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

Date: **May 28, 2019**

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

Facility: **Springville City Wastewater Treatment Plant**
UPDES No. UT0020834

Receiving water: **Little Spring Creek (2B, 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.

<u>Discharge</u>
Outfall 001: Little Spring Creek

The design capacity of the facility is 5.7 MGD maximum monthly average discharge and 6.6 MGD maximum daily discharge.

<u>Receiving Water</u>
The receiving water for Outfall 001 is Little Spring Creek, which is tributary to Big Spring Creek, Mill Race and Provo Bay of Utah Lake.

Per UAC R317-2-13.5.a, the designated beneficial uses for Little Spring Creek which receives the Springville City WWTP effluent from confluence with Big Spring Creek to headwaters are 2B, 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 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.*

Per UAC R317-2-13.5.a, the designated beneficial uses for Big Spring Creek from Utah Lake to 50 feet upstream from the east boundary of the Industrial Parkway Road right-of-way are 2B, 3B, and 4.

- *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.*

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 aquatic life use criteria need to be met for both Little Spring Creek and Big Spring Creek.

Receiving Water Critical 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). Due to a lack of flow records for each of the source waters, the 20th percentile of flow measurements from water quality monitoring conducted by DWQ was calculated to estimate seasonal critical flow in the receiving water (Table 1).

Table 1: Seasonal critical low flow (cfs)

Season	Headwater Spring	Little Spring Creek	Big Spring Creek
Monitoring ID	*4996290*	*4996200*	*4996310*
Summer			10.9
Fall			13.9
Winter			13.8
Spring			14.2
Annual	1.8	2.8	

TMDL

Spring Creek (Big) was listed as impaired for total ammonia according to the 303(d) list in *Utah's 2016 Integrated Report* (DWQ).

Utah Lake was listed for harmful algal blooms, total dissolved solids, total phosphorus and PCBs in fish tissue and Provo Bay was listed for pH, total ammonia, total phosphorus and PCBs in fish tissue on the 2016 303(d) list of impaired waterbodies. The Utah Lake Water Quality Study is ongoing with the objective to develop numeric nutrient criteria for Utah Lake and Provo Bay.

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 discharge is considered instantaneously fully mixed since the discharge is mixed with the headwater spring within a manhole structure. Therefore, no mixing zone is allowed. Since the discharge is considered fully mixed, 100% of the critical low flow was simulated for both chronic and acute conditions.

Parameters of Concern

The parameters of concern identified for the discharge/receiving water were total suspended solids (TSS), dissolved oxygen (DO), BOD_5, total phosphorus (TP), total nitrogen (TN), total ammonia (TAN), and pH as determined in consultation with the UPDES Permit Writer.

Water Quality Modeling

A QUAL2Kw model of the receiving water was built and calibrated to synoptic survey data collected by DWQ staff in September and October of 2012 and is documented in the *QUAL2Kw Model Calibration Report for Spring Creek* (DWQ 2019). The model extends 1.6 kilometers along Little Spring Creek downstream from the treatment facility outfall to the confluence with Big Spring Creek and then extends 1.05 kilometers downstream along Big Spring Creek.

Ambient receiving water quality data was obtained from monitoring site 4996290 Spring Creek above Springville WWTP, 4996200 Little Spring Creek without Effluent, and 4996310 Spring Creek below Fish Hatcheries and above Springville WWTP. Effluent parameters were characterized using data from monitoring site 4996280 Springville WWTP. The average seasonal value was calculated for each constituent with available data in the receiving water.

The QUAL2Kw model was used for determining the WQBELs for parameters related to eutrophication and in-stream DO criteria, as well as ammonia toxicity. Effluent concentrations were adjusted so that water quality standards were not exceeded in the receiving water. Where WQBELs exceeded secondary standards, the concentration in the model was set at the secondary standard.

The QUAL2Kw model was also used to determine the limits for ammonia. 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. QUAL2Kw rates, input and output for DO and eutrophication related constituents are summarized in Appendix A.

A mass balance mixing analysis was conducted for conservative constituents such as dissolved metals. The WQBELs for conservative constituents are summarized in Appendix B.

The wasteload model is available for review by request.

WET Limits

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

Table 2: WET Limits for IC_{25}

Season	Percent Effluent
Annual	83%

Effluent Limits

The effect of the effluent on the DO in the receiving water was evaluated using the QUAL2Kw model. A DO sag downstream in Little Spring Creek resulting from the plant discharge was predicted by the model, however, the DO did not fall below the criteria and limits beyond secondary standards are not required for DO and BOD_5 (Table 3).

Table 3: Water Quality Based Effluent Limits Summary

Effluent Constituent	Acute			Chronic		
	Standard	Limit	Averaging Period	Standard	Limit	Averaging Period
Flow (MGD)		6.6	1 day		5.7	30 days
Ammonia (mg/L)[1]	Varies	8.0	1 hour	Varies	1.8	30 days
Min. Dissolved Oxygen (mg/L)	5.0	5.0	Minimum	5.5	5.0	30 days
BOD_5 (mg/L)	None	35.0	7 days	None	25.0	30 days
1: Ammonia limits from previous permit due to impairment of Spring Creek and Provo Bay for ammonia.						

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 discharge, and the pollutant concentration and load from the facility is not being increased under this permit renewal.

Files

WLA Document: *springville_potw_wla_2019-05-28.docx*
QUAL2Kw Wasteload Model: *springville_potw_wla_2019.xlsm*

References

Utah's 2016 Integrated Report. 2016. Utah Division of Water Quality.

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

QUAL2Kw Model Calibration Report for Spring Creek. 2019. Utah Division of Water Quality.

WASTELOAD ANALYSIS [WLA] Date: 5/15/2019
Appendix A: QUAL2Kw Analysis for Eutrophication

Discharging Facility:	Springville WWTP	
UPDES No:	UT-0020834	
Permit Flow [MGD]:	5.7	Maximum Monthly Flow
	6.6	Maximum Daily Flow
Receiving Water:	Little Spring Creek	
Stream Classification:	2B, 3D, 4	
Stream Flows [cfs]:	1.8	Summer (July-Sept) Critical Low Flow
	1.8	Fall (Oct-Dec)
	1.8	Winter (Jan-Mar)
	1.8	Spring (Apr-June)
Fully Mixed:	YES	
Acute River Width:	100%	
Chronic River Width:	100%	

Modeling Information

A QUAL2Kw model was used to determine these effluent limits.

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.

Headwater Inputs	**Summer**	**Fall**	**Winter**	**Spring**
Flow (cfs)	1.8	1.8	1.8	1.8
Temperature (deg C)	20.9	12.8	8.7	13.6
Specific Conductance (μmhos)	1158	1158	1158	1158
Inorganic Suspended Solids (mg/L)	4.0	4.7	12.6	8.4
Dissolved Oxygen (mg/L)	9.0	9.0	9.9	9.3
$CBOD_5$ (mg/L)	2.5	1.5	1.8	3.9
Organic Nitrogen (mg/L)	0.500	0.500	0.500	0.500
NH4-Nitrogen (mg/L)	0.031	0.043	0.028	0.029
NO3-Nitrogen (mg/L)	0.850	0.850	0.850	0.850
Organic Phosphorus (mg/L)	0.000	0.000	0.000	0.000
Inorganic Ortho-Phosphorus (mg/L)	0.034	0.034	0.034	0.034
Phytoplankton (μg/L)	0.0	0.0	0.0	0.0
Detritus [POM] (mg/L)	0.4	0.5	1.4	0.9
Alkalinity (mg/L)	235	235	235	235
pH	8.4	8.0	8.1	8.1

Discharge Inputs	**Summer**	**Fall**	**Winter**	**Spring**
Flow (cfs)	5.7	5.7	5.7	5.7
Temperature (deg C)	22.8	16.2	12.7	17.5
Specific Conductance (μmhos)	959	989	1017	969
Inorganic Suspended Solids (mg/L)	10.8	12.5	16.2	15.1
Dissolved Oxygen (mg/L)	5.0	5.0	5.0	5.0
$CBOD_5$ (mg/L)	25.0	25.0	25.0	25.0
Organic Nitrogen (mg/L)	3.271	4.740	3.217	4.467
NH4-Nitrogen (mg/L)	2.500	4.000	5.000	4.000
NO3-Nitrogen (mg/L)	12.323	14.549	15.906	13.102
Organic Phosphorus (mg/L)	0.000	0.347	0.382	0.721
Inorganic Ortho-Phosphorus (mg/L)	3.009	3.042	2.700	2.241
Phytoplankton (μg/L)	0.000	0.000	0.000	0.000
Detritus [POM] (mg/L)	0.000	0.000	0.000	0.000
Alkalinity (mg/L)	235	235	235	235
pH	7.5	7.4	7.3	7.5

Little Spring Creek Inputs	**Summer**	**Fall**	**Winter**	**Spring**
Flow (cfs)	2.8	2.8	2.8	2.8
Temperature (deg C)	20.9	12.8	8.7	13.6
Specific Conductance (μmhos)	1158	1158	1158	1158
Inorganic Suspended Solids (mg/L)	4.0	4.7	12.6	8.4
Dissolved Oxygen (mg/L)	9.0	9.0	9.9	9.3
$CBOD_5$ (mg/L)	2.5	1.5	1.8	3.9
Organic Nitrogen (mg/L)	0.500	0.500	0.500	0.500
NH4-Nitrogen (mg/L)	0.031	0.043	0.028	0.029
NO3-Nitrogen (mg/L)	0.850	0.850	0.850	0.850
Organic Phosphorus (mg/L)	0.000	0.000	0.000	0.000
Inorganic Ortho-Phosphorus (mg/L)	0.034	0.034	0.034	0.034
Phytoplankton (μg/L)	0.0	0.0	0.0	0.0
Detritus [POM] (mg/L)	0.4	0.5	1.4	0.9
Alkalinity (mg/L)	235	235	235	235
pH	8.4	8.0	8.1	8.1

Big Spring Creek Inputs	**Summer**	**Fall**	**Winter**	**Spring**
Flow (cfs)	10.9	13.9	13.8	14.2
Temperature (deg C)	26.7	13.2	11.8	14.9
Specific Conductance (μmhos)	1134	1139	1071	1085
Inorganic Suspended Solids (mg/L)	13.6	27.3	8.4	7.3
Dissolved Oxygen (mg/L)	8.5	9.7	11.0	11.1
$CBOD_5$ (mg/L)	1.5	1.5	1.5	1.5
Organic Nitrogen (mg/L)	0.236	0.179	0.090	0.279
NH4-Nitrogen (mg/L)	0.036	0.041	0.026	0.025
NO3-Nitrogen (mg/L)	0.706	0.913	0.947	0.905
Organic Phosphorus (mg/L)	0.047	0.063	0.040	0.041
Inorganic Ortho-Phosphorus (mg/L)	0.026	0.024	0.025	0.026
Phytoplankton (μg/L)	1.4	1.4	1.4	1.4
Detritus [POM] (mg/L)	3.4	6.8	2.1	1.8
Alkalinity (mg/L)	236	236	236	228
pH	8.0	8.2	8.3	8.6

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

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 reflect the environmental conditions expected at low stream flows.

Effluent Limitations based upon Water Quality Standards for DO and Ammonia Toxicity

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

Chronic	Standard	Summer	Fall	Winter	Spring
Flow (MGD)	N/A	5.7	5.7	5.7	5.7
NH4-Nitrogen (mg/L)	Varies	2.5	4.0	5.0	4.0
$CBOD_5$ (mg/L)	N/A	25.0	25.0	25.0	25.0
Dissolved Oxygen [30-day Ave] (mg/L)	5.5	5.0	5.0	5.0	5.0

Acute	Standard	Summer	Fall	Winter	Spring
Flow (cfs)	N/A	6.6	6.6	6.6	6.6
NH4-Nitrogen (mg/L)	Varies	16.0	18.0	20.0	14.0
$CBOD_5$ (mg/L)	N/A	35.0	35.0	35.0	35.0
Dissolved Oxygen [Minimum] (mg/L)	5.0	5.0	5.0	5.0	5.0

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.

Coefficients and Other Model Information

Parameter	*Value*	*Units*
Stoichiometry:		
Carbon	40	gC
Nitrogen	7.2	gN
Phosphorus	1	gP
Dry weight	100	gD
Chlorophyll	1	gA
Inorganic suspended solids:		
Settling velocity	0.001	m/d
Oxygen:		
Reaeration model	Tsivoglou-Neal	
Temp correction	1.024	
Reaeration wind effect	None	
O2 for carbon oxidation	2.69	gO2/gC
O2 for NH4 nitrification	4.57	gO2/gN
Oxygen inhib model CBOD oxidation	Exponential	
Oxygen inhib parameter CBOD oxidation	0.60	L/mgO2
Oxygen inhib model nitrification	Exponential	
Oxygen inhib parameter nitrification	0.60	L/mgO2
Oxygen enhance model denitrification	Exponential	
Oxygen enhance parameter denitrification	0.60	L/mgO2
Oxygen inhib model phyto resp	Exponential	
Oxygen inhib parameter phyto resp	0.60	L/mgO2
Oxygen enhance model bot alg resp	Exponential	
Oxygen enhance parameter bot alg resp	0.60	L/mgO2
Slow CBOD:		
Hydrolysis rate	0	/d
Temp correction	1.047	
Oxidation rate	0.103	/d
Temp correction	1.047	
Fast CBOD:		
Oxidation rate	10	/d
Temp correction	1.047	
Organic N:		
Hydrolysis	0.93052954	/d
Temp correction	1.07	
Settling velocity	0.075512	m/d
Ammonium:		
Nitrification	8.5417597	/d
Temp correction	1.07	
Nitrate:		
Denitrification	1.22459618	/d
Temp correction	1.07	
Sed denitrification transfer coeff	0.22519	m/d
Temp correction	1.07	
Organic P:		
Hydrolysis	0.02341756	/d
Temp correction	1.07	
Settling velocity	0.012595	m/d
Inorganic P:		
Settling velocity	0.173285	m/d
Sed P oxygen attenuation half sat constant	0.37624	mgO2/L

Phytoplankton:		
Max Growth rate	2.8944	/d
Temp correction	1.07	
Respiration rate	0.480803	/d
Temp correction	1.07	
Death rate	0.86518	/d
Temp correction	1	
Nitrogen half sat constant	15	ugN/L
Phosphorus half sat constant	2	ugP/L
Inorganic carbon half sat constant	1.30E-05	moles/L
Phytoplankton use HCO3- as substrate	Yes	
Light model	Smith	
Light constant	57.6	langleys/d
Ammonia preference	25.4151	ugN/L
Settling velocity	0.468545	m/d
Bottom Plants:		
Growth model	Zero-order	
Max Growth rate	9.723175	gD/m2/d or /d
Temp correction	1.07	
First-order model carrying capacity	100	gD/m2
Basal respiration rate	0.5949614	/d
Photo-respiration rate parameter	0.01	unitless
Temp correction	1.07	
Excretion rate	0.114068	/d
Temp correction	1.07	
Death rate	0.016856	/d
Temp correction	1.07	
External nitrogen half sat constant	428.4848	ugN/L
External phosphorus half sat constant	95.6559	ugP/L
Inorganic carbon half sat constant	3.16E-05	moles/L
Bottom algae use HCO3- as substrate	Yes	
Light model	Smith	
Light constant	45.7548	mgO^2/L
Ammonia preference	18.969	ugN/L
Subsistence quota for nitrogen	11.7113	mgN/gD
Subsistence quota for phosphorus	2.55002	mgP/gD
Maximum uptake rate for nitrogen	880.0625	mgN/gD/d
Maximum uptake rate for phosphorus	73.4256	mgP/gD/d
Internal nitrogen half sat ratio	1.16297	
Internal phosphorus half sat ratio	4.8781425	
Nitrogen uptake water column fraction	1	
Phosphorus uptake water column fraction	1	
Detritus (POM):		
Dissolution rate	2.196361	/d
Temp correction	1.07	
Settling velocity	0.89671	m/d
pH:		
Partial pressure of carbon dioxide	370	ppm

Atmospheric Inputs:	Summer	Fall	Winter	Spring
Min. Air Temperature, F	57.7	29.5	24.0	45.0
Max. Air Temperature, F	90.5	51.0	44.9	74.2
Dew Point, Temp., F	58.6	35.0	30.3	48.5
Wind, ft./sec. @ 21 ft.	9.8	7.5	7.6	9.2
Cloud Cover, %	10%	10%	10%	10%

Other Inputs:	
Bottom Algae Coverage	100%
Bottom SOD Coverage	100%
Prescribed SOD, gO_2/m^2/day	0

WASTELOAD ANALYSIS [WLA] Date: 5/15/2019

Appendix B: Mass Balance Mixing Analysis for Conservative Constituents

Discharging Facility:	Springville WWTP		
UPDES No:	UT-0020834		
Permit Flow [MGD]:	5.7	Maximum Monthly Flow	
	6.6	Maximum Daily Flow	
Receiving Water:	Little Spring Creek		
Stream Classification:	2B, 3D, 4		
Stream Flows [cfs]:	1.8	Summer (July-Sept)	Critical Low Flow
	1.8	Fall (Oct-Dec)	
	1.8	Winter (Jan-Mar)	
	1.8	Spring (Apr-June)	
Fully Mixed:	YES		
Acute River Width:	100%		
Chronic River Width:	100%		

Modeling Information

A simple mixing analysis was used to determine these effluent limits.

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.

Headwater/Upstream Information

	Headwater Spring	**Little Spring Creek**
	cfs	cfs
Summer	1.8	2.8
Fall	1.8	2.8
Winter	1.8	2.8
Spring	1.8	2.8

Discharge Information

	Flow
	MGD
Maximum Daily	6.6
Maximum Monthly	5.7

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

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 reflect the environmental conditions expected at low stream flows.

Effluent Limitations for Protection of Recreation (Class 2B Waters)

Physical Parameter	Maximum Concentration
pH Minimum	6.5
pH Maximum	9.0

Bacteriological		
E. coli (30 Day Geometric Mean)	206	(#/100 mL)
E. coli (Maximum)	668	(#/100 mL)

Effluent Limitations for Protection of Aquatic Wildlife (Class 3D Waters)

Inorganics	Chronic Standard (4 Day Average)	Acute Standard (1 Hour Average)
Parameter	Standard	Standard
Phenol (mg/L)		0.010
Hydrogen Sulfide (Undissociated) [mg/L]		0.002

Total Recoverable Metals	Chronic Standard (4 Day Average)[1]			Acute Standard (1 Hour Average)[1]		
Parameter	Standard	Background	Limit	Standard	Background[2]	Limit
Aluminum (µg/L)	N/A[3]	20.6	N/A	750	69.0	931
Arsenic (µg/L)	150	0.9	196	340	0.9	430
Cadmium (µg/L)	0.5	0.1	0.6	4.9	0.1	6.2
Chromium VI (µg/L)	11.0	1.9	13.8	16.0	1.9	19.7
Chromium III (µg/L)	157	1.9	205	1,207	1.9	1,526
Copper (µg/L)	19.6	2.0	25.0	31.9	2.0	39.8
Cyanide (µg/L)[2]	5.2	3.5	5.7	22.0	3.5	26.9
Iron (µg/L)				1,000	30.0	1,257
Lead (µg/L)	6.7	0.7	8.6	172	0.7	218
Mercury (µg/L)[2]	0.012	0.008	0.013	2.4	0.0	3.0
Nickel (µg/L)	113	4.6	146	1,017	4.6	1,285
Selenium (µg/L)	4.6	1.0	5.7	18.4	1.0	23.0
Silver (µg/L)				15.6	0.5	19.5
Tributylin (µg/L)[2]	0.072	0.048	0.079	0.46	0.048	0.57
Zinc (µg/L)	257	9.3	333	255	9.3	320

1: Based upon a Hardness of 250 mg/l as CaCO3.

2: Background concentration assumed 67% of chronic standard.

3: Where the pH is equal to or greater than 7.0 and the hardness is equal to or greater than 50 ppm as $CaC0_3$ in the receiving water after mixing, the 87 ug/L chronic criterion (expressed as total recoverable) will not apply, and aluminum will be regulated based on compliance with the 750 ug/L acute aluminum criterion (expressed as total recoverable).

Organics [Pesticides]

Parameter	Chronic Standard (4 Day Average) Standard	Background[1]	Limit	Acute Standard (1 Hour Average) Standard	Background[1]	Limit
Aldrin (µg/L)				1.5	1.0	1.6
Chlordane (µg/L)	0.0043	0.0029	0.0047	1.2	0.0	1.5
DDT, DDE (µg/L)	0.001	0.001	0.001	0.55	0.00	0.70
Diazinon (µg/L)	0.17	0.11	0.19	0.17	0.11	0.18
Dieldrin (µg/L)	0.0056	0.0038	0.0062	0.24	0.00	0.30
Endosulfan, a & b (µg/L)	0.056	0.038	0.062	0.11	0.04	0.13
Endrin (µg/L)	0.036	0.024	0.040	0.086	0.024	0.102
Heptachlor & H. epoxide (µg/L)	0.0038	0.0025	0.0042	0.26	0.00	0.33
Lindane (µg/L)	0.08	0.05	0.09	1.0	0.1	1.3
Methoxychlor (µg/L)				0.03	0.02	0.03
Mirex (µg/L)				0.001	0.001	0.001
Nonylphenol (µg/L)	6.6	4.4	7.3	28.0	4.4	34.3
Parathion (µg/L)	0.0130	0.0087	0.0143	0.066	0.009	0.081
PCB's (µg/L)	0.014	0.009	0.015			
Pentachlorophenol (µg/L)	15.0	10.1	16.5	19.0	10.1	21.4
Toxephene (µg/L)	0.0002	0.0001	0.0002	0.73	0.00	0.92

1: Background concentration assumed 67% of chronic standard

Radiological

Parameter	Maximum Concentration Standard	Background[1]	Limit
Gross Alpha (pCi/L)	15	10.1	16.5

1: Background concentration assumed 67% of chronic standard.

Effluent Limitation for Protection of Agriculture (Class 4 Waters)

Parameter	Maximum Concentration Standard	Background[1]	Limit
Total Dissolved Solids (mg/L)	1,200	808	1,320
Boron (µg/L)	75.0	99.8	67.4
Arsenic (µg/L)	100	0.9	130
Cadmium (µg/L)	10.0	6.7	11.0
Chromium (µg/L)	100	1.9	130
Copper (µg/L)	200	2.0	261
Lead (µg/L)	100	0.7	130
Selenium (µg/L)	50.0	1.0	65.0
Gross Alpha (pCi/L)[1]	15.0	10.1	16.5

1: Background concentration assumed 67% of chronic standard.