FACT SHEET STATEMENT OF BASIS
MOAB CITY WASTEWATER TREATMENT FACILITY
RENEWAL PERMIT: DISCHARGE, BIOSOLIDS & STORM WATER
UPDES PERMIT NUMBER: UT0020419
UPDES BIOSOLIDS PERMIT NUMBER: UTL-020419
UPDES MULTI-SECTOR STORM WATER GENERAL PERMIT NUMBER: UTR000000
MAJOR MUNICIPAL

FACILITY CONTACTS

Person Name:	Jim Foster
Position:	Public Works Director
Person Name:	Gregg Fosse
Position:	Plant Operator
Person Name:	Sherman Standard
Position:	Assistant Plant Operator
Facility Name:	Moab City Wastewater Treatment Facility
Mailing Address:	217 East Center
	Moab City, Utah 84532
Telephone:	(435)-259-5577
Actual Address:	1070 West 400 North

DESCRIPTION OF FACILITY

The Moab Wastewater Treatment Facility (MWTF) was originally built in the early fifties, and currently has a design capacity of 1.5 million gallons a day (MGD) after two upgrades in 1983 and in 1996. Currently MWTF is at approximately one-half to two-thirds its organic and hydraulic loading capacity. MWTF's engineers and consultants have determined that the facility will not exceed design capacity during the lifetime of this permit, and have been working on plans for facility upgrades. Moab City is currently working to finalize plans and determine how they want to proceed.

The facility consists of a dump station, an inlet pump station, a screen and flume structure, a grit remover, two primary clarifiers, a primary digester, a secondary digester, two trickling filters, two secondary clarifiers, and an emergency power station. This facility chlorinates to disinfect the effluent prior to discharging to the Colorado River via a 2000 foot cement pipeline. The MWTF is located at 1100 West 400 North in the city of Moab, Grand County. The latitude is 38^0 34' 40", longitude 109^0 34' 47" with STORET number 495655.

SUMMARY OF CHANGES FROM PREVIOUS PERMIT

In an effort to better address the needs of the watershed and increase efficiency, the DWQ has recently begun consolidating permits. Therefore, in addition to the Discharge provisions, the renewal permit for MWTF will include provisions for storm water, biosolids, pretreatment and discharge.

In order to bring the facility into better compliance with updated salinity controls for the Colorado Basin, the monitoring frequency has been increased to quarterly for total dissolved solids. As a compromise the sampling will be increased from yearly to quarterly rather than monthly. Historic results do no indicate a salinity issue at Moab, and the flow is below 2 MGD.

DISCHARGE

DESCRIPTION OF DISCHARGE

The MWTF has been reporting self-monitoring results on Discharge Monitoring Reports on a monthly basis. A summary of the last 3 years of data is attached and there no violations resulting in enforcement activity. Previous WET failures have resulted in commencement of accelerated testing to determine if a Pattern of Toxicity existed. The results of the testing indicate the disappearance of the toxicity in the effluent. Moab then resumed regular WET testing as directed by the permit.

Outfall	Description of Discharge Point
001	Located at latitude 38°34'40" and longitude 109°34'47". The discharge is through a 2000 foot cement pipeline to the Colorado River.

RECEIVING WATERS AND STREAM CLASSIFICATION

The final discharge flows into the Colorado River which is classified as 1C, 2B, 3B and 4., according to *Utah Administrative Code (UAC) R317-2-13*.

Class1C	-Protected for domestic purposes with prior treatment by treatment processes as required by the Utah Division of Drinking Water.
Class 2B	-Protected for secondary contact recreation such as boating, wading, or similar uses.
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.

BASIS FOR EFFLUENT LIMITATIONS

Limitations on total suspended solids (TSS), biochemical oxygen demand (BOD_5), E. Coli coliforms, pH and percent removal for BOD_5 and TSS are based on current Utah Secondary Treatment Standards, *UAC R317-1-3.2*. The total dissolved solids (TDS) incremental increase limitation of 400 mg/L is based on the *Colorado River Basin Salinity Control Forum Policy for Municipal Discharges*, as adopted in *UAC R317-2-4*. The oil and grease is based on best professional judgment (BPJ). The permit limitations are:

	Effluent Limitations			
Parameter	Monthly Average	Weekly Average	Minimum	Maximum
Flow, MGD	1.5	NA	NA	NA
BOD_5, mg/L	25	35	NA	NA
BOD_5 Min. % Removal	85	NA	NA	NA
TSS, mg/L	25	35	NA	NA
TSS Min. % Removal	85	NA	NA	NA
TRC, mg/l	1.4	NA	NA	1.55
E. Coli, No/100mL	126	158	NA	NA
TDS, Culinary Intake, mg/L	Report	NA	NA	NA
TDS, Effluent, mg/L	<400 increase	NA	NA	NA
WET, Acute Biomonitoring	NA	NA	NA	LC_{50}> 100% effluent
Oil & Grease, mg/L	NA	NA	NA	10
pH, Standard Units	NA	NA	6.5	9.0

NA – Not Applicable.

SELF-MONITORING AND REPORTING REQUIREMENTS

The following self-monitoring requirements are the same as in the previous permit. The permit will require reports to be submitted monthly and quarterly, as applicable, on Discharge Monitoring Report (DMR) forms due 28 days after the end of the monitoring period. Lab sheets for biomonitoring must be attached to the biomonitoring DMR.

Self-Monitoring and Reporting Requirements *a			
Parameter	Frequency	Sample Type	Units
Total Flow b*, c*	Continuous	Recorder	MGD
BOD_5, Influent *d	Weekly	Composite	mg/L
Effluent	Weekly	Composite	mg/L
TSS, Influent*d	Weekly	Composite	mg/L
Effluent	Weekly	Composite	mg/L
E. Coli.	Weekly	Grab	No./100mL
TDS, Culinary Intake	Quarterly	Grab	mg/L
Effluent	Quarterly	Grab	mg/L
TRC	Daily	Grab	mg/L
WET, Acute Biomonitoring	Quarterly	Composite	Pass/Fail
Oil & Grease *e	Weekly	Grab	mg/L
pH	3 x Weekly	Grab	SU
Metals, Influent *d	Quarterly	Composite	mg/L
Effluent	Quarterly	Composite	mg/L
Organic Toxics, Influent *d	1st, 3rd and 5th Year	Grab	mg/L
Effluent	1st, 3rd and 5th Year	Grab	mg/L

*a See Definitions, *Part VIII*, of Permit for definition of terms.

*b Flow measurements of influent/effluent volume shall be made in such a manner that the permittee can affirmatively demonstrate that representative values are being obtained.

*c If the rate of discharge is controlled, the rate and duration of discharge shall be reported.

*d In addition to monitoring the final discharge, influent samples shall be taken and analyzed for this constituent at the same frequency as required for this constituent in the discharge

*e Sample when sheen is visible

BIOSOLIDS

The biosolids at the MWTF (sewage sludge) is stabilized in the anaerobic digesters with a hydraulic average retention time of 30 days and an estimated average temperature of 95° F (35° C). Once a week the biosolids are drawn off the bottom of the primary digester and sent to the secondary digester that serves as a holding tank. The biosolids from the secondary digester are wasted to the drying beds. The typical drying time is 3 to 4 months depending on the weather. In 2010 the MWTF produced 202 dry metric tons (DMT) of which 143 DMT were disposed in the Klondike Landfill and 59 DMT were still in the drying beds as of December 31, 2010.

BIOSOLIDS MONITORING REQUIREMENTS

Under *40 CFR 503* biosolids are not required to be monitored for heavy metals content or pathogens if the biosolids are disposed in a landfill.

LANDFILL MONITORING

Paint Filter Test
Under *40 CFR 258,* landfill monitoring requirements, the biosolids will need to pass a paint filter test before the biosolids are disposed of in a landfill. If the biosolids do not pass a paint filter test, the biosolids cannot be disposed in a landfill.

Vector Attraction Reduction Monitoring
The MWTF needs to meet a method of vector attraction reduction (VAR) if the biosolids are hauled to the landfill. The MWTF meets the VAR requirement by a 38% reduction in volatile solids through the anaerobic digesters and drying beds *(40 CFR 503.33(b)(1)).*

Minimum Frequency of Monitoring for VAR and the Paint Filter Test

Amount of Biosolids Disposed Per Year	Monitoring Frequency
> 0 to < 290 DMT	**One Time Per Year**
> 290 to < 1500 DMT	**Four times Per Year**

MONITORING DATA

The MWTF is not required to monitor for heavy metals or pathogens if the biosolids are disposed of in a landfill. Therefore, there is not any monitoring data for heavy metals or pathogens.

Paint Filter Tests and VAR Monitoring, 2005
The MWTP sampled for free liquids once in 2010. The paint filter test passed on November 17, 2010

VAR Monitoring
The MWTP was not required to sample for VAR in 2010. However, they did, and the total volatile solids reduction was 47.7%

RECORD KEEPING

The record keeping requirements from *40 CFR 503.17* are included under *Part III.F*. of the permit. Since the biosolids are disposed in a landfill the disposal records need to be retained for a minimum of five years.

REPORTING

The MWTF needs to report annually as required in *40 CFR 503.18*. This report is to include the results of all monitoring performed in accordance with *Part III.C*. of the permit, information on management practices, biosolids treatment, and certifications. This report is due no later than February 19 of each year. Each report is for the previous calendar year.

During the last permit cycle, the MWTF submitted all reports before the deadline of February 19. All reports were complete and accurate with the laboratory analysis attached.

STORM WATER

STORMWATER REQUIREMENTS

Storm water provisions are included in this combined UPDES permit.

The storm water requirements are based on the UPDES Multi-Sector General Permit for Storm Water Discharges for Industrial Activity, General Permit No. UTR000000 (MSGP). All sections of

the MSGP that pertain to discharges from wastewater treatment plants have been included and sections which are redundant or do not pertain have been deleted.

The permit requires the preparation and implementation of a storm water pollution prevention plan for all areas within the confines of the plant. Elements of this plan are required to include: 1. The development of a pollution prevention team: 2. Development of drainage maps and materials stockpiles: 3. An inventory of exposed materials: 4. Spill reporting and response procedures: 5. A preventative maintenance program: 6. Employee training: 7. Certification that storm water discharges are not mixed with non-storm water discharges: 8. Compliance site evaluations and potential pollutant source identification, and: 9. Visual examinations of storm water discharges.

PRETREATMENT REQUIREMENTS

The permittee has not been designated for pretreatment program development because it does not meet conditions which necessitate a full program. The flow through the plant is less than five (5) MGD, there are no categorical industries discharging to the treatment facility, industrial discharges comprise less than 1 percent of the flow through the treatment facility, and there is no indication of pass through or interference with the operation of the treatment facility such as upsets or violations of the POTW's UPDES permit limits.

Although the permittee does not have to develop a State-approved pretreatment program, any wastewater discharges to the sanitary sewer are subject to Federal, State and local regulations. Pursuant to *Section 307* of the *Clean Water Act*, the permittee shall comply with all applicable Federal General Pretreatment Regulations promulgated, found in *40 CFR 403* and the State Pretreatment Requirements found in *UAC R317-8-8*.

An industrial waste survey (IWS) is required of the permittee as stated in Part II of the permit. The IWS is to assess the needs of the permittee regarding pretreatment assistance. The IWS is required to be submitted within sixty (60) days after the issuance of the permit. If an Industrial User begins to discharge or an existing Industrial User changes their discharge the permittee must resubmit an IWS no later than sixty days following the introduction or change as stated in Part II of the permit.

It is recommended that the permittee perform an annual evaluation of the need to revise or develop technically based local limits for pollutants of concern, to implement the general and specific prohibitions *40 CFR, Part 403.5(a)* and *Part 403.5(b)*. This evaluation may indicate that present local limits are sufficiently protective, need to be revised or should be developed. It is recommended that the permittee submit for review any local limits that are developed to the Division of Water Quality for review.

The permittee has not been designated for pretreatment program development because it does not meet conditions which necessitate a full program. The flow through the plant is less than five (5) MGD, there are no categorical industries discharging to the treatment facility, industrial discharges comprise less than 1 percent of the flow through the treatment facility, and there is no indication of pass through or interference with the operation of the treatment facility such as upsets or violations of the POTW's UPDES permit limits.

BIOMONITORING REQUIREMENTS

A nationwide effort to control toxic discharges where effluent toxicity is an existing or potential concern is regulated in accordance with the *State of Utah Permitting and Enforcement Guidance Document for Whole Effluent Toxicity Control (biomonitoring).* Authority to require effluent

biomonitoring is provided in *Permit Conditions, UAC R317-8-4.2*, *Permit Provisions, UAC R317-8-5.3* and *Water Quality Standards, UAC R317-2-5* and *R317 -2-7.2*.

Since the permittee is a major municipal discharger, the renewal permit will require whole effluent toxicity (WET) testing. The receiving stream water quality monitoring data indicate no impairment of the stream. Therefore, there will be no numerical toxicity limitation and no chronic testing required at this time and the permittee will continue acute WET testing quarterly with alternating species and no acute WET limit. However, the permit will contain a toxicity limitation re-opener provision. This provision allows for modification of the permit to include WET limitations and/or increased WET monitoring, should additional information indicate the presence of toxicity in the discharge.

WET testing is required to determine if there is toxicity in the effluent and its possible impact on the receiving stream. WET testing has been required in previous permits. Toxicity has not occurred over the past three years of WET testing. As a result, the determination not to add WET limits in the renewal permit is supported.

PERMIT DURATION

It is recommended that this permit be effective for a duration of five (5) years.

Drafted by
Daniel Griffin, Discharge
Mark Schmitz, Biosolids
Mike George, Storm Water
Utah Division of Water Quality

Utah Division of Water Quality
ADDENDUM
Statement of Basis
Wasteload Analysis

Date: **June 20, 2011**

Facility: **Moab POTW**
Moab, UT
UPDES No. UT0020419

Receiving water: **Colorado River (1C, 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: Located at latitude 38°34'40" and longitude 109°34'47". The discharge is through a 2,000-lineal-foot, 18-inch diameter reinforced concrete pipeline to the Colorado River. Using Mannings equation (n = 0.014, slope = 0.005 ft/ft), travel time in the pipe was estimated to be 9.5 minutes.

The design flow for the discharge is 1.5 MGD (2.32 cfs), as estimated by the permittee. The current average discharge is 0.92 MGD and the current maximum discharge is 1.22 MGD. The design discharge was used for this wasteload analysis.

Receiving Water

The receiving water for the discharge is the Colorado River, which has designated uses of 1C, 2B, 3B, and 4. The receiving water does not have an approved TMDL for any parameters.

The critical flow for the wasteload analysis was considered the lowest stream flow for seven consecutive days with a ten year return frequency (7Q10). Flow records from USGS stream gage # 09180500 - COLORADO RIVER NEAR CISCO, UT, for the period 1913 – 2010 was obtained. The 7Q10 was calculated using the EPA computer software DFLOW V3.1b.

7Q10 Flow (Annual) = 1,220 cfs

Utah Division of Water Quality
Wasteload Analysis
Moab POTW, Moab, UT
UPDES No. UT0020419

Mixing Zone

The 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. Individual mixing zones may be further limited or disallowed in consideration of the following factors in the area affected by the discharge: Zone of passage for migrating fish or other species (including access to tributaries).

Mill Creek confluence with the Colorado River is approximately 1,400 feet downstream of the Moab POTW outfall pipe. Therefore, in consideration of potential fish migration concerns between Mill Creek and Colorado River, the acute mixing zone is limited to 1,400 feet (calculated to be 10.2 minutes travel time).

Dilution Factor

The EPA Region 8 stream mixing zone analysis (STREAMIX1, 1994), was used to determine the plume width and mixed flow rate for both acute and chronic conditions. A rectangular channel with a width of 300 feet, channel slope of 0.001 feet/feet, and roughness coefficient of 0.030 was assumed for channel geometry. Mannings equation was used to solve for the flow depth (1.8 feet) and velocity for the 7Q10 flow.

Table 1: Summary of plume characteristics at end of mixing zone.

Criteria	Distance to End of Mixing Zone (feet)	Plume Width		Flow	Dilution Factor
		feet	% of River	cfs	
Acute	1,400	35.4	11.6	142	61.7
Chronic	2,500	49.1	16.2	198	86.1

Parameters of Concern

The potential parameters of concern for the discharge/receiving water identified were total dissolved solids (TDS), total suspended solids (TSS), ammonia, and total residual chlorine, as determined in consultation with the UPDES Permit Writer. WQBELs were only determined for TRC and ammonia.

Table 2: Ambient conditions for #4956540 COLORADO R AT US191 XING NEAR MOAB (1999-2009)

Parameter	Percentile		Water Quality Standard			
	80th	20th	1C	2B	3B	4
Total Dissolved Solids (mg/L)	893.2		NA	NA	NA	1,200
Total Suspended Soilds (mg/L) Turbidity (NTU)	385.6		NA	NA	 10 Increase	NA
Total Residual Chlorine					Chronic 0.011 Acute 0.019	
Nitrogen, ammonia as N (mg/L)	0.130		NA	NA	Chronic 3.20 Acute 0.74	NA
pH	8.5	8.1	6.5-9.0	6.5-9.0	6.5-9.0	6.5-9.0
Temperature, water (deg C)	20.5		NA	NA	27	NA

Utah Division of Water Quality
Wasteload Analysis
Moab POTW, Moab, UT
UPDES No. UT0020419

Effluent Limits

The dilution factors, along with decay characteristics of the pollutant, were used to estimate the effluent limits for total residual chlorine and ammonia.

Table 3: Water quality based effluent limits

Parameter	Decay Rate at 20 deg C (/day)	Effluent Limit (mg/L)	
		Acute	Chronic
Total Residual Chlorine	20	1.55	1.40
Ammonia	4	196.6	55.6

For parameters without a WQBEL, permit limits should be set according to rules found in R317-1-3 and categorical UPDES discharge requirements for a design flow of 1.5 MGD.

WLA Document: *moab_wla_2011.doc*
Analysis: *moab_potw_wla_2011.xls*

Prepared by:
Nicholas von Stackelberg, P.E.
Water Quality Management Section

Moab	FLOW		PH EFFLUENT		TRC, mg/L		TDS, Culinary Intake		COLIFORM		TSS				BOD				METALS	WHOLE	OIL
UT0020419									Ecoli			EFFLUENT				EFFLUENT			RESULTS	EFFLUENT	GREASE
DMR MONTH	30 DAY AVE	DAILY MAX	DAILY MIN	DAILY MAX	30-day Avg.	Daily Max.	INF Water, mg/L	EFF mg/L 30-day	7 DAY MAX	30 DAY AVE	INFLUENT	30 DAY AVE	7 DAY MAX	REMOVAL	INFLUENT	30 DAY AVE	7 DAY MAX	REMOVAL			
			6.5	9		2.5.		<=+400	126	158		25	35	85		25	35	85			10
Dec-11																					
Nov-11																					
Oct-11																					
Sep-11																					
Aug-11																					
Jul-11																					
Jun-11																					
May-11																					
Apr-11	1.04	1.19	7.5	7.7	2.1	2.1			71	**2400**	262	17	21	94	270	21	26	92			0
Mar-11	0.9	1.16	7.5	7.7	1.9	1.9			16	**2400**	228	18	20	92	225	**27**	32	88	Test	Pass	0
Feb-11	0.82	0.95	7.6	7.8	2	2			8	17	265	16	19	94	235	**26**	29	89			0
Jan-11	0.81	0.91	7.7	7.8	1.9	1.9			4	16	248	14	17	94	214	25	28	88			0
			6.5	9		2.5.		<=+400	126	158		25	35	85		25	35	85			10
Dec-10	0.79	0.87	7.5	7.7	2.1	2.1			3	5	254	17	18	93	227	20	24	91	Test	Pass	0
Nov-10	0.88	1.01	7.4	7.7	2.1	2.1			4	5	251	13	14	95	227	19	20	92			0
Oct-10	1	1.16	7.4	7.6	2.1	2.1			13	53	279	16	18	96	251	25	29	90			0
Sep-10	1.06	1.2	7.4	7.7	2.2	2.2			123	**230**	263	15	19	94	241	**30**	34	88	Test	Pass	0
Aug-10	1.05	1.14	7.4	7.6	1.8	1.8			56	140	273	17	19	94	268	**30**	34	89			0
Jul-10	1.07	1.21	7.3	7.5	2	2			21	99	250	21	25	92	257	**29**	**36**	89			0
Jun-10	1.07	1.14	7.3	7.5	1.28	1.28		**412**	4	6	273	21	26	93	275	24	30	91	Test	Pass	0
May-10	1.07	1.19	7.4	7.7	2.1	2.1			4	10	268	16	28	**84**	290	20	28	**83**			0
Apr-10	1.05	1.19	7.4	7.7	2	2			1	4	255	19	23	93	258	23	28	91			0
Mar-10	0.95	1.14	7.4	7.7	1.6	1.6			1	3	270	18	20	96	253	**27**	28	89	Test	Pass	0
Feb-10	0.83	0.92	7.6	7.7	1.9	1.9			1	1	268	13	18	95	223	21	25	91			0
Jan-10	0.92	0.83	7.2	7.9	1.9	1.9			2	11	256	11	12	96	224	19	20	91			0
			6.5	9		2.5.		<=+400	126	158		25	35	85		25	35	85			10
Dec-09	0.85	0.98	7.5	7.7	1.9	1.9			2	3	233	19	23	91	190	17	20	92	Test	Pass	0
Nov-09	0.9	1.03	7.2	7.7	2.1	2.1			4	6	255	22	28	92	225	19	26	92			0
Oct-09	1.01	1.14	7.3	7.6	1.9	1.9			8	25	310	23	26	95	314	16	18	93			0
Sep-09	1.02	1.13	7.3	7.6	2.2	2.2			6	25	270	17	24	94	283	**26**	30	91	Test	Pass	0
Aug-09	1.02	1.14	7.2	7.5	1.6	1.6			13	52	250	18	22	95	238	22	28	91			0
Jul-09	1.04	1.12	7.2	7.5	1.8	1.8			4	11	245	23	26	91	255	15	15	94			0
Jun-09	1.03	1.1	7.2	7.6	1.9	1.9			11	66	260	18	24	93	258	16	19	94	Test	Pass	0
May-09	1.06	1.22	7.1	7.7	2.1	2.1			2	7	268	14	18	95	264	19	24	93			0
Apr-09	1.03	1.18	7.3	7.6	2.1	2.1			1	2	283	16	17	95	285	23	28	92			0
Mar-09	0.92	1.14	7.1	7.6	2.1	2.1			1	3	240	15	16	94	235	**27**	28	89	Test	Pass	0
Feb-09	0.81	0.89	7.1	7.6	2.2	2.2			1	2	223	17	23	93	238	24	33	90			0
Jan-09	0.78	0.87	7.1	7.7	2	2			3	19	352	13	16	96	250	21	28	92			0
			6.5	9		2.5.		<=+400	126	158		25	35	85		25	35	85			10
Dec-08	0.81	0.89	7.1	7.6	1.9	1.9			2	7	250	16	18	93	260	20	22	90	Test	Pass	0
Nov-08	0.87	1.03	7.3	7.7	2.2	2.2			14	140	236	19	20	92	242	19	25	92			0
Oct-08	0.94	1.04	7.3	7.7	2.2	2.2			4	11	243	16	17	93	270	23	24	92			0
Sep-08	0.98	1.05	7.2	7.6	2.2	2.2			9	66	225	15	16	93	235	25	27	90	Test	Pass	0
Aug-08	1.03	1.11	7.4	7.7	2	2			18	69	266	13	15	95	258	20	24	90			0
Jul-08	1.01	1.11	7.4	7.7	0.9	0.9			25	**200**	238	12	14	95	225	14	16	94			0
Jun-08	1.02	1.11	7.5	7.9	1.6	1.6			10	12	353	12	13	97	298	18	20	94	Test	Pass	0
May-08	1.01	1.11	7.4	7.6	1.8	1.8			4	22	270	14	19	95	258	23	32	91			0
Apr-08	0.99	1.12	7.3	7.6	2	2			7	45	265	18	20	93	298	**29**	32	90			0
Mar-08	0.93	1.16	7.3	7.7	2.2	2.2			5	23	210	13	21	94	242	**27**	34	89	Test	Fail	0
Feb-08	0.82	0.9	7.5	7.8	2.2	2.2			13	50	213	10	16	96	250	**30**	**36**	88			0
Jan-08	0.8	0.87	7.5	7.8	2.2	2.2			4	26	233	12	17	95	198	**26**	32	87			0
			6.5	9		2.5.		<=+400	126	158		25	35	85		25	35	85			10
Dec-07	0.82	0.88	7.4	7.6	1.9	1.9			2	18				89				94	Test	Pass	
Nov-07	0.89	1.06	7.3	7.6	2	2			13	**2400**	258	13	14	95	273	24	28	91			0
Oct-07	1	1.09	7.3	7.6		2.2			42	86	260	14	18	95	245	23	23	93			0
Sep-07	1.03	1.13	7.1	7.5		2.2			25	58	250	16	20	94	232	25	28	89	Test		0
Aug-07	1.03	1.13	7.2	7.4		1.7			23	140	223	15	16	93	268	24	**39**	91		Pass	0
Jul-07	1.01	1.08	7.2	7.5		1.9	170	410	4	5	243	13	15	95	285	24	**42**	92			0
Jun-07	1.01	1.07	7.3	7.6		2			6	14	244	12	13	95	264	22	28	92	Test	Pass	0
May-07	1.02	1.11	7.4	7.6		2.2			1	2	255	12	14	95	273	19	22	93			
Apr-07	1.04	1.28	7.4	7.6		2.1			1	3	255	16	19	94	300	24	28	92			0
Mar-07	0.93	1.11	7.4	7.6		1.7			9	76	244	16	18	93	254	**26**	28	90	Test	Fail	
Feb-07	0.2	0.97	7.4	7.6		2.2			8	25	213	16	18	93	240	**31**	32	87			
Jan-07	0.78	0.86	7.3	7.7		1.9			2	4	178	16	19	91	208	**30**	32	86			

Year	Qtr	Metal	Cyanide	Arsenic	Cadnium	Chromium	Lead	Molybdenum	Nickle	Silver	Zinc	Selenium	Mercury	Copper
	Limit	Chronic Acute												
	Average	Inf	*0.006*	*0.002*	*0.001*	*0.010*	*0.002*	*0.034*	*0.005*	*0.001*	*0.108*	*0.002*	*0.000*	*0.046*
		Eff	*0.029*	*0.002*	*0.001*	*0.010*	*0.002*	*0.034*	*0.005*	*0.001*	*0.075*	*9.657*	*0.000*	*0.028*
		Inf												
	Fall	Eff												
		Inf												
	Summer	Eff												
		Inf												
	Spring	Eff												
2011		Inf	0.005	0.0009	0.00018	0.01	0.0015	0.02	0.00596	0.00067	0.12	0.00168	0.00058	0.059
	Winter	Eff	0.022	0.00079	0.00018	0.01	0.00065	0.02	0.0061	0.00082	0.0733	0.0008	0.00015	0.0276
		Inf	*0.005*	0.001	0.00018	*0.01*	*0.0009*	0.02	0.0029	*0.0004*	0.07	*0.0013*	0.00015	0.08
	Fall	Eff	0.015	0.001	0.00018	0.01	0.00088	0.02	0.003	0.0004	0.0937	0.0008	0.00015	0.0435
		Inf	*0.005*	0.001	0.00018	*0.01*	0.00173	0.02	*0.0067*	0.0004	0.14	*0.0016*	*0.0002*	0.054
	Summer	Eff	0.031	0.0008	0.00018	*0.01*	*0.0005*	0.02	*0.0042*	0.00114	0.0488	*164*	*0.0002*	0.0284
		Inf	0.005	0.0011	0.00018	0.01	0.0014	0.02	0.0042	0.00048	0.12	0.0015	0.00024	0.041
	Spring	Eff	0.031	0.00069	0.00018	0.01	0.00068	0.02	0.0031	0.0004	0.067	0.00091	0.0002	0.021
2010		Inf	0.005	0.0011	0.0002	0.01	0.0015	0.02	0.0034	0.0004	0.12	0.0017	0.0002	0.03
	Winter	Eff	0.031	0.00088	0.00018	0.01	0.00099	0.02	0.0031	0.0004	0.074	0.0015	0.0002	0.037
		Inf	0.005	0.0011	0.0018	0.01	0.0018	0.04	0.0041	0.0012	0.12	0.0017	0.0002	0.041
	Fall	Eff	0.058	0.00093	0.00018	0.01	0.00064	0.04	0.0022	0.0004	0.062	0.0012	0.0002	0.02
		Inf	0.005	*0.001*	*0.0003*	*0.01*	*0.0022*	*0.04*	*0.0032*	*0.0004*	*0.12*	*0.0017*	*0.0002*	*0.038*
	Summer	Eff	0.063	*0.0008*	*0.0002*	*0.01*	*0.0006*	*0.04*	*0.0021*	*0.0004*	*0.058*	*0.0001*	*0.0002*	*0.019*
		Inf	*0.005*	*0.001*	*0.0002*	*0.01*	*0.0018*	*0.04*	*0.0029*	*0.001*	*0.11*	*0.0014*	*0.0002*	*0.041*
	Spring	Eff	0.046	*0.0008*	*0.0002*	*0.01*	*0.0006*	*0.04*	*0.0025*	*0.0004*	*0.064*	*0.0008*	*0.0002*	*0.018*
2009		Inf	0.005	*0.0011*	*0.0002*	*0.01*	*0.0026*	*0.04*	*0.0066*	*0.001*	*0.15*	*0.0014*	*0.0002*	*0.052*
	Winter	Eff	0.032	*0.001*	*0.0002*	*0.01*	*0.0008*	*0.04*	*0.0048*	*0.0004*	*0.072*	*0.15*	*0.0014*	*0.029*
		Inf	*0.005*	*0.0011*	*0.0002*	*0.01*	*0.0016*	*0.04*	*0.0051*	*0.0009*	*0.1*	*0.0014*	*0.0002*	*0.031*
	Fall	Eff	*0.005*	*0.0011*	*0.0002*	*0.01*	*0.0009*	*0.04*	*0.0044*	*0.0004*	*0.068*	*0.0014*	*0.0002*	*0.019*
		Inf	*0.005*	*0.0011*	*0.0002*	*0.01*	*0.0013*	*0.04*	*0.0069*	*0.0006*	*0.12*	*0.0014*	*0.0003*	*0.036*
	Summer	Eff	*0.042*	*0.001*	*0.0002*	*0.01*	*0.0008*	*0.04*	*0.0068*	*0.0004*	*0.073*	*0.0008*	*0.0002*	*0.031*
		Inf	*0.005*	*0.001*	*0.0002*	*0.01*	*0.0019*	*0.04*	*0.0079*	*0.001*	*0.097*	*0.0008*	*0.0002*	*0.034*

2008	Spring	Eff	*0.034*	*0.0011*	*0.0002*	*0.01*	*0.001*	*0.04*	*0.0081*	*0.0004*	*0.077*	*0.0008*	*0.0002*	*0.022*
		Inf	*0.026*	*0.0011*	*0.0002*	*0.01*	*0.0011*	*0.04*	*0.0059*	*0.0004*	*0.092*	*0.0014*	*0.0002*	*0.028*
	Winter	Eff	*0.005*	*0.001*	*0.0002*	*0.01*	*0.0021*	*0.04*	*0.0065*	*0.0008*	*0.14*	*0.0015*	*0.0002*	*0.043*
		Inf	*0.0022*	0.00085	0.00021	*0.01*	*0.0025*	0.04	0.0067	*0.0015*	0.11	*0.0012*	0.0002	0.04
	Fall	Eff	0.022	0.00079	0.00018	0.01	0.0012	0.04	0.006	0.0025	0.065	0.0016	0.0002	0.024
		Inf	*0.005*	0.005	0.004	*0.01*	0.005	0.04	*0.005*	0.005	0.12	*0.005*	*0.0002*	0.05
	Summer	Eff	0.02	0.005	0.004	*0.01*	*0.005*	0.04	*0.005*	0.005	0.061	*0.005*	*0.002*	0.027
		Inf	*0.005*	*0.005*	*0.004*	*0.01*	*0.005*	*0.04*	*0.0051*	*0.005*	*0.013*	*0.005*	*0.0002*	*0.056*
2007	Spring	Eff	0.021	*0.005*	*0.004*	*0.01*	*0.005*	*0.04*	*0.005*	*0.005*	*0.078*	*0.005*	*0.0002*	*0.033*
		Inf	0.005	*0.005*	*0.004*	*0.01*	*0.005*	*0.04*	*0.0081*	*0.005*	*0.12*	*0.005*	*0.0002*	*0.067*
	Winter	Eff	0.016	*0.005*	*0.004*	*0.01*	*0.005*	*0.04*	*0.0055*	*0.005*	*0.092*	*0.005*	*0.0002*	*0.026*
	Average	Inf	*0.009*	*0.005*	*0.014*	*0.010*	*0.005*	*0.040*	*0.006*	*0.005*	*0.579*	*0.005*	*0.000*	*0.036*
		Eff	*0.014*	*0.005*	*0.004*	*0.010*	*0.005*	*0.040*	*0.008*	*0.005*	*0.051*	*0.005*	*0.000*	*0.028*
		Inf	*0.016*	0.005	0.004	*0.01*	*0.005*	0.04	0.005	*0.005*	0.025	*0.005*	0.0002	0.023
	Fall	Eff	0.005	0.005	0.004	0.01	0.005	0.04	0.005	0.005	0.078	0.005	0.0002	0.04
		Inf												
	Summer	Eff												
		Inf												
2006	Spring	Eff												
		Inf												
	Winter	Eff												
		Inf	0.005	0.005	0.033	0.01	0.005	0.04	0.0064	0.005	1.7	0.005	0.0006	0.046
	Fall	Eff	0.025	0.005	0.004	0.01	0.005	0.04	0.013	0.005	0.014	0.005	0.0004	0.022
		Inf												
	Summer	Eff												
		Inf												
2005	Spring	Eff												
		Inf												
	Winter	Eff												
		Inf	*0.005*	*0.005*	*0.004*	*0.01*	*0.005*	*0.04*	*0.0056*	*0.005*	*0.011*	*0.005*	*0.0005*	*0.038*
	Fall	Eff	*0.013*	*0.005*	*0.004*	*0.01*	*0.005*	*0.04*	*0.005*	*0.005*	*0.06*	*0.005*	*0.0002*	*0.022*
		Inf												
	Summer	Eff												
		Inf												
2004	Spring	Eff												
		Inf												
	Winter	Eff												

Date	BOD	DO	Flow	N	pH	TDS	TSS
3-Feb-00	19	7.35	1.1	3.53	7.42	428	20.7
23-Mar-00	21	7.81	1.1	3.41	7.64	440	33
25-May-00	10	5.8	1.28	3.51	7.2	412	24
26-Jul-00	62	5.75	1.01	3.45	7.25	434	34
21-Sep-00	29	5.29		3.35	7.11	440	11.6
9-Nov-00		5.99	1.01	3.45	7.35		
26-Apr-01	16	6.04	1.25	0.269	7.36	442	28
28-Jun-01	13	4.75	1.17	1.37	7.05	1208	14.7
23-Aug-01	3	3.7	1.31	0.157	6.89	406	14
1-Nov-01	37	6.21	1.04	0.05	7.46	306	38
13-Dec-01	4	10.47	0.98	0.131	6.05	400	10
31-Jan-02	11	5.88		4.87	7.31	516	12
25-Apr-02	31	6.62	1.34	0.05	7.15	552	10
5-Jun-02	18	4.85			7.27	376	8
19-Jul-02		5.41	1.25		7.3	400	14.7
22-Aug-02	18	5.93	1.27	0.05	7.21	412	8
19-Sep-02	16	5.67	1.3		7.19	416	8
17-Oct-02	18	5.76	1.33		7.33	448	4
21-Nov-02	11	7.31	1		7.11	362	4
23-Jan-03	15	8.38	0.8		7.57	434	4
27-Feb-03	27	7.6	1	0.117	7.41	448	6
27-Mar-03	41	7.06	1.6		7.47	474	4
17-Apr-03	40	5.41	1.33		7.09	456	8
14-Aug-03	19	5.96	1.04		7.19	416	4
9-Oct-03	19	5.31	1.2	0.122	6.99	436	20.7
1-Apr-04	23	6.17	1.15	9.87	6.79	472	21.6
13-May-04	16	6.41	1.5	11.7	7.06	416	20
29-Jul-04	11	4.99	0.9	6.54	7.09	420	18.8
9-Sep-04	33	4.27	0.9	17.5	7.36	310	25.6
17-Nov-04	25	8.38	0.88	40.2	7.86	860	30.4
20-Jan-05	23	8.83	1.8	13.2	7.66	420	19.2
31-Mar-05	20	7.34	1.24	15.3	7.27	456	21.6
26-May-05	19	5.23	1.08	26	7.41	482	14
31-Aug-05	17			9.53		428	22.4
1-Sep-05		5.69	0.95		7.03		
6-Oct-05	18	5.85	1.24	8.18	7.15	388	25
1-Dec-05	16	7.19	1.15	13.2	7.17	412	27.3
9-Feb-06	26	7.98	0.69	14.9	7.04	448	19.6
30-Mar-06	25	8	1.5	17.7	7.09	416	32
11-May-06	9	5.39	0.9	10.7	8.2	372	16
22-Jun-06	65	4.9	1.8	34.4	7.55		
20-Jul-06	24	5.19	0.96	7.7	6.96	402	21.6
14-Sep-06	23	5.16	1.29	9.37	6.9	372	23.6
2-Nov-06	37	7.43	1.41	10.3	6.92	394	22.4
7-Dec-06	19	8.09	0.9	14	6.83		
15-Feb-07	20	7.97	0.8	16.9	7.4	398	45.2
29-Mar-07	20	7.89	1.1	14.5	7.33	386	19.3
30-Aug-07	9	3.87	1.2		7.18	394	30
20-Sep-07	12	4.89	1.35	9.17	7.03	378	18.8
1-Nov-07	36	4.46	0.83		7.3	388	11.6
24-Jan-08	19	8.39	0.61		7.48	374	8.8
1-May-08	12	6.12	0.99		7.66	440	26
27-Aug-08	75	4.2	1.19	9.89	7.14	418	22
22-Oct-08	11	6.54	1.14	11.7	7.27	378	19.2
9-Dec-08	21	7.81	0.86	16.9	7.37	444	27.2