

Utah Division of Water Quality

Statement of Basis

ADDENDUM

Wasteload Analysis and Antidegradation Level I Review - PRELIMINARY

Date: November 30, 2016

Prepared by: Dave Wham 
Standards and Technical Services

Facility: Moroni WWTP
UPDES No. UT0020222

Receiving water: San Pitch River (2B, 3C, 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

Outfall 001: Moroni WWTP effluent. The treatment plant processes domestic wastewater for the City of Moroni and wastewater from the Moroni Feed Company turkey processing plant.

The maximum daily flow is 1.1 MGD as estimated by the permittee.

Receiving Water

The receiving water for Outfall 001 is the San Pitch River.

Per UAC R317-2-13.6, the designated beneficial uses of the San Pitch River and tributaries, from confluence with Sevier River to Highway U-132 crossing (with exceptions) is 2B, 3C, 3D 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 3C - Protected for nongame fish and other aquatic life, including the necessary aquatic organisms in their food chain.*

- *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.*

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 the San Pitch River, the 20th percentile of flow measurements was calculated on an annual basis for the irrigation season (April - September) and non- irrigation (October - March). The source of flow data was DWQ monitoring site 4946955, San Pitch R above Moroni WWTP 200 meters above 100 E, 1996-2013.

Table 1.Critical Low Flow

| Season | Critical Low Flow (cfs) |
|-----------------------|-------------------------|
| Irrigation Season | 1.0 |
| Non-irrigation Season | 17.7 |

San Pitch River water quality was characterized based on samples collected from DWQ monitoring site 4946955 (2013-2014). Applicable Water Quality Standards are presented in the WLA Addendum.

TMDL

According to the Utah's 2016 303(d) Water Quality Assessment, the assessment unit for this section of the San Pitch River (UT16030004-005) was listed as impaired for E. coli (class 2B use), total ammonia (class 3C and 3D uses) and total dissolved solids (class 4 use).

A TMDL was completed for total dissolved solids (TDS) on the Middle San Pitch River (HUC #16030004) on November 18th 2003 (UDWQ 2003). The TMDL identified a critical season of March 1 - September 30 where the loading capacity was exceeded and load limitations apply. The TMDL identified a load limit of 1,177 tons during the critical season (March 1 - September 30), or 2,009 tons per year which is equivalent to the WWTP's design capacity of 1.1 MGD multiplied by the 1,200 mg/l water quality standard. Therefore, during the critical season, effluent limits for TDS will equal 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 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 effluent was consider to be totally mixed as the ratio of river flow (7Q10) to discharge flow was .6 (≤ 2). 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 TDS, E. coli, total residual chlorine and ammonia as determined in consultation with the UPDES Permit Writer.

WET Limits

The percent of effluent in the receiving water in a fully mixed condition, and acute and chronic dilution in a not fully mixed condition are calculated in the WLA in order to generate WET limits. The LC₅₀ (lethal concentration, 50%) percent effluent for acute toxicity and the IC₂₅ (inhibition concentration, 25%) percent effluent for chronic toxicity, as determined by the WET test, needs to be below the WET limits, as determined by the WLA. The WET limit for LC₅₀ is typically 100% effluent and does not need to be determined by the WLA.

IC₂₅ WET limits for Outfalls 001 should be based on 63% effluent.

Wasteload Allocation Methods

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

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. 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.

Utah Division of Water Quality
Wasteload Analysis
Moroni Feed Company
UPDES No. UT0020222

Documents:

WLA Document: *Moroni_WLADoc_11-30-16.docx*

Wasteload Analysis and Addendum: *Moroni_WLA_11-30-16.xlsm*

Supporting Data: *Moroni 8-3-16_Data.xlsm*

References:

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

Utah Division of Water Quality. 2003. San Pitch River Watershed Water Quality Management Plan.

WASTELOAD ANALYSIS [WLA] Addendum: Statement of Basis SUMMARY

Discharging Facility: Moroni WWTP

UPDES No: UT-0020222

Current Flow: 1.10 MGD Design Flow

Design Flow 1.10 MGD

Receiving Water: San Pitch River

Stream Classification: 2B, 3C, 3D, 4

| | | |
|---------------------|------------------------|-----------------|
| Stream Flows [cfs]: | 1.0 Summer (July-Sept) | 20th Percentile |
| | 17.7 Fall (Oct-Dec) | 20th Percentile |
| | 17.7 Winter (Jan-Mar) | 20th Percentile |
| | 1.0 Spring (Apr-June) | 20th Percentile |
| | 0.0 Average | |

| | | |
|--------------------|--------------------------|---------|
| Stream TDS Values: | 641.0 Summer (July-Sept) | Average |
| | 416.0 Fall (Oct-Dec) | Average |
| | 416.0 Winter (Jan-Mar) | Average |
| | 641.0 Spring (Apr-June) | Average |

Effluent Limits:

Flow, MGD: 1.10 MGD Design Flow

BOD, mg/l: 25.0 Summer 5.0 Indicator

Dissolved Oxygen, mg/l: 5.5 Summer 5.0 30 Day Average

TNH₃, Chronic, mg/l: 5.3 Summer Varies Function of pH and Temperature

TDS, mg/l: 1200.0 Summer 1200.0

WQ Standard:

Modeling Parameters:

Acute River Width: 50.0%

Chronic River Width: 100.0%

Level 1 Antidegradation Level Completed: Level II Review not required.

Date: 11/30/2016

Permit Writer:

WLA by:

WQM Sec. Approval:

TMDL Sec. Approval:

**Utah Division of Water Quality
Salt Lake City, Utah**

**WASTELOAD ANALYSIS [WLA]
Addendum: Statement of Basis**

| |
|------------------|
| 30-Nov-16 |
| 4:00 PM |

**Facilities: Moroni WWTP
Discharging to: San Pitch River**

UPDES No: UT-0020222

THIS IS A DRAFT DOCUMENT

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 in terms 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

| | |
|-------------------------|---|
| San Pitch River: | 2B, 3C, 3D, 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 | | 1 Hour Average (Acute) Standard | | |
|--------------|----------------------------------|---------------|---------------------------------|------|----------------|
| | Concentration | Load* | Concentration | | Load* |
| Aluminum | 87.00 ug/l** | 0.800 lbs/day | 750.00 | ug/l | 6.892 lbs/day |
| Arsenic | 190.00 ug/l | 1.746 lbs/day | 340.00 | ug/l | 3.125 lbs/day |
| Cadmium | 0.62 ug/l | 0.006 lbs/day | 6.73 | ug/l | 0.062 lbs/day |
| Chromium III | 217.36 ug/l | 1.998 lbs/day | 4547.61 | ug/l | 41.792 lbs/day |
| Chromium VI | 11.00 ug/l | 0.101 lbs/day | 16.00 | ug/l | 0.147 lbs/day |
| Copper | 24.49 ug/l | 0.225 lbs/day | 40.58 | ug/l | 0.373 lbs/day |
| Iron | | | 1000.00 | ug/l | 9.190 lbs/day |
| Lead | 13.40 ug/l | 0.123 lbs/day | 343.90 | ug/l | 3.160 lbs/day |
| Mercury | 0.0120 ug/l | 0.000 lbs/day | 2.40 | ug/l | 0.022 lbs/day |
| Nickel | 135.64 ug/l | 1.247 lbs/day | 1219.99 | ug/l | 11.212 lbs/day |
| Selenium | 4.60 ug/l | 0.042 lbs/day | 20.00 | ug/l | 0.184 lbs/day |
| Silver | N/A ug/l | N/A lbs/day | 26.41 | ug/l | 0.243 lbs/day |
| Zinc | 312.02 ug/l | 2.867 lbs/day | 312.02 | ug/l | 2.867 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 309.44 mg/l as CaCO₃

Organics [Pesticides]

| Parameter | 4 Day Average (Chronic) Standard | | 1 Hour Average (Acute) Standard | | |
|-------------------|----------------------------------|-----------------|---------------------------------|------|---------------|
| | Concentration | Load* | Concentration | | Load* |
| Aldrin | | | 1.500 | ug/l | 0.014 lbs/day |
| Chlordane | 0.004 ug/l | 0.063 lbs/day | 1.200 | ug/l | 0.011 lbs/day |
| DDT, DDE | 0.001 ug/l | 0.015 lbs/day | 0.550 | ug/l | 0.005 lbs/day |
| Dieldrin | 0.002 ug/l | 0.028 lbs/day | 1.250 | ug/l | 0.011 lbs/day |
| Endosulfan | 0.056 ug/l | 0.815 lbs/day | 0.110 | ug/l | 0.001 lbs/day |
| Endrin | 0.002 ug/l | 0.033 lbs/day | 0.090 | ug/l | 0.001 lbs/day |
| Guthion | | | 0.010 | ug/l | 0.000 lbs/day |
| Heptachlor | 0.004 ug/l | 0.055 lbs/day | 0.260 | ug/l | 0.002 lbs/day |
| Lindane | 0.080 ug/l | 1.165 lbs/day | 1.000 | ug/l | 0.009 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 | 0.204 lbs/day | 2.000 | ug/l | 0.018 lbs/day |
| Pentachlorophenol | 13.00 ug/l | 189.308 lbs/day | 20.000 | ug/l | 0.184 lbs/day |
| Toxephene | 0.0002 ug/l | 0.003 lbs/day | 0.7300 | ug/l | 0.007 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 | Concentration | Load* |
| Arsenic | | 100.0 ug/l | lbs/day |
| Boron | | 750.0 ug/l | lbs/day |
| Cadmium | | 10.0 ug/l | 0.05 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 | 5.51 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 | 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 | 39.32 lbs/day |
| Acrolein | ug/l lbs/day | 780.0 ug/l | 11.36 lbs/day |
| Acrylonitrile | ug/l lbs/day | 0.7 ug/l | 0.01 lbs/day |
| Benzene | ug/l lbs/day | 71.0 ug/l | 1.03 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 | 0.06 lbs/day |
| Chlorobenzene | ug/l lbs/day | 21000.0 ug/l | 305.81 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 | 1.44 lbs/day |

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|------------------------------|------|---------|---------------|-----------------|
| 1,1,1-Trichloroethane | | | | |
| Hexachloroethane | ug/l | lbs/day | 8.9 ug/l | 0.13 lbs/day |
| 1,1-Dichloroethane | | | | |
| 1,1,2-Trichloroethane | ug/l | lbs/day | 42.0 ug/l | 0.61 lbs/day |
| 1,1,2,2-Tetrachloroethane | ug/l | lbs/day | 11.0 ug/l | 0.16 lbs/day |
| Chloroethane | | | 0.0 ug/l | 0.00 lbs/day |
| Bis(2-chloroethyl) ether | ug/l | lbs/day | 1.4 ug/l | 0.02 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 | 62.62 lbs/day |
| 2,4,6-Trichlorophenol | ug/l | lbs/day | 6.5 ug/l | 0.09 lbs/day |
| p-Chloro-m-cresol | | | 0.0 ug/l | 0.00 lbs/day |
| Chloroform (HM) | ug/l | lbs/day | 470.0 ug/l | 6.84 lbs/day |
| 2-Chlorophenol | ug/l | lbs/day | 400.0 ug/l | 5.82 lbs/day |
| 1,2-Dichlorobenzene | ug/l | lbs/day | 17000.0 ug/l | 247.56 lbs/day |
| 1,3-Dichlorobenzene | ug/l | lbs/day | 2600.0 ug/l | 37.86 lbs/day |
| 1,4-Dichlorobenzene | ug/l | lbs/day | 2600.0 ug/l | 37.86 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 | 0.05 lbs/day |
| 1,2-trans-Dichloroethylene | ug/l | lbs/day | 0.0 ug/l | 0.00 lbs/day |
| 2,4-Dichlorophenol | ug/l | lbs/day | 790.0 ug/l | 11.50 lbs/day |
| 1,2-Dichloropropane | ug/l | lbs/day | 39.0 ug/l | 0.57 lbs/day |
| 1,3-Dichloropropylene | ug/l | lbs/day | 1700.0 ug/l | 24.76 lbs/day |
| 2,4-Dimethylphenol | ug/l | lbs/day | 2300.0 ug/l | 33.49 lbs/day |
| 2,4-Dinitrotoluene | ug/l | lbs/day | 9.1 ug/l | 0.13 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 | 0.01 lbs/day |
| Ethylbenzene | ug/l | lbs/day | 29000.0 ug/l | 422.30 lbs/day |
| Fluoranthene | ug/l | lbs/day | 370.0 ug/l | 5.39 lbs/day |
| 4-Chlorophenyl phenyl ether | | | | |
| 4-Bromophenyl phenyl ether | | | | |
| Bis(2-chloroisopropyl) ether | ug/l | lbs/day | 170000.0 ug/l | 2475.57 lbs/day |
| Bis(2-chloroethoxy) methane | ug/l | lbs/day | 0.0 ug/l | 0.00 lbs/day |
| Methylene chloride (HM) | ug/l | lbs/day | 1600.0 ug/l | 23.30 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 | 5.24 lbs/day |
| Dichlorobromomethane | ug/l | lbs/day | 22.0 ug/l | 0.32 lbs/day |
| Chlorodibromomethane | ug/l | lbs/day | 34.0 ug/l | 0.50 lbs/day |
| Hexachlorobutadiene(c) | ug/l | lbs/day | 50.0 ug/l | 0.73 lbs/day |
| Hexachlorocyclopentadiene | ug/l | lbs/day | 17000.0 ug/l | 247.56 lbs/day |
| Isophorone | ug/l | lbs/day | 600.0 ug/l | 8.74 lbs/day |
| Naphthalene | | | | |
| Nitrobenzene | ug/l | lbs/day | 1900.0 ug/l | 27.67 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 | 203.87 lbs/day |
| 4,6-Dinitro-o-cresol | ug/l | lbs/day | 765.0 ug/l | 11.14 lbs/day |
| N-Nitrosodimethylamine | ug/l | lbs/day | 8.1 ug/l | 0.12 lbs/day |
| N-Nitrosodiphenylamine | ug/l | lbs/day | 16.0 ug/l | 0.23 lbs/day |
| N-Nitrosodi-n-propylamine | ug/l | lbs/day | 1.4 ug/l | 0.02 lbs/day |
| Pentachlorophenol | ug/l | lbs/day | 8.2 ug/l | 0.12 lbs/day |

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|--------------------------|------|---------|---------------|------------------|
| Phenol | ug/l | lbs/day | 4.6E+06 ug/l | 6.70E+04 lbs/day |
| Bis(2-ethylhexyl)phthala | ug/l | lbs/day | 5.9 ug/l | 0.09 lbs/day |
| Butyl benzyl phthalate | ug/l | lbs/day | 5200.0 ug/l | 75.72 lbs/day |
| Di-n-butyl phthalate | ug/l | lbs/day | 12000.0 ug/l | 174.75 lbs/day |
| Di-n-octyl phthlate | | | | |
| Diethyl phthalate | ug/l | lbs/day | 120000.0 ug/l | 1747.46 lbs/day |
| Dimethyl phthlate | ug/l | lbs/day | 2.9E+06 ug/l | 4.22E+04 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 | 160.18 lbs/day |
| Tetrachloroethylene | ug/l | lbs/day | 8.9 ug/l | 0.13 lbs/day |
| Toluene | ug/l | lbs/day | 200000 ug/l | 2912.43 lbs/day |
| Trichloroethylene | ug/l | lbs/day | 81.0 ug/l | 1.18 lbs/day |
| Vinyl chloride | ug/l | lbs/day | 525.0 ug/l | 7.65 lbs/day |

Pesticides

| | | | | |
|--------------------|------|---------|----------|--------------|
| 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 | 0.03 lbs/day |
| beta-Endosulfan | ug/l | lbs/day | 2.0 ug/l | 0.03 lbs/day |
| Endosulfan sulfate | ug/l | lbs/day | 2.0 ug/l | 0.03 lbs/day |
| Endrin | ug/l | lbs/day | 0.8 ug/l | 0.01 lbs/day |
| Endrin aldehyde | ug/l | lbs/day | 0.8 ug/l | 0.01 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 | | |
|-----------------------|------|---------|--|--|

**Utah Division of Water Quality
Salt Lake City, Utah**

Metals

| | | | | |
|----------------|------|---------|--------------|-----------------|
| Antimony | ug/l | lbs/day | | |
| Arsenic | ug/l | lbs/day | 4300.00 ug/l | 62.62 lbs/day |
| Asbestos | ug/l | lbs/day | | |
| Beryllium | | | | |
| Cadmium | | | | |
| Chromium (III) | | | | |
| Chromium (VI) | | | | |
| Copper | | | | |
| Cyanide | ug/l | lbs/day | 2.2E+05 ug/l | 3203.68 lbs/day |
| Lead | ug/l | lbs/day | | |
| Mercury | | | 0.15 ug/l | 0.00 lbs/day |
| Nickel | | | 4600.00 ug/l | 66.99 lbs/day |
| Selenium | ug/l | lbs/day | | |
| Silver | ug/l | lbs/day | | |
| Thallium | | | 6.30 ug/l | 0.09 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.

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(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 | Temp. | pH | T-NH3 | BOD5 | DO | TRC | TDS | |
| | cfs | Deg. C | | mg/l as N | mg/l | mg/l | mg/l | mg/l | |
| Summer (Irrig. Season) | 1.0 | 14.9 | 7.8 | 0.03 | 26.00 | 7.07 | 0.00 | 641.0 | |
| Fall | 17.7 | 2.5 | 7.8 | 0.06 | 49.00 | ----- | 0.00 | 416.0 | |
| Winter | 17.7 | 2.5 | 7.8 | 0.06 | 49.00 | ----- | 0.00 | 416.0 | |
| Spring | 1.0 | 14.9 | 7.8 | 0.03 | 26.00 | ----- | 0.00 | 641.0 | |
| 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 | 3.12 | 0.05 | 1.00 | 1.00 | 1.29 | 0.0 | 0.21 | |
| Dissolved | Hg | Ni | Se | Ag | Zn | Boron | | | |
| Metals | ug/l | ug/l | ug/l | ug/l | ug/l | ug/l | | | |
| All Seasons | 0.0000 | 2.50 | 0.50 | 0.25 | 10.29 | 10.0 | | | * 1/2 MDL |

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Projected Discharge Information

| Season | Flow, MGD | Temp. | TDS mg/l | TDS tons/day |
|--------|-----------|-------|-------------|-----------------|
| Summer | 1.10000 | 19.9 | 607.00 | 2.78375 |
| Fall | 1.10000 | 14.4 | | |
| Winter | 1.10000 | 14.4 | | |
| Spring | 1.10000 | 19.9 | | |

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 | 1.100 MGD | 1.702 cfs |
| Fall | 1.100 MGD | 1.702 cfs |
| Winter | 1.100 MGD | 1.702 cfs |
| Spring | 1.100 MGD | 1.702 cfs |

Flow Requirement or Loading Requirement

The calculations in this wasteload analysis utilize the maximum effluent discharge flow of 1.1 MGD. If the discharger is allowed to have a flow greater than 1.1 MGD during 7Q10 conditions, and effluent limit concentrations as indicated, then water quality standards will be violated. In order to prevent this from occurring, the permit writers must include the discharge flow limitation 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 segments if the values below are met.

| | | | |
|------------------|--------|----------------|-----------|
| WET Requirements | LC50 > | EOP Effluent | [Acute] |
| | IC25 > | 63.0% Effluent | [Chronic] |

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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 | 229.3 lbs/day |
| Fall | 25.0 mg/l as BOD5 | 229.3 lbs/day |
| Winter | 25.0 mg/l as BOD5 | 229.3 lbs/day |
| Spring | 25.0 mg/l as BOD5 | 229.3 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 | 5.3 mg/l as N | 48.8 lbs/day |
| | 1 Hour Avg. - Acute | 26.0 mg/l as N | 238.5 lbs/day |
| Fall | 4 Day Avg. - Chronic | 38.5 mg/l as N | 353.1 lbs/day |
| | 1 Hour Avg. - Acute | 75.2 mg/l as N | 690.0 lbs/day |
| Winter | 4 Day Avg. - Chronic | 38.5 mg/l as N | 353.1 lbs/day |
| | 1 Hour Avg. - Acute | 75.2 mg/l as N | 690.0 lbs/day |
| Spring | 4 Day Avg. - Chronic | 5.3 mg/l as N | 48.8 lbs/day |
| | 1 Hour Avg. - Acute | 26.0 mg/l as N | 238.5 lbs/day |

Acute limit calculated with an Acute Zone of Initial Dilution (ZID) to be equal to 100.%.

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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 | 0.017 | mg/l | 0.15 | lbs/day |
| | 1 Hour Avg. - Acute | 0.030 | mg/l | 0.27 | lbs/day |
| Fall | 4 Day Avg. - Chronic | 0.115 | mg/l | 1.06 | lbs/day |
| | 1 Hour Avg. - Acute | 0.206 | mg/l | 1.89 | lbs/day |
| Winter | 4 Day Avg. - Chronic | 0.115 | mg/l | 1.06 | lbs/day |
| | 1 Hour Avg. - Acute | 0.206 | mg/l | 1.89 | lbs/day |
| Spring | 4 Day Avg. - Chronic | 0.017 | mg/l | 0.15 | lbs/day |
| | 1 Hour Avg. - Acute | 0.030 | mg/l | 0.27 | lbs/day |

Effluent Limitations for Total Dissolved Solids based upon Water Quality Standards

| Season | | Concentration | | Load | |
|--------|----------------------|---------------|------|------|----------|
| Summer | Maximum, Acute | 1200.0 | mg/l | 5.50 | tons/day |
| Fall | Maximum, Acute | 1660.7 | mg/l | 7.62 | tons/day |
| Winter | Maximum, Acute | 1660.7 | mg/l | 7.62 | tons/day |
| Spring | 4 Day Avg. - Chronic | 1200.0 | mg/l | 5.50 | 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 309.44 mg/l):

| | 4 Day Average | | 1 Hour Average | |
|--------------|---------------|-------------|----------------|------|
| | Concentration | Load | Concentration | Load |
| Aluminum* | N/A | N/A | 968.9 | ug/l |
| Arsenic* | 299.82 ug/l | 1.8 lbs/day | 439.0 | ug/l |
| Cadmium | 0.96 ug/l | 0.0 lbs/day | 8.7 | ug/l |
| Chromium III | 344.50 ug/l | 2.0 lbs/day | 5,883.5 | ug/l |
| Chromium VI* | 16.88 ug/l | 0.1 lbs/day | 20.4 | ug/l |
| Copper | 38.13 ug/l | 0.2 lbs/day | 52.1 | ug/l |
| Iron* | N/A | N/A | 1,293.8 | ug/l |
| Lead | 21.16 ug/l | 0.1 lbs/day | 444.9 | ug/l |
| Mercury* | 0.02 ug/l | 0.0 lbs/day | 3.1 | ug/l |
| Nickel | 213.88 ug/l | 1.3 lbs/day | 1,577.7 | ug/l |
| Selenium* | 7.01 ug/l | 0.0 lbs/day | 25.7 | ug/l |
| Silver | N/A ug/l | N/A lbs/day | 34.1 | ug/l |

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|----------|-------------|-------------|-------|------|-------------|
| Zinc | 489.32 ug/l | 2.9 lbs/day | 400.7 | ug/l | 3.7 lbs/day |
| Cyanide* | 8.26 ug/l | 0.0 lbs/day | 28.5 | ug/l | 0.3 lbs/day |

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

**Effluent Limitations for Heat/Temperature based upon
Water Quality Standards**

| | | |
|--------|--------------|-------------|
| Summer | 18.1 Deg. C. | 64.6 Deg. F |
| Fall | 25.3 Deg. C. | 77.6 Deg. F |
| Winter | 25.3 Deg. C. | 77.6 Deg. F |
| Spring | 18.1 Deg. C. | 64.6 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 2.13E-02 lbs/day |
| Chlordane | 4.30E-03 ug/l | 3.94E-02 lbs/day | 1.2E+00 | ug/l 1.71E-02 lbs/day |
| DDT, DDE | 1.00E-03 ug/l | 9.17E-03 lbs/day | 5.5E-01 | ug/l 7.82E-03 lbs/day |
| Dieldrin | 1.90E-03 ug/l | 1.74E-02 lbs/day | 1.3E+00 | ug/l 1.78E-02 lbs/day |
| Endosulfan | 5.60E-02 ug/l | 5.14E-01 lbs/day | 1.1E-01 | ug/l 1.56E-03 lbs/day |
| Endrin | 2.30E-03 ug/l | 2.11E-02 lbs/day | 9.0E-02 | ug/l 1.28E-03 lbs/day |
| Guthion | 0.00E+00 ug/l | 0.00E+00 lbs/day | 1.0E-02 | ug/l 1.42E-04 lbs/day |
| Heptachlor | 3.80E-03 ug/l | 3.49E-02 lbs/day | 2.6E-01 | ug/l 3.70E-03 lbs/day |
| Lindane | 8.00E-02 ug/l | 7.34E-01 lbs/day | 1.0E+00 | ug/l 1.42E-02 lbs/day |
| Methoxychlor | 0.00E+00 ug/l | 0.00E+00 lbs/day | 3.0E-02 | ug/l 4.27E-04 lbs/day |
| Mirex | 0.00E+00 ug/l | 0.00E+00 lbs/day | 1.0E-02 | ug/l 1.42E-04 lbs/day |
| Parathion | 0.00E+00 ug/l | 0.00E+00 lbs/day | 4.0E-02 | ug/l 5.69E-04 lbs/day |
| PCB's | 1.40E-02 ug/l | 1.28E-01 lbs/day | 2.0E+00 | ug/l 2.84E-02 lbs/day |
| Pentachlorophenol | 1.30E+01 ug/l | 1.19E+02 lbs/day | 2.0E+01 | ug/l 2.84E-01 lbs/day |
| Toxephene | 2.00E-04 ug/l | 1.83E-03 lbs/day | 7.3E-01 | ug/l 1.04E-02 lbs/day |

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**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 | 45.9 lbs/day |
| Nitrates as N | 4.0 mg/l | 36.8 lbs/day |
| Total Phosphorus as P | 0.05 mg/l | 0.5 lbs/day |
| Total Suspended Solids | 90.0 mg/l | 827.1 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 | 4.29E+03 ug/l | 3.93E+01 lbs/day |
| Acrolein | 1.24E+03 ug/l | 1.14E+01 lbs/day |
| Acrylonitrile | 1.05E+00 ug/l | 9.61E-03 lbs/day |
| Benzene | 1.13E+02 ug/l | 1.03E+00 lbs/day |
| Benzidine | ug/l | lbs/day |
| Carbon tetrachloride | 6.99E+00 ug/l | 6.41E-02 lbs/day |
| Chlorobenzene | 3.33E+04 ug/l | 3.06E+02 lbs/day |
| 1,2,4-Trichlorobenzene | | |
| Hexachlorobenzene | 1.22E-03 ug/l | 1.12E-05 lbs/day |
| 1,2-Dichloroethane | 1.57E+02 ug/l | 1.44E+00 lbs/day |
| 1,1,1-Trichloroethane | | |
| Hexachloroethane | 1.41E+01 ug/l | 1.30E-01 lbs/day |
| 1,1-Dichloroethane | | |
| 1,1,2-Trichloroethane | 6.67E+01 ug/l | 6.12E-01 lbs/day |
| 1,1,2,2-Tetrachloroethane | 1.75E+01 ug/l | 1.60E-01 lbs/day |
| Chloroethane | | |
| Bis(2-chloroethyl) ether | 2.22E+00 ug/l | 2.04E-02 lbs/day |
| 2-Chloroethyl vinyl ether | | |
| 2-Chloronaphthalene | 6.83E+03 ug/l | 6.26E+01 lbs/day |
| 2,4,6-Trichlorophenol | 1.03E+01 ug/l | 9.47E-02 lbs/day |
| p-Chloro-m-cresol | | |
| Chloroform (HM) | 7.46E+02 ug/l | 6.84E+00 lbs/day |
| 2-Chlorophenol | 6.35E+02 ug/l | 5.82E+00 lbs/day |
| 1,2-Dichlorobenzene | 2.70E+04 ug/l | 2.48E+02 lbs/day |
| 1,3-Dichlorobenzene | 4.13E+03 ug/l | 3.79E+01 lbs/day |

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|------------------------------|---------------|------------------|
| 1,4-Dichlorobenzene | 4.13E+03 ug/l | 3.79E+01 lbs/day |
| 3,3'-Dichlorobenzidine | 1.22E-01 ug/l | 1.12E-03 lbs/day |
| 1,1-Dichloroethylene | 5.08E+00 ug/l | 4.66E-02 lbs/day |
| 1,2-trans-Dichloroethylene1 | | |
| 2,4-Dichlorophenol | 1.25E+03 ug/l | 1.15E+01 lbs/day |
| 1,2-Dichloropropane | 6.19E+01 ug/l | 5.68E-01 lbs/day |
| 1,3-Dichloropropylene | 2.70E+03 ug/l | 2.48E+01 lbs/day |
| 2,4-Dimethylphenol | 3.65E+03 ug/l | 3.35E+01 lbs/day |
| 2,4-Dinitrotoluene | 1.44E+01 ug/l | 1.33E-01 lbs/day |
| 2,6-Dinitrotoluene | | |
| 1,2-Diphenylhydrazine | 8.57E-01 ug/l | 7.86E-03 lbs/day |
| Ethylbenzene | 4.60E+04 ug/l | 4.22E+02 lbs/day |
| Fluoranthene | 5.87E+02 ug/l | 5.39E+00 lbs/day |
| 4-Chlorophenyl phenyl ether | | |
| 4-Bromophenyl phenyl ether | | |
| Bis(2-chloroisopropyl) ether | 2.70E+05 ug/l | 2.48E+03 lbs/day |
| Bis(2-chloroethoxy) methane | | |
| Methylene chloride (HM) | 2.54E+03 ug/l | 2.33E+01 lbs/day |
| Methyl chloride (HM) | | |
| Methyl bromide (HM) | | |
| Bromoform (HM) | 5.72E+02 ug/l | 5.24E+00 lbs/day |
| Dichlorobromomethane(HM) | 3.49E+01 ug/l | 3.20E-01 lbs/day |
| Chlorodibromomethane (HM) | 5.40E+01 ug/l | 4.95E-01 lbs/day |
| Hexachlorocyclopentadiene | 2.70E+04 ug/l | 2.48E+02 lbs/day |
| Isophorone | 9.53E+02 ug/l | 8.74E+00 lbs/day |
| Naphthalene | | |
| Nitrobenzene | 3.02E+03 ug/l | 2.77E+01 lbs/day |
| 2-Nitrophenol | | |
| 4-Nitrophenol | | |
| 2,4-Dinitrophenol | 2.22E+04 ug/l | 2.04E+02 lbs/day |
| 4,6-Dinitro-o-cresol | 1.21E+03 ug/l | 1.11E+01 lbs/day |
| N-Nitrosodimethylamine | 1.29E+01 ug/l | 1.18E-01 lbs/day |
| N-Nitrosodiphenylamine | 2.54E+01 ug/l | 2.33E-01 lbs/day |
| N-Nitrosodi-n-propylamine | 2.22E+00 ug/l | 2.04E-02 lbs/day |
| Pentachlorophenol | 1.30E+01 ug/l | 1.19E-01 lbs/day |
| Phenol | 7.30E+06 ug/l | 6.70E+04 lbs/day |
| Bis(2-ethylhexyl)phthalate | 9.37E+00 ug/l | 8.59E-02 lbs/day |
| Butyl benzyl phthalate | 8.26E+03 ug/l | 7.57E+01 lbs/day |
| Di-n-butyl phthalate | 1.91E+04 ug/l | 1.75E+02 lbs/day |
| Di-n-octyl phthlate | | |
| Diethyl phthalate | 1.91E+05 ug/l | 1.75E+03 lbs/day |
| Dimethyl phthlate | 4.60E+06 ug/l | 4.22E+04 lbs/day |
| Benzo(a)anthracene (PAH) | 4.92E-02 ug/l | 4.51E-04 lbs/day |
| Benzo(a)pyrene (PAH) | 4.92E-02 ug/l | 4.51E-04 lbs/day |
| Benzo(b)fluoranthene (PAH) | 4.92E-02 ug/l | 4.51E-04 lbs/day |
| Benzo(k)fluoranthene (PAH) | 4.92E-02 ug/l | 4.51E-04 lbs/day |
| Chrysene (PAH) | 4.92E-02 ug/l | 4.51E-04 lbs/day |
| Acenaphthylene (PAH) | | |
| Anthracene (PAH) | | |
| Dibenzo(a,h)anthracene (PAH) | 4.92E-02 ug/l | 4.51E-04 lbs/day |
| Indeno(1,2,3-cd)pyrene (PAH) | 4.92E-02 ug/l | 4.51E-04 lbs/day |

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|---------------------|---------------|------------------|
| Pyrene (PAH) | 1.75E+04 ug/l | 1.60E+02 lbs/day |
| Tetrachloroethylene | 1.41E+01 ug/l | 1.30E-01 lbs/day |
| Toluene | 3.18E+05 ug/l | 2.91E+03 lbs/day |
| Trichloroethylene | 1.29E+02 ug/l | 1.18E+00 lbs/day |
| Vinyl chloride | 8.34E+02 ug/l | 7.65E+00 lbs/day |

Pesticides

| | | |
|--------------------|---------------|------------------|
| Aldrin | 2.22E-04 ug/l | 2.04E-06 lbs/day |
| Dieldrin | 2.22E-04 ug/l | 2.04E-06 lbs/day |
| Chlordane | 9.37E-04 ug/l | 8.59E-06 lbs/day |
| 4,4'-DDT | 9.37E-04 ug/l | 8.59E-06 lbs/day |
| 4,4'-DDE | 9.37E-04 ug/l | 8.59E-06 lbs/day |
| 4,4'-DDD | 1.33E-03 ug/l | 1.22E-05 lbs/day |
| alpha-Endosulfan | 3.18E+00 ug/l | 2.91E-02 lbs/day |
| beta-Endosulfan | 3.18E+00 ug/l | 2.91E-02 lbs/day |
| Endosulfan sulfate | 3.18E+00 ug/l | 2.91E-02 lbs/day |
| Endrin | 1.29E+00 ug/l | 1.18E-02 lbs/day |
| Endrin aldehyde | 1.29E+00 ug/l | 1.18E-02 lbs/day |
| Heptachlor | 3.33E-04 ug/l | 3.06E-06 lbs/day |
| Heptachlor epoxide | | |

PCB's

| | | |
|--------------------------|---------------|------------------|
| PCB 1242 (Arochlor 1242) | 7.14E-05 ug/l | 6.55E-07 lbs/day |
| PCB-1254 (Arochlor 1254) | 7.14E-05 ug/l | 6.55E-07 lbs/day |
| PCB-1221 (Arochlor 1221) | 7.14E-05 ug/l | 6.55E-07 lbs/day |
| PCB-1232 (Arochlor 1232) | 7.14E-05 ug/l | 6.55E-07 lbs/day |
| PCB-1248 (Arochlor 1248) | 7.14E-05 ug/l | 6.55E-07 lbs/day |
| PCB-1260 (Arochlor 1260) | 7.14E-05 ug/l | 6.55E-07 lbs/day |
| PCB-1016 (Arochlor 1016) | 7.14E-05 ug/l | 6.55E-07 lbs/day |

Pesticide

| | | |
|-----------|---------------|------------------|
| Toxaphene | 1.19E-03 ug/l | 1.09E-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 | | |

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Dioxin

Dioxin (2,3,7,8-TCDD)

2.22E-08 ug/l

2.04E-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 | | 968.9 | | | | 968.9 | N/A |
| Antimony | | | | 6826.9 | | 6826.9 | |
| Arsenic | 158.8 | 439.0 | | | 0.0 | 158.8 | 299.8 |
| Barium | | | | | | 0.0 | |
| Beryllium | | | | | | 0.0 | |
| Cadmium | 15.8 | 8.7 | | | 0.0 | 8.7 | 1.0 |
| Chromium (III) | | 5883.5 | | | 0.0 | 5883.5 | 344.5 |
| Chromium (VI) | 158.2 | 20.4 | | | 0.0 | 20.41 | 16.88 |
| Copper | 316.8 | 52.1 | | | | 52.1 | 38.1 |
| Cyanide | | 28.5 | 349282.5 | | | 28.5 | 8.3 |
| Iron | | 1293.8 | | | | 1293.8 | |
| Lead | 158.6 | 444.9 | | | 0.0 | 158.6 | 21.2 |
| Mercury | | 3.11 | | 0.24 | 0.0 | 0.24 | 0.019 |
| Nickel | | 1577.7 | | 7303.2 | | 1577.7 | 213.9 |
| Selenium | 79.1 | 25.7 | | | 0.0 | 25.7 | 7.0 |
| Silver | | 34.1 | | | 0.0 | 34.1 | |
| Thallium | | | | 10.0 | | 10.0 | |
| Zinc | | 400.7 | | | | 400.7 | 489.3 |
| Boron | 1190.6 | | | | | 1190.6 | |

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 | 968.9 | N/A | |
| Antimony | 6826.88 | | |
| Arsenic | 158.8 | 299.8 | Acute Controls |
| Asbestos | 0.00E+00 | | |
| Barium | | | |
| Beryllium | | | |
| Cadmium | 8.7 | 1.0 | |
| Chromium (III) | 5883.5 | 345 | |
| Chromium (VI) | 20.4 | 16.9 | |
| Copper | 52.1 | 38.1 | |

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| | | | |
|----------|---------|-------|----------------|
| Cyanide | 28.5 | 8.3 | |
| Iron | 1293.8 | | |
| Lead | 158.6 | 21.2 | |
| Mercury | 0.238 | 0.019 | |
| Nickel | 1577.7 | 214 | |
| Selenium | 25.7 | 7.0 | |
| Silver | 34.1 | N/A | |
| Thallium | 10.0 | | |
| Zinc | 400.7 | 489.3 | Acute Controls |
| Boron | 1190.64 | | |

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.

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.

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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

Moroni WWTP discharges to a segment of the San Pitch River that is 303(d) listed for total dissolved solids (TDS). A TDS TMDL was completed for the San Pitch River on November 18, 2003. The TMDL allocates a load limit of 1,177 tons TDS during the critical season (March 1 - September 30), or 2,009 tons per year which is equivalent to the WWTP's design capacity of 1.1 million gallons per day multiplied by the 1,200 mg/L water quality standard.

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Antidegradation 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.