

Official Draft Public Notice Version **February 18, 2026.**

The findings, determinations, and assertions contained in this document are not final and subject to change following the public comment period.

**FACT SHEET  
CITY OF OREM WATER RECLAMATION FACILITY  
RENEWAL PERMIT: DISCHARGE & BIOSOLIDS  
UPDES PERMIT NUMBER: UT0020915  
UPDES BIOSOLIDS PERMIT NUMBER: UTL-020915  
MAJOR MUNICIPAL**

**FACILITY CONTACTS**

Operator Name: City Of Orem  
Contact: Ryan Johnson  
Position: Water Reclamation Manager  
Phone Number: (801) 229-7481

Permittee Name: City of Orem  
Facility Name: City of Orem Water Reclamation Facility  
Mailing and Facility Address: 1797 West 1000 South  
Orem, Utah 84059  
Telephone: (801) 229-7481  
Actual Address: 1797 West 1000 South

**DESCRIPTION OF FACILITY**

The City of Orem Water Reclamation Facility (Facility), located at 1797 West 1000 South in Orem City, Utah County, Utah, at latitude 40°16'39" and longitude 111°44'19", with STORET Number 499525. The Facility was originally constructed in 1958, and was last upgraded in 2014. The Facility serves the City of Orem, the City of Lindon, and a portion of the Town of Vineyard. The average design flow is 13.5 million gallons a day (MGD), with a design population equivalent of 135,000.

The Facility consists of three mechanical bar screens and two aerated grit chambers. The flow then passes into four primary clarifiers before entering a system of biological nutrient removal (BNR) basins. After treatment in these basins, the flow goes to secondary clarifiers for separation, which consists of return activated sludge (RAS), waste activated sludge (WAS), and treated effluent for final disinfection at an ultraviolet (UV) disinfection system. The final effluent is discharged to Powell Slough, with the final receiving water being Utah Lake.

Solids are handled by the following: three anaerobic digesters, including one thermophilic digester and two mesophilic digesters. The mesophilic digesters consist of one fixed lid primary and one floating lid secondary. The anaerobic digesters consistently produce Class B biosolids. of the biosolids, after a belt press dewatering facility, are tested to meet regulations and land applied to farmland in southern Utah County.

### **SUMMARY OF CHANGES FROM PREVIOUS PERMIT**

Limitations for whole effluent toxicity (WET) testing and total ammonia were updated in accordance with the 2025 Wasteload Analysis (WLA) and have decreased as a result of lower flow of the receiving water body. Monitoring was increased for total cadmium, total cyanide, and total selenium in accordance with the Reasonable Potential Analysis performed (See Reasonable Potential Section below). The City of Orem (Permittee) will be completing a wastewater reuse building in 2026. This discharge will be covered under an Operating Permit with the Division of Water Quality (DWQ).

The Permittee completed a compliance schedule for total phosphorus in accordance with Utah Administrative Code (UAC) R317-1-3.3, Technology-Based Phosphorus Effluent Limit (TBPEL) Rule. Therefore, an effluent limitation of 1.0 mg/L yearly average is included in this Permit.

### **DISCHARGE**

#### **DESCRIPTION OF DISCHARGE**

The Permittee has been reporting self-monitoring results on Discharge Monitoring Reports (DMRs) on a monthly basis. A review of the last five years of data indicates there were minimal violations, which did not result in enforcement.

<u>Outfall</u>	<u>Description of Discharge Point</u>
001	Located at latitude 40° 16' 39" and longitude 111° 44' 19", wastewater effluent is discharged through a 36-inch diameter pipe located between a ground water drain pipe and the outflow from Clegg's pond into Powell Slough.

#### **RECEIVING WATERS AND STREAM CLASSIFICATION**

The receiving water for Outfall 001 is Powell Slough Waterfowl Management Area, Utah County, which is a tributary to Utah Lake, which is a Class 2B, 3C, and 3D according to 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 3C -- Protected for nongame fish and other 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.

Powell Slough is a tributary to 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**

According to the Utah's [Final 2024 Integrated Report on Water Quality](#) dated April 30, 2024 (UDWQ, 2024), the receiving water for Outfall 001 discharge "*Powell Slough Waterfowl Management Area, Utah County* (AU name: *Powell Slough*, AU ID: *UT16020201-010\_00*)" was listed as "Not Supporting" for Minimum Dissolved Oxygen.

The downstream waterbody, Utah Lake (AU name: *Utah Lake other than Provo Bay* AU ID: *UT-L-16020201-004\_01*), is listed as "Not Supporting" for *E. coli*, Eutrophication, Harmful algal blooms, polychlorinated biphenyls (PCBs) in Fish Tissue, Total Dissolved Solids (TDS), and Total Phosphorus as P.

The Utah Lake Water Quality Study is ongoing with the objective to develop nutrient-related water quality endpoints for Utah Lake and Provo Bay.

The Minimum Dissolved Oxygen impairment for Powell Slough is disconcerting considering the low criteria for 3C waters and the complete reliance on daytime monitoring values. The Q2Kw model does indicate predicted compliance with the dissolved oxygen (DO) criterion. This indicates that there is clearly a disconnect between the model and observed data, which cannot be explained. When a receiving water is listed as impaired for DO, typically the current permit limits for DO and biochemical oxygen demand (BOD5) are applied until the TMDL is completed. This was done in the 2025 WLA.

### **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. 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), BOD5, *E. coli*, pH, and percent removal for BOD5 and TSS are based on current Utah Secondary Treatment Standards, UAC R317-1-3.2. The oil and grease is based on BPJ. Effluent limitation for total phosphorus is based on UAC R317-1-3.3, TBPEL. Limitations for

DO, WET, and total ammonia are based on the attached WLA for this discharge into the Powell Slough. 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 framework for what routine monitoring or effluent limitations are required.

A quantitative RP was performed on aluminum, arsenic, cadmium, chromium, cyanide, copper, lead, mercury, molybdenum, nickel, selenium, silver, and zinc 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: cadmium, copper, cyanide, selenium, and ammonia. As a result, this Permit will increase the monitoring frequency for cadmium, cyanide, and selenium. A copy of the RP is included at the end of this Fact Sheet.

The Permit limitations are:

Parameter	Table 1: Effluent Limitations <sup>(a)</sup>				
	Maximum Monthly Avg	Maximum Weekly Avg	Yearly Average	Daily Minimum	Daily Maximum
Total Flow, MGD	13.5	--	--	--	--
BOD <sub>5</sub> , mg/L	25	35	--	--	--
BOD <sub>5</sub> Min. % Removal	85	--	--	--	--
TSS (Total Suspended Solids), mg/L	25	35	--	--	--
TSS Min. % Removal	85	--	--	--	--
DO, mg/L	--	--	--	5.5	--
Total Ammonia (as N), mg/L					
Summer (Jul-Sep)	1.6	--	--	--	10.0
Fall (Oct-Dec)	3.0	--	--	--	13.8
Winter (Jan-Mar)	3.6	--	--	--	15.5
Spring (Apr-Jun)	2.8	--	--	--	10.2
E. coli, No./100mL	126	158	--	--	--
Total Phosphorus (as P), mg/L	--	--	1.0	--	--
WET, Chronic Biomonitoring					IC <sub>25</sub> > XX% effluent
Summer (Jul-Sep)	--	--	--	--	87
Fall (Oct-Dec)	--	--	--	--	86
Winter (Jan-Mar)	--	--	--	--	88
Spring (Apr-Jun)	--	--	--	--	83

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 with the exception of cadmium, cyanide, and selenium.. 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.

Parameter	Frequency	Sample Type	Units
Total Flow <sup>(b)(c)</sup>	Continuous	Recorder	MGD
BOD <sub>5</sub> , Influent <sup>(d)</sup>	3 x Weekly	Composite	mg/L
Effluent	3 x Weekly	Composite	mg/L
TSS, Influent <sup>(d)</sup>	3 x Weekly	Composite	mg/L
Effluent	3 x Weekly	Composite	mg/L
E. coli	3 x Weekly	Grab	No./100mL
pH	3 x Weekly	Grab	SU
Total Ammonia (as N)	3 x Weekly	Composite	mg/L
DO	3 x Weekly	Grab	mg/L
WET – Biomonitoring <sup>(e)</sup>			
Ceriodaphnia - Chronic	2 <sup>nd</sup> & 4 <sup>th</sup> Quarter	Composite	Pass/Fail
Fathead Minnows - Chronic	1 <sup>st</sup> & 3 <sup>rd</sup> Quarter	Composite	Pass/Fail
Oil & Grease <sup>(f)</sup>	When Sheen Observed	Grab	mg/L
Orthophosphate (as P) <sup>(g)</sup>			
Effluent	Monthly	Composite	mg/L
Total Phosphorus (as P) <sup>(d)(g)</sup>			
Influent	Monthly	Composite	mg/L
Effluent	Monthly	Composite	mg/L
Total Kjeldahl Nitrogen, TKN (as N) <sup>(d)(g)</sup>			
Influent	Monthly	Composite	mg/L
Effluent	Monthly	Composite	mg/L
Nitrate, NO <sub>3</sub> <sup>(g)</sup>	Monthly	Composite	mg/L
Nitrite, NO <sub>2</sub> <sup>(g)</sup>	Monthly	Composite	mg/L
TDS	Monthly	Composite	mg/L

Metals Aluminium, Total Arsenic, Total Chromium, Total Copper, Total Lead, Total Mercury, Total Molybdenum, Total Nickel, Total Silver, Total Zinc, Total Influent Effluent	Quarterly Quarterly	Composite Composite	mg/L mg/L
Metals Cadmium, Total Cyanide, Total Selenium, Total Influent Effluent	Quarterly 6 X Yearly	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 2nd and 4th quarters and chronic fathead minnows will be tested during the 1st and 3rd 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 UAC R317-1-3.3, Technology-based Phosphorus Effluent Limits rule.

### 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**

There have been no changes to biosolids treatment during the last permit cycle.

### **DESCRIPTION OF TREATMENT AND DISPOSAL**

The Permittee submitted their 2024 annual biosolids report on February 18, 2025. The report states the Permittee produced 1070 dry metric tons (DMT) of solids and land applied 691 DMT.

The Permittee treats the wastewater through clarification and BNR's. The solids removed in the clarifier are sent to solids treatment. The solids are first thickened in diffused air floatation (DAF) basin prior to digestion. From the DAF the solids go to the Thermophilic Digester, then to the Mesophilic Digesters (one primary, one secondary). From here the solids are directed to the old aerobic digester which has been converted to a holding tank. This process produces 100% anaerobic biosolids.

The solids are dewatered by belt presses four days a week. Dewatered solids are stored in drying beds until they are delivered to farm for land application. This storage allows them to increase and adjust production as needed.

The solids could meet Class A, but Orem has chosen to only test for Class B. The solids are hauled off to multiple farms across Utah County to improve crop production.

The last inspection conducted at the land application site was December 23, 2023. The inspection showed that Orem was in compliance with all aspects of the biosolids management program.

**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 Permittee produced 1070 DMT and disposed of 691 DMT of biosolids, therefore they shall sample at least four 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)).

No biosolids were landfilled in 2024.

**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 <sup>1</sup> , (mg/kg)	CPLR <sup>2</sup> , (kg/ha)	Pollutant Conc. Limits <sup>3</sup> (mg/kg)	APLR <sup>4</sup> , (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

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 <sup>1</sup> , (mg/kg)	CPLR <sup>2</sup> , (kg/ha)	Pollutant Conc. Limits <sup>3</sup> (mg/kg)	APLR <sup>4</sup> , (kg/ha-yr)
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 <sup>1</sup> per four (4) grams total solids (DWB) <sup>2</sup> or Fecal Coliforms – less than 1,000 MPN per gram total solids (DWB).	Fecal Coliforms – less than 2,000,000 MPN or CFU <sup>3</sup> 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 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)). The Permittee has chosen to achieve PFRP through one of the following methods;

1. Class A, Alternative 1 - Thermally Treated Sewage sludge - The temperature of the sewage sludge that is used or disposed shall be maintained at a specific value for a period of time 50° C (122°F) or higher for at least 5 days), (40 CFR 503.32(a)(3)(ii).

This method is found under (40 CFR 503.32(a)). At this time the Permittee 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 at this time. But they have demonstrated in the past that they can meet these requirements in the past.

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 shall not 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 shall be treated by a specific process to significantly reduce pathogens (PSRP). The Permittee has chosen to achieve PSRP through anaerobic digestion:

1. Under 40 C.F.R. § 503.32 (b)(2), the Permittee may test the biosolids and shall meet a microbiological limit of less than 2,000,000 MPN of fecal coliform per gram for the biosolids to be considered Class B biosolids with respect to pathogens.
2. Under 40 C.F.R. § 503.32 (b)(3) The PSRP may be accomplished through anaerobic digesters that have a minimum retention time of 15 days at 95° F (35° C) or 60 days at 68° F (20°C).

#### Vector Attraction Reduction (VAR)

If the biosolids are land applied the Permittee shall be required to meet VAR through the use of a method of listed under 40 C.F.R. § 503.33. The Permittee intends to meet the vector attraction reduction requirements through one of the methods listed below.

1. Under 40 C.F.R. § 503.33(b)(1), the solids shall 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 biosolids do not meet a method of VAR, the biosolids shall not be land applied.

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 Permittee 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**

The Permittee was required to sample for metals at least four times in 2024. The Permittee sampled Class B biosolids Y times. All biosolids land applied in 2024 met Table 3 of 40 C.F.R. § 503.13, therefore the Permittee biosolids qualify as EQ with regards to metals. The monitoring data is provided in the following table.

Permittee Metals Monitoring Data 2015-2024

Metals Monitoring Data, (Land Application)			
Parameter	Table 3, mg/kg (Exceptional Quality)	Average, mg/kg	Maximum, mg/kg
Arsenic	41.0	4.9	36.8
Cadmium	39.0	1.5	11.6
Copper	1,500.0	380	804
Lead	300.0	11	37.4
Mercury	17.0	0.7	2.52
Molybdenum	75.0	7.5	46.3
Nickel	400.0	15	116
Selenium	36.0	7.8	22.1
Zinc	2,800.0	617	1150

**PATHOGEN MONITORING DATA**

The Permittee is required to monitor the biosolids for pathogens at least four times a year and has chosen to monitor fecal coliform. Each monitoring episode needs to consist of seven samples. All biosolids land applied have met the Class B pathogen standards. A summary of the last 10 years The monitoring data is as follows:

Permittee Fecal Coliform Monitoring Data 2015-2024

Fecal Coliform Monitoring Summary		
Year	Geomean	Max
2024	23	23
2023	24	24
2022	42	42
2021	102	1979
2020	232	232
2019	151	280
2018	609	11940
2017	64	200
2016	112	663
2015	62	90

### **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.

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 Permittee implements an Approved POTW Pretreatment Program (Program). Authority to require a Program is provided in 19-5-108 UCA, 1953 ann. and UAC R317-8-8. Any changes to the Program must be submitted to the Division of Water Quality in accordance with UAC R317-8-8.

The Pretreatment Requirements in Part II of the UPDES Permit were modified to include additional language clarifying the requirements. The changes are consistent with 40 CFR 122, UAC R317, and 40 CFR 403.

The permit requires the Permittee 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)*. The Permittee recently updated the Local Limits; however, an evaluation is needed to determine whether to revise or develop technically based local limits in light of the Permit renewal. This evaluation may indicate that the current Local Limits are sufficiently protective, or that they need to be revised. The Permittee should utilize the EPA Local Limits Development Guidance to justify the re-evaluation of the local limits.

To ensure data is available to develop technically based Local Limits, the permit requires influent and effluent monitoring for metals and organic toxics monitoring listed in *UAC R317-8-7.5* and sludge monitoring for potential pollutants listed in *40 CFR 503*. The sampling for the metals and TTO is consistent with the guidance developed by DWQ.

Organic toxics are required to be sampled yearly. All TTO analytical data reports shall be submitted to the DWQ Pretreatment Coordinator.

The sampling of metals will be conducted quarterly. Additional sampling for metals may be needed for Part I of the permit. The sampling in Part I can be used for the sampling in Part II.

Metals analysis must utilize a minimum detection limit to ensure that the metals are not above the allowable levels determined by the wasteload analysis for the receiving stream. If a test is unavailable, the lowest available test must be used; see Part II of the permit for additional requirements.

The Permit requires notification when the Maximum Allowable Head Works Loading is greater than the load calculated by the Permittee or when the value is greater than the value in the Part II table of the permit. These requirements are included in the permit to ensure the Orem Pretreatment Staff investigates the need to re-evaluate Local Limits or identify the source of the parameter. The notification needs to be provided to the DWQ Pretreatment Coordinator and can be via email.

### **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. A review of the past five years of WET testing results indicates that no pattern of toxicity has been reported. Therefore, 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  $IC_{25}$  is less than 87, 86, 88, or 83% effluent dilution as stipulated above. 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  
Lindsay Cowles, Discharge Permit Writer  
Daniel Griffin, Biosolids  
Jennifer Robinson, Pretreatment  
Lonnie Shull, Biomonitoring  
Carl Adams, Storm Water  
Scott Daley, TMDL/Watershed Protection  
Lindsay Cowles, Reasonable Potential Analysis  
Christopher Shope, PhD, 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 FACT SHEET**

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*

## 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)	Phosphorus, Total (mg/L)	
	11/30/2020	7.85	5	5	3.92	5.6	6.3	0.2	0.33	7.1	7.58	1	1	1.17
	12/31/2020	7.72	5	5	5.31	6.27	6.6	0.6	1.52	7	7.5	1	2	1.4
	1/31/2021	7.89	5	5	4.85	5.73	6.57	1.2	2.53	7.05	7.45	1	2	1.1
	2/28/2021	8.17	5	6	5.23	7.07	6.89	0.5	2.13	7.02	7.47	1	2	0.99
	3/31/2021	8.09	5	5	6.92	10.4	6.82	0.3	0.94	7.01	7.35	1	2	1.66
	4/30/2021		5	5	5.25	7.33	6.06	0.1	0.29	7.07	7.93	1	1	1.16
	5/31/2021	7.62	6	10	6.8	8.73	6.48	0.1	0.19	6.51	7.51	1	1	1.12
	6/30/2021	7.91	5	5	5.17	8.53	6.1	0.3	2.73	6.83	7.58	1	2	1.35
	7/31/2021	7.91	5	5	4.33	5.73	6.11	0.2	0.57	7.37	7.55	2	3	2.38
	8/31/2021	8.28	5	6	5.31	7.73	6.02	0.1	0.67	7.38	7.56	1	2	1.39
	9/30/2021	8.2	5	6	4.2	6.8	6.1	0.1	0.22	7.31	7.76	1	3	1.97
	10/31/2021	8.08	5	5	4.72	5.73	6.53	0.1	0.58	7.24	7.47	1	1	2.2
	11/30/2021	7.85	7	10	3.54	4.8	6.63	0.1	0.21	7.13	7.36	1	2	2.13
	12/31/2021	7.76	5	5	3.85	4.73	6.96	0.6	6.67	7.16	7.44	1	5	0.84
	1/31/2022	7.9	5	5	4.98	6.93	7.08	0.2	0.73	7.01	7.37	1	1	1.21
	2/28/2022	8.07	6	8	4	4	7.09	1.1	4.6	7.11	7.4	1	1	1.98
	3/31/2022	7.97	7	9	7.57	4	6.66	1.5	3.4	7.12	7.45	1	1	2.26
	4/30/2022	7.9	6	9	4.08	21.33	6.71	0.6	4.6	7.06	7.51	1	1	3.08
	5/31/2022	7.98	6	10	4.15	4.33	6.57	0.2	0.3	7.03	7.5	1	1	2.79
	6/30/2022	8.15	5	6	4.43	5.33	6.3	0.2	0.4	7.05	7.42	1	2	2.71
	7/31/2022	8.07	6	7	3.92	4.33	6.06	0.2	0.2	7.18	7.46	1	1	2.12
	8/31/2022	8.49	7	9	4.27	5	5.89	0.2	0.4	7.11	7.47	1	2	1.26
	9/30/2022	8.21	5	6	4.5	5.67	5.92	0.2	0.22	7.2	7.49	2	3	1.53
	10/31/2022	7.82	8	6	4.31	5.33	6.29	0.2	0.2	7.21	7.52	1	2	1.2
	11/30/2022	7.92	7	19	5.64	5.67	6.25	0.3	0.55	7.33	7.55	2	2	1.29
	12/31/2022	8.08	6	8	4.67	8.33	6.91	0.3	0.98	7.16	7.49	2	14	1.78
	1/31/2023	9.33	9	9	5.36	6.67	6.91	0.4	1.05	7.23	7.49	2	3	2.01
	2/28/2023	8.64	8	16	5.67	6	7.07	0.4	1.95	7.17	7.54	9	22	2.94
	3/31/2023	9.03	6	7	5.54	5.67	6.73	0.2	0.77	7.19	7.46	2	2	2.65
	4/30/2023	8.7	7	10	6.17	9	6.84	0.3	0.51	7.24	7.47	1	3	1.98
	5/31/2023	8.54	7	13	8.07	14.33	6.34	0.2	0.27	7.26	7.51	2	8	2.25
	6/30/2023	8.92	6	9	4	4	6.11	0.2	0.4	7.28	7.49	1	1	1.63
	7/31/2023	8.76	5	5	4.31	5.33	5.91	0.2	0.24	7.33	7.67	1	2	1.23
	8/31/2023	8.71	6	8	4	4	5.6	0.2	0.25	7.34	7.58	1	2	1.72
	9/30/2023	8.36	5	5	4.67	6.67	5.93	0.2	0.27	7.24	7.8	1	1	2.25
	10/31/2023	8	6	9	4.43	4.67	6.15	0.2	0.87	7.29	7.55	1	1	2.13
	11/30/2023	7.98	5	5	4.23	5	6.66	0.2	0.43	7.23	7.5	1	3	1.92
	12/31/2023	7.89	5	6	4.42	5.33	6.78	0.2	0.27	6.98	7.42	1	2	2.43
	1/31/2024	8.18	5	6	4.4	5	6.81	0.2	0.29	7.13	7.42	2	2	1.69
	2/29/2024	8.56	6	5	4.58	5	6.55	0.4	2	7.1	7.4	1	7	1.74
	3/31/2024	8.27	8	11	5.75	10.33	6.51	0.4	1.34	7.15	7.42	1	2	1.01
	4/30/2024	8.19	6	7	4	4	6.38	0.2	0.28	7.2	7.4	1	1	2.46
	5/31/2024	8.17	5	7	4	4	6.35	0.3	1	7.15	7.54	1	2	1.99
	6/30/2024	8.41	8	15	6	7.33	5.87	0.3	0.6	7.27	7.52	1	1	1.49
	7/31/2024	8.28	5	6	4.13	4.67	5.88	0.4	0.93	7.3	7.53	1	1	1.35
	8/31/2024	8.55	5	6	4	4	5.54	0.4	0.86	6.77	7.55	1	2	1.83
	9/30/2024	8.5	5	5	3.85	4.33	5.51	0.5	1.06	6.89	7.61	1	1	2.87
	10/31/2024	8.27	6	9	4.29	4.33	5.88	0.5	1.29	7.03	7.57	2	6	2.28
	11/30/2024	8.13	6	6	5.17	5.67	6.42	0.4	1.02	6.87	7.37	1	1	1.34
	12/31/2024	8.11	8	8	6.38	8	6.59	0.5	1.73	7.16	7.5	1	2	1.81
	1/31/2025	8.21	6	6	4.86	6	6.45	0.6	1.96	7.09	7.42	1	1	2.84
	2/28/2025	8.27	5	5	5.25	5.67	6.52	0.8	2.95	7.01	7.33	1	1	1.61
	3/31/2025	8.48	5	6	6	6.67	6.56	0.7	4.19	7.09	7.28	1	1	1.63
	4/30/2025	8.26	5	6	4.57	5.67	6.35	0.6	2.26	6.92	7.37	1	1	1.28
	5/31/2025	8.55	5	6	4	4	6.12	0.3	0.57	7.02	7.48	1	1	1.41
	6/30/2025	8.52	5	5	4	4	6.04	0.3	0.3	6.86	7.54	1	1	1.14
	7/31/2025	8.68	5	5	4	4	5.77	0.5	2.01	7.25	7.54	3	67	2.84
	8/31/2025	9.2	5	5	4.5	6	5.66			7.25	7.69	4	8	2.65

WET Results

Month	WET Test	Pass / Fail
Dec-20	Chronic Ceriodaphnia	Pass
Mar-21	Chronic Pimephales Promelas	Pass
Jun-21	Chronic Ceriodaphnia	Pass
Sep-21	Chronic Pimephales Promelas	Pass
Dec-21	Chronic Ceriodaphnia	Pass
Mar-22	Chronic Pimephales Promelas	Pass
Jun-22	Chronic Ceriodaphnia	Pass
Sep-22	Chronic Pimephales Promelas	Pass
Dec-22	Chronic Ceriodaphnia	Pass
Mar-23	Chronic Pimephales Promelas	Pass
Jun-23	Chronic Ceriodaphnia	Pass
Sep-23	Chronic Pimephales Promelas	Pass
Dec-23	Chronic Ceriodaphnia	Pass
Mar-24	Chronic Pimephales Promelas	Pass
Jun-24	Chronic Ceriodaphnia	Pass
Sep-24	Chronic Pimephales Promelas	Pass
Dec-24	Chronic Ceriodaphnia	Pass
Mar-25	Chronic Pimephales Promelas	Pass
Jun-25	Chronic Ceriodaphnia	Pass

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**ATTACHMENT 2**

*Wasteload Analysis*



State of Utah

SPENCER J. COX  
Governor

DEIDRE HENDERSON  
Lieutenant Governor

Department of  
Environmental Quality

Tim Davis  
Executive Director

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

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

**Date:** December 15, 2025

**Prepared by:** Christopher L. Shope, PhD  
Standards and Technical Services

**Facility:** Orem City Water Reclamation Facility  
UPDES Permit No. UT-0020915

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**

There is a single discharge point listed in the permit renewal application (Figure 1).

- Outfall 001 discharges treated effluent to the upper boundary of Powell Slough, which flows into Utah Lake. Effluent is discharged at a daily maximum design flow of 13.5 MGD and a monthly maximum design flow of 11.4 MGD.

**RECEIVING WATER**

The receiving water for Outfall 001 is *Powell Slough Waterfowl Management Area, Utah County*, which is a tributary to Utah Lake. Per UAC R317-2-13.11, the designated beneficial uses for *Powell Slough Waterfowl Management Area, Utah County* are 2B, 3C, and 3D.

- *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 3C - Protected for nongame fish and other 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.*

Powell Slough is tributary to Utah Lake. Per UAC R317-2-13.12.x, the designated beneficial uses Utah Lake, are: 2A,3B,3D,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 4 - Protected for agricultural uses including irrigation of crops and stock watering.*

Per UAC R317-2-8 Protection of Downstream Uses, all actions to control waste discharges under these rules shall be modified as necessary to protect downstream designated uses.

## **WATER QUALITY STANDARDS**

Numeric criteria based on designated beneficial uses are specified in UAC R317-2-14. In addition, narrative water quality standards must not be violated per UAC R317-2-7.2:

*It shall be unlawful, and a violation of these rules, for any person 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 bioassay or other tests performed in accordance with standard procedures; or determined by biological assessments in Subsection R317-2-7.3.*

## **CRITICAL LOW FLOW**

Typically, the critical flow for the receiving water in a wasteload analysis is considered the lowest stream flow for seven consecutive days with a ten-year return frequency (7Q10). Because there are no continuously monitored flow gauges on Powell Slough, the 20<sup>th</sup> percentile of flow measurements (UDWQ, 2021) was calculated using monitoring location DWQ 4995252 CLEGG'S POND OUTFALL-WLA (Table 1). In addition, Orem WRF collected flow measurements in September 2014 of the groundwater outfall for the plant's underdrain system, which were used in

this analysis. It is recommended that updated groundwater flow and water quality measurements be collected during this permit cycle to facilitate the 2030 wasteload analysis.

**Table 1: Seasonal critical low flows**

Season	DWQ 4995252 (ft <sup>3</sup> /s)	GW Outfall (ft <sup>3</sup> /s)	Combined Flow (ft <sup>3</sup> /s)
Summer	1.8	0.8	2.6
Fall	2.1	0.8	2.9
Winter	1.6	0.8	2.4
Spring	2.9	0.8	3.7

Upstream receiving water quality concentration for the parameters of interest at Outfall 001 were also estimated from monitoring location DWQ 4995252 CLEGG'S POND OUTFALL-WLA. Effluent water quality concentrations were evaluated using seasonal concentrations supplied by Orem City WRF in the application package as "2025 Data DWQ-2025-008192.xlsx" data. For model parameters not supplied in the aforementioned effluent discharge data, the discharge monitoring report (DMR) was used, and then monitoring location DWQ 4905070 LOGAN LAGOONS 001, as needed.

**TOTAL MAXIMUM DAILY LOAD (TMDL)**

According to the Utah's [Final 2024 Integrated Report on Water Quality](#) dated April 30, 2024 (UDWQ, 2024), the receiving water for Outfall 001 discharge "*Powell Slough Waterfowl Management Area, Utah County* (AU name: *Powell Slough*, AU ID: *UT16020201-010\_00*)" was listed as "Not Supporting" for Minimum Dissolved Oxygen.

The downstream waterbody, Utah Lake (AU name: *Utah Lake other than Provo Bay* AU ID: *UT-L-16020201-004\_01*), is listed as "Not Supporting" for E. coli, Eutrophication, Harmful algal blooms, PCBs in Fish Tissue, Total Dissolved Solids, and Total Phosphorus as P.

The Utah Lake Water Quality Study is ongoing with the objective to develop nutrient-related water quality endpoints for Utah Lake and Provo Bay.

The Minimum Dissolved Oxygen impairment for Powell Slough is disconcerting considering the low criteria for 3C waters and the complete reliance on daytime monitoring values. The Q2Kw model does indicate predicted compliance with the DO criterion. This indicates that there is clearly a disconnect between the model and observed data, which cannot be explained. When a receiving water is listed as impaired for DO, typically the current permit limits for DO and BOD are applied until the TMDL is completed. This was done for the current wasteload.

**MIXING ZONE**

Per UAC R317-2-5, 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. Water quality standards must be met at the end of the regulatory mixing zone.

Per UAC 317-2-5, the discharge is considered instantaneously fully mixed since the discharge is more than twice the background receiving water flow. Therefore, no mixing zone is allowed.

### PARAMETERS OF CONCERN

The potential parameters of concern identified for the discharge/receiving water were determined in consultation with the UPDES Permit Writer, the Utah Water Quality Assessment Reports, and the industry SIC codes from <https://www.osha.gov/data/sic-search>. The potential parameters of concern for this facility include: total suspended solids (TSS), dissolved oxygen (DO), biochemical oxygen demand (BOD<sub>5</sub>), total phosphorus (TP), total nitrogen (TN), total ammonia (TAN), E. coli, and pH.

### 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<sub>50</sub> (lethal concentration, 50%) percent effluent for acute toxicity and the IC<sub>25</sub> (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<sub>50</sub> is typically 100% effluent and does not need to be determined by the WLA. The IC<sub>25</sub> WET limits are provided in Table 2.

**Table 1: Percent effluent WET Limits for IC<sub>25</sub>**

Season	Outfall 003
Summer	87%
Fall	86%
Winter	88%
Spring	83%

### WASTELOAD ALLOCATION METHODS

A QUAL2Kw model of the receiving water was built and calibrated to synoptic survey data collected in September of 2014 by DWQ staff using standard operating procedures (DWQ 2012). The model of Powell Slough extends 2.1 kilometers downstream from the treatment facility outfall to the outlet at Utah Lake. Calibration of the model parameters and rates is described in detail in the updated 2020 Calibration Report.

Receiving water quality data were obtained from monitoring site 4995252 Clegg's Pond Outfall. Previous wasteload analysis calculated the average seasonal value for each constituent with available data in the receiving water from monitoring sites 4995260 Powell Slough above Orem WWTP and 4995251 Orem WRF GW Outfall. However, monitoring sites 4995260 and 4995251 did not have any data collected after 2013. Effluent parameters were characterized using data from monitoring site 4995250 Orem WWTP.

The QUAL2Kw model was used for determining the WQBELs for parameters related to eutrophication and in-stream DO criteria. Effluent concentrations were adjusted so that water quality standards were not exceeded in the receiving water. Where WQBELs exceeded secondary standards or technology based effluent limits (TBEL), the concentration in the model was set at the secondary standard or TBEL.

The QUAL2Kw model was also used to determine the limits for ammonia. The water quality standard for chronic ammonia toxicity is dependent on temperature and pH, and the water quality standard for acute ammonia toxicity is dependent on pH. QUAL2Kw rates, input and output for DO and eutrophication related constituents are summarized in Appendix A.

A mass balance mixing analysis was conducted for conservative constituents such as dissolved metals. The WQBELs for conservative constituents are summarized in Appendix B.

The calibration model and the wasteload model are available for review by request.

### ANTIDEGRADATION LEVEL I REVIEW

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

A Level II Antidegradation Review (ADR) is not required for this discharge, as neither pollutant concentration nor load is being increased under this permit renewal.

### LOCATION MAP



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

## **DOCUMENTS**

WLA Document: *251215-Orem\_WWTP\_Q2Kw\_WLA\_2025.docx*

Wasteload Analysis and Addendums: *251215-Orem\_WWTP\_Q2Kw\_WLA\_2025.xlsm*

QUAL2Kw Calibration Model: *orem\_potw\_q2kw\_cal\_2015.xlsm*

QUAL2Kw Calibration Report: *PowellSloughQ2KwCalibrationReport.docx*

## **REFERENCES**

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Utah Division of Water Quality

**WASTELOAD ANALYSIS [WLA]**

Date: 12/16/2025

**Appendix A: QUAL2Kw Analysis for Eutrophication**

Discharging Facility: Orem WRF  
 UPDES No: UT-0020915  
 Permit Flow [MGD]: 13.50 Maximum Monthly Flow  
 13.50 Maximum Daily Flow

Receiving Water: Powell Slough  
 Stream Classification: 2B, 3C, 3D  
 Stream Flows [cfs]: 1.8 Summer (July-Sept) Critical Low Flow  
 2.1 Fall (Oct-Dec)  
 1.6 Winter (Jan-Mar)  
 2.9 Spring (Apr-June)

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

**Modeling Information**

A QUAL2Kw model was used to determine these effluent limits.

**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.

Headwater/Upstream Information	Summer	Fall	Winter	Spring
Golden Pond Outfall Flow (cfs)	1.8	2.1	1.6	2.9
Groundwater Outfall Flow (cfs)	0.8	0.8	0.8	0.8
Temperature (deg C)	22.8	11.5	8.6	18.3
Specific Conductance (µmhos)	748	732	772	758
Inorganic Suspended Solids (mg/L)	12.5	7.7	11.8	13.8
Dissolved Oxygen (mg/L)	9.0	11.4	11.9	10.4
CBOD <sub>5</sub> (mg/L)	4.1	6.0	3.0	3.5
Organic Nitrogen (mg/L)	0.367	0.315	0.128	0.225
NH <sub>4</sub> -Nitrogen (mg/L)	0.031	0.031	0.048	0.042
NO <sub>3</sub> -Nitrogen (mg/L)	0.256	0.336	0.903	0.422
Organic Phosphorus (mg/L)	0.040	0.039	0.045	0.041
Inorganic Ortho-Phosphorus (mg/L)	0.002	0.002	0.002	0.002
Phytoplankton (µg/L)	0.0	0.0	0.0	0.0
Detritus [POM] (mg/L)	5.4	3.3	5.0	5.9
Alkalinity (mg/L)	231	256	252	248
pH	7.8	8.0	8.2	8.0

**Discharge Information**

	Chronic	Summer	Fall	Winter	Spring
Flow (MGD)		11.4	11.4	11.4	11.4
Temperature (deg C)		21.3	15.2	11.2	16.5
Specific Conductance (µmhos)		1045	1042	1006	1077
Inorganic Suspended Solids (mg/L)		5.0	4.1	5.7	6.7
Dissolved Oxygen (mg/L)		5.5	5.5	5.5	5.5
CBOD <sub>5</sub> (mg/L)		25.0	25.0	25.0	25.0
Organic Nitrogen (mg/L)		7.430	9.459	4.134	5.647
NH <sub>4</sub> -Nitrogen (mg/L)		1.600	3.000	3.600	2.800
NO <sub>3</sub> -Nitrogen (mg/L)		5.177	8.123	9.187	7.496
Organic Phosphorus (mg/L)		1.000	1.000	1.000	1.000
Inorganic Ortho-Phosphorus (mg/L)		0.200	0.200	0.200	0.200
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)		168	154	178	170
pH		7.7	7.6	7.6	7.6

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	Acute	Summer	Fall	Winter	Spring
Flow (MGD)		13.5	13.5	13.5	13.5
Temperature (deg C)		23.4	18.3	12.5	19.8
Specific Conductance (µmhos)		1045	1042	1006	1077
Inorganic Suspended Solids (mg/L)		5.6	4.2	6.3	7.6
Dissolved Oxygen (mg/L)		5.5	5.5	5.5	5.5
CBOD <sub>5</sub> (mg/L)		35.0	35.0	35.0	35.0
Organic Nitrogen (mg/L)		12.934	9.688	7.360	12.147
NH <sub>4</sub> -Nitrogen (mg/L)		10.000	13.800	15.500	10.200
NO <sub>3</sub> -Nitrogen (mg/L)		6.546	11.892	10.880	9.773
Organic Phosphorus (mg/L)		0.200	0.200	0.200	0.200
Inorganic Ortho-Phosphorus (mg/L)		0.800	0.800	0.800	0.800
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)		191	166	193	203
pH		7.8	7.7	7.6	7.8

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

### 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 based upon Water Quality Standards for DO

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

	Constituent	Standard	Summer	Fall	Winter	Spring
	Flow [Maximum Daily] (MGD)	N/A	11.4	11.4	11.4	11.4
	Flow [Monthly Average] (MGD)	N/A	13.5	13.5	13.5	13.5
	BOD <sub>5</sub> [7-day Average] (mg/L)	N/A	35.0	35.0	35.0	35.0
	BOD <sub>5</sub> [30-day Average] (mg/L)	N/A	25.0	25.0	25.0	25.0
	Dissolved Oxygen [30-day Average] (mg/L)	5.0	5.5	5.5	5.5	5.5
	Dissolved Oxygen [Minimum] (mg/L)	3.0	5.5	5.5	5.5	5.5
	NH <sub>4</sub> -Nitrogen (mg/L)	N/A	1.6	3.0	3.6	2.8

### 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:

	NH <sub>4</sub> -Nitrogen (mg/L)	Standard	Summer	Fall	Winter	Spring
	Acute [1-hour Average]	Varies	10.0	13.8	15.5	10.2
	Chronic [30-day Average]	Varies	1.6	3.0	3.6	2.8

### 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 downstream segments, will not occur for the evaluated parameters of concern as discussed above if the effluent limitations indicated above are met.

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**Coefficients and Other Model Information**

<i>Parameter</i>	<i>Value</i>	<i>Units</i>
<b><i>Stoichiometry:</i></b>		
Carbon	40	gC
Nitrogen	7.2	gN
Phosphorus	1	gP
Dry weight	100	gD
Chlorophyll	1	gA
<b><i>Inorganic suspended solids:</i></b>		
Settling velocity	0.001	m/d
<b><i>Oxygen:</i></b>		
Reaeration model	Thackston-Dawson	
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
<b><i>Slow CBOD:</i></b>		
Hydrolysis rate	0	/d
Temp correction	1.047	
Oxidation rate	0.103	/d
Temp correction	1.047	
<b><i>Fast CBOD:</i></b>		
Oxidation rate	10	/d
Temp correction	1.047	
<b><i>Organic N:</i></b>		
Hydrolysis	0.84524491	/d
Temp correction	1.07	
Settling velocity	0.056128	m/d
<b><i>Ammonium:</i></b>		
Nitrification	0.1761337	/d
Temp correction	1.07	
<b><i>Nitrate:</i></b>		
Denitrification	0.66745388	/d
Temp correction	1.07	
Sed denitrification transfer coeff	0.045495	m/d
Temp correction	1.07	
<b><i>Organic P:</i></b>		
Hydrolysis	0.32642425	/d
Temp correction	1.07	
Settling velocity	0.086465	m/d
<b><i>Inorganic P:</i></b>		
Settling velocity	0.015655	m/d
Sed P oxygen attenuation half sat constant	0.28717	mgO2/L

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<b>Phytoplankton:</b>			
Max Growth rate	2.8944	/d	
Temp correction	1.07		
Respiration rate	0.480803	/d	
Temp correction	1.07		
Death rate	0.86518	/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	25.4151	ugN/L	
Settling velocity	0.468545	m/d	
<b>Bottom Plants:</b>			
Growth model	Zero-order		
Max Growth rate	15.15954	gD/m2/d or /d	
Temp correction	1.07		
First-order model carrying capacity	100	gD/m2	
Basal respiration rate	0.6500528	/d	
Photo-respiration rate parameter	0.01	unitless	
Temp correction	1.07		
Excretion rate	0.192404	/d	
Temp correction	1.07		
Death rate	0.168976	/d	
Temp correction	1.07		
External nitrogen half sat constant	609.3926	ugN/L	
External phosphorus half sat constant	166.1311	ugP/L	
Inorganic carbon half sat constant	1.00E-04	moles/L	
Bottom algae use HCO3- as substrate	Yes		
Light model	Smith		
Light constant	77.733	mgO <sup>2</sup> /L	
Ammonia preference	17.54875	ugN/L	
Subsistence quota for nitrogen	5.1638	mgN/gD	
Subsistence quota for phosphorus	3.7292	mgP/gD	
Maximum uptake rate for nitrogen	80.134	mgN/gD/d	
Maximum uptake rate for phosphorus	72.3308	mgP/gD/d	
Internal nitrogen half sat ratio	2.531408		
Internal phosphorus half sat ratio	1.7292025		
Nitrogen uptake water column fraction	1		
Phosphorus uptake water column fraction	1		
<b>Detritus (POM):</b>			
Dissolution rate	2.7941785	/d	
Temp correction	1.07		
Settling velocity	0.38251	m/d	
<b>pH:</b>			
Partial pressure of carbon dioxide	370	ppm	

Atmospheric Inputs:	Summer	Fall	Winter	Spring
Min. Air Temperature, F	61.6	31.4	24.5	48.4
Max. Air Temperature, F	89.5	49.4	42.5	74.1
Dew Point, Temp., F	58.6	35.0	30.3	48.5
Wind, ft./sec. @ 21 ft.	6.6	5.2	6.0	7.4
Cloud Cover, %	10%	10%	10%	10%

Other Inputs:	
Bottom Algae Coverage	100%
Bottom SOD Coverage	100%
Prescribed SOD, gO <sub>2</sub> /m <sup>2</sup> /day	0 to 1.5
Prescribed NH <sub>4</sub> Flux, μgN/m <sup>2</sup> /day	0 to 600
Prescribed PO <sub>4</sub> Flux, μgP/m <sup>2</sup> /day	0 to 300

**WASTELOAD ANALYSIS [WLA]**  
**Appendix B: Mass Balance Mixing Analysis for Conservative Constituents**

Date: 12/16/2025

Discharging Facility: 2B, 3C, 3D  
 UPDES No: UT-0020915  
 Permit Flow [MGD]: 13.50 Maximum Daily Flow  
 11.42 Maximum Monthly Flow

Receiving Water: Powell Slough  
 Stream Classification: 2B, 3C, 3D  
 Stream Flows [cfs]: 2.60 Summer (July-Sept) Critical Low Flow  
 2.90 Fall (Oct-Dec)  
 2.40 Winter (Jan-Mar)  
 3.66 Spring (Apr-June)

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

**Modeling Information**

A simple mixing analysis was used to determine these effluent limits.

**Model Inputs**

The following is upstream and discharge information that was utilized as inputs for the analysis.

**Headwater/Upstream Information**

	<b>Flow</b>
	cfs
Summer	2.6
Fall	2.9
Winter	2.4
Spring	3.7

**Discharge Information**

	<b>Flow</b>
	MGD
Maximum Daily	13.5
Maximum Monthly	11.4

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

**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		Maximum Concentration
Parameter		
	pH Minimum	6.5
	pH Maximum	9.0

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

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

Physical		Maximum Concentration
Parameter		
	Temperature (deg C)	27
	Temperature Change (deg C)	4

Inorganics	Chronic Standard (4 Day Average)		Acute Standard (1 Hour Average)
	Parameter	Standard	Standard
	Phenol (mg/L)		0.010
	Hydrogen Sulfide (Undissociated) [mg/L]		0.002

Dissolved Metals	Chronic Standard (4 Day Average) <sup>1</sup>			Acute Standard (1 Hour Average) <sup>1</sup>			
	Parameter	Standard	Background <sup>2</sup>	Limit	Standard	Background <sup>2</sup>	Limit
	Aluminum (µg/L)	N/A	20.0	N/A	750.0	20.0	840.9
	Arsenic (µg/L)	150.0	3.3	171.6	340.0	3.3	381.9
	Cadmium (µg/L)	0.46	0.15	0.50	4.8	0.2	5.4
	Chromium VI (µg/L) <sup>3</sup>	11.0	7.4	11.5	16.0	7.4	17.1
	Chromium III (µg/L) <sup>3</sup>	153.9	103.1	161.4	1183.0	103.1	1317.4
	Copper (µg/L)	19.2	2.5	21.6	31.1	2.5	34.7
	Cyanide (µg/L) <sup>3</sup>	5.2	3.5	5.5	22.0	3.5	24.3
	Iron (µg/L)				1000.0	17.7	1122.3
	Lead (µg/L)	6.5	0.2	7.5	168.0	0.2	188.9
	Mercury (µg/L) <sup>3</sup>	0.012	0.008	0.013	2.4	0.0	2.7
	Nickel (µg/L)	110.6	6.1	126.0	995.9	6.1	1119.1
	Selenium (µg/L)	4.6	1.3	5.1	18.4	1.3	20.5
	Silver (µg/L)				14.9	0.6	16.7
	Tributyltin (µg/L) <sup>3</sup>	0.072	0.048	0.075	0.46	0.05	0.51
	Zinc (µg/L)	251.6	16.0	286.2	249.5	16.0	278.6

1: Based upon a Hardness of 244 mg/l as CaCO3  
 2: Background concentration average of monitoring data  
 3: Background assumed 67% of chronic standard

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Organics [Pesticides]	Parameter	Chronic Standard (4 Day Average)			Acute Standard (1 Hour Average)		
		Standard	Background <sup>1</sup>	Limit	Standard	Background <sup>1</sup>	Limit
	Aldrin (µg/L)				1.5	1.0	1.6
	Chlordane (µg/L)	0.0043	0.0029	0.0045	1.2	0.0	1.3
	DDT, DDE (µg/L)	0.001	0.001	0.001	0.55	0.00	0.62
	Diazinon (µg/L)	0.17	0.11	0.18	0.17	0.11	0.18
	Dieldrin (µg/L)	0.0056	0.0038	0.0059	0.24	0.00	0.27
	Endosulfan, a & b (µg/L)	0.056	0.038	0.059	0.11	0.04	0.12
	Endrin (µg/L)	0.036	0.024	0.038	0.086	0.024	0.094
	Heptachlor & H. epoxide (µg/L)	0.0038	0.0025	0.0040	0.26	0.00	0.29
	Lindane (µg/L)	0.08	0.05	0.08	1.0	0.1	1.1
	Methoxychlor (µg/L)				0.03	0.02	0.03
	Mirex (µg/L)				0.001	0.001	0.001
	Nonylphenol (µg/L)	6.6	4.4	6.9	28.0	4.4	30.9
	Parathion (µg/L)	0.0130	0.0087	0.0136	0.066	0.009	0.073
	PCB's (µg/L)	0.014	0.009	0.015			
	Pentachlorophenol (µg/L)	15.0	10.1	15.7	19.0	10.1	20.1
	Toxephene (µg/L)	0.0002	0.0001	0.0002	0.73	0.00	0.82

1: Background concentration assumed 67% of chronic standard

Radiological	Parameter	Maximum Concentration		
		Standard	Background <sup>1</sup>	Limit
	Gross Alpha (pCi/L)	15	10.1	15.7

1: Background concentration assumed 67% of chronic standard; TDS is based on observed ambient data

PND Draft

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**ATTACHMENT 3**

*Reasonable Potential Analysis*

## 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<sup>1</sup>. 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. A copy of the initial screening is included in the “Effluent Metals and RP Screening Results” table in this attachment. The initial screening check for metals showed that the full model needed to be run on cadmium, copper, cyanide, selenium, and ammonia.

The RP model was run on cadmium, cyanide, and selenium using the most recent data back through 2020. This resulted in 19 data points for cadmium, cyanide, and selenium and that there is a Reasonable Potential for a chronic limit exceedance for cadmium, cyanide, and selenium. Reviewing the data showed that there could be at least one outlier in the data. The EPA ProUCL model was used to evaluate the data. This identified no outliers in the data set. The results of the model are that there is no acute RP at 95% and 99% confidence, and there is chronic RP at 95% and 99% Confidence for cadmium, cyanide, and selenium. This result indicates that the inclusion of an effluent limit for cadmium, cyanide, and selenium is not required at this time, but routine monitoring requirements will be added or increased in the Permit.

The RP model was run on copper using the most recent data back through 2020. This resulted in 19 data points and that there is a Reasonable Potential for a chronic limit exceedance for copper. Reviewing the data showed that there could be at least one outlier in the data. The EPA ProUCL model was used to evaluate the data. This produced one outlier for the data points. This outlier was from the September 2024 data set (0.0141). The value was excluded from the data set and RP was rerun at both the 95% and 99% confidence levels. The results of the model are that there is no chronic RP at 95% or 99% confidence. This result indicates that the inclusion of an effluent limit for copper is not required at this time, and that routine monitoring requirements will remain the same in this Permit.

The RP model was run on ammonia using the most recent data back through 2020. This resulted in 58 data points and that there is a Reasonable Potential for the Permittee to exceed a chronic limit for ammonia. Reviewing the data showed that there could be at least one outlier in the data. The EPA ProUCL model was used to evaluate the data. This produced one outlier for the data points. This outlier was from the April 2022 data set (3.9). The value was excluded from the data set, and RP was rerun at both the 95% and 99% confidence levels. The results of the model are that there is no chronic RP at 95% confidence, but there is chronic RP at 99% confidence. This result indicates that the Permit will maintain an effluent limit for ammonia, however monitoring will remain the same in this Permit.

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

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<sup>1</sup> See Reasonable Potential Analysis Guidance for definitions of terms

RP Input/Output Summary

RP Procedure Output	Outfall Number: 001			
Parameter	Cadmium		Cyanide	
Distribution	Logarithmic		Logarithmic	
Reporting Limit	(0.001)		(0.001)	
Significant Figures	2		2	
Maximum Reported Effluent Conc.	0.002		0.0073	
Coefficient of Variation (CV)	0.67		0.49	
Acute Criterion	0.0054		0.0243	
Chronic Criterion	0.0005		0.0055	
Confidence Interval	95	99	95	99
Projected Maximum Effluent Conc. (MEC)	0.0029	0.0051	0.0096	0.015
RP Multiplier	1.4	2.6	1.3	2.0
RP for Acute?	NO	NO	NO	NO
RP for Chronic?	YES	YES	YES	YES
Outcome	B		B	

RP Procedure Output	Outfall Number: 001			
Parameter	Copper		Copper (Outlier Removed)	
Distribution	Logarithmic		Logarithmic	
Reporting Limit	(0.001)		(0.001)	
Significant Figures	2		2	
Maximum Reported Effluent Conc.	0.0141		0.0141	
Coefficient of Variation (CV)	0.30		0.24	
Acute Criterion	0.0347		0.0347	
Chronic Criterion	0.0216		0.0216	
Confidence Interval	95	99	95	99
Projected Maximum Effluent Conc. (MEC)	0.017	0.022	0.013	0.016
RP Multiplier	1.4	2.6	1.3	2.0
RP for Acute?	NO	NO	NO	NO
RP for Chronic?	NO	YES	YES	NO
Outcome	C		C	

RP Procedure Output	Outfall Number: 001	
Parameter	Selenium	
Distribution	Logarithmic	
Reporting Limit	(0.001)	
Significant Figures	2	
Maximum Reported Effluent Conc.	0.005	
Coefficient of Variation (CV)	0.53	
Acute Criterion	0.0205	
Chronic Criterion	0.0051	
Confidence Interval	95	99
Projected Maximum Effluent Conc. (MEC)	0.0067	0.011
RP Multiplier	1.3	2.2
RP for Acute?	NO	NO
RP for Chronic?	YES	YES
Outcome	B	

RP Procedure Output	Outfall Number: 001			
Parameter	Ammonia		Ammonia (Outlier Removed)	
Distribution	Logarithmic		Logarithmic	
Reporting Limit	(0.01)		(0.01)	
Significant Figures	2		2	
Maximum Reported Effluent Conc.	3.9		3.0	
Coefficient of Variation (CV)	1.2		1.1	
Acute Criterion	10.0		10.0	
Chronic Criterion	1.6		1.6	
Confidence Interval	95	99	95	99
Projected Maximum Effluent Conc. (MEC)	3.9	8.9	3.0	6.6
RP Multiplier	1.0	2.3	1.0	2.2
RP for Acute?	NO	NO	NO	NO
RP for Chronic?	YES	YES	NO	YES
Outcome	C		C	

Metals Monitoring Screening and RP Check

Effluent													
	Metal	Aluminum	Arsenic	Cadmium	Chromium	Copper	Cyanide	Lead	Mercury	Nickel	Selenium	Silver	Zinc
	ARP Val	0.8409	0.381	0.0054	0.0171	0.0347	0.0243	0.1889	0.0027	1.1191	0.0205	0.0167	0.2786
	CRP Val		0.1716	0.0005	0.0115	0.0216	0.0055	0.0075	0.000013	0.126	0.0051		0.2786
12/31/2020	Metals, mg/L		0.002	0.0005	0.002	0.0058	0.0073	0.002	7E-07	0.002	0.002	0.002	0.0444
3/31/2021			0.002	0.0005	0.002	0.006	0.005	0.002	2.9E-06	0.002	0.002	0.002	0.0697
6/30/2021		0.1	0.002	0.0005	0.002	0.0067	0.005	0.002	1.1E-06	0.002	0.002	0.002	0.0678
9/30/2021		0.1	0.002	0.0005	0.0009	0.0092	0.005	0.002	8E-07	0.002	0.002	0.002	0.0394
12/31/2021		0.1	0.002	0.0005	0.0008	0.0081	0.005	0.002	1.8E-06	0.002	0.002	0.002	0.0384
3/31/2022		0.06	0.001	0.002	0.0005	0.0052	0.002	0.0005	1.8E-06	0.0013	0.0015	0.0005	0.05
6/30/2022		0.05	0.0007	0.0002	0.0005	0.0054	0.002	0.0005	1.4E-06	0.0022	0.0013	0.0005	0.05
9/30/2022		0.08	0.0011	0.0002	0.0009	0.0078	0.002	0.0005	1.5E-06	0.0014	0.0013	0.0005	0.03
12/31/2022		0.06	0.0012	0.0002	0.0007	0.0091	0.002	0.0005	2.4E-06	0.0015	0.0013	0.0005	0.02
3/31/2023		0.05	0.0012	0.0002	0.0005	0.0046	0.002	0.0005	1.4E-06	0.0009	0.0023	0.0005	0.04
6/30/2023		0.06	0.0012	0.0002	0.0005	0.0058	0.002	0.0005	1.4E-06	0.0012	0.0015	0.0005	0.03
9/30/2023		0.05	0.001	0.0002	0.0007	0.0058	0.003	0.0005	1.1E-06	0.0013	0.0008	0.0005	0.03
12/31/2023		0.05	0.0012	0.0002	0.0009	0.0064	0.003	0.0005	1.2E-06	0.001	0.0005	0.0005	0.03
3/31/2024		0.05	0.0012	0.0002	0.0005	0.0055	0.004	0.0005	1.9E-06	0.0012	0.0026	0.0005	0.05
6/30/2024		0.05	0.0011	0.0002	0.0007	0.0113	0.002	0.0008	1.6E-06	0.0018	0.005	0.0005	0.06
9/30/2024		0.06	0.0013	0.0002	0.0006	0.0141	0.005	0.0005	1.4E-06	0.0018	0.001	0.0005	0.04
12/31/2024		0.06	0.001	0.0003	0.0005	0.0069	0.005	0.0005	1.8E-06	0.0016	0.0009	0.0005	0.03
3/31/2025		0.06	0.0007	0.0002		0.0069	0.005	0.0005	2.4E-06	0.0019	0.0013	0.0005	0.05
6/30/2025		0.06	0.0009	0.0003		0.0052	0.005	0.0005	0.000001	0.0015	0.00144	0.0005	0.04
		ND Value	0	0	0	0	0	0	0	0	0	0	0
	Max	0.1	0.002	0.002	0.002	0.0141	0.0073	0.002	2.9E-06	0.0022	0.005	0.002	0.0697
	ARP?	No	No	No	No	No	No	No	No	No	No	No	no
	CRP?	No	No	Yes	No	No/Yes	Yes	No	No	No	Yes	No	No

PND Draft

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