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

Date: **February 19, 2024**

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Standards and Technical Services

Facility: **Hexcel Corporation**
UPDES No. UT 0025305

Receiving water: **The Ridge Golf Club→Riter Canal (2B, 3E, 3D 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

001 Hexcel Corporation 0.6 MGD (maximum monthly average)

Receiving Water

Hexcel Corporation discharges into the Ridge Golf Course and then to Riter Canal. As per R317-2-13.9, the designated beneficial uses of irrigation canals and ditches statewide, except as otherwise designated are 2B, 3E, 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 3E - Severely habitat-limited waters. Narrative standards will be applied to protect these waters for aquatic wildlife. The narrative standards will be defaulted to 3D beneficial use class.*

- *Class 3D -Protected for waterfowl, shore birds and other water-oriented wildlife not included in Classes 3A, 3B, or 3C, including the necessary aquatic organisms in their food chain.*

- *Class 4 - Protected for agricultural uses including irrigation of crops and stock watering.*

Flow

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). Flow values for the Utah and Salt Lake Canal were obtained from the Utah Division of Water Rights website (https://www.waterrights.utah.gov/cgibin/dvrtview.exe?STATION_ID=1&RECORD_YEAR=&Modinfo=Daily_Comma&Startup=0.7126994544417689) for the period 2010-2022. The most consistent data set for each season was for the period 2011-2021.

Table 1. The critical low flow conditions for Utah & Salt Lake Canal are:

	7Q10 Flow	**Flow Units**	**Period**
Summer	12.286	cfs	2011-2021
Fall	9.643	cfs	2011-2021
Winter	0.40	cfs	2011-2021
Spring	7.143	cfs	2011-2021
Avg Flow	75.033	cfs	2011-2021
20th percentile	**48.52**	cfs	2011-2021

Ambient Water Quality Parameters

Ambient water quality for the receiving water body was characterized using data from DWQ monitoring station #4994790, JORDAN R AT UTAH L OUTLET U121 XING (the Jordan River is the source of the canal water) for the period 2002-2022 and data provided by the Ridge Golf Club personnel for the period 2017-2023.

Parameters of Concern

Antimony, Methylene Chloride, Cyanide, Toluene, Phenols, total dissolved solids (TDS) and BOD were identified as a potential parameter of concern for the discharge. Addition parameters of concern may become apparent as a result of reasonable potential analysis, technology-based standards, or other factors as determined by the UPDES Permit Writer.

Protection of Downstream Uses

Per UAC R317-2-8, all actions to control waste discharges under these rules shall be modified as necessary to protect downstream designated uses. For this discharge, numeric criteria for aquatic wildlife (Class 3D, protected for waterfowl, shore birds and other water-oriented wildlife) applies

to the immediate receiving water (Riter Canal) will be applied under the narrative standards.

TMDL

The Riter Canal is not listed as impaired on Utah's 2022 303(d) Water Quality Assessment Report (canals are not typically assessed for the report). However, the Jordan River source water is listed as impaired for TDS, as are several downstream river segments. In order to protect against causing or contributing to these existing impairments, TDS effluent limit should not exceed the Class 4 standard of 1,200 mg/l.

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, per UAC R317-2-5. Water quality standards must be met at the end of the mixing zone. For the discharge to the Utah and Salt Lake Canal, complete mixing was assumed for the chronic condition. Acute limits were calculated using 50% of the seasonal critical low flow for both discharge points.

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.

IC25 WET limits for Outfall 001 should be based on

Season	IC25 WET limits
Summer	7.0
Fall	8.8
Winter	100.0
Spring	11.6

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.

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 for this facility. 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*: Hexcel_WLADoc_2-19-2024.docx*
Wasteload Analysis and Addendums: *Hexcel_WLA_2-19-2043.xlsm*

References:

Utah Division of Water Quality. 2022. *Final 2022 Integrated Report on Water Quality*

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

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Salt Lake City, Utah

WASTELOAD ANALYSIS [WLA] **19-Feb-24**
Addendum: Statement of Basis

Facilities: **Hexcel Corp.** **UPDES No: UT-0025305**
Discharging to: **The Ridge Golf Club--> Riter Canal**
Design Flow: **0.60** **MGD**

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

The Ridge Golf Club--> Riter Canal:	2B, 3D,3E, 4
Antidegradation Review:	Level I review completed. Level II review not required.

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)	5.00	mg/l (30 Day Average)
	N/A	mg/l (7Day Average)
	3.00	mg/l (1 Day Average
Maximum Total Dissolved Solids	1200.0	mg/l

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Acute and Chronic Heavy Metals (Dissolved)

Parameter	4 Day Average (Chronic) Standard Concentration		Load*		1 Hour Average (Acute) Standard Concentration		Load*	
Aluminum	87.00	ug/l**	0.436	lbs/day	750.00	ug/l	3.760	lbs/day
Arsenic	190.00	ug/l	0.952	lbs/day	340.00	ug/l	1.704	lbs/day
Cadmium	2.49	ug/l	0.012	lbs/day	7.00	ug/l	0.035	lbs/day
Chromium III	268.22	ug/l	1.345	lbs/day	5611.67	ug/l	28.130	lbs/day
ChromiumVI	11.00	ug/l	0.055	lbs/day	16.00	ug/l	0.080	lbs/day
Copper	30.50	ug/l	0.153	lbs/day	51.68	ug/l	0.259	lbs/day
Iron					1000.00	ug/l	5.013	lbs/day
Lead	18.58	ug/l	0.093	lbs/day	476.82	ug/l	2.390	lbs/day
Mercury	0.0120	ug/l	0.000	lbs/day	2.40	ug/l	0.012	lbs/day
Nickel	168.54	ug/l	0.845	lbs/day	1515.91	ug/l	7.599	lbs/day
Selenium	4.60	ug/l	0.023	lbs/day	20.00	ug/l	0.100	lbs/day
Silver	N/A	ug/l	N/A	lbs/day	41.07	ug/l	0.206	lbs/day
Zinc	387.83	ug/l	1.944	lbs/day	387.83	ug/l	1.944	lbs/day

* 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		Load*		1 Hour Average (Acute) Standard Concentration		Load*	
Aldrin					1.500	ug/l	0.008	lbs/day
Chlordane	0.004	ug/l	0.307	lbs/day	1.200	ug/l	0.006	lbs/day
DDT, DDE	0.001	ug/l	0.071	lbs/day	0.550	ug/l	0.003	lbs/day
Dieldrin	0.002	ug/l	0.135	lbs/day	1.250	ug/l	0.006	lbs/day
Endosulfan	0.056	ug/l	3.993	lbs/day	0.110	ug/l	0.001	lbs/day
Endrin	0.002	ug/l	0.164	lbs/day	0.090	ug/l	0.000	lbs/day
Guthion					0.010	ug/l	0.000	lbs/day
Heptachlor	0.004	ug/l	0.271	lbs/day	0.260	ug/l	0.001	lbs/day
Lindane	0.080	ug/l	5.704	lbs/day	1.000	ug/l	0.005	lbs/day
Methoxychlor					0.030	ug/l	0.000	lbs/day
Mirex					0.010	ug/l	0.000	lbs/day
Parathion					0.040	ug/l	0.000	lbs/day
PCB's	0.014	ug/l	0.998	lbs/day	2.000	ug/l	0.010	lbs/day
Pentachlorophenol	13.00	ug/l	926.900	lbs/day	20.000	ug/l	0.100	lbs/day
Toxephene	0.0002	ug/l	0.014	lbs/day	0.7300	ug/l	0.004	lbs/day

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IV. Numeric Stream Standards for Protection of Agriculture

	4 Day Average (Chronic) Standard			1 Hour Average (Acute) Standard		
	Concentration		Load*	Concentration		Load*
Arsenic				100.0	ug/l	lbs/day
Boron				750.0	ug/l	lbs/day
Cadmium				10.0	ug/l	0.03 lbs/day
Chromium				100.0	ug/l	lbs/day
Copper				200.0	ug/l	lbs/day
Lead				100.0	ug/l	lbs/day
Selenium				50.0	ug/l	lbs/day
TDS, Summer				1200.0	mg/l	3.01 tons/day

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		
Toxic Organics	[2 Liters/Day for 70 Kg Person over 70 Yr.]			[6.5 g for 70 Kg Person over 70 Yr.]		
Acenaphthene	ug/l	lbs/day	2700.0	ug/l	192.51	lbs/day
Acrolein	ug/l	lbs/day	780.0	ug/l	55.61	lbs/day
Acrylonitrile	ug/l	lbs/day	0.7	ug/l	0.05	lbs/day
Benzene	ug/l	lbs/day	71.0	ug/l	5.06	lbs/day
Benzidine	ug/l	lbs/day	0.0	ug/l	0.00	lbs/day
Carbon tetrachloride	ug/l	lbs/day	4.4	ug/l	0.31	lbs/day
Chlorobenzene	ug/l	lbs/day	21000.0	ug/l	1497.30	lbs/day
1,2,4-Trichlorobenzene						
Hexachlorobenzene	ug/l	lbs/day	0.0	ug/l	0.00	lbs/day
1,2-Dichloroethane	ug/l	lbs/day	99.0	ug/l	7.06	lbs/day
1,1,1-Trichloroethane						
Hexachloroethane	ug/l	lbs/day	8.9	ug/l	0.63	lbs/day
1,1-Dichloroethane						
1,1,2-Trichloroethane	ug/l	lbs/day	42.0	ug/l	2.99	lbs/day
1,1,2,2-Tetrachloroetha	ug/l	lbs/day	11.0	ug/l	0.78	lbs/day
Chloroethane			0.0	ug/l	0.00	lbs/day
Bis(2-chloroethyl) ether	ug/l	lbs/day	1.4	ug/l	0.10	lbs/day
2-Chloroethyl vinyl ethe	ug/l	lbs/day	0.0	ug/l	0.00	lbs/day
2-Chloronaphthalene	ug/l	lbs/day	4300.0	ug/l	306.59	lbs/day
2,4,6-Trichlorophenol	ug/l	lbs/day	6.5	ug/l	0.46	lbs/day
p-Chloro-m-cresol			0.0	ug/l	0.00	lbs/day
Chloroform (HM)	ug/l	lbs/day	470.0	ug/l	33.51	lbs/day
2-Chlorophenol	ug/l	lbs/day	400.0	ug/l	28.52	lbs/day
1,2-Dichlorobenzene	ug/l	lbs/day	17000.0	ug/l	1212.10	lbs/day
1,3-Dichlorobenzene	ug/l	lbs/day	2600.0	ug/l	185.38	lbs/day
1,4-Dichlorobenzene	ug/l	lbs/day	2600.0	ug/l	185.38	lbs/day
3,3'-Dichlorobenzidine	ug/l	lbs/day	0.1	ug/l	0.01	lbs/day
1,1-Dichloroethylene	ug/l	lbs/day	3.2	ug/l	0.23	lbs/day
1,2-trans-Dichloroethyle	ug/l	lbs/day	0.0	ug/l	0.00	lbs/day
2,4-Dichlorophenol	ug/l	lbs/day	790.0	ug/l	56.33	lbs/day
1,2-Dichloropropane	ug/l	lbs/day	39.0	ug/l	2.78	lbs/day
1,3-Dichloropropylene	ug/l	lbs/day	1700.0	ug/l	121.21	lbs/day
2,4-Dimethylphenol	ug/l	lbs/day	2300.0	ug/l	163.99	lbs/day
2,4-Dinitrotoluene	ug/l	lbs/day	9.1	ug/l	0.65	lbs/day
2,6-Dinitrotoluene	ug/l	lbs/day	0.0	ug/l	0.00	lbs/day
1,2-Diphenylhydrazine	ug/l	lbs/day	0.5	ug/l	0.04	lbs/day
Ethylbenzene	ug/l	lbs/day	29000.0	ug/l	2067.70	lbs/day
Fluoranthene	ug/l	lbs/day	370.0	ug/l	26.38	lbs/day
4-Chlorophenyl phenyl ether						

4-Bromophenyl phenyl ether						
Bis(2-chloroisopropyl) e	ug/l	lbs/day	170000.0	ug/l	12121.00	lbs/day
Bis(2-chloroethoxy) met	ug/l	lbs/day	0.0	ug/l	0.00	lbs/day
Methylene chloride (HM	ug/l	lbs/day	1600.0	ug/l	114.08	lbs/day
Methyl chloride (HM)	ug/l	lbs/day	0.0	ug/l	0.00	lbs/day
Methyl bromide (HM)	ug/l	lbs/day	0.0	ug/l	0.00	lbs/day
Bromoform (HM)	ug/l	lbs/day	360.0	ug/l	25.67	lbs/day
Dichlorobromomethane	ug/l	lbs/day	22.0	ug/l	1.57	lbs/day
Chlorodibromomethane	ug/l	lbs/day	34.0	ug/l	2.42	lbs/day
Hexachlorobutadiene(c)	ug/l	lbs/day	50.0	ug/l	3.56	lbs/day
Hexachlorocyclopentadi	ug/l	lbs/day	17000.0	ug/l	1212.10	lbs/day
Isophorone	ug/l	lbs/day	600.0	ug/l	42.78	lbs/day
Naphthalene						
Nitrobenzene	ug/l	lbs/day	1900.0	ug/l	135.47	lbs/day
2-Nitrophenol	ug/l	lbs/day	0.0	ug/l	0.00	lbs/day
4-Nitrophenol	ug/l	lbs/day	0.0	ug/l	0.00	lbs/day
2,4-Dinitrophenol	ug/l	lbs/day	14000.0	ug/l	998.20	lbs/day
4,6-Dinitro-o-cresol	ug/l	lbs/day	765.0	ug/l	54.54	lbs/day
N-Nitrosodimethylamine	ug/l	lbs/day	8.1	ug/l	0.58	lbs/day
N-Nitrosodiphenylamine	ug/l	lbs/day	16.0	ug/l	1.14	lbs/day
N-Nitrosodi-n-propylami	ug/l	lbs/day	1.4	ug/l	0.10	lbs/day
Pentachlorophenol	ug/l	lbs/day	8.2	ug/l	0.58	lbs/day
Phenol	ug/l	lbs/day	4.6E+06	ug/l	3.28E+05	lbs/day
Bis(2-ethylhexyl)phthala	ug/l	lbs/day	5.9	ug/l	0.42	lbs/day
Butyl benzyl phthalate	ug/l	lbs/day	5200.0	ug/l	370.76	lbs/day
Di-n-butyl phthalate	ug/l	lbs/day	12000.0	ug/l	855.60	lbs/day
Di-n-octyl phthlate						
Diethyl phthalate	ug/l	lbs/day	120000.0	ug/l	8556.00	lbs/day
Dimethyl phthlate	ug/l	lbs/day	2.9E+06	ug/l	2.07E+05	lbs/day
Benzo(a)anthracene (P/	ug/l	lbs/day	0.0	ug/l	0.00	lbs/day
Benzo(a)pyrene (PAH)	ug/l	lbs/day	0.0	ug/l	0.00	lbs/day
Benzo(b)fluoranthene (F	ug/l	lbs/day	0.0	ug/l	0.00	lbs/day
Benzo(k)fluoranthene (F	ug/l	lbs/day	0.0	ug/l	0.00	lbs/day
Chrysene (PAH)	ug/l	lbs/day	0.0	ug/l	0.00	lbs/day
Acenaphthylene (PAH)						
Anthracene (PAH)	ug/l	lbs/day	0.0	ug/l	0.00	lbs/day
Dibenzo(a,h)anthracene	ug/l	lbs/day	0.0	ug/l	0.00	lbs/day
Indeno(1,2,3-cd)pyrene	ug/l	lbs/day	0.0	ug/l	0.00	lbs/day
Pyrene (PAH)	ug/l	lbs/day	11000.0	ug/l	784.30	lbs/day
Tetrachloroethylene	ug/l	lbs/day	8.9	ug/l	0.63	lbs/day
Toluene	ug/l	lbs/day	200000	ug/l	14260.00	lbs/day
Trichloroethylene	ug/l	lbs/day	81.0	ug/l	5.78	lbs/day
Vinyl chloride	ug/l	lbs/day	525.0	ug/l	37.43	lbs/day
						lbs/day
Pesticides						lbs/day
Aldrin	ug/l	lbs/day	0.0	ug/l	0.00	lbs/day
Dieldrin	ug/l	lbs/day	0.0	ug/l	0.00	lbs/day
Chlordane	ug/l	lbs/day	0.0	ug/l	0.00	lbs/day
4,4'-DDT	ug/l	lbs/day	0.0	ug/l	0.00	lbs/day
4,4'-DDE	ug/l	lbs/day	0.0	ug/l	0.00	lbs/day
4,4'-DDD	ug/l	lbs/day	0.0	ug/l	0.00	lbs/day
alpha-Endosulfan	ug/l	lbs/day	2.0	ug/l	0.14	lbs/day
beta-Endosulfan	ug/l	lbs/day	2.0	ug/l	0.14	lbs/day
Endosulfan sulfate	ug/l	lbs/day	2.0	ug/l	0.14	lbs/day
Endrin	ug/l	lbs/day	0.8	ug/l	0.06	lbs/day
Endrin aldehyde	ug/l	lbs/day	0.8	ug/l	0.06	lbs/day
Heptachlor	ug/l	lbs/day	0.0	ug/l	0.00	lbs/day
Heptachlor epoxide						

Metals						
Antimony	ug/l	lbs/day				
Arsenic	ug/l	lbs/day	4300.00	ug/l	306.59	lbs/day
Asbestos	ug/l	lbs/day				
Beryllium						
Cadmium						
Chromium (III)						
Chromium (VI)						
Copper						
Cyanide	ug/l	lbs/day	2.2E+05	ug/l	15686.00	lbs/day
Lead	ug/l	lbs/day				
Mercury			0.15	ug/l	0.0107	lbs/day
Nickel			4600.00	ug/l	327.98	lbs/day
Selenium	ug/l	lbs/day				
Silver	ug/l	lbs/day				
Thallium			6.30	ug/l	0.45	lbs/day
Zinc						

There are additional standards that apply to this receiving water, but were not considered in this modeling/waste load allocation analysis.

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)	12.30	22.1	7.3	0.16	11.18	6.50	0.00	1065.0
Fall	9.60	10.2	7.3	0.17	3.64	---	0.00	1101.1
Winter	0.40	4.4	7.3	0.13	2.60	---	0.00	1079.8
Spring	7.10	15.9	7.3	0.07	2.24	---	0.00	913.6

Dissolved	Al	As	Cd	CrIII	CrVI	Copper	Fe	Pb
Metals	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
All Seasons	2.385*	0.795*	0.0795*	0.795*	3.975*	0.8*	1.25*	0.795*

Dissolved	Hg	Ni	Se	Ag	Zn	Boron		
Metals	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l		
All Seasons	0.0000	0.795*	1.59*	0.15*	0.0795*	1.59*		* ~80% MDL

Projected Discharge Information

Season	Flow, MGD	Temp.
Summer	0.60000	24.9
Fall	0.60000	17.2
Winter	0.60000	12.1
Spring	0.60000	19.2

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	
Summer	0.600 MGD	0.928 cfs
Fall	0.600 MGD	0.928 cfs
Winter	0.600 MGD	0.928 cfs
Spring	0.600 MGD	0.928 cfs

Flow Requirement or Loading Requirement

The calculations in this wasteload analysis utilize the maximum effluent discharge flow of 0.6 MGD. If the discharger is allowed to have a flow greater than 0.6 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 >	7.0%	Effluent	[Chronic]

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			
Summer	25.0	mg/l as BOD5	125.1	lbs/day
Fall	25.0	mg/l as BOD5	125.1	lbs/day
Winter	25.0	mg/l as BOD5	125.1	lbs/day
Spring	25.0	mg/l as BOD5	125.1	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	**Concentration**
Summer	5.00
Fall	5.00
Winter	5.00
Spring	5.00

Effluent Limitation for Total Ammonia based upon Water Quality Standards

In-stream criteria of downstream segments for Total Ammonia will be met with an effluent limitation (expressed as Total Ammonia as N) as follows:

Season		**Concentration**		**Load**	
Summer	4 Day Avg. - Chronic	45.15	mg/l as N	225.9	lbs/day
	1 Hour Avg. - Acute	151.7	mg/l as N	758.8	lbs/day
Fall	4 Day Avg. - Chronic	41.5	mg/l as N	207.8	lbs/day
	1 Hour Avg. - Acute	94.8	mg/l as N	474.2	lbs/day
Winter	4 Day Avg. - Chronic	6.6	mg/l as N	33.0	lbs/day
	1 Hour Avg. - Acute	21.7	mg/l as N	108.4	lbs/day
Spring	4 Day Avg. - Chronic	53.6	mg/l as N	268.4	lbs/day
	1 Hour Avg. - Acute	119.6	mg/l as N	598.2	lbs/day

Acute limit calculated with an Acute Zone of Initial Dilution (ZID) to be equal to 50.%.

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Effluent Limitation for Total Residual Chlorine based upon Water Quality Standards

In-stream criteria of downstream segments for Total Residual Chlorine will be met with an effluent limitation as follows:

Season		Concentration		Load	
Summer	4 Day Avg. - Chronic	0.143	mg/l	0.72	lbs/day
	1 Hour Avg. - Acute	0.138	mg/l	0.69	lbs/day
Fall	4 Day Avg. - Chronic	0.114	mg/l	0.57	lbs/day
	1 Hour Avg. - Acute	0.112	mg/l	0.56	lbs/day
Winter	4 Day Avg. - Chronic	0.015	mg/l	0.08	lbs/day
	1 Hour Avg. - Acute	0.023	mg/l	0.11	lbs/day
Spring	4 Day Avg. - Chronic	0.087	mg/l	0.44	lbs/day
	1 Hour Avg. - Acute	0.088	mg/l	0.44	lbs/day

Effluent Limitations for Total Dissolved Solids based upon Water Quality Standards

Season		Concentration		Load	
Summer	Maximum, Acute	2988.9	mg/l	7.48	tons/day
Fall	Maximum, Acute	2510.6	mg/l	6.28	tons/day
Winter	Maximum, Acute	2792.8	mg/l	6.99	tons/day
Spring	Maximum, Acute	4995.2	mg/l	12.50	tons/day

Colorado Salinity Forum Limits — Determined by Permitting Section

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 Concentration		Load		1 Hour Average Concentration		Load	
Aluminum*	N/A		N/A		5,703.5	ug/l	28.5899	lbs/day
Arsenic*	2,697.24	ug/l	8.7	lbs/day	2,587.5	ug/l	12.9703	lbs/day
Cadmium	34.47	ug/l	0.1	lbs/day	52.8	ug/l	0.2649	lbs/day
Chromium III	3,811.98	ug/l	12.3	lbs/day	42,787.8	ug/l	214.4824	lbs/day
Chromium VI*	104.09	ug/l	0.3	lbs/day	95.7	ug/l	0.4796	lbs/day
Copper	424.12	ug/l	1.4	lbs/day	388.9	ug/l	1.9493	lbs/day
Iron*	N/A		N/A		7,617.4	ug/l	38.1840	lbs/day
Lead	254.27	ug/l	0.8	lbs/day	3,630.8	ug/l	18.2001	lbs/day
Mercury*	0.17	ug/l	0.0	lbs/day	18.3	ug/l	0.0917	lbs/day
Nickel	2,391.41	ug/l	7.7	lbs/day	11,554.7	ug/l	57.9202	lbs/day
Selenium*	44.49	ug/l	0.1	lbs/day	142.0	ug/l	0.7117	lbs/day
Silver	N/A	ug/l	N/A	lbs/day	313.2	ug/l	1.5700	lbs/day
Zinc	5,526.07	ug/l	17.9	lbs/day	2,956.9	ug/l	14.8223	lbs/day
Cyanide*	74.11	ug/l	0.2	lbs/day	167.8	ug/l	0.8410	lbs/day

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

Effluent Limitations for Heat/Temperature based upon Water Quality Standards

Summer	79.1 Deg. C.	174.4 Deg. F
Fall	55.6 Deg. C.	132.0 Deg. F
Winter	10.1 Deg. C.	50.2 Deg. F
Spring	50.5 Deg. C.	122.9 Deg. F

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 Concentration		Load		1 Hour Average Concentration		Load	
Aldrin					1.5E+00	ug/l	1.16E-02	lbs/day
Chlordane	4.30E-03	ug/l	2.15E-02	lbs/day	1.2E+00	ug/l	9.31E-03	lbs/day
DDT, DDE	1.00E-03	ug/l	5.00E-03	lbs/day	5.5E-01	ug/l	4.27E-03	lbs/day
Dieldrin	1.90E-03	ug/l	9.51E-03	lbs/day	1.3E+00	ug/l	9.69E-03	lbs/day
Endosulfan	5.60E-02	ug/l	2.80E-01	lbs/day	1.1E-01	ug/l	8.53E-04	lbs/day
Endrin	2.30E-03	ug/l	1.15E-02	lbs/day	9.0E-02	ug/l	6.98E-04	lbs/day
Guthion	0.00E+00	ug/l	0.00E+00	lbs/day	1.0E-02	ug/l	7.75E-05	lbs/day
Heptachlor	3.80E-03	ug/l	1.90E-02	lbs/day	2.6E-01	ug/l	2.02E-03	lbs/day
Lindane	8.00E-02	ug/l	4.00E-01	lbs/day	1.0E+00	ug/l	7.75E-03	lbs/day
Methoxychlor	0.00E+00	ug/l	0.00E+00	lbs/day	3.0E-02	ug/l	2.33E-04	lbs/day
Mirex	0.00E+00	ug/l	0.00E+00	lbs/day	1.0E-02	ug/l	7.75E-05	lbs/day
Parathion	0.00E+00	ug/l	0.00E+00	lbs/day	4.0E-02	ug/l	3.10E-04	lbs/day
PCB's	1.40E-02	ug/l	7.00E-02	lbs/day	2.0E+00	ug/l	1.55E-02	lbs/day
Pentachlorophenol	1.30E+01	ug/l	6.50E+01	lbs/day	2.0E+01	ug/l	1.55E-01	lbs/day
Toxephene	2.00E-04	ug/l	1.00E-03	lbs/day	7.3E-01	ug/l	5.66E-03	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	
Toxic Organics				
Acenaphthene	3.85E+04	ug/l	1.93E+02	lbs/day
Acrolein	1.11E+04	ug/l	5.56E+01	lbs/day
Acrylonitrile	9.41E+00	ug/l	4.71E-02	lbs/day
Benzene	1.01E+03	ug/l	5.06E+00	lbs/day
Benzidine		ug/l		lbs/day
Carbon tetrachloride	6.27E+01	ug/l	3.14E-01	lbs/day
Chlorobenzene	2.99E+05	ug/l	1.50E+03	lbs/day
1,2,4-Trichlorobenzene				
Hexachlorobenzene	1.10E-02	ug/l	5.49E-05	lbs/day
1,2-Dichloroethane	1.41E+03	ug/l	7.06E+00	lbs/day
1,1,1-Trichloroethane				
Hexachloroethane	1.27E+02	ug/l	6.35E-01	lbs/day
1,1-Dichloroethane				
1,1,2-Trichloroethane	5.99E+02	ug/l	2.99E+00	lbs/day
1,1,2,2-Tetrachloroethane	1.57E+02	ug/l	7.84E-01	lbs/day
Chloroethane				
Bis(2-chloroethyl) ether	2.00E+01	ug/l	9.98E-02	lbs/day
2-Chloroethyl vinyl ether				
2-Chloronaphthalene	6.13E+04	ug/l	3.07E+02	lbs/day
2,4,6-Trichlorophenol	9.26E+01	ug/l	4.63E-01	lbs/day
p-Chloro-m-cresol				
Chloroform (HM)	6.70E+03	ug/l	3.35E+01	lbs/day
2-Chlorophenol	5.70E+03	ug/l	2.85E+01	lbs/day
1,2-Dichlorobenzene	2.42E+05	ug/l	1.21E+03	lbs/day
1,3-Dichlorobenzene	3.71E+04	ug/l	1.85E+02	lbs/day
1,4-Dichlorobenzene	3.71E+04	ug/l	1.85E+02	lbs/day
3,3'-Dichlorobenzidine	1.10E+00	ug/l	5.49E-03	lbs/day
1,1-Dichloroethylene	4.56E+01	ug/l	2.28E-01	lbs/day
1,2-trans-Dichloroethylene1				
2,4-Dichlorophenol	1.13E+04	ug/l	5.63E+01	lbs/day
1,2-Dichloropropane	5.56E+02	ug/l	2.78E+00	lbs/day
1,3-Dichloropropylene	2.42E+04	ug/l	1.21E+02	lbs/day
2,4-Dimethylphenol	3.28E+04	ug/l	1.64E+02	lbs/day
2,4-Dinitrotoluene	1.30E+02	ug/l	6.49E-01	lbs/day
2,6-Dinitrotoluene				
1,2-Diphenylhydrazine	7.70E+00	ug/l	3.85E-02	lbs/day
Ethylbenzene	4.13E+05	ug/l	2.07E+03	lbs/day
Fluoranthene	5.27E+03	ug/l	2.64E+01	lbs/day
4-Chlorophenyl phenyl ether				
4-Bromophenyl phenyl ether				
Bis(2-chloroisopropyl) ether	2.42E+06	ug/l	1.21E+04	lbs/day
Bis(2-chloroethoxy) methane				
Methylene chloride (HM)	2.28E+04	ug/l	1.14E+02	lbs/day
Methyl chloride (HM)				
Methyl bromide (HM)				
Bromoform (HM)	5.13E+03	ug/l	2.57E+01	lbs/day
Dichlorobromomethane(HM)	3.14E+02	ug/l	1.57E+00	lbs/day
Chlorodibromomethane (HM)	4.85E+02	ug/l	2.42E+00	lbs/day

Hexachlorocyclopentadiene	2.42E+05	ug/l	1.21E+03	lbs/day
Isophorone	8.55E+03	ug/l	4.28E+01	lbs/day
Naphthalene				
Nitrobenzene	2.71E+04	ug/l	1.35E+02	lbs/day
2-Nitrophenol				
4-Nitrophenol				
2,4-Dinitrophenol	2.00E+05	ug/l	9.98E+02	lbs/day
4,6-Dinitro-o-cresol	1.09E+04	ug/l	5.45E+01	lbs/day
N-Nitrosodimethylamine	1.15E+02	ug/l	5.78E-01	lbs/day
N-Nitrosodiphenylamine	2.28E+02	ug/l	1.14E+00	lbs/day
N-Nitrosodi-n-propylamine	2.00E+01	ug/l	9.98E-02	lbs/day
Pentachlorophenol	1.17E+02	ug/l	5.85E-01	lbs/day
Phenol	6.56E+07	ug/l	3.28E+05	lbs/day
Bis(2-ethylhexyl)phthalate	8.41E+01	ug/l	4.21E-01	lbs/day
Butyl benzyl phthalate	7.41E+04	ug/l	3.71E+02	lbs/day
Di-n-butyl phthalate	1.71E+05	ug/l	8.56E+02	lbs/day
Di-n-octyl phthlate				
Diethyl phthalate	1.71E+06	ug/l	8.56E+03	lbs/day
Dimethyl phthlate	4.13E+07	ug/l	2.07E+05	lbs/day
Benzo(a)anthracene (PAH)	4.42E-01	ug/l	2.21E-03	lbs/day
Benzo(a)pyrene (PAH)	4.42E-01	ug/l	2.21E-03	lbs/day
Benzo(b)fluoranthene (PAH)	4.42E-01	ug/l	2.21E-03	lbs/day
Benzo(k)fluoranthene (PAH)	4.42E-01	ug/l	2.21E-03	lbs/day
Chrysene (PAH)	4.42E-01	ug/l	2.21E-03	lbs/day
Acenaphthylene (PAH)				
Anthracene (PAH)				
Dibenzo(a,h)anthracene (PAH)	4.42E-01	ug/l	2.21E-03	lbs/day
Indeno(1,2,3-cd)pyrene (PAH)	4.42E-01	ug/l	2.21E-03	lbs/day
Pyrene (PAH)	1.57E+05	ug/l	7.84E+02	lbs/day
Tetrachloroethylene	1.27E+02	ug/l	6.35E-01	lbs/day
Toluene	2.85E+06	ug/l	1.43E+04	lbs/day
Trichloroethylene	1.15E+03	ug/l	5.78E+00	lbs/day
Vinyl chloride	7.48E+03	ug/l	3.74E+01	lbs/day
Pesticides				
Aldrin	2.00E-03	ug/l	9.98E-06	lbs/day
Dieldrin	2.00E-03	ug/l	9.98E-06	lbs/day
Chlordane	8.41E-03	ug/l	4.21E-05	lbs/day
4,4'-DDT	8.41E-03	ug/l	4.21E-05	lbs/day
4,4'-DDE	8.41E-03	ug/l	4.21E-05	lbs/day
4,4'-DDD	1.20E-02	ug/l	5.99E-05	lbs/day
alpha-Endosulfan	2.85E+01	ug/l	1.43E-01	lbs/day
beta-Endosulfan	2.85E+01	ug/l	1.43E-01	lbs/day
Endosulfan sulfate	2.85E+01	ug/l	1.43E-01	lbs/day
Endrin	1.15E+01	ug/l	5.78E-02	lbs/day
Endrin aldehyde	1.15E+01	ug/l	5.78E-02	lbs/day
Heptachlor	2.99E-03	ug/l	1.50E-05	lbs/day
Heptachlor epoxide				
PCB's				
PCB 1242 (Arochlor 1242)	6.41E-04	ug/l	3.21E-06	lbs/day
PCB-1254 (Arochlor 1254)	6.41E-04	ug/l	3.21E-06	lbs/day
PCB-1221 (Arochlor 1221)	6.41E-04	ug/l	3.21E-06	lbs/day
PCB-1232 (Arochlor 1232)	6.41E-04	ug/l	3.21E-06	lbs/day
PCB-1248 (Arochlor 1248)	6.41E-04	ug/l	3.21E-06	lbs/day
PCB-1260 (Arochlor 1260)	6.41E-04	ug/l	3.21E-06	lbs/day
PCB-1016 (Arochlor 1016)	6.41E-04	ug/l	3.21E-06	lbs/day
Pesticide				

Toxaphene	1.07E-02	ug/l	5.35E-05	lbs/day
Metals				
Antimony		ug/l		lbs/day
Arsenic		ug/l		lbs/day
Asbestos		ug/l		lbs/day
Beryllium				
Cadmium				
Chromium (III)				
Chromium (VI)				
Copper		ug/l		lbs/day
Cyanide		ug/l		lbs/day
Lead				
Mercury		ug/l		lbs/day
Nickel		ug/l		lbs/day
Selenium				
Silver				
Thallium		ug/l		lbs/day
Zinc				
Dioxin				
Dioxin (2,3,7,8-TCDD)	2.00E-07	ug/l	9.98E-10	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		5703.5				5703.5	N/A
Antimony				61281.3		61281.3	
Arsenic	1425.1	2587.5				1425.1	2697.2
Barium							
Beryllium						0.0	
Cadmium	141.5	52.8				52.8	34.5
Chromium (III)		42787.8				42787.8	3812.0
Chromium (VI)	1414.6	95.7				95.67	104.09
Copper	2839.8	388.9				388.9	424.1
Cyanide		167.8	3135320.0			167.8	74.1
Iron		7617.4				7617.4	
Lead	1414.6	3630.8				1414.6	254.3
Mercury		18.30		2.14		2.14	0.171
Nickel		11554.7		65556.7		11554.7	2391.4
Selenium	691.5	142.0				142.0	44.5
Silver		313.2				313.2	
Thallium				89.8		89.8	
Zinc		2956.9				2956.9	5526.1
Boron	10688.6					10688.6	
Sulfate	28502.9					28502.9	

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	5703.5	N/A	
Antimony	61281.25		
Arsenic	1425.1	2697.2	Acute Controls
Asbestos			
Barium			
Beryllium			
Cadmium	52.8	34.5	
Chromium (III)	42787.8	3812	
Chromium (VI)	95.7	104.1	Acute Controls
Copper	388.9	424.1	Acute Controls
Cyanide	167.8	74.1	
Iron	7617.4		
Lead	1414.6	254.3	
Mercury	2.138	0.171	
Nickel	11554.7	2391	
Selenium	142.0	44.5	
Silver	313.2	N/A	
Thallium	89.8		
Zinc	2956.9	5526.1	Acute Controls
Boron	10688.59		
Sulfate	28502.9		N/A at this Waterbody

Other Effluent Limitations are based upon R317-1.

E. coli	126.0	organisms per 100 ml

X. Antidegradation Considerations

The Utah Antidegradation Policy allows for degradation of existing quality where it is determined that such lowering of water quality is necessary to accommodate important economic or social development in the area in which the waters are protected [R317-2-3]. It has been determined that certain chemical parameters introduced by this discharge will cause an increase of the concentration of said parameters in the receiving waters. Under no conditions will the increase in concentration be allowed to interfere with existing instream water uses.

An Antidegradation Level I Review was conducted on this discharge and its effect on the receiving water. Based upon that review, it has been determined that an Antidegradation Level II Review is not required. The proposed permit is a simple renewal, with no increase in flow or concentration over that which was approved in the existing permit.

XI. Colorado River Salinity Forum Considerations

Discharges in the Colorado River Basin are required to have their discharge at a TDS loading of less than 1.00 tons/day unless certain exemptions apply. Refer to the Forum's Guidelines for additional information allowing for an exceedence of this value.
This doesn't apply to facilities that do not discharge to the Colorado River Basin.

XII. 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.