

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

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Facility: Hiawatha Mine, UPDES Permit No. UT0023094

Receiving water(s): CEDAR CREEK (2B, 3C and 4) → Tributary to Huntington Creek
MILLER CREEK (2B, 3C and 4) → Tributary to Price River

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

001	Outfall (Ground Water)	0.1601 MGD (maximum daily discharge)
002	Outfall (Ground Water)	0.1928 MGD
003	Outfall (Surface Runoff)	0.000 MGD
004	Outfall (Surface Runoff)	0.000 MGD
006	Outfall (Surface Runoff)	0.000 MGD
008	Outfall (Surface Runoff)	0.000 MGD
009	Outfall (Surface Runoff)	0.000 MGD
010	Outfall (Ground Water)	0.000 MGD
011	Outfall (Surface Runoff)	0.000 MGD
012	Outfall (Ground Water)	0.000 MGD
013	Outfall (Ground Water)	0.000 MGD

Receiving Water

The receiving waters (Cedar Creek and Miller Creek) as designated by Utah Administrative Code (UAC) R317-2-13 are 2B, 3C and 4.

- *Class 2B -Protected for infrequent primary contact recreation and for secondary contact recreation (boating, wading, hunting, fishing and similar uses).*
- *Class 3C -Protected for nongame fish and other aquatic life, including the necessary aquatic organisms in their food chain.*
- *Class 4 -Protected for agricultural uses including irrigation of crops and stock watering.*

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Flow

Typically, the critical flow for the wasteload analysis is considered the lowest stream flow for seven consecutive days with a ten year return frequency (7Q10). The receiving water bodies are intermittent, therefore flow was assumed to be 0.001 cfs because the model needs a flow value to run the calculations. These values are displayed in Table 1.

Table 1. Seasonal Flow Values (20th percentile)

Season	20 th percentile (cfs)
Summer	0.001
Fall	0.001
Winter	0.001
Spring	0.001

The Ambient receiving water bodies are intermittent therefore it was not possible to characterize the ambient water quality.

Discharge data was characterized using data from the Utah Division of Oil, Gas and Mining sampling station # UT0023094-001(HIAWATHA COMPLEX, MOHRLAND MINE PORTAL) for the period 1979-2019.

Total Maximum Daily Load (TMDL)

According to the Utah's 2016 303(d) Water Quality Assessment Report, the receiving water for the discharge Huntington Creek-3 (UT14060009-003_00) is not supporting all assessed uses and exhibits evidence of water quality impairment for pH, Dissolved Oxygen and Total Dissolved Solids (TDS). There have been no updates to the EPA approved West Colorado Watershed 2004 TMDL ([link](#)).

Mixing Zone

The maximum allowable mixing zone is 15 minutes of travel time for acute conditions, not to exceed 50% of stream width, and for chronic conditions is 2500 ft, per UAC R317-2-5. Water quality standards must be met at the end of the mixing zone.

Based on the results of the mixing zone modeling, plume width was 100 % of the river at 2500 feet. 100 % of the seasonal critical low flow was used to calculate chronic limits. Acute limits were calculated using 50% of the seasonal critical low flow.

Parameters of Concern

TDS was identified as the primary potential parameter of concern based on review of the impairment status of the receiving waters and review of the previous permit.

WET Limits

The percent of effluent in the receiving water in a fully mixed condition, and acute and chronic dilution in a not fully mixed condition are calculated in the WLA in order to generate WET limits. The 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.

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IC25 WET limits for Outfall 001 should be based on 99.9 % effluent.

Wasteload Allocation Methods

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

The water quality standard for chronic ammonia toxicity is dependent on temperature and pH, and the water quality standard for acute ammonia toxicity is dependent on pH. The AMMTOX Model developed by University of Colorado and adapted by Utah DWQ and EPA Region VIII was used to determine ammonia effluent limits (Lewis et al. 2002). The analysis is summarized in the Wasteload Addendum.

Models and supporting documentation are available for review upon request.

Antidegradation Level I Review

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

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

Documents:

WLA Document: *Hiawatha Mine_WLA_2020.docx*

Wasteload Analysis and Addendums: *Hiawatha_WLA_09-17-2020.xlsm*

References:

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

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