. Examples include, but are not limited to, wading, hunting, and fishing.*
- *Class 3A - Protected for cold water species of game fish and other cold water aquatic life, including the necessary aquatic organisms in their food chain.*
- *Class 4 - Protected for agricultural uses including irrigation of crops and stock watering.*

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

daily flow values from Salt Lake County's *Jordan River at 90th South* Station for the period 1997-2018 station. Receiving water quality was characterized using data from DWQ Monitoring Station # 4994270, Jordan River at 9000 S Crossing for the period 2001-2013.

The calculated annual critical low flow condition (7Q10) for Discharge 002 is 13.15 cfs.

TMDL

According to the Utah's 2016 303(d) Water Quality Assessment Report, the receiving water for the discharge, Jordan River from 7800 South to Bluffdale at 14600 South (AU UT16020204-006) is listed as impaired for TDS, temperature, O/E bioassessment and selenium. Additional impairments are present in downstream stream segments as outlined in Table 1.

Table 1. 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	AU UT16020204-005	TDS, Temperature, E. coli
Jordan River from 2100 South to the confluence with Little Cottonwood Creek	AU UT16020204-004	TDS, E. coli, O/E
Jordan River from North Temple to 2100 South	AU UT16020204-003	E. coli, O/E, Phosphorous
Jordan River from Davis County line upstream to North Temple Street	AU UT16020204-002	TDS, E. coli, O/E
Jordan River from Farmington Bay upstream contiguous with the Davis County line	AU UT16020204-001	TDS, E. coli, O/E, Copper

Although the WLA may show higher allowed effluent limits for these impaired parameters, the following constituents from Table 1 should be evaluated in the effluent against the end of pipe Water Quality Standards in Table 2 to determine whether or not they have reasonable potential to cause or contribute to the existing impairments.

Table 2. End of pipe Criteria

Constituent	Criteria
TDS	1200 mg/l
Temperature	20 Degrees C
Selenium	4.6 ug/l (chronic)
Copper	30.5 ug/l (chronic)

Mixing Zone

The maximum allowable mixing zone is 15 minutes of travel time for acute conditions, not to exceed 50% of stream width, and for chronic conditions, per UAC R317-2-5. Water quality standards must be met at the end of the mixing zone. The mixing zone model showed complete mixing within 2,500 feet for chronic conditions. Acute limits were calculated using 50% of the seasonal critical low flow.

Parameters of Concern

The potential parameters of concern identified for the discharge were TDS, temperature, selenium, E. coli, and copper as determined by the impairment status of the receiving water and review of the previous permit.

WET Limits

The percent of effluent in the receiving water in a fully mixed condition, and acute and chronic dilution in a not fully mixed condition are calculated in the WLA in order to generate WET limits. The LC_{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 for Outfall 002 should be based on 26.1% effluent.

Wasteload Allocation Methods

Effluent limits were determined for conservative constituents using a simple mass balance mixing analysis (UDWQ 2012). The mass balance analysis is summarized in the Wasteload Addendums.

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 analysis is summarized in the Wasteload Addendum.

Models and supporting documentation are available for review upon request.

Antidegradation Level I Review

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

A Level II Antidegradation Review (ADR) is not required for this facility. The proposed permit is a simple renewal of an existing UPDES permit. No increase in flow or concentration of pollutants over those authorized in the the existing permit is being requested.

Documents:

WLA Document: *JVWCD_002_WLADoc_1-29-19.docx*
Wasteload Analysis and Addendums: *JVWCD_002_WLA_1-29-19.xlsm;*

References:

Utah Division of Water Quality. 2012. *Utah Wasteload Analysis Procedures Version 1.0.*

WASTELOAD ANALYSIS [WLA]
Addendum: Statement of Basis
SUMMARY

Discharging Facility:	**JVWCD 002 Discharge**		
UPDES No:	UT-UT0025836		
Design Flow	3.00	MGD	
Receiving Water:	**Jordan River**		
Stream Classification:	2B, 3A, 4		
Stream Flows [cfs]:	13.15	Summer (July-Sept)	7Q10
	13.15	Fall (Oct-Dec)	7Q10
	13.15	Winter (Jan-Mar)	7Q10
	13.15	Spring (Apr-June)	7Q10
	0.0	Average	
Stream TDS Values:	1066.0	Summer (July-Sept)	Average
	1205.0	Fall (Oct-Dec)	Average
	1190.0	Winter (Jan-Mar)	Average
	886.0	Spring (Apr-June)	Average

Effluent Limits:				**WQ Standard:**
Flow, MGD:	3.00	MGD	Design Flow	
BOD, mg/l:	25.0	Summer	5.0	Indicator
Dissolved Oxygen, mg/l	5.0	Summer	6.5	30 Day Average
TNH3, Chronic, mg/l:	8.3	Summer	Varies	Function of pH and Temperature
TDS, mg/l:	1579.7	Summer	1200.0	

Modeling Parameters:	
Acute River Width:	50.0%
Chronic River Width:	100.0%

Level 1 Antidegradation Level Completed: Level II Review not required.

Date: 1/29/2019

WASTELOAD ANALYSIS [WLA]
Addendum: Statement of Basis

29-Jan-19
4:00 PM

Facilities: **JVWCD 002 Discharge** **UPDES No: UT-UT0025836**
Discharging to: **Jordan River**

THIS IS A DRAFT DOCUMENT

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

Jordan River:	2B, 3A, 4
Antidegradation Review:	Level I review completed. Level II review 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)	6.50 mg/l (30 Day Average) 5.00 mg/l (7Day Average) 4.00 mg/l (1 Day Average
Maximum Total Dissolved Solids	1200.0 mg/l

Utah Division of Water Quality
Salt Lake City, Utah

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**	2.181 lbs/day	750.00 ug/l	18.798 lbs/day
Arsenic	190.00 ug/l	4.762 lbs/day	340.00 ug/l	8.522 lbs/day
Cadmium	2.49 ug/l	0.062 lbs/day	7.00 ug/l	0.175 lbs/day
Chromium III	268.22 ug/l	6.723 lbs/day	5611.67 ug/l	140.648 lbs/day
ChromiumVI	11.00 ug/l	0.276 lbs/day	16.00 ug/l	0.401 lbs/day
Copper	30.50 ug/l	0.764 lbs/day	51.68 ug/l	1.295 lbs/day
Iron			1000.00 ug/l	25.064 lbs/day
Lead	18.58 ug/l	0.466 lbs/day	476.82 ug/l	11.951 lbs/day
Mercury	0.0120 ug/l	0.000 lbs/day	2.40 ug/l	0.060 lbs/day
Nickel	168.54 ug/l	4.224 lbs/day	1515.91 ug/l	37.994 lbs/day
Selenium	4.60 ug/l	0.115 lbs/day	20.00 ug/l	0.501 lbs/day
Silver	N/A ug/l	N/A lbs/day	41.07 ug/l	1.029 lbs/day
Zinc	387.83 ug/l	9.720 lbs/day	387.83 ug/l	9.720 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 400 mg/l as CaCO3

Organics [Pesticides]

Parameter	4 Day Average (Chronic) Standard Concentration	Load*	1 Hour Average (Acute) Standard Concentration	Load*
Aldrin			1.500 ug/l	0.038 lbs/day
Chlordane	0.004 ug/l	0.412 lbs/day	1.200 ug/l	0.030 lbs/day
DDT, DDE	0.001 ug/l	0.096 lbs/day	0.550 ug/l	0.014 lbs/day
Dieldrin	0.002 ug/l	0.182 lbs/day	1.250 ug/l	0.031 lbs/day
Endosulfan	0.056 ug/l	5.370 lbs/day	0.110 ug/l	0.003 lbs/day
Endrin	0.002 ug/l	0.221 lbs/day	0.090 ug/l	0.002 lbs/day
Guthion			0.010 ug/l	0.000 lbs/day
Heptachlor	0.004 ug/l	0.364 lbs/day	0.260 ug/l	0.007 lbs/day
Lindane	0.080 ug/l	7.671 lbs/day	1.000 ug/l	0.025 lbs/day
Methoxychlor			0.030 ug/l	0.001 lbs/day
Mirex			0.010 ug/l	0.000 lbs/day
Parathion			0.040 ug/l	0.001 lbs/day
PCB's	0.014 ug/l	1.343 lbs/day	2.000 ug/l	0.050 lbs/day
Pentachlorophenol	13.00 ug/l	1246.615 lbs/day	20.000 ug/l	0.501 lbs/day
Toxephene	0.0002 ug/l	0.019 lbs/day	0.7300 ug/l	0.018 lbs/day

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	0.13 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	15.04 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
Chlorophenoxy Herbicides				
2,4-D			ug/l	lbs/day
2,4,5-TP			ug/l	lbs/day
Endrin			ug/l	lbs/day
ocyclohexane (Lindane)			ug/l	lbs/day
Methoxychlor			ug/l	lbs/day
Toxaphene			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	
Toxic Organics	[2 Liters/Day for 70 Kg Person over 70 Yr.]		[6.5 g for 70 Kg Person over 70 Yr.]	
Acenaphthene	ug/l	lbs/day	2700.0 ug/l	258.91 lbs/day
Acrolein	ug/l	lbs/day	780.0 ug/l	74.80 lbs/day
Acrylonitrile	ug/l	lbs/day	0.7 ug/l	0.06 lbs/day
Benzene	ug/l	lbs/day	71.0 ug/l	6.81 lbs/day
Benzidine	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
Carbon tetrachloride	ug/l	lbs/day	4.4 ug/l	0.42 lbs/day
Chlorobenzene	ug/l	lbs/day	21000.0 ug/l	2013.76 lbs/day
1,2,4-Trichlorobenzene				
Hexachlorobenzene	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
1,2-Dichloroethane	ug/l	lbs/day	99.0 ug/l	9.49 lbs/day

1,1,1-Trichloroethane					
Hexachloroethane	ug/l	lbs/day	8.9	ug/l	0.85 lbs/day
1,1-Dichloroethane					
1,1,2-Trichloroethane	ug/l	lbs/day	42.0	ug/l	4.03 lbs/day
1,1,2,2-Tetrachloroethai	ug/l	lbs/day	11.0	ug/l	1.05 lbs/day
Chloroethane			0.0	ug/l	0.00 lbs/day
Bis(2-chloroethyl) ether	ug/l	lbs/day	1.4	ug/l	0.13 lbs/day
2-Chloroethyl vinyl ether	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
2-Chloronaphthalene	ug/l	lbs/day	4300.0	ug/l	412.34 lbs/day
2,4,6-Trichlorophenol	ug/l	lbs/day	6.5	ug/l	0.62 lbs/day
p-Chloro-m-cresol			0.0	ug/l	0.00 lbs/day
Chloroform (HM)	ug/l	lbs/day	470.0	ug/l	45.07 lbs/day
2-Chlorophenol	ug/l	lbs/day	400.0	ug/l	38.36 lbs/day
1,2-Dichlorobenzene	ug/l	lbs/day	17000.0	ug/l	1630.19 lbs/day
1,3-Dichlorobenzene	ug/l	lbs/day	2600.0	ug/l	249.32 lbs/day
1,4-Dichlorobenzene	ug/l	lbs/day	2600.0	ug/l	249.32 lbs/day
3,3'-Dichlorobenzidine	ug/l	lbs/day	0.1	ug/l	0.01 lbs/day
1,1-Dichloroethylene	ug/l	lbs/day	3.2	ug/l	0.31 lbs/day
1,2-trans-Dichloroethyle	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
2,4-Dichlorophenol	ug/l	lbs/day	790.0	ug/l	75.76 lbs/day
1,2-Dichloropropane	ug/l	lbs/day	39.0	ug/l	3.74 lbs/day
1,3-Dichloropropylene	ug/l	lbs/day	1700.0	ug/l	163.02 lbs/day
2,4-Dimethylphenol	ug/l	lbs/day	2300.0	ug/l	220.56 lbs/day
2,4-Dinitrotoluene	ug/l	lbs/day	9.1	ug/l	0.87 lbs/day
2,6-Dinitrotoluene	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
1,2-Diphenylhydrazine	ug/l	lbs/day	0.5	ug/l	0.05 lbs/day
Ethylbenzene	ug/l	lbs/day	29000.0	ug/l	2780.91 lbs/day
Fluoranthene	ug/l	lbs/day	370.0	ug/l	35.48 lbs/day
4-Chlorophenyl phenyl ether					
4-Bromophenyl phenyl ether					
Bis(2-chloroisopropyl) e	ug/l	lbs/day	170000.0	ug/l	16301.89 lbs/day
Bis(2-chloroethoxy) met	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
Methylene chloride (HM	ug/l	lbs/day	1600.0	ug/l	153.43 lbs/day
Methyl chloride (HM)	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
Methyl bromide (HM)	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
Bromoform (HM)	ug/l	lbs/day	360.0	ug/l	34.52 lbs/day
Dichlorobromomethane	ug/l	lbs/day	22.0	ug/l	2.11 lbs/day
Chlorodibromomethane	ug/l	lbs/day	34.0	ug/l	3.26 lbs/day
Hexachlorobutadiene(c)	ug/l	lbs/day	50.0	ug/l	4.79 lbs/day
Hexachlorocyclopentadi	ug/l	lbs/day	17000.0	ug/l	1630.19 lbs/day
Isophorone	ug/l	lbs/day	600.0	ug/l	57.54 lbs/day
Naphthalene					
Nitrobenzene	ug/l	lbs/day	1900.0	ug/l	182.20 lbs/day
2-Nitrophenol	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
4-Nitrophenol	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
2,4-Dinitrophenol	ug/l	lbs/day	14000.0	ug/l	1342.51 lbs/day
4,6-Dinitro-o-cresol	ug/l	lbs/day	765.0	ug/l	73.36 lbs/day
N-Nitrosodimethylamine	ug/l	lbs/day	8.1	ug/l	0.78 lbs/day
N-Nitrosodiphenylamine	ug/l	lbs/day	16.0	ug/l	1.53 lbs/day
N-Nitrosodi-n-propylami	ug/l	lbs/day	1.4	ug/l	0.13 lbs/day
Pentachlorophenol	ug/l	lbs/day	8.2	ug/l	0.79 lbs/day

Phenol	ug/l	lbs/day	4.6E+06	ug/l	4.41E+05 lbs/day
Bis(2-ethylhexyl)phthala	ug/l	lbs/day	5.9	ug/l	0.57 lbs/day
Butyl benzyl phthalate	ug/l	lbs/day	5200.0	ug/l	498.65 lbs/day
Di-n-butyl phthalate	ug/l	lbs/day	12000.0	ug/l	1150.72 lbs/day
Di-n-octyl phthlate					
Diethyl phthalate	ug/l	lbs/day	120000.0	ug/l	11507.22 lbs/day
Dimethyl phthlate	ug/l	lbs/day	2.9E+06	ug/l	2.78E+05 lbs/day
Benzo(a)anthracene (P/	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
Benzo(a)pyrene (PAH)	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
Benzo(b)fluoranthene (F	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
Benzo(k)fluoranthene (F	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
Chrysene (PAH)	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
Acenaphthylene (PAH)					
Anthracene (PAH)	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
Dibenzo(a,h)anthracene	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
Indeno(1,2,3-cd)pyrene	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
Pyrene (PAH)	ug/l	lbs/day	11000.0	ug/l	1054.83 lbs/day
Tetrachloroethylene	ug/l	lbs/day	8.9	ug/l	0.85 lbs/day
Toluene	ug/l	lbs/day	200000	ug/l	19178.70 lbs/day
Trichloroethylene	ug/l	lbs/day	81.0	ug/l	7.77 lbs/day
Vinyl chloride	ug/l	lbs/day	525.0	ug/l	50.34 lbs/day
					lbs/day
Pesticides					lbs/day
Aldrin	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
Dieldrin	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
Chlordane	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
4,4'-DDT	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
4,4'-DDE	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
4,4'-DDD	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
alpha-Endosulfan	ug/l	lbs/day	2.0	ug/l	0.19 lbs/day
beta-Endosulfan	ug/l	lbs/day	2.0	ug/l	0.19 lbs/day
Endosulfan sulfate	ug/l	lbs/day	2.0	ug/l	0.19 lbs/day
Endrin	ug/l	lbs/day	0.8	ug/l	0.08 lbs/day
Endrin aldehyde	ug/l	lbs/day	0.8	ug/l	0.08 lbs/day
Heptachlor	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
Heptachlor epoxide					
PCB's					
PCB 1242 (Arochlor 12/	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
PCB-1254 (Arochlor 12!	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
PCB-1221 (Arochlor 12:	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
PCB-1232 (Arochlor 12:	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
PCB-1248 (Arochlor 12/	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
PCB-1260 (Arochlor 12(	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
PCB-1016 (Arochlor 10'	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
Pesticide					
Toxaphene	ug/l		0.0	ug/l	0.00 lbs/day
Dioxin					
Dioxin (2,3,7,8-TCDD)	ug/l	lbs/day			

Metals				
Antimony	ug/l	lbs/day		
Arsenic	ug/l	lbs/day	4300.00 ug/l	412.34 lbs/day
Asbestos	ug/l	lbs/day		
Beryllium				
Cadmium				
Chromium (III)				
Chromium (VI)				
Copper				
Cyanide	ug/l	lbs/day	2.2E+05 ug/l	21096.57 lbs/day
Lead	ug/l	lbs/day		
Mercury			0.15 ug/l	0.01 lbs/day
Nickel			4600.00 ug/l	441.11 lbs/day
Selenium	ug/l	lbs/day		
Silver	ug/l	lbs/day		
Thallium			6.30 ug/l	0.60 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)	13.15	19.2	7.9	0.05	1.00	7.09	0.00	1066.0
Fall	13.15	8.8	8.0	0.05	1.00	---	0.00	1205.0
Winter	13.15	5.5	7.7	0.05	1.00	---	0.00	1190.0
Spring	13.15	14.0	8.0	0.05	1.00	---	0.00	886.0

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	13.50	0.05	2.82	3.975*	2.41	10.0	0.25

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	2.86	0.25	15.90	318.0	* ~80% MDL

Projected Discharge Information

Season	Flow, MGD	Temp.
Summer	3.00000	15.0
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 >	100.0% Effluent	[Acute]
	IC25 >	26.1% Effluent	[Chronic]

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	8.32 mg/l as N	208.2 lbs/day
	1 Hour Avg. - Acute	12.5 mg/l as N	312.5 lbs/day
Fall	4 Day Avg. - Chronic	9.2 mg/l as N	230.7 lbs/day
	1 Hour Avg. - Acute	10.9 mg/l as N	272.3 lbs/day
Winter	4 Day Avg. - Chronic	12.7 mg/l as N	318.1 lbs/day
	1 Hour Avg. - Acute	15.2 mg/l as N	379.4 lbs/day
Spring	4 Day Avg. - Chronic	9.9 mg/l as N	246.9 lbs/day
	1 Hour Avg. - Acute	11.9 mg/l as N	298.2 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	0.039	mg/l	0.98	lbs/day
	1 Hour Avg. - Acute	0.044	mg/l	1.11	lbs/day
Fall	4 Day Avg. - Chronic	0.039	mg/l	0.98	lbs/day
	1 Hour Avg. - Acute	0.044	mg/l	1.11	lbs/day
Winter	4 Day Avg. - Chronic	0.039	mg/l	0.98	lbs/day
	1 Hour Avg. - Acute	0.044	mg/l	1.11	lbs/day
Spring	4 Day Avg. - Chronic	0.039	mg/l	0.98	lbs/day
	1 Hour Avg. - Acute	0.044	mg/l	1.11	lbs/day

Effluent Limitations for Total Dissolved Solids based upon Water Quality Standards

Season		Concentration		Load	
Summer	Maximum, Acute	1579.7	mg/l	19.76	tons/day
Fall	Maximum, Acute	1185.8	mg/l	14.83	tons/day
Winter	Maximum, Acute	1228.3	mg/l	15.36	tons/day
Spring	Maximum, Acute	2089.7	mg/l	26.14	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 400 mg/l):

	4 Day Average Concentration		Load	1 Hour Average Concentration		Load
Aluminum*	N/A		N/A	1,805.5	ug/l	45.3 lbs/day
Arsenic*	690.10	ug/l	11.2 lbs/day	802.6	ug/l	20.1 lbs/day
Cadmium	9.41	ug/l	0.2 lbs/day	16.8	ug/l	0.4 lbs/day
Chromium III	1,020.21	ug/l	16.5 lbs/day	13,557.8	ug/l	339.8 lbs/day
Chromium VI*	30.90	ug/l	0.5 lbs/day	33.0	ug/l	0.8 lbs/day
Copper	110.09	ug/l	1.8 lbs/day	121.5	ug/l	3.0 lbs/day
Iron*	N/A		N/A	2,402.6	ug/l	60.2 lbs/day
Lead	70.52	ug/l	1.1 lbs/day	1,152.0	ug/l	28.9 lbs/day
Mercury*	0.05	ug/l	0.0 lbs/day	5.8	ug/l	0.1 lbs/day
Nickel	639.01	ug/l	10.3 lbs/day	3,660.0	ug/l	91.7 lbs/day
Selenium*	9.53	ug/l	0.2 lbs/day	44.3	ug/l	1.1 lbs/day
Silver	N/A	ug/l	N/A lbs/day	98.9	ug/l	2.5 lbs/day

Zinc	1,441.67	ug/l	23.3	lbs/day	914.7	ug/l	22.9 lbs/day
Cyanide*	19.93	ug/l	0.3	lbs/day	53.2	ug/l	1.3 lbs/day

*Limits for these metals are based on the dissolved standard.

Effluent Limitations for Heat/Temperature based upon Water Quality Standards

Summer	26.8 Deg. C.	80.3 Deg. F
Fall	16.5 Deg. C.	61.7 Deg. F
Winter	13.2 Deg. C.	55.7 Deg. F
Spring	21.7 Deg. C.	71.0 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	5.82E-02	lbs/day
Chlordane	4.30E-03	ug/l	1.08E-01	lbs/day	1.2E+00	ug/l	4.65E-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	4.85E-02	lbs/day
Endosulfan	5.60E-02	ug/l	1.40E+00	lbs/day	1.1E-01	ug/l	4.27E-03	lbs/day
Endrin	2.30E-03	ug/l	5.75E-02	lbs/day	9.0E-02	ug/l	3.49E-03	lbs/day
Guthion	0.00E+00	ug/l	0.00E+00	lbs/day	1.0E-02	ug/l	3.88E-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	3.88E-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	3.88E-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	7.75E-02	lbs/day
Pentachlorophenol	1.30E+01	ug/l	3.25E+02	lbs/day	2.0E+01	ug/l	7.75E-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	125.3 lbs/day
Nitrates as N	4.0 mg/l	100.3 lbs/day
Total Phosphorus as P	0.05 mg/l	1.3 lbs/day
Total Suspended Solids	90.0 mg/l	2255.7 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**
Toxic Organics		
Acenaphthene	1.04E+04 ug/l	2.59E+02 lbs/day
Acrolein	2.99E+03 ug/l	7.48E+01 lbs/day
Acrylonitrile	2.53E+00 ug/l	6.33E-02 lbs/day
Benzene	2.72E+02 ug/l	6.81E+00 lbs/day
Benzidine	ug/l	lbs/day
Carbon tetrachloride	1.69E+01 ug/l	4.22E-01 lbs/day
Chlorobenzene	8.05E+04 ug/l	2.01E+03 lbs/day
1,2,4-Trichlorobenzene		
Hexachlorobenzene	2.95E-03 ug/l	7.38E-05 lbs/day
1,2-Dichloroethane	3.80E+02 ug/l	9.49E+00 lbs/day
1,1,1-Trichloroethane		
Hexachloroethane	3.41E+01 ug/l	8.53E-01 lbs/day
1,1-Dichloroethane		
1,1,2-Trichloroethane	1.61E+02 ug/l	4.03E+00 lbs/day
1,1,2,2-Tetrachloroethane	4.22E+01 ug/l	1.05E+00 lbs/day
Chloroethane		
Bis(2-chloroethyl) ether	5.37E+00 ug/l	1.34E-01 lbs/day
2-Chloroethyl vinyl ether		
2-Chloronaphthalene	1.65E+04 ug/l	4.12E+02 lbs/day
2,4,6-Trichlorophenol	2.49E+01 ug/l	6.23E-01 lbs/day
p-Chloro-m-cresol		
Chloroform (HM)	1.80E+03 ug/l	4.51E+01 lbs/day
2-Chlorophenol	1.53E+03 ug/l	3.84E+01 lbs/day
1,2-Dichlorobenzene	6.52E+04 ug/l	1.63E+03 lbs/day
1,3-Dichlorobenzene	9.97E+03 ug/l	2.49E+02 lbs/day

1,4-Dichlorobenzene	9.97E+03 ug/l	2.49E+02 lbs/day
3,3'-Dichlorobenzidine	2.95E-01 ug/l	7.38E-03 lbs/day
1,1-Dichloroethylene	1.23E+01 ug/l	3.07E-01 lbs/day
1,2-trans-Dichloroethylene1		
2,4-Dichlorophenol	3.03E+03 ug/l	7.58E+01 lbs/day
1,2-Dichloropropane	1.50E+02 ug/l	3.74E+00 lbs/day
1,3-Dichloropropylene	6.52E+03 ug/l	1.63E+02 lbs/day
2,4-Dimethylphenol	8.82E+03 ug/l	2.21E+02 lbs/day
2,4-Dinitrotoluene	3.49E+01 ug/l	8.73E-01 lbs/day
2,6-Dinitrotoluene		
1,2-Diphenylhydrazine	2.07E+00 ug/l	5.18E-02 lbs/day
Ethylbenzene	1.11E+05 ug/l	2.78E+03 lbs/day
Fluoranthene	1.42E+03 ug/l	3.55E+01 lbs/day
4-Chlorophenyl phenyl ether		
4-Bromophenyl phenyl ether		
Bis(2-chloroisopropyl) ether	6.52E+05 ug/l	1.63E+04 lbs/day
Bis(2-chloroethoxy) methane		
Methylene chloride (HM)	6.13E+03 ug/l	1.53E+02 lbs/day
Methyl chloride (HM)		
Methyl bromide (HM)		
Bromoform (HM)	1.38E+03 ug/l	3.45E+01 lbs/day
Dichlorobromomethane(HM)	8.43E+01 ug/l	2.11E+00 lbs/day
Chlorodibromomethane (HM)	1.30E+02 ug/l	3.26E+00 lbs/day
Hexachlorocyclopentadiene	6.52E+04 ug/l	1.63E+03 lbs/day
Isophorone	2.30E+03 ug/l	5.75E+01 lbs/day
Naphthalene		
Nitrobenzene	7.28E+03 ug/l	1.82E+02 lbs/day
2-Nitrophenol		
4-Nitrophenol		
2,4-Dinitrophenol	5.37E+04 ug/l	1.34E+03 lbs/day
4,6-Dinitro-o-cresol	2.93E+03 ug/l	7.34E+01 lbs/day
N-Nitrosodimethylamine	3.11E+01 ug/l	7.77E-01 lbs/day
N-Nitrosodiphenylamine	6.13E+01 ug/l	1.53E+00 lbs/day
N-Nitrosodi-n-propylamine	5.37E+00 ug/l	1.34E-01 lbs/day
Pentachlorophenol	3.14E+01 ug/l	7.86E-01 lbs/day
Phenol	1.76E+07 ug/l	4.41E+05 lbs/day
Bis(2-ethylhexyl)phthalate	2.26E+01 ug/l	5.66E-01 lbs/day
Butyl benzyl phthalate	1.99E+04 ug/l	4.99E+02 lbs/day
Di-n-butyl phthalate	4.60E+04 ug/l	1.15E+03 lbs/day
Di-n-octyl phthlate		
Diethyl phthalate	4.60E+05 ug/l	1.15E+04 lbs/day
Dimethyl phthlate	1.11E+07 ug/l	2.78E+05 lbs/day
Benzo(a)anthracene (PAH)	1.19E-01 ug/l	2.97E-03 lbs/day
Benzo(a)pyrene (PAH)	1.19E-01 ug/l	2.97E-03 lbs/day
Benzo(b)fluoranthene (PAH)	1.19E-01 ug/l	2.97E-03 lbs/day
Benzo(k)fluoranthene (PAH)	1.19E-01 ug/l	2.97E-03 lbs/day
Chrysene (PAH)	1.19E-01 ug/l	2.97E-03 lbs/day
Acenaphthylene (PAH)		
Anthracene (PAH)		
Dibenzo(a,h)anthracene (PAH)	1.19E-01 ug/l	2.97E-03 lbs/day
Indeno(1,2,3-cd)pyrene (PAH)	1.19E-01 ug/l	2.97E-03 lbs/day

Pyrene (PAH)	4.22E+04 ug/l	1.05E+03 lbs/day
Tetrachloroethylene	3.41E+01 ug/l	8.53E-01 lbs/day
Toluene	7.67E+05 ug/l	1.92E+04 lbs/day
Trichloroethylene	3.11E+02 ug/l	7.77E+00 lbs/day
Vinyl chloride	2.01E+03 ug/l	5.03E+01 lbs/day
Pesticides		
Aldrin	5.37E-04 ug/l	1.34E-05 lbs/day
Dieldrin	5.37E-04 ug/l	1.34E-05 lbs/day
Chlordane	2.26E-03 ug/l	5.66E-05 lbs/day
4,4'-DDT	2.26E-03 ug/l	5.66E-05 lbs/day
4,4'-DDE	2.26E-03 ug/l	5.66E-05 lbs/day
4,4'-DDD	3.22E-03 ug/l	8.06E-05 lbs/day
alpha-Endosulfan	7.67E+00 ug/l	1.92E-01 lbs/day
beta-Endosulfan	7.67E+00 ug/l	1.92E-01 lbs/day
Endosulfan sulfate	7.67E+00 ug/l	1.92E-01 lbs/day
Endrin	3.11E+00 ug/l	7.77E-02 lbs/day
Endrin aldehyde	3.11E+00 ug/l	7.77E-02 lbs/day
Heptachlor	8.05E-04 ug/l	2.01E-05 lbs/day
Heptachlor epoxide		
PCB's		
PCB 1242 (Arochlor 1242)	1.73E-04 ug/l	4.32E-06 lbs/day
PCB-1254 (Arochlor 1254)	1.73E-04 ug/l	4.32E-06 lbs/day
PCB-1221 (Arochlor 1221)	1.73E-04 ug/l	4.32E-06 lbs/day
PCB-1232 (Arochlor 1232)	1.73E-04 ug/l	4.32E-06 lbs/day
PCB-1248 (Arochlor 1248)	1.73E-04 ug/l	4.32E-06 lbs/day
PCB-1260 (Arochlor 1260)	1.73E-04 ug/l	4.32E-06 lbs/day
PCB-1016 (Arochlor 1016)	1.73E-04 ug/l	4.32E-06 lbs/day
Pesticide		
Toxaphene	2.88E-03 ug/l	7.19E-05 lbs/day
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		

Dioxin		
Dioxin (2,3,7,8-TCDD)	5.37E-08 ug/l	1.34E-09 lbs/day

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

	Class 4 Acute Agricultural ug/l	Class 3 Acute Aquatic Wildlife ug/l	Acute Toxics Drinking Water Source ug/l	Acute Toxics Wildlife ug/l	1C Acute Health Criteria ug/l	Acute Most Stringent ug/l	Class 3 Chronic Aquatic Wildlife ug/l
Aluminum		1805.5				1805.5	N/A
Antimony				16483.8		16483.8	
Arsenic	383.3	802.6				383.3	690.1
Barium							
Beryllium						0.0	
Cadmium	38.2	16.8				16.8	9.4
Chromium (III)		13557.8				13557.8	1020.2
Chromium (VI)	375.4	33.0				33.04	30.90
Copper	759.9	121.5				121.5	110.1
Cyanide		53.2	843357.0			53.2	19.9
Iron		2402.6				2402.6	
Lead	382.6	1152.0				382.6	70.5
Mercury		5.80		0.58		0.58	0.046
Nickel		3660.0		17633.8		3660.0	639.0
Selenium	183.6	44.3				44.3	9.5
Silver		98.9				98.9	
Thallium				24.2		24.2	
Zinc		914.7				914.7	1441.7
Boron	1974.0					1974.0	
Sulfate	7666.9					7666.9	

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	1805.5	N/A	
Antimony	16483.80		
Arsenic	383.3	690.1	Acute Controls
Asbestos			
Barium			
Beryllium			
Cadmium	16.8	9.4	
Chromium (III)	13557.8	1020	
Chromium (VI)	33.0	30.9	
Copper	121.5	110.1	

Cyanide	53.2	19.9	
Iron	2402.6		
Lead	382.6	70.5	
Mercury	0.575	0.046	
Nickel	3660.0	639	
Selenium	44.3	9.5	
Silver	98.9	N/A	
Thallium	24.2		
Zinc	914.7	1441.7	Acute Controls
Boron	1974.05		
Sulfate	7666.9		N/A at this Waterbody

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.

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. The proposed permit is a simple renewal, with no increase in flow or concentration over that which was approved in the existing permit.

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.

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.

DWQ-2019-012802

ATTACHMENT 2

Reasonable Potential Analysis

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REASONABLE POTENTIAL ANALYSIS

Water Quality has worked to improve our reasonable potential analysis (RP) for the inclusion of limits for parameters in the permit by using an EPA provided model. As a result of the model, more parameters may be included in the renewal permit. A Copy of the Reasonable Potential Analysis Guidance (RP Guide) is available at water Quality. There are four outcomes for the RP Analysis[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 for metals values that were submitted through the discharge monitoring reports showed that a closer look at some of the metals is needed. The facility was contacted for further data which resulted in a RP Screening all the metal data provided.

Outfall 001 Parameters
Antimony
Arsenic
Barium
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Selenium
Silver
Thallium
Zinc

Outfall 001: The RP model was run on Antimony using the most recent data back through 2013. This resulted in 35 data points and that there was not a Reasonable Potential Antimony.

Outfall 001: The RP model was run on Arsenic using the most recent data back through 2013. This resulted in 35 data points and that there was not a Reasonable Potential Arsenic.

Outfall 001: The RP model was run on Barium using the most recent data back through 2013. This resulted in 35 data points and that there was not a Reasonable Potential Barium.

Outfall 001: The RP model was run on Cadmium using the most recent data back through 2013. This resulted in 35 data points and that there was not a Reasonable Potential Cadmium.

Outfall 001: The RP model was run on Chromium (Total) using the most recent data back through 2013. This resulted in 35 data points and that there was not a Reasonable Potential Chromium (Total).

Outfall 001: The RP model was run on Copper using the most recent data back through 2013. This resulted in 40 data points and that there is a Reasonable Potential for an acute and chronic limit for Copper. Studies have been conducted by the facility and determined there is leaching off the sampling port. A new sample port is

being installed. Monitoring at the Outfall 001 will be required. An annual report will be required to help accurately characterize the Copper concentrations in the effluent.

Outfall 001: The RP model was run on Lead using the most recent data back through 2013. This resulted in 40 data points and that there is a Reasonable Potential for a chronic limit for Lead. Per the permittee, the spikes in Lead are when the facility pig the byproduct pipeline. Monitoring at the Outfall 001 will be required. An annual report will be required to help accurately characterize the Lead source and concentrations in the effluent

Outfall 001: The RP model was run on Mercury using the most recent data back through 2013. This resulted in 72 data points and that there is a Reasonable Potential for a chronic limit for Mercury. The spikes in Mercury are believed to be caused from sampling procedures. Appropriate Quality Control sampling methods need to be established. Monitoring at the Outfall 001 will be required. An annual report will be required to help accurately characterize the Mercury concentrations in the effluent.

Outfall 001: The RP model was run on Nickel using the most recent data back through 2013. This resulted in 40 data points and that there was not a Reasonable Potential Nickel.

Outfall 001: The RP model was run on Selenium using the most recent data back through 2013. This resulted in 40 data points and that there is a Reasonable Potential for an acute and chronic limit for Selenium. Permit limitations will remain in the permit.

Outfall 001: The RP model was run on Silver using the most recent data back through 2013. This resulted in 40 data points and that there was not a Reasonable Potential Silver.

Outfall 001: The RP model was run on Zinc using the most recent data back through 2013. This resulted in 40 data points and that there was not a Reasonable Potential Zinc.

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

Outfall 002 Parameters
Mercury
Selenium

Outfall 002: The RP model was run on Mercury using the most recent data back through 2013. This resulted in 3 data points. With limited data set, RP could not be completed on the parameter. Annually monitoring will be required.

Outfall 002: The RP model was run on Selenium using the most recent data back through 2013. This resulted in 8 data points and that there is a Reasonable Potential for a chronic limit for Selenium. Permit limitations will remain in the permit.

RP Procedure Output

Facility Name:	**Jordan Valley**
Permit Number:	**UT0025836**
Outfall Number:	**Outfall 001**
Parameter	**Antimony**
Distribution	**Delta-Lognormal**
Data Units	**mg/L**
Reporting Limit	**0.0005**
Significant Figures	**4**
Confidence Interval	**95**

Maximum Reported Effluent Conc.	**0.0009**	**mg/L**
Coefficient of Variation (CV)	**0.1292**	
RP Multiplier	**1.033**	
Projected Maximum Effluent Conc. (MEC)	**0.0009298**	**mg/L**
Acute Criterion	**4.30028**	**mg/L**
Chronic Criterion	**0**	**mg/L**
Human Health Criterion	**0**	**mg/L**

RP for Acute?	**NO**
RP for Chronic?	**N/A**
RP for Human Health?	**N/A**

Effluent Data

#		#	
1	**ND**	**21**	**0.0006**
2	**ND**	**22**	**ND**
3	**0.0005**	**23**	**ND**
4	**ND**	**24**	**0.0006**
5	**0.0005**	**25**	**0.0006**
6	**0.0005**	**26**	**0.0006**
7	**ND**	**27**	**ND**
8	**ND**	**28**	**ND**
9	**ND**	**29**	**0.0006**
10	**0.0006**	**30**	**ND**
11	**ND**	**31**	**ND**
12	**0.0005**	**32**	**ND**
13	**0.0006**	**33**	**0.0009**
14	**ND**	**34**	**0.0005**
15	**0.0005**	**35**	**ND**
16	**0.0005**		
17	**0.0005**		
18	**0.0005**		
19	**0.0005**		
20	**0.0006**		

RP Procedure Output

Facility Name:	**Jordan Valley**
Permit Number:	**UT0025836**
Outfall Number:	**Outfall 001**
Parameter	**Arsenic**
Distribution	**Delta-Lognormal**
Data Units	**mg/L**
Reporting Limit	**0.0005**
Significant Figures	**4**
Confidence Interval	**95**

Maximum Reported Effluent Conc.	**0.0254**	**mg/L**
Coefficient of Variation (CV)	**0.6346**	
RP Multiplier	**1.159**	
Projected Maximum Effluent Conc. (MEC)	**0.02944**	**mg/L**
Acute Criterion	**0.1**	**mg/L**
Chronic Criterion	**0.19**	**mg/L**
Human Health Criterion	**0**	**mg/L**

RP for Acute?	**NO**
RP for Chronic?	**NO**
RP for Human Health?	**N/A**

Effluent Data

#		#	
1	**0.015**	**21**	**0.018**
2	**0.0112**	**21**	**0.018**
3	**0.0228**	**22**	**0.0099**
4	**0.002**	**23**	**0.0062**
5	**0.0161**	**24**	**0.0187**
6	**0.0167**	**25**	**0.0188**
7	**0.008**	**26**	**0.0168**
8	**0.0069**	**27**	**0.0146**
9	**0.0073**	**28**	**0.0046**
10	**0.0171**	**29**	**0.0199**
11	**0.0064**	**30**	**0.0043**
12	**0.0166**	**31**	**0.0112**
13	**0.0254**	**32**	**0.0098**
14	**0.0071**	**33**	**0.0057**
15	**0.021**	**34**	**0.0127**
16	**0.0171**	**35**	**0.0101**
17	**0.0188**		
18	**0.0202**		
19	**0.018**		
20	**0.0213**		

RP Procedure Output

Facility Name:	**Jordan Valley**			
Permit Number:	**UT0025836**			
Outfall Number:	**Outfall 001**			
Parameter	**Barium**			
Distribution	**Delta-Lognormal**			
Data Units	**mg/L**			
Reporting Limit	**0.0005**			
Significant Figures	**4**			
Confidence Interval	**95**			
Maximum Reported Effluent Conc.			**0.29**	**mg/L**
Coefficient of Variation (CV)			**0.5338**	
RP Multiplier			**1.135**	
Projected Maximum Effluent Conc. (MEC)			**0.3292**	**mg/L**
Acute Criterion			**0**	**mg/L**
Chronic Criterion			**0**	**mg/L**
Human Health Criterion			**0**	**mg/L**
RP for Acute?		**N/A**		
RP for Chronic?		**N/A**		
RP for Human Health?		**N/A**		

Effluent Data

#		#	
1	**0.2**	**20**	**0.272**
2	**0.157**	**21**	**0.248**
3	**0.264**	**22**	**0.135**
4	**0.255**	**23**	**0.09**
5	**0.27**	**24**	**0.277**
6	**0.261**	**25**	**0.272**
7	**0.11**	**26**	**0.281**
8	**0.094**	**27**	**0.229**
9	**0.095**	**28**	**0.071**
10	**0.258**	**29**	**0.256**
11	**0.094**	**30**	**0.05**
12	**0.26**	**31**	**0.183**
13	**0.29**	**32**	**0.191**
14	**0.103**	**33**	**0.078**
15	**0.261**	**34**	**0.256**
16	**0.242**	**35**	**0.118**
17	**0.225**		
18	**0.251**		
19	**0.267**		

RP Procedure Output

Facility Name:	**Jordan Valley**		
Permit Number:	**UT0025836**		
Outfall Number:	**Outfall 001**		
Parameter	**Cadmium**		
Distribution	**Delta-Lognormal**		
Data Units	**mg/L**		
Reporting Limit	**0.0005**		
Significant Figures	**4**		
Confidence Interval	**95**		
Maximum Reported Effluent Conc.		**0.0006**	**mg/L**
Coefficient of Variation (CV)		**0.2225**	
RP Multiplier		**1.057**	
Projected Maximum Effluent Conc. (MEC)		**0.0006344**	**mg/L**
Acute Criterion		**0.007**	**mg/L**
Chronic Criterion		**0.0025**	**mg/L**
Human Health Criterion		**0**	**mg/L**
RP for Acute?	**NO**		
RP for Chronic?	**NO**		
RP for Human Health?	**N/A**		

Effluent Data

#		#	
1	**ND**	**20**	**0.0002**
2	**ND**	**21**	**0.0002**
3	**0.0003**	**22**	**0.0003**
4	**ND**	**23**	**ND**
5	**ND**	**24**	**ND**
6	**ND**	**25**	**ND**
7	**ND**	**26**	**ND**
8	**ND**	**27**	**ND**
9	**ND**	**28**	**ND**
10	**ND**	**29**	**ND**
11	**ND**	**30**	**ND**
12	**ND**	**31**	**ND**
13	**ND**	**32**	**ND**
14	**0.0002**	**33**	**0.0006**
15	**0.0002**	**34**	**ND**
16	**ND**	**35**	**ND**
17	**ND**		
18	**ND**		
19	**ND**		

RP Procedure Output

Facility Name:	**Jordan Valley**			
Permit Number:	**UT0025836**			
Outfall Number:	**Outfall 001**			
Parameter	**Chromium (Total)**			
Distribution	**Delta-Lognormal**			
Data Units	**mg/L**			
Reporting Limit	**0.0005**			
Significant Figures	**4**			
Confidence Interval	**95**			
Maximum Reported Effluent Conc.			**0.118**	**mg/L**
Coefficient of Variation (CV)			**0.8107**	
RP Multiplier			**1.197**	
Projected Maximum Effluent Conc. (MEC)			**0.1413**	**mg/L**
Acute Criterion			**5.612**	**mg/L**
Chronic Criterion			**0.268**	**mg/L**
Human Health Criterion			**0**	**mg/L**
RP for Acute?	**NO**			
RP for Chronic?	**NO**			
RP for Human Health?	**NA**			

Effluent Data

#		#	
1	**0.02**	**20**	**0.022**
2	**0.118**	**21**	**0.018**
3	**0.022**	**22**	**0.008**
4	**0.036**	**23**	**0.097**
5	**0.043**	**24**	**0.02**
6	**0.028**	**25**	**0.02**
7	**0.008**	**26**	**0.019**
8	**0.008**	**27**	**0.016**
9	**0.024**	**28**	**ND**
10	**0.026**	**29**	**0.019**
11	**0.008**	**30**	**0.006**
12	**0.033**	**31**	**0.011**
13	**0.032**	**32**	**0.013**
14	**0.014**	**33**	**0.042**
15	**0.059**	**34**	**0.021**
16	**0.029**	**35**	**0.009**
17	**0.028**		
18	**0.031**		
19	**0.036**		

RP Procedure Output

Facility Name:	**Jordan Valley**		
Permit Number:	**UT0025836**		
Outfall Number:	**Outfall 001**		
Parameter	**Copper**		
Distribution	**Delta-Lognormal**		
Data Units	**mg/L**		
Reporting Limit	**0.0005**		
Significant Figures	**5**		
Confidence Interval	**95**		
Maximum Reported Effluent Conc.		**0.148**	**mg/L**
Coefficient of Variation (CV)		**1.6016**	
RP Multiplier		**1.1254**	
Projected Maximum Effluent Conc. (MEC)		**0.16655**	**mg/L**
Acute Criterion		**0.0517**	**mg/L**
Chronic Criterion		**0.0305**	**mg/L**
Human Health Criterion		**0**	**mg/L**
RP for Acute?	**YES**		
RP for Chronic?	**YES**		
RP for Human Health?	**N/A**		

Effluent Data

#		#	
1	**0.008**	**21**	**0.021**
2	**0.09**	**22**	**0.0073**
3	**0.008**	**23**	**0.0089**
4	**ND**	**24**	**0.0072**
5	**ND**	**25**	**0.038**
6	**0.006**	**26**	**0.0072**
7	**ND**	**27**	**0.0147**
8	**ND**	**28**	**0.0039**
9	**0.029**	**29**	**0.006**
10	**0.055**	**30**	**0.0077**
11	**ND**	**31**	**0.0056**
12	**0.007**	**32**	**0.066**
13	**0.024**	**33**	**ND**
14	**0.045**	**34**	**0.01**
15	**0.093**	**35**	**0.072**
16	**ND**	**36**	**ND**
17	**0.029**	**37**	**0.01**
18	**0.0082**	**38**	**ND**
19	**0.0088**	**39**	**0.031**
20	**0.0072**	**40**	**ND**

RP Procedure Output

Facility Name:	**Jordan Valley**
Permit Number:	**UT0025836**
Outfall Number:	**Outfall 001**
Parameter	**Lead**
Distribution	**Delta-Lognormal**
Data Units	**mg/L**
Reporting Limit	**0.0005**
Significant Figures	**4**
Confidence Interval	**95**

Maximum Reported Effluent Conc.	**0.0256**	**mg/L**
Coefficient of Variation (CV)	**1.928**	
RP Multiplier	**1.371**	
Projected Maximum Effluent Conc. (MEC)	**0.0351**	**mg/L**
Acute Criterion	**0.1**	**mg/L**
Chronic Criterion	**0.0186**	**mg/L**
Human Health Criterion	**0**	**mg/L**

RP for Acute?	**NO**
RP for Chronic?	**YES**
RP for Human Health?	**N/A**

Effluent Data

#		#	
1	**0.0013**	**20**	**0.0013**
2	**0.0256**	**21**	**0.0005**
3	**ND**	**22**	**0.0015**
4	**ND**	**23**	**0.0121**
5	**0.0021**	**24**	**ND**
6	**0.003**	**25**	**ND**
7	**ND**	**26**	**0.0005**
8	**ND**	**27**	**0.0006**
9	**0.0072**	**28**	**ND**
10	**0.0012**	**29**	**ND**
11	**ND**	**30**	**ND**
12	**0.0005**	**31**	**0.0006**
13	**0.0009**	**32**	**ND**
14	**0.0012**	**33**	**0.0139**
15	**0.0016**	**34**	**0.0016**
16	**0.0007**	**35**	**ND**
17	**0.0012**		
18	**0.0005**		
19	**0.0007**		

RP Procedure Output

Facility Name:	**Jordan Valley**
Permit Number:	**UT0025836**
Outfall Number:	**Outfall 001**
Parameter	**Mercury**
Distribution	**Delta-Lognormal**
Data Units	**mg/L**
Reporting Limit	**0.000002**
Significant Figures	**4**
Confidence Interval	**95**

Maximum Reported Effluent Conc.	**0.000118**	**mg/L**
Coefficient of Variation (CV)	**8760**	
RP Multiplier	**0.6614**	
Projected Maximum Effluent Conc. (MEC)	**7.805E-05**	**mg/L**
Acute Criterion	**0.00015**	**mg/L**
Chronic Criterion	**0.000012**	**mg/L**
Human Health Criterion	**0**	**mg/L**

RP for Acute?	**NO**
RP for Chronic?	**YES**
RP for Human Health?	**N/A**

Effluent Data

#		#		#		#	
1	**0.00000275**	**21**	**0.00000130**	**41**	**ND**	**61**	**ND**
2	**0.00000288**	**22**	**0.00000140**	**42**	**ND**	**62**	**0.00000000**
3	**0.00000310**	**23**	**0.00011800**	**43**	**ND**	**63**	**ND**
4	**0.00000226**	**24**	**0.00000240**	**44**	**ND**	**64**	**ND**
5	**0.00000130**	**25**	**0.00000000**	**45**	**ND**	**65**	**0.00000000**
6	**0.00000298**	**26**	**ND**	**46**	**ND**	**66**	**0.00000000**
7	**0.00000180**	**27**	**ND**	**47**	**ND**	**67**	**ND**
8	**0.00000246**	**28**	**ND**	**48**	**ND**	**68**	**ND**
9	**0.00000410**	**29**	**ND**	**49**	**ND**	**69**	**ND**
10	**0.00000290**	**30**	**0.00000000**	**50**	**ND**	**70**	**ND**
11	**0.00000323**	**31**	**ND**	**51**	**ND**	**71**	**ND**
12	**0.00000253**	**32**	**ND**	**52**	**ND**	**72**	**ND**
13	**ND**	**33**	**ND**	**53**	**ND**		
14	**0.00000290**	**34**	**ND**	**54**	**ND**		
15	**0.00000240**	**35**	**ND**	**55**	**ND**		
16	**0.00000165**	**36**	**ND**	**56**	**ND**		
17	**ND**	**37**	**0.00000000**	**57**	**0.00000000**		
18	**0.00000752**	**38**	**ND**	**58**	**ND**		
19	**0.00000070**	**39**	**ND**	**59**	**ND**		
20	**0.00000080**	**40**	**0.00000410**	**60**	**ND**		

RP Procedure Output

Facility Name:	**Jordan Valley**
Permit Number:	**UT0025836**
Outfall Number:	**Outfall 001**
Parameter	**Nickel**
Distribution	**Delta-Lognormal**
Data Units	**mg/L**
Reporting Limit	**0.0005**
Significant Figures	**4**
Confidence Interval	**95**

Maximum Reported Effluent Conc.	**0.0755**	**mg/L**
Coefficient of Variation (CV)	**2.252**	
RP Multiplier	**1.151**	
Projected Maximum Effluent Conc. (MEC)	**0.0869**	**mg/L**
Acute Criterion	**1.516**	**mg/L**
Chronic Criterion	**0.169**	**mg/L**
Human Health Criterion	**0**	**mg/L**

RP for Acute?	**NO**
RP for Chronic?	**NO**
RP for Human Health?	**N/A**

Effluent Data

#		#	
1	**0.005**	**21**	**ND**
2	**ND**	**22**	**0.0265**
3	**ND**	**23**	**0.036**
4	**ND**	**24**	**0.0442**
5	**ND**	**25**	**ND**
6	**ND**	**26**	**0.05**
7	**ND**	**27**	**0.0755**
8	**ND**	**28**	**0.0171**
9	**ND**	**29**	**0.0258**
10	**0.005**	**30**	**0.0336**
11	**ND**	**31**	**0.0343**
12	**ND**	**32**	**ND**
13	**ND**	**33**	**ND**
14	**ND**	**34**	**0.01**
15	**ND**	**35**	**0.005**
16	**ND**	**36**	**ND**
17	**ND**	**37**	**ND**
18	**0.0576**	**38**	**ND**
19	**0.0513**	**39**	**ND**
20	**0.0264**	**40**	**ND**

RP Procedure Output

Facility Name:	**Jordan Valley**			
Permit Number:	**UT0025836**			
Outfall Number:	**Outfall 001**			
Parameter	**Selenium**			
Distribution	**Delta-Lognormal**			
Data Units	**mg/L**			
Reporting Limit	**0.0005**			
Significant Figures	**4**			
Confidence Interval	**95**			
Maximum Reported Effluent Conc.			**0.0441**	**mg/L**
Coefficient of Variation (CV)			**0.6741**	
RP Multiplier			**1.060**	
Projected Maximum Effluent Conc. (MEC)			**0.04672**	**mg/L**
Acute Criterion			**0.02**	**mg/L**
Chronic Criterion			**0.0046**	**mg/L**
Human Health Criterion			**0**	**mg/L**
RP for Acute?		**YES**		
RP for Chronic?		**YES**		
RP for Human Health?		**N/A**		

Effluent Data

#		#	
1	**0.026**	**21**	**0.0297**
2	**0.0167**	**22**	**0.0335**
3	**0.0173**	**23**	**0.0318**
4	**0.0214**	**24**	**0.0261**
5	**0.0027**	**25**	**0.0282**
6	**0.0238**	**26**	**0.0326**
7	**0.0312**	**27**	**0.0395**
8	**0.0112**	**28**	**0.0367**
9	**0.0116**	**29**	**0.0164**
10	**0.0097**	**30**	**0.0184**
11	**0.0273**	**31**	**0.0263**
12	**0.01**	**32**	**0.0321**
13	**0.0292**	**33**	**0.0382**
14	**0.0441**	**34**	**0.0241**
15	**0.011**	**35**	**0.0097**
16	**0.0361**	**36**	**0.0105**
17	**0.0308**	**37**	**0.035**
18	**0.0279**	**38**	**0.0327**
19	**0.0352**	**39**	**0.0276**
20	**0.0305**	**40**	**0.0249**

RP Procedure Output

Facility Name:	**Jordan Valley**		
Permit Number:	**UT0025836**		
Outfall Number:	**Outfall 001**		
Parameter	**Silver**		
Distribution	**Delta-Lognormal**		
Data Units	**mg/L**		
Reporting Limit	**0.0005**		
Significant Figures	**4**		
Confidence Interval	**95**		
Maximum Reported Effluent Conc.		**0.017**	**mg/L**
Coefficient of Variation (CV)		**3.258**	
RP Multiplier		**1.159**	
Projected Maximum Effluent Conc. (MEC)		**0.01971**	**mg/L**
Acute Criterion		**0.0411**	**mg/L**
Chronic Criterion		**0**	**mg/L**
Human Health Criterion		**0**	**mg/L**
RP for Acute?	**NO**		
RP for Chronic?	**N/A**		
RP for Human Health?	**N/A**		

Effluent Data

#		#	
1	**ND**	**21**	**ND**
2	**ND**	**22**	**ND**
3	**ND**	**23**	**0.0009**
4	**ND**	**24**	**ND**
5	**ND**	**25**	**ND**
6	**ND**	**26**	**ND**
7	**ND**	**27**	**ND**
8	**ND**	**28**	**ND**
9	**0.002**	**29**	**ND**
10	**ND**	**30**	**ND**
11	**ND**	**31**	**ND**
12	**ND**	**32**	**ND**
13	**ND**	**33**	**0.002**
14	**ND**	**34**	**ND**
15	**ND**	**35**	**ND**
16	**ND**	**36**	**ND**
17	**ND**	**37**	**ND**
18	**ND**	**38**	**ND**
19	**ND**	**39**	**ND**
20	**ND**	**40**	**ND**

RP Procedure Output

Facility Name:	**Jordan Valley**			
Permit Number:	**UT0025836**			
Outfall Number:	**Outfall 001**			
Parameter	**Zinc**			
Distribution	**Delta-Lognormal**			
Data Units	**mg/L**			
Reporting Limit	**0.0005**			
Significant Figures	**4**			
Confidence Interval	**95**			
Maximum Reported Effluent Conc.			**0.14**	**mg/L**
Coefficient of Variation (CV)			**1.289**	
RP Multiplier			**1.109**	
Projected Maximum Effluent Conc. (MEC)			**0.1553**	**mg/L**
Acute Criterion			**0.3879**	**mg/L**
Chronic Criterion			**0.3879**	**mg/L**
Human Health Criterion			**0**	**mg/L**
RP for Acute?		**NO**		
RP for Chronic?		**NO**		
RP for Human Health?		**N/A**		

Effluent Data

#		#	
1	**ND**	**21**	**0.05**
2	**0.05**	**22**	**0.03**
3	**0.01**	**23**	**0.09**
4	**ND**	**24**	**ND**
5	**ND**	**25**	**0.07**
6	**0.04**	**26**	**ND**
7	**0.01**	**27**	**0.12**
8	**0.02**	**28**	**0.07**
9	**0.02**	**29**	**0.12**
10	**0.11**	**30**	**0.02**
11	**ND**	**31**	**0.02**
12	**0.1**	**32**	**0.11**
13	**0.08**	**33**	**0.01**
14	**0.06**	**34**	**0.1**
15	**0.14**	**35**	**0.07**
16	**0.03**	**36**	**0.01**
17	**0.11**	**37**	**0.06**
18	**0.09**	**38**	**ND**
19	**0.07**	**39**	**0.07**
20	**0.05**	**40**	**0.02**

RP Procedure Output

Facility Name:	**Jordan Valley**		
Permit Number:	**UT0025836**		
Outfall Number:	**Outfall 002**		
Parameter	**Selenium**		
Distribution	**Delta-Lognormal**		
Data Units	**mg/L**		
Reporting Limit	**0.0005**		
Significant Figures	**4**		
Confidence Interval	**95**		
Maximum Reported Effluent Conc.		**0.0151**	**mg/L**
Coefficient of Variation (CV)		**0.4520**	
RP Multiplier		**1.646**	
Projected Maximum Effluent Conc. (MEC)		**0.02485**	**mg/L**
Acute Criterion		**0.0491**	**mg/L**
Chronic Criterion		**0.0105**	**mg/L**
Human Health Criterion		**0**	**mg/L**
RP for Acute?	**NO**		
RP for Chronic?	**YES**		
RP for Human Health?	**N/A**		

Effluent Data

#	
1	**0.004**
2	**0.0043**
3	**0.0045**
4	**0.0046**
5	**0.0046**
6	**0.0048**
7	**0.0049**
8	**0.0151**

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

Date: **October 15, 2019**

Prepared by: **Chris Bittner**
Standards and Technical Services Section

Facility: **Jordan Valley Water Conservancy District Southwest Groundwater Treatment Plant**
UPDES No. UT0025836

Receiving water: **Outfall 001 Transitional Waters of Great Salt Lake, Gilbert Bay of Great Salt Lake (5E, 5A)**

This addendum summarizes the wasteload analyses that were performed to determine water quality based effluent limits (WQBEL) for Outfall 001 discharge. Wasteload analyses are performed to determine point source effluent limitations necessary to maintain designated beneficial uses by evaluating projected effects of discharge concentrations on in-stream water quality. The wasteload analysis also takes into account downstream designated uses (UAC R317-2-8). Projected concentrations are compared to numeric water quality standards to determine acceptability. The numeric criteria in this wasteload analysis may be modified by narrative criteria and other conditions determined by staff of the Division of Water Quality.

Discharge

Outfall 001: 3.0 MGD

Receiving Waters Outfall 001
The receiving waters for Outfalls 001 are the Transitional Waters to Great Salt Lake and Gilbert Bay, Great Salt Lake

Per 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 are:

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

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 Gilbert Bay and 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 be reliably measured. As a result, the annual critical low flow was determined to be zero for the wasteload.

With the exception of the selenium standard for Gilbert Bay, 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 (UPDES) Permits*, Version 1.0 (DWQ, 2016).

The selenium standard for Gilbert Bay is based on bird egg concentration and no 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. The limited number of birds nesting in the area combined with high predation rates has prevented successful collection of at least 5 eggs and in the majority of years, no eggs could be collected. At least 5 eggs are required by the permit to calculate the geometric mean.

As required by the existing permit, JVWCD recently notified DWQ that the selenium concentrations in 3 eggs collected during the 2019 nesting season exceeded 9.8 mg/kg. No additional actions are required at this time because less than 5 eggs are available. However, if the 2019 egg concentrations are an indication that selenium concentrations are increasing in the food web, additional actions may be required in the future. Pictures from the Annual Monitoring Reports suggest that the habitat is evolving with the establishment of vegetation, including phragmites because of the continuous discharge from the JVWCD Outfall 001. If these habitat changes result in an increased usage by birds, a sufficient number of eggs should be available in the future. If less than 5 eggs annually are available during the upcoming permit cycle and concentrations in the available eggs support that selenium concentrations are increasing in the food web, i.e., greater than 9.8 mg/kg, an alternative monitoring approach may be considered.

Selenium concentrations were annually monitored in water and biota in Gilbert Bay. No exceedances were observed or increasing trends observed. 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.

TMDL

The water quality of the Transitional Waters and Great Salt Lake are not currently impaired for any pollutant.

Mixing Zone

Because the critical low flow for the receiving water is zero, no mixing zone was 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, 7 effluent samples were characterized for all potentially present pollutants as part of a WET investigation and routine monitoring was conducted by the permittee. After identifying and removing some non-representative measurements, the similarity in results to previous effluent characterizations support that no other pollutants have reasonable potential. Other pollutants of concern may become apparent as a result of technology based standards, or other factors as determined by the UPDES Permit Writer.

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 (2018) WET guidance, the chronic testing results are interpreted as an indicator.

Antidegradation Level I and II Reviews

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, know 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.

A Level II Antidegradation Review (ADR) is not required for this facility. The proposed permit is a simple renewal, with no increase in flow or concentration over that which was approved in the existing permit.

Documents:

WLA Document:
Wasteload Analysis: *JVWCD_WLADoc01232019.xlsm*

References:

Ackerman, J. T., et al. 2015. Mercury and selenium contamination in water bird eggs and risk to avian reproduction at Great Salt Lake, Utah, USGS Open File Report 2015-1020 https://pubs.er.usgs.gov/publication/ofr20151020

Utah Division of Water Quality. 2012. *Utah Wasteload Analysis Procedures Version 1.0*.

Utah Division of Water Quality. 2016. *Interim Methods for Evaluating Use Support for Great Salt Lake, Utah Pollution Discharge Elimination (UPDES) Permits*, Version 1.0

Utah Division of Water Quality. 2018. *Utah Pollution Discharge Elimination System Permit and Enforcement Guidance Document for Whole Effluent Toxicity*.

DWQ-2019-012808

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

Date: **January 29, 2019**

Prepared by: **Dave Wham**
Standards and Technical Services

Facility: **JVWCD 002 Discharge**
UPDES No. UT0025836

Receiving water: **Jordan River (2B, 3A, 4)**

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

Discharge

002 untreated shallow groundwater aquifer bypass water discharge 3.0 MGD

Receiving Water

Per UAC R317-2-13.5(a), the designated beneficial uses of Jordan River from confluence with Little Cottonwood Creek to Narrows Diversion are 2B, 3A, 4.

- *Class 2B - Protected for infrequent primary contact recreation. Also protected for secondary contact recreation where there is a low likelihood of ingestion of water or a low degree of bodily contact with the water. Examples include, but are not limited to, wading, hunting, and fishing.*
- *Class 3A - Protected for cold water species of game fish and other cold water aquatic life, including the necessary aquatic organisms in their food chain.*
- *Class 4 - Protected for agricultural uses including irrigation of crops and stock watering.*

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

daily flow values from Salt Lake County's *Jordan River at 90th South* Station for the period 1997-2018 station. Receiving water quality was characterized using data from DWQ Monitoring Station # 4994270, Jordan River at 9000 S Crossing for the period 2001-2013.

The calculated annual critical low flow condition (7Q10) for Discharge 002 is 13.15 cfs.

TMDL

According to the Utah's 2016 303(d) Water Quality Assessment Report, the receiving water for the discharge, Jordan River from 7800 South to Bluffdale at 14600 South (AU UT16020204-006) is listed as impaired for TDS, temperature, O/E bioassessment and selenium. Additional impairments are present in downstream stream segments as outlined in Table 1.

Table 1. 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	AU UT16020204-005	TDS, Temperature, E. coli
Jordan River from 2100 South to the confluence with Little Cottonwood Creek	AU UT16020204-004	TDS, E. coli, O/E
Jordan River from North Temple to 2100 South	AU UT16020204-003	E. coli, O/E, Phosphorous
Jordan River from Davis County line upstream to North Temple Street	AU UT16020204-002	TDS, E. coli, O/E
Jordan River from Farmington Bay upstream contiguous with the Davis County line	AU UT16020204-001	TDS, E. coli, O/E, Copper

Although the WLA may show higher allowed effluent limits for these impaired parameters, the following constituents from Table 1 should be evaluated in the effluent against the end of pipe Water Quality Standards in Table 2 to determine whether or not they have reasonable potential to cause or contribute to the existing impairments.

Table 2. End of pipe Criteria

Constituent	Criteria
TDS	1200 mg/l
Temperature	20 Degrees C
Selenium	4.6 ug/l (chronic)
Copper	30.5 ug/l (chronic)

Mixing Zone

The maximum allowable mixing zone is 15 minutes of travel time for acute conditions, not to exceed 50% of stream width, and for chronic conditions, per UAC R317-2-5. Water quality standards must be met at the end of the mixing zone. The mixing zone model showed complete mixing within 2,500 feet for chronic conditions. Acute limits were calculated using 50% of the seasonal critical low flow.

Parameters of Concern

The potential parameters of concern identified for the discharge were TDS, temperature, selenium, E. coli, and copper as determined by the impairment status of the receiving water and review of the previous permit.

WET Limits

The percent of effluent in the receiving water in a fully mixed condition, and acute and chronic dilution in a not fully mixed condition are calculated in the WLA in order to generate WET limits. The LC_{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 for Outfall 002 should be based on 26.1% effluent.

Wasteload Allocation Methods

Effluent limits were determined for conservative constituents using a simple mass balance mixing analysis (UDWQ 2012). The mass balance analysis is summarized in the Wasteload Addendums.

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 analysis is summarized in the Wasteload Addendum.

Models and supporting documentation are available for review upon request.

Antidegradation Level I Review

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

A Level II Antidegradation Review (ADR) is not required for this facility. The proposed permit is a simple renewal of an existing UPDES permit. No increase in flow or concentration of pollutants over those authorized in the the existing permit is being requested.

Documents:

WLA Document: *JVWCD_002_WLADoc_1-29-19.docx*
Wasteload Analysis and Addendums: *JVWCD_002_WLA_1-29-19.xlsm;*

References:

Utah Division of Water Quality. 2012. *Utah Wasteload Analysis Procedures Version 1.0.*

WASTELOAD ANALYSIS [WLA]
Addendum: Statement of Basis
SUMMARY

Discharging Facility:	**JVWCD 002 Discharge**		
UPDES No:	UT-UT0025836		
Design Flow	3.00	MGD	
Receiving Water:	**Jordan River**		
Stream Classification:	2B, 3A, 4		
Stream Flows [cfs]:	13.15	Summer (July-Sept)	7Q10
	13.15	Fall (Oct-Dec)	7Q10
	13.15	Winter (Jan-Mar)	7Q10
	13.15	Spring (Apr-June)	7Q10
	0.0	Average	
Stream TDS Values:	1066.0	Summer (July-Sept)	Average
	1205.0	Fall (Oct-Dec)	Average
	1190.0	Winter (Jan-Mar)	Average
	886.0	Spring (Apr-June)	Average

Effluent Limits:				**WQ Standard:**
Flow, MGD:	3.00	MGD	Design Flow	
BOD, mg/l:	25.0	Summer	5.0	Indicator
Dissolved Oxygen, mg/l	5.0	Summer	6.5	30 Day Average
TNH3, Chronic, mg/l:	8.3	Summer	Varies	Function of pH and Temperature
TDS, mg/l:	1579.7	Summer	1200.0	

Modeling Parameters:	
Acute River Width:	50.0%
Chronic River Width:	100.0%

Level 1 Antidegradation Level Completed: Level II Review not required.

Date: 1/29/2019

WASTELOAD ANALYSIS [WLA]
Addendum: Statement of Basis

29-Jan-19
4:00 PM

Facilities: **JVWCD 002 Discharge** **UPDES No: UT-UT0025836**
Discharging to: **Jordan River**

THIS IS A DRAFT DOCUMENT

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

Jordan River:	2B, 3A, 4
Antidegradation Review:	Level I review completed. Level II review 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)	6.50 mg/l (30 Day Average) 5.00 mg/l (7Day Average) 4.00 mg/l (1 Day Average
Maximum Total Dissolved Solids	1200.0 mg/l

Utah Division of Water Quality
Salt Lake City, Utah

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**	2.181 lbs/day	750.00 ug/l	18.798 lbs/day
Arsenic	190.00 ug/l	4.762 lbs/day	340.00 ug/l	8.522 lbs/day
Cadmium	2.49 ug/l	0.062 lbs/day	7.00 ug/l	0.175 lbs/day
Chromium III	268.22 ug/l	6.723 lbs/day	5611.67 ug/l	140.648 lbs/day
ChromiumVI	11.00 ug/l	0.276 lbs/day	16.00 ug/l	0.401 lbs/day
Copper	30.50 ug/l	0.764 lbs/day	51.68 ug/l	1.295 lbs/day
Iron			1000.00 ug/l	25.064 lbs/day
Lead	18.58 ug/l	0.466 lbs/day	476.82 ug/l	11.951 lbs/day
Mercury	0.0120 ug/l	0.000 lbs/day	2.40 ug/l	0.060 lbs/day
Nickel	168.54 ug/l	4.224 lbs/day	1515.91 ug/l	37.994 lbs/day
Selenium	4.60 ug/l	0.115 lbs/day	20.00 ug/l	0.501 lbs/day
Silver	N/A ug/l	N/A lbs/day	41.07 ug/l	1.029 lbs/day
Zinc	387.83 ug/l	9.720 lbs/day	387.83 ug/l	9.720 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 400 mg/l as CaCO3

Organics [Pesticides]

Parameter	4 Day Average (Chronic) Standard Concentration	Load*	1 Hour Average (Acute) Standard Concentration	Load*
Aldrin			1.500 ug/l	0.038 lbs/day
Chlordane	0.004 ug/l	0.412 lbs/day	1.200 ug/l	0.030 lbs/day
DDT, DDE	0.001 ug/l	0.096 lbs/day	0.550 ug/l	0.014 lbs/day
Dieldrin	0.002 ug/l	0.182 lbs/day	1.250 ug/l	0.031 lbs/day
Endosulfan	0.056 ug/l	5.370 lbs/day	0.110 ug/l	0.003 lbs/day
Endrin	0.002 ug/l	0.221 lbs/day	0.090 ug/l	0.002 lbs/day
Guthion			0.010 ug/l	0.000 lbs/day
Heptachlor	0.004 ug/l	0.364 lbs/day	0.260 ug/l	0.007 lbs/day
Lindane	0.080 ug/l	7.671 lbs/day	1.000 ug/l	0.025 lbs/day
Methoxychlor			0.030 ug/l	0.001 lbs/day
Mirex			0.010 ug/l	0.000 lbs/day
Parathion			0.040 ug/l	0.001 lbs/day
PCB's	0.014 ug/l	1.343 lbs/day	2.000 ug/l	0.050 lbs/day
Pentachlorophenol	13.00 ug/l	1246.615 lbs/day	20.000 ug/l	0.501 lbs/day
Toxephene	0.0002 ug/l	0.019 lbs/day	0.7300 ug/l	0.018 lbs/day

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	0.13 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	15.04 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
Chlorophenoxy Herbicides				
2,4-D			ug/l	lbs/day
2,4,5-TP			ug/l	lbs/day
Endrin			ug/l	lbs/day
ocyclohexane (Lindane)			ug/l	lbs/day
Methoxychlor			ug/l	lbs/day
Toxaphene			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	
Toxic Organics	[2 Liters/Day for 70 Kg Person over 70 Yr.]		[6.5 g for 70 Kg Person over 70 Yr.]	
Acenaphthene	ug/l	lbs/day	2700.0 ug/l	258.91 lbs/day
Acrolein	ug/l	lbs/day	780.0 ug/l	74.80 lbs/day
Acrylonitrile	ug/l	lbs/day	0.7 ug/l	0.06 lbs/day
Benzene	ug/l	lbs/day	71.0 ug/l	6.81 lbs/day
Benzidine	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
Carbon tetrachloride	ug/l	lbs/day	4.4 ug/l	0.42 lbs/day
Chlorobenzene	ug/l	lbs/day	21000.0 ug/l	2013.76 lbs/day
1,2,4-Trichlorobenzene				
Hexachlorobenzene	ug/l	lbs/day	0.0 ug/l	0.00 lbs/day
1,2-Dichloroethane	ug/l	lbs/day	99.0 ug/l	9.49 lbs/day

1,1,1-Trichloroethane					
Hexachloroethane	ug/l	lbs/day	8.9	ug/l	0.85 lbs/day
1,1-Dichloroethane					
1,1,2-Trichloroethane	ug/l	lbs/day	42.0	ug/l	4.03 lbs/day
1,1,2,2-Tetrachloroethai	ug/l	lbs/day	11.0	ug/l	1.05 lbs/day
Chloroethane			0.0	ug/l	0.00 lbs/day
Bis(2-chloroethyl) ether	ug/l	lbs/day	1.4	ug/l	0.13 lbs/day
2-Chloroethyl vinyl ether	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
2-Chloronaphthalene	ug/l	lbs/day	4300.0	ug/l	412.34 lbs/day
2,4,6-Trichlorophenol	ug/l	lbs/day	6.5	ug/l	0.62 lbs/day
p-Chloro-m-cresol			0.0	ug/l	0.00 lbs/day
Chloroform (HM)	ug/l	lbs/day	470.0	ug/l	45.07 lbs/day
2-Chlorophenol	ug/l	lbs/day	400.0	ug/l	38.36 lbs/day
1,2-Dichlorobenzene	ug/l	lbs/day	17000.0	ug/l	1630.19 lbs/day
1,3-Dichlorobenzene	ug/l	lbs/day	2600.0	ug/l	249.32 lbs/day
1,4-Dichlorobenzene	ug/l	lbs/day	2600.0	ug/l	249.32 lbs/day
3,3'-Dichlorobenzidine	ug/l	lbs/day	0.1	ug/l	0.01 lbs/day
1,1-Dichloroethylene	ug/l	lbs/day	3.2	ug/l	0.31 lbs/day
1,2-trans-Dichloroethyle	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
2,4-Dichlorophenol	ug/l	lbs/day	790.0	ug/l	75.76 lbs/day
1,2-Dichloropropane	ug/l	lbs/day	39.0	ug/l	3.74 lbs/day
1,3-Dichloropropylene	ug/l	lbs/day	1700.0	ug/l	163.02 lbs/day
2,4-Dimethylphenol	ug/l	lbs/day	2300.0	ug/l	220.56 lbs/day
2,4-Dinitrotoluene	ug/l	lbs/day	9.1	ug/l	0.87 lbs/day
2,6-Dinitrotoluene	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
1,2-Diphenylhydrazine	ug/l	lbs/day	0.5	ug/l	0.05 lbs/day
Ethylbenzene	ug/l	lbs/day	29000.0	ug/l	2780.91 lbs/day
Fluoranthene	ug/l	lbs/day	370.0	ug/l	35.48 lbs/day
4-Chlorophenyl phenyl ether					
4-Bromophenyl phenyl ether					
Bis(2-chloroisopropyl) e	ug/l	lbs/day	170000.0	ug/l	16301.89 lbs/day
Bis(2-chloroethoxy) met	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
Methylene chloride (HM	ug/l	lbs/day	1600.0	ug/l	153.43 lbs/day
Methyl chloride (HM)	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
Methyl bromide (HM)	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
Bromoform (HM)	ug/l	lbs/day	360.0	ug/l	34.52 lbs/day
Dichlorobromomethane	ug/l	lbs/day	22.0	ug/l	2.11 lbs/day
Chlorodibromomethane	ug/l	lbs/day	34.0	ug/l	3.26 lbs/day
Hexachlorobutadiene(c)	ug/l	lbs/day	50.0	ug/l	4.79 lbs/day
Hexachlorocyclopentadi	ug/l	lbs/day	17000.0	ug/l	1630.19 lbs/day
Isophorone	ug/l	lbs/day	600.0	ug/l	57.54 lbs/day
Naphthalene					
Nitrobenzene	ug/l	lbs/day	1900.0	ug/l	182.20 lbs/day
2-Nitrophenol	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
4-Nitrophenol	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
2,4-Dinitrophenol	ug/l	lbs/day	14000.0	ug/l	1342.51 lbs/day
4,6-Dinitro-o-cresol	ug/l	lbs/day	765.0	ug/l	73.36 lbs/day
N-Nitrosodimethylamine	ug/l	lbs/day	8.1	ug/l	0.78 lbs/day
N-Nitrosodiphenylamine	ug/l	lbs/day	16.0	ug/l	1.53 lbs/day
N-Nitrosodi-n-propylami	ug/l	lbs/day	1.4	ug/l	0.13 lbs/day
Pentachlorophenol	ug/l	lbs/day	8.2	ug/l	0.79 lbs/day

Phenol	ug/l	lbs/day	4.6E+06	ug/l	4.41E+05 lbs/day
Bis(2-ethylhexyl)phthala	ug/l	lbs/day	5.9	ug/l	0.57 lbs/day
Butyl benzyl phthalate	ug/l	lbs/day	5200.0	ug/l	498.65 lbs/day
Di-n-butyl phthalate	ug/l	lbs/day	12000.0	ug/l	1150.72 lbs/day
Di-n-octyl phthlate					
Diethyl phthalate	ug/l	lbs/day	120000.0	ug/l	11507.22 lbs/day
Dimethyl phthlate	ug/l	lbs/day	2.9E+06	ug/l	2.78E+05 lbs/day
Benzo(a)anthracene (P/	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
Benzo(a)pyrene (PAH)	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
Benzo(b)fluoranthene (F	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
Benzo(k)fluoranthene (F	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
Chrysene (PAH)	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
Acenaphthylene (PAH)					
Anthracene (PAH)	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
Dibenzo(a,h)anthracene	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
Indeno(1,2,3-cd)pyrene	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
Pyrene (PAH)	ug/l	lbs/day	11000.0	ug/l	1054.83 lbs/day
Tetrachloroethylene	ug/l	lbs/day	8.9	ug/l	0.85 lbs/day
Toluene	ug/l	lbs/day	200000	ug/l	19178.70 lbs/day
Trichloroethylene	ug/l	lbs/day	81.0	ug/l	7.77 lbs/day
Vinyl chloride	ug/l	lbs/day	525.0	ug/l	50.34 lbs/day
					lbs/day
Pesticides					lbs/day
Aldrin	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
Dieldrin	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
Chlordane	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
4,4'-DDT	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
4,4'-DDE	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
4,4'-DDD	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
alpha-Endosulfan	ug/l	lbs/day	2.0	ug/l	0.19 lbs/day
beta-Endosulfan	ug/l	lbs/day	2.0	ug/l	0.19 lbs/day
Endosulfan sulfate	ug/l	lbs/day	2.0	ug/l	0.19 lbs/day
Endrin	ug/l	lbs/day	0.8	ug/l	0.08 lbs/day
Endrin aldehyde	ug/l	lbs/day	0.8	ug/l	0.08 lbs/day
Heptachlor	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
Heptachlor epoxide					
PCB's					
PCB 1242 (Arochlor 12/	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
PCB-1254 (Arochlor 12!	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
PCB-1221 (Arochlor 12:	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
PCB-1232 (Arochlor 12:	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
PCB-1248 (Arochlor 12/	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
PCB-1260 (Arochlor 12(	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
PCB-1016 (Arochlor 10'	ug/l	lbs/day	0.0	ug/l	0.00 lbs/day
Pesticide					
Toxaphene	ug/l		0.0	ug/l	0.00 lbs/day
Dioxin					
Dioxin (2,3,7,8-TCDD)	ug/l	lbs/day			

Metals				
Antimony	ug/l	lbs/day		
Arsenic	ug/l	lbs/day	4300.00 ug/l	412.34 lbs/day
Asbestos	ug/l	lbs/day		
Beryllium				
Cadmium				
Chromium (III)				
Chromium (VI)				
Copper				
Cyanide	ug/l	lbs/day	2.2E+05 ug/l	21096.57 lbs/day
Lead	ug/l	lbs/day		
Mercury			0.15 ug/l	0.01 lbs/day
Nickel			4600.00 ug/l	441.11 lbs/day
Selenium	ug/l	lbs/day		
Silver	ug/l	lbs/day		
Thallium			6.30 ug/l	0.60 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)	13.15	19.2	7.9	0.05	1.00	7.09	0.00	1066.0
Fall	13.15	8.8	8.0	0.05	1.00	---	0.00	1205.0
Winter	13.15	5.5	7.7	0.05	1.00	---	0.00	1190.0
Spring	13.15	14.0	8.0	0.05	1.00	---	0.00	886.0

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	13.50	0.05	2.82	3.975*	2.41	10.0	0.25

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	2.86	0.25	15.90	318.0	* ~80% MDL

Projected Discharge Information

Season	Flow, MGD	Temp.
Summer	3.00000	15.0
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 >	100.0% Effluent	[Acute]
	IC25 >	26.1% Effluent	[Chronic]

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	8.32 mg/l as N	208.2 lbs/day
	1 Hour Avg. - Acute	12.5 mg/l as N	312.5 lbs/day
Fall	4 Day Avg. - Chronic	9.2 mg/l as N	230.7 lbs/day
	1 Hour Avg. - Acute	10.9 mg/l as N	272.3 lbs/day
Winter	4 Day Avg. - Chronic	12.7 mg/l as N	318.1 lbs/day
	1 Hour Avg. - Acute	15.2 mg/l as N	379.4 lbs/day
Spring	4 Day Avg. - Chronic	9.9 mg/l as N	246.9 lbs/day
	1 Hour Avg. - Acute	11.9 mg/l as N	298.2 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	0.039	mg/l	0.98	lbs/day
	1 Hour Avg. - Acute	0.044	mg/l	1.11	lbs/day
Fall	4 Day Avg. - Chronic	0.039	mg/l	0.98	lbs/day
	1 Hour Avg. - Acute	0.044	mg/l	1.11	lbs/day
Winter	4 Day Avg. - Chronic	0.039	mg/l	0.98	lbs/day
	1 Hour Avg. - Acute	0.044	mg/l	1.11	lbs/day
Spring	4 Day Avg. - Chronic	0.039	mg/l	0.98	lbs/day
	1 Hour Avg. - Acute	0.044	mg/l	1.11	lbs/day

Effluent Limitations for Total Dissolved Solids based upon Water Quality Standards

Season		Concentration		Load	
Summer	Maximum, Acute	1579.7	mg/l	19.76	tons/day
Fall	Maximum, Acute	1185.8	mg/l	14.83	tons/day
Winter	Maximum, Acute	1228.3	mg/l	15.36	tons/day
Spring	Maximum, Acute	2089.7	mg/l	26.14	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 400 mg/l):

	4 Day Average Concentration		Load	1 Hour Average Concentration		Load
Aluminum*	N/A		N/A	1,805.5	ug/l	45.3 lbs/day
Arsenic*	690.10	ug/l	11.2 lbs/day	802.6	ug/l	20.1 lbs/day
Cadmium	9.41	ug/l	0.2 lbs/day	16.8	ug/l	0.4 lbs/day
Chromium III	1,020.21	ug/l	16.5 lbs/day	13,557.8	ug/l	339.8 lbs/day
Chromium VI*	30.90	ug/l	0.5 lbs/day	33.0	ug/l	0.8 lbs/day
Copper	110.09	ug/l	1.8 lbs/day	121.5	ug/l	3.0 lbs/day
Iron*	N/A		N/A	2,402.6	ug/l	60.2 lbs/day
Lead	70.52	ug/l	1.1 lbs/day	1,152.0	ug/l	28.9 lbs/day
Mercury*	0.05	ug/l	0.0 lbs/day	5.8	ug/l	0.1 lbs/day
Nickel	639.01	ug/l	10.3 lbs/day	3,660.0	ug/l	91.7 lbs/day
Selenium*	9.53	ug/l	0.2 lbs/day	44.3	ug/l	1.1 lbs/day
Silver	N/A	ug/l	N/A lbs/day	98.9	ug/l	2.5 lbs/day

Zinc	1,441.67	ug/l	23.3	lbs/day	914.7	ug/l	22.9 lbs/day
Cyanide*	19.93	ug/l	0.3	lbs/day	53.2	ug/l	1.3 lbs/day

*Limits for these metals are based on the dissolved standard.

Effluent Limitations for Heat/Temperature based upon Water Quality Standards

Summer	26.8 Deg. C.	80.3 Deg. F
Fall	16.5 Deg. C.	61.7 Deg. F
Winter	13.2 Deg. C.	55.7 Deg. F
Spring	21.7 Deg. C.	71.0 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	5.82E-02	lbs/day
Chlordane	4.30E-03	ug/l	1.08E-01	lbs/day	1.2E+00	ug/l	4.65E-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	4.85E-02	lbs/day
Endosulfan	5.60E-02	ug/l	1.40E+00	lbs/day	1.1E-01	ug/l	4.27E-03	lbs/day
Endrin	2.30E-03	ug/l	5.75E-02	lbs/day	9.0E-02	ug/l	3.49E-03	lbs/day
Guthion	0.00E+00	ug/l	0.00E+00	lbs/day	1.0E-02	ug/l	3.88E-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	3.88E-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	3.88E-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	7.75E-02	lbs/day
Pentachlorophenol	1.30E+01	ug/l	3.25E+02	lbs/day	2.0E+01	ug/l	7.75E-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	125.3 lbs/day
Nitrates as N	4.0 mg/l	100.3 lbs/day
Total Phosphorus as P	0.05 mg/l	1.3 lbs/day
Total Suspended Solids	90.0 mg/l	2255.7 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**
Toxic Organics		
Acenaphthene	1.04E+04 ug/l	2.59E+02 lbs/day
Acrolein	2.99E+03 ug/l	7.48E+01 lbs/day
Acrylonitrile	2.53E+00 ug/l	6.33E-02 lbs/day
Benzene	2.72E+02 ug/l	6.81E+00 lbs/day
Benzidine	ug/l	lbs/day
Carbon tetrachloride	1.69E+01 ug/l	4.22E-01 lbs/day
Chlorobenzene	8.05E+04 ug/l	2.01E+03 lbs/day
1,2,4-Trichlorobenzene		
Hexachlorobenzene	2.95E-03 ug/l	7.38E-05 lbs/day
1,2-Dichloroethane	3.80E+02 ug/l	9.49E+00 lbs/day
1,1,1-Trichloroethane		
Hexachloroethane	3.41E+01 ug/l	8.53E-01 lbs/day
1,1-Dichloroethane		
1,1,2-Trichloroethane	1.61E+02 ug/l	4.03E+00 lbs/day
1,1,2,2-Tetrachloroethane	4.22E+01 ug/l	1.05E+00 lbs/day
Chloroethane		
Bis(2-chloroethyl) ether	5.37E+00 ug/l	1.34E-01 lbs/day
2-Chloroethyl vinyl ether		
2-Chloronaphthalene	1.65E+04 ug/l	4.12E+02 lbs/day
2,4,6-Trichlorophenol	2.49E+01 ug/l	6.23E-01 lbs/day
p-Chloro-m-cresol		
Chloroform (HM)	1.80E+03 ug/l	4.51E+01 lbs/day
2-Chlorophenol	1.53E+03 ug/l	3.84E+01 lbs/day
1,2-Dichlorobenzene	6.52E+04 ug/l	1.63E+03 lbs/day
1,3-Dichlorobenzene	9.97E+03 ug/l	2.49E+02 lbs/day

1,4-Dichlorobenzene	9.97E+03 ug/l	2.49E+02 lbs/day
3,3'-Dichlorobenzidine	2.95E-01 ug/l	7.38E-03 lbs/day
1,1-Dichloroethylene	1.23E+01 ug/l	3.07E-01 lbs/day
1,2-trans-Dichloroethylene1		
2,4-Dichlorophenol	3.03E+03 ug/l	7.58E+01 lbs/day
1,2-Dichloropropane	1.50E+02 ug/l	3.74E+00 lbs/day
1,3-Dichloropropylene	6.52E+03 ug/l	1.63E+02 lbs/day
2,4-Dimethylphenol	8.82E+03 ug/l	2.21E+02 lbs/day
2,4-Dinitrotoluene	3.49E+01 ug/l	8.73E-01 lbs/day
2,6-Dinitrotoluene		
1,2-Diphenylhydrazine	2.07E+00 ug/l	5.18E-02 lbs/day
Ethylbenzene	1.11E+05 ug/l	2.78E+03 lbs/day
Fluoranthene	1.42E+03 ug/l	3.55E+01 lbs/day
4-Chlorophenyl phenyl ether		
4-Bromophenyl phenyl ether		
Bis(2-chloroisopropyl) ether	6.52E+05 ug/l	1.63E+04 lbs/day
Bis(2-chloroethoxy) methane		
Methylene chloride (HM)	6.13E+03 ug/l	1.53E+02 lbs/day
Methyl chloride (HM)		
Methyl bromide (HM)		
Bromoform (HM)	1.38E+03 ug/l	3.45E+01 lbs/day
Dichlorobromomethane(HM)	8.43E+01 ug/l	2.11E+00 lbs/day
Chlorodibromomethane (HM)	1.30E+02 ug/l	3.26E+00 lbs/day
Hexachlorocyclopentadiene	6.52E+04 ug/l	1.63E+03 lbs/day
Isophorone	2.30E+03 ug/l	5.75E+01 lbs/day
Naphthalene		
Nitrobenzene	7.28E+03 ug/l	1.82E+02 lbs/day
2-Nitrophenol		
4-Nitrophenol		
2,4-Dinitrophenol	5.37E+04 ug/l	1.34E+03 lbs/day
4,6-Dinitro-o-cresol	2.93E+03 ug/l	7.34E+01 lbs/day
N-Nitrosodimethylamine	3.11E+01 ug/l	7.77E-01 lbs/day
N-Nitrosodiphenylamine	6.13E+01 ug/l	1.53E+00 lbs/day
N-Nitrosodi-n-propylamine	5.37E+00 ug/l	1.34E-01 lbs/day
Pentachlorophenol	3.14E+01 ug/l	7.86E-01 lbs/day
Phenol	1.76E+07 ug/l	4.41E+05 lbs/day
Bis(2-ethylhexyl)phthalate	2.26E+01 ug/l	5.66E-01 lbs/day
Butyl benzyl phthalate	1.99E+04 ug/l	4.99E+02 lbs/day
Di-n-butyl phthalate	4.60E+04 ug/l	1.15E+03 lbs/day
Di-n-octyl phthlate		
Diethyl phthalate	4.60E+05 ug/l	1.15E+04 lbs/day
Dimethyl phthlate	1.11E+07 ug/l	2.78E+05 lbs/day
Benzo(a)anthracene (PAH)	1.19E-01 ug/l	2.97E-03 lbs/day
Benzo(a)pyrene (PAH)	1.19E-01 ug/l	2.97E-03 lbs/day
Benzo(b)fluoranthene (PAH)	1.19E-01 ug/l	2.97E-03 lbs/day
Benzo(k)fluoranthene (PAH)	1.19E-01 ug/l	2.97E-03 lbs/day
Chrysene (PAH)	1.19E-01 ug/l	2.97E-03 lbs/day
Acenaphthylene (PAH)		
Anthracene (PAH)		
Dibenzo(a,h)anthracene (PAH)	1.19E-01 ug/l	2.97E-03 lbs/day
Indeno(1,2,3-cd)pyrene (PAH)	1.19E-01 ug/l	2.97E-03 lbs/day

Pyrene (PAH)	4.22E+04 ug/l	1.05E+03 lbs/day
Tetrachloroethylene	3.41E+01 ug/l	8.53E-01 lbs/day
Toluene	7.67E+05 ug/l	1.92E+04 lbs/day
Trichloroethylene	3.11E+02 ug/l	7.77E+00 lbs/day
Vinyl chloride	2.01E+03 ug/l	5.03E+01 lbs/day
Pesticides		
Aldrin	5.37E-04 ug/l	1.34E-05 lbs/day
Dieldrin	5.37E-04 ug/l	1.34E-05 lbs/day
Chlordane	2.26E-03 ug/l	5.66E-05 lbs/day
4,4'-DDT	2.26E-03 ug/l	5.66E-05 lbs/day
4,4'-DDE	2.26E-03 ug/l	5.66E-05 lbs/day
4,4'-DDD	3.22E-03 ug/l	8.06E-05 lbs/day
alpha-Endosulfan	7.67E+00 ug/l	1.92E-01 lbs/day
beta-Endosulfan	7.67E+00 ug/l	1.92E-01 lbs/day
Endosulfan sulfate	7.67E+00 ug/l	1.92E-01 lbs/day
Endrin	3.11E+00 ug/l	7.77E-02 lbs/day
Endrin aldehyde	3.11E+00 ug/l	7.77E-02 lbs/day
Heptachlor	8.05E-04 ug/l	2.01E-05 lbs/day
Heptachlor epoxide		
PCB's		
PCB 1242 (Arochlor 1242)	1.73E-04 ug/l	4.32E-06 lbs/day
PCB-1254 (Arochlor 1254)	1.73E-04 ug/l	4.32E-06 lbs/day
PCB-1221 (Arochlor 1221)	1.73E-04 ug/l	4.32E-06 lbs/day
PCB-1232 (Arochlor 1232)	1.73E-04 ug/l	4.32E-06 lbs/day
PCB-1248 (Arochlor 1248)	1.73E-04 ug/l	4.32E-06 lbs/day
PCB-1260 (Arochlor 1260)	1.73E-04 ug/l	4.32E-06 lbs/day
PCB-1016 (Arochlor 1016)	1.73E-04 ug/l	4.32E-06 lbs/day
Pesticide		
Toxaphene	2.88E-03 ug/l	7.19E-05 lbs/day
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		

Dioxin		
Dioxin (2,3,7,8-TCDD)	5.37E-08 ug/l	1.34E-09 lbs/day

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

	Class 4 Acute Agricultural ug/l	Class 3 Acute Aquatic Wildlife ug/l	Acute Toxics Drinking Water Source ug/l	Acute Toxics Wildlife ug/l	1C Acute Health Criteria ug/l	Acute Most Stringent ug/l	Class 3 Chronic Aquatic Wildlife ug/l
Aluminum		1805.5				1805.5	N/A
Antimony				16483.8		16483.8	
Arsenic	383.3	802.6				383.3	690.1
Barium							
Beryllium						0.0	
Cadmium	38.2	16.8				16.8	9.4
Chromium (III)		13557.8				13557.8	1020.2
Chromium (VI)	375.4	33.0				33.04	30.90
Copper	759.9	121.5				121.5	110.1
Cyanide		53.2	843357.0			53.2	19.9
Iron		2402.6				2402.6	
Lead	382.6	1152.0				382.6	70.5
Mercury		5.80		0.58		0.58	0.046
Nickel		3660.0		17633.8		3660.0	639.0
Selenium	183.6	44.3				44.3	9.5
Silver		98.9				98.9	
Thallium				24.2		24.2	
Zinc		914.7				914.7	1441.7
Boron	1974.0					1974.0	
Sulfate	7666.9					7666.9	

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	1805.5	N/A	
Antimony	16483.80		
Arsenic	383.3	690.1	Acute Controls
Asbestos			
Barium			
Beryllium			
Cadmium	16.8	9.4	
Chromium (III)	13557.8	1020	
Chromium (VI)	33.0	30.9	
Copper	121.5	110.1	

Cyanide	53.2	19.9	
Iron	2402.6		
Lead	382.6	70.5	
Mercury	0.575	0.046	
Nickel	3660.0	639	
Selenium	44.3	9.5	
Silver	98.9	N/A	
Thallium	24.2		
Zinc	914.7	1441.7	Acute Controls
Boron	1974.05		
Sulfate	7666.9		N/A at this Waterbody

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.

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. The proposed permit is a simple renewal, with no increase in flow or concentration over that which was approved in the existing permit.

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.

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.

DWQ-2019-012802