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

Date: **July 31, 2020**

Prepared by: **Nicholas von, Stackelberg, P.E.**
Watershed Protection Section

Facility: **Ashley Valley Operating**
UPDES No. UT-0000035

Receiving water: **Ashley Creek (2B, 3B, 4)**

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: Outfall is located at the discharge pipe from Ashley Valley Operating Pond #3.

The design flow rate of the facility is 1.5 MGD maximum monthly average.

Receiving Water
The receiving water for Outfall 001 is an ephemeral dry wash that drains into the Union Canal. An overflow structure diverts a portion of the flow into Ashley Creek, with the remainder flowing via the Union Canal to the Green River.

Per UAC R317-2-13.1.b, the designated beneficial uses of Ashley Creek and tributaries, from confluence with Green River to Steinaker diversion are 2B, 3B, and 4.

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

Typically, the critical flow for the wasteload analysis is considered the lowest stream flow for

seven consecutive days with a ten year return frequency (7Q10). Due to a lack of flow records for Ashley Creek, the 20th percentile of available flow measurements was calculated to approximate the 7Q10 low flow condition. The source of flow data was DWQ sampling station 4937210 Ashley Creek Above Confluence with Green River at 6550 South Crossing for 2010-2019. The critical low flow condition for Ashley Creek is 11.6 cfs

Ashley Creek water quality was characterized based on samples collected from DWQ monitoring site 4937210 Ashley Creek Above Confluence with Green River at 6550 South Crossing and 4937420 Ashley Creek at US40 Crossing for 2010-2019.

Impaired Waters and TMDL

Ashley Creek is listed as impaired for total dissolved solids (TDS) and selenium according to Utah's 2016 Integrated Report. A TMDL has not been completed for these constituents. Water quality based effluent limits (WQBELs) for these constituents will be set at the applicable water quality standards with no allowance for mixing.

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 mixing zone. Acute limits were calculated using 50% of the seasonal critical low flow.

Parameters of Concern

The potential parameters of concern identified for the discharge were total suspended solids (TSS), dissolved oxygen (DO), biochemical oxygen demand (BOD_5), dissolved metals, undissociated H_2S, and TDS, as determined in consultation with the UPDES Permit Writer.

Wasteload Allocation Methods

Effluent limits were determined for conservative constituents using a mass balance mixing analysis (UDWQ 2012). The effluent limits for DO and BOD_5 to meet minimum DO criteria in the receiving water was evaluated using the Utah River Model.

Models and supporting documentation are available for review upon request.

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	Dilution Ratio
All	16.7%	5:1

Effluent Limits

Select WQBELs are summarized in Table 2. The complete list of WQBELs is attached in the Wasteload Addendum. Ammonia limits were set in order to meet instream DO criteria.

Table 2: Water Quality Based Effluent Limits Summary

Effluent Constituent	Acute			Chronic		
	Standard	Limit	Averaging Period	Standard	Limit	Averaging Period
Flow (MGD)					1.5	30 days
Dissolved Oxygen (mg/L)	5.0	5.0	Minimum	5.5	5.5	30 days
BOD_5 (mg/L)	N/A	45.0	Maximum	N/A	30.0	30 days
TDS	1,200	1,200	Maximum			
Un-dissociated H_2S (mg/L)	0.002	0.002	Maximum			
Turbidity Increase (NTU)	10	10	Maximum			

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 if the BOD limits are raised from the secondary standards in the current permit. Otherwise, a Level II ADR is not required for this discharge since the pollutant concentration and load is not increasing under this permit renewal.

Documents:

WLA Document*: AshleyValleyOperatingWLA_2020-07-31.docx*
Wasteload Analysis and Addendum: *AshleyValleyOperatingWLA_2020.xlsm*

References:

Utah Division of Water Quality. 2012. *Utah Wasteload Analysis Procedures Version 1.0*.
Utah Division of Water Quality. 2016. *Utah's 2016 Integrated Report*.

Utah Division of Water Quality
Salt Lake City, Utah

WASTELOAD ANALYSIS [WLA] **7/31/2020**
Addendum: Statement of Basis

Facilities: **Ashley Valley Operating** **UPDES No: UT-0000035**
Discharging to: **Union Canal => Ashley Creek**

I. Introduction

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

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

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

II. Receiving Water and Stream Classification

Union Canal => Ashley Creek: 2B, 3B, 4

III. Numeric Stream Standards for Protection of Aquatic Wildlife

Total Ammonia (TNH3)	Varies as a function of Temperature and pH Rebound. See Water Quality Standards
Chronic Total Residual Chlorine (TRC)	0.011 mg/l (4 Day Average) 0.019 mg/l (1 Hour Average)
Chronic Dissolved Oxygen (DO)	5.5 mg/l (30 Day Average) 6.0 mg/l (7Day Average) 5.0 mg/l (1 Day Average
Maximum Turbitity Increase	10.0 NTU
Maximum Total Dissolved Solids	1200.0 mg/l

Acute and Chronic Heavy Metals (Dissolved)

Parameter	4 Day Average (Chronic) Standard Concentration	1 Hour Average (Acute) Standard Concentration
Aluminum	87.0 ug/l**	750.0 ug/l
Arsenic	190.0 ug/l	340.0 ug/l
Cadmium	0.76 ug/l	8.73 ug/l
Chromium III	268.2 ug/l	5612 ug/l
ChromiumVI	11.0 ug/l	16.0 ug/l
Copper	30.5 ug/l	51.7 ug/l
Iron		1000 ug/l
Lead	18.6 ug/l	476.8 ug/l
Mercury	0.012 ug/l	2.4 ug/l
Nickel	168.5 ug/l	1516 ug/l
Selenium	4.6 ug/l	20.0 ug/l
Silver	N/A ug/l	41.1 ug/l
Zinc	387.8 ug/l	387.8 ug/l

* Allowed below discharge

**Chronic Aluminum standard applies only to waters with a pH < 7.0 and a Hardness < 50 mg/l as CaCO3

Metals Standards Based upon a Hardness of 400 mg/l as CaCO3

Organics [Pesticides]

Parameter	4 Day Average (Chronic) Standard Concentration	1 Hour Average (Acute) Standard Concentration
Aldrin		1.5 ug/l
Carbaryl	2.1 ug/l	2.1 ug/l
Chlordane	0.0043 ug/l	1.2 ug/l
Chlorpyrifos	0.041 ug/l	0.083 ug/l
DDT, DDE	0.001 ug/l	0.55 ug/l
Diazinon	0.17 ug/l	0.17 ug/l
Dieldrin	0.056 ug/l	0.24 ug/l
Endosulfan	0.056 ug/l	0.11 ug/l
Endrin	0.036 ug/l	0.086 ug/l
Heptachlor	0.0038 ug/l	0.26 ug/l
Lindane	0.08 ug/l	1 ug/l
Methoxychlor		0.03 ug/l
Mirex		0.001 ug/l
Nonylphenol	6.6 ug/l	28 ug/l
Parathion	0.013 ug/l	0.066 ug/l
PCB's	0.014 ug/l	
Pentachlorophenol	15 ug/l	19 ug/l
Toxaphene	0.0002 ug/l	0.73 ug/l

IV. Numeric Stream Standards for Protection of Agriculture

	4 Day Average (Chronic) Standard Concentration	1 Hour Average (Acute) Standard Concentration
Arsenic		100.0 ug/l
Boron		750.0 ug/l
Cadmium		10.0 ug/l
Chromium		100.0 ug/l
Copper		200.0 ug/l
Lead		100.0 ug/l
Selenium		50.0 ug/l
TDS, Summer		1200.0 mg/l

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

Metals	4 Day Average (Chronic) Standard Concentration	1 Hour Average (Acute) Standard Concentration
Arsenic		
Barium		
Cadmium		
Chromium		
Lead		
Mercury		
Selenium		
Silver		
Fluoride (3)		
to		
Nitrates as N		

Chlorophenoxy Herbicides

2,4-D	
2,4,5-TP	
Endrin	
ɔcyclohexane (Lindane)	
Methoxychlor	
Toxaphene	

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

	Maximum Conc., ug/l - Acute Standards	
	Class 1C	**Class 3A, 3B**
	[2 Liters/Day for 70 Kg Person over 70 Yr.]	[6.5 g for 70 Kg Person over 70 Yr.]
Antimony		640 ug/l
Copper		
Nickel		4600 ug/l
Selenium		4200 ug/l
Thallium		0.47 ug/l
Zinc		26000 ug/l
Cyanide		400 ug/l
Asbestos (million fibers/		
2,3,7,8-TCDD Dioxin		5.1E-09 ug/l
Acrolein		400 ug/l
Acrylonitrile		7 ug/l
Benzene		51 ug/l
Bromoform		120 ug/l
Carbon Tetrachloride		5 ug/l
Chlorobenzene		800 ug/l
Chlorodibromomethane		21 ug/l
Chloroform		2000 ug/l
Dalapon		
Dichlorobromomethane		27 ug/l
1,2-Dichloroethane		2000 ug/l
1,1-Dichloroethylene		20000 ug/l
1,2-Dichloropropane		31 ug/l
1,3-Dichloropropene		12 ug/l
Ethylbenzene		130 ug/l
Ethylene Dibromide		
Methyl Bromide		10000 ug/l
Methylene Chloride		1000 ug/l
1,1,2,2-Tetrachloroetha		3 ug/l
Tetrachloroethylene		29 ug/l
Toluene		520 ug/l
1,2 -Trans-Dichloroethy		4000 ug/l
1,1,1-Trichloroethane		200000 ug/l
1,1,2-Trichloroethane		8.9 ug/l
Trichloroethylene		7 ug/l
Vinyl Chloride		1.6 ug/l
2-Chlorophenol		800 ug/l
2,4-Dichlorophenol		60 ug/l
2,4-Dimethylphenol		3000 ug/l
2-Methyl-4,6-Dinitrophe		30 ug/l
2,4-Dinitrophenol		300 ug/l
3-Methyl-4-Chlorophenc		2000 ug/l
Penetachlorophenol		0.04 ug/l
Phenol		300000 ug/l
2,4,5-Trichlorophenol		600 ug/l
2,4,6-Trichlorophenol		2.8 ug/l
Acenaphthene		90 ug/l
Anthracene		400 ug/l
Benzidine		0.011 ug/l
BenzoaAnthracene		0.0013 ug/l

BenzoaPyrene	0.00013	ug/l
BenzobFluoranthene	0.0013	ug/l
BenzokFluoranthene	0.013	ug/l
Bis2-Chloro1methylethe	0.017	ug/l
Bis2-Chloro1methylethy	4000	ug/l
Bis2-ChloroethylEther	2.2	ug/l
Bis2-Chloroisopropy1Et	65000	ug/l
Bis2-EthylhexylPhthalat	0.37	ug/l
Butylbenzyl Phthalate	0.1	ug/l
2-Chloronaphthalene	1000	ug/l
Chrysene	0.13	ug/l
Dibenzoa, (h)Anthracen	0.00013	ug/l
1,2-Dichlorobenzene	3000	ug/l
1,3-Dichlorobenzene	10	ug/l
1,4-Dichlorobenzene	900	ug/l
3,3-Dichlorobenzidine	0.15	ug/l
Diethyl Phthalate	600	ug/l
Dimethyl Phthalate	2000	ug/l
Di-n-Butyl Phthalate	30	ug/l
2,4-Dinitrotoluene	1.7	ug/l
Dinitrophenols	1000	ug/l
1,2-Diphenylhydrazine	0.2	ug/l
Fluoranthene	20	ug/l
Fluorene	70	ug/l
Hexachlorobenzene	0.000079	ug/l
Hexachlorobutedine	0.01	ug/l
Hexachloroethane	0.1	ug/l
Hexachlorocyclopentad	4	ug/l
Ideno 1,2,3-cdPyrene	0.0013	ug/l
Isophorone	1800	ug/l
Nitrobenzene	600	ug/l
N-Nitrosodiethylamine	1.24	ug/l
N-Nitrosodimethylamine	3	ug/l
N-Nitrosodi-n-Propylam	0.51	ug/l
N-Nitrosodiphenylamine	6	ug/l
N-Nitrosopyrrolidine	34	ug/l
Pentachlorobenzene	0.1	ug/l
Pyrene	30	ug/l
1,2,4-Trichlorobenzene	0.076	ug/l
Aldrin	7.7E-07	ug/l
alpha-BHC	0.00039	ug/l
beta-BHC	0.014	ug/l
gamma-BHC (Lindane)	4.4	ug/l
Hexachlorocyclohexane	0.01	ug/l
Chlordane	0.00032	ug/l
4,4-DDT	0.00003	ug/l
4,4-DDE	0.000018	ug/l
4,4-DDD	0.00012	ug/l
Dieldrin	1.2E-06	ug/l
alpha-Endosulfan	30	ug/l
beta-Endosulfan	40	ug/l
Endosulfan Sulfate	40	ug/l
Endrin	0.03	ug/l
Endrin Aldehyde	1	ug/l
Heptachlor	5.9E-06	ug/l
Heptachlor Epoxide	0.000032	ug/l
Methoxychlor	0.02	ug/l
Polychlorinated Biphen	0.000064	ug/l
Toxaphene	0.00071	ug/l

VII. Mathematical Modeling of Stream Quality

Model configuration was accomplished utilizing standard modeling procedures. Data points were plotted and coefficients adjusted as required to match observed data as closely as possible.

The modeling approach used in this analysis included one or a combination of the following models.

(1) The Utah River Model, Utah Division of Water Quality, 1992. Based upon STREAMDO IV (Region VIII) and Supplemental Ammonia Toxicity Models; EPA Region VIII, Sept. 1990 and QUAL2E (EPA, Athens, GA).

(2) Utah Ammonia/Chlorine Model, Utah Division of Water Quality, 1992.

(3) AMMTOX Model, University of Colorado, Center of Limnology, and EPA Region 8

(4) Principles of Surface Water Quality Modeling and Control. Robert V. Thomann, et.al. Harper Collins Publisher, Inc. 1987, pp. 644.

Coefficients used in the model were based, in part, upon the following references:

(1) Rates, Constants, and Kinetics Formulations in Surface Water Quality Modeling. Environmental Research Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, Athens Georgia. EPA/600/3-85/040 June 1985.

(2) Principles of Surface Water Quality Modeling and Control. Robert V. Thomann, et.al. Harper Collins Publisher, Inc. 1987, pp. 644.

VIII. Modeling Information

The required information for the model may include the following information for both the upstream conditions at low flow and the effluent conditions:

Flow, Q, (cfs or MGD)	D.O. mg/l
Temperature, Deg. C.	Total Residual Chlorine (TRC), mg/l
pH	Total NH3-N, mg/l
BOD5, mg/l	Total Dissolved Solids (TDS), mg/l
Metals, ug/l	Toxic Organics of Concern, ug/l

Other Conditions

In addition to the upstream and effluent conditions, the models require a variety of physical and biological coefficients and other technical information. In the process of actually establishing the permit limits for an effluent, values are used based upon the available data, model calibration, literature values, site visits and best professional judgement.

Model Inputs

The following is upstream and discharge information that was utilized as inputs for the analysis. Dry washes are considered to have an upstream flow equal to the flow of the discharge.

Current Upstream Information

	Stream Critical Low Flow cfs	Temp. Deg. C	pH	T-NH3 mg/l as N	BOD5 mg/l	DO mg/l	TRC mg/l	TDS mg/l
Summer (Irrig. Season)	11.60	23.4	8.3	0.05	3.00	6.33	0.00	0.0

	Al	As	Cd	CrIII	CrVI	Copper	Fe	Pb
Dissolved Metals	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
All Seasons	12.00	1.26	0.10	2.00	2.00	1.20	30.4	0.11

	Hg	Ni	Se	Ag	Zn	Boron	
Dissolved Metals	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	
All Seasons	0.00106*	5.00	1.06*	0.50	10.00	10.0	* 1/2 MDL

Projected Discharge Information

Season	Flow, MGD	Temp.
All	1.50000	21.2

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

IX. Effluent Limitations

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

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

Effluent Limitation for Flow based upon Water Quality Standards

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

Season	Daily Average			
All	1.500	MGD	2.321	cfs

Flow Requirement or Loading Requirement

The calculations in this wasteload analysis utilize the maximum effluent discharge flow of 1.5 MGD. If the discharger is allowed to have a flow greater than 1.5 MGD during 7Q10 conditions, and effluent limit concentrations as indicated, then water quality standards will be violated. In order to prevent this from occuring, the permit writers must include the discharge flow limititation as indicated above; or, include loading effluent limits in the permit.

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

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

WET Requirements	LC50 >	100.0%	Effluent	[Acute]
	IC25 >	16.7%	Effluent	[Chronic]
	Dilution Ratio	5.00	:1	

Effluent Limitation for Biological Oxygen Demand (BOD) based upon Water Quality Standards or Regulations

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

Season		Concentration			
All	30-day Ave	30.0	mg/l as BOD5	375.2	lbs/day
All	Maximum	45.0	mg/l as BOD6	562.8	lbs/day

Effluent Limitation for Dissolved Oxygen (DO) based upon Water Quality Standards

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

Season			
All	30-day Ave	5.50	mg/L as DO
All	Minimum	5.00	mg/L as DO

Effluent Limitations for Turbidity based upon Water Quality Standards

Season		Concentration	
All	Maximum Increase	10.0	NTU

Effluent Limitations for Total Dissolved Solids based upon Water Quality Standards

Season		Concentration		Load	
All	Maximum, Acute	1200	mg/l	7.50	tons/day

Ashley Creek is listed on Utah's 303(d) list as impaired for TDS (2016)
No assimilative capacity exists for this pollutant. Effluent limit equals the standard.

Colorado Salinity Forum Limits Determined by Permitting Section

Effluent Limitations for Hydrogen Sulfide (undisassociated) based upon Water Quality Standards

Season		Concentration		Load	
All	Maximum, Acute	0.002	mg/l	0.025	lbs/day

The Division has determined that WEO's current discharge is in violation of the narrative water qualit standards due to excessive growth of sulphide-loving bacteria in the receiving water. As a result, the aquatic water quality standard for undissociated hydrogen sulfide of 0.002 mg/L will be applied to the discharge as an end-of-pipe limit.

Effluent Limitations for Total Recoverable Metals based upon Water Quality Standards

In-stream criteria of downstream segments for Dissolved Metals will be met with an effluent limitation as follows (based upon a hardness of 400 mg/l):

	4 Day Average		1 Hour Average	
	Concentration	Load	Concentration	Load
Aluminum*	N/A	N/A	2,594.6 ug/l	3.25E+01 lbs/day
Arsenic*	1133.5 ug/l	9.16E+00 lbs/day	1,186.7 ug/l	1.49E+01 lbs/day
Cadmium	4.0 ug/l	3.26E-02 lbs/day	30.3 ug/l	3.80E-01 lbs/day
Chromium III	1599.0 ug/l	1.29E+01 lbs/day	19,632.8 ug/l	2.46E+02 lbs/day
Chromium VI*	56.0 ug/l	4.53E-01 lbs/day	51.0 ug/l	6.39E-01 lbs/day
Copper	177.0 ug/l	1.43E+00 lbs/day	177.9 ug/l	2.23E+00 lbs/day
Cyanide*	31.2 ug/l	2.52E-01 lbs/day	77.0 ug/l	9.65E-01 lbs/day
Iron*	N/A	N/A	3,423.6 ug/l	4.29E+01 lbs/day
Lead	110.9 ug/l	8.97E-01 lbs/day	1,668.3 ug/l	2.09E+01 lbs/day
Mercury*	0.064 ug/l	5.18E-04 lbs/day	8.4 ug/l	1.05E-01 lbs/day
Nickel	986.1 ug/l	7.97E+00 lbs/day	5,292.4 ug/l	6.63E+01 lbs/day
Selenium*	4.6 ug/l	3.72E-02 lbs/day	20.0 ug/l	2.51E-01 lbs/day
Silver	N/A ug/l	N/A lbs/day	142.5 ug/l	1.79E+00 lbs/day
Zinc	2276.6 ug/l	1.84E+01 lbs/day	1,332.2 ug/l	1.67E+01 lbs/day

*Limits for these metals are based on the dissolved standard.

Effluent Limitations for Organics [Pesticides] Based upon Water Quality Standards

In-stream criteria of downstream segments for Organics [Pesticides] will be met with an effluent limit as follows:

	4 Day Average		1 Hour Average	
	Concentration	Load	Concentration	Load
Aldrin			1.5 ug/l	2.91E-02 lbs/day
Carbaryl	2.1 ug/l	2.63E+01 lbs/day	2.1 ug/l	4.07E-02 lbs/day
Chlordane	0.0043 ug/l	5.38E-02 lbs/day	1.2 ug/l	2.33E-02 lbs/day
Chlorpyrifos	0.041 ug/l	5.13E-01 lbs/day	0.083 ug/l	1.61E-03 lbs/day
DDT, DDE	0.001 ug/l	1.25E-02 lbs/day	0.55 ug/l	1.07E-02 lbs/day
Diazinon	0.17 ug/l	2.13E+00 lbs/day	0.17 ug/l	3.30E-03 lbs/day
Dieldrin	0.056 ug/l	7.00E-01 lbs/day	0.24 ug/l	4.65E-03 lbs/day
Endosulfan	0.056 ug/l	7.00E-01 lbs/day	0.11 ug/l	2.13E-03 lbs/day
Endrin	0.036 ug/l	4.50E-01 lbs/day	0.086 ug/l	1.67E-03 lbs/day
Heptachlor	0.0038 ug/l	4.75E-02 lbs/day	0.26 ug/l	5.04E-03 lbs/day
Lindane	0.08 ug/l	1.00E+00 lbs/day	1 ug/l	1.94E-02 lbs/day
Methoxychlor			0.03 ug/l	5.82E-04 lbs/day
Mirex			0.001 ug/l	1.94E-05 lbs/day
Nonylphenol	6.6 ug/l	8.25E+01 lbs/day	28 ug/l	5.43E-01 lbs/day
Parathion	0.013 ug/l	1.63E-01 lbs/day	0.066 ug/l	1.28E-03 lbs/day
PCB's	0.014 ug/l	1.75E-01 lbs/day		
Pentachlorophenol	15 ug/l	1.88E+02 lbs/day	19 ug/l	3.68E-01 lbs/day
Toxaphene	0.0002 ug/l	2.50E-03 lbs/day	0.73 ug/l	1.42E-02 lbs/day

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

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

	Maximum Concentration			
	Concentration		**Load**	
Antimony	640	ug/l	8.00E+00	lbs/day
Copper				
Nickel	4600	ug/l	5.75E+01	lbs/day
Selenium	4200	ug/l	5.25E+01	lbs/day
Thallium	0.47	ug/l	5.88E-03	lbs/day
Zinc	26000	ug/l	3.25E+02	lbs/day
Cyanide	400	ug/l	5.00E+00	lbs/day
Asbestos (million fibers/L)				
2,3,7,8-TCDD Dioxin	5.1E-09	ug/l	6.38E-11	lbs/day
Acrolein	400	ug/l	5.00E+00	lbs/day
Acrylonitrile	7	ug/l	8.76E-02	lbs/day
Benzene	51	ug/l	6.38E-01	lbs/day
Bromoform	120	ug/l	1.50E+00	lbs/day
Carbon Tetrachloride	5	ug/l	6.25E-02	lbs/day
Chlorobenzene	800	ug/l	1.00E+01	lbs/day
Chlorodibromomethane	21	ug/l	2.63E-01	lbs/day
Chloroform	2000	ug/l	2.50E+01	lbs/day
Dalapon				
Dichlorobromomethane	27	ug/l	3.38E-01	lbs/day
1,2-Dichloroethane	2000	ug/l	2.50E+01	lbs/day
1,1-Dichloroethylene				
1,2-Dichloropropane	31	ug/l	3.88E-01	lbs/day
1,3-Dichloropropene	12	ug/l	1.50E-01	lbs/day
Ethylbenzene	130	ug/l	1.63E+00	lbs/day
Ethylene Dibromide				
Methyl Bromide	10000	ug/l	1.25E+02	lbs/day
Methylene Chloride	1000	ug/l	1.25E+01	lbs/day
1,1,2,2-Tetrachloroethane	3	ug/l	3.75E-02	lbs/day
Tetrachloroethylene	29	ug/l	3.63E-01	lbs/day
Toluene	520	ug/l	6.50E+00	lbs/day
1,2 -Trans-Dichloroethyle	4000	ug/l	5.00E+01	lbs/day
1,1,1-Trichloroethane	200000	ug/l	2.50E+03	lbs/day
1,1,2-Trichloroethane	8.9	ug/l	1.11E-01	lbs/day
Trichloroethylene	7	ug/l	8.76E-02	lbs/day
Vinyl Chloride	1.6	ug/l	2.00E-02	lbs/day
2-Chlorophenol	800	ug/l	1.00E+01	lbs/day
2,4-Dichlorophenol	60	ug/l	7.50E-01	lbs/day
2,4-Dimethylphenol	3000	ug/l	3.75E+01	lbs/day
2-Methyl-4,6-Dinitrophenol	30	ug/l	3.75E-01	lbs/day
2,4-Dinitrophenol	300	ug/l	3.75E+00	lbs/day
3-Methyl-4-Chlorophenol	2000	ug/l	2.50E+01	lbs/day
Penetachlorophenol	0.04	ug/l	5.00E-04	lbs/day
Phenol	300000	ug/l	3.75E+03	lbs/day
2,4,5-Trichlorophenol	600	ug/l	7.50E+00	lbs/day
2,4,6-Trichlorophenol	2.8	ug/l	3.50E-02	lbs/day
Acenaphthene	90	ug/l	1.13E+00	lbs/day
Anthracene	400	ug/l	5.00E+00	lbs/day
Benzidine	0.011	ug/l	1.38E-04	lbs/day
BenzoaAnthracene	0.0013	ug/l	1.63E-05	lbs/day
BenzoaPyrene	0.00013	ug/l	1.63E-06	lbs/day
BenzobFluoranthene	0.0013	ug/l	1.63E-05	lbs/day
BenzokFluoranthene	0.013	ug/l	1.63E-04	lbs/day

Bis2-Chloro1methylether	0.017	ug/l	2.13E-04	lbs/day
Bis2-Chloro1methylethylether	4000	ug/l	5.00E+01	lbs/day
Bis2-ChloroethylEther	2.2	ug/l	2.75E-02	lbs/day
Bis2-Chloroisopropy1Ether	65000	ug/l	8.13E+02	lbs/day
Bis2-EthylhexylPhthalate	0.37	ug/l	4.63E-03	lbs/day
Butylbenzyl Phthalate	0.1	ug/l	1.25E-03	lbs/day
2-Chloronaphthalene	1000	ug/l	1.25E+01	lbs/day
Chrysene	0.13	ug/l	1.63E-03	lbs/day
Dibenzoa, (h)Anthracene	0.00013	ug/l	1.63E-06	lbs/day
1,2-Dichlorobenzene	3000	ug/l	3.75E+01	lbs/day
1,3-Dichlorobenzene	10	ug/l	1.25E-01	lbs/day
1,4-Dichlorobenzene	900	ug/l	1.13E+01	lbs/day
3,3-Dichlorobenzidine	0.15	ug/l	1.88E-03	lbs/day
Diethyl Phthalate	600	ug/l	7.50E+00	lbs/day
Dimethyl Phthalate	2000	ug/l	2.50E+01	lbs/day
Di-n-Butyl Phthalate	30	ug/l	3.75E-01	lbs/day
2,4-Dinitrotoluene	1.7	ug/l	2.13E-02	lbs/day
Dinitrophenols	1000	ug/l	1.25E+01	lbs/day
1,2-Diphenylhydrazine	0.2	ug/l	2.50E-03	lbs/day
Fluoranthene	20	ug/l	2.50E-01	lbs/day
Fluorene	70	ug/l	8.76E-01	lbs/day
Hexachlorobenzene	0.000079	ug/l	9.88E-07	lbs/day
Hexachlorobutedine	0.01	ug/l	1.25E-04	lbs/day
Hexachloroethane	0.1	ug/l	1.25E-03	lbs/day
Hexachlorocyclopentadiene	4	ug/l	5.00E-02	lbs/day
Ideno 1,2,3-cdPyrene	0.0013	ug/l	1.63E-05	lbs/day
Isophorone	1800	ug/l	2.25E+01	lbs/day
Nitrobenzene	600	ug/l	7.50E+00	lbs/day
N-Nitrosodiethylamine	1.24	ug/l	1.55E-02	lbs/day
N-Nitrosodimethylamine	3	ug/l	3.75E-02	lbs/day
N-Nitrosodi-n-Propylamine	0.51	ug/l	6.38E-03	lbs/day
N-Nitrosodiphenylamine	6	ug/l	7.50E-02	lbs/day
N-Nitrosopyrrolidine	34	ug/l	4.25E-01	lbs/day
Pentachlorobenzene	0.1	ug/l	1.25E-03	lbs/day
Pyrene	30	ug/l	3.75E-01	lbs/day
1,2,4-Trichlorobenzene	0.076	ug/l	9.51E-04	lbs/day
Aldrin	7.7E-07	ug/l	9.63E-09	lbs/day
alpha-BHC	0.00039	ug/l	4.88E-06	lbs/day
beta-BHC	0.014	ug/l	1.75E-04	lbs/day
gamma-BHC (Lindane)	4.4	ug/l	5.50E-02	lbs/day
Hexachlorocyclohexane (HCH)	0.01	ug/l	1.25E-04	lbs/day
Chlordane	0.00032	ug/l	4.00E-06	lbs/day
4,4-DDT	0.00003	ug/l	3.75E-07	lbs/day
4,4-DDE	0.000018	ug/l	2.25E-07	lbs/day
4,4-DDD	0.00012	ug/l	1.50E-06	lbs/day
Dieldrin	1.2E-06	ug/l	1.50E-08	lbs/day
alpha-Endosulfan	30	ug/l	3.75E-01	lbs/day
beta-Endosulfan	40	ug/l	5.00E-01	lbs/day
Endosulfan Sulfate	40	ug/l	5.00E-01	lbs/day
Endrin	0.03	ug/l	3.75E-04	lbs/day
Endrin Aldehyde	1	ug/l	1.25E-02	lbs/day
Heptachlor	5.9E-06	ug/l	7.38E-08	lbs/day
Heptachlor Epoxide	0.000032	ug/l	4.00E-07	lbs/day
Methoxychlor	0.02	ug/l	2.50E-04	lbs/day
Polychlorinated Biphenyls (PCB)	0.000064	ug/l	8.00E-07	lbs/day
Toxaphene	0.00071	ug/l	8.88E-06	lbs/day

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

	Class 4 Acute Agricultural ug/l	Class 3 Acute Aquatic Wildlife ug/l	Acute Toxics Drinking Water Source ug/l	Acute Toxics Wildlife ug/l	1C Acute Health Criteria ug/l	Acute Most Stringent ug/l	Class 3 Chronic Aquatic Wildlife ug/l
Aluminum		2594.6				2594.6	N/A
Antimony				640.0		640.0	
Arsenic	599.9	1186.7				599.9	1133.5
Barium						0.0	
Beryllium						0.0	
Boron	3107.0					3107.0	
Cadmium	59.5	30.3				30.3	4.0
Chromium (III)		19632.8				19632.8	1599.0
Chromium (VI)	589.9	51.0				50.99	55.99
Copper	1193.8	177.9				177.9	177.0
Cyanide		77.0	400.0			77.0	31.2
Iron		3423.6				3423.6	
Lead	599.3	1668.3				599.3	110.9
Mercury		8.39				8.39	0.064
Nickel		5292.4		4600.0		4600.0	986.1
Selenium	292.0	20.0				20.0	4.6
Silver		142.5				142.5	
Thallium				0.5		0.5	
Zinc		1332.2				1332.2	2276.6

Summary Effluent Limitations for Metals [Wasteload Allocation, TMDL]
[If Acute is more stringent than Chronic, then the Chronic takes on the Acute value.]

	WLA Acute ug/l	WLA Chronic ug/l	
Aluminum	2594.6	N/A	
Antimony	640.0		
Arsenic	599.9	1133.5	Acute Controls
Barium			
Beryllium			
Boron	3107.0		
Cadmium	30.3	4.0	
Chromium (III)	19632.8	1599.0	
Chromium (VI)	51.0	56.0	Acute Controls
Copper	177.9	177.0	
Cyanide	77.0	31.2	
Iron	3423.6		
Lead	599.3	110.9	
Mercury	8.4	0.1	
Nickel	4600.0	986.1	
Selenium	20.0	4.6	
Silver	142.5	N/A	
Thallium	0.5		
Zinc	1332.2	2276.6	Acute Controls

X. Summary Comments

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

XI. Notice of UPDES Requirement

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