

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

Date: May 22, 2020

Prepared by: Suzan Tahir
Standards and Technical Services

Receiving water: Little Salt Lake (2B, 3D)

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 → Little Salt Lake

The maximum monthly design discharge is 0.474 MGD for the facility.

Receiving Water

The receiving water for Outfall 001 is Little Salt Lake.

Based on UAC 317-2-13.13(Unclassified Waters), Little Salt Lake does not have designated beneficial uses and would be presumptively designated as 2B 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 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.*

Typically, the critical flow for the wasteload analysis is considered the lowest lake elevation averaged over seven consecutive days with a ten year return frequency (7Q10). No stage records were found for Little Salt Lake and no water was assumed present during critical conditions.

**Utah Division of Water Quality
Wasteload Analysis
Parowan City Lagoons
UPDES No. UT0026158**

TMDL

The receiving water and downstream waterbodies are not listed as impaired for any parameters according to the 2016 303(d) list.

Mixing Zone

The maximum allowable mixing zone is 15 minutes of travel time for acute conditions, not to exceed 50% of stream width, and 2,500 feet for chronic conditions, per UAC R317-2-5. Water quality standards must be met at the end of the mixing zone. Due to the lack of dilution in Little Salt Lake during critical conditions, no mixing zone is allowed.

Parameters of Concern

The potential parameters of concern identified for the discharge/receiving water were total suspended solids (TSS), dissolved oxygen (DO), BOD₅, total ammonia (TAN), total phosphorus (TP), E. coli, and pH as determined in consultation with the UPDES Permit Writer.

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 LC₅₀ (lethal concentration, 50%) percent effluent for acute toxicity and the IC₂₅ (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 LC₅₀ is typically 100% effluent and does not need to be determined by the WLA.

Table 1: WET Limits for IC₂₅

Season	Percent Effluent	Dilution Ratio
Annual	100%	0

Effluent Limits

Effluent limits were determined using a mass balance mixing analysis (UDWQ 2012). Due to the lack of dilution from the receiving water during critical conditions, the WQBELs were set at the water quality criteria. The mass balance analysis is summarized in Appendix A.

The toxicity of some metals is dependent on the hardness of the water. Due to the lack of sampling data, a hardness of 271 mg/L as CaCO₃ was used based on a single sample tested on November 8th, 2013.

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

Because of the infrequency of the discharges, it is presumed that secondary standards for BOD₅ and water quality criteria for DO are sufficiently protective of the receiving water.

**Utah Division of Water Quality
Wasteload Analysis
Parowan City Lagoons
UPDES No. UT0026158**

Table 3: Water Quality Based Effluent Limits Summary

Effluent Constituent	Acute			Chronic		
	Standard	Limit	Averaging Period	Standard	Limit	Averaging Period
Flow (MGD)		0.711	1 day		0.474	30 days
Dissolved Oxygen, Min. (mg/L)	3.0	3.0	Minimum	5.0	5.0	30 days
Ammonia (mg/L)	Varies	2.7	1 hour	Varies		30 days
Summer (Jul-Sep)					0.7	
Fall (Oct-Dec)					1.5	
Winter (Jan-Mar)					2.1	
Spring (Apr-Jun)					1.0	

Models and supporting documentation are available for review upon request.

Antidegradation Level I Review

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

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

Documents:

WLA Document: *Parowan_WLA_2020_Final.docx*
Wasteload Analysis: *Parowan_WLA_2020.xlsm*

References:

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

DWQ-2020-013296