Official Draft Public Notice Version **November 12th, 2025**
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FACT SHEET
TIMPANOGOS SPECIAL SERVICE DISTRICT
RENEWAL PERMIT: DISCHARGE & BIOSOLIDS
UPDES PERMIT NUMBER: UT0023639
UPDES BIOSOLIDS PERMIT NUMBER: UTL-023639
MAJOR MUNICIPAL

FACILITY CONTACTS

Operator Name:	Timpanogos Special Service District
Contact:	Richard Mickelsen
Position:	District Manager
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Permittee Name:	Timpanogos Special Service District
Facility Name:	Timpanogos Wastewater Treatment Plant
Mailing and Facility Address:	PO Box 923 American Fork, Utah 84003
Telephone:	(801) 756-5231
Actual Address:	5050 West 6400 North Utah County, Utah

DESCRIPTION OF FACILITY

Timpanogos Special Service District (TSSD) operates a publicly owned wastewater treatment works located at 5050 West 6400 North, Utah County, Utah. Timpanogos Wastewater Treatment Plant (Facility) was originally built in 1979 and currently has a design flow of 30.0 million gallons a day (MGD). Wastewater is treated by aerated bioreactors, settling and disinfection. Discharge from the Facility's ultraviolet (UV) unit goes through a six-cell pond system before discharge to Utah Lake at a latitude of 40º 20' 26" and a longitude of 111º 46' 35". The point at which Utah Lake receives effluent from the pond system varies depending on the lake level. There is also currently a bypass of the wetlands, which extends from the UV process to Utah Lake. TSSD is undergoing upgrades that include thermal dryers, tertiary filters, upgrades to primary treatment, digestions, gas, UV, and the Outfall, in addition to sidestream treatment. All upgrades are expected to be completed and operational at the end of year 2029.

TSSD provides wastewater disposal services to the communities of Alpine, American Fork, Cedar Hills, Eagle Mountain, Highland, Lehi, Pleasant Grove, Vineyard, Draper, and Saratoga Springs, Utah. TSSD has a Permitted biosolids program and an approved pretreatment program.

SUMMARY OF CHANGES FROM PREVIOUS PERMIT

Phosphorous:
TSSD completed the Phosphorus Compliance Schedule. This Permit contains an effluent limit of 1.0 mg/L annual average in accordance with Utah Administrative Code (UAC) R317-1-3.3.

Ammonia and Compliance Schedule:
Ammonia limitations included in the 2024 wasteload analysis (WLA) for the Fall and Winter seasons are more restrictive than in the previous permit. TSSD would like to further investigate the model used in the WLA and, by association, the limitations produced. TSSD has requested (DWQ-2025-008105) a Compliance Schedule to conduct a mixing zone study for use during the next permit cycle. DWQ has granted this request; the following Compliance Schedule has been incorporated into the permit as a result.

Mixing Zone Study Compliance Schedule*	
Date	**Milestone**
July 1, 2026	Design and submit a tracer study for approval from DWQ. The study shall include sampling at radial transects from the point of discharge to Utah Lake.
January 1, 2027	Submit update to DWQ.
January 1, 2028	Submit update to DWQ.
January 1, 2029	Submit update to DWQ.
January 1, 2030	Submit update to DWQ.
July 1, 2030	Submit completed study report to DWQ.

* Interim ammonia limits will be in place for the duration of this permit cycle and were taken from pervious permit/previous WLA.

DWQ will use the mixing zone study from TSSD to help inform and/ or develop the WLA for the next permit cycle.

Narrative Standard:
Narrative standard language found in Part I.B. of the Permit has been modified, per request from TSSD (DWQ-2025-003978), and still pertains to discharge.

DISCHARGE

DESCRIPTION OF DISCHARGE

TSSD has been reporting self-monitoring results on Discharge Monitoring Reports (DMRs) on a monthly basis. The previous five years of data show that there were no violations.

Outfall	Description of Discharge Point
001	Located at latitude 40°20'26" and longitude 111°46'35". This effluent either travels through an onsite wetlands area and then to Utah Lake or is transported via pipe directly to Utah Lake.

RECEIVING WATERS AND STREAM CLASSIFICATION

Discharge occurs into Utah Lake, which is a Class 2A, 3B, 3D, and 4 according to UAC R317-2-13:

Class 2A -- Protected for frequent primary contact recreation where there is a high likelihood of ingestion of water or a high degree of bodily contact with the water. Examples include, but are not limited to, swimming, rafting, kayaking, diving, and water skiing.
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 MAXIMUM DAILY LOAD (TMDL) REQUIREMENTS

This Facility currently discharges wastewater into an impaired waterbody listed in Utah's 303(d) list of impaired waters as defined in the Clean Water Act. Per the 303(d) list of impaired waters in *Utah's 2024 Integrated Report* (UDWQ 20224), Utah Lake other than Provo Bay (UT-L-16020201-004_01) was listed as impaired for *E. coli*, Harmful Algal Blooms, Eutrophication, PCBs in fish tissue, Phosphorus, Total Dissolved Solids (TDS). No TMDLs have been approved for Utah Lake.

BASIS FOR EFFLUENT LIMITATIONS

In accordance with regulations promulgated in 40 Code of Federal Regulations Part 122.44 and UAC R317-8-4.2, effluent limitations are derived from technology-based effluent limitations guidelines, Utah Secondary Treatment Standards (UAC R317-1-3.2) or Utah Water Quality Standards (UAC R317-2) as applicable. In cases where multiple limits have been developed, those that are more stringent apply. In cases where no limits or multiple limits have been developed, Best Professional Judgment (BPJ) of the Permitting authority may be used where applicable. Best Professional Judgment, or BPJ, refers to a discretionary, best professional decision made by the Permit writer based upon precedent, prevailing regulatory standards, or other relevant information.

Permit limits can also be derived from the WLA, which incorporates Secondary Treatment Standards, Water Quality Standards, including any applicable TMDL impairments as appropriate, Antidegradation Reviews (ADR), and designated uses into a water quality model that projects the effects of discharge concentrations on receiving water quality. Effluent limitations are those that the model demonstrates are sufficient to meet State water quality standards in the receiving waters. During this UPDES renewal Permit development, a WLA and ADR were completed as appropriate and determined that this discharge will not cause a violation of water quality standards. An ADR Level I review was performed and concluded that an ADR Level II review was not required at this time since water quality will not be further lowered by the proposed activity, as per UAC R317-2-3.5.b.1.(b). The WLA indicates that the effluent limitations will be sufficiently protective of water quality, in order to meet State water quality standards in the receiving waters. The WLA with ADR information is attached to this Fact Sheet.

Limitations on total suspended solids (TSS), biochemical oxygen demand (BOD_5), *E. coli*, pH, and percent removal for BOD_5 and TSS are based on current Utah Secondary Treatment Standards, UAC R317-1-3.2. The oil and grease is based on BPJ. Limitations for total phosphorus come from UAC R317-1-.3.3, Technology Based Phosphorus Effluent Limit. Limitations for Ammonia were carried over from the previous Permit under the Mixing Zone Compliance Schedule. The remaining parameters come from the WLA -- attached is the WLA for this discharge into Utah Lake.

Reasonable Potential Analysis

Since January 1, 2016, the Utah Division of Water Quality (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 framework for what routine monitoring or effluent limitations are required.

An initial effluent metals screening and RP check was performed on arsenic, cadmium, chromium, copper, cyanide, lead, mercury, nickel, selenium, and zinc to determine if there was reasonable potential for the discharge to exceed the applicable water quality standards. Based on the initial metals screening, none of the metals were found to have a reasonable potential to exceed the most stringent chronic water quality standard. RP was also run on Ammonia which indicated RP and the continuation of Ammonia limits in the Permit. TDS will remain monitoring only in this Permit renewal. See Attachment 4 for more details on RP.

The Permit limitations are:

Parameter	**Table 1: Effluent Limitations[a]**				
	Maximum Monthly Avg	Maximum Weekly Avg	Yearly Average	Daily Minimum	Daily Maximum
Total Flow, MGD	30.0	--	--	--	--
BOD_5, mg/L	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), mg/L[j]					
Summer (Jul-Sep)	5.2	--	--	--	11.4
Fall (Oct-Dec)	12.4	--	--	--	12.8
Winter (Jan-Mar)	11.2	--	--	--	12.1
Spring (Apr-Jun)	10.1	--	--	--	14.0
Total Ammonia (as N), lbs/day[j]					
Summer (Jul-Sep)	1,311	--	--	--	2,854
Fall (Oct-Dec)	3,114	--	--	--	3,206
Winter (Jan-Mar)	2,813	--	--	--	3,034
Spring (Apr-Jun)	2,528	--	--	--	3,494
E. coli, No./100mL	126	158	--	--	--
Total Phosphorus (as P), mg/L (Final)	--	--	1.0	--	--
WET, Chronic Biomonitoring	--	--	--	--	IC_{25}> 9.1% effluent (from WLA)
Oil & Grease, mg/L	--	--	--	--	10.0
pH, Standard Units	--	--	--	6.5	9

SELF-MONITORING AND REPORTING REQUIREMENTS

The following self-monitoring requirements are the same as in the previous Permit. The Permit requires reports to be submitted monthly and annually, as applicable, on DMR forms due 28 days after the end of the monitoring period. Effective January 1, 2017, monitoring results shall be submitted using NetDMR unless the Permittee has successfully petitioned for an exception. Lab sheets for biomonitoring, metals and toxic organics shall be attached to the DMRs.

Table 2: Self-Monitoring and Reporting Requirements[a]			
Parameter	Frequency	Sample Type	Units
Total Flow[b][c]	Continuous	Recorder	MGD
BOD_5, Influent[d]	5 x Week	Composite	mg/L
Effluent	5 x Week	Composite	mg/L
TSS, Influent[d]	5 x Week	Composite	mg/L
Effluent	5 x Week	Composite	mg/L
E. coli	5 x Week	Grab	No./100mL
pH	5 x Week	Grab	SU
Total Ammonia (as N)	Monthly	Composite	mg/L
Total Ammonia (as N)	5 x Week	Grab	mg/L
DO	5 x Week	Grab	mg/L
WET – Biomonitoring[e]	Quarterly		
Ceriodaphnia - Chronic	2nd & 4th Quarter	Composite	Pass/Fail
Fathead Minnows - Chronic	1st & 3rd Quarter	Composite	Pass/Fail
Oil & Grease[f]	When Sheen Observed	Grab	mg/L
Orthophosphate (as P),[g]			
Effluent	Monthly	Composite	mg/L
Total Phosphorus (as P),[g][h]			
Influent	Monthly	Composite	mg/L
Effluent	Monthly	Composite	mg/L
Total Kjeldahl Nitrogen, TKN (as N)[g][h]			
Influent	Monthly	Composite	mg/L
Effluent	Monthly	Composite	mg/L
Nitrate, NO3[g][h]	Monthly	Composite	mg/L
Nitrite, NO2[g][h]	Monthly	Composite	mg/L
TDS[i]	Monthly	Composite	mg/L

Metals, Arsenic, Total Cadmium, Total Chromium, Total Copper, Total Cyanide, Total Lead, Total Mercury, Total Molybdeunum, Total Nickel, Total Selenium, Total Silver, Total Zinc, Total Influent Effluent	 Quarterly Quarterly	 Composite Composite	 mg/L mg/L
Organic Toxic Pollutants, Influent Effluent	 Yearly Yearly	 Grab/Composite Grab/Composite	 mg/L mg/L

Notes Tables 1 and 2

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 effluent discharge. During months where a discharge will not occur, influent samples shall be taken and analyzed at the frequency stipulated in **Table 2**.
e. Chronic Ceriodaphnia will be tested during the 1st and 3rd quarters and chronic fathead minnows will be tested during the 2nd and 4th quarters.
f. Oil and grease shall be sampled when sheen is present or visible. If no sheen is present or visible, report NA.
g. These reflect changes required with the adoption of UCA R317-1-3.3, Technology-based Phosphorus Effluent Limits rule.
h. Pollutants are being sampled in support of the work being done for the TMDL currently underway for Utah Lake. 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), TSSD will report the results of all sampling done for the POC. If TSSD decides to sample more frequently for these POC's, the additional data will be welcome.
i. Utah Lake is listed as impaired for TDS in Utah's 2024 Integrated Report.
j. Ammonia limits from the previous WLA were incorporated in this Permit for the duration of this Permit cycle. See Part I.C. for more information.

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

No substantial changes have been made.

DESCRIPTION OF TREATMENT AND DISPOSAL

The Permittee submitted their 2024 annual biosolids report on February 18, 2025. The report states the Permittee produced 6,108 dry metric tons (DMT) of solids.

Biosolids are stabilized by an activated sludge process within aerated sludge holding basins. Waste activated sludge and secondary scum are pumped to one or more of four aerated sludge holding basins at an average 1.5% solids. After stabilization, the solids are dewatered by belt presses to about 15 percent solids and landfilled at one of three landfills (i.e., Bay View, Intermountain Regional Landfill or Wasatch Regional Landfill).

The last inspection conducted at the TSSD was March 17, 2025. The inspection showed that TSSD was in compliance with all aspects of the biosolids management program.

During the inspection TSSD updated the Division of the plans to improve the processing of biosolids onsite. They will be bringing an additional aerated holding basin online, increased the number of trailers they have for hauling to the landfill, and had plans to build a biosolids thermal drying system for the facility.

When the thermal dryer is online the facility plans to restart the beneficial use of biosolids through land application. The system will produce Class B biosolids in the beginning, confirming the pathogen reduction through testing.

The thermal dryer will have the ability to produce Class A biosolids, which will be through time and temperature, and confirming the pathogen reduction through testing.

The thermal dryer will also be able to reduce the moisture content to the point where the biosolids will be 80% to 90% solids out of the dryer, and will meet vector attraction reduction (VAR) requirements in 40 CFR 503.33(b) (7 and/or 8).

These changes are not scheduled to be completed until 2029. When they are completed, TSSD may follow Part III A.3.a of the Permit to make changes to the biosolids portion of the Permit and notify the Division of the new biosolids process.

SELF-MONITORING REQUIREMENTS

Under 40 C.F.R. § 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 following chart:

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

In 2024, the TSSD disposed of 6,108 DMT of biosolids, therefore they shall sample at least six times a year.

Landfill Monitoring
Under 40 C.F.R. § 258, the landfill monitoring requirements include a paint filter test. If the biosolids do not pass a paint filter test, the biosolids shall not be disposed in the sanitary landfill (40 C.F.R. § 258.28(c)(1).

TSSD disposed of 6,108 DMT of biosolids at the Wasatch Regional Landfills, the Intermountain Regional Landfill, and North Pointe Solid Waste Special Service District.

BIOSOLIDS LIMITATIONS

Heavy Metals

Class A Biosolids for Home Lawn and Garden Use
The intent of the heavy metals regulations of Table 3, 40 C.F.R. § 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 shall 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 shall 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 shall be provided to the public, because the Permittee shall not be 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 shown in the following Table 3 column. If the biosolids do not meet these requirements, the biosolids shall not 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 C.F.R. § 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 shall 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 C.F.R. § 503.13, to any reasonable degree, the Class B biosolids shall 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 shall meet at all times:

> The maximum heavy metals concentration limits listed in 40 C.F.R. § Part 503.13(b) Table 1 and the heavy metals loading rates in 40 C.F.R. § Part 503.13(b) Table 2; or

The maximum heavy metals in 40 C.F.R. § Part 503.13(b) Table 1 and the monthly heavy metals concentration limits in 40 C.F.R. § Part 503.13(b) Table 3.

Tables 1, 2, 3 and 4 of Heavy Metal Limitations:

Pollutant Limits, (40 C.F.R. § 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], (kg/ha)	Pollutant Conc. Limits [3] (mg/kg)	APLR [4], (kg/ha-yr)
Total Arsenic	75	41	41	2.0
Total Cadmium	85	39	39	1.9
Total Copper	4300	1500	1500	75
Total Lead	840	300	300	15
Total Mercury	57	17	17	0.85
Total Molybdenum	75	N/A	N/A	N/A
Total Nickel	420	420	420	21
Total Selenium	100	100	100	5.0
Total Zinc	7500	2800	2800	140
1, If the concentration of any 1 (one) of these parameters exceeds the Table 1 limit, the biosolids shall not be land applied or beneficially reused in any way.				
2, CPLR - Cumulative Pollutant Loading Rate - The maximum loading for any 1 (one) of the parameters listed that may be applied to land when biosolids are land applied or beneficially used on agricultural, forestry, or reclamation site.				
3, If the concentration of any 1 (one) of these parameters exceeds the Table 3 limit, the biosolids shall not be land applied or beneficially used in on a lawn, home garden, or other high potential public contact site (40 C.F.R. § Part 503.31(d)). If any 1 (one) of these parameters exceeds the Table 3 limit, the biosolids may be land applied or beneficially reused on an agricultural, forestry, reclamation site, or other high potential public contact site, as long as it meets the requirements of Table 1, Table 2, and Table 4.				
4, APLR - Annual Pollutant Loading Rate - The maximum annual loading for any 1 (one) of the parameters listed that may be applied to land when biosolids are land applied or beneficially reused on agricultural, forestry, or a reclamation site, when they do not meet Table 3, but do meet Table 1.				

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 shall not be land applied.

Pathogens

The following table presents Pathogen Control Class limitations that 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)[2] or Fecal Coliforms – less than 1,000 MPN per gram total solids (DWB).	Fecal Coliforms – less than 2,000,000 MPN or CFU[3] per gram total solids (DWB).

Pathogen Control Class	
503.32 (a)(1) - (5), (7), (8), Class A	503.32 (b)(1) - (5), Class B
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 shall 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 (40 C.F.R. § 503.32(a)(7)(i)). At this time TSSD does not intend to distribute biosolids to the public for use on the lawn and garden and thus is not required meet Class A Biosolids requirements currently.

Pathogens Class B

If biosolids are to be land applied for agriculture or land reclamation the solids shall be treated by a specific process to significantly reduce pathogens (PSRP). The TSSD has chosen to achieve PSRP through anerobic digestion: At this time TSSD does not intend to distribute biosolids to the public for use on agricultural land and thus is not required to meet Class B Biosolids requirements currently.

Vector Attraction Reduction (VAR)

If the biosolids are land applied TSSD shall be required to meet VAR through the use of a method of listed under 40 C.F.R. § 503.33. At this time TSSD does not intend to distribute biosolids to the public for beneficial use, and shall be disposing of them in a landfill. Under 40 C.F.R. § 503.33(b)(11)

If the Permittee intends to use another one of the listed alternatives in 40 C.F.R. § 503.33, the Director and the EPA shall be informed at least thirty (30) days prior to its use. This change may be made without additional public notice

Landfill Monitoring

Under 40 C.F.R. § 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 shall not be disposed in the sanitary landfill (40 C.F.R. § 258.28(c)(1)).

Record Keeping

The record keeping requirements from 40 C.F.R. § 503.17 are included under Part III.G. of the Permit. The amount of time the records shall 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 C.F.R. §

503.13, and are sold or given away the records shall be retained for a minimum of five years. If the biosolids are disposed in a landfill the records shall retained for a minimum of five years.

Reporting
For calendar years during which biosolids are produced and/or processed the TSSD shall report annually as required in 40 C.F.R. § 503.18. This report shall 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
TSSD was required to sample for metals at least six times in 2024. Over the past 10 years, all biosolids have met the concentration limits in Table 3 of 40 C.F.R. § 503.13, therefore TSSD biosolids qualify as EQ with regards to metals. A summary of the monitoring data is provided in the following table.

TSSD Metals Monitoring Data

TSSD Metals Monitoring Data, 2015 - 2024			
Parameter	Table 3, mg/kg (Exceptional Quality)	Average, mg/kg	Maximum, mg/kg
Arsenic	41.0	6.3	32
Cadmium	39.0	1.3	5.7
Copper	1,500.0	211	403
Lead	300.0	22	31.8
Mercury	17.0	0.59	15
Molybdenum	75.0	13	80
Nickel	400.0	21	80
Selenium	36.0	8.6	34
Zinc	2,800.0	297	601

PATHOGEN MONITORING DATA
The TSSD has not prepared any biosolids to be beneficially reused in the previous 5 years, so TSSD was not required to monitor for pathogens. Therefore, there is no Pathogen monitoring data for the biosolids that were landfilled. All biosolids land applied in 2024 met the Class B pathogen standards through anaerobic digestion.

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 may be required based on the Standard Industrial Classification (SIC) code for the facility and the types of industrial activities occurring. MSGP coverage is required for Treatment Works treating domestic sewage or any other sewage sludge or wastewater treatment device or system, used in the storage, treatment, recycling, and reclamation of municipal or domestic sewage, including lands dedicated to the disposal of sewage sludge that are located within the confines of the facility, with a design flow of

1.0 million gallons per day (MGD) or more, or required to have an approved pretreatment program under 40 C.F.R. § Part 403. 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

Timpanogos owns, maintains and operates a portion of the Publicly Owned Treatment Works (POTW), which includes the water reclamation facility. The water reclamation facility has a design flow of greater than 5.0 MDG and has Significant Industrial Users discharging to the POTW; therefore, Timpanogos is required to implement an Approved POTW Pretreatment Program (Program). The authority to require a Program is provided in *19-5-108 UCA, 1953 ann.* and *UAC R317-8-8*.

The pretreatment requirements for administering the Program remain the same in the Permit. Timpanogos should review the Program and make changes as needed. Any substantial or non-substantial changes to the Program, as defined in *40 CFR 403.18*, must be submitted to the Division of Water Quality for approval.

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 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 in Part II of the Permit have been added. One requirement is to ensure that if the allowable headworks loading is above the value calculated for the local limit development, then notification must occur and additional monitoring may need to occur. The other change is a requirement to notify the Director of any new pollutants or increased pollutants by an Industrial User.

Timpanogos will be required to annually evaluate 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 must be revised. The initial evaluation is due twelve months after the effective date of the Permit. The Permittee should utilize the EPA Local Limits Development Guidance when evaluating the local limits. Information is provided in Chapter 7 of the EPA Local Limits Development Guidance 2004 to assist with 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 require whole effluent toxicity (WET) testing. Chronic toxicity testing will be required using one species quarterly, alternating between Ceriodaphnia dubia and Pimephales promelas (fathead minnow). The Permit will contain the standard requirements for accelerated testing upon failure of a WET test and a PTI (Preliminary Toxicity Investigation) and TRE (Toxicity Reduction Evaluation) as necessary.

PERMIT DURATION

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

Drafted and Reviewed by
Lindsay Cowles, Discharge Permit Writer
Daniel Griffin, Biosolids
Jennifer Robinson, Pretreatment
Lonnie Shull, Biomonitoring
Carl Adams, Storm Water
Scott Daly, TMDL/Watershed Protection
Lindsay Cowles, Reasonable Potential Analysis
Suzan Tahir, Wasteload Analysis/ADR
Utah Division of Water Quality, (801) 536-4300

PUBLIC NOTICE INFORMATION (to be updated after)

Began: Month Day, Year
Ended: Month Day, Year

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

The Public Notice of the draft Permit was published on State of Utah and/or DWQ's website for at least 30 days as required.

During the public notice and comment period provided under UAC 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 UAC 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 are considered minor changes and the Permit is not required to be re Public Noticed as provided in UAC R317-8-5.6(3)

Responsiveness Summary

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

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ATTACHMENT 1

Effluent Monitoring Data

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Effluent Monitoring Data.

Parameter		Flow (MGD)	BOD Maximum Monthly Average (mg/L)	BOD Maximum Weekly Average (mg/L)	TSS Maximum Monthly Average (mg/L)	TSS Maximum Weekly Average (mg/L)	DO (mg/L)	Ammonia Maximum Monthly Average (mg/L)	Ammonia Daily Maximum (mg/L)	pH Daily Minimum (SU)	pH Daily Maximum (SU)	Ecoli Maximum Monthly Average (No./100 mL)	Ecoli Maximum Weekly Average (No./100 mL)
	Permit Limit	30.0	25	35	25	35	5.0			6.5	9	126	157
Monitoring Period	1/31/2020	20.31	6.5	7.1	13.1	15.8	7		0.75	7.1	7.4	6.9	9.6
	2/29/2020	20.45	7	8.7	11.4	13.4	7.1		0.5	7.1	7.4	7	9.5
	3/31/2020	20.5	6	8	10.2	14.1	6.47		1.02	7.3	7.5	6.7	13.4
	4/30/2020	20.5	5.3	8	10.5	14	6.28		0.44	7.3	7.4	4	5.2
	5/31/2020	21	5.1	5.6	9.6	11.4	6.16		0.63	7.3	7.4	5	5.9
	6/30/2020	21.1	3.4	4.9	8.3	9.7	5.97		9.05	7.4	7.5	6.3	10.5
	7/31/2020	20.9	4.2	4.9	8.6	12.3	5.97	0.547	3.18	7.4	7.5	4.4	10.5
	8/31/2020	20.8	5.3	9.7	7.2	7.7	6.4	2.5	9.95	7.4	7.5	4.9	14.6
	9/30/2020	20.6	4.9	6.7	7	8.9	5.62	1.56	6.52	7.4	7.7	5.9	15.5
	10/31/2020	20.3	4.7	9.7	7.9	9.3	6.77	0.12	0.27	7.4	7.5	4.8	6.8
	11/30/2020	20.2	8	11.9	16.8	28.4	6.77	0.13	0.18	7.4	7.5	5.2	15.7
	12/31/2020	19.9	6.8	7.9	13.5	15.5	7.15	0.35	0.64	7.3	7.5	3.2	3.3
	1/31/2021	19.9	12	18.4	20.9	31.6	7.08	0.64	0.64	7.3	7.5	4.7	7.9
	2/28/2021	19.9	9.3	12.3	18.7	23.1	6.83	6.32	6.32	7.3	7.5	4.8	6.2
	3/31/2021	20.1	8.1	8.5	15	20.9	6.73	1.02	1.08	7.3	7.5	6.6	14.7
	4/30/2021	20	5.9	8.2	10.6	13.4	6.5	0.52	0.52	7.3	7.5	4.4	12.2
	5/31/2021	20.5	4	5.7	7.7	9.9	6.5	2.34	2.34	7.4	7.5	3.2	4.5
	6/30/2021	20.5	3.1	3.5	7.4	8.4	5.89	4.1	4.1	7.4	7.7	2.7	4.1
	7/31/2021	20.4	3.3	3.5	6.2	7.3	5.8	1.37	1.37	7.4	7.5	2.6	2.8
	8/31/2021	20.8	6.1	7.2	7.3	8.5	6.57	0.52	0.52	7.3	7.5	4.1	7.4
	9/30/2021	20	4.3	7.3	6.5	8.6	6.77	1.44	1.44	7.3	7.5	4.3	6.6
	10/31/2021	20.4	2.9	3.4	7.4	10.1	6.98	0.35	0.35	7.3	7.5	4.7	8.6
	11/30/2021	19.9	2.9	3.6	6.4	7.7	7.3	2.4	2.4	7.3	7.5	2.8	3.1
	12/31/2021	19.9	3.7	4.8	7.6	12	7.33	0.08	0.08	7.3	7.6	3.2	4.4
	1/31/2022	20.2	4.3	4.9	7.5	9.9	7.7	0.12	0.12	7.4	7.5	2.3	4.1
	2/28/2022	19.6	3.3	4.5	5.6	8.6	7.1	0.23	0.23	7.3	7.4	1.9	2.5
	3/31/2022	20	4.3	5.4	6	8.3	7.58	0.46	0.46	7.3	7.4	2.5	3.5
	4/30/2022	20.2	2.8	5.1	5.2	6.3	6.14	0.08	0.08	7.3	7.5	3.3	4.3
	5/31/2022	20.7	2.9	3.4	5.5	7.7	7.26	0.14	0.14	7.4	7.6	4.5	7.2
	6/30/2022	22.1	3.6	4.8	6.6	8.9	6.82	0.09	0.09	7.4	7.5	5.8	8.7
	7/31/2022	22.8	4.5	5	4.8	6.1	6.1	0.3	0.3	7.4	7.6	6.8	10.3
	8/31/2022	22	5.5	6.2	5.2	6.2	6.9	1.65	1.65	7.4	7.6	9.1	15.1
	9/30/2022	20.7	4.3	5.3	6.1	7.3	6.8	0.32	0.32	7.4	7.5	18.7	26.6
	10/31/2022	20.4	2.7	4.3	5.4	8.7	6.8	0.34	0.34	7.3	7.5	18.4	27.9
	11/30/2022	20.9	4.2	8	6	7.8	6.93	0.72	0.72	7.3	7.5	19.6	28.7
	12/31/2022	21.3	4.7	8	6.6	8.8	7	4.1	4.1	7.3	7.5	16.5	22.3
	1/31/2023	25.3	7.9	10.5	8.4	11.9	7.3	2.14	2.14	7.3	7.5	12.1	23
	2/28/2023	23	5.5	6.8	6.7	7.6	6.7	0.41	0.41	7.4	7.5	9.4	12.3
	3/31/2023	24	8	12.1	9.3	13.7	6.8	0.98	0.98	7.4	7.5	13.7	29.6
	4/30/2023	23.6	8.6	12.1	8	14.3	7.2	2.3	2.3	7.3	7.5	11.8	29.6
	5/31/2023	23.2	7.5	9	7.5	10.1	6.8	3.61	3.61	7.3	7.9	5.8	12.6
	6/30/2023	23.4	3.8	5.7	4.6	6.5	6.25	0.42	0.42	7.2	7.5	3.4	6.2
	7/31/2023	24.4	3.7	5.8	7.1	11.8	6.16	1.28	1.28	7.3	7.5	8.8	20.5
	8/31/2023	24.8	3.1	4.3	3.8	5.4	6.4	0.44	0.44	7.3	7.5	7	9.9
	9/30/2023	25.3	2.3	2.8	3.8	5.8	6.5	0.94	0.94	7.2	7.5	6.4	8.4
	10/31/2023	25.4	1.8	2	4.2	5.5	6.6	0.98	0.98	7.3	7.4	6.2	10.4
	11/30/2023	23.2	3.4	6	6.6	7.6	6.76	0.17	0.17	7.3	7.5	5.6	7.4
	12/31/2023	23.8	5.3	7.3	6.5	11.7	6.7	3.8	3.8	7.3	7.5	8.2	14.1
	1/31/2024	25.3	4.5	6.6	4.4	6.1	6.8	3.74	3.74	7.3	7.5	9.9	19.9
	2/29/2024	26.5	2.8	3.5	3.9	4.6	6.79	1.6	1.6	7.4	7.4	9.9	19.9
	3/31/2024	25.7	4.5	8.1	5	5.7	6.75	1.59	1.59	7.3	7.5	7.3	37.6
	4/30/2024	25.5	4.5	8.9	3.6	6.2	6.8	1.59	1.59	7.3	7.4	6.9	8.6
	5/31/2024	25.6	2.2	4.1	3.5	6.2	6.66	0.76	0.76	7.2	7.4	6	8.8
	6/30/2024	25.7	1.6	2.3	4.4	5	6.3	0.07	0.07	7.2	7.4	6.8	8.8
	7/31/2024	25.6	3.1	5.1	4.9	6.2	6.09	0.18	0.18	7.3	7.4	11.6	18.1
	8/31/2024	27.3	5.3	7.1	8.4	12.2	6	0.59	0.59	7.3	7.4	17.3	19.1
	9/30/2024	26.4	6.9	8.1	10.4	13.3	6.08	0.58	0.58	7.3	7.4	26.9	48.8
	10/31/2024	25.4	8.3	10.5	15.1	19.4	6.16	0.92	0.92	7.3	7.4	21.9	29.2
	11/30/2024	25.3	8.5	10.5	13.5	19.4	6.33	1	1	7.2	7.4	25.7	40.3

WET Results

Month	WET Test	Pass / Fail
Mar-20	96Hr Chronic Pimephales Promelas	Pass
Jun-20	96Hr Chronic Ceriodaphnia	Pass
Aug-20	96Hr Chronic Pimephales Promelas	Pass
Nov-20	96Hr Chronic Ceriodaphnia	Pass
Feb-21	96Hr Chronic Pimephales Promelas	Pass
May-21	96Hr Chronic Ceriodaphnia	Pass
Aug-21	96Hr Chronic Pimephales Promelas	Pass
Nov-21	96Hr Chronic Ceriodaphnia	Pass
Feb-22	96Hr Chronic Pimephales Promelas	Pass
May-22	96Hr Chronic Ceriodaphnia	Pass
Aug-22	96Hr Chronic Pimephales Promelas	Pass
Nov-22	96Hr Chronic Ceriodaphnia	Pass
Feb-23	96Hr Chronic Pimephales Promelas	Pass
May-23	96Hr Chronic Ceriodaphnia	Pass
Aug-23	96Hr Chronic Pimephales Promelas	Pass
Nov-23	96Hr Chronic Ceriodaphnia	Pass
Feb-24	96Hr Chronic Pimephales Promelas	Pass
May-24	96Hr Chronic Ceriodaphnia	Pass
Aug-24	96Hr Chronic Pimephales Promelas	Pass

ATTACHMENT 2

Wasteload Analysis

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

Date: **March 4, 2025**

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

Facility: **Timpanogos Special Service District**
UPDES No. UT-0023639

Receiving water: **Utah Lake**

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

Discharge

Outfall 001: Utah Lake

Water is discharged in two ways to Utah Lake. The first method is for the effluent to be routed through a series of basins originally constructed for the purpose of dechlorination. These basins outlet via an open channel surface discharge to Utah Lake. The second method is direct discharge to the lake via a circular pipe.

The maximum daily design flow for the facility is 30 MGD, as provided by the permittee on the permit application.

Receiving Water

The receiving water for Outfall 001 is Utah Lake. Per UAC R317-2-13.12.x, the beneficial uses for Utah Lake are 2A, 3B, 3D and 4.

- *Class 2A: Protected for frequent primary contact recreation where there is a high likelihood of ingestion of water or a high degree of bodily contact with the water. Examples include, but are not limited to, swimming, rafting, kayaking, diving, and water skiing.*

- *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.*

Flow

The critical water surface elevation for the wasteload analysis was considered the lowest elevation for seven consecutive days with a ten year return frequency (7Q10). Based on aerial photography and site reconnaissance, the 7Q10 water surface elevation was assumed to be below the discharge pipe during low lake levels, resulting in a surface discharge to Utah Lake.

Protection of Downstream Uses

Per UAC R317-2-8, all actions to control waste discharges under these rules shall be modified as necessary to protect downstream designated uses. The effluent limits derived to support the uses in Utah Lake are considered protective of downstream uses.

Parameters of Concern

The potential parameters of concern identified for the discharge were total suspended solids (TSS), dissolved oxygen (DO), BOD_5, total phosphorus (TP), total nitrogen (TN), total ammonia (TAN), dissolved metals, and pH, as determined in consultation with the UPDES Permit Writer.

Impaired Waters and TMDL

Per the 303(d) list of impaired waters in *Utah's 2024 Intergrated Report* (UDWQ 20224), Utah Lake other than Provo Bay (UT-L-16020201-004_01) was listed as impaired for E. coli, Harmful Algal Blooms, Eutrophication, PCBs in fish tissue, Phosphorus, Total Dissolved Solids (TDS). No TMDLs have been approved for Utah Lake.

Water Quality Modeling

The Visual Plumes program (Version 20), originally developed by EPA and currently maintained and distributed by the California State Water Resources Control Board, was utilized to determine the dilution at the mixing zone boundary (Frick et al. 2003). The Prych, Davis, Shirazi (PDS) sub-model, which simulates surface discharges to waterbodies from open channels, was applied (Davis 1998). The inputs and results of the mixing zone model are attached in Appendix C.

The dilution factors determined by the mixing zone model were applied to determine the WQBELs. Water quality constituents were assumed not to decay within the mixing zone. Ambient receiving water quality data was characterized using data from monitoring site 4917310 Utah Lake 0.5 Miles West of Geneva Discharge #15-A. The mean value was calculated for each constituent

with available data in the receiving water. Effluent parameters were characterized using data from monitoring site 4995038, 4995040, and 4995041 for Timpanogos WWTP. The results of the mass balance mixing analysis are summarized in Appendix A.

The water quality criterion for chronic ammonia toxicity is dependent on temperature and pH, and the water quality criterion for acute ammonia toxicity is dependent on pH. The water quality criteria for ammonia are summarized in Appendix B.

Mixing Zone

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

The dilution at the mixing zone boundary for acute conditions (35 feet) was 2.5:1 and for chronic conditions (200 feet) was 10:1.

WET Limits

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

Table 1: WET Limits for IC_{25}

Season	Percent Effluent
Annual	9.1%

Antidegradation Level I Review

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

Level II Antidegradation Review

A Level II Antidegradation Review (ADR) is not required for this discharge since the pollutant concentration and/or load is not increasing under this permit renewal.

Documents

WLA Document: *TimpanogosWLA_03-04-2025.docx*

Analysis:

- *TimpanogosWLA_03-04-2025.xlsx*
- *TimpanogosWLA_03_04-2025_AppendA.pdf*
- *TimpanogosWLA_03_04-2025_AppendB(Acute).pdf*
- *TimpanogosWLA_03_04-2025_AppendB(Chronic).pdf*
- *TimpanogosWLA_03_04-2025_AppendC.pdf*

References:

Davis, L.R. 1998. Fundamentals of Environmental Discharge Modeling. CRC Press.

Frick, W.E., P.J.W. Roberts, L.R. Davis, J. Keyes, D.J. Baumgartner , and K.P. George. 2003. Dilution Models for Effluent Discharges 4th Edition (Visual Plumes). United States Environmental Protection Agency, National Exposure Research Laboratory. EPA/600/R-03/025.

Utah Division of Water Quality. 2024. *Final 2024 Integrated Report on Water Quality*

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

WASTELOAD ANALYSIS [WLA] Date: 5/20/2025
Appendix A: Mass Balance Mixing Analysis

Discharging Facility: Timpanogos SSD
UPDES No: UT-0023639
Permit Flow [MGD]: 30.00 Max. Daily

Downstream Receiving Water: Utah Lake
Beneficial Uses: 2B, 3B, 3D, 4

Modeling Information

A mass balance mixing analysis was used to determine the effluent limits.

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

Model Inputs

Mixing Information

Acute Dilution Ratio	2.5 to 1
Chronic Dilution Ratio	10.0 to 1

	Mean Temp.	Mean pH	Max pH
Summer Critical Season	**Deg. C**		
Lake Background	23.8	8.50	8.53
Discharge	24.0	7.38	7.70
Mixed	23.8	8.46	8.41

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 reflect the environmental conditions expected at low stream flows.

Effluent Limitations for Protection of Recreation (Class 2B Waters)

Physical Parameter	Concentration Minimum	Maximum
pH	6.5	9.0
Turbidity Increase (NTU)		10.0

Bacteriological

E. coli (30 Day Geometric Mean)	206	(#/100 mL)
E. coli (Maximum)	668	(#/100 mL)

Effluent Limitations for Protection of Aquatic Wildlife (Class 3D Waters)

Physical Parameter	Concentration Minimum	Maximum
pH	6.5	9.0

WET Limits for IC_{25} 9.09% Effluent

Dissolved Oxygen (mg/L)	Minimum Concentration
Instantaneous	5.0
7-day Average	6.0
30-day Average	5.5

Inorganics Parameter	Acute Standard (1 Hour Average) Standard
Phenol (mg/L)	0.010
Hydrogen Sulfide (Undissociated) [mg/L]	0.002

Ammonia-Total (mg/L)	Chronic (30-day ave)				Acute (1-hour ave)			
Season	Standard	Background	Conc. Limit (mg/L)	Load Limit (lbs/day)	Standard	Background	Conc. Limit (mg/L)	Load Limit (lbs/day)
Summer	0.61	0.03	6.4	1,593	3.48	0.03	12.1	3,034
Fall	1.16	0.03	12.4	3,114	3.68	0.03	12.8	3,206
Winter	1.05	0.03	11.2	2,813	3.48	0.03	12.1	3,034
Spring	1.15	0.03	12.4	3,103	4.66	0.03	16.2	4,067

Metals-Total Recoverable		Chronic (4-day ave)			Acute (1-hour ave)			
Parameter	Standard[1]	Background	Conc. Limit (µg/L)	Load Limit (lbs/day)	Standard[1]	Background	Conc. Limit (µg/L)	Load Limit (lbs/day)
Aluminum	N/A[2]		N/A[2]	N/A[2]	750	52	2,495	625
Arsenic	150	14.6	1,504	376	340	14.6	1,153	289
Cadmium	0.7	0.1	7.3	1.8	8.2	0.1	28	7.1
Chromium VI	11.0	1.1	110	28	16.0	1.1	53	13
Chromium III	254	1.1	2,783	697	5,314	1.1	18,598	4,656
Copper	28.8	2.1	296	74	48.5	2.1	165	41
Cyanide	5.2	2.6	31.2	7.8	22.0	2.6	71	18
Iron					1,000	64	3,339	836
Lead	17.1	0.30	185	46	438	0.3	1533	384
Mercury[2]	0.012	0.006	0.072	0.018	2.4	0.006	8.4	2.1
Nickel	159	2.4	1,729	433	1,433	2.4	5,010	1,254
Selenium	4.6	0.7	43.2	10.8	18.4	0.7	63	16
Silver					36.6	0.3	128	32
Tributylin[2]	0.072	0.036	0.432	0.108	0.46	0.0	1.5	0.4
Zinc	367	4.8	3,985	998	367	4.8	1,271	318

1: Based upon a Hardness of 374.3 mg/l as CaCO3

2: Where the pH is equal to or greater than 7.0 and the hardness is equal to or greater than 50 ppm as $CaC0_3$ in the receiving water after mixing, the 87 ug/L chronic criterion (expressed as total recoverable) will not apply, and aluminum will be regulated based on compliance with the 750 ug/L acute aluminum criterion (expressed as total recoverable).

Organics [Pesticides]		Chronic (4-day ave)			Acute (1-hour ave)			
Parameter	Standard	Background	Conc. Limit (µg/L)	Load Limit (lbs/day)	Standard	Background	Conc. Limit (µg/L)	Load Limit (lbs/day)
Aldrin					1.5	0.75	3.4	0.8
Chlordane	0.0043	0.00215	0.0258	0.0065	1.2	0.00215	4.2	1.1
DDT, DDE	0.001	0.0005	0.006	0.002	0.55	0.0005	1.92	0.48
Diazinon	0.17	0.085	1.02	0.26	0.17	0.085	0.38	0.10
Dieldrin	0.0056	0.0028	0.0336	0.0084	0.24	0.0028	0.83	0.21
Endosulfan, a & b	0.056	0.028	0.336	0.084	0.11	0.028	0.32	0.08
Endrin	0.036	0.018	0.216	0.054	0.086	0.018	0.256	0.064
Heptachlor & H. epoxide	0.0038	0.0019	0.0228	0.0057	0.26	0.0019	0.91	0.23
Lindane	0.08	0.04	0.48	0.12	1.0	0.04	3.4	0.9
Methoxychlor					0.03	0.015	0.07	0.02
Mirex					0.001	0.0005	0.002	0.001
Nonylphenol	6.6	3.3	39.6	9.9	28.0	3.3	89.8	22.5
Parathion	0.0130	0.0065	0.0780	0.0195	0.066	0.0065	0.215	0.054
PCB's	0.014	0.007	0.084	0.021				
Pentachlorophenol	15.0	7.5	90.0	22.5	19.0	7.5	47.8	12.0
Toxephene	0.0002	0.0001	0.0012	0.0003	0.73	0.0001	2.55	0.64

Radiological	Maximum Concentration
Parameter	Standard
Gross Alpha (pCi/L)	15

Numeric Criteria for the Protection of Human Health from Consumption of Water and Fish

	Class 1C (Water and Organism)				Class 3 (Organism Only)			
Toxic Organics	**Standard**	**Background**	**Conc. Limit (µg/L)**	**Load Limit (lbs/day)**	**Standard**	**Background**	**Conc. Limit (µg/L)**	**Load Limit (lbs/day)**
Antimony	5.6	2.8	N/A	N/A	640	2.8	7012	1756
Copper	1300	650	N/A	N/A				
Nickel	610	305	N/A	N/A	4600	305	47550	11905
Selenium	170	85	N/A	N/A	4200	85	45350	11354
Thallium	0.24	0.12	N/A	N/A	0.47	0.12	3.97	0.99
Zinc	7400	3700	N/A	N/A	26000	3700	249000	62340
Cyanide	4	2	N/A	N/A	400	2	4380	1097
Asbestos (million fibers/L)	7	3.5	N/A	N/A				
2,3,7,8-TCDD Dioxin	5.00E-09	2.50E-09	N/A	N/A	5.1E-09	2.5E-09	3.11E-08	7.786E-09
Acrolein	3	1.5	N/A	N/A	400	1.5	4385	1098
Acrylonitrile	0.061	0.0305	N/A	N/A	7	0.0305	76.7	19
Benzene	2.1	1.05	N/A	N/A	51	1.05	551	138
Bromoform	7	3.5	N/A	N/A	120	3.5	1285	322
Carbon Tetrachloride	0.4	0.2	N/A	N/A	5	0.2	53.0	13
Chlorobenzene	100	50	N/A	N/A	800	50	8300	2078
Chlorodibromomethane	0.8	0.4	N/A	N/A	21	0.4	227	57
Chloroform	60	30	N/A	N/A	2000	30	21700	5433
Dalapon	200	100	N/A	N/A				
Dichlorobromomethane	0.95	0.475	N/A	N/A	27	0.475	292	73
1,2-Dichloroethane	9.9	4.95	N/A	N/A	2000	4.95	21951	5496
1,1-Dichloroethylene	300	150	N/A	N/A	20000	150	218500	54704
1,2-Dichloropropane	0.9	0.45	N/A	N/A	31	0.45	337	84
1,3-Dichloropropene	0.27	0.135	N/A	N/A	12	0.135	131	33
Ethylbenzene	68	34	N/A	N/A	130	34	1090	273
Ethylene Dibromide	0.05	0.025	N/A	N/A				
Methyl Bromide	100	50	N/A	N/A	10000	50	109500	27415
Methylene Chloride	20	10	N/A	N/A	1000	10	10900	2729
1,1,2,2-Tetrachloroethane	0.2	0.1	N/A	N/A	3	0.1	32.0	8.0
Tetrachloroethylene	10	5	N/A	N/A	29	5	269	67
Toluene	57	28.5	N/A	N/A	520	28.5	5435	1361
1,2 -Trans-Dichloroethyle	100	50	N/A	N/A	4000	50	43500	10891
1,1,1-Trichloroethane	10000	5000	N/A	N/A	200000	5000	2150000	538279
1,1,2-Trichloroethane	0.55	0.275	N/A	N/A	8.9	0.275	95.2	24
Trichloroethylene	0.6	0.3	N/A	N/A	7	0.3	74.0	19
Vinyl Chloride	0.022	0.011	N/A	N/A	1.6	0.011	17.5	4.4
2-Chlorophenol	30	15	N/A	N/A	800	15	8650	2166
2,4-Dichlorophenol	10	5	N/A	N/A	60	5	610	153
2,4-Dimethylphenol	100	50	N/A	N/A	3000	50	32500	8137
2-Methyl-4,6-Dinitrophenol	2	1	N/A	N/A	30	1	320	80
2,4-Dinitrophenol	10	5	N/A	N/A	300	5	3250	814
3-Methyl-4-Chlorophenol	500	250	N/A	N/A	2000	250	19500	4882
Penetachlorophenol	0.03	0.015	N/A	N/A	0.04	0.015	0.29	0.073
Phenol	4000	2000	N/A	N/A	300000	2000	3280000	821188
2,4,5-Trichlorophenol	300	150	N/A	N/A	600	150	5100	1277
2,4,6-Trichlorophenol	1.5	0.75	N/A	N/A	2.8	0.75	23.3	6
Acenaphthene	70	35	N/A	N/A	90	35	640	160
Anthracene	300	150	N/A	N/A	400	150	2900	726
Benzidine	0.00014	0.00007	N/A	N/A	0.011	0.00007	0.1203	0.0301
BenzoaAnthracene	0.0012	0.0006	N/A	N/A	0.0013	0.0006	0.0083	0.0021
BenzoaPyrene	0.00012	0.00006	N/A	N/A	0.00013	0.00006	0.00083	0.00021
BenzobFluoranthene	0.0012	0.0006	N/A	N/A	0.0013	0.0006	0.0083	0.0021
BenzokFluoranthene	0.012	0.006	N/A	N/A	0.013	0.006	0.083	0.0208

	Class 1C (Water and Organism)				Class 3 (Organism Only)			
Toxic Organics	**Standard**	**Background**	**Conc. Limit (µg/L)**	**Load Limit (lbs/day)**	**Standard**	**Background**	**Conc. Limit (µg/L)**	**Load Limit (lbs/day)**
Bis2-Chloro1methylether	0.00015	0.000075	N/A	N/A	0.017	0.000075	0.18625	0.0466
Bis2-Chloro1methylethylether	200	100	N/A	N/A	4000	100	43000	10766
Bis2-ChloroethylEther	0.03	0.015	N/A	N/A	2.2	0.015	24.1	6.0
Bis2-Chloroisopropy1Ether	1400	700	N/A	N/A	65000	700	708000	177256
Bis2-EthylhexylPhthalate	0.32	0.16	N/A	N/A	0.37	0.16	2.47	0.62
Butylbenzyl Phthalate	0.1	0.05	N/A	N/A	0.1	0.05	0.6	0.15
2-Chloronaphthalene	800	400	N/A	N/A	1000	400	7000	1753
Chrysene	0.12	0.06	N/A	N/A	0.13	0.06	0.83	0.21
Dibenzoa, (h)Anthracene	0.00012	0.00006	N/A	N/A	0.00013	0.00006	0.00083	0.00021
1,2-Dichlorobenzene	1000	500	N/A	N/A	3000	500	28000	7010
1,3-Dichlorobenzene	7	3.5	N/A	N/A	10	3.5	75.0	19
1,4-Dichlorobenzene	300	150	N/A	N/A	900	150	8400	2103
3,3-Dichlorobenzidine	0.049	0.0245	N/A	N/A	0.15	0.0245	1.405	0.35
Diethyl Phthalate	600	300	N/A	N/A	600	300	3600	901
Dimethyl Phthalate	2000	1000	N/A	N/A	2000	1000	12000	3004
Di-n-Butyl Phthalate	20	10	N/A	N/A	30	10	230	58
2,4-Dinitrotoluene	0.049	0.0245	N/A	N/A	1.7	0.0245	18.455	4.6
Dinitrophenols	10	5	N/A	N/A	1000	5	10950	2741
1,2-Diphenylhydrazine	0.03	0.015	N/A	N/A	0.2	0.015	2.05	0.51
Fluoranthene	20	10	N/A	N/A	20	10	120	30
Fluorene	50	25	N/A	N/A	70	25	520	130
Hexachlorobenzene	0.000079	0.0000395	N/A	N/A	0.000079	0.0000395	0.000474	0.000119
Hexachlorobutedine	0.01	0.005	N/A	N/A	0.01	0.005	0.06	0.015
Hexachloroethane	0.1	0.05	N/A	N/A	0.1	0.05	0.6	0.15
Hexachlorocyclopentadiene	4	2	N/A	N/A	4	2	24.0	6.0
Ideno 1,2,3-cdPyrene	0.0012	0.0006	N/A	N/A	0.0013	0.0006	0.0083	0.0021
Isophorone	34	17	N/A	N/A	1800	17	19630	4915
Nitrobenzene	10	5	N/A	N/A	600	5	6550	1640
N-Nitrosodiethylamine	0.0008	0.0004	N/A	N/A	1.24	0.0004	13.6	3.4
N-Nitrosodimethylamine	0.00069	0.000345	N/A	N/A	3	0.000345	32.99655	8.3
N-Nitrosodi-n-Propylamine	0.005	0.0025	N/A	N/A	0.51	0.0025	5.6	1.4
N-Nitrosodiphenylamine	3.3	1.65	N/A	N/A	6	1.65	49.5	12
N-Nitrosopyrrolidine	0.016	0.008	N/A	N/A	34	0.008	373.92	94
Pentachlorobenzene	0.1	0.05	N/A	N/A	0.1	0.05	0.6	0.15
Pyrene	20	10	N/A	N/A	30	10	230	58
1,2,4-Trichlorobenzene	0.071	0.0355	N/A	N/A	0.076	0.0355	0.481	0.12
Aldrin	0.00000077	0.000000385	N/A	N/A	0.00000077	0.000000385	0.00000462	#########
alpha-BHC	0.00036	0.00018	N/A	N/A	0.00039	0.00018	0.00249	0.00062
beta-BHC	0.008	0.004	N/A	N/A	0.014	0.004	0.114	0.029
gamma-BHC (Lindane)	4.2	2.1	N/A	N/A	4.4	2.1	27.4	6.9
Hexachlorocyclohexane (HCH)	0.0066	0.0033	N/A	N/A	0.01	0.0033	0.077	0.019
Chlordane	0.00031	0.000155	N/A	N/A	0.00032	0.000155	0.00197	0.00049
4,4-DDT	0.00003	0.000015	N/A	N/A	0.00003	0.000015	0.00018	0.000045
4,4-DDE	0.000018	0.000009	N/A	N/A	0.000018	0.000009	0.000108	0.000027
4,4-DDD	0.00012	0.00006	N/A	N/A	0.00012	0.00006	0.00072	0.00018
Dieldrin	0.0000012	0.0000006	N/A	N/A	0.0000012	0.0000006	0.0000072	0.0000018
alpha-Endosulfan	20	10	N/A	N/A	30	10	230	58
beta-Endosulfan	20	10	N/A	N/A	40	10	340	85
Endosulfan Sulfate	20	10	N/A	N/A	40	10	340	85
Endrin	0.03	0.015	N/A	N/A	0.03	0.015	0.18	0.05
Endrin Aldehyde	1	0.5	N/A	N/A	1	0.5	6.0	2
Heptachlor	0.0000059	0.00000295	N/A	N/A	0.0000059	0.00000295	0.0000354	0.0000089
Heptachlor Epoxide	0.000032	0.000016	N/A	N/A	0.000032	0.000016	0.000192	0.000048
Methoxychlor	0.02	0.01	N/A	N/A	0.02	0.01	0.12	0.03
Polychlorinated Biphenyls (PCB)	0.000064	0.000032	N/A	N/A	0.000064	0.000032	0.000384	0.000096
Toxaphene	0.0007	0.00035	N/A	N/A	0.00071	0.00035	0.00431	0.00108

Effluent Limitation for Protection of Agriculture (Class 4 Waters)

	Maximum Concentration				
Parameter	**Standard**	**Background**	**Conc. Limit**	**Load Limit (lbs/day)**	
Total Dissolved Solids (mg/L)	1,200		1,200	300,435	Impaired
Boron (µg/L)	750	388	1,655	414	
Arsenic, Dissolved (µg/L)	100	14.6	313	78	
Cadmium, Dissolved (µg/L)	10	0.1	35	9	
Chromium, Dissolved (µg/L)	100	1.1	347	87	
Copper, Dissolved (µg/L)	200	2.1	695	174	
Lead, Dissolved (µg/L)	100	0.3	349	87	
Selenium, Dissolved (µg/L)	50	0.7	173	43	
Gross Alpha (pCi/L)	15		15		

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

INPUT	Summer	Fall	Winter	Spring
pH:	8.61	8.48	8.54	8.36
Beneficial use classification:	3B	3B	3B	3B

OUTPUT				
Total ammonia nitrogen criteria (mg N/L):				
Acute:	2.60	3.36	2.96	4.18

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

INPUT	Summer	Fall	Winter	Spring
Temperature (deg C):	23.78	9.82	7.36	17.00
pH:	8.49	8.46	8.52	8.37
Are fish early life stages present?	Yes	Yes	Yes	Yes

OUTPUT				
Total ammonia nitrogen criteria (mg N/L):				
Chronic - Fish Early Life Stages Present:	0.60	1.16	1.05	1.15
Chronic - Fish Early Life Stages Absent:	0.60	1.57	1.66	1.15

Project "C:\Plumes20\TimpSurfaceWLA" memo

Model configuration items checked:
Channel width (m) 100
Start case for graphs 1
Max detailed graphs 10 (limits plots that can overflow memory)
Elevation Projection Plane (deg) 0
Shore vector (m,deg) not checked
Bacteria model : Mancini (1978) coliform model
PDS sfc. model heat transfer : Low
Equation of State : S, T
Similarity Profile : Default profile (k=2.0, ...)
Diffuser port contraction coefficient 1
Light absorption coefficient 0.16
Farfield increment (m) 200
UM3 aspiration coefficient 0.1
Output file: text output tab
Output each ?? steps 100
Maximum dilution reported 100000
Text output format : Standard
Max vertical reversals : to max rise or fall

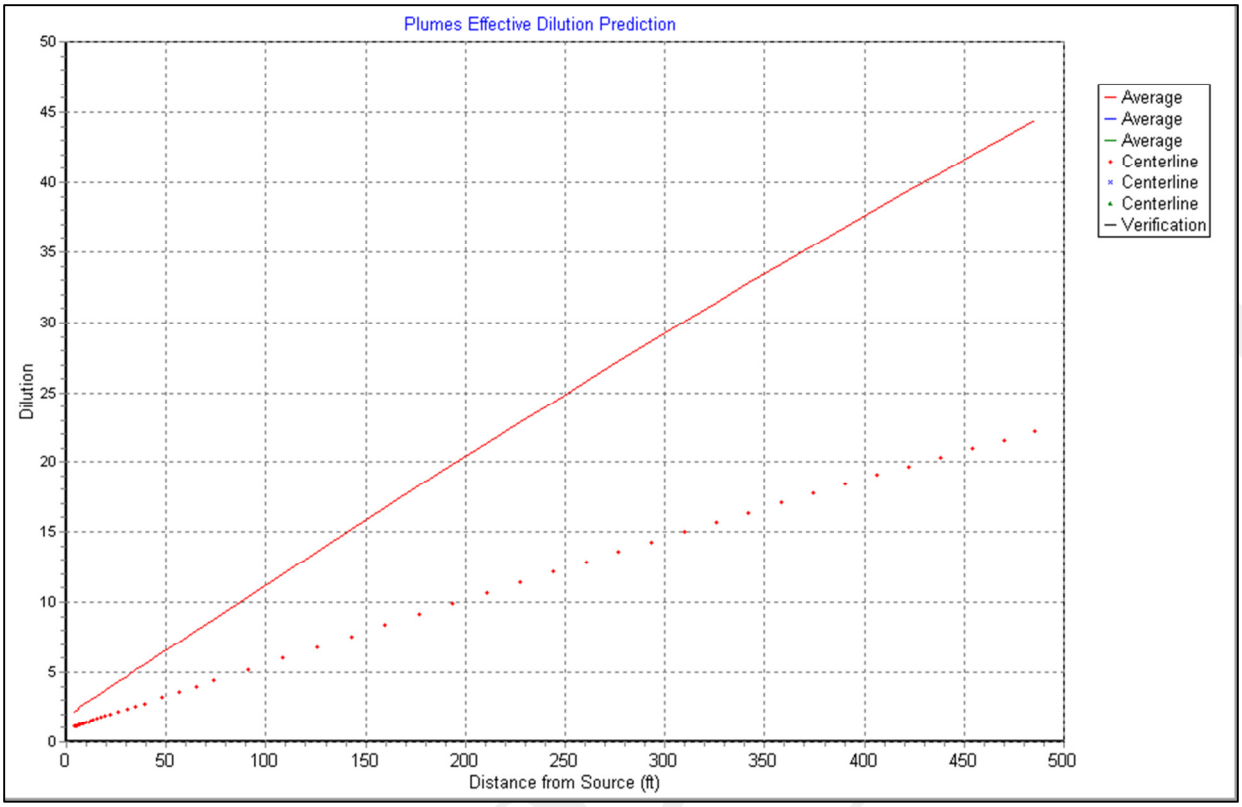
/ PDS surface discharge model

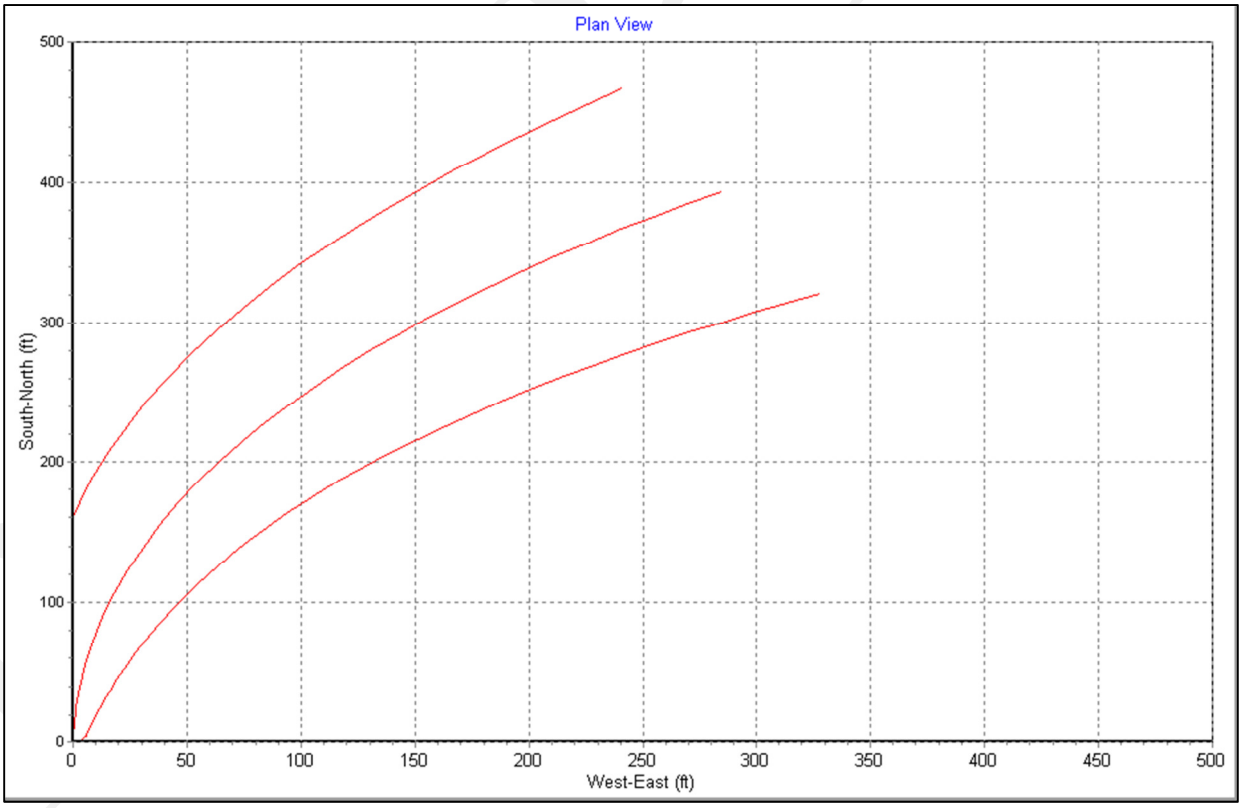
3	3.379	0.0984	10.43	4.651E-5	2.150	0.0656	3.821	0.0; MZ dis, merging;
4	3.478	0.0984	10.70	4.545E-5	2.200	0.0656	4.180	0.0;
5	3.543	0.0984	10.93	4.425E-5	2.260	0.0984	4.583	3.3300;
6	3.642	0.0984	11.19	4.329E-5	2.310	0.0984	5.011	3.4100;
7	3.806	0.0984	11.68	4.149E-5	2.410	0.131	5.887	3.5600;
8	3.937	0.0984	12.17	3.984E-5	2.510	0.197	6.861	3.7100;
9	4.101	0.0984	12.66	3.831E-5	2.610	0.230	7.850	3.8600;
10	4.265	0.0984	13.16	3.690E-5	2.710	0.262	8.878	4.0100;
11	4.429	0.0984	13.65	3.546E-5	2.820	0.328	9.920	4.1600;
12	4.593	0.0984	14.14	3.425E-5	2.920	0.394	10.97	4.3100;
13	4.757	0.0984	14.63	3.311E-5	3.020	0.427	12.03	4.4600;
14	4.921	0.0984	15.12	3.205E-5	3.120	0.492	13.07	4.6100;
15	5.249	0.0984	16.11	3.003E-5	3.330	0.623	15.16	4.9100;
16	5.545	0.0984	17.09	2.833E-5	3.530	0.755	17.32	5.2100;
17	5.873	0.0984	18.08	2.681E-5	3.730	0.919	19.47	5.5100;
18	6.201	0.0984	19.06	2.538E-5	3.940	1.083	21.64	5.8100;
19	6.824	0.0984	21.00	2.304E-5	4.340	1.444	25.88	6.4000;
20	7.480	0.0984	22.97	2.105E-5	4.750	1.870	30.24	7.0000;
21	8.104	0.0984	24.90	1.938E-5	5.160	2.329	34.58	7.5900;
22	8.760	0.0984	26.87	1.795E-5	5.570	2.854	38.91	8.1900;
23	10.01	0.0984	30.74	1.567E-5	6.380	4.068	47.44	9.3700;
24	11.25	0.0984	34.58	1.390E-5	7.190	5.446	56.08	10.540;
25	12.53	0.0984	38.39	1.250E-5	8.000	7.054	64.67	11.700;
26	13.75	0.0984	42.16	1.135E-5	8.810	8.858	73.23	12.850;
27	16.21	0.0984	49.61	9.597E-6	10.42	13.09	90.00	15.120;
28	18.60	0.0984	56.86	8.319E-6	12.02	18.14	106.7	17.330;
29	20.93	0.0984	63.91	7.348E-6	13.61	23.98	123.2	19.480;
30	23.20	0.0984	70.77	6.583E-6	15.19	30.58	139.4	21.570;
31	25.39	0.0984	77.39	5.970E-6	16.75	37.93	155.3	23.590;
32	27.53	0.0984	83.79	5.464E-6	18.30	46.00	170.7	25.540;
33	29.56	0.0984	89.96	5.043E-6	19.83	54.72	185.8	27.420;
34	31.53	0.0984	95.90	4.686E-6	21.34	64.11	200.5	29.230;
35	33.43	0.0984	101.6	4.378E-6	22.84	74.05	214.9	30.970;

```
 36    35.27  0.0984   107.1 4.114E-6   24.31   84.55   228.8   32.640;
 37    37.01  0.0984   112.4 3.880E-6   25.77   95.54   242.3   34.250;
 38    38.68  0.0984   117.5 3.675E-6   27.21   107.0   255.4   35.800;
 39    40.29  0.0984   122.4 3.493E-6   28.63   118.9   268.1   37.300;
 40    41.86  0.0984   127.1 3.330E-6   30.03   131.2   280.4   38.730;
 41    43.34  0.0984   131.6 3.183E-6   31.42   143.8   292.3   40.120;
 42    44.78  0.0984   136.0 3.050E-6   32.79   156.8   303.9   41.460;
 43    46.16  0.0984   140.3 2.929E-6   34.14   170.1   315.1   42.750;
 44    47.51  0.0984   144.4 2.819E-6   35.47   183.7   326.0   44.000;
 45    48.79  0.0984   148.4 2.718E-6   36.79   197.5   336.5   45.220; stream limit reached;
 46    50.03  0.0984   152.2 2.625E-6   38.10   211.5   346.7   46.390;
 47    51.21  0.0984   155.9 2.539E-6   39.39   225.8   356.7   47.530;
 48    52.39  0.0984   159.6 2.459E-6   40.67   240.2   366.3   48.640;
 49    53.51  0.0984   163.1 2.384E-6   41.94   254.8   375.6   49.720;
 50    54.59  0.0984   166.6 2.315E-6   43.19   269.6   384.7   50.770;
 51    55.68  0.0984   169.9 2.251E-6   44.43   284.5   393.6   51.790;
 51    55.68  0.0984   169.9 2.251E-6   44.43   284.5   393.6   51.790;
  196000.0 m^3 (      48.433ac) within isopleth
Case 1; ambient file C:\Plumes20\TimpSurfaceWLA.001.db; Diffuser table record 1: ----------------------------------

Ambient Table:
    Depth   Amb-cur   Amb-dir   Amb-sal   Amb-tem   Amb-pol    Decay   Far-spd   Far-dir   Disprsn   Density
        m      m/s       deg       psu         C     kg/kg      s-1       m/s       deg  m0.67/s2   sigma-T
      0.0    0.0305       0.0     0.001     20.00       0.0       0.0       0.0       0.0    0.0003 -1.732077
    15.00    0.0305       0.0     0.001     20.00       0.0       0.0       0.0       0.0    0.0003 -1.732077

Diffuser table:
Cnduit wCnduit d H-Angle SourceX SourceYRegIntst Isoplth Ttl-flo Eff-sal    Temp
   (ft)    (ft)  (deg)     (m)     (m)    (ft)(concent)   (MGD)   (psu)     (C)
 6.0000  2.0000  90.000     0.0     0.0  500.00     0.0  30.000 1.00E-3  15.000
Simulation:
Low
      Depth  Amb-cur Cnduit w  Polutnt   Dilutn   x-posn   y-posn   Iso dia
Step     (ft)   (ft/s)     (ft)    (ppm)       ()     (ft)     (ft)       (m)
  0      0.0    0.100    6.000   0.0001    1.000      0.0      0.0       0.0; merging;
Simulation:
Low
      Depth  Amb-cur Cnduit w  Polutnt   Dilutn   x-posn   y-posn   Iso dia
Step     (ft)   (ft/s)     (ft)    (ppm)       ()     (ft)     (ft)       (m)
  0      0.0    0.100    6.000   0.0001    44.43      0.0      0.0    1.8288; stream limit reached, merging;
 ;
```


Plumes Effective Dilution Prediction
Dilution
Distance from Source (ft)
Average
Average
Average
Centerline
Centerline
Centerline
Verification
0
5
10
15
20
25
30
35
40
45
50
0
50
100
150
200
250
300
350
400
450
500


Plan View
South-North (ft)
West-East (ft)
0
100
200
300
400
500
0
50
100
150
200
250
300
350
400
450
500

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.

REASONABLE POTENTIAL LANGUAGE

Initial screening for metals values that were submitted through the discharge monitoring reports showed that a closer look at the metals is not needed. A copy of the initial screening is included in the "Effluent Metals and RP Screening Results" table in this attachment.

During the previous Permit renewal, TSSD requested that TDS be monitoring only. RP was run for TDS using the last five years of data and it was determined that there was not a reasonable potential for TDS to violate water quality standards. TDS will remain monitoring only in this Permit renewal. RP was also run on Ammonia which indicated the continuation of Ammonia limits in this Permit renewal. A copy of the RP input/out table is included in this attachment.

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

Effluent Metals and RP Screening Results

Effluent											
Metal	Arsenic	Cadmium	Chromium	Copper	Cyanide	Lead	Mercury	Nickel	Selenium	Silver	Zinc
ARP Val	2.495	0.028	0.053	0.165	0.071	1.533	0.0084	5.01	0.063	0.128	1.271
CRP Val	1.504	0.0073	0.11	0.296	0.0312	0.185	0.00072	1.729	0.0432	0.128	3.985
Metals, mg/L	0.0017	0.0002	0.0009	0.0189	0.002	0.0005	0.000001	0.0013	0.0017	0.0005	0.04
	0.0016	0.0002	0.001	0.0035	0.002	0.0005	0.00000123	0.0008	0.0012	0.0005	0.04
	0.0017	0.0002	0.0006	0.0214	0.002	0.0005	0.0000043	0.0024	0.0013	0.0005	0.02
	0.0016	0.0002	0.0006	0.0059	0.002	0.0005	0.0000025	0.0013	0.0011	0.0005	0.02
	0.0009	0.0002	0.0009	0.0085	0.002	0.0005	0.000002	0.0016	0.0016	0.0005	0.04
	0.001	0.0002	0.0007	0.0039	0.002	0.0005	0.0000006	0.0011	0.0009	0.0005	0.04
	0.0013	0.0002	0.0006	0.0025	0.004	0.0005	0.0000012	0.0022	0.0009	0.0005	0.04
	0.0012	0.0002	0.0006	0.0033	0.004	0.0005	0.000001	0.0015	0.0012	0.0005	0.04
	0.001	0.0002	0.0007	0.0026	0.002	0.0005	0.0000014	0.0012	0.0005	0.0005	0.04
	0.0009	0.0002	0.0007	0.0037	0.002	0.0005	0.000001	0.0016	0.0011	0.0005	0.04
	0.0011	0.0002	0.0007	0.0043	0.003	0.0005	0.0000011	0.0017	0.001	0.0005	0.02
	0.0014	0.0002	0.0006	0.0022	0.002	0.0005	0.0000012	0.0016	0.0011	0.0005	0.03
	0.0015	0.0002	0.0008	0.0044	0.002	0.0005	0.0000016	0.0016	0.0018	0.0005	0.03
	0.0013	0.0002	0.0009	0.0034	0.002	0.0005	0.0000022	0.0015	0.0015	0.0005	0.03
	0.0013	0.0002	0.0006	0.0022	0.004	0.0005	0.0000015	0.0013	0.0011	0.0005	0.04
	0.0016	0.0002	0.0006	0.0041	0.003	0.0005	0.0000014	0.0013	0.0013	0.0005	0.01
	0.0008	0.0002	0.0007	0.008	0.002	0.0005	0.0000011	0.0014	0.0007	0.0005	0.03
	0.001	0.0002	0.0005	0.006	0.005	0.0005	0.0000021	0.0013	0.0013	0.0005	0.02
	0.0016	0.0002	0.0005	0.0043	0.005	0.0005	0.0000025	0.0015	0.0014	0.0005	0.02
ND Value	0	0	0	0	0	0	0	0	0	0	0
Max	0.0017	0.0002	0.001	0.0214	0.005	0.0005	0.0000043	0.0024	0.0018	0.0005	0.04
A RP?	No	No	No	No	No	No	No	No	No	No	No
C RP?	No	No	No	No	No	No	No	No	No	No	No

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RP Input/Output Summary

RP Procedure Output	Outfall Number: 001	
Parameter	TDS	
Distribution	Lognormal	
Reporting Limit	0.10	
Significant Figures	2	
Maximum Reported Effluent Conc.	882	
Coefficient of Variation (CV)	0.051	
Acute Criterion	1200	
Chronic Criterion	1200	
Confidence Interval	95	99
Projected Maximum Effluent Conc. (MEC)	880	930
RP Multiplier	1.0	1.1
RP for Acute?	NO	NO
RP for Chronic?	NO	NO
Outcome	C	

RP Procedure Output	Outfall Number: 001			
Parameter	Ammonia (mg/L)		Ammonia (mg/L)	
Distribution	Lognormal		Lognormal	
Reporting Limit	0.01		0.01	
Significant Figures	2		2	
Maximum Reported Effluent Conc.	4.1		4.1	
Coefficient of Variation (CV)	1.5		1.5	
Acute Criterion	11.4		12.8	
Chronic Criterion	5.2		12.4	
Confidence Interval	95	99	95	99
Projected Maximum Effluent Conc. (MEC)	5.1	14.0	5.1	14.0
RP Multiplier	1.2	3.4	1.2	3.4
RP for Acute?	NO	YES	NO	YES
RP for Chronic?	NO	YES	NO	YES
Outcome	C		C	

RP Procedure Output	Outfall Number: 001			
Parameter	Ammonia (lbs/day)		Ammonia (lbs/day)	
Distribution	Lognormal		Lognormal	
Reporting Limit	0.01		0.01	
Significant Figures	2		2	
Maximum Reported Effluent Conc.	3,785.5		3,785.5	
Coefficient of Variation (CV)	.95		.95	
Acute Criterion	2,854		3,206	
Chronic Criterion	1,311		3,114	
Confidence Interval	95	99	95	99
Projected Maximum Effluent Conc. (MEC)	4,400	9,200	4,400	9,200
RP Multiplier	1.2	2.4	1.2	2.4
RP for Acute?	YES	YES	YES	YES
RP for Chronic?	YES	YES	YES	YES
Outcome	C		C	