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

Date: **October 5, 2020**

Prepared by: **Suzan Tahir**
Standards and Technical Services

Facility: **Casper Ice Cream**
UPDES No. UT- UT0025623

Receiving water: **Cub River (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: Cub River

The mean monthly design discharge is 0.075 MGD (0.14 cfs) for the facility.

Receiving Water
The receiving water for Outfall 001 the Cub River.

Per UAC R317-2-13.3(a), the designated beneficial uses for the Cub River and Cub River and tributaries, from confluence with Bear River to state line is 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 data, the 7Q10 flow was estimated by calculating the 20th percentile of available flow data. Cub River flows were determined from DWQ monitoring station 4904340 (Cub River at 800 South Above High Creek) for the period 2000-2020. This station is located upstream of the facility. The calculated critical low flow values for each season are listed in Table 1.
In the past, Cub River flows were determined from DWQ monitoring station 4904240 (Cub River at Casper Ice Cream Road). This station is located downstream of the facility, however in the past, it was selected as the most appropriate station for the following reasons: 1) it is the only station with a reasonable data set in the vicinity of the discharge; 2) the Casper facility has very low flows compared to the receiving water, and; 3) the nearest upstream station is quite a bit above this location, (4903770, Cub River at U61Crossing) and has very limited flow data. Additionally, there are several tributaries and Lewiston's Lagoon discharge between that station and this point.

Table 1. Seasonal Flow Values (20th percentile)

Season	Average Flow (cfs)
Summer	11.6
Fall	11.6
Winter	11.6
Spring	11.6
Overall	44.1

The receiving water quality in the Cub River was characterized by samples collected from DWQ monitoring site 4904340 (Cub River at 800 South Above High Creek) for the period 2000-2020.

TMDL
The Cub River from the confluence with the Bear River to the Utah-Idaho State Line (UT16010202-010-00) is listed as impaired (Class 4A, Impaired: TMDL approved) on the 2016 303(d) list for phosphorous and sedimentation.
A TMDL was completed for the Middle Bear River on February 23, 2010 (UDWQ 2010). The TMDL identified an instream concentration goal of 0.05 mg/l total phosphorous in the Cub River.

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.

The mixing zone analysis shows the discharge to be fully mixed by 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/receiving water were temperature and total phosphorous 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 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 2: WET Limits for IC_{25}

Outfall	Percent Effluent
Outfall 001	1.1%

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 Addendum.

Effluent limits for total phosphorous are based on the approved Middle Bear River TMDL (UDWQ 2010).

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 for this facility.

Documents:

WLA Document*: CasperIceCream_WLA_2020.docx*
Wasteload Analysis and Addendum: *CasperIceCream_WLA_2020.xlsm*

References:

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

Utah Division of Water Quality. 2010. Middle Bear River TMDL, February 23, 2010.

Lewis, B., J. Saunders, and M. Murphy. 2002. *Ammonia Toxicity Model (AMMTOX, Version2): A Tool for Determining Effluent Ammonia Limits*. University of Colorado, Center for Limnology.

Utah Division of Water Quality
Salt Lake City, Utah

WASTELOAD ANALYSIS [WLA]
Addendum: Statement of Basis

20-Oct-20
4:00 PM

Facilities: **Casper Ice Cream** **UPDES No: UT-0025526**
Discharging to: **Cub River**

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

Cub River:	2B, 3B, 4
Antidegradation Review:	Level I review completed. Level II review is 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)	5.50 mg/l (30 Day Average) 4.00 mg/l (7Day Average) 3.00 mg/l (1 Day Average
Maximum Total Dissolved Solids	1200.0 mg/l

Utah Division of Water Quality
Salt Lake City, Utah

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**	0.058	lbs/day	750.00	ug/l	0.501	lbs/day
Arsenic	190.00	ug/l	0.127	lbs/day	340.00	ug/l	0.227	lbs/day
Cadmium	0.46	ug/l	0.000	lbs/day	4.36	ug/l	0.003	lbs/day
Chromium III	153.37	ug/l	0.103	lbs/day	3208.79	ug/l	2.145	lbs/day
ChromiumVI	11.00	ug/l	0.007	lbs/day	16.00	ug/l	0.011	lbs/day
Copper	17.02	ug/l	0.011	lbs/day	27.17	ug/l	0.018	lbs/day
Iron					1000.00	ug/l	0.668	lbs/day
Lead	7.79	ug/l	0.005	lbs/day	200.00	ug/l	0.134	lbs/day
Mercury	0.0120	ug/l	0.000	lbs/day	2.40	ug/l	0.002	lbs/day
Nickel	94.61	ug/l	0.063	lbs/day	850.98	ug/l	0.569	lbs/day
Selenium	4.60	ug/l	0.003	lbs/day	20.00	ug/l	0.013	lbs/day
Silver	N/A	ug/l	N/A	lbs/day	12.70	ug/l	0.008	lbs/day
Zinc	217.52	ug/l	0.145	lbs/day	217.52	ug/l	0.145	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 202.14 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	0.001	lbs/day
Chlordane	0.004	ug/l	0.272	lbs/day	1.200	ug/l	0.001	lbs/day
DDT, DDE	0.001	ug/l	0.063	lbs/day	0.550	ug/l	0.000	lbs/day
Dieldrin	0.002	ug/l	0.120	lbs/day	1.250	ug/l	0.001	lbs/day
Endosulfan	0.056	ug/l	3.539	lbs/day	0.110	ug/l	0.000	lbs/day
Endrin	0.002	ug/l	0.145	lbs/day	0.090	ug/l	0.000	lbs/day
Guthion					0.010	ug/l	0.000	lbs/day
Heptachlor	0.004	ug/l	0.240	lbs/day	0.260	ug/l	0.000	lbs/day
Lindane	0.080	ug/l	5.055	lbs/day	1.000	ug/l	0.001	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	0.885	lbs/day	2.000	ug/l	0.001	lbs/day
Pentachlorophenol	13.00	ug/l	821.484	lbs/day	20.000	ug/l	0.013	lbs/day
Toxephene	0.0002	ug/l	0.013	lbs/day	0.7300	ug/l	0.000	lbs/day

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	0.00 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	0.40 tons/day

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

	4 Day Average (Chronic) Standard		1 Hour Average (Acute) Standard		
Metals	Concentration	Load*	Concentration		Load*
Arsenic				ug/l	lbs/day
Barium				ug/l	lbs/day
Cadmium				ug/l	lbs/day
Chromium				ug/l	lbs/day
Lead				ug/l	lbs/day
Mercury				ug/l	lbs/day
Selenium				ug/l	lbs/day
Silver				ug/l	lbs/day
Fluoride (3)				ug/l	lbs/day
to				ug/l	lbs/day
Nitrates as N				ug/l	lbs/day
Chlorophenoxy Herbicides					
2,4-D				ug/l	lbs/day
2,4,5-TP				ug/l	lbs/day
Endrin				ug/l	lbs/day
ocyclohexane (Lindane)				ug/l	lbs/day
Methoxychlor				ug/l	lbs/day
Toxaphene				ug/l	lbs/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	170.62 lbs/day
Acrolein	ug/l	lbs/day	780.0	ug/l	49.29 lbs/day
Acrylonitrile	ug/l	lbs/day	0.7	ug/l	0.04 lbs/day
Benzene	ug/l	lbs/day	71.0	ug/l	4.49 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	0.28 lbs/day
Chlorobenzene	ug/l	lbs/day	21000.0	ug/l	1327.01 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	6.26 lbs/day
1,1,1-Trichloroethane					
Hexachloroethane	ug/l	lbs/day	8.9	ug/l	0.56 lbs/day

1,1-Dichloroethane						
1,1,2-Trichloroethane	ug/l	lbs/day	42.0	ug/l	2.65	lbs/day
1,1,2,2-Tetrachloroethar	ug/l	lbs/day	11.0	ug/l	0.70	lbs/day
Chloroethane			0.0	ug/l	0.00	lbs/day
Bis(2-chloroethyl) ether	ug/l	lbs/day	1.4	ug/l	0.09	lbs/day
2-Chloroethyl vinyl ether	ug/l	lbs/day	0.0	ug/l	0.00	lbs/day
2-Chloronaphthalene	ug/l	lbs/day	4300.0	ug/l	271.72	lbs/day
2,4,6-Trichlorophenol	ug/l	lbs/day	6.5	ug/l	0.41	lbs/day
p-Chloro-m-cresol			0.0	ug/l	0.00	lbs/day
Chloroform (HM)	ug/l	lbs/day	470.0	ug/l	29.70	lbs/day
2-Chlorophenol	ug/l	lbs/day	400.0	ug/l	25.28	lbs/day
1,2-Dichlorobenzene	ug/l	lbs/day	17000.0	ug/l	1074.25	lbs/day
1,3-Dichlorobenzene	ug/l	lbs/day	2600.0	ug/l	164.30	lbs/day
1,4-Dichlorobenzene	ug/l	lbs/day	2600.0	ug/l	164.30	lbs/day
3,3'-Dichlorobenzidine	ug/l	lbs/day	0.1	ug/l	0.00	lbs/day
1,1-Dichloroethylene	ug/l	lbs/day	3.2	ug/l	0.20	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	49.92	lbs/day
1,2-Dichloropropane	ug/l	lbs/day	39.0	ug/l	2.46	lbs/day
1,3-Dichloropropylene	ug/l	lbs/day	1700.0	ug/l	107.42	lbs/day
2,4-Dimethylphenol	ug/l	lbs/day	2300.0	ug/l	145.34	lbs/day
2,4-Dinitrotoluene	ug/l	lbs/day	9.1	ug/l	0.58	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	0.03	lbs/day
Ethylbenzene	ug/l	lbs/day	29000.0	ug/l	1832.54	lbs/day
Fluoranthene	ug/l	lbs/day	370.0	ug/l	23.38	lbs/day
4-Chlorophenyl phenyl ether						
4-Bromophenyl phenyl ether						
Bis(2-chloroisopropyl) et	ug/l	lbs/day	170000.0	ug/l	10742.48	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	101.11	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	22.75	lbs/day
Dichlorobromomethane(	ug/l	lbs/day	22.0	ug/l	1.39	lbs/day
Chlorodibromomethane	ug/l	lbs/day	34.0	ug/l	2.15	lbs/day
Hexachlorobutadiene(c)	ug/l	lbs/day	50.0	ug/l	3.16	lbs/day
Hexachlorocyclopentadi	ug/l	lbs/day	17000.0	ug/l	1074.25	lbs/day
Isophorone	ug/l	lbs/day	600.0	ug/l	37.91	lbs/day
Naphthalene						
Nitrobenzene	ug/l	lbs/day	1900.0	ug/l	120.06	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	884.67	lbs/day
4,6-Dinitro-o-cresol	ug/l	lbs/day	765.0	ug/l	48.34	lbs/day
N-Nitrosodimethylamine	ug/l	lbs/day	8.1	ug/l	0.51	lbs/day
N-Nitrosodiphenylamine	ug/l	lbs/day	16.0	ug/l	1.01	lbs/day
N-Nitrosodi-n-propylami	ug/l	lbs/day	1.4	ug/l	0.09	lbs/day
Pentachlorophenol	ug/l	lbs/day	8.2	ug/l	0.52	lbs/day
Phenol	ug/l	lbs/day	4.6E+06	ug/l	2.91E+05	lbs/day
Bis(2-ethylhexyl)phthala	ug/l	lbs/day	5.9	ug/l	0.37	lbs/day
Butyl benzyl phthalate	ug/l	lbs/day	5200.0	ug/l	328.59	lbs/day
Di-n-butyl phthalate	ug/l	lbs/day	12000.0	ug/l	758.29	lbs/day
Di-n-octyl phthlate						

Diethyl phthalate	ug/l	lbs/day	120000.0	ug/l	7582.93	lbs/day
Dimethyl phthlate	ug/l	lbs/day	2.9E+06	ug/l	1.83E+05	lbs/day
Benzo(a)anthracene (PA	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	695.10	lbs/day
Tetrachloroethylene	ug/l	lbs/day	8.9	ug/l	0.56	lbs/day
Toluene	ug/l	lbs/day	200000	ug/l	12638.21	lbs/day
Trichloroethylene	ug/l	lbs/day	81.0	ug/l	5.12	lbs/day
Vinyl chloride	ug/l	lbs/day	525.0	ug/l	33.18	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	0.13	lbs/day
beta-Endosulfan	ug/l	lbs/day	2.0	ug/l	0.13	lbs/day
Endosulfan sulfate	ug/l	lbs/day	2.0	ug/l	0.13	lbs/day
Endrin	ug/l	lbs/day	0.8	ug/l	0.05	lbs/day
Endrin aldehyde	ug/l	lbs/day	0.8	ug/l	0.05	lbs/day
Heptachlor	ug/l	lbs/day	0.0	ug/l	0.00	lbs/day
Heptachlor epoxide						
PCB's						
PCB 1242 (Arochlor 124	ug/l	lbs/day	0.0	ug/l	0.00	lbs/day
PCB-1254 (Arochlor 125	ug/l	lbs/day	0.0	ug/l	0.00	lbs/day
PCB-1221 (Arochlor 122	ug/l	lbs/day	0.0	ug/l	0.00	lbs/day
PCB-1232 (Arochlor 123	ug/l	lbs/day	0.0	ug/l	0.00	lbs/day
PCB-1248 (Arochlor 124	ug/l	lbs/day	0.0	ug/l	0.00	lbs/day
PCB-1260 (Arochlor 126	ug/l	lbs/day	0.0	ug/l	0.00	lbs/day
PCB-1016 (Arochlor 101	ug/l	lbs/day	0.0	ug/l	0.00	lbs/day
Pesticide						
Toxaphene	ug/l		0.0	ug/l	0.00	lbs/day
Dioxin						
Dioxin (2,3,7,8-TCDD)	ug/l	lbs/day				
Metals						
Antimony	ug/l	lbs/day				
Arsenic	ug/l	lbs/day	4300.00	ug/l	271.72	lbs/day
Asbestos	ug/l	lbs/day				
Beryllium						
Cadmium						

Chromium (III)					
Chromium (VI)					
Copper					
Cyanide	ug/l	lbs/day	2.2E+05 ug/l	13902.03	lbs/day
Lead	ug/l	lbs/day			
Mercury			0.15 ug/l	0.01	lbs/day
Nickel			4600.00 ug/l	290.68	lbs/day
Selenium	ug/l	lbs/day			
Silver	ug/l	lbs/day			
Thallium			6.30 ug/l	0.40	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)	11.6	17.0	7.9	0.03	6.00	7.39	0.00	285.3
Fall	11.6	3.6	8.1	0.03	1.50	---	0.00	250.8
Winter	11.6	3.7	8.1	0.06	3.00	---	0.00	290.7
Spring	11.6	10.4	8.1	0.04	1.50	---	0.00	182.3

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	5.00	1.76	0.05	0.53*	1.00	0.50	10.0	0.05

Dissolved	Hg	Ni	Se	Ag	Zn	Boron		
Metals	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l		
All Seasons	0.1000	2.50	0.50	0.25	5.00	10.0		* 1/2 MDL

Projected Discharge Information

Season	Flow, MGD	Temp.	TDS mg/l	TDS tons/day
Summer	0.08000	16.9	500.00	0.16677
Fall	0.08000	16.9		
Winter	0.08000	13.1		
Spring	0.08000	18.0		

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	0.080 MGD	0.124 cfs
Fall	0.080 MGD	0.124 cfs
Winter	0.080 MGD	0.124 cfs
Spring	0.080 MGD	0.124 cfs

Flow Requirement or Loading Requirement

The calculations in this wasteload analysis utilize the maximum effluent discharge flow of 0.08 MGD. If the discharger is allowed to have a flow greater than 0.08 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 >	7.1% Effluent	[Acute]
	IC25 >	1.1% 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	16.7 lbs/day
Fall	25.0 mg/l as BOD5	16.7 lbs/day
Winter	25.0 mg/l as BOD5	16.7 lbs/day
Spring	25.0 mg/l as BOD5	16.7 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	5.50
Fall	5.50
Winter	5.50
Spring	5.50

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	232.9	mg/l as N	155.4	lbs/day
	1 Hour Avg. - Acute	206.2	mg/l as N	137.6	lbs/day
Fall	4 Day Avg. - Chronic	187.0	mg/l as N	124.7	lbs/day
	1 Hour Avg. - Acute	150.6	mg/l as N	100.4	lbs/day
Winter	4 Day Avg. - Chronic	210.7	mg/l as N	140.6	lbs/day
	1 Hour Avg. - Acute	181.5	mg/l as N	121.0	lbs/day
Spring	4 Day Avg. - Chronic	185.7	mg/l as N	123.9	lbs/day
	1 Hour Avg. - Acute	150.6	mg/l as N	100.4	lbs/day

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

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	0.946	mg/l	0.63	lbs/day
	1 Hour Avg. - Acute	0.861	mg/l	0.57	lbs/day
Fall	4 Day Avg. - Chronic	0.946	mg/l	0.63	lbs/day
	1 Hour Avg. - Acute	0.861	mg/l	0.57	lbs/day
Winter	4 Day Avg. - Chronic	0.946	mg/l	0.63	lbs/day
	1 Hour Avg. - Acute	0.861	mg/l	0.57	lbs/day
Spring	4 Day Avg. - Chronic	0.946	mg/l	0.00	lbs/day
	1 Hour Avg. - Acute	0.861	mg/l	0.00	lbs/day

Effluent Limitations for Total Dissolved Solids based upon Water Quality Standards

Season		Concentration		Load	
Summer	Maximum, Acute	86931.0	mg/l	28.99	tons/day
Fall	Maximum, Acute	90168.3	mg/l	30.07	tons/day
Winter	Maximum, Acute	86431.3	mg/l	28.83	tons/day
Spring	4 Day Avg. - Chronic	96593.5	mg/l	32.22	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 202.14 mg/l):

	4 Day Average Concentration		Load		1 Hour Average Concentration		Load	
Aluminum*	N/A		N/A		35,664.4	ug/l	23.8	lbs/day
Arsenic*	17,833.79	ug/l	7.7	lbs/day	16,191.6	ug/l	10.8	lbs/day
Cadmium	38.50	ug/l	0.0	lbs/day	206.5	ug/l	0.1	lbs/day
Chromium III	14,454.17	ug/l	6.2	lbs/day	153,551.2	ug/l	102.6	lbs/day
Chromium VI*	948.30	ug/l	0.4	lbs/day	719.0	ug/l	0.5	lbs/day
Copper	1,565.65	ug/l	0.7	lbs/day	1,277.1	ug/l	0.9	lbs/day
Iron*	N/A		N/A		47,396.3	ug/l	31.7	lbs/day
Lead	733.62	ug/l	0.3	lbs/day	9,570.7	ug/l	6.4	lbs/day
Mercury*	(8.24)	ug/l	0.0	lbs/day	110.2	ug/l	0.1	lbs/day
Nickel	8,728.34	ug/l	3.8	lbs/day	40,615.1	ug/l	27.1	lbs/day
Selenium*	388.89	ug/l	0.2	lbs/day	933.9	ug/l	0.6	lbs/day
Silver	N/A	ug/l	N/A	lbs/day	596.1	ug/l	0.4	lbs/day
Zinc	20,137.07	ug/l	8.7	lbs/day	10,177.3	ug/l	6.8	lbs/day
Cyanide*	492.59	ug/l	0.2	lbs/day	1,053.0	ug/l	0.7	lbs/day

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

Effluent Limitations for Heat/Temperature based upon Water Quality Standards

Summer	100.0 Deg. C.	212.0 Deg. F
Fall	99.3 Deg. C.	210.7 Deg. F
Winter	99.4 Deg. C.	210.9 Deg. F
Spring	100.0 Deg. C.	212.0 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			1 Hour Average		
	Concentration		Load	Concentration		Load
Aldrin				1.5E+00	ug/l	1.55E-03 lbs/day
Chlordane	4.30E-03	ug/l	2.87E-03 lbs/day	1.2E+00	ug/l	1.24E-03 lbs/day
DDT, DDE	1.00E-03	ug/l	6.67E-04 lbs/day	5.5E-01	ug/l	5.69E-04 lbs/day
Dieldrin	1.90E-03	ug/l	1.27E-03 lbs/day	1.3E+00	ug/l	1.29E-03 lbs/day
Endosulfan	5.60E-02	ug/l	3.74E-02 lbs/day	1.1E-01	ug/l	1.14E-04 lbs/day
Endrin	2.30E-03	ug/l	1.53E-03 lbs/day	9.0E-02	ug/l	9.31E-05 lbs/day
Guthion	0.00E+00	ug/l	0.00E+00 lbs/day	1.0E-02	ug/l	1.03E-05 lbs/day
Heptachlor	3.80E-03	ug/l	2.53E-03 lbs/day	2.6E-01	ug/l	2.69E-04 lbs/day
Lindane	8.00E-02	ug/l	5.34E-02 lbs/day	1.0E+00	ug/l	1.03E-03 lbs/day
Methoxychlor	0.00E+00	ug/l	0.00E+00 lbs/day	3.0E-02	ug/l	3.10E-05 lbs/day
Mirex	0.00E+00	ug/l	0.00E+00 lbs/day	1.0E-02	ug/l	1.03E-05 lbs/day
Parathion	0.00E+00	ug/l	0.00E+00 lbs/day	4.0E-02	ug/l	4.14E-05 lbs/day
PCB's	1.40E-02	ug/l	9.34E-03 lbs/day	2.0E+00	ug/l	2.07E-03 lbs/day
Pentachlorophenol	1.30E+01	ug/l	8.67E+00 lbs/day	2.0E+01	ug/l	2.07E-02 lbs/day
Toxephene	2.00E-04	ug/l	1.33E-04 lbs/day	7.3E-01	ug/l	7.55E-04 lbs/day

Effluent Targets for Pollution Indicators
Based upon Water Quality Standards

In-stream criteria of downstream segments for Pollution Indicators
will be met with an effluent limit as follows:

	1 Hour Average Concentration		Loading	
Gross Beta (pCi/l)	50.0	pCi/L		
BOD (mg/l)	5.0	mg/l	3.3	lbs/day
Nitrates as N	4.0	mg/l	2.7	lbs/day
Total Phosphorus as P	0.05	mg/l	0.0	lbs/day
Total Suspended Solids	90.0	mg/l	60.2	lbs/day

Note: Pollution indicator targets are for information purposes only.

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	2.56E+05	ug/l	1.71E+02	lbs/day
Acrolein	7.39E+04	ug/l	4.93E+01	lbs/day
Acrylonitrile	6.25E+01	ug/l	4.17E-02	lbs/day
Benzene	6.73E+03	ug/l	4.49E+00	lbs/day
Benzidine		ug/l		lbs/day
Carbon tetrachloride	4.17E+02	ug/l	2.78E-01	lbs/day
Chlorobenzene	1.99E+06	ug/l	1.33E+03	lbs/day
1,2,4-Trichlorobenzene				
Hexachlorobenzene	7.29E-02	ug/l	4.87E-05	lbs/day
1,2-Dichloroethane	9.38E+03	ug/l	6.26E+00	lbs/day
1,1,1-Trichloroethane				
Hexachloroethane	8.43E+02	ug/l	5.62E-01	lbs/day
1,1-Dichloroethane				
1,1,2-Trichloroethane	3.98E+03	ug/l	2.65E+00	lbs/day
1,1,2,2-Tetrachloroethane	1.04E+03	ug/l	6.95E-01	lbs/day
Chloroethane				
Bis(2-chloroethyl) ether	1.33E+02	ug/l	8.85E-02	lbs/day
2-Chloroethyl vinyl ether				
2-Chloronaphthalene	4.07E+05	ug/l	2.72E+02	lbs/day
2,4,6-Trichlorophenol	6.16E+02	ug/l	4.11E-01	lbs/day
p-Chloro-m-cresol				
Chloroform (HM)	4.45E+04	ug/l	2.97E+01	lbs/day
2-Chlorophenol	3.79E+04	ug/l	2.53E+01	lbs/day
1,2-Dichlorobenzene	1.61E+06	ug/l	1.07E+03	lbs/day
1,3-Dichlorobenzene	2.46E+05	ug/l	1.64E+02	lbs/day
1,4-Dichlorobenzene	2.46E+05	ug/l	1.64E+02	lbs/day
3,3'-Dichlorobenzidine	7.29E+00	ug/l	4.87E-03	lbs/day

1,1-Dichloroethylene	3.03E+02	ug/l	2.02E-01	lbs/day
1,2-trans-Dichloroethylene1				
2,4-Dichlorophenol	7.48E+04	ug/l	4.99E+01	lbs/day
1,2-Dichloropropane	3.69E+03	ug/l	2.46E+00	lbs/day
1,3-Dichloropropylene	1.61E+05	ug/l	1.07E+02	lbs/day
2,4-Dimethylphenol	2.18E+05	ug/l	1.45E+02	lbs/day
2,4-Dinitrotoluene	8.62E+02	ug/l	5.75E-01	lbs/day
2,6-Dinitrotoluene				
1,2-Diphenylhydrazine	5.12E+01	ug/l	3.41E-02	lbs/day
Ethylbenzene	2.75E+06	ug/l	1.83E+03	lbs/day
Fluoranthene	3.51E+04	ug/l	2.34E+01	lbs/day
4-Chlorophenyl phenyl ether				
4-Bromophenyl phenyl ether				
Bis(2-chloroisopropyl) ether	1.61E+07	ug/l	1.07E+04	lbs/day
Bis(2-chloroethoxy) methane				
Methylene chloride (HM)	1.52E+05	ug/l	1.01E+02	lbs/day
Methyl chloride (HM)				
Methyl bromide (HM)				
Bromoform (HM)	3.41E+04	ug/l	2.27E+01	lbs/day
Dichlorobromomethane(HM)	2.08E+03	ug/l	1.39E+00	lbs/day
Chlorodibromomethane (HM)	3.22E+03	ug/l	2.15E+00	lbs/day
Hexachlorocyclopentadiene	1.61E+06	ug/l	1.07E+03	lbs/day
Isophorone	5.68E+04	ug/l	3.79E+01	lbs/day
Naphthalene				
Nitrobenzene	1.80E+05	ug/l	1.20E+02	lbs/day
2-Nitrophenol				
4-Nitrophenol				
2,4-Dinitrophenol	1.33E+06	ug/l	8.85E+02	lbs/day
4,6-Dinitro-o-cresol	7.25E+04	ug/l	4.83E+01	lbs/day
N-Nitrosodimethylamine	7.67E+02	ug/l	5.12E-01	lbs/day
N-Nitrosodiphenylamine	1.52E+03	ug/l	1.01E+00	lbs/day
N-Nitrosodi-n-propylamine	1.33E+02	ug/l	8.85E-02	lbs/day
Pentachlorophenol	7.77E+02	ug/l	5.18E-01	lbs/day
Phenol	4.36E+08	ug/l	2.91E+05	lbs/day
Bis(2-ethylhexyl)phthalate	5.59E+02	ug/l	3.73E-01	lbs/day
Butyl benzyl phthalate	4.93E+05	ug/l	3.29E+02	lbs/day
Di-n-butyl phthalate	1.14E+06	ug/l	7.58E+02	lbs/day
Di-n-octyl phthlate				
Diethyl phthalate	1.14E+07	ug/l	7.58E+03	lbs/day
Dimethyl phthlate	2.75E+08	ug/l	1.83E+05	lbs/day
Benzo(a)anthracene (PAH)	2.94E+00	ug/l	1.96E-03	lbs/day
Benzo(a)pyrene (PAH)	2.94E+00	ug/l	1.96E-03	lbs/day
Benzo(b)fluoranthene (PAH)	2.94E+00	ug/l	1.96E-03	lbs/day
Benzo(k)fluoranthene (PAH)	2.94E+00	ug/l	1.96E-03	lbs/day
Chrysene (PAH)	2.94E+00	ug/l	1.96E-03	lbs/day
Acenaphthylene (PAH)				
Anthracene (PAH)				
Dibenzo(a,h)anthracene (PAH)	2.94E+00	ug/l	1.96E-03	lbs/day
Indeno(1,2,3-cd)pyrene (PAH)	2.94E+00	ug/l	1.96E-03	lbs/day
Pyrene (PAH)	1.04E+06	ug/l	6.95E+02	lbs/day
Tetrachloroethylene	8.43E+02	ug/l	5.62E-01	lbs/day
Toluene	1.89E+07	ug/l	1.26E+04	lbs/day
Trichloroethylene	7.67E+03	ug/l	5.12E+00	lbs/day
Vinyl chloride	4.97E+04	ug/l	3.32E+01	lbs/day

Pesticides				
Aldrin	1.33E-02	ug/l	8.85E-06	lbs/day
Dieldrin	1.33E-02	ug/l	8.85E-06	lbs/day
Chlordane	5.59E-02	ug/l	3.73E-05	lbs/day
4,4'-DDT	5.59E-02	ug/l	3.73E-05	lbs/day
4,4'-DDE	5.59E-02	ug/l	3.73E-05	lbs/day
4,4'-DDD	7.96E-02	ug/l	5.31E-05	lbs/day
alpha-Endosulfan	1.89E+02	ug/l	1.26E-01	lbs/day
beta-Endosulfan	1.89E+02	ug/l	1.26E-01	lbs/day
Endosulfan sulfate	1.89E+02	ug/l	1.26E-01	lbs/day
Endrin	7.67E+01	ug/l	5.12E-02	lbs/day
Endrin aldehyde	7.67E+01	ug/l	5.12E-02	lbs/day
Heptachlor	1.99E-02	ug/l	1.33E-05	lbs/day
Heptachlor epoxide				
PCB's				
PCB 1242 (Arochlor 1242)	4.26E-03	ug/l	2.84E-06	lbs/day
PCB-1254 (Arochlor 1254)	4.26E-03	ug/l	2.84E-06	lbs/day
PCB-1221 (Arochlor 1221)	4.26E-03	ug/l	2.84E-06	lbs/day
PCB-1232 (Arochlor 1232)	4.26E-03	ug/l	2.84E-06	lbs/day
PCB-1248 (Arochlor 1248)	4.26E-03	ug/l	2.84E-06	lbs/day
PCB-1260 (Arochlor 1260)	4.26E-03	ug/l	2.84E-06	lbs/day
PCB-1016 (Arochlor 1016)	4.26E-03	ug/l	2.84E-06	lbs/day
Pesticide				
Toxaphene	7.10E-02	ug/l	4.74E-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)	1.33E-06	ug/l	8.85E-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		35664.4				35664.4	N/A
Antimony				407338.1		407338.1	
Arsenic	9473.0	16191.6			0.0	9473.0	17833.8
Barium						0.0	
Beryllium						0.0	
Cadmium	942.6	206.5			0.0	206.5	38.5
Chromium (III)		153551.2			0.0	153551.2	14454.2
Chromium (VI)	9398.5	719.0			0.0	718.97	948.30
Copper	18899.1	1277.1				1277.1	1565.7
Cyanide		1053.0	20840555.9			1053.0	492.6
Iron		47396.3				47396.3	
Lead	9468.3	9570.7			0.0	9468.3	733.6
Mercury		110.19		14.21	0.0	14.21	-8.236
Nickel		40615.1		435757.1		40615.1	8728.3
Selenium	4689.6	933.9			0.0	933.9	388.9
Silver		596.1			0.0	596.1	
Thallium				596.8		596.8	
Zinc		10177.3				10177.3	20137.1
Boron	69641.4					69641.4	

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	35664.4	N/A	
Antimony	407338.14		
Arsenic	9473.0	17833.8	Acute Controls
Asbestos	0.00E+00		
Barium			
Beryllium			
Cadmium	206.5	38.5	
Chromium (III)	153551.2	14454	
Chromium (VI)	719.0	948.3	Acute Controls
Copper	1277.1	1565.7	Acute Controls
Cyanide	1053.0	492.6	
Iron	47396.3		
Lead	9468.3	733.6	
Mercury	14.209	-8.236	
Nickel	40615.1	8728	
Selenium	933.9	388.9	
Silver	596.1	N/A	
Thallium	596.8		
Zinc	10177.3	20137.1	Acute Controls
Boron	69641.40		

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.

The antidegradation rules and procedures allow for modification of effluent limits less than those based strictly upon mass balance equations utilizing 100% of the assimilative capacity of the receiving water. Additional factors include considerations for "Blue-ribbon" fisheries, special recreational areas, threatened and endangered species, and drinking water sources.

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. Basic renewal, no increase in effluent flow or concentration.

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.

XIII. 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.

XIV. TMDL Requirements

Casper Ice Cream discharges to a segment of the Cub River that is 303(d) listed for total phosphorous (TP). A TP TMDL was completed for the Cub River on December 23, 1997. The TMDL requires a total phosphorous effluent limit of .05 mg/L for Casper Ice Cream.

*Calculation based on limited flow and concentration data

1/day	1/day	1/day	1/day	1/day	1/day	1/day	1/day
0.000	0.000	4.000	3.477	0.000	0.000	32.000	26.790

BENTHIC DEMAND (SOD)20 gm/m2/day	BENTHIC DEMAND (SOD)T gm/m2/day
1.000	0.825

K1 CBOD {theta}	K2 Reaer. {theta}	K3 NH3 {theta}	K4 Open {theta}	K5 NH3 Loss {theta}	K6 NO2+3 {theta}	K(Cl) TRC {theta}	S Benthic {theta}
1.0	1.0	1.1	1.0	1.0	1.0	1.1	1.1

Antidegredation Review

An antidegradation review (ADR) was conducted to determine whether the proposed activity complies with the applicable antidegradation requirements for receiving waters that may be affected. The Level I ADR evaluated the criteria of R317-2-3.5(b) and determined that the proposed discharge will not require a Level II Antidegradation Review. The Proposed permit is a simple renewal. No increase in effluent flow or concentration.