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

UTAH POLLUTANT DISCHARGE ELIMINATION SYSTEM (UPDES) PERMITS

Major Municipal Permit No. **UT0021628**
Biosolids Permit No. **UTL-021628**

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

SOUTH DAVIS SEWER DISTRICT – SOUTH PLANT

is hereby authorized to discharge from its wastewater treatment facility to receiving waters named **JORDAN RIVER**,

to dispose biosolids,

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

This permit shall become effective on December 9, 2021.

This permit expires at midnight on December 8, 2026.

Signed this 9th day of December, 2021.

Erica Brown Gaddis, PhD
Director

DWQ-2021-017251

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I. DISCHARGE LIMITATIONS AND REPORTING REQUIREMENTS

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

Outfall Number	Location of Discharge Outfall
001	Located at latitude 40°50'33" and longitude 111°56'30". The discharge is through a concrete pipe leading from the chlorine contact basin directly to the 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 001 as defined in *Part VIII*, and determined by test procedures described in *Part I. C.4.a* of this permit.

2.

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

Parameter	Effluent Limitations *a				
	Maximum Monthly Avg	Maximum Weekly Avg	Yearly Average	Daily Minimum	Daily Maximum
Total Flow	4.0	--	--	--	--
BOD_5, mg/L					
Summer (Jul-Sep)	20	27	--	--	--
Fall (Oct-Dec)	25	35	--	--	--
Winter (Jan-Mar)	25	35	--	--	--
Spring (Apr-Jun)	25	35	--	--	--
BOD_5 Min. % Removal	85	--	--	--	--
TSS, mg/L	25	35	--	--	--
TSS Min. % Removal	85	--	--	--	--
Dissolved Oxygen, mg/L	--	--	--	5.0	--
Total Ammonia (as N), *k mg/L					
Summer (Jul-Sep)	8.0	--	--	--	30.0
Fall (Oct-Dec)	20.0	--	--	--	40.0
Winter (Jan-Mar)	14.0	--	--	--	17.0

Spring (Apr-Jun)	12.0	--	--	--	26.0
TRC, mg/L Summer (Jul-Sep) Fall (Oct-Dec) Winter (Jan-Mar) Spring (Apr-Jun)	 -- -- -- --	 -- -- -- --	 -- -- -- --	 -- -- -- --	 0.321 0.253 0.134 0.163
E. coli, No./100mL	126	157	--	--	--
Total Phosphorus, mg/L (Final)	--	--	1.0	--	--
WET, Chronic Biomonitoring	--	--	--	--	IC_{25} > 21% effluent
Oil & Grease, mg/L	--	--	--	--	10.0
pH, Standard Units	--	--	--	6.5	9

Self-Monitoring and Reporting Requirements *a			
Parameter	Frequency	Sample Type	Units
Total Flow *b, *c	Continuous	Recorder	MGD
BOD_5, Influent *d Effluent	3 x Week 3 x Week	Composite Composite	mg/L mg/L
TSS, Influent *d Effluent	3 x Week 3 x Week	Composite Composite	mg/L mg/L
E. coli	3 x Week	Grab	No./100mL
pH	Daily	Grab	SU
Total Ammonia (as N)	3 x Week	Grab	mg/L
Total Ammonia (as N) *j	Monthly	Composite	mg/L
DO	Daily	Grab	mg/L
WET – Biomonitoring *g Ceriodaphnia - Chronic Fathead Minnows - Chronic	 1st & 3rd Quarter 2nd & 4th Quarter	 Composite Composite	 Pass/Fail Pass/Fail
TRC *e	Daily	Grab	mg/L
Oil & Grease *f	When Sheen Observed	Grab	mg/L
Orthophosphate (as P), *i Effluent	 Monthly	 Composite	 mg/L
Total Phosphorus (as P), *i, *j Influent Effluent	 Monthly Monthly	 Composite Composite	 mg/L mg/L
Total Kjeldahl Nitrogen TKN (as N), *i, *j Influent Effluent	 Monthly Monthly	 Composite Composite	 mg/L mg/L
Nitrate, NO3 *i, *j	Monthly	Composite	mg/L
Nitrite, NO2 *i, *j	Monthly	Composite	mg/L
TDS *j	Monthly	Composite	mg/L
Temperature *j	Monthly	Grab	ºC
Metals, Influent *h Effluent	Quarterly Quarterly	Composite/Grab Composite/Grab	mg/L mg/L
Cyanide *h	Monthly	Composite	mg/L
Organic Toxics, Influent Effluent	Yearly Yearly	Grab Grab	mg/L mg/L

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

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

*c If the rate of discharge is controlled, the rate and duration of discharge shall be reported.

*d In addition to monitoring the final discharge, influent samples shall be taken and analyzed for this constituent at the same frequency as required for this constituent in the discharge.

*e For purposes of calculating averages and reporting on the Discharge Monitoring Report form, the following will apply:
1) analytical values less than 0.02 mg/L shall be considered zero; and
2) analytical values less than 0.06 mg/L and equal to or greater than 0.02 mg/L will be recorded as measured.

*f Oil & Grease sampled when sheen is present or visible. If no sheen is present or visible, report NA.

*g The chronic Ceriodaphnia will be tested during the 1st and 3rd quarters and the chronic fathead minnows will be tested during the 2nd and 4th quarters.

*h Reasonable Potential Analysis was run on metals data for the 36 months. The results indicated that increased cyanide monitoring is required at this time. See Attachment 3 of FSSOB for details.

*i These reflect changes required with the adoption of UCA R317-1-3.3, Technology-based Phosphorus Effluent Limits rule.

*j Pollutants are being sampled in support of the work being done for the TMDL currently underway for the Jordan River. The Pollutants of Concern (POC) will be monitored and reported (on a monthly basis by the facility on Discharge Monitoring Report, but will not have a limit associated with them /or at the end of each Calendar year of sampling for these POC's), SDSDS will report the results of all sampling done for the POC. If SDSDS decides to sample more frequently for these POC's, the additional data will be welcome.

*k Final ammonia limits go into effect on April 1, 2022. See *Part I.C.3.b* for interim limits.

3. Compliance Schedule for Ammonia

   a. SDSDS Plant is schedule to finish plant upgrade by March, 2022.

   b. Ammonia Compliance Schedule:

	Permit Limits for Ammonia, mg/L			
Date	Maximum Monthly Average		Daily Maximum	
Permit Issue – March 31, 2022	Fall (Oct-Dec) Winter (Jan-Mar)	20.0 15.0	Fall (Oct-Dec) Winter (Jan-Mar)	40.0 40.0
April 1, 2022	Summer (Jul-Sep) Fall (Oct-Dec) Winter (Jan-Mar) Spring (Apr-Jun)	8.0 20.0 14.0 12.0	Summer (Jul-Sep) Fall (Oct-Dec) Winter (Jan-Mar) Spring (Apr-Jun)	30.0 40.0 17.0 26.0

4. Chronic Whole Effluent Toxicity (WET) Testing.

   a. *Whole Effluent Testing – Chronic Toxicity*.

Starting immediately, the permittee shall quarterly conduct chronic static renewal toxicity tests on a composite sample of the final effluent at Outfall 001. The sample shall be collected at the point of compliance before mixing with the receiving water.

Three samples are required and samples shall be collected on Monday, Wednesday and Friday of each sampling period or collected on a two day progression for each sampling period. This may be changed with Director approval. The chronic toxicity tests shall be conducted in general accordance with the procedures set out in the latest revision of *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms, Fourth Edition*, October 2002, *EPA—821-R-02-013* as per *40 CFR 136.3(a)* TABLE IA-LIST OF APPROVED BIOLOGICAL METHODS. Test species shall consist of *Ceriodaphnia dubia* and *Pimephales promelas* (fathead minnow). A CO2 atmosphere may be used (in conjunction with an unmodified test) in order to account for artificial pH drift, if demonstrated and authorized by the Director.

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. Chronic toxicity occurs when, during a chronic toxicity test, the 25% inhibition concentration (IC25) calculated on the basis of test organism survival and growth or survival and reproduction, is less than or equal to 21% effluent concentration (equivalent to the RWC). If a sample is found to be chronically toxic during a routine test, the monitoring frequency shall become biweekly (see Part 1.C.4.b Accelerated Testing). (the Director may enter acceptable variations in the test procedure here as documented in the Fact Sheet Statement of Basis and based on the test acceptability criteria as contained in Utah Pollutant Discharge Elimination System (UPDES) Permitting and Enforcement Guidance Document for Whole Effluent Toxicity Control February, 2018). 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 de-chlorination is negatively affecting the test, the permittee may collect the sample just before chlorination with Director approval.

Quarterly test results shall be reported along with the Discharge Monitoring Report (DMR) submitted for the end of the required reporting period (e.g., biomonitoring results for the calendar quarter ending March 31 shall be reported with the DMR due April 28, with the remaining biomonitoring reports submitted with DMRs due each July 28, October 28, and January 28). Monthly test results shall be reported along with the DMR submitted for that month. The format for the report shall be consistent with Appendix C of "Utah Pollutant Discharge Elimination System (UPDES) Permitting and Enforcement Guidance Document for Whole Effluent Toxicity, Utah Division of Water Quality, February, 2018.

b. *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.

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

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

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

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

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

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

d. *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.4.e* Toxicity 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.

e. *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.

1. Reporting of Wastewater Monitoring Results Monitoring results obtained during the previous month shall be summarized for each month and reported on a Discharge Monitoring Report Form (EPA No. 3320-1)* or by NetDMR, post-marked or entered into NetDMR no later than the 28th day of the month following the completed reporting period. The first report is due on January 28, 2021. 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

* Starting January 1, 2017 monitoring results must be submitted using NetDMR unless the permittee has successfully petitioned for an exception.

II. INDUSTRIAL PRETREATMENT PROGRAM

A. Pretreatment Program Delegation. The permittee has been delegated primary responsibility for enforcing against discharges prohibited by *40 CFR 403.5* and applying and enforcing any national Pretreatment Standards established by the United States Environmental Protection Agency in accordance with Section 307 (b) and (c) of *The Clean Water Act (CWA)*, as amended by *The Water Quality Act (WQA), of 1987*.

The permittee shall implement the Industrial Pretreatment Program in accordance with the legal authorities, policies, and procedures described in the approved Pretreatment Program submission. Such program commits the permittee to do the following:

1. Carry out inspection, surveillance, and monitoring procedures, which will determine, independent of information supplied by the industrial user, whether the industrial user is in compliance with the pretreatment standards. At a minimum, all significant industrial users shall be inspected and sampled by the permittee at least once per year;

2. Control through permit, order, or similar means, the contribution to the POTW by each industrial user to ensure compliance with applicable pretreatment standards and requirements;

3. Require development, as necessary, of compliance schedules by each industrial user for the installation of control technologies to meet applicable pretreatment standards;

4. Maintain and update industrial user information as necessary, to ensure that all IUs are properly permitted and/or controlled at all times;

5. Enforce all applicable pretreatment standards and requirements and obtain appropriate remedies for noncompliance by any industrial user;

6. Annually publish a list of industrial users that were determined to be in significant noncompliance during the previous year. The notice must be published before March 28 of the following year;

7. Maintain an adequate revenue structure and staffing level for continued implementation of the Pretreatment Program.

8. Evaluate all significant industrial users at least once every two years to determine if they need to develop a slug prevention plan. If a slug prevention plan is required, the permittee shall insure that the plan contains at least the minimum elements required in *40 CFR 403.8(f)(2)(v);*

9. Notify all significant industrial users of their obligation to comply with applicable requirements under *Subtitles C and D* of the *Resource* Conservation and Recovery Act (RCRA); and

10. Develop, implement, and maintain an enforcement response plan as required by *40 CFR 403.8(f)(5)* which shall, at a minimum,

    a. Describe how the POTW will investigate instances of noncompliance;

    b. Describe the types of escalating enforcement responses the POTW will take in response to all anticipated type of industrial user violations; and

c. Describe the time periods within which such responses will be taken and identify the POTW staff position(s) responsible for pursuing these actions.

11. Establish and enforce specific local limits as necessary to implement the provisions of the *40 CFR Parts 403.5(a)* and *(b)*, and as required by *40 CFR Part 403.5(c)*.

B. Program Updates. The permittee is required to modify its pretreatment program, as necessary, to reflect changes in the regulations of *40 CFR 403*. Such modifications shall be completed within the time frame set forth by the applicable regulations. Modification of the approved pretreatment program must be done in accordance with the requirements of *40 CFR 403.18*. Modifications of the approved program which result in less stringent industrial user requirements shall not be effective until after approval has been granted by the Director.

C. Annual Report. The permittee shall provide the Division of Water Quality and EPA with an annual report briefly describing the pretreatment program activities over the previous calendar year for the permittee. Reports shall be submitted no later than March 28 of each year. The permittee shall submit an annual report, that includes at a minimum, the following:

1. An updated listing of the industrial users.

2. A descriptive summary of the compliance activities including numbers of any major enforcement actions, i.e., administrative orders, penalties, civil actions, etc.

3. An assessment of the compliance status of the industrial users and the effectiveness of the Pretreatment Program in meeting its needs and objectives.

4. A description of all changes made to the pretreatment program.

5. Changes to pollutants of concern to include but not limited to the following

   a. Violations of effluent limits,
   b. Summary of pollutants of concern, and
   c. Exceedances of the maximum headwork loading or industrial loading.

6. Other information as may be determined necessary by the Director.

D. General and Specific Prohibitions. Pretreatment standards (*40 CFR 403.5*) specifically prohibit the introduction of the following pollutants into the waste treatment system from any source of non-domestic discharge:

1. Pollutants which create a fire or explosion hazard in the publicly owned treatment works (POTW), including, but not limited to, wastestreams with a closed cup flashpoint of less than 140˚F (60˚C);

2. Pollutants, which will cause corrosive structural damage to the POTW, but in no case, discharges with a pH lower than 5.0;

3. Solid or viscous pollutants in amounts which will cause obstruction to the flow in the POTW resulting in interference;

4. Any pollutant, including oxygen demanding pollutants (BOD, etc.), released in a discharge at such volume or strength as to cause interference in the POTW;

5. Heat in amounts, which will inhibit biological activity in the POTW, resulting in interference, but in no case, heat in such quantities that the influent to the sewage treatment works exceeds 104˚F (40˚C));

6. Petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass through;

7. Pollutants, which result in the presence of toxic gases, vapor, or fumes within the POTW in a quantity that may cause worker health or safety problems;

8. Any trucked or hauled pollutants, except at discharge points designated by the POTW; or

9. Any pollutant that causes pass through or interference at the POTW.

10. Any specific pollutant which exceeds any local limitation established by the POTW in accordance with the requirement of *40 CFR 403.5(c)* and *40 CFR 403.5(d)*.

E. Categorical Standards. In addition to the general and specific limitations expressed in *Part D* of this section, applicable National Categorical Pretreatment Standards must be met by all industrial users of the POTW. These standards are published in the federal regulations at *40 CFR 405* et. seq.

F. Self-Monitoring and Reporting Requirements.

1. Influent and Effluent Monitoring and Reporting Requirements. The permittee shall sample and analyze both the influent and effluent, for the parameters listed in the Monitoring for Pretreatment Program Table.

Monitoring for Pretreatment Program Table				
Parameter	Reporting Limit	Sample Type	Frequency	Units
Total Arsenic	2.27	Composite	Quarterly	mg/L
Total Cadmium	0.0454			
Total Chromium	0.153			
Total Copper	0.552			
Total Lead	0.383			
Total Molybdenum	NA			
Total Nickel	3.73			
Total Selenium	0.0693			
Total Silver	0.472			
Total Zinc	4.34			
Total Cyanide	0.117	Composite/Grab		
Total Mercury	0.000272			
TTOs	NA		Yearly	

2. A test method must be used that has a reporting limit as stated in the column. If a test method is not available the permittee must submit documentation to the Director regarding the method that will be used.

3. The influent and effluent shall be analyzed by the permittee for total toxic pollutants (TTOs) listed in 40 CFR 122 Appendix D Table II (Organic Toxic Pollutants). The pesticides fraction of Appendix D, Table II is suspended unless pesticides are expected to be present.

4. The results of the analyses of metals, cyanide and toxic organics shall be submitted along with the Discharge Monitoring Report (DMR) at the end of the earliest possible reporting period. Also, the permittee must submit a copy of the toxic organics data to the Pretreatment Coordinator for DWQ via email.

5. In accordance with the requirements of 40 CFR Part 403.5(c), the permittee shall determine if there is a need to develop or revise its local limits in order to implement the general and specific prohibitions of 40 CFR Part 403.5 (a) and Part 403.5 (b). A technical evaluation of the need to develop or revise local limits shall be submitted to the Division within 12 months of the effective date of this permit. This evaluation should be conducted in accordance with the latest revision of the EPA Local Limits Development Guidance. If a technical evaluation, reveals that development or revision of local limits is necessary, the permittee shall submit the proposed local limits revision to the Division of Water Quality for approval, and after approval implement the new local limits, within 12 months of the determination that a revision is necessary.

6. For local limit parameters it is recommended that the most sensitive method be used for analysis. This will determine if the parameter is present and provide removal efficiencies based on actual data rather than literature values. If a parameter load is greater than the allowable head works load, for any pollutant listed in Part II.F.1. or a pollutant of concern listed in the local limit development document, the permittee must report the information to the Pretreatment Coordinator for the DWQ. If the loading exceeds the allowable headworks load, increase sampling must occur based on the requirements given by the Pretreatment Coordinator for the DWQ. Additional sampling may need to occur to find the source(s) of the increase. This may include sampling of the collection system and/or additional sampling of industrial users. Notification regarding the exceedances of the allowable headworks loading can be provided via email.

G. Enforcement Notice. *UCA 19-5-104* provides that the State may issue a notice to the POTW stating that a determination has been made that appropriate enforcement action must be taken against an industrial user for noncompliance with any pretreatment requirements within 30 days. The issuance of such notice shall not be construed to limit the authority of the Director.

H. Formal Action. The Director retains the right to take legal action against any industrial user and/or POTW for those cases where a permit violation has occurred because of the failure of an industrial user to meet an applicable pretreatment standard.

III. BIOSOLIDS REQUIREMENTS

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

1. Treatment

a. The SDSDS facility functions in two-stage trickling filter mode. Sludge generated during unit processes is stabilized in two-stage mesophilic anaerobic digesters with a solids retention time of at least 30 days. Under 40 CFR 503.33(b)(1), the solids need to be treated through anaerobic digestion for at least 15 days at a temperature of a least 35° C (95° F) with a 38% reduction of volatile solids. After stabilization, biosolids are wasted to belt filter press for dewatering before the biosolids are hauled off-site to the landfill for disposal.

2. Description of Biosolids Disposal Method

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

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

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

3. Changes in Treatment Systems and Disposal Practices.

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

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

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

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

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

Pollutant Limits, (40 CFR Part 503.13(b)) Dry Mass Basis				
Heavy Metals	Table 1	Table 2	Table 3	Table 4
	Ceiling Conc. Limits [1], (mg/kg)	CPLR [2] (mg/ha)	Pollutant Conc. Limits [3], (mg/kg)	APLR [4], (mg/ha-yr)
Total Arsenic	75	41	41	2.0
Total Cadmium	85	39	39	1.9
Total Copper	4300	1500	1500	75
Total Lead	840	300	300	15
Total Mercury	57	17	17	0.85
Total Molybdenum	75	N/A	N/A	-
Total Nickel	420	420	420	21
Total Selenium	100	100	100	5
Total Zinc	7500	2800	2800	140
1 - The limitations represent the maximum allowable levels of heavy metals in any biosolids intended for land application.				
2 - CPLR - Cumulative Pollutant Loading Rate; the maximum pollutant load for any given piece of land.				
3 - These limitations represent the maximum allowable levels of heavy metals based on an average of all samples taken during a 30-day period.				
4 - APLR – Annual Pollutant Loading Rate; the maximum pollutant load for any given piece of land in any given year.				

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

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

      (1) SDSDS has chosen to not treat the biosolids through a PFRP to meet Class A biosolids requirements, as the biosolids are not intended for land application on home lawns or gardens.

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

      (1) Anaerobic Digestion - solids are digested in an anaerobic digester with a retention time with a minimum retention time of 15 days at 95° F (35° C) or 60 days at 68° F (20°C). *40 CFR 503 (C)(6), Class A, Alternative 4(i)*

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

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

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

(3) Food crops with harvested parts below the surface of the land shall not be harvested for 38 months after application of sewage sludge when the sewage sludge remains on the land surface for less than four months prior to incorporation into the soil.

(4) Food crops, feed crops, and fiber crops shall not be harvested from the land for 30 days after application.

(5) Animals shall not be allowed to graze on the land for 30 days after application.

(6) Turf grown on land where biosolids is applied shall not be harvested for one year after application if the harvested turf is placed on either land with a high potential for public exposure or a lawn.

(7) Public access to land with a high potential for public exposure shall be restricted for one year after application.

(8) Public access to land with a low potential for public exposure shall be restricted for 30 days after application.

(9) The sludge or the application of the sludge shall not cause or contribute to the harm of a threatened or endangered species or result in the destruction or adverse modification of critical habitat of a threatened or endangered species after application.

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

3. Vector Attraction Reduction Requirements.

   a. The permittee will meet vector attraction reduction through use of one of the methods listed in *40 CFR 503.33*. Facility is meeting the requirements though the following methods.

      (1) Anaerobic Digestion - Under *40 CFR 503.33(b)(1)*, the solids need to be treated through anaerobic digestion for at least 15 days at a temperature of a least 35° C (95° F) with a 38% reduction of volatile solids.

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

4. Self-Monitoring Requirements.

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

Minimum Frequency of Monitoring (40 CFR Part 503.16, 503.26. and 503.46)		
Amount of Biosolids Disposed Per Year		Monitoring Frequency
Dry US Tons	Dry Metric Tons	Per Year or Batch
> 0 to < 320	> 0 to < 290	Once Per Year or Batch
> 320 to < 1650	> 290 to < 1,500	Once a Quarter or Four Times
> 1,650 to < 16,500	> 1,500 to < 15,000 [1]	Bi-Monthly or Six Times
> 16,500	> 15,000	Monthly or Twelve Times
1 - Over the previous decade, SDSDS has disposed of an average of 900 DMT of biosolids. It is recommended that they be required to monitor at least four time a year.		

   b. Sample collection, preservation and analysis shall be performed in a manner consistent with the requirements of *40 CRF 503* and/or other criteria specific to this permit. A metals analysis is to be performed using *Method SW 846* with *Method 3050* used for digestion. For the digestion procedure, an amount of biosolids equivalent to a dry weight of one gram shall be used. The methods are also described in the latest version of the *Region VIII Biosolids Management Handbook.*

   c. The Director may request additional monitoring for specific pollutants derived from biosolids if the data shows a potential for concern.

   d. After two (2) years of monitoring at the frequency specified, the permittee may request that the Director reduce the sampling frequency for the heavy metals. The frequency cannot be reduced to less than once per year for biosolids that are sold or given away to the public for any parameter. The frequency also cannot be reduced for any of the pathogen or vector attraction reduction requirements listed in this permit.

C. Management Practices of Biosolids.

1. Biosolids Distribution Information

   a. For biosolids that are sold or given away, an information sheet shall be provided to the person who receives the biosolids. The label or information sheet shall contain:

(1) The name and address of the person who prepared the biosolids for a sale or to be given away.

(2) A statement that prohibits the application of the biosolids to the land except in accordance with the instructions on the label or information sheet.

2. Biosolids Application Site Storage

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

3. Land Application Practices

a. The permittee shall operate and maintain the land application site operations in accordance with the following requirements:

(1) The permittee shall provide to the Director and the EPA within 90 days of the effective date of this permit a land application plan.

(2) Application of biosolids shall be conducted in a manner that will not contaminate the groundwater or impair the use classification for that water underlying the sites.

(3) Application of biosolids shall be conducted in a manner that will not cause a violation of any receiving water quality standard from discharges of surface runoff from the land application sites. Biosolids shall not be applied to land 10 meters or less from waters of the United States (as defined in 40 CFR 122.2).

(4) No person shall apply biosolids for beneficial use to frozen, ice-covered, or snow-covered land where the slope of such land is greater than three percent and is less than or equal to six percent unless one of the following requirements is met:

(a) there is 80 percent vegetative ground cover; or,

(b) approval has been obtained based upon a plan demonstrating adequate runoff containment measures.

(5) Application of biosolids is prohibited to frozen, ice-covered, or snow-covered sites where the slope of the site exceeds six percent.

(6) Agronomic Rate

(a) Application of biosolids shall be conducted in a manner that does not exceed the agronomic rate for available nitrogen of the crops grown on the site. At a minimum, the permittee is required to follow the methods for calculating agronomic rate outlined in the latest version of the *Region VIII Biosolids Management Handbook* (other methods may be approved by the Director). The treatment plant shall provide written notification to the applier of the biosolids of the concentration of total nitrogen (as N on a dry weight basis) in the biosolids. Written permission from the Director is required to exceed the agronomic rate.

(b) The permittee may request the limits of *Part III, C, 6* be modified if different limits would be justified based on local conditions. The limits are required to be developed in cooperation with the local agricultural extension office or university.

(c) Deep soil monitoring for nitrate-nitrogen is required for all land application sites (does not apply to sites where biosolids are applied less than once every five years). A minimum of six samples for each 320 (or less) acre area is to be collected. These samples are to be collected down to either a 5-foot depth, or the confining layer, whichever is shallower (sample at 1-foot, 2-foot, 3-foot, 4-foot and 5-foot intervals). Each of these one-foot interval samples shall be analyzed for nitrate-nitrogen. In addition to the one-foot interval samples, a composite sample of the 5-foot intervals shall be taken, and analyzed for nitrate-nitrogen as well. Samples are required to be taken once every five years for non-irrigated sites that receive more than 18 inches of precipitation annually or for irrigated sites. Sample results should be included on the Annual Report.

(7) Biosolids shall not be applied to any site area with standing surface water. If the annual high groundwater level is known or suspected to be within five feet of the surface, additional deep soil monitoring for nitrate-nitrogen as described in *Part III.C.(6),(c).* is to be performed. At a minimum, this additional monitoring will involve a collection of more samples in the affected area and possibly more frequent sampling. The exact number of samples to be collected will be outlined in a deep soil monitoring plan to be submitted to the Director and the EPA within 90 days of the effective date of this permit. The plan is subject to approval by the Director.

(8) The specified cover crop shall be planted during the next available planting season. If this does not occur, the permittee shall notify the Director in writing. Additional restrictions may be placed on the application of the biosolids on that site on a case-by-case basis to control nitrate movement. Deep soil monitoring may be increased under the discretion of the Director.

(9) When weather and or soil conditions prevent adherence to the biosolids application procedure, biosolids shall not be applied on the site.

(10) For biosolids that are sold or given away, an information sheet shall be provided to the person who receives the biosolids. The label or information sheet shall contain:

(a) The name and address of the person who prepared the biosolids for sale or give away for application to the land.

(b) A statement that prohibits the application of the biosolids to the land except in accordance with the instructions on the label or information sheet.

(c) The annual whole biosolids application rate for the biosolids that do not cause the metals loading rates in Tables 1, 2, and 3 (*Part III.B.1.*) to be exceeded.

(11) Biosolids subject to the cumulative pollutant loading rates in Table 2 (*Part III.B.1.*) shall not be applied to agricultural land, forest, a public contact site, or

a reclamation site if any of the cumulative pollutant loading rates in Table 2 have been reached.

(12) If the treatment plant applies the biosolids, it shall provide the owner or leaseholder of the land on which the biosolids are applied notice and necessary information to comply with the requirements in this permit.

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

D. Special Conditions on Biosolids Storage. Permanent storage of biosolids is prohibited. Biosolids shall not be temporarily stored for more than two (2) years. Written permission to store biosolids for more than two years must be obtained from the Director. Storage of biosolids for more than two years will be allowed only if it is determined that significant treatment is occurring.

E. Representative Sampling. Biosolids samples used to measure compliance with *Part III* of this Permit shall be collected at locations representative of the quality of biosolids generated at the treatment works and immediately prior to land application.

F. Reporting of Monitoring Results.

1. Biosolids. The permittee shall provide the results of all monitoring performed in accordance with *Part III.B*, and information on management practices, biosolids treatment, site restrictions and certifications shall be provided no later than February 19 of each year. Each report is for the previous calendar year. If no biosolids were sold or given away during the reporting period, "no biosolids were sold or given away" shall be reported. Legible copies of these, and all other reports required herein, shall be signed and certified in accordance with the *Signatory Requirements (see Part VII.G)*, and submitted to the Utah Division of Water Quality and the EPA by the NeT-Biosolids System through the EPA Central Data Exchange (CDX) system.

G. Additional Record Keeping Requirements Specific to Biosolids.

1. Unless otherwise required by the Director, **the permittee is not required to keep records** on compost products if the permittee prepared them from biosolids that meet the limits in Table 3 (*Part III.B.1*), the Class A pathogen requirements in *Part III.B.2* and the vector attraction reduction requirements in *Part III.B.3*. The Director may notify the permittee that additional record keeping is required if it is determined to be significant to protecting public health and the environment.

2. **The permittee is required** to keep the following information for at least 5 years:

a. Concentration of each heavy metal in Table 3 (*Part III.B.1*).

b. A description of how the pathogen reduction requirements in *Part III.B.2* were met.

c. A description of how the vector attraction reduction requirements in *Part III.B.3* were met.

d. A description of how the management practices in *Part III.C* were met (if necessary).

e. The following certification statement:

"I certify under the penalty of law, that the heavy metals requirements in *Part III.B.1*, the pathogen requirements in *Part III.B.2*, the vector attraction requirements in *Part III.B.3*, the management practices in *Part III.C*. This determination has been made under my direction and supervision in accordance with the system designed to assure that qualified personnel properly gather and evaluate the information used to determine that the pathogen requirements, the vector attraction reduction requirements and the management practices have been met. I am aware that there are significant penalties for false certification including the possibility of imprisonment."

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

IV. STORM WATER REQUIREMENTS.

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

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

V. MONITORING, RECORDING & GENERAL REPORTING REQUIREMENTS

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

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

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

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

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

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

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

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

H. Twenty-four Hour Notice of Noncompliance Reporting.

1. The permittee shall (orally) report any noncompliance including transportation accidents, spills, and uncontrolled runoff from biosolids transfer or land application sites which may seriously endanger health or environment, as soon as possible, but no later than twenty-four (24) hours from the time the permittee first became aware of circumstances. The report shall be made to the Division of Water Quality, (801) 536-4300, or 24-hour answering service (801) 536-4123.

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

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

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

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

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

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

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

   a. A description of the noncompliance and its cause;

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

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

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

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

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

5. Reports shall be submitted 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 judgement to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance, and

      (3) The permittee submitted notices as required under *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 VI.D*, *Duty to Mitigate*.

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

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 areawide treatment management plans or promulgations/revisions to TMDLs (40 CFR 130.7) approved by the EPA and adopted by DWQ which calls for different effluent limitations than contained in this permit.

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

Q. Toxicity Limitation - Reopener Provision. Use the following paragraph if WET testing is required at the facility:

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* 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.

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. "Annual Loading Cap" is the highest allowable phosphorus loading discharged over a calendar year, calculated as the sum of all the monthly loading discharges measured during a calendar year divided by the number of monthly discharges measured during that year.

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

7. "Chronic toxicity" occurs when the IC_{25}< 21% effluent. The 21% effluent is the concentration of the effluent in the receiving water, at the end of the mixing zone expressed as per cent effluent.

8. "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.

9. "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.

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

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

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

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

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

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

16. "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.

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

B. Biosolids.

1. "Biosolids," means any material or material derived from sewage solids that have been biologically treated.

2. "Dry Weight-Basis," means 100 percent solids (i.e. zero percent moisture).

3. "Land Application" is the spraying or spreading of biosolids onto the land surface; the injection of biosolids below the land surface; or the incorporation of biosolids into the land

so that the biosolids can either condition the soil or fertilize crops or vegetation grown in the soil. Land application includes distribution and marketing (i.e. the selling or giving away of the biosolids).

4. "Pathogen," means an organism that is capable of producing an infection or disease in a susceptible host.

5. "Pollutant" for the purposes of this permit is an organic substance, an inorganic substance, a combination of organic and inorganic substances, or pathogenic organisms that after discharge and upon exposure, ingestion, inhalation, or assimilation into an organism either directly from the environment or indirectly by ingestion through the food-chain, could on the basis of information available to the Administrator of EPA, cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunction in reproduction), or physical deformations in either organisms or offspring of the organisms.

6. "Runoff" is rainwater, leachate, or other liquid that drains over any part of a land surface and runs off the land surface.

7. "Similar Container" is either an open or closed receptacle. This includes, but is not limited to, a bucket, a box, a carton, and a vehicle or trailer with a load capacity of one metric ton or less.

8. "Total Solids" are the materials in the biosolids that remain as a residue if the biosolids are dried at 103^{o} or 105^{o} Celsius.

9. "Treatment Works" are either Federally owned, publicly owned, or privately owned devices or systems used to treat (including recycling and reclamation) either domestic sewage or a combination of domestic sewage and industrial waste or liquid manure.

10. "Vector Attraction" is the characteristic of biosolids that attracts rodents, flies, mosquitos or other organisms capable of transporting infectious agents.

11. "Animals" for the purpose of this permit are domestic livestock.

12. "Annual Whole Sludge Application Rate" is the amount of sewage sludge (dry-weight basis) that can be applied to a unit area of land during a cropping cycle.

13. "Agronomic Rate is the whole sludge application rate (dry-weight basis) designed to: (1) provide the amount of nitrogen needed by the crop or vegetation grown on the land; and (2) minimize the amount of nitrogen in the sewage sludge that passes below the root zone of the crop or vegetation grown on the land to the ground water.

14. "Annual Pollutant Loading Rate" is the maximum amount of a pollutant (dry-weight basis) that can be applied to a unit area of land during a 365-day period.

15. "Application Site or Land Application Site" means all contiguous areas of a users' property intended for sludge application.

16. "Cumulative Pollutant Loading Rate" is the maximum amount of an inorganic pollutant (dry-weight basis) that can be applied to a unit area of land.

17. "Grit and Screenings" are sand, gravel, cinders, other materials with a high specific gravity and relatively large materials such as rags generated during preliminary treatment of domestic sewage at a treatment works and shall be disposed of according to *40 CFR 258*.

18. "High Potential for Public Contact Site" is land with a high potential for contact by the public. This includes, but is not limited to, public parks, ball fields, cemeteries, plant nurseries, turf farms, and golf courses.

19. "Low Potential for Public Contact Site" is the land with a low potential for contact by the public. This includes, but is not limited to, farms, ranches, reclamation areas, and other lands which are private lands, restricted public lands, or lands which are not generally accessible to or used by the public.

20. "Monthly Average" is the arithmetic mean of all measurements taken during the month.

21. "Volatile Solids" is the amount of the total solids in sewage sludge lost when the sludge is combusted at 550 degrees Celsius for 15-20 minutes in the presence of excess air.

FACT SHEET AND STATEMENT OF BASIS
SOUTH DAVIS SEWER DISTRICT SOUTH TREATMENT PLANT
RENEWAL PERMIT: DISCHARGE & BIOSOLIDS
UPDES PERMIT NUMBER: UT0021628
UPDES BIOSOLIDS PERMIT NUMBER: UTL-021628
MAJOR MUNICIPAL

FACILITY CONTACTS

Person Name:	Dal D. Wayment, P.E.
Position:	General Manager
Phone Number:	(801) 580-3889
Person Name:	Matt Myers
Position:	Assistant General Manager
Phone Number:	(801) 232-7017
Facility Name:	South Davis Sewer District South Treatment Plant
Mailing Address:	PO Box 140111 Salt Lake City, UT 84114-4870
Telephone:	(801) 295-3469
Actual Address:	1380 West Center Street North Salt Lake City, UT 84054

DESCRIPTION OF FACILITY

The South Davis Sewer District South Treatment Plant (SDSDS) serves the cities of North Salt Lake, Woods Cross and a portion of Bountiful with a daily average design flow of 4 million gallons per day (MGD) and a design population equivalent of 27,000. The facility functions utilizing a two-stage trickling filter mode, followed by a moving bed bioreactor (scheduled to be complete March 2022). Unit operations and processes include influent pumping, screening, grit removal, primary, intermediate and secondary clarification and biological processing using trickling filters, followed by further nutrient removal using a moving bed bioreactor (MMBR), chlorination, and dechlorination prior to release into the Jordan River. The facility is located in North Salt Lake City, Davis County, with Outfall 001 which discharges to the Jordan River at latitude 40º 50' 33" and longitude 111º 56'30" and STORET Number 499181.

SUMMARY OF CHANGES FROM PREVIOUS PERMIT

To meet nutrient removal requirements, SDSDS installed, and incorporated, a MMBR into the treatment process. Construction is scheduled to be complete by the end of March 2022.

Reasonable Potential Analysis was run on metals data for the 36 months. The results indicated that increased cyanide monitoring is required at this time. See *Attachment 3* of FSSOB for details. Cyanide monitoring frequency will be increased to monthly. If elevated data continues, permit may be modified to include a cyanide limit.

Monitoring frequency for the Ammonia (as N) parameter shall be increased to three times a week, as determined by design flow MGD. SDSDS is now required to monitor temperature and total dissolved solids

(TDS) on a monthly frequency – to gather data for TMDL development. Also, WET Biomonitoring limit increased to IC25 >21% effluent, as determined by the WLA developed for this permit renewal.

This permit will no longer cover Storm Water – a separate permit, the Multi-Sector General Permit (MSGP) for Storm Water Discharges Associated with Industrial Activities (UTR000000) must be obtained.

This permit contains a Compliance Schedule for Total Ammonia (as N). SDSDS Plant is schedule to finish nutrient removal upgrades by March, 2022, and final limits will go into effect April 1, 2022. Interim Limits are based on previous permit limits.

Date	Permit Limits for Ammonia (as N), mg/L			
	Maximum Monthly Average		Daily Maximum	
Permit Issue – March 31, 2022	Fall (Oct-Dec) Winter (Jan-Mar)	20.0 15.0	Fall (Oct-Dec) Winter (Jan-Mar)	40.0 40.0
April 1, 2022	Summer (Jul-Sep) Fall (Oct-Dec) Winter (Jan-Mar) Spring (Apr-Jun)	8.0 20.0 14.0 12.0	Summer (Jul-Sep) Fall (Oct-Dec) Winter (Jan-Mar) Spring (Apr-Jun)	30.0 40.0 17.0 26.0

DISCHARGE

DESCRIPTION OF DISCHARGE

SDSDS has been reporting self-monitoring results on Discharge Monitoring Reports on a monthly basis.

Outfall	Description of Discharge Point
001	Located at latitude 40°50'33" and longitude 111°56'30". The discharge is through a concrete pipe leading from the chlorine contact basin directly to the Jordan River.

RECEIVING WATERS AND STREAM CLASSIFICATION

The discharge flows into the Jordan River before entering the Great Salt Lake. The Jordan River is Class 2B, 3B, 3D, and 4 according to *Utah Administrative Code (UAC) R317-2-13*:

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

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

Class 3D -- Protected for waterfowl, shore birds and other water-oriented wildlife not included in Classes 3A, 3B, or 3C, including the necessary aquatic organisms in their food chain.

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

TOTAL MAXIUM DAILY LOAD (TMDL) REQUIREMENTS

A QUAL2Kw model of the Jordan River was populated and calibrated as part of the TMDL study (Stantec Consulting 2010, UDWQ 2010). The model was subsequently validated to a synoptic survey conducted by UDWQ and the Jordan River/Farmington Bay Water Quality Council (JRFBWQC) during July 2014 (UDWQ 2015). The model validation identified areas for future improvement of the model; however, the model was considered suitable for application to the wasteload allocation for ammonia. Due to ongoing studies related to the TMDL, this wasteload allocation used for permit development does not address parameters related to dissolved oxygen, including biochemical oxygen demand (BOD), dissolved oxygen (DO), total nitrogen (TN), and total phosphorus (TP).

BASIS FOR EFFLUENT LIMITATIONS

Limitations on total suspended solids (TSS), *E. coli*, pH and percent removal for biochemical oxygen demand (BOD5) and TSS are based on current Utah Secondary Treatment Standards, UAC R317-1-3.2. The oil and grease are based on best professional judgment (BPJ). All other parameters were determined by the WLA (attached) for discharge into the Jordan River. It has been determined that this discharge will not cause a violation of water quality standards. The permittee is expected to be able to comply with these limitations.

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

A quantitative RP analysis was performed on cyanide, aluminum, arsenic, cadmium, chromium, copper, lead, molybdenum, nickel, silver, zinc, selenium, and mercury to determine if there was reasonable potential for the discharge to exceed the applicable water quality standards. Based on the RP analysis, the following parameters exceeded the most stringent chronic water quality standard or were determined to have a reasonable potential to exceed the standard: cyanide. Increased monitoring is required at this time. A copy of the RP analysis is included at the end of this Fact Sheet.

The permit limitations are:

Parameter	Effluent Limitations *a				
	Maximum Monthly Avg	Maximum Weekly Avg	Yearly Average	Daily Minimum	Daily Maximum
Total Flow	4.0	--	--	--	--
BOD_5, mg/L					
Summer (Jul-Sep)	20	27	--	--	--
Fall (Oct-Dec)	25	35	--	--	--
Winter (Jan-Mar)	25	35	--	--	--
Spring (Apr-Jun)	25	35	--	--	--
BOD_5 Min. % Removal	85	--	--	--	--
TSS, mg/L	25	35	--	--	--
TSS Min. % Removal	85	--	--	--	--
Dissolved Oxygen, mg/L	--	--	--	5.0	--
Total Ammonia (as N), *k mg/L					

Summer (Jul-Sep)	8.0	--	--	--	30.0
Fall (Oct-Dec)	20.0	--	--	--	40.0
Winter (Jan-Mar)	14.0	--	--	--	17.0
Spring (Apr-Jun)	12.0	--	--	--	26.0
TRC, mg/L					
Summer (Jul-Sep)	--	--	--	--	0.321
Fall (Oct-Dec)	--	--	--	--	0.253
Winter (Jan-Mar)	--	--	--	--	0.134
Spring (Apr-Jun)	--	--	--	--	0.163
E. coli, No./100mL	126	157	--	--	--
Total Phosphorus, mg/L (Final)	--	--	1.0	--	--
WET, Chronic Biomonitoring	--	--	--	--	IC_{25} > 21% effluent
Oil & Grease, mg/L	--	--	--	--	10.0
pH, Standard Units	--	--	--	6.5	9

SELF-MONITORING AND REPORTING REQUIREMENTS

The following self-monitoring requirements are different compared to the previous permit – TDS and temperature are now included. In addition, cyanide monitoring frequency will be increased to monthly. 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. Lab sheets for metals and toxic organics must be attached to the DMRs.

Self-Monitoring and Reporting Requirements *a			
Parameter	Frequency	Sample Type	Units
Total Flow *b, *c	Continuous	Recorder	MGD
BOD_5, Influent *d	3 x Week	Composite	mg/L
Effluent	3 x Week	Composite	mg/L
TSS, Influent *d	3 x Week	Composite	mg/L
Effluent	3 x Week	Composite	mg/L
E. coli	3 x Week	Grab	No./100mL
pH	Daily	Grab	SU
Total Ammonia (as N)	3 x Week	Grab	mg/L
Total Ammonia (as N) *j	Monthly	Composite	mg/L
DO	Daily	Grab	mg/L
WET – Biomonitoring *g			
Ceriodaphnia - Chronic	1st & 3rd Quarter	Composite	Pass/Fail
Fathead Minnows - Chronic	2nd & 4th Quarter	Composite	Pass/Fail
TRC, mg/L, *e	Daily	Grab	mg/L
Oil & Grease *f	When Sheen Observed	Grab	mg/L
Orthophosphate (as P), *i			
Effluent	Monthly	Composite	mg/L

Total Phosphorus (as P), *i, *j Influent Effluent	 Monthly Monthly	 Composite Composite	 mg/L mg/L
Total Kjeldahl Nitrogen TKN (as N), *i, *j Influent Effluent	 Monthly Monthly	 Composite Composite	 mg/L mg/L
Nitrate, NO3 *i, *j	Monthly	Composite	mg/L
Nitrite, NO2 *i, *j	Monthly	Composite	mg/L
TDS, mg/L *j	Monthly	Composite	mg/L
Temperature *j	Monthly	Grab	ºC
Metals, Influent *h Effluent	Quarterly Quarterly	Composite/Grab Composite/Grab	mg/L mg/L
Cyanide *h	Monthly	Composite	mg/L
Organic Toxics, Influent Effluent	Yearly Yearly	Grab Grab	mg/L mg/L

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

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

*c If the rate of discharge is controlled, the rate and duration of discharge shall be reported.

*d In addition to monitoring the final discharge, influent samples shall be taken and analyzed for this constituent at the same frequency as required for this constituent in the discharge.

*e For purposes of calculating averages and reporting on the Discharge Monitoring Report form, the following will apply:
1) analytical values less than 0.02 mg/L shall be considered zero; and
2) analytical values less than 0.06 mg/L and equal to or greater than 0.02 mg/L will be recorded as measured.

*f Oil & Grease sampled when sheen is present or visible. If no sheen is present or visible, report NA.

*g The chronic Ceriodaphnia will be tested during the 1st and 3rd quarters and the chronic fathead minnows will be tested during the 2nd and 4th quarters.

*h Reasonable Potential Analysis was run on metals data for the 36 months. The results indicated that increased cyanide monitoring is required at this time. See *Attachment 3* of FSSOB for details.

*i These reflect changes required with the adoption of UCA R317-1-3.3, Technology-based Phosphorus Effluent Limits rule.

*j Pollutants are being sampled in support of the work being done for the TMDL currently underway for the Jordan River. The Pollutants of Concern (POC) will be monitored and reported (on a monthly basis by the facility on Discharge Monitoring Report, but will not have a limit associated with them /or at the end of each Calendar year of sampling for these POC's), SDSDS will report

the results of all sampling done for the POC. If SDSDS decides to sample more frequently for these POC's, the additional data will be welcome.

*k Final ammonia limits go into effect on April 1, 2022. See *Part I.C.3.b* of permit for interim limits.

BIOSOLIDS

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

SUBSTANTIAL BIOSOLIDS TREATMENT CHANGES

SDSDS has made only one change to the biosolids process since the previous permit renewal. They added a belt press to the facility to replace the drying beds.

DESCRIPTION OF TREATMENT AND DISPOSAL

The Permittee submitted their 2020 annual biosolids report on February 19, 20121. The report states the Permittee produced 660 dry metric tons (DMT) of solids, all of which was hauled offsite and disposed in a municipal landfill.

The SDSDS facility functions in single-stage trickling filter mode. Sludge generated during unit processes is stabilized in two-stage mesophilic anaerobic digesters with a solid's retention time of at least 30 days. After stabilization, biosolids are wasted to and dewatered in a belt press before being staged for hauling off-site to the landfill for disposal. Wasatch Resource Recovery (WRR) is a facility located on-site at the SDSDS plant, which receives food waste for processing. The waste is separated from packaging, shredded and sent to be digested. The resulting product is a methane gas which is then further processed for distribution on the commercial market. The solids may be used as soil amendment as described below.

During the startup of WRR the digestors used approximately 150 DMT of anaerobically digested biosolids from the SDSDS and SDSDN plants to seed the digestors. Once operating, the facility wasted a total of 800 DMT of solids from the digestor. The wasted solids are considered to be biosolids and subject to the biosolids regulations as they may still have contained some biosolids in them. However, after startup and initial seeding, WRR no longer requires biosolids to operate the digestors; following the initial seeding, the digestors will be operated by feeding food waste and wasting solids until the biosolids in the digestors meet Class A PFRP treatment standards and the percentage of biosolids is low enough to not be of a concern. After that point, as long as the digestors do not require more biosolids, the wasted solids will no longer be subject to the biosolids regulations.

The last inspection conducted at the facility was September 17, 2018. The inspection showed that the facility was in compliance with all aspects of the biosolids management program.

SELF-MONITORING REQUIREMENTS

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

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

Over the previous decade SDSDS has disposed an average of 900 DMT of biosolids, however SDSD disposed 2,283 DMT of biosolids in 2019. The larger amount of biosolids would indicate SDSD needs to start monitoring six times a year, however, 800 DMT of the 2019 amount was transferred from, and generated by, the WRR which is located onsite. The additional biosolids were from the start-up of the digestors at the WRR facility and were digested and tested separately. For this reason, SDSD will continue to operate as they have previously with a requirement to monitor at least four time a year.

Landfill Monitoring

Under *40 CFR 258,* the landfill monitoring requirements include a paint filter test. If the biosolids do not pass a paint filter test, the biosolids cannot be disposed in the sanitary landfill *(40 CFR 258.28(c)(1).* SDSDS disposes of all biosolids (except the WRR generated biosolids from 2018) at the Bay Area Refuse Disposal (BARD) landfill.

BIOSOLIDS LIMITATIONS

Heavy Metals

Class A Biosolids for Home Lawn and Garden Use

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

Class A Requirements With Regards to Heavy Metals

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

Class B Requirements for Agriculture and Reclamation Sites

The intent of the heavy metals regulations of Tables 1, 2 and 3, of *40 CFR 503.13* is to ensure that heavy metals do not build up in the soil at farms, forest land, and land reclamation sites to the point where the heavy metals become phytotoxic to plants. The permittee will be required to produce an information sheet (see *Part III. C*. of the permit) to be handed out to all people who are receiving and land applying Class B biosolids to farms, ranches, and land reclamation sites (if biosolids are only applied to land owned by the permittee, the information sheet requirements are waived). If the biosolids are land applied according to

the regulations of *40 CFR 503.13*, to any reasonable degree, the Class B biosolids will be able to be land applied year after year, to the same farms, ranches, and land reclamation sites without any deleterious effects to the environment.

Class B Requirements With Regards to Heavy Metals

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

> The maximum heavy metals listed in *40 CFR Part 503.13(b) Table 1* and the heavy metals loading rates in *40 CFR Part 503.13(b) Table 2*; or
>
> The maximum heavy metals in *40 CFR Part 503.13(b) Table 1* and the monthly heavy metals concentrations in *40 CFR Part 503.13(b) Table 3*.

Tables 1, 2, and 3 of Heavy Metal Limitations

Pollutant Limits, (40 CFR Part 503.13(b)) Dry Mass Basis				
Heavy Metals	Table 1	Table 2	Table 3	Table 4
	Ceiling Conc. Limits [1], (mg/kg)	CPLR [2] (mg/ha)	Pollutant Conc. Limits [3], (mg/kg)	APLR [4], (mg/ha-yr)
Total Arsenic	75	41	41	2.0
Total Cadmium	85	39	39	1.9
Total Copper	4300	1500	1500	75
Total Lead	840	300	300	15
Total Mercury	57	17	17	0.85
Total Molybdenum	75	N/A	N/A	-
Total Nickel	420	420	420	21
Total Selenium	100	100	100	5
Total Zinc	7500	2800	2800	140
1 - The limitations represent the maximum allowable levels of heavy metals in any biosolids intended for land application.				
2 - CPLR - Cumulative Pollutant Loading Rate; the maximum pollutant load for any given piece of land.				
3 - These limitations represent the maximum allowable levels of heavy metals based on an average of all samples taken during a 30-day period.				
4 - APLR – Annual Pollutant Loading Rate; the maximum pollutant load for any given piece of land in any given year.				

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

Pathogens

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

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

Class A Requirements for Home Lawn and Garden Use

If biosolids are land applied to home lawns and gardens, the biosolids need to be treated by a specific process to further reduce pathogens (PFRP), and meet a microbiological limit of less than less than 3 most probable number (MPN) of *Salmonella* per 4 grams of total solids (or less than 1,000 most probable number (MPN/g) of fecal coliform per gram of total solids) to be considered Class A biosolids. SDSDS ceased the production of Class A biosolids and has chosen to not pursue a PFRP through.

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

Pathogens Class B

If biosolids are to be land applied for agriculture or land reclamation, the solids need to be treated by a specific process to significantly reduce pathogens (PSRP). The SDSDS has chosen to accomplish PSRP through:

- Anaerobic Digestion - solids are digested in an anaerobic digester with a retention time with a minimum retention time of 15 days at 95° F (35° C) or 60 days at 68° F (20°C). 40 CFR 503 (C)(6), Class A, Alternative 4(i)

Vector Attraction Reduction (VAR)

If the biosolids are land applied SDSDS will be required to meet VAR through the use of a method of listed under *40 CFR 503.33.* SDSDS intends to meet the vector attraction reduction requirements through one of the methods listed below.

- Anaerobic Digestion- Under 40 CFR 503.33(b)(1), the solids need to be treated for at least 15 days at a temperature of a least 95°F (35°C) with a 38% reduction of volatile solids.

If the biosolids do not meet a method of VAR, the biosolids cannot be land applied. SDSDS did not Land Apply in 2020.

If the permittee intends to use another one of the listed alternatives in *40 CFR 503.33*, the Director and the EPA must be informed at least thirty (30) days prior to its use. This change may be made without additional public notice

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

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

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

MONITORING DATA

METALS MONITORING DATA
SDSDS is required to sample for metals at least four times a year. SDSDN has sampled the Class B biosolids at least four times a year from 2012 to 2020. A summary of the monitoring data is below.

SDSDS Metals Monitoring Data 2011 - 2020

SDSDS Metals Monitoring Data, 2011 - 2020 (Landfill)			
Parameter	Table 3, mg/kg (Exceptional Quality)	Average, mg/kg	Maximum, mg/kg
Arsenic	41.0	83	409
Cadmium	39.0	2.22	5.44
Copper	1,500.0	464	786
Lead	300.0	22	188
Mercury	17.0	1.83	7.81
Molybdenum	75.0	17	198
Nickel	400.0	42	145
Selenium	36.0	28	744
Zinc	2,800.0	1948	4420

The summary of data shows that the average of the metals monitoring results over this period was below the Table 3. However, the Maximum value for multiple pollutants is above the corresponding limit. The SDSDS plant has a high percentage of categorical industrial users that contribute to the waste stream and has had issues with different metals for several years now. As a result of this, SDSDS choses to landfill rather than land apply the biosolids as a means of disposal. The biosolids land applied in 2019 all came from the WRR facility an had a different metals monitoring result. Those biosolids all met Table 3 of *40 CFR 503.13* limits and qualify as Exceptional Quality with regards to metals.

SDSDS WRR Metals Monitoring Data 2019

SDSDS Metals Monitoring Data, WRR - 2019 (Land Application)			
Parameter	Table 3, mg/kg (Exceptional Quality)	Average, mg/kg	Maximum, mg/kg
Arsenic	41.0	11.8	21.1
Cadmium	39.0	0.49	0.69
Copper	1,500.0	114	165
Lead	300.0	3.81	5.64
Mercury	17.0	0.24	0.32
Molybdenum	75.0	5.33	7.84
Nickel	400.0	26.9	66.5
Selenium	36.0	3.74	5.48
Zinc	2,800.0	795	1260

PATHOGEN MONITORING DATA

SDSDS has been meeting Class B Biosolids requirements through a PSRP and is not required to monitor the biosolids for pathogens. Therefore, there is no pathogen monitoring data for the Class B biosolids.

STORM WATER

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

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

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

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

PRETREATMENT REQUIREMENTS

The pretreatment requirements regarding administering an approved pretreatment program, remain the same as in the current permit. Any changes to the pretreatment program, must be submitted for approval to the Division of Water Quality prior to implementing the change, 40 CFR 403.18. Authority to require a pretreatment program is provided for in 19-5-108 UCA, 1953 ann. and UAC R317-8-8.

Sampling of metals will be conducted quarterly and the sampling of organic toxics yearly, see Part II of the UPDES Permit. This is consistent with the UPDES Pretreatment Guidance for Sampling of POTWs, which

is based on the design flow of the wastewater treatment plant. Additional requirements have been added to the permit to ensure that if the allowable headworks loading is above the value calculated for the local limit development that additional monitoring and notification must occur. The permittee must submit the analysis for the TTO, via email, to the Pretreatment Coordinator for the DWQ.

Technology based local limits must be developed per 40 CFR 403.5(a) and 403.5(b). This evaluation may indicate that present local limits are sufficiently protective, or that the local limits must be revised. The permittee will be required to perform an annual evaluation of the need to revise or develop technically based local limits to implement the general and specific prohibitions of 40 CFR Part 403.5(a) and Part 403.5(b). This evaluation may indicate that present local limits are sufficiently protective, or that they must be revised. The initial evaluation is due twelve months after the effective date of the permit. As part of this evaluation, the permit requires influent and effluent monitoring for metals and organic toxics as stated in the permit the most sensitive method should be used for analyzing pollutants of concern as determined by the local limit development. The permittee should utilize the EPA Local Limits Development Guidance to justify the re-evaluation of the local limits. Information is provided in Chapter 7 of the EPA Local Limits Development Guidance 2004 to assist with the development of revising the local limits.

BIOMONITORING REQUIREMENTS

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

Since the permittee is a major municipal discharger, the renewal permit will again require WET testing. The permittee will continue Chronic WET testing using one species quarterly, alternating between Ceriodaphnia dubia and Pimephales promelas (fathead minnow). The permit will contain the standard requirements for re-testing upon failure of a WET test, and for a Toxicity Reduction Evaluation (TRE) as appropriate.

Chronic toxicity occurs when the survival, growth, or reproduction for either test species, when exposed to a dilution of 21% effluent or lower, is significantly less (at 95% confidence level) than that of the control specimens. The 21% effluent dilution criterion is based upon the waste load analysis and is consistent with previous permit conditions. The permit will also contain a toxicity limitation re-opener provision. This provision allows for modification of the permit at any time to include WET limitations and/or increased WET monitoring, should additional information indicate the presence of toxicity in the discharge.

PERMIT DURATION

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

Drafted and Reviewed by
Danielle Lenz, Discharge and Reasonable Potential Analysis
Daniel Griffin, Biosolids
Jennifer Robinson, Pretreatment
Lonnie Shull, Biomonitoring
Carl Adams, Storm Water
Amy Dickey, TMDL/Watershed
Nick von Stackelberg, Wasteload Analysis
Utah Division of Water Quality, (801) 536-4300

PUBLIC NOTICE

Began: October 19, 2021
Ended: November 19, 2021

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 on the DWQ Webpage.

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

ADDENDUM TO FSSOB

During finalization of the Permit certain dates, spelling edits and minor language corrections were completed. Due to the nature of these changes they were not considered Major and the permit is not required to be re Public Noticed.

RESPONSIVENESS SUMMARY

No comments were received during the Public Notice comment period.

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ATTACHMENT 1

Effluent Monitoring Data

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Effluent Monitoring Data.

	Flow	pH		O & G	TRC	*E. coli*		BOD5		TSS	
Month	Ave	Min	Max	Max	Max	Weekly	Monthly	Weekly	Monthly	Weekly	Monthly
Apr-18	3	7.3	8.1	5.2	0.04	1.8	1.3	11	10.2	16.9	13.7
May-18	3.8	7	8	5	0.05	3.1	2.3	11.9	10.2	13.5	11.9
Jun-18	3.6	7.3	7.9	5	0.05	5	2.7	10.9	8.2	12.1	10.1
Jul-18	3.5	7	7.9	5	0.06	3.9	2.9	18.5	12.2	20	16.6
Aug-18	3.7	7.2	8	5	0.04	3.1	2.4	9.4	8.5	12.8	9.7
Sep-18	3.6	7	8.1	5	0.04	5.6	2.6	13	6.9	9.2	8.6
Oct-18	4	7.4	8.1	5	0.09	9.7	3.6	8.9	8.5	13.3	11.9
Nov-18	3.9	7.7	8.1	5	0.06	5.1	4.4	13.3	12.1	16.7	15.9
Dec-18	3.5	7	8.2	5	0.04	6.3	1.3	16.3	14.6	23.6	20.5
Jan-19	3.6	7.2	7.8	5	0.03	4.5	1.9	23.8	15.2	26.1	22.2
Feb-19	3.6	7.4	8.4	5	0.07	3.9	2.6	14.9	15.3	22.5	24.1
Mar-19	3.2	7.7	8.1	5	0.05	2.5	1.8	17.3	11.3	30.8	19
Apr-19	3.8	7.1	8.4	5	0.03	3.5	2.1	12.8	10.8	14.5	11.5
May-19	3.4	7.3	8.1	5	0.04	2.5	2.5	13.3	11.1	9.7	9.1
Jun-19	3.4	7	8.1	5	0.05	4	2.2	15.9	13	15.7	13.2
Jul-19	3.2	7.5	8.8	5	0.05	2	1.6	14.4	11.2	13.9	12.2
Aug-19	3.2	7.3	8.9	5.4	0.18	2.5	1.5	15.9	13.2	27.7	15.3
Sep-19	3.4	7.2	8.7	5	0.07	122.2	107.3	22.3	12.6	17.2	14
Oct-19	3.3	7.8	8.9	5	0.04	3.4	2.3	17.8	15.5	23.5	19.5
Nov-19	3.1	7.6	8.8	5	0.06	2	1.3	19.9	13.5	19.9	15.2
Dec-19	3.3	6.8	8.4	5	0.04	2.6	1.4	19.3	16.4	24.4	19.1
Jan-20	3.3	7.2	8.4	5	0.08	2	1.7	20.3	16.4	16.5	12.1
Feb-20	3.6	6.9	8.4	5	0.06	2.2	1.3	34.8	21.9	18.5	15
Mar-20	3.5	6.9	8.3	5	0.04	1.4	1.2	18.3	14.7	19.3	17.5
Apr-20	3.3	7.3	8.3	5	0.03	1.7	1.4	24.5	20.9	23.7	22.4
May-20	3.3	7.8	8.5	5	0.03	3.7	2.8	34.1	29.6	28.8	26.6
Jun-20	3.4	7.4	8.4	7.6	0.06	1.6	1.4	23.6	17.3	30.6	26.7
Jul-20	3.4	6.7	8.1	5	0.03	2.9	1.6	16.1	12	25.5	20.2
Aug-20	3.5	7.8	8.4	5	0.03	2.9	1.8	23	19	22.4	18.1
Sep-20	3.6	7.5	8.3	5.1	0.03	2.5	1.7	19.8	15.3	27.7	21.2
Oct-20	3.5	7.1	8.4	5	0.02	1.3	1.1	13	10.8	22.3	17.5
Nov-20	3.4	7.5	8.5	5.1	0.04	2.6	1.6	14.6	10.7	14.1	13.3
Dec-20	3.3	7.5	8.9	5	0.02	1.3	1.1	12.8	9.1	19.7	13.1
Jan-21	3.4	7.1	8.3	5	0.02	1.3	1.1	16.4	12.6	14.8	13
Feb-21	3.7	7.8	8.2	5	0.01	1.6	1.3	15.1	13.3	18.1	15.5
Mar-21	3.4	7.7	8.4	5	0	1.3	1.2	16.5	15	23.3	19.8
Apr-21	3.4	7.8	8.2	5	0.03	1.7	1.4	14.1	11.9	19.5	15.9
May-21	3.4	6.6	8.3	5	0.04	3	2	13	11.29	12.71	12.65
Jun-21	3.2	7.2	8.7	5	0.05	2	1	10.6	9.07	11.9	11.31

WET Results

Month	WET Test	Pass / Fail
Jun-18	Chronic Pimephales Promelas	Pass
Sep-18	Chronic Ceriodaphnia	Pass
Dec-19	Chronic Pimephales Promelas	Pass
Mar-19	Chronic Ceriodaphnia	Pass
Jun-19	Chronic Pimephales Promelas	Pass
Sep-19	Chronic Ceriodaphnia	Pass
Dec-19	Chronic Pimephales Promelas	Pass
Mar-20	Chronic Ceriodaphnia	Pass
Jun-20	Chronic Pimephales Promelas	Pass
Sep-20	Chronic Ceriodaphnia	Pass
Dec-20	Chronic Pimephales Promelas	Pass
Mar-21	Chronic Ceriodaphnia	Pass
Jun-21	Chronic Pimephales Promelas	Pass

ATTACHMENT 2

Wasteload Analysis

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Utah Division of Water Quality
Statement of Basis
Wasteload Analysis for Jordan River POTWs

Date: **October 8, 2021**

Prepared by: **Nicholas von Stackelberg, P.E., Watershed Protection Section**
Chris Shope, Ph.D., Standards and Technical Services Section
Suzan Tahir, Standards and Technical Services Section

Facility: **Jordan River Publicly Owned Treatment Works (POTW)**

Receiving water: **Jordan River and State Canal**

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 considers 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.

Discharges

The following dischargers are considered in this combined wasteload analysis for discharge to the Jordan River:

1. Jordan Basin Water Reclamation Facility (WRF) - UT0025852
2. South Valley Water Reclamation Facility (WRF) - UT0024384
3. Central Valley Water Reclamation Facility (WRF) - UT0024392
4. South Davis Sewer District South Wastewater Treatment Plant (WWTP) - UT0021628
5. South Davis Sewer District North Wastewater Treatment Plant (WWTP) - UT0021636

The receiving water and the maximum monthly average discharges used in this wasteload allocation are summarized in Table 1. The projected 5-year monthly average discharge was estimated by multiplying the current average discharge (2016-2021) by 10% to account for growth in the service district. Jordan Basin WRF was assumed to operate at design capacity.

Table 1: Receiving waters and discharge rate

Facility	Receiving Water	Monthly Ave (MGD)	
		Design Capacity	Projected 5-YR
Jordan Basin WRF	Jordan River, from confluence with Little Cottonwood Creek to Narrows Diversion	15	15
South Valley WRF	Jordan River, from confluence with Little Cottonwood Creek to Narrows Diversion	50	21.7
Central Valley WRF	Jordan River, from North Temple Street to confluence with Little Cottonwood Creek	75	55.7
SDSD South WWTP	Jordan River, from Farmington Bay to North Temple Street	4	3.8
SDSD North WWTP	State Canal, from Farmington Bay to confluence with the Jordan River	12	8.1

Effluent water quality data were obtained from UDWQ monitoring, Jordan River/Farmington Bay Water Quality Council (JRFBWQC) monitoring, and Discharge Monitoring Reports (DMR) and Monthly Operating Reports (MOR) from each facility.

Receiving Waters

The receiving waters for this wasteload allocation are Jordan River and State Canal.

Per UAC R317-2-14, the designated beneficial uses for the Jordan River and State Canal are shown in Table 2.

Table 2: Beneficial uses for receiving waters

POTW	Assessment Unit	Assessment Unit Description	Assessment Unit ID	Beneficial Uses
SDSDN WWTP	State Canal[a]	State Canal from Farmington Bay to confluence with the Jordan River	UT16020204-034_00	2B, 3B*, 3D, 4
SDSDS WWTP	Jordan River-1[a]	Jordan River from Farmington Bay upstream contiguous with the Davis County line	UT16020204-001_00	2B, 3B*, 3D, 4
CVWRF	Jordan River-4	Jordan River from 2100 South to the confluence with Little Cottonwood Creek	UT16020204-004_00	2B, 3B*, 4
SVWRF	Jordan River-5	Jordan River from the confluence with Little Cottonwood Creek to 7800 South	UT16020204-005_00	2B, 3B, 4
JBWRF	Jordan River-6	Jordan River from 7800 South to Bluffdale at 14600 South	UT16020204-006_00	2B, 3B, 4
* Site specific criteria for dissolved oxygen. See UAC R317.2.14 Table 2.14.5.				

Per UAC R317-2-6, the following is the description for each beneficial use listed in Table 2.

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

Typically, the critical flow for the wasteload analysis is considered the lowest stream flow for seven consecutive days with a ten-year return frequency (7Q10). The seasonal 7Q10 flows calculated in the *Jordan River Low Flow Analysis* report (Hansen Allen and Luce, 2021) were used for the critical low flows for the POTWs, tributaries and diversions along the Jordan River. The critical low flows are summarized in Table 3.

Table 3: Critical low flows along Jordan River

QUAL2Kw Segment No(s)	Source/Diversion Name	7Q10			
		WINTER	SPRING	SUMMER	FALL
31	Jordan Narrows (Total)	3.2	7.7	222	6.4
31-32	Groundwater Segment	3	3	223	3
32	JVWCD Pumps	3	3	207	3
32	ULDC North & South	3	3	180	3
32	Utah & Salt Lake Canal	3	3	117	3
32	East Jordan Canal	2.9	2.8	76.7	3.4
32	Jordan River Station No 1	2.9	2.8	76.7	3.4
32-51	Groundwater Segment	23	24	82	17
37	Jordan & Salt Lake Canal	23	24	67	17
37	South Jordan Canal	23	24	27	17
47	Rose Creek	**23**	**24**	**27**	**17**
51	Jordan Basin WRF	35	36	37	28
51-76	Groundwater Segment	62	64	44	46
54	Corner Canyon Creek	62	65	44	46
59	Riverton 126th Pump Station	62	65	44	46
65	Midas Creek	62	65	44	47
66	Willow Creek	63	66	45	47
74	North Jordan Canal	27	32	27	23
74	Dry Creek	27	32	28	23
76	Jordan River at 9000 South	27	32	28	23
76-84	Groundwater Segment	39	40	43	36
76	9000 South Drain	39	40	43	36
81	Bingham Creek	**40**	**40**	**47**	**37**
84	South Valley WRF	71	71	80	68
84-111	Groundwater Segment	112	97	130	110
85	7200 South Drain	112	97	130	110
97	Little Cottonwood Creek	113	98	139	112
98	Brighton Canal	113	98	139	112
100	Big Cottonwood Creek	**119**	**106**	**161**	**123**
N/A	Mill Creek above Central Valley	3	10	21	10
111	Mill Creek at Jordan River	122	116	182	133

QUAL2Kw Segment No(s)	Source/Diversion Name	7Q10			
		WINTER	SPRING	SUMMER	FALL
111	Central Valley WRF	191	188	255	200
111-115	Groundwater Segment	197	192	263	206
112	Decker Lake Outfall	197	192	265	207
115	Jordan River above Surplus Canal	197	192	265	207
115-118	Groundwater Segment	200	195	267	210
116	Surplus Canal	25	11	26	89
118	Jordan River at 1700 South	25	11	26	89
118-133	Groundwater Segment	37	48	104	92
122	1300 South Conduits	39	50	121	93
130	City Creek/N Temple Conduit	40	52	123	93
133	Jordan River at 500 North	40	52	123	93
133-151	Groundwater Segment	**51**	**64**	**134**	**104**
151	South Davis South WRF	55	67	137	107
151-162	Groundwater Segment	62	74	144	114
162	State Canal	21	25	48	38
162-171	Groundwater Segment	26	31	54	44
162	A-1 Drain	**26**	**31**	**54**	**44**
169	South Davis North WRF	34	39	62	52
171	Mill Creek (Davis County)	34	38	62	51
171-172	Groundwater Segment	35	40	63	52
172	Stone Creek	36	41	63	53

Receiving and tributary water quality data were obtained from UDWQ and WFWQC monitoring sites. The average seasonal value was calculated for each constituent with available data in the receiving water for the period 2006 - 2021.

TMDL

The 303(d) list of impairments of the Jordan River, Mill Creek, and State Canal in *Utah's Final 2016 303(d) Water Quality Assessment Report dated December 7, 2016* (Utah DWQ 2016) is summarized in Table 4. The table also includes changes in the Utah *Combined 2018/2020 303(d) Water Quality Assessment Report dated February 9, 2021*, which has not been approved to date. The dissolved oxygen impairment in the lower Jordan River (below Surplus Canal) was addressed by the *Jordan River Total Maximum Daily Load Water Quality Study – Phase 1* (Cirrus Ecological Solutions and Stantec Consultants 2013), which identified organic matter as the pollutant of concern and recommended additional studies to determine the sources and allocation [CS1] . The E. coli impairment in the Jordan River watershed is currently being identified and addressed through a Total Maximum Daily Load Study within Utah DWQ.

Table 4: List of impairments of Jordan River and State Canal

Assessment Unit	Assessment Unit Description	Assessment Unit ID	Impaired Parameter
State Canal	State Canal from Farmington Bay to confluence with the Jordan River	UT16020204-034_00	Total Ammonia as N Min Dissolved Oxygen Total Dissolved Solids
Jordan River-1	Jordan River from Farmington Bay upstream contiguous with the Davis County line	UT16020204-001_00	E. coli *DissolvedCopper Min Dissolved Oxygen Total Dissolved Solids Bioassessment/Macroinv
Jordan River 2	Jordan River from Davis County line upstream to North Temple Street	UT16020204-002_00	E. coli Min Dissolved Oxygen *Total Dissolved Solids Bioassessment/Macroinv
Jordan River-3	Jordan River from North Temple to 2100 South	UT16020204-003_00	E. coli Total Phosphorus as P Min Dissolved Oxygen Bioassessment/Macroinv
Jordan River-4	Jordan River from 2100 South to the confluence with Little Cottonwood Creek	UT16020204-004_00	E. coli Total Dissolved Solids Bioassessment/Macroinv
Jordan River-5	Jordan River from the confluence with Little Cottonwood Creek to 7800 South	UT16020204-005_00	E. coli Max Temperature Total Dissolved Solids
Jordan River-6	Jordan River from 7800 South to Bluffdale at 14600 South	UT16020204-006_00	*Dissolved Selenium Max Temperature Total Dissolved Solids Bioassessment/Macroinv
Jordan River-7	Jordan River from Bluffdale at 14600 South to Narrows	UT16020204-007_00	Max Temperature **Total Dissolved Solids Bioassessment/Macroinv
Jordan River-8	Jordan River from Narrows to Utah Lake	UT16020201-008_00	Arsenic Total Dissolved Solids
* impaired parameter in 2016 IR but not in 2018/2020 IR ** impaired as of 2018/2020 IR			

Mixing Zone

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

The mixing zone was presumed to remain within the maximum allowable mixing zone dimensions for each discharge. Acute limits were calculated using 50% of the seasonal critical low flow.

Parameters of Concern

The parameters of concern considered in this wasteload allocation are total ammonia (TAN) and total recoverable metals. Due to ongoing studies related to the TMDL, this wasteload allocation does not address parameters related to dissolved oxygen, including biochemical oxygen demand (BOD), dissolved oxygen (DO), total nitrogen (TN), and total phosphorus (TP).

Water Quality Modeling

A QUAL2Kw model of the Jordan River was populated and calibrated as part of the DO TMDL study (Stantec Consulting 2010, UDWQ 2010). The model was subsequently validated to a synoptic survey conducted by UDWQ and the Jordan River/Farmington Bay Water Quality Council (JRFBWQC) during July 2014 (UDWQ 2015). The model validation identified areas for future improvement of the model; however, the model was considered suitable for application to the wasteload allocation for ammonia.

The TMDL model of the Jordan River extends 52.4 miles from the outlet of Utah Lake to Burton Dam. For the purposes of the WLA, the model was split at Burnham Dam (approximately 1.7 miles upstream of Burton Dam) and extended down State Canal to the Farmington Bay Waterfowl Management Area (approximately 3.5 miles downstream from Burnham Dam). The following point sources were added to the State Canal: A-1 Drain, South Davis Sewer District North WWTP, and outlet channel from Bountiful Pond (Mill Creek and Stone Creek). In addition, the Jordan Basin WRF discharge was added to the Jordan River, as this discharge was not active at the time of the model calibration.

The Jordan River WLA QUAL2Kw model was used for determining the WQBEL for ammonia. Effluent concentrations were adjusted up to the current permit limits so that water quality criteria were not exceeded in the receiving water. Background conditions for each plant were characterized by assuming each upstream plant was operating at the low flow rate with average ammonia concentration in the effluent. For calculating the chronic ammonia criterion, fish early life stages (ELS) were assumed to be present during all seasons except downstream of the CVWRF and SDSD plants, where ELS were assumed to be present from March through October. Per UAC R317-2-14, Table 2.14.2, the site specific standard for ammonia for the Jordan River from Mill Creek to 900 South was applied.

A mass balance mixing analysis was used to calculate the seasonal WLA for conservative constituents such as metals. Each wastewater treatment plant was granted a full allocation at the point of discharge. Background condition in the Jordan River for each plant was characterized by either a single or combined, multiple monitoring location data.

The calibration, validation and wasteload models are available for review by request.

WET Limits

The percent of effluent in the receiving water in a fully mixed condition, and acute and chronic dilution in an incompletely 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 (Table 5). The WET limit for LC_{50} is typically 100% effluent and does not need to be determined by the WLA.

Table 5: WET Limits for IC_{25}

Season	Percent Effluent
Jordan Basin WRF	46%
South Valley WRF	62%
Central Valley WRF	39%
SDSD South WWTP	21%
SDSD North WWTP	63%

Effluent Limits

The water quality based effluent limits determined as part of this combined wasteload allocation are summarized in Table 6.

Since the DO impairment of the Jordan River is being addressed through the TMDL process, limits were not calculated for DO, BOD/CBOD, or nutrients. The permit limits for DO and BOD/CBOD were calculated in a previous permit issued prior to the impairment of the Jordan River and are carried forward in this WLA.

Table 6: Water Quality Based Effluent Limits Summary

Effluent Constituent	Averaging Period	Jordan Basin	South Valley	Central Valley	SDSD South WWTP	SDSD North WWTP
Flow (MGD)	Monthly	15	50	75	4	12
Ammonia Acute (mg/L)						
Summer (Jun-Aug)		6.0	6.0	13.1	30.0	24.0
Fall (Sep-Nov)	Daily	6.0	9.0	15.9	40.0	16.2
Winter (Dec-Feb)		9.0	9.4	12.3	17.0	13.0
Spring (Mar-May)		8.0	7.4	15.9	26.0	15.0
Ammonia Chronic (mg/L)						
Summer (Jun-Aug)		3.0	1.5	3.7	8.0	5.5
Fall (Sep-Nov)		2.5	3.0		20.0	7.5
(Sep-Oct)	Monthly			4.5		
(Nov)				5.9		
Winter (Dec-Feb)		3.0	4.0	5.8	14.0	6.5
Spring (Mar-May)		2.5	3.0	5.3	12.0	6.0
TRC Acute (mg/L)						
Summer (Jul-Sep)		N/A[b]	0.028	N/A[b]	0.321	0.066
Fall (Oct-Dec)	Daily	N/A[b]	0.022	N/A[b]	0.253	0.057
Winter (Jan-Mar)		N/A[b]	0.028	N/A[b]	0.134	0.045
Spring (Apr-Jun)		N/A[b]	0.023	N/A[b]	0.163	0.048
DO (mg/L)	Minimum	5.0	5.0	5.0	5.0	5.0
BOD_5/$CBOD_5$ (mg/L)		BOD_5	BOD_5	$CBOD_5$	BOD_5	BOD_5
Summer (Jul-Sep)		15.0	15.0	16.0	20.0	20.0
Fall (Oct-Dec)	Monthly	15.0	15.0	20.0	25.0	25.0
Winter (Jan-Mar)		15.0	15.0	20.0	25.0	25.0
Spring (Apr-Jun)		15.0	15.0	20.0	25.0	25.0
BOD_5/$CBOD_5$ (mg/L)		BOD_5	BOD_5	$CBOD_5$	BOD_5	BOD_5
Summer (Jul-Sep)		21.0	21.0	27.0	27.0	27.0
Fall (Oct-Dec)	Weekly	21.0	21.0	28.0	35.0	35.0
Winter (Jan-Mar)		21.0	21.0	28.0	35.0	35.0
Spring (Apr-Jun)		21.0	21.0	28.0	35.0	35.0

a: Limit due to impairment of receiving segment.
b: Ultraviolet disinfection utilized, hence no limit for TRC

QUAL2Kw rates, input and output are summarized in Appendix A. The WQBELs for conservative constituents are summarized in Appendix B. Per R317-2.14.2, cyanide numeric criteria for aquatic life is based on free cyanide, which is a portion of total cyanide. Models and supporting documentation are available for review upon request.

Files:
Wasteload Report: 211008-*JordanRiverPOTWWLA_2021.docx*
QUAL2Kw Calibration Model: *jordan_aug2009_q2kw_calib_2010-8-26.xls*
QUAL2Kw Validation Model: *jordan_q2kw_synoptic_2014-07-22.xlsm*
QUAL2Kw Wasteload Model: *jordan_potw_q2kw_wla_2021.xlsm*
JBWRF Metals Wasteload Model: *JBWRF_WLA_2021.xlsm*
SVWRF Metals Wasteload Model: *SVWRF_WLA_2021.xlsm*
CVWRF Metals Wasteload Model: *CVWRF_WLA_JR_2021.xlsm*
SDSWRF Metals Wasteload Model: *SDSDSWWTP_WLA_2021.xlsm*
SDNWRF Metals Wasteload Model: *SDSDNWWTP _WLA_2021.xlsm*

References:

Cirrus Ecological Solutions and Stantec Consulting. 2013. *Jordan River Total Maximum Daily Load Water Quality Study – Phase 1*. Prepared for State of Utah, Department of Environmental Quality, Division of Water Quality.

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Neilson, B.T., A.J. Hobson, N. von Stackelberg, M. Shupryt, and J.D. Ostermiller. 2012. *Using QUAL2K Modeling to Support Nutrient Criteria Development and Wasteload Analyses in Utah*. Prepared for State of Utah, Department of Environmental Quality, Division of Water Quality.

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Utah DWQ. 2016. *Utah's 2016 303(d) Water Quality Assessment Report*. December October 2016. State of Utah, Department of Environmental Quality, Division of Water Quality.

Utah DWQ. 2021. *Utah's Combined 2018/2020 303(d) Water Quality Assessment Report*. August 2021. State of Utah, Department of Environmental Quality, Division of Water Quality.

WASTELOAD ANALYSIS [WLA] Date: 8/13/2021
Appendix A: QUAL2Kw Analysis for Ammonia

Discharging Facility: Jordan River POTWs
Receiving Water: Jordan River and State Canal

Fully Mixed: Yes
Acute River Width: 100%
Chronic River Width: 100%

Modeling Information

A QUAL2Kw model was used to determine these effluent limits.

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 reflect the environmental conditions expected at low stream flows.

Model Inputs

The following were utilized as inputs for the analysis.

Headwater - Utah Lake	Summer	Fall	Winter	Spring
Flow (cfs)	222.0	6.4	3.2	7.7
Temperature, Mean (deg C)	22.3	13.9	2.7	11.4
Temperature, Diel Range (deg C)	3.0	2.5	2.0	2.5
Specific Conductance (µmhos)	1593	1689	1817	1513
Inorganic Suspended Solids (mg/L)	66.2	53.8	7.6	48.1
Dissolved Oxygen, Mean (mg/L)	6.9	8.5	23.2	14.2
Dissolved Oxygen, Diel Range (mg/L)	2.5	2.0	1.5	2.0
$CBOD_5$ (mg/L)	1.8	2.7	2.3	2.0
Organic Nitrogen (mg/L)	0.426	0.396	0.533	0.441
NH4-Nitrogen (mg/L)	0.056	0.176	0.232	0.073
NO3-Nitrogen (mg/L)	0.061	0.275	0.586	0.178
Organic Phosphorus (mg/L)	0.047	0.051	0.019	0.031
Inorganic Ortho-Phosphorus (mg/L)	0.038	0.040	0.039	0.035
Phytoplankton (µg/L)	20.3	22.0	15.6	10.2
Detritus [POM] (mg/L)	14.0	10.4	4.7	8.5
Alkalinity (mg/L)	200	191	220	200
pH	8.4	8.2	8.1	8.3

Discharge Information - Jordan Basin WRF

Chronic	Summer	Fall	Winter	Spring
Flow (MGD)	6.6	6.6	7.6	7.3
Temperature (deg C)	22.1	18.7	15.6	18.3
Specific Conductance (µmhos)	1791	1791	1791	1791
Inorganic Suspended Solids (mg/L)	1.7	1.7	1.7	1.7
Dissolved Oxygen (mg/L)	5.0	5.0	5.0	5.0
$CBOD_5$ (mg/L)	15.0	15.0	15.0	15.0
Organic Nitrogen (mg/L)	0.383	0.791	0.719	0.913
NH4-Nitrogen (mg/L)	0.620	0.058	0.084	0.074
NO3-Nitrogen (mg/L)	9.886	9.796	9.204	9.143
Organic Phosphorus (mg/L)	0.500	0.500	0.500	0.500
Inorganic Ortho-Phosphorus (mg/L)	0.500	0.500	0.500	0.500
Phytoplankton (µg/L)	0.000	0.000	0.000	0.000
Detritus [POM] (mg/L)	0.5	0.5	0.5	0.5
Alkalinity (mg/L)	200	200	200	200
pH	7.6	7.5	7.4	7.4

Acute	Summer	Fall	Winter	Spring
Flow (MGD)	6.6	6.6	7.6	7.3
pH	7.6	7.5	7.4	7.4

Discharge Information - South Valley WRF

Chronic	Summer	Fall	Winter	Spring
Flow (MGD)	21.2	20.5	19.8	19.8
Temperature (deg C)	21.6	20.0	14.7	16.7
Specific Conductance (µmhos)	1517	1444	1543	1459
Inorganic Suspended Solids (mg/L)	0.0	0.4	2.0	1.1
Dissolved Oxygen (mg/L)	5.0	5.0	5.0	5.0
$CBOD_5$ (mg/L)	15.0	15.0	15.0	15.0
Organic Nitrogen (mg/L)	1.862	1.447	1.624	1.559
NH4-Nitrogen (mg/L)	0.108	0.103	0.340	0.188
NO3-Nitrogen (mg/L)	6.654	7.117	7.093	6.960
Organic Phosphorus (mg/L)	0.500	0.500	0.500	0.500
Inorganic Ortho-Phosphorus (mg/L)	0.500	0.500	0.500	0.500
Phytoplankton (µg/L)	0.000	0.000	0.000	0.000
Detritus [POM] (mg/L)	4.1	4.2	4.8	4.4
Alkalinity (mg/L)	189	184	170	173
pH	7.7	7.7	7.6	7.6

Acute	Summer	Fall	Winter	Spring
Flow (MGD)	21.2	20.5	19.8	19.8
pH	7.7	7.7	7.6	7.6

Discharge Information - Central Valley WRF

Chronic	Summer	Fall	Winter	Spring
Flow (MGD)	47.4	43.5	44.1	46.5
Temperature (deg C)	21.2	18.4	12.7	14.8
Specific Conductance (µmhos)	1330	1271	1422	1422
Inorganic Suspended Solids (mg/L)	1.1	0.0	0.4	0.3
Dissolved Oxygen (mg/L)	5.0	5.0	5.0	5.0
$CBOD_5$ (mg/L)	27.0	28.0	28.0	28.0
Organic Nitrogen (mg/L)	3.207	0.119	0.033	1.678
NH4-Nitrogen (mg/L)	0.681	1.297	1.842	1.794
NO3-Nitrogen (mg/L)	16.579	17.817	17.525	13.829
Organic Phosphorus (mg/L)	0.955	1.082	1.532	1.611
Inorganic Ortho-Phosphorus (mg/L)	3.045	2.918	2.468	2.389
Phytoplankton (µg/L)	0.000	0.000	0.000	0.000
Detritus [POM] (mg/L)	4.5	6.7	5.6	4.1
Alkalinity (mg/L)	172	164	173	179
pH	7.4	7.4	7.3	7.2

Acute	Summer	Fall	Winter	Spring
Flow (MGD)	75.0	75.0	75.0	75.0
pH	7.4	7.4	7.3	7.2

Discharge Information - South Davis Sewer District South WWTP

Chronic	Summer	Fall	Winter	Spring
Flow (MGD)	2.0	2.0	2.5	2.5
Temperature (deg C)	22.0	19.6	12.1	16.6
Specific Conductance (µmhos)	2658	2659	2913	2852
Inorganic Suspended Solids (mg/L)	6.8	6.6	5.9	6.7
Dissolved Oxygen (mg/L)	5.0	5.0	5.0	5.0
$CBOD_5$ (mg/L)	20.0	25.0	25.0	25.0
Organic Nitrogen (mg/L)	5.174	3.692	1.908	1.114
NH4-Nitrogen (mg/L)	7.685	13.067	27.675	16.446
NO3-Nitrogen (mg/L)	7.685	13.067	27.675	16.446
Organic Phosphorus (mg/L)	0.500	0.500	0.500	0.500
Inorganic Ortho-Phosphorus (mg/L)	0.500	0.500	0.500	0.500
Phytoplankton (µg/L)	0.000	0.000	0.000	0.000
Detritus [POM] (mg/L)	4.9	4.5	7.0	6.4
Alkalinity (mg/L)	282	292	328	323
pH	7.7	7.6	7.7	7.7

Acute	Summer	Fall	Winter	Spring
Flow (MGD)	2.0	2.0	2.5	2.5
pH	7.7	7.6	7.7	7.7

Discharge Information - South Davis Sewer District North WWTP

Chronic	Summer	Fall	Winter	Spring
Flow (MGD)	4.8	4.8	4.8	4.9
Temperature (deg C)	22.5	20.5	12.9	16.4
Specific Conductance (µmhos)	1986	2017	2258	1981
Inorganic Suspended Solids (mg/L)	6.0	6.0	6.9	6.6
Dissolved Oxygen (mg/L)	5.0	5.0	5.0	5.0
$CBOD_5$ (mg/L)	20.0	25.0	25.0	25.0
Organic Nitrogen (mg/L)	2.108	1.267	0.908	3.754
NH4-Nitrogen (mg/L)	7.938	8.583	14.175	9.446
NO3-Nitrogen (mg/L)	10.351	10.170	9.671	10.839
Organic Phosphorus (mg/L)	0.500	0.500	0.500	0.500
Inorganic Ortho-Phosphorus (mg/L)	0.500	0.500	0.500	0.500
Phytoplankton (µg/L)	0.000	0.000	0.000	0.000
Detritus [POM] (mg/L)	4.9	7.8	9.2	8.9
Alkalinity (mg/L)	324	324	324	324
pH	7.2	7.2	7.4	7.4

Acute	Summer	Fall	Winter	Spring
Flow (MGD)	4.8	4.8	4.8	4.9
pH	7.2	7.2	7.4	7.4

Tributary - Little Cottonwood Creek	Summer	Fall	Winter	Spring
Flow (cfs)	8.5	1.6	1.4	1.4
Temperature, Mean (deg C)	16.1	11.5	3.3	9.0
Temperature, Diel Range (deg C)	0.0	0.0	0.0	0.0
Specific Conductance (µmhos)	1085	1214	2554	815
Inorganic Suspended Solids (mg/L)	33.9	15.1	9.6	12.9
Dissolved Oxygen, Mean (mg/L)	8.1	9.3	11.4	10.7
Dissolved Oxygen, Diel Range (mg/L)	0.0	0.0	0.0	0.0
$CBOD_5$ (mg/L)	1.5	1.9	3.9	1.5
Organic Nitrogen (mg/L)	0.230	0.425	0.385	0.010
NH4-Nitrogen (mg/L)	0.022	0.032	0.098	0.058
NO3-Nitrogen (mg/L)	0.424	0.647	1.040	0.591
Organic Phosphorus (mg/L)	0.039	0.016	0.010	0.016
Inorganic Ortho-Phosphorus (mg/L)	0.032	0.029	0.021	0.025
Phytoplankton (µg/L)	17.2	17.6	6.0	16.1
Detritus [POM] (mg/L)	6.1	3.8	8.1	5.1
Alkalinity (mg/L)	118	238	232	165
pH	8.2	8.1	7.8	8.2

Tributary - Big Cottonwood Creek	Summer	Fall	Winter	Spring
Flow (cfs)	21.7	10.8	5.9	7.9
Temperature, Mean (deg C)	17.0	12.1	4.5	8.8
Temperature, Diel Range (deg C)	0.0	0.0	0.0	0.0
Specific Conductance (µmhos)	1026	1088	1406	655
Inorganic Suspended Solids (mg/L)	23.9	12.9	8.7	19.3
Dissolved Oxygen, Mean (mg/L)	8.3	9.4	11.3	10.9
Dissolved Oxygen, Diel Range (mg/L)	0.0	0.0	0.0	0.0
$CBOD_5$ (mg/L)	1.5	1.8	3.3	1.5
Organic Nitrogen (mg/L)	0.417	0.300	0.285	0.160
NH4-Nitrogen (mg/L)	0.023	0.023	0.050	0.036
NO3-Nitrogen (mg/L)	0.325	0.408	0.716	0.389
Organic Phosphorus (mg/L)	0.015	0.006	0.011	0.016
Inorganic Ortho-Phosphorus (mg/L)	0.036	0.027	0.022	0.024
Phytoplankton (µg/L)	14.7	13.2	6.5	10.3
Detritus [POM] (mg/L)	6.2	4.5	8.4	4.9
Alkalinity (mg/L)	142	211	221	155
pH	8.3	8.2	8.1	8.2

Tributary - Mill Creek above CVWRF	Summer	Fall	Winter	Spring
Flow (cfs)	21.4	10.1	3.0	10.1
Temperature, Mean (deg C)	17.9	11.9	6.7	11.0
Temperature, Diel Range (deg C)	0.0	0.0	0.0	0.0
Specific Conductance (µmhos)	1103	1086	1068	1017
Inorganic Suspended Solids (mg/L)	14.4	14.6	21.6	11.8
Dissolved Oxygen, Mean (mg/L)	8.3	8.5	10.9	9.7
Dissolved Oxygen, Diel Range (mg/L)	0.0	0.0	0.0	0.0
$CBOD_5$ (mg/L)	1.5	1.5	1.5	2.4
Organic Nitrogen (mg/L)	0.264	0.400	0.311	0.054
NH4-Nitrogen (mg/L)	0.025	0.027	0.030	0.030
NO3-Nitrogen (mg/L)	1.063	1.411	1.765	1.341
Organic Phosphorus (mg/L)	0.018	0.025	0.018	0.010
Inorganic Ortho-Phosphorus (mg/L)	0.035	0.028	0.032	0.036
Phytoplankton (µg/L)	4.1	5.4	5.2	2.7
Detritus [POM] (mg/L)	4.0	4.3	10.3	4.6
Alkalinity (mg/L)	207	237	245	213
pH	7.9	7.9	7.7	7.8

Tributary - Decker Lake Outlet	Summer	Fall	Winter	Spring
Flow (cfs)	1.9	0.4	0.3	0.3
Temperature, Mean (deg C)	21.3	10.0	2.8	12.7
Temperature, Diel Range (deg C)	0.0	0.0	0.0	0.0
Specific Conductance (µmhos)	1711	1908	2660	1798
Inorganic Suspended Solids (mg/L)	52.5	41.8	19.6	26.0
Dissolved Oxygen, Mean (mg/L)	5.9	9.6	12.3	10.6
Dissolved Oxygen, Diel Range (mg/L)	0.0	0.0	0.0	0.0
$CBOD_5$ (mg/L)	3.9	1.9	2.0	3.8
Organic Nitrogen (mg/L)	0.682	0.408	0.389	0.511
NH4-Nitrogen (mg/L)	0.180	0.107	0.131	0.139
NO3-Nitrogen (mg/L)	0.568	1.085	1.444	0.580
Organic Phosphorus (mg/L)	0.022	0.023	0.024	0.037
Inorganic Ortho-Phosphorus (mg/L)	0.061	0.054	0.042	0.050
Phytoplankton (µg/L)	19.2	16.8	14.1	25.4
Detritus [POM] (mg/L)	7.6	7.1	9.1	6.9
Alkalinity (mg/L)	230	246	258	218
pH	8.1	8.3	8.3	8.2

Tributary - 1300 South Drain	Summer	Fall	Winter	Spring
Flow (cfs)	17.6	0.6	2.3	2.3
Temperature, Mean (deg C)	19.9	13.5	8.7	13.3
Temperature, Diel Range (deg C)	0.0	0.0	0.0	0.0
Specific Conductance (µmhos)	1928	2223	2275	1968
Inorganic Suspended Solids (mg/L)	54.6	42.7	39.0	48.4
Dissolved Oxygen, Mean (mg/L)	7.9	9.1	10.2	10.2
Dissolved Oxygen, Diel Range (mg/L)	0.0	0.0	0.0	0.0
$CBOD_5$ (mg/L)	2.3	2.5	1.6	1.6
Organic Nitrogen (mg/L)	0.346	0.322	0.000	-0.081
NH4-Nitrogen (mg/L)	0.029	0.031	0.065	0.038
NO3-Nitrogen (mg/L)	1.237	2.153	3.486	2.444
Organic Phosphorus (mg/L)	0.050	0.041	0.038	0.050
Inorganic Ortho-Phosphorus (mg/L)	0.076	0.056	0.046	0.043
Phytoplankton (µg/L)	0.0	0.0	0.0	0.0
Detritus [POM] (mg/L)	7.1	6.2	5.3	6.2
Alkalinity (mg/L)	251	296	343	286
pH	8.0	8.1	8.0	8.2

Tributary - North Temple Drain	Summer	Fall	Winter	Spring
Flow (cfs)	1.6	0.1	0.2	2.1
Temperature, Mean (deg C)	18.6	12.1	7.9	10.1
Temperature, Diel Range (deg C)	0.0	0.0	0.0	0.0
Specific Conductance (µmhos)	946	1031	1680	680
Inorganic Suspended Solids (mg/L)	5.9	0.2	3.9	10.7
Dissolved Oxygen, Mean (mg/L)	7.7	7.7	9.8	9.5
Dissolved Oxygen, Diel Range (mg/L)	0.0	0.0	0.0	0.0
$CBOD_5$ (mg/L)	2.1	2.4	1.5	1.7
Organic Nitrogen (mg/L)	0.161	0.000	0.058	0.184
NH4-Nitrogen (mg/L)	0.026	0.038	0.031	0.054
NO3-Nitrogen (mg/L)	2.280	2.645	2.148	0.920
Organic Phosphorus (mg/L)	0.005	0.000	0.000	0.020
Inorganic Ortho-Phosphorus (mg/L)	0.030	0.022	0.020	0.033
Phytoplankton (µg/L)	2.4	2.4	0.8	0.4
Detritus [POM] (mg/L)	2.5	2.5	2.5	2.5
Alkalinity (mg/L)	237	237	257	221
pH	8.1	8.5	8.2	8.2

Minor Tributaries - Quality	Summer	Fall	Winter	Spring
Temperature, Mean (deg C)	19.9	13.5	8.7	13.3
Temperature, Diel Range (deg C)	0.0	0.0	0.0	0.0
Specific Conductance (µmhos)	1928	2223	2275	1968
Inorganic Suspended Solids (mg/L)	54.6	42.7	39.0	48.4
Dissolved Oxygen, Mean (mg/L)	7.9	9.1	10.2	10.2
Dissolved Oxygen, Diel Range (mg/L)	0.0	0.0	0.0	0.0
$CBOD_5$ (mg/L)	2.3	2.5	1.6	1.6
Organic Nitrogen (mg/L)	0.346	0.322	0.000	-0.081
NH4-Nitrogen (mg/L)	0.029	0.031	0.065	0.038
NO3-Nitrogen (mg/L)	1.237	2.153	3.486	2.444
Organic Phosphorus (mg/L)	0.050	0.041	0.038	0.050
Inorganic Ortho-Phosphorus (mg/L)	0.076	0.056	0.046	0.043
Phytoplankton (µg/L)	0.0	0.0	0.0	0.0
Detritus [POM] (mg/L)	7.1	6.2	5.3	6.2
Alkalinity (mg/L)	251	296	343	286
pH	8.0	8.1	8.0	8.2

Minor Tributaries - Flow (MGD)	Summer	Fall	Winter	Spring
Corner Canyon Creek	0.0	0.0	0.0	0.0
Midas Creek (Butterfield)	0.0	0.3	0.3	0.2
Willow Creek	0.6	0.4	0.5	0.8
Dry Creek	0.2	0.1	0.2	0.3
9000 South Conduit	0.0	0.0	0.0	0.0
Bingham Creek	4.7	1.0	0.9	0.4

Diversions - Flow (cfs)	Summer	Fall	Winter	Spring
Jordan Valley Pump Station	15.6	3.0	0.0	0.0
Utah Lake Distribution Canal	27.2	0.0	0.0	0.0
Utah & Salt Lake Canal	62.3	0.0	0.0	0.0
East Jordan & Draper Canal	40.8	0.0	0.0	0.0
South Jordan Canal	15.1	0.0	0.0	0.0
Jordan & Salt Lake Canal	39.6	0.0	0.0	0.0
Beckstead Ditch	0.0	0.0	0.0	0.0
North Jordan Canal	17.1	23.9	35.8	38.6
Gardner Mill Race	0.0	0.0	0.0	0.0
Brighton Canal	0.0	0.0	0.0	0.0
Surplus Canal	241.4	120.5	175.2	183.9
Jordan River at Burnham Dam	96.0	76.0	41.0	49.0

Groundwater - Quality	Summer	Fall	Winter	Spring
Temperature, Mean (deg C)	16.0	16.0	16.0	16.0
Specific Conductance (μmhos)	2000	2000	2000	2000
Inorganic Suspended Solids (mg/L)	0.0	0.0	0.0	0.0
Dissolved Oxygen, Mean (mg/L)	0.0	0.0	0.0	0.0
$CBOD_5$ (mg/L)	2.0	2.0	2.0	2.0
Organic Nitrogen (mg/L)	0.500	0.500	0.500	0.500
NH4-Nitrogen (mg/L)	0.500	0.500	0.500	0.500
NO3-Nitrogen (mg/L)	2.000	2.000	2.000	2.000
Organic Phosphorus (mg/L)	0.050	0.050	0.050	0.050
Inorganic Ortho-Phosphorus (mg/L)	0.100	0.100	0.100	0.100
Phytoplankton (μg/L)	0.0	0.0	0.0	0.0
Detritus [POM] (mg/L)	0.0	0.0	0.0	0.0
Alkalinity (mg/L)	300	300	300	300
pH	8.0	8.0	8.0	8.0

Groundwater - Flow (cfs)	Summer	Fall	Winter	Spring
Segment 1-32	0.5	0.0	0.0	0.0
Segment 32-51	4.9	14.1	20.3	21.6
Segment 51-76	6.5	18.5	26.7	28.5
Segment 76-84	14.9	12.5	12.2	7.6
Segment 84-111	50.3	42.0	41.3	25.7
Segment 111-115	7.5	6.2	6.1	3.8
Segment 115-118	2.8	2.8	2.8	2.8
Segment 118-133	77.8	3.0	12.5	37.0
Segment 133-151	11.2	11.2	11.2	11.2
Segment 151-162	6.8	6.8	6.8	6.8
State Canal 162-171	5.6	5.6	5.6	5.6
State Canal 171-172	0.6	0.6	0.6	0.6

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

Effluent Limitations

Effluent Limitations based upon Water Quality Standards for Ammonia

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

Chronic	Summer Jun-Aug	Fall Sep-Oct	Fall Nov	Winter Dec-Feb	Spring Mar-May
Flow (MGD)					
Jordan Basin WRF	15.0	15.0	15.0	15.0	15.0
South Valley WRF	50.0	50.0	50.0	50.0	50.0
Central Valley WRF	75.0	75.0	75.0	75.0	75.0
SDSD South WWTP	4.0	4.0	4.0	4.0	4.0
SDSD North WWTP	12.0	12.0	12.0	12.0	12.0
NH4-Nitrogen (mg/L)					
Jordan Basin WRF	3.0	2.5	2.5	3.0	2.5
South Valley WRF	1.5	3.0	3.0	4.0	3.0
Central Valley WRF	3.7	4.5	5.9	5.8	5.3
SDSD South WWTP	8.0	20.0	20.0	14.0	12.0
SDSD North WWTP	5.5	7.5	7.5	6.5	6.0

Acute	Standard	Summer	Fall	Winter	Spring
Flow (MGD)	N/A	**Jun-Aug**	**Sep-Nov**	**Dec-Feb**	**Mar-May**
Jordan Basin WRF		15.0	15.0	15.0	15.0
South Valley WRF		50.0	50.0	50.0	50.0
Central Valley WRF		75.0	75.0	75.0	75.0
SDSD South WWTP		4.0	4.0	4.0	4.0
SDSD North WWTP		12.0	12.0	12.0	12.0
NH4-Nitrogen (mg/L)	Varies				
Jordan Basin WRF		6.0	6.0	9.0	8.0
South Valley WRF		6.0	9.0	9.4	7.4
Central Valley WRF		13.1	15.9	12.3	15.9
SDSD South WWTP		30.0	40.0	17.0	26.0
SDSD North WWTP		24.0	16.2	13.0	15.0

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.

Coefficients and Other Model Information

Parameter	*Value*	*Units*
Stoichiometry:		
Carbon	40	gC
Nitrogen	7.2	gN
Phosphorus	1	gP
Dry weight	100	gD
Chlorophyll	1	gA
Inorganic suspended solids:		
Settling velocity	0.001	m/d
Oxygen:		
Reaeration model	Internal	
Temp correction	1.024	
Reaeration wind effect	None	
O2 for carbon oxidation	2.69	gO2/gC
O2 for NH4 nitrification	4.57	gO2/gN
Oxygen inhib model CBOD oxidation	Exponential	
Oxygen inhib parameter CBOD oxidation	0.60	L/mgO2
Oxygen inhib model nitrification	Exponential	
Oxygen inhib parameter nitrification	0.60	L/mgO2
Oxygen enhance model denitrification	Exponential	
Oxygen enhance parameter denitrification	0.60	L/mgO2
Oxygen inhib model phyto resp	Exponential	
Oxygen inhib parameter phyto resp	0.60	L/mgO2
Oxygen enhance model bot alg resp	Exponential	
Oxygen enhance parameter bot alg resp	0.60	L/mgO2
Slow CBOD:		
Hydrolysis rate	0	/d
Temp correction	1.047	
Oxidation rate	0.2	/d
Temp correction	1.047	
Fast CBOD:		
Oxidation rate	10	/d
Temp correction	1.047	
Organic N:		
Hydrolysis	0.4	/d
Temp correction	1.07	
Settling velocity	0.05	m/d
Ammonium:		
Nitrification	2	/d
Temp correction	1.07	
Nitrate:		
Denitrification	0.05	/d
Temp correction	1.07	
Sed denitrification transfer coeff	0.05	m/d
Temp correction	1.07	
Organic P:		
Hydrolysis	0.05	/d
Temp correction	1.07	
Settling velocity	0.05	m/d
Inorganic P:		
Settling velocity	0.5	m/d
Sed P oxygen attenuation half sat constant	0.05	mgO2/L

Phytoplankton:		
Max Growth rate	2	/d
Temp correction	1.07	
Respiration rate	0.1	/d
Temp correction	1.07	
Death rate	0.1	/d
Temp correction	1	
Nitrogen half sat constant	15	ugN/L
Phosphorus half sat constant	2	ugP/L
Inorganic carbon half sat constant	1.30E-05	moles/L
Phytoplankton use HCO3- as substrate	Yes	
Light model	Smith	
Light constant	57.6	langleys/d
Ammonia preference	25	ugN/L
Settling velocity	0.05	m/d
Bottom Plants:		
Growth model	Zero-order	
Max Growth rate	50	gD/m2/d or /d
Temp correction	1.07	
First-order model carrying capacity	50	gD/m2
Basal respiration rate	0.042	/d
Photo-respiration rate parameter	0.389	unitless
Temp correction	1.07	
Excretion rate	0.1	/d
Temp correction	1.05	
Death rate	0.1	/d
Temp correction	1.07	
External nitrogen half sat constant	163	ugN/L
External phosphorus half sat constant	48	ugP/L
Inorganic carbon half sat constant	1.30E-05	moles/L
Bottom algae use HCO3- as substrate	Yes	
Light model	Half saturation	
Light constant	50	langleys/d
Ammonia preference	1	ugN/L
Subsistence quota for nitrogen	30	mgN/gD
Subsistence quota for phosphorus	0.4	mgP/gD
Maximum uptake rate for nitrogen	447	mgN/gD/d
Maximum uptake rate for phosphorus	114	mgP/gD/d
Internal nitrogen half sat ratio	2.9	
Internal phosphorus half sat ratio	1.8	
Nitrogen uptake water column fraction	1	
Phosphorus uptake water column fraction	1	
Detritus (POM):		
Dissolution rate	0.1	/d
Temp correction	1.07	
Settling velocity	0.1	m/d
pH:		
Partial pressure of carbon dioxide	347	ppm
TRC:		
Decay rate	0.8	/d

Atmospheric Inputs:	Summer	Fall	Winter	Spring
Min. Air Temperature, F	63.4	40.4	20.4	38.3
Max. Air Temperature, F	92.8	65.7	37.3	61.4
Dew Point, Temp., F	60.2	43.6	26.8	41.6
Wind, ft./sec. @ 21 ft.	9.5	8.2	6.9	9.8
Cloud Cover, %	10%	10%	10%	10%

Utah Division of Water Quality
Salt Lake City, Utah

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

8-Oct-21
4:00 PM

Facilities: **Jordan Basin Water Reclamation Facility** **UPDES No: UT-0025852**
Discharging to: **Jordan River**

I. Introduction

Wasteload analyses are performed to determine point source effluent limitations necessary to maintain designated beneficial uses by evaluating projected effects of discharge concentrations on in-stream water quality. The wasteload analysis also takes into account downstream designated uses [R317-2-8, UAC]. Projected concentrations are compared to numeric water quality standards to determine acceptability. The anti-degradation policy and procedures are also considered. The primary in-stream parameters of concern may include metals (as a function of hardness), total dissolved solids (TDS), total residual chlorine (TRC), un-ionized ammonia (as a function of pH and temperature, measured and evaluated interms of total ammonia), and dissolved oxygen.

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

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

II. Receiving Water and Stream Classification

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

III. Numeric Stream Standards for Protection of Aquatic Wildlife

Total Ammonia (TNH3)	Varies as a function of Temperature and pH Rebound. See Water Quality Standards
Chronic Total Residual Chlorine (TRC)	0.011 mg/l (4 Day Average) 0.019 mg/l (1 Hour Average)
Chronic Dissolved Oxygen (DO)	5.5 mg/l (30 Day Average) 4.0 mg/l (7Day Average) 3.0 mg/l (1 Day Average)
Maximum Total Dissolved Solids	1200.0 mg/l

Acute and Chronic Heavy Metals (Dissolved)

Parameter	4 Day Average (Chronic) Standard Concentration	Load*	1 Hour Average (Acute) Standard Concentration	Load*
Aluminum	87.00 ug/l**	13.070 lbs/day	750.00 ug/l	112.673 lbs/day
Arsenic	150.00 ug/l	22.535 lbs/day	340.00 ug/l	51.079 lbs/day
Cadmium	2.18 ug/l	0.327 lbs/day	6.59 ug/l	0.989 lbs/day
Chromium III	243.79 ug/l	36.624 lbs/day	5100.48 ug/l	766.250 lbs/day
ChromiumVI	11.00 ug/l	1.653 lbs/day	16.00 ug/l	2.404 lbs/day
Copper	27.61 ug/l	4.147 lbs/day	46.31 ug/l	6.957 lbs/day
Iron			1000.00 ug/l	150.231 lbs/day
Lead	16.02 ug/l	2.406 lbs/day	411.03 ug/l	61.750 lbs/day
Mercury	0.0120 ug/l	0.002 lbs/day	2.40 ug/l	0.361 lbs/day
Nickel	152.71 ug/l	22.941 lbs/day	1373.49 ug/l	206.341 lbs/day
Selenium	4.60 ug/l	0.691 lbs/day	20.00 ug/l	3.005 lbs/day
Silver	N/A ug/l	N/A lbs/day	33.61 ug/l	5.049 lbs/day
Zinc	351.34 ug/l	52.782 lbs/day	351.34 ug/l	52.782 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 355.97 mg/l as CaCO3

IV. Numeric Stream Standards for Protection of Agriculture

	4 Day Average (Chronic) Standard		1 Hour Average (Acute) Standard	
	Concentration	**Load***	**Concentration**	**Load***
Arsenic			100.0 ug/l	lbs/day
Boron			750.0 ug/l	lbs/day
Cadmium			10.0 ug/l	0.75 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	90.14 tons/day

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

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

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

	Maximum Conc., ug/l - Acute Standards			
	Class 1C		**Class 3A, 3B**	
Metals				
Antimony	ug/l	lbs/day		
Arsenic	ug/l	lbs/day	4300.00 ug/l	1163.60 lbs/day
Asbestos	ug/l	lbs/day		
Beryllium				
Cadmium				
Chromium (III)				
Chromium (VI)				
Copper				
Cyanide	ug/l	lbs/day	2.2E+05 ug/l	59533.09 lbs/day
Lead	ug/l	lbs/day		
Mercury			0.15 ug/l	0.04 lbs/day
Nickel			4600.00 ug/l	1244.78 lbs/day
Selenium	ug/l	lbs/day		
Silver	ug/l	lbs/day		
Thallium			6.30 ug/l	1.70 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)	27.0	19.3	8.1	0.03	3.56	7.05	0.001	1067.5
Fall	17.0	8.9	8.1	0.05	2.06	---	0.001	1054.6
Winter	23.0	4.8	7.9	0.04	1.91	---	0.001	1054.6
Spring	24.0	14.8	8.7	0.04	2.06	---	0.001	1054.6

	Al	As	Cd	CrIII	CrVI	Copper	Fe	Pb
Dissolved Metals	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
All Seasons	124.00	12.10	0.06	1.35	2.65*	1.12	0.0	0.12

	Hg	Ni	Se	Ag	Zn	Boron
Dissolved Metals	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
All Seasons	0.0000	2.50	1.09	0.25	8.62	10.0

* 1/2 MDL

Projected Discharge Information

Season	Flow, MGD	Temp.	TDS mg/l	TDS tons/day
Summer	15.00000	23.5	982.67	61.45349
Fall	15.00000	20.2		
Winter	15.00000	17.1		
Spring	15.00000	20.2		

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	15.000 MGD	23.205 cfs
Fall	15.000 MGD	23.205 cfs
Winter	15.000 MGD	23.205 cfs
Spring	15.000 MGD	23.205 cfs

Flow Requirement or Loading Requirement

The calculations in this wasteload analysis utilize the maximum effluent discharge flow of 15 MGD. If the discharger is allowed to have a flow greater than 15 MGD during 7Q10 conditions, and effluent limit concentrations as indicated, then water quality standards will be violated. In order to prevent this from occuring, the permit writers must include the discharge flow limititation as indicated above; or, include loading effluent limits in the permit.

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

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

WET Requirements	LC50 >	EOP Effluent	[Acute]
	IC25 >	46.2% Effluent	[Chronic]

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 355.97 mg/l):

	4 Day Average Concentration		Load		1 Hour Average Concentration		Load	
Aluminum	N/A		N/A		1,114.2	ug/l	167.4	lbs/day
Arsenic	310.45	ug/l	25.1	lbs/day	530.8	ug/l	79.7	lbs/day
Cadmium	4.64	ug/l	0.4	lbs/day	10.4	ug/l	1.6	lbs/day
Chromium III	525.87	ug/l	42.5	lbs/day	8,067.0	ug/l	1211.9	lbs/day
Chromium VI	19.17	ug/l	1.6	lbs/day	23.0	ug/l	3.5	lbs/day
Copper	58.42	ug/l	4.7	lbs/day	72.6	ug/l	10.9	lbs/day
Iron	N/A		N/A		1,581.8	ug/l	237.6	lbs/day
Lead	34.51	ug/l	2.8	lbs/day	650.1	ug/l	97.7	lbs/day

Mercury	0.03	ug/l	0.0	lbs/day	3.8	ug/l	0.6 lbs/day
Nickel	327.48	ug/l	26.5	lbs/day	2,171.1	ug/l	326.2 lbs/day
Selenium	8.68	ug/l	0.7	lbs/day	31.0	ug/l	4.7 lbs/day
Silver	N/A	ug/l	N/A	lbs/day	53.0	ug/l	8.0 lbs/day
Zinc	750.11	ug/l	60.6	lbs/day	550.7	ug/l	82.7 lbs/day
Cyanide	11.25	ug/l	0.9	lbs/day	34.8	ug/l	5.2 lbs/day

Effluent Limitations for Heat/Temperature based upon Water Quality Standards

Summer	25.6	Deg. C.	78.1	Deg. F
Fall	14.3	Deg. C.	57.8	Deg. F
Winter	10.8	Deg. C.	51.4	Deg. F
Spring	20.9	Deg. C.	69.6	Deg. F

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	751.2	lbs/day
Nitrates as N	4.0	mg/l	600.9	lbs/day
Total Phosphorus as P	0.05	mg/l	7.5	lbs/day
Total Suspended Solids	90.0	mg/l	13520.8	lbs/day

Note: Pollution indicator targets are for information purposes only.

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

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

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

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

	Class 4 Acute Agricultural 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		1114.2				1114.2	N/A
Antimony				9303.2		9303.2	
Arsenic	216.4	530.8			0.0	216.4	310.5
Asbestos						0.00E+00	
Barium						0.0	
Beryllium						0.0	
Cadmium	21.6	10.4			0.0	10.4	4.6
Chromium (III)		8067.0			0.0	8067.0	525.9
Chromium (VI)	214.8	23.0			0.0	23.00	19.17
Copper	431.4	72.6				72.6	58.4
Cyanide		34.8	475979.3			34.8	11.3
Iron		1581.8				1581.8	
Lead	216.2	650.1			0.0	216.2	34.5
Mercury		3.80		0.32	0.0	0.32	0.026
Nickel		2171.1		9952.3		2171.1	327.5
Selenium	106.9	31.0			0.0	31.0	8.7
Silver		53.0			0.0	53.0	
Thallium				13.6		13.6	
Zinc		550.7				550.7	750.1
Boron	1622.3					1622.3	

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	1114.2	N/A	
Antimony	9303.23		
Arsenic	216.4	310.5	Acute Controls
Asbestos	0.00E+00		
Barium			
Beryllium			
Cadmium	10.4	4.6	
Chromium (III)	8067.0	526	
Chromium (VI)	23.0	19.2	
Copper	72.6	58.4	
Cyanide	34.8	11.3	
Iron	1581.8		
Lead	216.2	34.5	
Mercury	0.325	0.026	
Nickel	2171.1	327	
Selenium	31.0	8.7	
Silver	53.0	N/A	
Thallium	13.6		
Zinc	550.7	750.1	Acute Controls
Boron	1622.31		

X. Antidegradation Considerations

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

The antidegradation rules and procedures allow for modification of effluent limits less than those based

strictly upon mass balance equations utilizing 100% of the assimilative capacity of the receiving water. Additional factors include considerations for "Blue-ribbon" fisheries, special recreational areas, threatened and endangered species, and drinking water sources.

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

XI. Colorado River Salinity Forum Considerations

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

XII. Summary Comments

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

XIII. Notice of UPDES Requirement

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

Utah Division of Water Quality
801-538-6052
File Name: JBWRF_WLA_2021.xlsm

APPENDIX - Coefficients and Other Model Information

CBOD Coeff. (Kd)20 1/day	CBOD Coeff. FORCED (Kd)/day	CBOD Coeff. (Ka)T 1/day	REAER. Coeff. (Ka)20 (Ka)/day	REAER. Coeff. FORCED 1/day	REAER. Coeff. (Ka)T 1/day	NBOD Coeff. (Kn)20 1/day	NBOD Coeff. (Kn)T 1/day
2.000	0.000	1.937	20.892	0.000	20.552	0.250	0.237

Open Coeff. (K4)20 1/day	Open Coeff. (K4)T 1/day	NH3 LOSS (K5)20 1/day	NH3 (K5)T 1/day	NO2+NO3 LOSS (K6)20 1/day	NO2+NO3 (K6)T 1/day	TRC Decay K(Cl)20 1/day	TRC K(Cl)(T) 1/day
0.000	0.000	4.000	3.875	0.000	0.000	32.000	30.735

BENTHIC DEMAND (SOD)20 gm/m2/day	BENTHIC DEMAND (SOD)T gm/m2/day
1.000	0.957

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

Antidegredation Review

An antidegradation review (ADR) was conducted to determine whether the proposed activity complies with the applicable antidegradation requirements for receiving waters that may be affected. The Level I ADR evaluated the criteria of R317-2-3.5(b) and determined that a Level II antidegradation Review is not required.

Utah Division of Water Quality
Salt Lake City, Utah

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

8-Oct-21
4:00 PM

Facilities: **South Valley Water Reclamation Facility** **UPDES No: UT-0024384**
Discharging to: **Jordan River**

I. Introduction

Wasteload analyses are performed to determine point source effluent limitations necessary to maintain designated beneficial uses by evaluating projected effects of discharge concentrations on in-stream water quality. The wasteload analysis also takes into account downstream designated uses [R317-2-8, UAC]. Projected concentrations are compared to numeric water quality standards to determine acceptability. The anti-degradation policy and procedures are also considered. The primary in-stream parameters of concern may include metals (as a function of hardness), total dissolved solids (TDS), total residual chlorine (TRC), un-ionized ammonia (as a function of pH and temperature, measured and evaluated interms of total ammonia), and dissolved oxygen.

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

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

II. Receiving Water and Stream Classification

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

III. Numeric Stream Standards for Protection of Aquatic Wildlife

Total Ammonia (TNH3)	Varies as a function of Temperature and pH Rebound. See Water Quality Standards
Chronic Total Residual Chlorine (TRC)	0.011 mg/l (4 Day Average) 0.019 mg/l (1 Hour Average)
Chronic Dissolved Oxygen (DO)	5.5 mg/l (30 Day Average) 4.0 mg/l (7Day Average) 3.0 mg/l (1 Day Average)
Maximum Total Dissolved Solids	1200.0 mg/l

Acute and Chronic Heavy Metals (Dissolved)

Parameter	4 Day Average (Chronic) Standard Concentration		Load*	1 Hour Average (Acute) Standard Concentration		Load*
Aluminum	87.00	ug/l**	43.567 lbs/day	750.00	ug/l	375.577 lbs/day
Arsenic	150.00	ug/l	75.115 lbs/day	340.00	ug/l	170.262 lbs/day
Cadmium	2.30	ug/l	1.151 lbs/day	7.04	ug/l	3.527 lbs/day
Chromium III	257.90	ug/l	129.150 lbs/day	5395.84	ug/l	2,702.072 lbs/day
ChromiumVI	11.00	ug/l	5.508 lbs/day	16.00	ug/l	8.012 lbs/day
Copper	29.28	ug/l	14.661 lbs/day	49.40	ug/l	24.740 lbs/day
Iron				1000.00	ug/l	500.770 lbs/day
Lead	17.48	ug/l	8.754 lbs/day	448.62	ug/l	224.653 lbs/day
Mercury	0.0120	ug/l	0.006 lbs/day	2.40	ug/l	1.202 lbs/day
Nickel	161.85	ug/l	81.049 lbs/day	1455.73	ug/l	728.984 lbs/day
Selenium	4.60	ug/l	2.304 lbs/day	20.00	ug/l	10.015 lbs/day
Silver	N/A	ug/l	N/A lbs/day	37.82	ug/l	18.941 lbs/day
Zinc	372.41	ug/l	186.490 lbs/day	372.41	ug/l	186.490 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 381.3 mg/l as CaCO3

IV. Numeric Stream Standards for Protection of Agriculture

	4 Day Average (Chronic) Standard		1 Hour Average (Acute) Standard	
	Concentration	**Load***	**Concentration**	**Load***
Arsenic			100.0 ug/l	lbs/day
Boron			750.0 ug/l	lbs/day
Cadmium			10.0 ug/l	2.50 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	300.46 tons/day

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

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

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

	Maximum Conc., ug/l - Acute Standards			
	Class 1C		**Class 3A, 3B**	
Metals				
Antimony	ug/l	lbs/day		
Arsenic	ug/l	lbs/day	4300.00 ug/l	2882.06 lbs/day
Asbestos	ug/l	lbs/day		
Beryllium				
Cadmium				
Chromium (III)				
Chromium (VI)				
Copper				
Cyanide	ug/l	lbs/day	2.2E+05 ug/l	147454.23 lbs/day
Lead	ug/l	lbs/day		
Mercury			0.15 ug/l	0.10 lbs/day
Nickel			4600.00 ug/l	3083.13 lbs/day
Selenium	ug/l	lbs/day		
Silver	ug/l	lbs/day		
Thallium			6.30 ug/l	4.22 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)	47.0	19.1	8.0	0.14	3.41	7.10	0.000	1194.4
Fall	37.0	10.3	7.9	0.15	3.18	---	0.010	1277.4
Winter	40.0	6.8	9.5	0.15	2.58	---	0.000	1277.4
Spring	40.0	14.9	8.6	0.15	3.02	---	0.025	1277.4

	Al	As	Cd	CrIII	CrVI	Copper	Fe	Pb
Dissolved Metals	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
All Seasons	23.80	10.24	0.33	2.58	3.33	4.46	0.0	1.42

	Hg	Ni	Se	Ag	Zn	Boron	
Dissolved Metals	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	
All Seasons	0.0000	3.14	2.37	0.80	14.71	10.0	* 1/2 MDL

Projected Discharge Information

Season	Flow, MGD	Temp.	TDS mg/l	TDS tons/day
Summer	50.00000	23.9	738.67	153.98116
Fall	50.00000	19.7		
Winter	50.00000	16.3		
Spring	50.00000	19.8		

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	50.000 MGD	77.350 cfs
Fall	50.000 MGD	77.350 cfs
Winter	50.000 MGD	77.350 cfs
Spring	50.000 MGD	77.350 cfs

Flow Requirement or Loading Requirement

The calculations in this wasteload analysis utilize the maximum effluent discharge flow of 50 MGD. If the discharger is allowed to have a flow greater than 50 MGD during 7Q10 conditions, and effluent limit concentrations as indicated, then water quality standards will be violated. In order to prevent this from occuring, the permit writers must include the discharge flow limititation as indicated above; or, include loading effluent limits in the permit.

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

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

WET Requirements	LC50 >	EOP Effluent	[Acute]
	IC25 >	62.2% Effluent	[Chronic]

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 381.3 mg/l):

	4 Day Average Concentration		Load		1 Hour Average Concentration		Load	
Aluminum	N/A		N/A		970.6	ug/l	486.1	lbs/day
Arsenic	234.92	ug/l	63.3	lbs/day	440.2	ug/l	220.4	lbs/day
Cadmium	3.50	ug/l	0.9	lbs/day	9.1	ug/l	4.5	lbs/day
Chromium III	413.04	ug/l	111.3	lbs/day	7,034.4	ug/l	3522.6	lbs/day
Chromium VI	15.66	ug/l	4.2	lbs/day	19.8	ug/l	9.9	lbs/day
Copper	44.35	ug/l	12.0	lbs/day	63.1	ug/l	31.6	lbs/day
Iron	N/A		N/A		1,303.8	ug/l	652.9	lbs/day
Lead	27.24	ug/l	7.3	lbs/day	584.5	ug/l	292.7	lbs/day

Mercury	0.02	ug/l	0.0	lbs/day	3.1	ug/l	1.6 lbs/day
Nickel	258.28	ug/l	69.6	lbs/day	1,897.0	ug/l	950.0 lbs/day
Selenium	5.96	ug/l	1.6	lbs/day	25.4	ug/l	12.7 lbs/day
Silver	N/A	ug/l	N/A	lbs/day	49.1	ug/l	24.6 lbs/day
Zinc	589.75	ug/l	158.9	lbs/day	481.1	ug/l	240.9 lbs/day
Cyanide	8.36	ug/l	2.3	lbs/day	28.7	ug/l	14.4 lbs/day

Effluent Limitations for Heat/Temperature based upon Water Quality Standards

Summer	24.3	Deg. C.	75.8	Deg. F
Fall	15.2	Deg. C.	59.4	Deg. F
Winter	11.9	Deg. C.	53.4	Deg. F
Spring	20.0	Deg. C.	67.9	Deg. F

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	2503.8 lbs/day
Nitrates as N	4.0	mg/l	2003.1 lbs/day
Total Phosphorus as P	0.05	mg/l	25.0 lbs/day
Total Suspended Solids	90.0	mg/l	45069.3 lbs/day

Note: Pollution indicator targets are for information purposes only.

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

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

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

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

	Class 4 Acute Agricultural 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		970.6				970.6	N/A
Antimony				6912.8		6912.8	
Arsenic	160.8	440.2			0.0	160.8	234.9
Asbestos						0.00E+00	
Barium						0.0	
Beryllium						0.0	
Cadmium	15.9	9.1			0.0	9.1	3.5
Chromium (III)		7034.4			0.0	7034.4	413.0
Chromium (VI)	159.2	19.8			0.0	19.85	15.66
Copper	318.8	63.1				63.1	44.4
Cyanide		28.7	353678.1			28.7	8.4
Iron		1303.8				1303.8	
Lead	159.9	584.5			0.0	159.9	27.2
Mercury		3.13		0.24	0.0	0.24	0.019
Nickel		1897.0		7395.1		1897.0	258.3
Selenium	78.9	25.4			0.0	25.4	6.0
Silver		49.1			0.0	49.1	
Thallium				10.1		10.1	
Zinc		481.1				481.1	589.8
Boron	1205.2					1205.2	

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	970.6	N/A	
Antimony	6912.80		
Arsenic	160.8	234.9	Acute Controls
Asbestos	0.00E+00		
Barium			
Beryllium			
Cadmium	9.1	3.5	
Chromium (III)	7034.4	413	
Chromium (VI)	19.8	15.7	
Copper	63.1	44.4	
Cyanide	28.7	8.4	
Iron	1303.8		
Lead	159.9	27.2	
Mercury	0.241	0.019	
Nickel	1897.0	258	
Selenium	25.4	6.0	
Silver	49.1	N/A	
Thallium	10.1		
Zinc	481.1	589.8	Acute Controls
Boron	1205.23		

X. Antidegradation Considerations

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

The antidegradation rules and procedures allow for modification of effluent limits less than those based

strictly upon mass balance equations utilizing 100% of the assimilative capacity of the receiving water. Additional factors include considerations for "Blue-ribbon" fisheries, special recreational areas, threatened and endangered species, and drinking water sources.

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

XI. Colorado River Salinity Forum Considerations

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

XII. Summary Comments

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

XIII. Notice of UPDES Requirement

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

Utah Division of Water Quality
801-538-6052
File Name: SVWRF_WLA_2021.xlsm

APPENDIX - Coefficients and Other Model Information

CBOD Coeff. (Kd)20 1/day	CBOD Coeff. FORCED (Kd)/day	CBOD Coeff. (Ka)T 1/day	REAER. Coeff. (Ka)20 (Ka)/day	REAER. Coeff. FORCED 1/day	REAER. Coeff. (Ka)T 1/day	NBOD Coeff. (Kn)20 1/day	NBOD Coeff. (Kn)T 1/day
2.000	0.000	1.920	15.113	0.000	14.797	0.250	0.233

Open Coeff. (K4)20 1/day	Open Coeff. (K4)T 1/day	NH3 LOSS (K5)20 1/day	NH3 (K5)T 1/day	NO2+NO3 LOSS (K6)20 1/day	NO2+NO3 (K6)T 1/day	TRC Decay K(Cl)20 1/day	TRC K(Cl)(T) 1/day
0.000	0.000	4.000	3.840	0.000	0.000	32.000	30.384

BENTHIC DEMAND (SOD)20 gm/m2/day	BENTHIC DEMAND (SOD)T gm/m2/day
1.000	0.946

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

Antidegredation Review

An antidegradation review (ADR) was conducted to determine whether the proposed activity complies with the applicable antidegradation requirements for receiving waters that may be affected. The Level I ADR evaluated the criteria of R317-2-3.5(b) and determined that a Level II antidegradation Review is not required.

Utah Division of Water Quality
Salt Lake City, Utah

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

8-Oct-21
4:00 PM

Facilities: **Central Valley Water Reclamation Facility** **UPDES No: UT-0024392**
Discharging to: **Jordan River**

I. Introduction

Wasteload analyses are performed to determine point source effluent limitations necessary to maintain designated beneficial uses by evaluating projected effects of discharge concentrations on in-stream water quality. The wasteload analysis also takes into account downstream designated uses [R317-2-8, UAC]. Projected concentrations are compared to numeric water quality standards to determine acceptability. The anti-degradation policy and procedures are also considered. The primary in-stream parameters of concern may include metals (as a function of hardness), total dissolved solids (TDS), total residual chlorine (TRC), un-ionized ammonia (as a function of pH and temperature, measured and evaluated interms of total ammonia), and dissolved oxygen.

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

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

II. Receiving Water and Stream Classification

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

III. Numeric Stream Standards for Protection of Aquatic Wildlife

Total Ammonia (TNH3)	Varies as a function of Temperature and pH Rebound. See Water Quality Standards
Chronic Total Residual Chlorine (TRC)	0.011 mg/l (4 Day Average) 0.019 mg/l (1 Hour Average)
Chronic Dissolved Oxygen (DO)	5.5 mg/l (30 Day Average) 4.0 mg/l (7Day Average) 3.0 mg/l (1 Day Average)
Maximum Total Dissolved Solids	1200.0 mg/l

Acute and Chronic Heavy Metals (Dissolved)

Parameter	4 Day Average (Chronic) Standard Concentration		Load*	1 Hour Average (Acute) Standard Concentration		Load*
Aluminum	87.00	ug/l**	65.350 lbs/day	750.00	ug/l	563.366 lbs/day
Arsenic	150.00	ug/l	112.673 lbs/day	340.00	ug/l	255.393 lbs/day
Cadmium	2.41	ug/l	1.808 lbs/day	7.45	ug/l	5.599 lbs/day
Chromium III	270.40	ug/l	203.113 lbs/day	5657.30	ug/l	4,249.508 lbs/day
ChromiumVI	11.00	ug/l	8.263 lbs/day	16.00	ug/l	12.018 lbs/day
Copper	30.76	ug/l	23.104 lbs/day	52.17	ug/l	39.186 lbs/day
Iron				1000.00	ug/l	751.155 lbs/day
Lead	18.82	ug/l	14.134 lbs/day	482.86	ug/l	362.699 lbs/day
Mercury	0.0120	ug/l	0.009 lbs/day	2.40	ug/l	1.803 lbs/day
Nickel	169.96	ug/l	127.663 lbs/day	1528.65	ug/l	1,148.252 lbs/day
Selenium	4.60	ug/l	3.455 lbs/day	20.00	ug/l	15.023 lbs/day
Silver	N/A	ug/l	N/A lbs/day	41.78	ug/l	31.380 lbs/day
Zinc	391.09	ug/l	293.770 lbs/day	391.09	ug/l	293.770 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 403.97 mg/l as CaCO3

IV. Numeric Stream Standards for Protection of Agriculture

	4 Day Average (Chronic) Standard		1 Hour Average (Acute) Standard	
	Concentration	**Load***	**Concentration**	**Load***
Arsenic			100.0 ug/l	lbs/day
Boron			750.0 ug/l	lbs/day
Cadmium			10.0 ug/l	3.76 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	450.69 tons/day

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

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

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

	Maximum Conc., ug/l - Acute Standards			
	Class 1C		**Class 3A, 3B**	
Metals				
Antimony	ug/l	lbs/day		
Arsenic	ug/l	lbs/day	4300.00 ug/l	6907.33 lbs/day
Asbestos	ug/l	lbs/day		
Beryllium				
Cadmium				
Chromium (III)				
Chromium (VI)				
Copper				
Cyanide	ug/l	lbs/day	2.2E+05 ug/l	353398.05 lbs/day
Lead	ug/l	lbs/day		
Mercury			0.15 ug/l	0.24 lbs/day
Nickel			4600.00 ug/l	7389.23 lbs/day
Selenium	ug/l	lbs/day		
Silver	ug/l	lbs/day		
Thallium			6.30 ug/l	10.12 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)	182.0	18.7	8.0	0.22	4.92	7.18	0.00	1248.8
Fall	133.0	10.9	8.0	0.34	3.44	---	0.00	1158.0
Winter	122.0	6.3	8.0	0.44	3.94	---	0.00	1158.0
Spring	116.0	12.5	8.0	0.24	3.25	---	0.00	1158.0

	Al	As	Cd	CrIII	CrVI	Copper	Fe	Pb
Dissolved Metals	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
All Seasons	221.00	42.77	4.23	4.45	2.65*	5.36	0.0	2.74

	Hg	Ni	Se	Ag	Zn	Boron
Dissolved Metals	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
All Seasons	0.0000	3.38	2.47	1.17	19.93	10.0

* 1/2 MDL

Projected Discharge Information

Season	Flow, MGD	Temp.	TDS mg/l	TDS tons/day
Summer	75.00000	NA	982.67	307.26746
Fall	75.00000	NA		
Winter	75.00000	NA		
Spring	75.00000	NA		

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	75.000 MGD	116.025 cfs
Fall	75.000 MGD	116.025 cfs
Winter	75.000 MGD	116.025 cfs
Spring	75.000 MGD	116.025 cfs

Flow Requirement or Loading Requirement

The calculations in this wasteload analysis utilize the maximum effluent discharge flow of 75 MGD. If the discharger is allowed to have a flow greater than 75 MGD during 7Q10 conditions, and effluent limit concentrations as indicated, then water quality standards will be violated. In order to prevent this from occuring, the permit writers must include the discharge flow limititation as indicated above; or, include loading effluent limits in the permit.

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

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

WET Requirements	LC50 >	EOP Effluent	[Acute]
	IC25 >	38.9% Effluent	[Chronic]

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 403.97 mg/l):

	4 Day Average Concentration		4 Day Average Load		1 Hour Average Concentration		1 Hour Average Load	
Aluminum	N/A		N/A		1,164.9	ug/l	875.0	lbs/day
Arsenic	318.21	ug/l	128.6	lbs/day	573.1	ug/l	430.5	lbs/day
Cadmium	-	ug/l	0.0	lbs/day	10.0	ug/l	7.5	lbs/day
Chromium III	687.58	ug/l	278.0	lbs/day	10,090.9	ug/l	7579.8	lbs/day
Chromium VI	22.02	ug/l	8.9	lbs/day	25.4	ug/l	19.1	lbs/day
Copper	70.60	ug/l	28.5	lbs/day	88.9	ug/l	66.8	lbs/day
Iron	N/A		N/A		1,784.3	ug/l	1340.3	lbs/day
Lead	44.04	ug/l	17.8	lbs/day	859.4	ug/l	645.6	lbs/day

Mercury	0.03	ug/l	0.0	lbs/day	4.3	ug/l	3.2 lbs/day
Nickel	431.26	ug/l	174.3	lbs/day	2,724.9	ug/l	2046.9 lbs/day
Selenium	7.95	ug/l	3.2	lbs/day	33.8	ug/l	25.4 lbs/day
Silver	N/A	ug/l	N/A	lbs/day	73.6	ug/l	55.3 lbs/day
Zinc	973.31	ug/l	393.5	lbs/day	682.2	ug/l	512.4 lbs/day
Cyanide	13.36	ug/l	5.4	lbs/day	39.3	ug/l	29.5 lbs/day

Effluent Limitations for Heat/Temperature based upon Water Quality Standards

Summer	24.9	Deg. C.	76.9	Deg. F
Fall	16.6	Deg. C.	61.8	Deg. F
Winter	11.8	Deg. C.	53.3	Deg. F
Spring	18.0	Deg. C.	64.4	Deg. F

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	3755.8	lbs/day
Nitrates as N	4.0	mg/l	3004.6	lbs/day
Total Phosphorus as P	0.05	mg/l	37.6	lbs/day
Total Suspended Solids	90.0	mg/l	67603.9	lbs/day

Note: Pollution indicator targets are for information purposes only.

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

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

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

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

	Class 4 Acute Agricultural 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		1164.9				1164.9	N/A
Antimony				11045.1		11045.1	
Arsenic	256.9	573.1			0.0	256.9	318.2
Asbestos						0.00E+00	
Barium						0.0	
Beryllium						0.0	
Cadmium	19.1	10.0			0.0	10.0	0.0
Chromium (III)		10090.9			0.0	10090.9	687.6
Chromium (VI)	249.9	25.4			0.0	25.43	22.02
Copper	505.3	88.9				88.9	70.6
Cyanide		39.3	565098.0			39.3	13.4
Iron		1784.3				1784.3	
Lead	252.6	859.4			0.0	252.6	44.0
Mercury		4.28		0.39	0.0	0.39	0.031
Nickel		2724.9		11815.7		2724.9	431.3
Selenium	124.6	33.8			0.0	33.8	7.9
Silver		73.6			0.0	73.6	
Thallium				16.2		16.2	
Zinc		682.2				682.2	973.3
Boron	1925.9					1925.9	

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	1164.9	N/A	
Antimony	11045.10		
Arsenic	256.9	318.2	Acute Controls
Asbestos	0.00E+00		
Barium			
Beryllium			
Cadmium	10.0	0.0	
Chromium (III)	10090.9	688	
Chromium (VI)	25.4	22.0	
Copper	88.9	70.6	
Cyanide	39.3	13.4	
Iron	1784.3		
Lead	252.6	44.0	
Mercury	0.385	0.031	
Nickel	2724.9	431	
Selenium	33.8	7.9	
Silver	73.6	N/A	
Thallium	16.2		
Zinc	682.2	973.3	Acute Controls
Boron	1925.92		

X. Antidegradation Considerations

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

The antidegradation rules and procedures allow for modification of effluent limits less than those based

strictly upon mass balance equations utilizing 100% of the assimilative capacity of the receiving water. Additional factors include considerations for "Blue-ribbon" fisheries, special recreational areas, threatened and endangered species, and drinking water sources.

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

XI. Colorado River Salinity Forum Considerations

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

XII. Summary Comments

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

XIII. Notice of UPDES Requirement

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

Utah Division of Water Quality
801-538-6052
File Name: CVWRF_WLA_JR_2021.xlsm

APPENDIX - Coefficients and Other Model Information

CBOD Coeff. (Kd)20 1/day	CBOD Coeff. FORCED (Kd)/day	CBOD Coeff. (Ka)T 1/day	REAER. Coeff. (Ka)20 (Ka)/day	REAER. Coeff. FORCED 1/day	REAER. Coeff. (Ka)T 1/day	NBOD Coeff. (Kn)20 1/day	NBOD Coeff. (Kn)T 1/day
0.520	0.000	0.490	2.040	0.000	1.978	0.250	0.226

Open Coeff. (K4)20 1/day	Open Coeff. (K4)T 1/day	NH3 LOSS (K5)20 1/day	NH3 (K5)T 1/day	NO2+NO3 LOSS (K6)20 1/day	NO2+NO3 (K6)T 1/day	TRC Decay K(Cl)20 1/day	TRC K(Cl)(T) 1/day
0.000	0.000	4.000	3.766	0.000	0.000	32.000	29.647

BENTHIC DEMAND (SOD)20 gm/m2/day	BENTHIC DEMAND (SOD)T gm/m2/day
1.000	0.921

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

Antidegredation Review

An antidegradation review (ADR) was conducted to determine whether the proposed activity complies with the applicable antidegradation requirements for receiving waters that may be affected. The Level I ADR evaluated the criteria of R317-2-3.5(b) and determined that a Level II antidegradation Review is not required.

Utah Division of Water Quality
Salt Lake City, Utah

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

8-Oct-21
4:00 PM

Facilities: **South Davis Sewer District South Wastewater Treatment Plant** **UPDES No: UT-0021628**
Discharging to: **Jordan River**

I. Introduction

Wasteload analyses are performed to determine point source effluent limitations necessary to maintain designated beneficial uses by evaluating projected effects of discharge concentrations on in-stream water quality. The wasteload analysis also takes into account downstream designated uses [R317-2-8, UAC]. Projected concentrations are compared to numeric water quality standards to determine acceptability. The anti-degradation policy and procedures are also considered. The primary in-stream parameters of concern may include metals (as a function of hardness), total dissolved solids (TDS), total residual chlorine (TRC), un-ionized ammonia (as a function of pH and temperature, measured and evaluated interms of total ammonia), and dissolved oxygen.

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

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

II. Receiving Water and Stream Classification

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

III. Numeric Stream Standards for Protection of Aquatic Wildlife

Total Ammonia (TNH3)	Varies as a function of Temperature and pH Rebound. See Water Quality Standards
Chronic Total Residual Chlorine (TRC)	0.011 mg/l (4 Day Average) 0.019 mg/l (1 Hour Average)
Chronic Dissolved Oxygen (DO)	5.5 mg/l (30 Day Average) 4.0 mg/l (7Day Average) 3.0 mg/l (1 Day Average)
Maximum Total Dissolved Solids	1200.0 mg/l

Acute and Chronic Heavy Metals (Dissolved)

Parameter	4 Day Average (Chronic) Standard Concentration		Load*	1 Hour Average (Acute) Standard Concentration		Load*
Aluminum	87.00	ug/l**	3.485 lbs/day	750.00	ug/l	30.046 lbs/day
Arsenic	150.00	ug/l	6.009 lbs/day	340.00	ug/l	13.621 lbs/day
Cadmium	2.37	ug/l	0.095 lbs/day	7.32	ug/l	0.293 lbs/day
Chromium III	266.44	ug/l	10.674 lbs/day	5574.36	ug/l	223.318 lbs/day
ChromiumVI	11.00	ug/l	0.441 lbs/day	16.00	ug/l	0.641 lbs/day
Copper	30.29	ug/l	1.213 lbs/day	51.29	ug/l	2.055 lbs/day
Iron				1000.00	ug/l	40.062 lbs/day
Lead	18.39	ug/l	0.737 lbs/day	471.90	ug/l	18.905 lbs/day
Mercury	0.0120	ug/l	0.000 lbs/day	2.40	ug/l	0.096 lbs/day
Nickel	167.38	ug/l	6.706 lbs/day	1505.50	ug/l	60.313 lbs/day
Selenium	4.60	ug/l	0.184 lbs/day	20.00	ug/l	0.801 lbs/day
Silver	N/A	ug/l	N/A lbs/day	40.50	ug/l	1.623 lbs/day
Zinc	385.16	ug/l	15.430 lbs/day	385.16	ug/l	15.430 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 396.76 mg/l as CaCO3

IV. Numeric Stream Standards for Protection of Agriculture

	4 Day Average (Chronic) Standard		1 Hour Average (Acute) Standard	
	Concentration	**Load***	**Concentration**	**Load***
Arsenic			100.0 ug/l	lbs/day
Boron			750.0 ug/l	lbs/day
Cadmium			10.0 ug/l	0.20 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	24.04 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

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

	Maximum Conc., ug/l - Acute Standards			
	Class 1C		**Class 3A, 3B**	
Metals				
Antimony	ug/l	lbs/day		
Arsenic	ug/l	lbs/day	4300.00 ug/l	3249.14 lbs/day
Asbestos	ug/l	lbs/day		
Beryllium				
Cadmium				
Chromium (III)				
Chromium (VI)				
Copper				
Cyanide	ug/l	lbs/day	2.2E+05 ug/l	166234.93 lbs/day
Lead	ug/l	lbs/day		
Mercury			0.15 ug/l	0.11 lbs/day
Nickel			4600.00 ug/l	3475.82 lbs/day
Selenium	ug/l	lbs/day		
Silver	ug/l	lbs/day		
Thallium			6.30 ug/l	4.76 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)	134.0	20.6	7.9	0.71	6.03	6.91	0.00	796.7
Fall	104.0	9.9	7.9	0.74	5.24	---	0.00	782.4
Winter	51.0	6.8	7.9	0.87	6.15	---	0.00	782.4
Spring	64.0	13.9	7.9	0.46	4.26	---	0.00	782.4

	Al	As	Cd	CrIII	CrVI	Copper	Fe	Pb
Dissolved Metals	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
All Seasons	232.00	8.03	0.39	2.58	3.31	5.01	0.0	1.53

	Hg	Ni	Se	Ag	Zn	Boron	
Dissolved Metals	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	
All Seasons	0.0000	2.70	1.61	0.63	19.46	10.0	* 1/2 MDL

Projected Discharge Information

Season	Flow, MGD	Temp.	TDS mg/l	TDS tons/day
Summer	4.00000	5.0	845.39	14.09829
Fall	4.00000	5.0		
Winter	4.00000	5.0		
Spring	4.00000	5.0		

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

IX. Effluent Limitations

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

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

Effluent Limitation for Flow based upon Water Quality Standards

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

Season	Daily Average	
Summer	4.000 MGD	6.188 cfs
Fall	4.000 MGD	6.188 cfs
Winter	4.000 MGD	6.188 cfs
Spring	4.000 MGD	6.188 cfs

Flow Requirement or Loading Requirement

The calculations in this wasteload analysis utilize the maximum effluent discharge flow of 4 MGD. If the discharger is allowed to have a flow greater than 4 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 >	98.5% Effluent	[Acute]
	IC25 >	20.9% Effluent	[Chronic]

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 396.76 mg/l):

	4 Day Average Concentration		4 Day Average Load	1 Hour Average Concentration		1 Hour Average Load
Aluminum	N/A		N/A	6,358.6	ug/l	254.7 lbs/day
Arsenic	3,224.33	ug/l	69.5 lbs/day	3,934.4	ug/l	157.6 lbs/day
Cadmium	45.39	ug/l	1.0 lbs/day	82.4	ug/l	3.3 lbs/day
Chromium III	5,980.15	ug/l	128.9 lbs/day	65,902.3	ug/l	2640.1 lbs/day
Chromium VI	177.46	ug/l	3.8 lbs/day	153.4	ug/l	6.1 lbs/day
Copper	577.78	ug/l	12.5 lbs/day	552.4	ug/l	22.1 lbs/day
Iron	N/A		N/A	11,827.2	ug/l	473.8 lbs/day
Lead	383.39	ug/l	8.3 lbs/day	5,564.7	ug/l	222.9 lbs/day

Mercury	0.27	ug/l	0.0	lbs/day	28.4	ug/l	1.1 lbs/day
Nickel	3,733.48	ug/l	80.5	lbs/day	17,776.9	ug/l	712.2 lbs/day
Selenium	69.26	ug/l	1.5	lbs/day	219.1	ug/l	8.8 lbs/day
Silver	N/A	ug/l	N/A	lbs/day	472.2	ug/l	18.9 lbs/day
Zinc	8,304.47	ug/l	179.0	lbs/day	4,344.8	ug/l	174.1 lbs/day
Cyanide	117.81	ug/l	2.5	lbs/day	260.2	ug/l	10.4 lbs/day

Effluent Limitations for Heat/Temperature based upon Water Quality Standards

Summer	60.6	Deg. C.	141.2	Deg. F
Fall	41.9	Deg. C.	107.4	Deg. F
Winter	24.6	Deg. C.	76.2	Deg. F
Spring	35.2	Deg. C.	95.3	Deg. F

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	200.3	lbs/day
Nitrates as N	4.0	mg/l	160.2	lbs/day
Total Phosphorus as P	0.05	mg/l	2.0	lbs/day
Total Suspended Solids	90.0	mg/l	3605.5	lbs/day

Note: Pollution indicator targets are for information purposes only.

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

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

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

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

	Class 4 Acute Agricultural 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		6358.6				6358.6	N/A
Antimony				97415.7		97415.7	
Arsenic	2265.5	3934.4			0.0	2265.5	3224.3
Asbestos						0.00E+00	
Barium						0.0	
Beryllium						0.0	
Cadmium	218.2	82.4			0.0	82.4	45.4
Chromium (III)		65902.3			0.0	65902.3	5980.2
Chromium (VI)	2209.6	153.4			0.0	153.37	177.46
Copper	4422.6	552.4				552.4	577.8
Cyanide		260.2	4984059.5			260.2	117.8
Iron		11827.2				11827.2	
Lead	2232.3	5564.7			0.0	2232.3	383.4
Mercury		28.39		3.40	0.0	3.40	0.272
Nickel		17776.9		104212.2		17776.9	3733.5
Selenium	1097.8	219.1			0.0	219.1	69.3
Silver		472.2			0.0	472.2	
Thallium				142.7		142.7	
Zinc		4344.8				4344.8	8304.5
Boron	16985.8					16985.8	

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	6358.6	N/A	
Antimony	97415.71		
Arsenic	2265.5	3224.3	Acute Controls
Asbestos	0.00E+00		
Barium			
Beryllium			
Cadmium	82.4	45.4	
Chromium (III)	65902.3	5980	
Chromium (VI)	153.4	177.5	Acute Controls
Copper	552.4	577.8	Acute Controls
Cyanide	260.2	117.8	
Iron	11827.2		
Lead	2232.3	383.4	
Mercury	3.398	0.272	
Nickel	17776.9	3733	
Selenium	219.1	69.3	
Silver	472.2	N/A	
Thallium	142.7		
Zinc	4344.8	8304.5	Acute Controls
Boron	16985.78		

X. Antidegradation Considerations

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

The antidegradation rules and procedures allow for modification of effluent limits less than those based

strictly upon mass balance equations utilizing 100% of the assimilative capacity of the receiving water. Additional factors include considerations for "Blue-ribbon" fisheries, special recreational areas, threatened and endangered species, and drinking water sources.

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

XI. Colorado River Salinity Forum Considerations

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

XII. Summary Comments

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

XIII. Notice of UPDES Requirement

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

Utah Division of Water Quality
801-538-6052
File Name: SDSWRF_WLA_2021.xlsm

APPENDIX - Coefficients and Other Model Information

CBOD Coeff. (Kd)20 1/day	CBOD Coeff. FORCED (Kd)/day	CBOD Coeff. (Ka)T 1/day	REAER. Coeff. (Ka)20 (Ka)/day	REAER. Coeff. FORCED 1/day	REAER. Coeff. (Ka)T 1/day	NBOD Coeff. (Kn)20 1/day	NBOD Coeff. (Kn)T 1/day
0.830	0.000	0.852	3.450	0.000	3.498	0.250	0.261

Open Coeff. (K4)20 1/day	Open Coeff. (K4)T 1/day	NH3 LOSS (K5)20 1/day	NH3 (K5)T 1/day	NO2+NO3 LOSS (K6)20 1/day	NO2+NO3 (K6)T 1/day	TRC Decay K(Cl)20 1/day	TRC K(Cl)(T) 1/day
0.000	0.000	4.000	4.108	0.000	0.000	32.000	33.103

BENTHIC DEMAND (SOD)20 gm/m2/day	BENTHIC DEMAND (SOD)T gm/m2/day
1.000	1.037

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

Antidegredation Review

An antidegradation review (ADR) was conducted to determine whether the proposed activity complies with the applicable antidegradation requirements for receiving waters that may be affected. The Level I ADR evaluated the criteria of R317-2-3.5(b) and determined that a Level II antidegradation Review is not required.

Utah Division of Water Quality
Salt Lake City, Utah

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

8-Oct-21
4:00 PM

Facilities: **South Davis Sewer District North Wastewater Treatment Plant** **UPDES No: UT-0021636**
Discharging to: **Jordan River**

I. Introduction

Wasteload analyses are performed to determine point source effluent limitations necessary to maintain designated beneficial uses by evaluating projected effects of discharge concentrations on in-stream water quality. The wasteload analysis also takes into account downstream designated uses [R317-2-8, UAC]. Projected concentrations are compared to numeric water quality standards to determine acceptability. The anti-degradation policy and procedures are also considered. The primary in-stream parameters of concern may include metals (as a function of hardness), total dissolved solids (TDS), total residual chlorine (TRC), un-ionized ammonia (as a function of pH and temperature, measured and evaluated interms of total ammonia), and dissolved oxygen.

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

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

II. Receiving Water and Stream Classification

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

III. Numeric Stream Standards for Protection of Aquatic Wildlife

Total Ammonia (TNH3)	Varies as a function of Temperature and pH Rebound. See Water Quality Standards
Chronic Total Residual Chlorine (TRC)	0.011 mg/l (4 Day Average) 0.019 mg/l (1 Hour Average)
Chronic Dissolved Oxygen (DO)	5.5 mg/l (30 Day Average) 4.0 mg/l (7Day Average) 3.0 mg/l (1 Day Average)
Maximum Total Dissolved Solids	1200.0 mg/l

Acute and Chronic Heavy Metals (Dissolved)

Parameter	4 Day Average (Chronic) Standard Concentration		Load*	1 Hour Average (Acute) Standard Concentration		Load*
Aluminum	87.00	ug/l**	10.456 lbs/day	750.00	ug/l	90.139 lbs/day
Arsenic	150.00	ug/l	18.028 lbs/day	340.00	ug/l	40.863 lbs/day
Cadmium	2.29	ug/l	0.275 lbs/day	7.00	ug/l	0.841 lbs/day
Chromium III	256.58	ug/l	30.837 lbs/day	5368.13	ug/l	645.167 lbs/day
ChromiumVI	11.00	ug/l	1.322 lbs/day	16.00	ug/l	1.923 lbs/day
Copper	29.12	ug/l	3.500 lbs/day	49.11	ug/l	5.903 lbs/day
Iron				1000.00	ug/l	120.185 lbs/day
Lead	17.34	ug/l	2.084 lbs/day	445.04	ug/l	53.487 lbs/day
Mercury	0.0120	ug/l	0.001 lbs/day	2.40	ug/l	0.288 lbs/day
Nickel	160.99	ug/l	19.349 lbs/day	1448.00	ug/l	174.028 lbs/day
Selenium	4.60	ug/l	0.553 lbs/day	20.00	ug/l	2.404 lbs/day
Silver	N/A	ug/l	N/A lbs/day	37.42	ug/l	4.497 lbs/day
Zinc	370.43	ug/l	44.520 lbs/day	370.43	ug/l	44.520 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 378.91 mg/l as CaCO3

IV. Numeric Stream Standards for Protection of Agriculture

	4 Day Average (Chronic) Standard		1 Hour Average (Acute) Standard	
	Concentration	**Load***	**Concentration**	**Load***
Arsenic			100.0 ug/l	lbs/day
Boron			750.0 ug/l	lbs/day
Cadmium			10.0 ug/l	0.60 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	72.11 tons/day

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

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

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

	Maximum Conc., ug/l - Acute Standards			
	Class 1C		**Class 3A, 3B**	
Metals				
Antimony	ug/l	lbs/day		
Arsenic	ug/l	lbs/day	4300.00 ug/l	1681.82 lbs/day
Asbestos	ug/l	lbs/day		
Beryllium				
Cadmium				
Chromium (III)				
Chromium (VI)				
Copper				
Cyanide	ug/l	lbs/day	2.2E+05 ug/l	86046.39 lbs/day
Lead	ug/l	lbs/day		
Mercury			0.15 ug/l	0.06 lbs/day
Nickel			4600.00 ug/l	1799.15 lbs/day
Selenium	ug/l	lbs/day		
Silver	ug/l	lbs/day		
Thallium			6.30 ug/l	2.46 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

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(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)	54.0	21.2	7.9	0.36	6.03	6.82	0.00	880.9
Fall	44.0	10.1	7.9	0.57	4.80	---	0.00	954.4
Winter	26.0	5.8	8.0	0.64	5.73	---	0.00	954.4
Spring	31.0	13.5	8.0	0.26	63.16	---	0.00	954.4

	Al	As	Cd	CrIII	CrVI	Copper	Fe	Pb
Dissolved Metals	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
All Seasons	24.30	8.89	0.47	2.78	4.75	5.91	0.0	2.15

	Hg	Ni	Se	Ag	Zn	Boron	
Dissolved Metals	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	
All Seasons	0.0000	4.90	1.62	0.75	18.84	10.0	* 1/2 MDL

Projected Discharge Information

Season	Flow, MGD	Temp.	TDS mg/l	TDS tons/day
Summer	12.00000	NA	982.67	49.16279
Fall	12.00000	NA		
Winter	12.00000	NA		
Spring	12.00000	NA		

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	12.000 MGD	18.564 cfs
Fall	12.000 MGD	18.564 cfs
Winter	12.000 MGD	18.564 cfs
Spring	12.000 MGD	18.564 cfs

Flow Requirement or Loading Requirement

The calculations in this wasteload analysis utilize the maximum effluent discharge flow of 12 MGD. If the discharger is allowed to have a flow greater than 12 MGD during 7Q10 conditions, and effluent limit concentrations as indicated, then water quality standards will be violated. In order to prevent this from occuring, the permit writers must include the discharge flow limititation as indicated above; or, include loading effluent limits in the permit.

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

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

WET Requirements	LC50 >	EOP Effluent	[Acute]
	IC25 >	66.3% Effluent	[Chronic]

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 378.91 mg/l):

	4 Day Average Concentration		Load		1 Hour Average Concentration		Load	
Aluminum	N/A		N/A		1,805.5	ug/l	217.0	lbs/day
Arsenic	560.47	ug/l	36.3	lbs/day	821.6	ug/l	98.7	lbs/day
Cadmium	7.57	ug/l	0.5	lbs/day	16.5	ug/l	2.0	lbs/day
Chromium III	994.84	ug/l	64.3	lbs/day	13,171.6	ug/l	1583.0	lbs/day
Chromium VI	29.18	ug/l	1.9	lbs/day	32.4	ug/l	3.9	lbs/day
Copper	96.63	ug/l	6.3	lbs/day	111.9	ug/l	13.5	lbs/day
Iron	N/A		N/A		2,454.4	ug/l	295.0	lbs/day
Lead	61.54	ug/l	4.0	lbs/day	1,089.2	ug/l	130.9	lbs/day

Mercury	0.05	ug/l	0.0	lbs/day	5.9	ug/l	0.7 lbs/day
Nickel	615.03	ug/l	39.8	lbs/day	3,546.9	ug/l	426.3 lbs/day
Selenium	13.27	ug/l	0.9	lbs/day	46.7	ug/l	5.6 lbs/day
Silver	N/A	ug/l	N/A	lbs/day	90.7	ug/l	10.9 lbs/day
Zinc	1,393.15	ug/l	90.1	lbs/day	881.8	ug/l	106.0 lbs/day
Cyanide	20.33	ug/l	1.3	lbs/day	54.0	ug/l	6.5 lbs/day

Effluent Limitations for Heat/Temperature based upon Water Quality Standards

Summer	31.1	Deg. C.	87.9	Deg. F
Fall	18.9	Deg. C.	66.0	Deg. F
Winter	12.6	Deg. C.	54.6	Deg. F
Spring	20.9	Deg. C.	69.6	Deg. F

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	600.9	lbs/day
Nitrates as N	4.0	mg/l	480.7	lbs/day
Total Phosphorus as P	0.05	mg/l	6.0	lbs/day
Total Suspended Solids	90.0	mg/l	10816.6	lbs/day

Note: Pollution indicator targets are for information purposes only.

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

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

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

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

	Class 4 Acute Agricultural 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				16808.1		16808.1	
Arsenic	390.9	821.6			0.0	390.9	560.5
Asbestos						0.00E+00	
Barium						0.0	
Beryllium						0.0	
Cadmium	37.7	16.5			0.0	16.5	7.6
Chromium (III)		13171.6			0.0	13171.6	994.8
Chromium (VI)	382.8	32.4			0.0	32.36	29.18
Copper	764.6	111.9				111.9	96.6
Cyanide		54.0	859948.3			54.0	20.3
Iron		2454.4				2454.4	
Lead	384.6	1089.2			0.0	384.6	61.5
Mercury		5.89		0.59	0.0	0.59	0.047
Nickel		3546.9		17980.7		3546.9	615.0
Selenium	190.7	46.7			0.0	46.7	13.3
Silver		90.7			0.0	90.7	
Thallium				24.6		24.6	
Zinc		881.8				881.8	1393.2
Boron	2930.9					2930.9	

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	16808.08		
Arsenic	390.9	560.5	Acute Controls
Asbestos	0.00E+00		
Barium			
Beryllium			
Cadmium	16.5	7.6	
Chromium (III)	13171.6	995	
Chromium (VI)	32.4	29.2	
Copper	111.9	96.6	
Cyanide	54.0	20.3	
Iron	2454.4		
Lead	384.6	61.5	
Mercury	0.586	0.047	
Nickel	3546.9	615	
Selenium	46.7	13.3	
Silver	90.7	N/A	
Thallium	24.6		
Zinc	881.8	1393.2	Acute Controls
Boron	2930.85		

X. Antidegradation Considerations

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

The antidegradation rules and procedures allow for modification of effluent limits less than those based

strictly upon mass balance equations utilizing 100% of the assimilative capacity of the receiving water. Additional factors include considerations for "Blue-ribbon" fisheries, special recreational areas, threatened and endangered species, and drinking water sources.

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

XI. Colorado River Salinity Forum Considerations

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

XII. Summary Comments

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

XIII. Notice of UPDES Requirement

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

Utah Division of Water Quality
801-538-6052
File Name: SDNWRF_WLA_2021.xlsm

APPENDIX - Coefficients and Other Model Information

CBOD Coeff. (Kd)20 1/day	CBOD Coeff. FORCED (Kd)/day	CBOD Coeff. (Ka)T 1/day	REAER. Coeff. (Ka)20 (Ka)/day	REAER. Coeff. FORCED 1/day	REAER. Coeff. (Ka)T 1/day	NBOD Coeff. (Kn)20 1/day	NBOD Coeff. (Kn)T 1/day
1.000	0.000	1.059	6.012	0.000	6.191	0.250	0.275

Open Coeff. (K4)20 1/day	Open Coeff. (K4)T 1/day	NH3 LOSS (K5)20 1/day	NH3 (K5)T 1/day	NO2+NO3 LOSS (K6)20 1/day	NO2+NO3 (K6)T 1/day	TRC Decay K(Cl)20 1/day	TRC K(Cl)(T) 1/day
0.000	0.000	4.000	4.235	0.000	0.000	32.000	34.401

BENTHIC DEMAND (SOD)20 gm/m2/day	BENTHIC DEMAND (SOD)T gm/m2/day
1.000	1.081

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

Antidegredation Review

An antidegradation review (ADR) was conducted to determine whether the proposed activity complies with the applicable antidegradation requirements for receiving waters that may be affected. The Level I ADR evaluated the criteria of R317-2-3.5(b) and determined that a Level II antidegradation Review is not required.

ATTACHMENT 3

Reasonable Potential Analysis

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REASONABLE POTENTIAL ANALYSIS

Water Quality has worked to improve our reasonable potential analysis (RP) for the inclusion of limits for parameters in the permit by using an EPA provided model. As a result of the model, more parameters may be included in the renewal permit. A Copy of the Reasonable Potential Analysis Guidance (RP Guide) is available at water Quality. There are four outcomes for the RP Analysis[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 initial screening check for metals showed that the full model needed to be run on cyanide, aluminum, arsenic, cadmium, chromium, copper, lead, molybdenum, nickel, silver, zinc, selenium, and mercury.

The RP model was run on aluminum, arsenic, cadmium, chromium, lead, molybdenum, nickel, selenium, silver, and zinc using the most recent data back through 2018. This resulted in 13 data points for each constitute. The results of the models are that there is not acute or chronic RP at 95% confidence or 99% confidence (Outcome C from Reasonable Potential Guide).

The RP model was run on cyanide using the most recent data back through 2018. This resulted in 13 data points. The results of the models are that there is chronic RP at 95% and 99% confidence (Outcome B from Reasonable Potential Guide). The EPA ProUCL model was used to evaluate the data. This identified 0.0783 as an outlier at 10% significance. The value was excluded from the data set and RP was rerun at both the 95% and 99% confidence levels – there was still chronic RP at 99% confidence. The results indicate that increased cyanide monitoring is required at this time. If elevated data continues, permit may be modified to include a cyanide limit.

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

Outfall 001 RP Input/Output Summary Tables

RP Procedure Output	Outfall Number: 001 Data Units: mg/L	
Parameter	Cyanide	
Distribution	Lognormal	
Reporting Limit	0.0010	
Significant Figures	2	
Maximum Reported Effluent Conc.	0.0783*	
Coefficient of Variation (CV)	1.1	
Acute Criterion	0.2602	
Chronic Criterion	0.1178	
Confidence Interval	95	99
Projected Maximum Effluent Conc. (MEC)	0.1600	0.3900
RP Multiplier	2.1	5.0

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

RP for Acute?	NO	YES
RP for Chronic?	YES	YES
RP for Human Health?	NO	NO
Outcome	B	

* The EPA ProUCL model was used to evaluate the data. This identified 0.0783 as an outlier at 10% significance. The value was excluded from the data set and RP was rerun at both the 95% and 99% confidence levels – there was still chronic RP at 99% confidence.

1. Observation Value 0.0783 is a Potential Outlier
Test Statistic: 0.506
For 10% significance level, 0.0783 is an outlier.
For 5% significance level, 0.0783 is not an outlier.
For 1% significance level, 0.0783 is not an outlier.

RP Procedure Output	Outfall Number: 001 Data Units: mg/L	
Parameter	Aluminum	
Distribution	Lognormal	
Reporting Limit	0.0010	
Significant Figures	2	
Maximum Reported Effluent Conc.	0.374	
Coefficient of Variation (CV)	0.38	
Acute Criterion	6.3586	
Chronic Criterion	NA	
Confidence Interval	95	99
Projected Maximum Effluent Conc. (MEC)	0.510	0.730
RP Multiplier	1.4	1.9
RP for Acute?	NO	NO
RP for Chronic?	NA	NA
RP for Human Health?	NO	NO
Outcome	C	

RP Procedure Output	Outfall Number: 001 Data Units: mg/L	
Parameter	Arsenic	
Distribution	Lognormal	
Reporting Limit	0.0010	
Significant Figures	2	
Maximum Reported Effluent Conc.	0.0315	
Coefficient of Variation (CV)	0.32	
Acute Criterion	2.2655	
Chronic Criterion	3.2243	
Confidence Interval	95	99

Projected Maximum Effluent Conc. (MEC)	0.0410	0.0550
RP Multiplier	1.3	1.8
RP for Acute?	NO	NO
RP for Chronic?	NO	NO
RP for Human Health?	NO	NO
Outcome	C	

RP Procedure Output	Outfall Number: 001 Data Units: mg/L	
Parameter	Cadmium	
Distribution	Lognormal	
Reporting Limit	0.0010	
Significant Figures	2	
Maximum Reported Effluent Conc.	<0.0005	
Coefficient of Variation (CV)	0.19	
Acute Criterion	0.0824	
Chronic Criterion	0.0454	
Confidence Interval	95	99
Projected Maximum Effluent Conc. (MEC)	0.0006	0.0007
RP Multiplier	1.2	1.4
RP for Acute?	NO	NO
RP for Chronic?	NO	NO
RP for Human Health?	NO	NO
Outcome	C	

RP Procedure Output	Outfall Number: 001 Data Units: mg/L	
Parameter	Chromium	
Distribution	Lognormal	
Reporting Limit	0.0010	
Significant Figures	2	
Maximum Reported Effluent Conc.	0.0207	
Coefficient of Variation (CV)	NA	
Acute Criterion	0.1534	
Chronic Criterion	0.1775	
Confidence Interval	95	99
Projected Maximum Effluent Conc. (MEC)	0.0360	0.070
RP Multiplier	1.8	3.4
RP for Acute?	NO	NO
RP for Chronic?	NO	NO
RP for Human Health?	NO	NO
Outcome	C	

RP Procedure Output	Outfall Number: 001 Data Units: mg/L	
Parameter	Copper	
Distribution	Lognormal	
Reporting Limit	0.0010	
Significant Figures	2	
Maximum Reported Effluent Conc.	0.039	
Coefficient of Variation (CV)	0.60	
Acute Criterion	0.552.4	
Chronic Criterion	0.5778	
Confidence Interval	95	99
Projected Maximum Effluent Conc. (MEC)	0.0610	0.100
RP Multiplier	1.6	2.7
RP for Acute?	NO	NO
RP for Chronic?	NO	NO
RP for Human Health?	NO	NO
Outcome	C	

RP Procedure Output	Outfall Number: 001 Data Units: mg/L	
Parameter	Lead	
Distribution	Lognormal	
Reporting Limit	0.0010	
Significant Figures	2	
Maximum Reported Effluent Conc.	<0.002	
Coefficient of Variation (CV)	NA	
Acute Criterion	2.2323	
Chronic Criterion	0.3834	
Confidence Interval	95	99
Projected Maximum Effluent Conc. (MEC)	0.002	0.002
RP Multiplier	1.0	1.0
RP for Acute?	NO	NO
RP for Chronic?	NO	NO
RP for Human Health?	NO	NO
Outcome	C	

RP Procedure Output	Outfall Number: 001 Data Units: mg/L
Parameter	Mercury
Distribution	Lognormal
Reporting Limit	0.0010
Significant Figures	2
Maximum Reported Effluent Conc.	<0.00015
Coefficient of Variation (CV)	0.23

Acute Criterion	0.003398	
Chronic Criterion	0.000272	
Confidence Interval	95	99
Projected Maximum Effluent Conc. (MEC)	0.0002	0.0002
RP Multiplier	1.2	1.5
RP for Acute?	NO	NO
RP for Chronic?	NO	NO
RP for Human Health?	NO	NO
Outcome	C	

RP Procedure Output	Outfall Number: 001 Data Units: mg/L	
Parameter	Molybdenum	
Distribution	Lognormal	
Reporting Limit	0.0010	
Significant Figures	2	
Maximum Reported Effluent Conc.	0.0216	
Coefficient of Variation (CV)	0.23	
Acute Criterion	NA	
Chronic Criterion	NA	
Confidence Interval	95	99
Projected Maximum Effluent Conc. (MEC)	0.0260	0.0320
RP Multiplier	1.2	1.5
RP for Acute?	NA	NA
RP for Chronic?	NA	NA
RP for Human Health?	NA	NA
Outcome	C	

RP Procedure Output	Outfall Number: 001 Data Units: mg/L	
Parameter	Nickel	
Distribution	Lognormal	
Reporting Limit	0.0010	
Significant Figures	2	
Maximum Reported Effluent Conc.	0.0219	
Coefficient of Variation (CV)	0.86	
Acute Criterion	17.7769	
Chronic Criterion	3.733	
Confidence Interval	95	99
Projected Maximum Effluent Conc. (MEC)	0.0400	0.0840
RP Multiplier	1.9	3.8
RP for Acute?	NO	NO
RP for Chronic?	NO	NO
RP for Human Health?	NO	NO

Outcome	C

RP Procedure Output	Outfall Number: 001 Data Units: mg/L	
Parameter	Selenium	
Distribution	Lognormal	
Reporting Limit	0.0010	
Significant Figures	2	
Maximum Reported Effluent Conc.	0.0182	
Coefficient of Variation (CV)	0.80	
Acute Criterion	0.2191	
Chronic Criterion	0.0693	
Confidence Interval	95	99
Projected Maximum Effluent Conc. (MEC)	0.0320	0.0640
RP Multiplier	1.8	3.5
RP for Acute?	NO	NO
RP for Chronic?	NO	NO
RP for Human Health?	NO	NO
Outcome	C	

RP Procedure Output	Outfall Number: 001 Data Units: mg/L	
Parameter	Silver	
Distribution	Lognormal	
Reporting Limit	0.0010	
Significant Figures	2	
Maximum Reported Effluent Conc.	0.002	
Coefficient of Variation (CV)	0.42	
Acute Criterion	0.4722	
Chronic Criterion	NA	
Confidence Interval	95	99
Projected Maximum Effluent Conc. (MEC)	0.0023	0.0028
RP Multiplier	1.2	1.4
RP for Acute?	NO	NO
RP for Chronic?	NA	NA
RP for Human Health?	NO	NO
Outcome	C	

RP Procedure Output	Outfall Number: 001 Data Units: mg/L
Parameter	Zinc
Distribution	Lognormal
Reporting Limit	0.0010
Significant Figures	2

Maximum Reported Effluent Conc.	0.165	
Coefficient of Variation (CV)	0.38	
Acute Criterion	4.3448	
Chronic Criterion	8.3045	
Confidence Interval	95	99
Projected Maximum Effluent Conc. (MEC)	0.2200	0.3200
RP Multiplier	1.4	1.9
RP for Acute?	NO	NO
RP for Chronic?	NO	NO
RP for Human Health?	NO	NO
Outcome	C	

Metals Monitoring and RP Check

Effluent													
Metal	Aluminum	Arsenic	Cadmium	Chromium	Copper	Cyanide	Lead	Mercury	Moly.	Nickel	Selenium	Silver	Zinc
ARP Val	6.3586	2.2655	0.0824	0.1534	0.552.4	0.2602	2.2323	0.003398	NA	17.7769	0.2191	0.4722	4.3448
CRP Val	NA	3.2243	0.0454	0.1775	0.5778	0.1178	0.3834	0.000272	NA	3.733	0.0693	NA	8.3045
Metals, mg/L	<0.1	0.0292	<0.0005	0.0207	0.0144	0.0109	<0.002	<0.00015	0.0132	0.00374	<0.002	<0.002	0.165
	<0.1	0.0253	<0.0005	0.00647	0.0106	0.00876	<0.002	<0.00015	0.0104	0.00251	0.00243	<0.002	0.0672
	0.138	0.0181	<0.0005	<0.002	0.0117	<0.005	<0.002	<0.00015	0.0105	0.00369	<0.002	<0.002	0.0856
	<0.1	0.0275	<0.0005	0.00288	0.039	0.0231	<0.002	<0.00009	0.0166	0.00293	0.00217	<0.02	0.119
	<0.1	0.0315	<0.0005	<0.002	0.0127	<0.005	<0.002	<0.00009	0.0157	0.00337	0.00202	<0.002	0.087
	<0.1	0.0275	<0.0005	<0.002	0.015	0.00818	<0.002	<0.00009	0.0133	0.00257	<0.002	<0.002	0.0683
	<0.1	0.0297	<0.00025	0.0022	0.0112	0.00631	<0.002	<0.00009	0.0144	0.00552	0.00862	<0.001	0.0513
	<0.1	0.0133	<0.0005	0.00376	0.00803	0.0153	<0.002	<0.00009	0.0156	0.00972	<0.002	<0.002	0.0807
	0.374	0.0287	<0.0005	0.00279	0.0183	0.00849	<0.002	<0.00009	0.0216	0.0219	0.0026	<0.002	0.129
	<0.1	0.0173	<0.0005	0.00531	0.00654	0.0102	<0.002	<0.00009	0.0134	0.00485	<0.002	<0.002	0.136
	<0.1	0.0174	<0.0005	0.00212	0.0351	0.0783	<0.002	<0.00009	0.0128	0.00725	0.0182	<0.002	0.122
	<0.1	0.0224	<0.0005	0.00372	0.0127	0.0508	<0.002	<0.00009	0.0187	0.018	0.00474	<0.002	0.161
	<0.1	0.0128	<0.0005	<0.002	0.0063	0.0412	<0.002	<0.00009	0.0199	0.0137	0.00481	<0.002	0.138
Max	0.374	0.0315	<0.0005	0.0207	0.039	0.0783	<0.002	<0.00015	0.0216	0.0219	0.0182	<0.002	0.165
A RP?	NO	NO	NO	NO	NO	YES	NO	NO	NA	NO	NO	NO	NO
C RP?	NA	NO	NO	NO	NO	YES	NO	NO	NA	NO	NO	NO	NO

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