US EPA Environmental Technology Initiative

Onsite Wastewater Technology Testing Report

Massachusetts
Alternative
Septic
System
Test
Center

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Waterloo Biofilter®

Technology Vendor

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The Massachusetts Alternative Septic System Test Center (MASSTC) is operated by the Barnstable County Department of Health and the Environment (BCDHE) with support from the United States Environmental Protection Agency (USEPA), The Massachusetts Department of Environmental Protection (MDEP) and Barnstable County. The mention of any products or proprietary methods within this document does not constitute an endorsement of same by these agencies. Opinions expressed herein do not necessarily reflect those of the supporting agencies. The Test Center can be contacted through George Heufelder, Barnstable County Department of Health and the Environment, Box 427, Barnstable, Massachusetts 02630 – Phone 508-375-6616, or visit the website at http://www.buzzardsbay.org/etimain.htm.

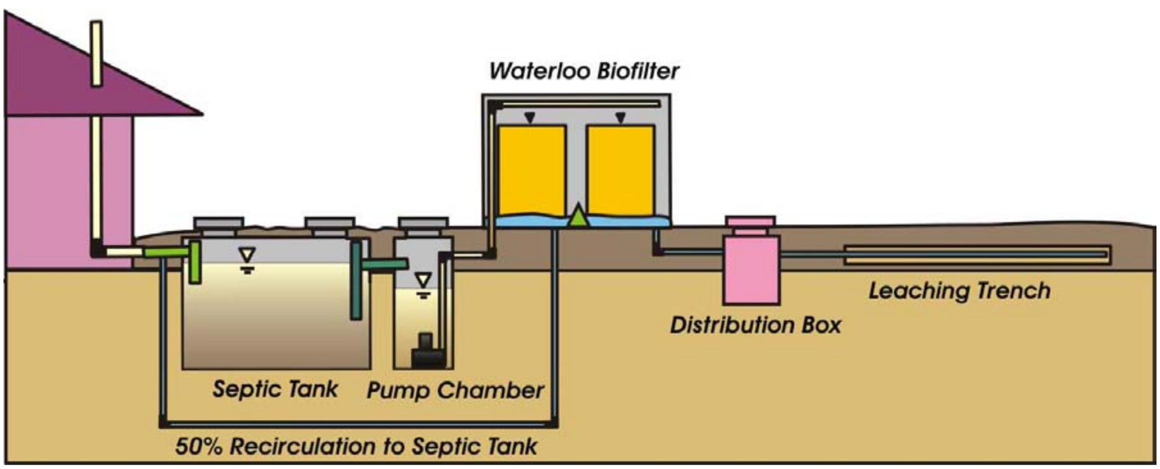
1. Technology description

General

The Waterloo Biofilter® belongs to a broad class of treatment units called trickling filters. When used in denitrifying systems, the filters are generally configured so as to return a portion of the filtrate to the septic tank, while the remaining portion flows forward to a soil absorption system.

Components

As installed and tested at MASSTC the technology consisted of a 1,500 gallon concrete septic tank, a 20-in diameter pump chamber and a Waterloo Biofilter. As Tested, a cylindrical, plastic mesh basket containing man-made fibers was suspended in the septic tank liquid. One Zabel model A100 effluent filter was fitted to the septic tank outlet tee. The pump chamber was Zabel cylindrical 50-gallon polyethylene unit, containing a pump and two control floats. The demand control panel was fitted with visual and audible



alarms. The Biofilter® was a foam-insulated cedar, above-ground unit, 8'l x 4'w x 5'h, of 160 cu ft total volume and contained approximately 108 cu ft of filter medium. The five foot tall containment of the trickling filter was buried to a depth of one foot with four feet exposed. The trickling filter was insulated on the interior surfaces and contained two, five-foot high reinforced plastic mesh cylinders about forty-five inches in diameter. These cylinders contained and supported a column of foam media. The volume of each foam cylinder was approximately 54 cu ft. A schema of a general installation is given below.

Siting Considerations and Installation Notes

The Biofilter® may be installed above grade, as it was for this testing, or the Biofilter® may be installed flush to grade at sites which have suitable topography and depth to the water table so the septic tank may be set deeply enough to permit gravity return flow from the Biofilter®. Below ground installations may use concrete tanks with a proper access opening, 2' x 4'. Alternately, a pump may be used in the Biofilter tank to maintain a free-draining condition. The pressure manifold atop the filter must be self-draining to prevent freezing. Above ground wooden enclosure installations should consider treatment for carpenter ants and burrowing insects. An approved effluent tee filter should be installed in the septic tank. Above-ground units can have varying heights of the containment structure exposed above grade depending on land topography. The units include an electrical panel with a visual and audible alarm. Configuration of the installed system will depend upon the individual site characteristics and the manufacturer's recommendations. Dosing of the filter can be on demand, as tested, or by timer. If the system is designed for timed dose, a larger pump chamber is required.

Theory of Operation

Wastewater from a source (in most instances a residence) enters a standard septic tank. The septic tank effluent then flows by gravity to a pump chamber which is variously sized. An effluent filter on the outlet of the septic tank prevents the passage of large solids (>1/16") from entering the pump chamber. Within the septic tank, a portion of the solids are settled out, and the organic nitrogen is converted to the reduced mineral form of ammonium (NH_4^+). From the pump chamber the effluent is dispersed over the foam media. The foam is proprietary open-cell foam cut into 2" x 2" blocks and placed in random attitude in the containment structure.

As the effluent percolates through the foam media, the consumption of the organic matter by microbes occurs. An overall reduction in the Biochemical Oxygen Demand (BOD) and Total Suspended Solids (TSS) occurs and the ammonium is oxidized into first nitrite (NO_2^-) and then nitrate (NO_3^{-2}). Some microzones within the foam cubes that have the prerequisite anoxic conditions for denitrification result in the conversion of some of the nitrate to nitrogen gas (N_2). At the bottom of the foam-media containment structure the percolate is divided by a dam that diverts approximately 50% of the percolate forward toward the soil absorption system. The reminder of the percolate (again approximately 50 %) is diverted back to the septic tank. Within the septic tank, the prerequisite anoxic conditions results in further denitrification of the wastewater. The process is purportedly enhanced by the substrate provided within the cylindrical basket containing man-made fiber.

2. Costs

Installation

The manufacturer claims that the Waterloo Biofilter® components including installation as installed at the MASSTC are $7,350 and to these costs should be added other conventional system costs for this installation of approximately $7,000. The cost of installation for any treatment technology is very dependent upon the particular site conditions, so readers should use the above estimates as approximations of average costs.

Design and permitting costs vary with the site conditions.

Electric usage
Average electric usage by the three units was 2.43 kW per day per unit or about $.27 per day at $.10 per kW; monthly this comes to $7.20 per month, and $86.20 per year. By comparison with other technologies at MASSTC, this electric cost is the lowest cost of the technologies tested at MASSTC (generally $8-$30 /month).

Maintenance
Massachusetts requires that all alternative technologies have a service contract in force for the life of the installation. Costs for this service vary but are approximately $400 per year. The service includes inspection of pumps, alarms, controls, fan, effluent filter, and septic tank sludge depth. Septic tanks are pumped at a frequency based on usage, but an approximate cost is $60 per annum.

Replacement parts
Pumps have a one year warranty; replacement cost is about $300. The medium is claimed to last 30 years, but may require cleaning at 10-15 year intervals ($300-$800 cost to add or replace media).

Other costs
Quarterly effluent quality monitoring is required for some permits at a cost of $300 or more annually, however this cost ends after 18 months of operation for residential installations.

3. ETI Testing Protocols Synopsis

The testing duration was for two years. The technology was installed in triplicate, with identical components. The Waterloo Biofilter® received wastewater at the rate of 330 gallons per day, throughout the two-year testing period. The 330 gallon per day volume is the Massachusetts Department of Environmental Protection (MA DEP) minimum design flow for a new residential house of three bedrooms or less.

Delivery of the wastewater was apportioned into fifteen equal doses of 22 gallons each, on a schedule which was designed to mimic the pattern of wastewater use in a typical residence (see ETI QAPP and NSFI/AINSI Standard 40). Periodic calibration of dose volumes delivered to each technology ensured equal dosing to each replicate and to different technologies.

Effluent from the technology flowed to a distribution box with four outlets. Three of the four outlets directed effluent to a facility sewer, and the fourth conveyed treated effluent to a one-quarter sized soil absorption system (SAS), designed to MA DEP rules. Lysimeters were installed at depths of one, two and five feet beneath the SAS to collect leachate for analysis. A polyethylene liner with sump collected all leachate from the three technology replicates.

The technologies were sampled at two-week intervals. During each sampling event, technology influent wastewater was sampled at the common dosing channel. Technology effluent was sampled at the distribution box. Influent wastewater and technology effluent were sampled using automated samplers, programmed to obtain fifteen flow-weighted samples composited over a twenty four hour period. Initiation of the individual samples was timed with a delay, to the influent wastewater dosing schedule for each technology.

Composite samples were kept refrigerated at 4 degrees centigrade either by ice packed in the sampler or by use of a refrigerated sampler. Upon completion of the sampling schedule samples were processed at the MASSTC. Analysis for pH and specific conductance were conducted at MAASTC during sample processing. Subsamples for BOD_5 and fecal coliform were sent to the Barnstable County Department of Health and the Environment laboratory. Subsamples for nitrogen and phosphorus analysis: ammonium (NH_4), nitrate plus nitrite (NO_x), dissolved organic nitrogen, (DON), particulate organic nitrogen (PON), alkalinity, orthophosphate (PO_4), total suspended solids (TSS) and total phosphorus (TP); were sent to the School for Marine Science University of Massachusetts, Dartmouth (SMAST).

Electrical usage by each technology was measured by an electric meter and recorded monthly.

<u>Mechanical and other non-quantitative performance monitoring</u>
Alarms, mechanical failures, unusual sounds, smells were recorded in a log book as they occurred. Restorative measures taken by the technology vendor to address non-normal conditions were also recorded and appear in the Section 6 of this report.

<u>Technology operating history</u>
The three Waterloo Biofilter® units were started up on June 7, 1999. Units 1 and 2 were operated continuously for the two-year test period with a last sampling date of June 5, 2001. Data was not collected from Unit 3 after November 28,2001, as Unit 3 was removed from service in December 2000, in order to begin another testing protocol US EPA ETV in February 2001.

4. Testing Objectives

The Waterloo Biofilter® was tested to demonstrate nitrogen removal for use in Massachusetts watersheds which are nitrogen sensitive. Technologies must be able to demonstrate reduction of average total nitrogen levels to below 19 mg/l. Waterloo Biofilter® systems also sought to obtain Massachusetts approvals for higher hydraulic loading rates in soil absorption systems (SAS) which are granted to technologies able to achieve average BOD_5 and TSS levels below 30 mg/l. Waterloo Biofilter® also sought to obtain Massachusetts approvals for reduction in the groundwater separation distance for SAS which are also based upon average BOD_5 and TSS levels below 30 mg/l.

5. Contaminant Removal Performance Summary for the Waterloo Biofilter®

Note: Technologies were allowed a start-up period, when measures of removal performance would be excluded from the test period. We define the start-up period as ending when the technology attains effluent levels below 30 mg/l BOD_5; 30 mg/l TSS; and 19 mg/l TN. These levels are performance thresholds for alternative systems set by MA DEP.

The data from all three units from the second sampling event attained levels below 30/30/19 mg/l, so that only the first sample event was excluded under the start-up period rules.

Biochemical Oxygen Demand ($BOD_{5)}$ removal

BOD_5 measured in the technology effluent averaged 9.3 mg/l (median, 8.0 mg/l) over the monitoring period, versus 175 mg/l for influent wastewater, representing a removal rate of 95 per cent (Table 1, Appendix 1 & 2)). Measurements exceeded the threshold 30 mg/l level only 2% of the time (3 samples out of 124 taken). Standard deviation, reflection of the variability of the performance was relatively low; an indication that the technology was able to provide good removal performance consistently over the testing period.

Table 1. Biochemical Oxygen Demand (5-day) removal performance of the Waterloo Biofilter® system during testing at the Massachusetts Alternative Septic System Test Center - June 1999- June 2001.

BOD (mg/l)	Replicate 1	Replicate 2	Replicate 3	Influent	Mean	%Removal
Average	9.7	8.9	9.1	174.5	9.3	94.7%
Median	9.0	7.5	8.0	162.0		
Standard Deviation	6.0	6.7	8.1	59.8		
Maximum	28.0	36.0	36.0	385.0		
Minimum	1.0	1.0	1.0	83.0		
Count	46	46	32	46		
Count> 30 mg/l	0	1	2			

The three maximum values occurred in May 2000. At that time, in all three units the baskets supporting the foam cube media tilted and slumped. This movement displaced the distribution manifold, causing some of the spray of septic tank effluent to miss the media column and hit the enclosure walls and short-circuit to the discharge point. Thus with each pressure dose, a portion of the technology effluent was not fully treated by the filter media, with resultant poorer effluent quality. Waterloo Biofilter® personnel repaired the baskets and subsequent samples show an improvement in the effluent quality (Appendix 1 &2) until the period January – March 2001 when levels rose above 20 mg/l. We interpret this decline as a seasonal effect: lower influent wastewater temperature and ambient air temperature slow biological activity and thus degrade performance. Waterloo Biofilter now uses rigid baskets or bulk filter tanks to avoid problematic slumping.

Total Suspended Solids (TSS) removal.
Total Suspended Solids (TSS) measured in the technology effluent averaged 6.2 mg/l (median 4.0 mg/l) over the monitoring period, versus 160 mg/l for influent wastewater, representing a removal rate of 96 per cent (Table 2).). Measurements exceeded the threshold 30 mg/l level less than 2% of the time (2 out of 118 samples taken). Standard deviation, a reflection of the variability of the performance was relatively low, an indication that the technology was able to provide good removal performance consistently over the testing period.

Table 2. Total Suspended Solids (TSS) removal performance of the Waterloo Biofilter® system during testing at the Massachusetts Alternative Septic System Test Center - June 1999- June 2001.

TSS (mg/l)	Replicate 1	Replicate 2	Replicate 3	Influent	Mean	%Removal
Average	6.7	6.1	5.5	160	6.2	96.2%
Median	3.5	4.0	3.0	161		
Standard Deviation	6.6	7.6	6.7	55		
Maximum	26.0	46.0	31.0	323		
Minimum	0.0	1.0	0.0	47		
Count	44	45	29	44		
Count> 30 mg/l	0	1	1	44		

As with the BOD results above, the three maximum values occurred in May 2000 and the causes were also basket slumping. When the baskets were repaired subsequent samples show an improvement in the effluent quality (Figure 2) until the period January–April 2001 when levels rose to level of 20-21 mg/l. Again this decline in efficiency appears to be a seasonal effect: lower influent wastewater temperature and ambient air temperature slow biological activity and thus degrade performance.

Nitrogen removal
Total nitrogen (TN) measured in the technology effluent averaged 14.4 mg/l (median, 13.9 mg/l) over the monitoring period, versus 35.0 mg/l for influent wastewater, representing a removal rate of 59 per cent (Table 3). TN measurements exceeded the threshold 19 mg/l level 13% of the time (16 out of 124 samples taken), principally in Unit 2.

Units 1&3 had very good nitrogen removal performance, 11.9 and 13.2 mg/l TN respectively, with only one sample above 19 mg/l. While the performance of Unit 2 was similar to Units 1&3 through the first 14 months of testing (Table 4), performance deteriorated for the final 10 months (Appendix 1 &2). The single high value of 46.30 mg/l for Unit 2 recorded September 6, 2000 was higher than average influent TN, of 35.21 and deserves comment. Upon rechecking the data source, we found no reason to

Table 3. Total Nitrogen removal performance of the Waterloo Biofilter® system during testing at the Massachusetts Alternative Septic System Test Center - June 1999- June 2001.

Total Nitrogen (mg/l)	Replicate 1	Replicate 2	Replicate 3	Influent	Mean	%Removal
Average	11.9	17.8	13.2	35.0	14.4	58.8%
Median	12.6	16.7	12.5	34.4	13.9	
Standard Deviation	3.4	6.3	2.5	3.6		
Maximum	19.8	46.3	18.7	46.3		
Minimum	4.8	7.5	9.9	28.4		
Count	46	46	32	46		
Count > 19 mg/l	1	15	0			

exclude this value. Another higher value, 54.56 mg/l for Unit 2 TN was measured on July 2, 2001 (after the 2 year testing cycle was complete) so the value was not an anomaly. Both BOD and TSS data for Unit 2 were consistent with the other units throughout the test period.

The NH_4 data for all three units for the testing period show a seasonal rise in ammonium in both years, but both Units 1&2 showed higher NH_4 values in the second winter, with Unit 2 showing variably elevated NH_4 levels during the final ten months. The higher levels in the second winter indicate increasingly incomplete nitrification in the Biofilter®. Higher NH_4 levels can indicate flow short-circuiting within or without the media column, poor distribution of spray on the filter, or poor oxygenation of spray and of liquid on the media surface. Spray nozzles were changed to a new design October 14, 2000 in all three units and this may have affected the nitrification in the filter units.

Fecal Coliform Removal

Fecal coliform is often used as a surrogate measure of public health significance. Wastewater treatment systems that remove fecal coliform are thought to concurrently reduce the discharge of human pathogens. In general, the Waterloo Biofilter removed >99% of the fecal coliform in the influent (Table 4).

Table4. Fecal Coliform removal performance of the Waterloo Biofilter® system during testing at the Massachusetts Alternative Septic System Test Center. June 1999- June 2001.

Fecal Coliform CFU/100 ml	Replicate 1	Replicate 2	Replicate 3	Influent	Mean	%Removal
Log Mean	2.6E+04	3.0E+04	1.3E+04	2.7E+06	2.2E+04	99.2
Maximum	7.5E+05	4.3E+05	2.4E+05	2.6E+07		
Minimum	8.0E+02	5.0E+02	2.0E+02	1.0E+04		

6. Operation and Maintenance Monitoring – Waterloo Biofilter®

Slumping of the basket support structures:

Slumping of the basket support structures occurred in all three units at about the same time, month ten. This problem did not recur during the rest of the test period. Waterloo Biofilter® claimed that the filter enclosures were shipped with incorrectly sized baskets. Some of the support for the baskets is provided by the enclosure. Since the baskets were too small, the added space around the baskets allowed the baskets to lean and then slump. Waterloo Biofilter® units are now all equipped with rigid support for the foam media as a response to this problem.

Spray nozzle clogging

Clogging of the plastic spray nozzles occurred on seven occasions between start-up and October 14, 2000 when the spray nozzle design was changed from a helical spray head to a splash plate design similar to a fire sprinkler. After that alteration, clogging of nozzles did not recur. A high water alarm typically announced a problem with the nozzles.

Septic tank effluent filters

The Zabel effluent filters needed cleaning on August 28,2000, about 14 months after start-up. There was about a 1.5-inch fall in the septic tank level after removing the filter for cleaning on August 28, 2000, confirming the need to clean the Zabel filter. The 14-month interval between filter cleaning is consistent with the hydraulic load of 330 gallons per day. This volume is about 1.5 to 2 times higher than the average household usage of 100-200 gallons per day, and should also shorten the maintenance interval for cleaning the effluent filter. In Massachusetts servicing is required at quarterly intervals, and we recommend that checking and cleaning the effluent filter should normally be a part of the service/maintenance procedure.

Biofilter® Enclosure integrity
Enclosures were fitted with hinged wooden access covers. The hinge fasteners (screws) were inadequate to the stresses placed upon them and stripped out on Unit 1 (August 4, 2000).

Noise
The primary source of noise from the system is the sound of water being sprayed upon the filter media. Noise levels were measured on 2/27/00 using a quest Model 2700 Sound Level Meter calibrated by factor on 2/23/00 (NIST Traceable) using slow response and A weighting. Levels were recorded 20 feet from the unit 4 feet above grade. Recorded levels averaged 38.9 db. Some of the sound measured was contributed by an adjacent technology. These levels were equivalent to background levels at the test site at the time of measurement.

Ease of maintenance
Components which may require maintenance, such as the pump, the fan, the filter media, the spray heads and spray manifold and the effluent filter were relatively easy to access for servicing with one exception. The Biofilter® unit access cover was heavy because of its size, and had to be propped open with a stick or other object, and due to its weight presented a hazard to the service person. Waterloo Biofilter now uses smaller, lighter-weight covers with large hinges secured by bolts to address these problems.

APPENDIX 1

Graphs of Major Wastewater Constituents
At Discharge

Waterloo Biofilter®

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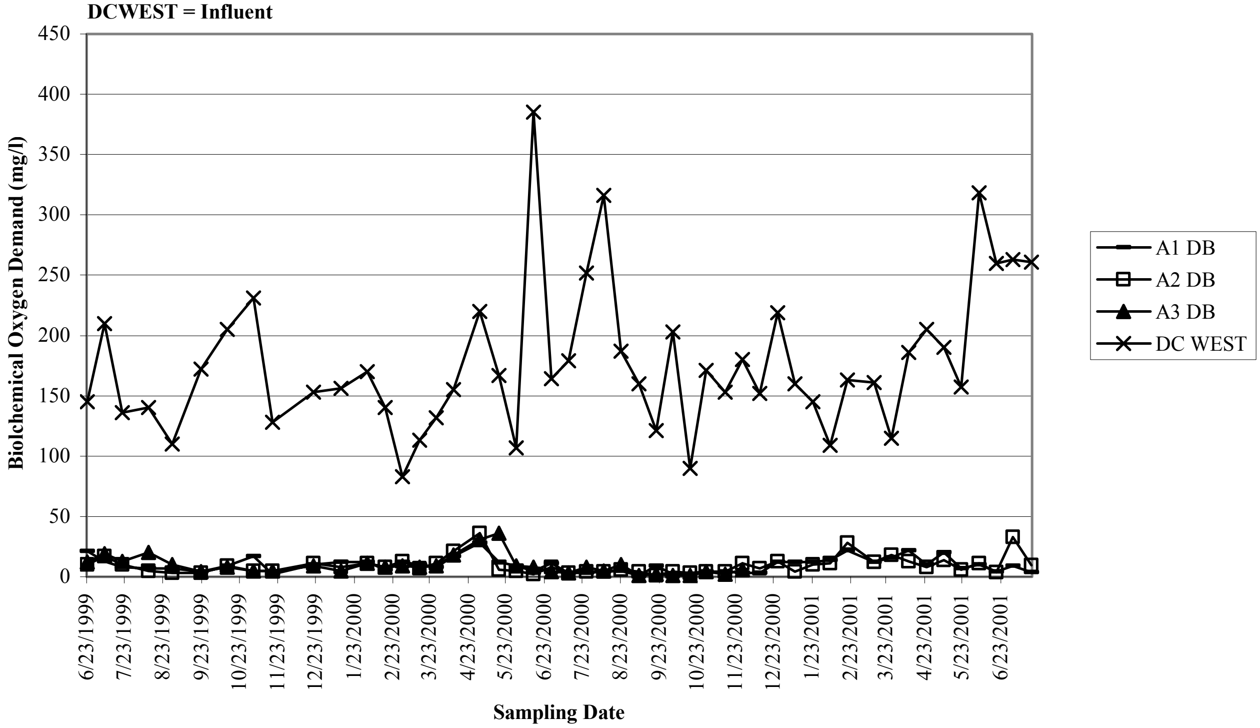
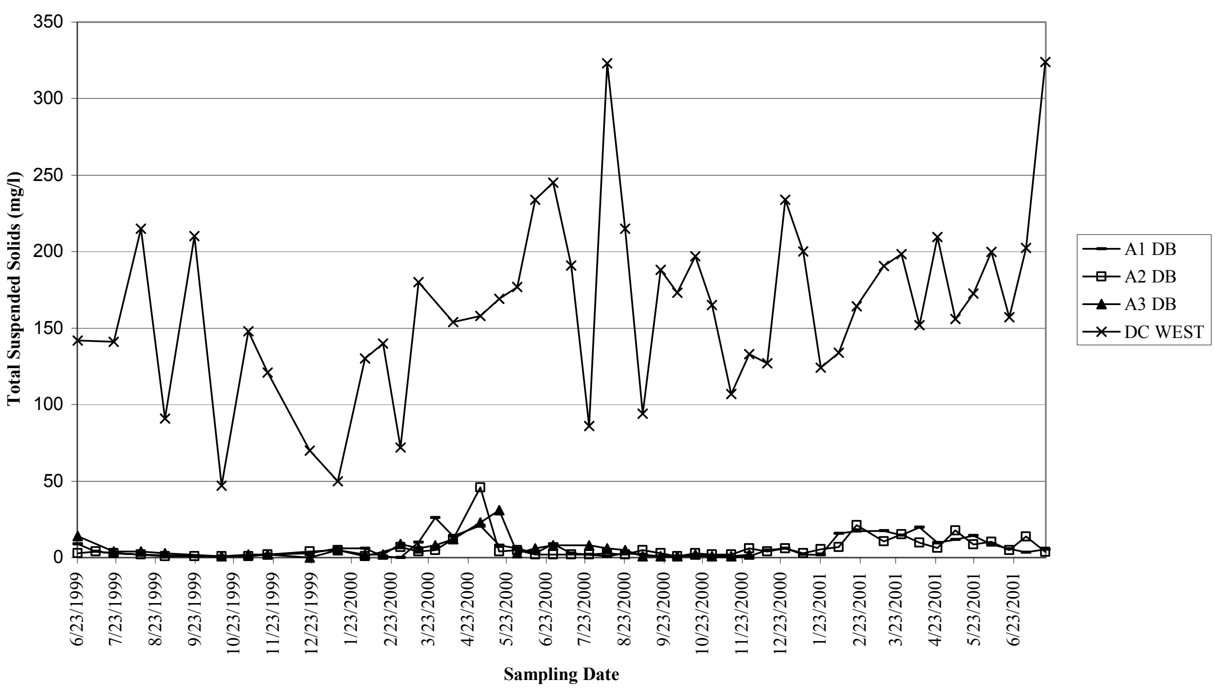
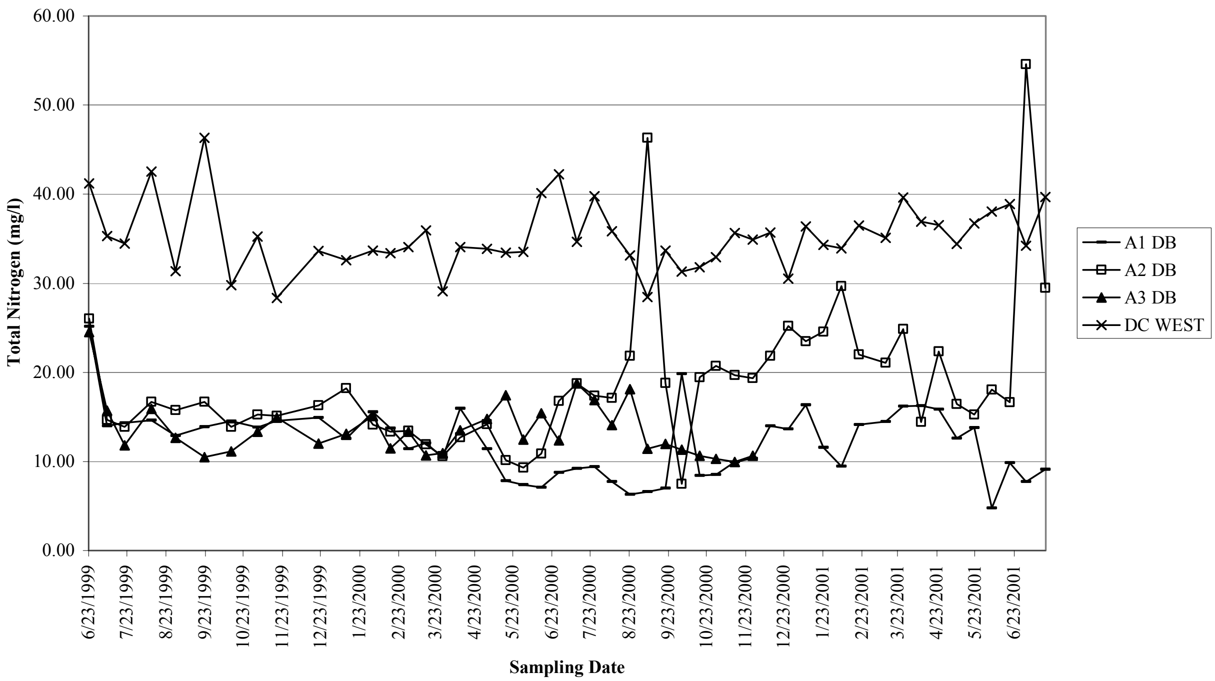
BOD(5day) Concentrations of Waterloo Biofilter Discharge vs. Influent During Testing at the Massachusetts Alternative Septic System Test Center June 1999 - June 2001. A1 DB, A2 DB, A3 DB = Replicates 1-3 respectively, DCWEST = Influent



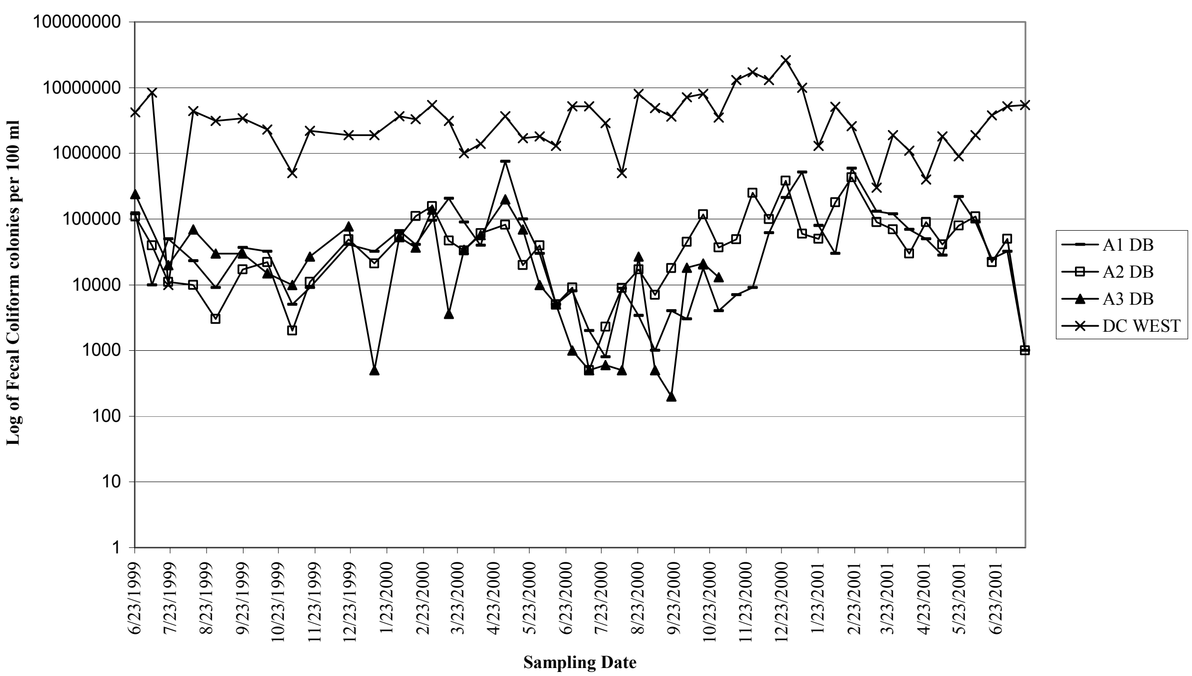
Total Suspended Solids Concentrations of Waterloo Biofilter Discharge vs. Influent During Testing at the Massachusetts Alternative Septic System Test Center June 1999 - June 2001. A1 DB, A2 DB, A3 DB = Replicates 1-3 respectively, DCWEST = Influent



Total Nitrogen Concentrations of Waterloo Biofilter Discharge vs. Influent During Testing at the Massachusetts Alternative Septic System Test Center June 1999 - June 2001. A1 DB, A2 DB, A3 DB = Replicates 1-3 respectively, DCWEST = Influent



Fecal Coliform Densities of Waterloo Biofilter Discharge vs. Influent During Testing at the Massachusetts Alternative Septic System Test Center June 1999 - June 2001. A1 DB, A2 DB, A3 DB = Replicates 1-3 respectively, DCWEST = Influent



APPENDIX 2

Tables of All Wastewater Constituents Monitored in Conjunction with Testing

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Key:

A1DB, A2DB, and A3DB represent the discharges of units #1-3 accordingly
ASU = Sump data – a composite collection in a sump situated beneath all three soil absorption systems.

A1 1 FT, A1 2 FT, A1 5 FT – Pan lysimeters collections beneath the A1 soil absorption system at 1 ft, 2 ft, and 5 ft respectively. Similar for system A2 and A3.

DCWEST – samples at the relevant influent location.

Location	Date	pH	Alkalinity (mgl)	BOD5 (mg/l)	FC #/100 ml	DON (mg/l)	NH_4 (mg/l)	NO_x (mg/l)	PON (mg/l)	Total Nitrogen (mg/l)	POC (mg/l)	PO_4 (mg/l)	TP (mg/l)	Sp Cond (uS)	TSS (mgl)
DC WEST	6/9/99	7.30	205.0	108	1.9E+06	0.5	27.0	0.10	6.5	34.1	64.6	3.4	5.3	518	135
DC WEST	6/23/99	7.39	192.0	145	4.2E+06	2.4	30.8	0.03	8.0	41.2	63.8	3.9	5.5	485	142
DC WEST	7/7/99	7.21	171.0	210	8.4E+06	1.0	23.1	0.03	11.2	35.3	97.0	3.9	5.0	418	
DC WEST	7/21/99	7.24	190.0	136	1.0E+04	1.4	26.7	0.08	6.4	34.4	63.1	3.7	5.4	503	141
DC WEST	8/11/99	7.31	185.0	140	4.4E+06	0.5	31.6	0.13	10.3	42.5	95.3	4.2	6.1	573	215
DC WEST	8/30/99	7.28	172.0	110	3.1E+06	1.6	24.7	0.06	5.0	31.3	43.7	3.7	4.8	516	91
DC WEST	9/22/99	7.47	195.0	172	3.4E+06	0.3	35.9	0.00	10.1	46.3	92.9	4.3	5.7	569	210
DC WEST	10/13/99	7.18	163.0	205	2.3E+06	1.8	24.7	0.00	3.3	29.8	31.6	3.4	4.8	488	47
DC WEST	11/3/99	7.33	175.0	231	5.0E+05	3.9	24.3	0.04	7.0	35.2	65.2	3.3	4.9	594	148
DC WEST	11/18/99	7.48		128	2.2E+06		23.0	0.05	5.3	28.4	52.2			595	121
DC WEST	12/14/99	7.33	173.0	168	3.4E+06	0.0	29.2	0.09	5.2	34.5	58.2	3.6	5.3	550	151
DC WEST	12/21/99	7.38	182.0	153	1.9E+06	3.5	26.2	0.04	3.8	33.6	35.9	3.6	5.8	582	70
DC WEST QA	12/21/99	7.36	179.0	182	2.0E+06	1.3	27.9	0.05	3.9	33.1	32.4	3.7	5.8	514	64
DC WEST	1/12/00	7.46	180.0	156	1.9E+06	1.0	27.9	0.07	3.7	32.6	28.0	3.8	5.3	552	50
DC WEST	2/2/00	7.35	147.0	170	3.7E+06	3.2	24.9	0.02	5.6	33.7	72.5	3.7		514	130
DC WEST QA	2/2/00		149.0	127	1.5E+06	2.1	26.4	0.04	5.7	34.1	58.9	3.3			96
DC WEST	2/16/00	7.54	168.0	140	3.3E+06	3.6	22.8	0.06	6.9	33.4	70.3	3.0		548	140
DC WEST	2/23/00	7.35	164.0	107	9.0E+05	2.9	22.3	0.10	5.3	30.6	50.2	2.9		1000	112
DC WEST	3/1/00	7.43	171.0	83	5.4E+06	3.1	23.5	0.02	7.4	34.0	78.5	3.1	5.9	575	72
DC WEST	3/8/00	7.31	176.0	146	1.6E+06	2.2	25.5	0.01	8.5	36.2	94.9	3.0	5.2	540	200
DC WEST	3/15/00	7.28	179.0	113	3.1E+06	3.0	23.1	0.12	9.7	35.9	91.9	3.4	4.5	595	180
DC WEST	3/28/00	7.45	157.0	132	1.0E+06	2.9	22.0	0.04	4.1	29.1	33.4	2.9	5.5	555	
DC WEST	4/11/00	7.47	170.0	155	1.4E+06	2.6	22.7	0.12	8.7	34.0	72.1	2.7	5.6	561	154
DC WEST	4/19/00	7.81	159.0	345	1.2E+06	3.8	22.7	0.09	7.3	33.9	71.4	3.5		552	232
DC WEST	5/2/00	7.47	159.0	220	3.7E+06	3.8	22.7	0.09	7.3	33.8	71.4	3.5	5.7	552	158
DC WEST	5/17/00	7.43	167.0	167	1.7E+06	3.6	22.1	0.07	7.6	33.4	74.1	2.8	3.9	561	169
DC WEST QA	5/17/00		147.0	180	1.5E+06	4.3	21.8	0.06	8.2	34.3	78.5	2.8	3.9		172
DC WEST	5/31/00	7.50	170.0	107	1.8E+06	5.1	20.3	0.14	8.0	33.5	80.0	2.7	4.9	566	177
DC WEST	6/14/00	7.13	129.0	385	1.3E+06	0.1	30.0	0.19	9.8	40.1	106.9	3.7	5.4	577	234
DC WEST	6/28/00	7.27	163.0	164	5.2E+06	6.1	24.5	0.21	11.4	42.3	112.9	3.7	5.8	655	245
DC WEST	7/12/00	7.04	60.4	179	5.2E+06	1.4	23.9	0.05	9.3	34.7	93.2	2.4	3.5	528	191
DC WEST	7/26/00	7.46	189.0	252	2.9E+06	4.2	29.0	0.03	6.6	39.8	58.3	4.4	6.1	657	86
DC WEST QA	7/26/00		188.0	283	4.0E+05	6.1	26.0	0.06	7.9	40.0	63.7	4.1	6.5		141
DC WEST	8/9/00	7.25	169.0	316	5.0E+05	4.9	19.7	0.10	11.1	35.8	162.5	3.2		592	323
DC WEST	8/23/00	7.30	151.0	187	8.0E+06	0.0	23.1	0.04	10.0	33.1	109.2	3.4	5.5	606	215

Location	Date	pH	Alkalinity (mgl)	BOD5 (mg/l)	FC #/100 ml	DON (mg/l)	NH_4 (mg/l)	NO_x (mg/l)	PON (mg/l)	Total Nitrogen (mg/l)	POC (mg/l)	PO_4 (mg/l)	TP (mg/l)	Sp Cond (uS)	TSS (mgl)
DC WEST QA	8/23/00	7.38	158.0	174	8.5E+06	6.5	24.4	0.04	11.5	42.5	139.3	3.2	4.9	650	272
DC WEST	9/6/00	7.50	144.0	160	4.9E+06	0.2	21.1	0.02	7.1	28.4	54.9	2.6	4.2	610	94
DC WEST	9/20/00	7.36	127.0	121	3.6E+06	2.6	21.4	0.00	9.7	33.7	86.7	3.0	5.3	544	188
DC WEST	10/3/00	7.24	139.0	203	7.1E+06	0.6	23.0	0.04	7.8	31.3	82.4	3.5	5.3	604	173
DC WEST QA	10/3/00	7.51	137.0	150	7.2E+06	0.4	25.7	0.02	8.6	34.6	86.7	3.7	5.3	608	184
DC WEST	10/17/00	7.09	189.0	90	8.1E+06	0.6	21.5	0.09	9.6	31.8	85.8	2.7	4.9	549	197
DC WEST	10/30/00	7.32	156.5	171	3.5E+06	3.6	21.1	0.08	8.1	32.9	80.3	2.9	3.4	463	165
DC WEST	11/14/00	7.29	163.5	153	1.3E+07	4.7	23.8	0.03	7.1	35.6	53.1	3.0	5.1	486	107
DC WEST	11/28/00	7.45	184.5	180	1.7E+07	3.8	24.5	0.01	6.6	34.9	65.0	3.2	4.8	538	133
DC WEST	12/12/00	7.57	183.5	152	1.3E+07	1.8	27.1	0.03	6.7	35.7	60.5	3.1	4.6	558	127
DC WEST QA	12/12/00	7.59	185.0	144	1.5E+07	0.3	27.2	0.04	6.0	33.5	52.3	3.3	4.4	565	112
DC WEST	1/9/01	7.56	180.0	160	1.0E+07	5.5	22.6	0.08	8.2	36.4	84.9	3.6	4.6	555	200
DC WEST	1/23/01	7.56	184.5	138	1.3E+06		27.1	0.05	7.1	34.3	69.9	3.6	4.9	514	123
DC WEST	2/6/01	7.53	179.5	109	5.1E+06	3.2	24.0	0.05	6.7	33.9	71.5	3.3	4.5	775	134
DC WEST	2/20/01	7.45	185.5	163	2.6E+06	5.5	23.5	0.05	7.5	36.5	74.2	3.5	4.9	526	164
DC WEST	3/13/01	7.43	169.5	114	3.0E+05	2.6	24.0	0.08	8.4	35.1	84.9	3.6	5.8	977	191
DC WEST QA	3/13/01	7.45	171.5	168	7.0E+05	2.9	24.0	0.08	8.4	35.4	85.0	3.6	5.7	993	191
DC WEST	3/27/01	7.48	177.5	115	1.9E+06	3.3	26.9	0.06	9.3	39.6	89.1	3.6	5.4	837	199
DC WEST	4/10/01	7.48	181.5	186	1.1E+06	4.1	24.9	0.05	7.8	36.9	72.3	3.9	5.0	501	152
DC WEST	4/24/01	7.54	195.0	205	4.0E+05	1.0	26.6	0.06	8.9	36.5	88.0	3.2	5.1	533	210
DC WEST	5/8/01	7.60	174.0	190	1.8E+06	1.8	25.3	0.07	7.3	34.4	77.0	3.0	5.1	514	156
DC WEST	5/22/01	7.46	173.0	157	9.0E+05	2.1	27.0	0.04	7.6	36.7	83.1	3.8	3.9	526	173
DC WEST	6/5/01	7.59	187.0	318	1.9E+06	1.0	28.1	0.10	8.8	38.0	87.4	3.3	4.5	507	200
DC WEST	6/19/01	7.46	183.5	260	3.8E+06	1.5	29.6	0.02	7.7	38.9	71.6	3.3		526	157
DC WEST QA	6/19/01	7.47	186.0	281	1.0E+07	1.6	29.8	0.06	7.9	39.3	72.2	3.2		508	164
DC WEST	7/2/01	7.27	185.0	263	5.2E+06	5.2	19.9	0.04	9.0	34.2	88.5	3.2	3.8	539	202
DC WEST	7/17/01	7.22	188.0	261	5.4E+06	1.7	25.3	0.06	12.6	39.7	148.8	3.3	6.1	515	288

Location	Date	pH	Alkalinity (mgl)	BOD5 (mg/l)	FC #/100 ml	DON (mg/l)	NH_4 (mg/l)	NO_x (mg/l)	PON (mg/l)	Total Nitrogen (mg/l)	POC (mg/l)	PO_4 (mg/l)	TP (mg/l)	Sp Cond (uS)	TSS (mgl)
A1 DBOX															
A1 DB	6/23/99	7.65	150.0	21.0	1.2E+05	0.7	18.1	5.6	0.7	25.1	4.0	3.8	5.4	471	9.0
A1 DB	7/7/99	7.32	48.0	13.0	1.0E+04	0.2	0.3	13.2	0.3	14.0	1.6	3.7	4.8	349	4.0
A1 DB	7/21/99	7.28	57.0	8.0	5.0E+04	0.4	0.2	13.6	0.2	14.3	1.4	4.5	4.8	359	3.0
A1 DB	8/11/99	7.28	50.3	7.0	2.3E+04	0.4	0.1	14.0	0.2	14.6	1.0	4.3	4.8	407	2.0
A1 DB QA	8/11/99	7.36	50.0	8.0	2.8E+04	0.3	0.1	14.0	0.2	14.6	1.1	4.1	4.5	424	3.0
A1 DB	8/30/99	7.26	54.7	7.0	9.0E+03	0.2	0.2	12.5		12.9		4.4	5.3	412	
A1 DB	9/22/99	7.36	54.0	4.0	3.7E+04	0.5	0.1	13.3		13.9		4.1	4.4	418	1.0
A1 DB	10/13/99	7.29	63.0	9.0	3.2E+04	1.2	1.0	12.2	0.1	14.5	0.7	4.1	4.1	388	1.0
A1 DB	11/3/99	7.49	106.0	17.0	5.0E+03	0.7	0.2	12.9	0.0	13.8	0.2	4.0	4.1	446	
A1 DB	11/18/99	7.12	65.0	2.0	9.0E+03	0.6	0.4	13.5	0.1	14.6	0.9	4.0	4.0	446	2.0
A1 DB	12/21/99	7.21	65.0	10.0	4.1E+04	0.2	1.7	12.7	0.3	14.9	2.4	4.1	4.3	438	3.0
A1 DB	1/12/00	7.35	83.6	12.0	3.2E+04	1.1	3.2	7.6	0.6	12.5	3.2	4.4	4.6	462	6.0
A1 DB	2/2/00	7.09	50.4	12.0	6.6E+04	2.4	1.1	11.5	0.5	15.6	3.1	3.3		462	6.0
A1 DB	2/16/00	7.25	64.8	6.0	4.1E+04	1.9	1.7	9.9	0.2	13.7	1.8	4.2		462	1.0
A1 DB	3/1/00	7.34	71.6	12.0	9.5E+04	1.2	1.9	7.7	0.6	11.4	3.2	3.8	4.1	476	0.0
A1 DB	3/15/00	7.28	80.0	10.0	2.1E+05	0.5	2.5	8.4	0.7	12.1	4.5	4.2	4.7	404	10.0
A1 DB	3/28/00	7.41	78.4	8.0	9.0E+04	0.8	2.4	6.5	0.7	10.4	4.2	3.9	4.5	523	26.0
A1 DB	4/11/00	7.35	74.4	17.0	4.0E+04	1.3	1.6	12.2	0.9	16.0	5.7	5.2	5.8	464	14.0
A1 DB	5/2/00	7.38	70.4	28.0	7.5E+05	0.8	0.6	8.1	1.9	11.4	9.3	4.2		467	21.0
A1 DB	5/17/00	7.40	66.8	12.0	1.0E+05	1.5	0.1	5.7	0.6	7.8	3.3	4.2	5.4	417	8.0
A1 DB	5/31/00	7.52	80.0	9.0	3.0E+04	0.6	0.1	6.7		7.4		4.6	5.3	450	6.0
A1 DB	6/14/00	7.46	104.4	5.0	5.0E+03	0.7	0.3	5.9	0.2	7.1	1.2	4.7	5.1	427	3.0
A1 DB	6/28/00	7.27	82.0	11.0	8.0E+03	0.6	0.6	6.8	0.8	8.8	4.1	5.6	5.8	499	9.0
A1 DB	7/12/00	7.02	59.6	3.0	2.0E+03	0.7	0.1	8.2	0.2	9.2	1.2	5.0	5.0	419	3.0
A1 DB QA	7/12/00		58.8	4.0	2.0E+03	1.5	0.0	7.5	0.2	9.2	1.1	5.0	5.3		2.0
A1 DB	7/26/00	7.38	88.8	3.0	8.0E+02	0.9	0.0	8.3	0.1	9.4	0.7	5.2	5.4	426	2.0
A1 DB	8/9/00	7.38	98.8	4.0	8.8E+03	0.8	0.0	6.8	0.2	7.7	1.1	4.6		512	1.0

Location	Date	pH	Alkalinity (mgl)	BOD5 (mg/l)	FC #/100 ml	DON (mg/l)	NH_4 (mg/l)	NO_x (mg/l)	PON (mg/l)	Total Nitrogen (mg/l)	POC (mg/l)	PO_4 (mg/l)	TP (mg/l)	Sp Cond (uS)	TSS (mgl)
A1 DB	8/23/00	7.36	402.8	5.0	3.4E+03	1.8	0.5	3.8	0.2	6.3	1.3	3.9	4.2	490	3.0
A1 DB	9/6/00	7.77	89.2	1.0	1.0E+03	0.3	0.0	6.1	0.1	6.6	0.7	3.6	3.6	469	2.0
A1 DB	9/20/00	7.59	89.2	9.0	4.0E+03	0.1	0.0	6.8	0.1	7.0	0.5	3.8	3.8	402	1.0
A1 DB	10/3/00	7.38	87.6	2.0	3.0E+03	0.8	1.3	17.7	0.1	19.8	0.6	4.4	4.4	455	1.0
A1 DB	10/17/00	7.60	96.0	2.0	1.8E+04	0.5	0.0	7.8	0.1	8.4	0.5	3.6	3.9	451	1.0
A1 DB	10/30/00	7.45	68.5	4.0	4.0E+03	0.6	0.0	7.8	0.1	8.5	0.4	4.0	4.2	385	1.0
A1 DB	11/14/00	7.18	52.5	4.0	7.0E+03	0.5	0.0	9.4	0.0	9.9	0.3	3.0	3.5	362	0.0
A1 DB	11/28/00	7.31	72.5	3.0	9.0E+03	1.0	0.0	9.3	0.1	10.3	0.4	3.5	3.6	390	1.0
A1 DB	12/12/00	7.23	58.5	3.0	6.2E+04	0.7	0.8	12.4	0.2	14.0	0.9	3.2	3.2	465	5.0
A1 DB	12/26/00	7.26	81.5	12.0	2.1E+05	1.4	2.5	9.3	0.5	13.7	2.8	3.5	3.7	419	6.0
A1 DB	1/9/01	7.05	83.5	12.0	5.2E+05	1.7	4.9	9.6	0.2	16.4	1.0	3.7	4.0	456	1.9
A1 DB	1/23/01	7.09	82.5	12.0	8.0E+04	0.8	3.1	7.5	0.2	11.6	1.0	4.1	4.2	433	1.8
A1 DB	2/6/01	7.36	88.0	14.0	3.0E+04	1.1	3.4	3.7	1.2	9.4	6.7	3.8	3.8	450	15.9
A1 DB	2/20/01	7.29	100.0	22.0	5.9E+05	2.8	5.0	6.2	0.2	14.1	1.0	3.8	3.8	438	17.2
A1 DB QA	2/20/01	7.35	100.0	21.0	7.8E+04	2.3	4.6	6.9	1.7	15.4	8.9	3.9	4.0	454	18.1
A1 DB	3/13/01	7.17	92.0	12.0	1.3E+05	1.9	5.0	6.0	1.5	14.5	8.0	2.7	4.0	591	17.6
A1 DB	3/27/01	7.39	92.0	16.0	1.2E+05	1.7	5.3	7.6	1.6	16.2	8.3	3.9	4.1	400	14.5
A1 DB	4/10/01	7.56	89.0	22.0	7.0E+04	1.8	5.6	7.3	1.5	16.3	8.5	4.3	4.3	419	19.7
A1 DB	4/24/01	7.41	68.0	10.0	5.0E+04	2.5	0.8	11.9	0.6	15.9	4.0	4.5	4.7	422	9.8
A1 DB	5/8/01	7.21	70.0	20.0	2.8E+04	0.4	1.1	9.9	1.2	12.6	9.1	5.0	5.3	412	11.8
A1 DB	5/22/01	7.30	61.5	7.0	2.2E+05	1.0	0.4	11.6	0.8	13.8	6.3	4.9	4.9	388	14.3
A1 DB	6/5/01	7.37	84.5	10.0	9.0E+04	1.2	0.4	2.5	0.6	4.8	3.8	4.5	4.6	393	8.6
A1 DB	6/19/01	7.22	73.5	4.0	2.5E+04	3.2	0.3	6.1	0.3	9.9	2.4	5.4		373	5.8
A1 DB	7/2/01	7.14	85.0	9.2	3.2E+04	0.1	0.8	6.6	0.2	7.7	1.4	6.9	7.1	401	3.4
A1 DB	7/17/01	6.95	78.0	3.5	1.0E+03	0.6	0.0	7.9	0.5	9.1	2.2	4.9	5.0	399	5.5
A1 DB QA	7/17/01	6.97	74.5	3.8	2.0E+03	0.9	0.0	8.1	0.5	9.5	2.3	4.9	4.9	406	3.5

Location	Date	pH	Alkalinity (mgl)	BOD5 (mg/l)	FC #/100 ml	DON (mg/l)	NH_4 (mg/l)	NO_x (mg/l)	PON (mg/l)	Total Nitrogen (mg/l)	POC (mg/l)	PO_4 (mg/l)	TP (mg/l)	Sp Cond (uS)	TSS (mgl)
A2 DBOX															
A2 DB	6/23/99	7.60	148.0	10.0	1.1E+05	0.3	16.8	8.7	0.3	26.0	1.6	4.0	5.0	460	3.0
A2 DB	7/7/99	7.11	54.0	17.0	4.0E+04	0.1	0.3	13.9	0.3	14.7	1.7	3.9	4.7	344	4.0
A2 DB	7/21/99	7.30	62.0	10.0	1.1E+04	0.0	0.1	13.5	0.2	13.9	1.4	4.2	4.7	364	3.0
A2 DB	8/11/99	7.45	45.9	5.0	1.0E+04	0.0	0.0	16.6	0.1	16.7	0.6	4.3	4.5	437	2.0
A2 DB	8/30/99	7.30	49.6	3.0	3.0E+03	0.6	0.1	15.0	0.1	15.8	0.6	4.2	4.5	413	1.0
A2 DB	9/22/99	7.40	49.0	3.0	1.7E+04	0.7	0.0	15.9	0.1	16.7	0.4	4.0	4.4	428	1.0
A2 DB	10/13/99	7.34	58.0	9.0	2.2E+04	0.6	0.3	12.9	0.1	13.9	0.5	4.1	4.3	386	1.0
A2 DB	11/3/99	7.47	65.0	5.0	2.0E+03	1.0	0.1	14.1	0.1	15.3	0.7	4.2	4.2	467	1.0
A2 DB	11/18/99	7.31	66.0	5.0	1.1E+04	1.6	0.3	13.1	0.1	15.1	0.7	4.1	4.1	436	2.0
A2 DB QA	11/18/99	7.16	62.8	2.0	1.7E+05	0.3	0.3	13.8	0.2	14.6	1.2	4.1	4.1	436	2.0
A2 DB	12/21/99	7.09	53.0	11.0	4.9E+04	0.0	0.9	15.1	0.3	16.3	1.9	4.2	4.6	448	4.0
A2 DB	1/12/00	7.20	62.4	8.0	2.1E+04	1.2	1.9	14.8	0.4	18.2	2.1	5.0	5.1	464	5.0
A2 DB	2/2/00	7.18	58.0	11.0	5.3E+04	2.6	2.9	8.3	0.3	14.1	3.2	3.7		509	1.0
A2 DB	2/16/00	7.24	75.2	8.0	1.1E+05	0.8	3.0	9.1	0.4	13.3	2.5	4.0		477	
A2 DB	3/1/00	7.20	68.0	13.0	1.6E+05	1.2	2.0	9.7	0.5	13.5	3.1	4.0	4.4	478	7.0
A2 DB	3/15/00	7.21	72.0	7.0	4.7E+04	1.3	1.3	9.0	0.3	11.9	2.0	4.3	4.7	449	4.0
A2 DB	3/28/00	7.42	70.8	11.0	3.3E+04	0.9	1.3	8.0	0.4	10.6	2.2	4.1	5.0	470	5.0
A2 DB	4/11/00	7.45	89.2	21.0	6.1E+04	1.4	2.3	8.1	0.9	12.7	5.2	3.4	4.2	517	12.0
A2 DB	5/2/00	7.51	72.4	36.0	8.2E+04	1.3	0.0	9.8	3.1	14.2	17.9	4.1		461	46.0
A2 DB	5/17/00	7.28	60.8	6.0	2.0E+04	0.5	0.1	9.3	0.3	10.1	1.7	4.3	5.1	434	4.0
A2 DB	5/31/00	7.42	66.4	5.0	4.0E+04	0.6	0.1	8.4	0.3	9.3	1.7	4.6	5.0	445	5.0
A2 DB QA	5/31/00	7.42	96.0	4.0	4.6E+03	0.4	0.1	8.5	0.2	9.3	1.5	4.3	4.9	445	2.0
A2 DB	6/14/00	7.28	68.4	2.0	5.0E+03	0.1	0.1	10.6	0.1	10.9	0.9	4.8	5.1	460	2.0
A2 DB	6/28/00	7.12	56.0	8.0	9.0E+03	0.2	0.1	16.4	0.1	16.8	0.9	5.4	5.8	529	2.0
A2 DB	7/12/00	6.83	45.2	3.0	5.0E+02	0.8	0.1	17.8	0.1	18.8	0.8	5.3	5.4	471	2.0
A2 DB	7/26/00	7.15	53.2	4.0	2.3E+03	0.8	0.1	16.4	0.1	17.4	0.7	4.9	5.2	447	2.0
A2 DB	8/9/00	7.38	70.0	4.0	8.9E+03	0.1	0.3	16.5	0.2	17.1	1.5	4.8		512	3.0

Location	Date	pH	Alkalinity (mgl)	BOD5 (mg/l)	FC #/100 ml	DON (mg/l)	NH_4 (mg/l)	NO_x (mg/l)	PON (mg/l)	Total Nitrogen (mg/l)	POC (mg/l)	PO_4 (mg/l)	TP (mg/l)	Sp Cond (uS)
A2 DB	8/23/00	7.08	240.0	6.0	1.7E+04	1.4	0.4	19.9	0.2	21.9	1.2	4.1	4.6	490
A2 DB	9/6/00	6.88	60.0	4.0	7.0E+03	8.4	0.2	37.2	0.5	46.3	2.1	7.0	7.0	652
A2 DB	9/20/00	7.23	63.6	1.0	1.8E+04	0.1	0.6	17.9	0.2	18.8	1.3	3.7	4.5	476
A2 DB	10/3/00	7.14	65.6	4.0	4.5E+04	0.2	0.0	6.9	0.4	7.5	2.0	4.3	4.3	508
A2 DB	10/17/00	7.02	65.2	3.0	1.2E+05	0.4	0.8	18.0	0.3	19.4	1.2	3.4	3.6	483
A2 DB	10/30/00	7.00	13.5	4.0	3.7E+04	1.1	0.2	19.2	0.1	20.7	0.9	3.9	4.0	397
A2 DB	11/14/00	6.56	27.5	4.0	4.9E+04	0.9	0.4	18.2	0.2	19.7	1.2	3.2	3.7	388
A2 DB	11/28/00	6.81	64.0	11.0	2.5E+05	1.5	3.3	14.1	0.4	19.3	2.7	3.2	3.4	415
A2 DB	12/12/00	6.75	40.0	7.0	1.0E+05	1.5	1.8	18.3	0.2	21.9	1.7	3.8	3.8	488
A2 DB	12/26/00	7.02	49.0	13.0	3.8E+05	1.2	4.5	19.1	0.4	25.2	2.6	4.1	4.4	453
A2 DB	1/9/01	6.86	45.0	4.0	6.0E+04	1.7	3.2	18.4	0.2	23.5	1.5	4.4	4.5	471
A2 DB QA	1/9/01	6.97	45.0	4.0	8.0E+04	0.1	3.2	13.2	0.1	16.5	0.7	4.2	4.4	464
A2 DB	1/23/01	6.90	65.0	10.0	5.0E+04		6.0	18.1	0.4	24.6	3.1	4.3	4.4	466
A2 DB	2/6/01	6.94	55.5	11.0	1.8E+05	7.7	4.3	17.2	0.5	29.7	3.4	4.3	4.3	472
A2 DB	2/20/01	7.24	114.5	28.0	4.3E+05	1.9	10.2	8.2	1.7	22.0	10.3	3.4	3.7	477
A2 DB	3/13/01	7.23	97.5	12.0	9.0E+04	2.4	9.7	8.1	0.9	21.1	5.4	2.7	4.0	653
A2 DB QA	3/13/01	7.26	99.5	11.0	5.3E+04	3.3	9.5	6.9	1.1	20.8	7.0	3.8	3.9	650
A2 DB	3/27/01	7.18	77.0	18.0	7.0E+04	0.3	5.6	17.7	1.2	24.8	6.9	4.8	5.3	443
A2 DB	4/10/01	7.18	69.5	13.0	3.0E+04	2.3	1.6	9.9	0.6	14.4	3.9	4.5	4.5	412
A2 DB	4/24/01	7.34	86.0	8.0	9.0E+04	2.5	11.8	7.7	0.4	22.4	2.3	4.2	4.4	418
A2 DB	5/8/01	7.06	50.5	14.0	4.1E+04	1.0	0.4	14.7	0.4	16.4	2.7	6.0	6.3	422
A2 DB	5/22/01	7.09	46.0	6.0	8.0E+04	1.5	4.7	8.5	0.5	15.3	3.3	5.3	5.4	416
A2 DB	6/5/01	7.03	48.0	11.0	1.1E+05	2.4	0.6	14.3	0.8	18.1	4.6	4.9	4.9	398
A2 DB	6/19/01	6.96	45.0	3.8	2.2E+04	1.8	0.3	14.3	0.3	16.7	2.2	4.7		395
A2 DB	7/2/01	6.54	26.0	32.9	5.0E+04	6.4	6.0	40.6	1.7	54.6	9.8	8.9	8.9	619
A2 DB QA	7/2/01	6.54	26.0	41.0	3.0E+04	13.1	5.6	33.9	3.6	56.2	19.1	8.8	9.0	593
A2 DB	7/17/01	6.29	28.0	9.7	1.0E+03	1.4	0.3	27.5	0.3	29.5	1.8	5.3	5.4	461

Location	Date		Alkalinity (mgl)	BOD5 (mg/l)	FC #/100 ml	DON (mg/l)	NH_4 (mg/l)	NO_x (mg/l)	PON (mg/l)	Total Nitrogen (mg/l)	POC (mg/l)	(mg/l)	TP (mg/l)	Sp Cond (uS)	TSS (mgl)
A 3 DBOX															
A3 DB	6/23/99	7.69	173.0	12.0	2.4E+05	0.0	20.7	2.8	1.0	24.5	5.4	4.0	5.3	473	14.0
A3 DB	7/7/99	7.63	93.0	19.0		0.9	4.5	10.3		15.7		4.0	4.8	356	
A3 DB	7/21/99	7.26	75.0	13.0	2.0E+04	0.7	0.7	10.1	0.3	11.8	1.8	4.3	4.9	360	4.0
A3 DB	8/11/99	7.34	63.8	20.0	7.0E+04	0.0	2.2	13.4	0.3	15.9	1.8	4.3	4.4	449	4.0
A3 DB	8/30/99	7.27	58.4	10.0	3.0E+04	0.7	0.4	11.3	0.2	12.6	1.2	4.2	4.2	404	3.0
A3 DB	9/22/99	7.06		4.0	3.0E+04	0.7	0.1	9.7		10.5		3.8		461	
A3 DB	10/13/99	7.39	63.0	8.0	1.5E+04	0.4	0.2	10.4	0.1	11.1	0.7	4.1	4.1	370	1.0
A3 DB	11/3/99	7.39	59.0	5.0	1.0E+04	1.0	0.2	12.1	0.1	13.3	0.6	4.0	4.0	436	2.0
A3 DB	11/18/99	7.39	60.8	5.0	2.7E+04	0.1	1.0	13.8	0.1	14.9	1.0	4.1	4.1	419	2.0
A3 DB	12/21/99	7.28	74.0	9.0	7.7E+04	0.4	1.8	9.6	0.2	12.0	1.7	4.2	4.6	444	0.0
A3 DB	1/12/00	7.56	68.8	5.0	5.0E+02	0.9	1.4	10.4	0.4	13.1	2.1	5.2	5.4	434	5.0
A3 DB	2/2/00	7.10	54.4	11.0	5.3E+04	1.9	3.9	8.8	0.5	15.1	3.3	3.4		485	2.0
A3 DB	2/16/00	7.38	86.4	8.0	3.7E+04	1.0	3.7	6.4	0.4	11.5	2.8	4.0		471	2.0
A3 DB	3/1/00	7.32	70.8	9.0	1.4E+05	1.3	2.5	9.1	0.5	13.3	2.6	3.9	4.1	520	9.0
A3 DB	3/15/00	7.28	75.0	8.0	3.6E+03	0.5	1.6	8.1	0.5	10.7	2.9	4.2		458	6.0
A3 DB	3/28/00	7.42	80.4	9.0	3.4E+04	1.0	2.7	6.8	0.5	10.9	3.1	4.2	5.2	479	8.0
A3 DB	4/11/00	7.33	97.0	18.0	5.7E+04	2.3	5.2	6.0		13.5		4.3		472	12.0
A3 DB	5/2/00	7.32	67.6	31.0	2.0E+05	0.9	0.9	11.4	1.7	14.8	10.0	4.4	5.5	469	23.0
A3 DB	5/17/00	7.22	42.4	36.0	7.0E+04	0.7	0.3	14.4	2.0	17.4	12.2	4.3	5.6	434	31.0
A3 DB	5/31/00	7.37	74.8	9.0	1.0E+04	0.8	0.5	11.2		12.5		4.8	5.2	457	3.0
A3 DB	6/14/00	7.31	57.2	8.0	5.0E+03	0.6	0.2	14.5	0.1	15.4	0.9	5.5	5.8	443	6.0
A3 DB	6/28/00	7.34	60.0	4.0	1.0E+03	0.4	0.1	11.6	0.2	12.4	1.4	5.5	5.9	479	8.0
A3 DB	7/12/00	6.84	38.4	3.0	5.0E+02	0.2	0.4	17.5	0.6	18.7	4.6	6.0	6.1	462	
A3 DB	7/26/00	7.20	57.6	8.0	6.0E+02	1.7	0.3	14.4	0.5	16.9	3.4	5.2	5.6	447	8.0
A3 DB	8/9/00	7.26	77.2	5.0	5.0E+02	0.3	0.5	13.0	0.4	14.1	2.6	4.7		503	6.0
A3 DB QA	8/9/00	7.43	74.4	3.0	1.0E+03	0.8	0.3	12.9	0.0	14.0	2.6	4.6		496	6.0
A3 DB	8/23/00	7.19	331.2	10.0	2.7E+04	0.5	1.4	15.9	0.4	18.1	2.5	4.9	5.1	526	5.0

Location	Date	pH	Alkalinity (mgl)	BOD5 (mg/l)	FC #/100 ml	DON (mg/l)	NH_4 (mg/l)	NO_x (mg/l)	PON (mg/l)	Total Nitrogen (mg/l)	POC (mg/l)	PO_4 (mg/l)	TP (mg/l)	Sp Cond (uS)	TSS (mgl)
A3 DB	9/6/00	7.66	81.2	1.0	5.0E+02	0.1	0.0	11.3	0.1	11.4	0.6	3.9	4.1	463	1.0
A3 DB	9/20/00	7.34	76.8	2.0	2.0E+02	0.1	0.0	11.8	0.1	11.9	0.5	4.0	4.1	460	1.0
A3 DB QA	9/20/00	7.55	78.8	1.0	5.0E+02	0.5	0.0	11.5	0.1	12.1	0.6	4.2	4.3	461	1.0
A3 DB	10/3/00	7.30	78.0	1.0	1.8E+04	0.4	0.2	10.6	0.1	11.3	0.6	4.4	4.4	478	1.0
A3 DB	10/17/00	7.47	84.8	1.0	2.1E+04	0.4	0.2	10.0	0.1	10.7	0.6	3.6	3.9	459	2.0
A3 DB	10/30/00	7.48	53.0	4.0	1.3E+04	0.6	0.0	9.6	0.0	10.3	0.3	3.9	4.1	381	1.0
A3 DB	11/14/00	7.19	50.5	2.0	4.3E+04	0.4	0.0	9.4	0.1	9.9	0.5	3.1	3.4	356	1.0
A3 DB	11/28/00	7.19	71.0	6.0	1.0E+05	0.9	0.2	9.4	0.1	10.6	0.7	3.2	3.4	391	2.0

Location	Date	pH	FC #/100 ml	DON (mg/l)	NH_4 (mg/l)	NO_x (mg/l)	Total Nitrogen (mg/l)	PO_4 (mg/l)	TDP (mg/l)	Sp Cond (uS)
A1 1FT	8/30/99	6.87	1.3E+04	0.5	0.0	13.3	13.8	4.6		420
A1 1FT	9/22/99	6.88		0.6	0.0	13.9	14.5	4.1		
A1 1FT	10/13/99	6.74	7.4E+03	0.0	0.3	13.5	13.8	4.1		
A1 1FT	11/3/99		6.0E+02	0.7	0.0	13.1	13.8	3.9		
A1 1FT	11/18/99	6.77	1.4E+03	0.5	0.1	14.1	14.8	4.1		
A1 1FT	12/21/99	6.75	3.4E+03	0.0	0.6	0.0	0.6	4.0		387
A1 1FT	1/12/00	6.74	2.8E+03	1.1	2.3	8.5	11.8	4.3		461
A1 1FT	2/2/00	6.68	1.0E+04	0.7	0.8	11.9	13.4	3.4		488
A1 1FT	2/16/00	6.60	1.0E+03	0.0	0.7	15.3	16.0	4.2		524
A1 1FT	3/1/00	6.74		1.0	1.1	8.5	10.5	3.7		522
A1 1FT	3/15/00	6.38	1.0E+03	1.0	0.1	9.9	11.0	4.3		434
A1 1FT	3/28/00	6.56	4.0E+02	0.7	0.1	9.6	10.3	3.7		495
A1 1FT	4/11/00	6.72	3.0E+02	1.4	0.0	9.9	11.3	3.6		442
A1 1FT	5/2/00	6.31	2.0E+04	1.8	0.0	41.5	43.3	5.2		595
A1 1FT	5/17/00	6.84	1.0E+03	1.6	0.1	6.3	8.0	4.2	4.8	437
A1 1FT	5/31/00	7.01	3.0E+02	0.6	0.0	7.3	7.9	4.6	4.8	444
A1 1FT	6/14/00	6.98	8.0E+02	0.9	0.0	5.9	6.8	4.6	4.7	452
A1 1FT	6/28/00	6.90		0.5	0.0	7.0	7.5	5.2	5.3	439
A1 1FT	7/12/00	6.94	2.0E+02	0.8	0.0	6.5	7.3	5.0	5.3	420
A1 1FT	7/26/00	6.72	5.0E+01	1.1	0.0	9.6	10.7	4.9		487
A1 1FT	8/9/00	7.02	1.4E+02	0.5	0.0	8.6	9.1	4.3	4.4	519
A1 1FT	8/23/00	6.83	1.1E+02	0.2	0.0	5.6	5.9	4.3	4.6	483
A1 1FT	9/6/00	7.00	1.0E+01	0.5	0.0	5.1	5.6	3.7	3.8	483
A1 1FT	9/20/00	7.01	6.5E+02	0.2	0.0	5.1	5.3	3.7	3.7	438
A1 1FT	10/3/00	6.94	9.0E+01	0.4	0.0	7.4	7.8	4.1	4.1	470
A1 1FT	10/17/00	7.07	4.0E+01	0.5	0.0	7.4	7.9	3.4		413
A1 1FT	10/30/00	7.10	5.0E+00	0.9	0.0	6.9	7.8	3.2	4.3	403
A1 1FT	11/14/00	6.99	7.0E+01	0.7	0.0	5.0	5.6	2.7		259
A1 1FT	11/28/00	7.03	1.1E+02	0.4	0.0	8.0	8.4	3.0		369
A1 1FT	12/12/00	6.81	1.4E+03	0.5	0.1	12.7	13.3	3.3		469
A1 1FT	12/26/00	6.82	1.9E+04	1.4	0.2	10.9	12.5	3.4		410
A1 1FT	1/9/01	6.30	2.7E+04	1.6	0.0	23.2	24.8	4.3		470
A1 1FT	1/23/01	6.58	1.0E+03	0.3	1.1	10.4	11.8	4.1		430
A1 1FT	2/6/01	6.52	1.0E+02	2.6	1.5	8.2	12.3	3.9		450
A1 1FT	2/20/01	6.52	4.0E+01	1.3	0.9	9.5	11.7	3.8		468
A1 1FT	3/13/01	6.77	2.8E+02	1.5	0.1	9.1	10.7	3.1		494
A1 1FT	4/10/01	6.60	8.0E+01	0.1	0.0	11.7	11.8	4.1		313
A1 1FT	4/24/01	6.63	3.3E+02	0.2	0.0	17.9	18.2	3.7		397
A1 1FT	5/8/01	6.51	1.7E+03	2.5	0.0	13.1	15.6	5.4		408
A1 1FT	5/22/01	6.58	1.3E+03	2.8	0.0	18.9	21.7	4.8		422
A1 1FT	6/5/01	6.61	4.0E+02	0.9	0.0	8.6	9.5	4.5		384
A1 1FT	6/19/01	6.71	5.0E+01	0.8	0.0	3.1	3.9	4.9		370
A1 1FT	7/2/01	6.76	5.0E+00	1.4	0.0	9.6	11.0	6.3		393
A1 1FT	7/17/01	6.56	5.0E+00	0.8	0.0	6.8	7.6	5.2		362

A1 5FT

Location	Date	pH	FC #/100 ml	DON (mg/l)	NH_4 (mg/l)	NO_x (mg/l)	Total Nitrogen (mg/l)	PO_4 (mg/l)	TDP (mg/l)	Sp Cond (uS)
A1 5FT	5/31/00	7.30	5.0E+01	0.6	0.3	6.9	7.8	4.0	4.2	487
A1 5FT	6/14/00	7.29	2.0E+02	0.6	0.0	5.4	6.0	4.0	4.4	479
A1 5FT	7/12/00		5.0E+01				0.0			
A1 5FT	8/23/00	7.01	1.0E+01	2.2	0.0	4.0	6.2	3.8	3.9	499
A1 5FT	9/6/00	7.54	5.0E+00				0.0			509
A1 5FT	12/12/00	7.49	5.0E+01	0.7	0.0	10.2	10.9	3.3		410
A1 5FT	12/26/00	7.24	5.0E+01	1.2	0.2	10.7	12.1	3.4	3.4	419
A1 5FT	1/9/01	6.86	2.2E+02	1.0	1.2	10.3	12.4	3.3	3.9	447
A1 5FT	1/23/01	6.87	5.0E+00				0.0			309
A1 5FT	2/20/01		5.0E+00				0.0			
A1 5FT	3/27/01		1.0E+01				0.0			
A1 5FT	4/10/01	6.91	5.0E+00	1.4	0.0	9.1	10.6	3.3	3.3	309
A1 5FT	4/24/01	6.73	2.0E+00				0.0			335
A1 5FT	5/22/01	6.53	5.0E+01	1.8	0.1	30.6	32.5	5.2	5.3	459
A1 5FT	6/19/01	6.57	5.0E+00	1.1	0.0	5.6	6.7	4.3	4.5	376
A1 5FT	7/17/01	6.67	5.0E+00	1.9	0.0	5.2	7.2	5.1	5.5	397

A2 1FT

Location	Date	pH	FC #/100 ml	DON (mg/l)	NH_4 (mg/l)	NO_x (mg/l)	Total Nitrogen (mg/l)	PO_4 (mg/l)	TDP (mg/l)	Sp Cond (uS)
A2 1FT	8/30/99	6.75	5.1E+03	0.5	0.0	14.6	15.1	4.4		403
A2 1FT	9/22/99	6.80		0.3	0.0	16.5	16.8	4.0		
A2 1FT	10/13/99	6.77	1.3E+04	0.7	0.1	13.9	14.7	4.1		
A2 1FT	11/3/99		1.0E+03	0.6	0.0	14.4	15.0	4.0		
A2 1FT	11/18/99	6.92	3.0E+03	0.5	0.1	14.2	14.8	4.1		
A2 1FT	12/21/99	6.81	8.0E+03	0.5	0.2	16.4	17.1	4.2		393
A2 1FT	1/12/00	6.63	2.0E+03	0.8	0.0	15.9	16.8	5.1		450
A2 1FT	2/2/00	6.69	1.3E+03	3.1	0.0	10.7	13.8	3.6		483
A2 1FT	2/16/00	6.48	3.0E+02	1.0	0.3	14.9	16.2	4.5		567
A2 1FT	3/1/00	6.52		0.5	0.1	12.1	12.7	3.9		576
A2 1FT	3/15/00	6.32	3.0E+02	0.5	0.0	11.0	11.5	4.2		426
A2 1FT	3/28/00	6.66	5.0E+01	0.1	0.0	11.3	11.4	4.1		454
A2 1FT	4/11/00	6.84	5.0E+01	0.7	0.0	11.0	11.7	4.2		452
A2 1FT	5/2/00	6.47	2.0E+03	1.5	0.1	39.1	40.7	6.3		611
A2 1FT	5/17/00	6.79	1.0E+02	0.7	0.0	17.5	18.2	4.9		464
A2 1FT	5/31/00	7.01	5.0E+01	0.5	0.0	7.6	8.1	4.4	4.6	454
A2 1FT	6/14/00	6.97	1.7E+03	1.1	0.0	9.6	10.7	4.5		462
A2 1FT	6/28/00	6.85	2.0E+02	0.8	0.0	9.6	10.4	3.9	4.0	425
A2 1FT	7/12/00	6.88	1.0E+02	0.4	0.0	25.0	25.4	3.6	3.6	554
A2 1FT	7/26/00	6.95	5.0E+01	0.9	0.1	15.8	16.8	4.3	4.3	497
A2 1FT	8/23/00	6.60	5.0E+00	1.0	0.0	15.4	16.5	3.7	3.9	514
A2 1FT	9/7/00	6.68					0.0			664

A2 1FT

Location	Date	pH	FC #/100 ml	DON (mg/l)	NH_4 (mg/l)	NO_x (mg/l)	Total Nitrogen (mg/l)	PO_4 (mg/l)	TDP (mg/l)	Sp Cond (uS)
A2 1FT	9/20/00	6.90	5.0E+00	0.2	0.0	18.0	18.3	3.5	4.1	488
A2 1FT	10/3/00	6.85	3.0E+01	0.1	0.0	17.7	17.8	3.9	4.0	495
A2 1FT	10/17/00	6.75	1.0E+01	0.3	0.1	18.4	18.8	3.1		438
A2 1FT	10/30/00	6.74	2.0E+02	1.0	0.0	18.8	19.8	3.5	4.0	414
A2 1FT	11/14/00	6.59	5.0E+02	0.7	0.0	17.8	18.4	3.1		386
A2 1FT	11/28/00	6.66	1.3E+03	0.7	0.5	15.6	16.8	3.1		399
A2 1FT	12/12/00	6.53	8.0E+02	0.5	0.0	20.3	20.8	3.8		439
A2 1FT	12/26/00	6.43	1.2E+04	2.6	0.1	24.5	27.1	4.6		443
A2 1FT	1/9/01	6.47	1.4E+03	0.7	0.0	22.7	23.4	4.2		465
A2 1FT	1/23/01	6.22	1.0E+02		0.8	24.4	25.3	4.2		444
A2 1FT	2/6/01	6.20	5.0E+01	1.5	0.7	22.6	24.8	4.2		455
A2 1FT	2/20/01	6.51	6.8E+03	4.2	0.4	14.5	19.1	3.8		428
A2 1FT	3/27/01	6.59	3.3E+02	1.2	0.1	19.2	20.4	3.6		337
A2 1FT	4/10/01	6.59	2.9E+02	0.8	0.0	24.6	25.3	4.8		451
A2 1FT	4/24/01	6.52	3.1E+02	1.6	0.0	23.9	25.6	4.9		510
A2 1FT	5/8/01	6.24	2.8E+03	8.4	0.1	43.1	51.6	7.6		660
A2 1FT	5/22/01	6.56	5.0E+01	8.0	0.0	25.5	33.5	5.3		458
A2 1FT	6/5/01	6.27	1.1E+02	2.3	0.0	19.4	21.7	5.1		397
A2 1FT	6/19/01	6.24	2.4E+02	1.9	0.0	27.3	29.2	4.7		474
A2 1FT	7/2/01	6.15	5.0E+00	2.0	0.0	42.9	44.9	6.4		445
A2 1FT	7/17/01	6.16	5.0E+00	0.1	0.0	25.7	25.8	4.9		452

A2 2FT

Location	Date	pH	FC #/100 ml	DON (mg/l)	NH_4 (mg/l)	NO_x (mg/l)	Total Nitrogen (mg/l)	PO_4 (mg/l)	TDP (mg/l)	Sp Cond (uS)
A2 2FT	4/11/00	7.32	1.8E+03	0.2	0.3	8.5	9.1	3.7		452
A2 2FT	6/28/00	6.96	9.0E+02	0.6	0.0	10.0	10.6	3.9	4.0	453
A2 2FT	7/12/00	6.84	2.0E+02	1.1	0.0	17.0	18.1	4.7	4.9	465
A2 2FT	7/26/00	6.89	1.3E+04	0.8	0.0	15.4	16.2	4.5	4.5	488
A2 2FT	8/9/00	6.97	5.0E+02	0.0	0.0	15.2	15.2	4.6	4.6	526
A2 2FT	8/23/00	6.50	1.2E+02	0.3	0.0	31.3	31.6	4.5	4.5	500
A2 2FT	9/6/00	6.59	1.0E+01	0.6	0.0	33.7	34.3	4.2	4.4	611
A2 2FT	9/7/00	6.64					0.0			680
A2 2FT	9/20/00	6.83	5.0E+00	0.4	0.0	18.8	19.2	4.0	4.0	487
A2 2FT	10/3/00	6.84	5.0E+00	0.1	0.0	17.9	18.0	3.9	3.9	494
A2 2FT	10/17/00	6.78	4.0E+01	0.0	0.0	18.7	18.7	3.3		439
A2 2FT	10/30/00	6.72	6.0E+02	1.6	0.0	19.2	20.8	3.6	4.2	419
A2 2FT	11/14/00	6.59	2.2E+03	0.3	0.0	18.8	19.2	3.3	3.9	386
A2 2FT	11/28/00	6.60	3.4E+03	1.0	1.4	15.9	18.2	3.2	3.9	407
A2 2FT	12/12/00	6.42	6.2E+03	1.0	0.0	19.8	20.8	3.9	4.1	460
A2 2FT	12/26/00	6.48	3.9E+04	2.9	0.1	21.3	24.3	4.3	4.4	420
A2 2FT	1/9/01	6.74	1.8E+03	0.7	3.6	10.5	14.8	3.7	3.7	451
A2 2FT	1/23/01	6.01	9.0E+02	4.2	1.2	17.4	22.8	4.4	4.4	450

A2 5FT

Location	Date	pH	FC #/100 ml	DON (mg/l)	NH_4 (mg/l)	NO_x (mg/l)	Total Nitrogen (mg/l)	PO_4 (mg/l)	TDP (mg/l)	Sp Cond (uS)
A2 5FT	6/5/01	6.32	5.0E+00	0.8	0.1	21.2	22.1	4.9	5.3	434
A2 5FT	6/19/01	6.23	1.0E+01	3.3	0.0	22.4	25.7	4.8	5.0	428
A2 5FT	7/2/01	6.36	5.0E+00	2.7	0.0	32.9	35.6	5.5	5.6	442
A2 5FT	7/17/01	6.01	5.0E+00	2.2	0.0	33.0	35.2	5.3	5.6	448

A3 1FT

Location	Date	pH	FC #/100 ml	DON (mg/l)	NH_4 (mg/l)	NO_x (mg/l)	Total Nitrogen (mg/l)	PO_4 (mg/l)	TDP (mg/l)	Sp Cond (uS)
A3 1FT	11/3/99			0.8	0.0	15.0	15.9	3.7		
A3 1FT	12/21/99	6.36	5.0E+00	0.5	0.0	1.4	1.9	0.0		1
A3 1FT	1/12/00	6.67	3.1E+02	1.2	0.0	4.5	5.7	2.4		312
A3 1FT	2/2/00	6.75	1.0E+03	1.9	3.0	9.2	14.1	3.2		435
A3 1FT	2/16/00	6.44	1.0E+02	0.7	3.4	8.4	12.5	3.9		503
A3 1FT	3/1/00	6.62	5.0E+01	0.7	1.1	9.0	10.8	3.1		501
A3 1FT	3/28/00	6.83	1.4E+03	0.4	0.1	8.3	8.8	3.7		454
A3 1FT	4/11/00	7.01	3.0E+02	1.1	0.0	10.1	11.3	4.0		447
A3 1FT	5/17/00		4.4E+02				0.0			
A3 1FT	6/14/00	7.06	3.0E+02	0.4	0.0	9.7	10.1	4.4		436
A3 1FT	6/28/00	6.94	3.3E+02	0.4	0.0	9.4	9.8	4.6	4.7	435
A3 1FT	7/12/00	6.96	6.0E+01	1.4	0.0	11.6	13.1	4.9	5.0	438
A3 1FT	7/26/00	6.78	5.0E+01	1.1	0.0	15.1	16.2	4.8	4.9	493
A3 1FT	8/9/00	6.98	5.0E+00	0.9	0.0	11.7	12.6	4.4	4.4	504
A3 1FT	8/23/00	6.72	2.6E+02	0.2	0.0	13.4	13.6	4.4	4.6	496
A3 1FT	9/6/00	6.86	5.0E+00	0.5	0.0	8.4	8.9	3.7	3.8	473
A3 1FT	9/20/00	7.06	5.0E+00	0.5	0.0	8.0	8.5	3.7	3.7	450
A3 1FT	10/3/00	7.07	5.0E+00	0.1	0.0	10.3	10.4	4.3	4.4	472
A3 1FT	10/17/00	7.01	5.0E+00	0.3	0.1	9.8	10.1	3.6		431
A3 1FT	11/14/00	7.17	1.0E+01	0.4	0.0	4.1	4.5	2.9		279
A3 1FT	11/28/00	7.25	6.0E+01	0.4	0.0	7.2	7.7	3.0		350

A3 2FT

Location	Date	pH	FC #/100 ml	DON (mg/l)	NH_4 (mg/l)	NO_x (mg/l)	Total Nitrogen (mg/l)	PO_4 (mg/l)	TDP (mg/l)	Sp Cond (uS)
A3 2FT	6/14/00	7.47	1.0E+02	1.0	1.0	7.5	9.5	2.4	2.5	535
A3 2FT	9/6/00	6.97	5.0E+00	0.5	0.0	9.4	9.9	3.9	3.9	497
A3 2FT	11/28/00	7.19	2.2E+03	0.6	0.0	8.8	9.4	3.3	3.9	380

A3 5FT

Location	Date	pH	FC #/100 ml	DON (mg/l)	NH_4 (mg/l)	NO_x (mg/l)	Total Nitrogen (mg/l)	PO_4 (mg/l)	TDP (mg/l)	Sp Cond (uS)
A3 5FT	6/14/00	7.07	2.0E+02	0.2	0.0	10.4	10.6	3.3		456
A3 5FT	6/28/00	6.84	6.0E+01	0.3	0.0	10.0	10.3	4.6	4.6	439
A3 5FT	7/12/00		1.4E+02				0.0			
A3 5FT	9/6/00	6.86	1.0E+01	0.7	0.0	10.2	10.9	3.7	3.8	506
A3 5FT	9/20/00	6.97	5.0E+00	0.4	0.0	10.1	10.5	3.9	3.9	468
A3 5FT	10/3/00	7.18	5.0E+00	0.0	0.0	10.6	10.6	4.1	4.2	485
A3 5FT	10/17/00	7.28	5.0E+00	0.5	0.0	10.0	10.6	3.6		428
A3 5FT	10/30/00	6.95	5.0E+00	0.9	0.0	10.1	11.0	3.8	4.5	392
A3 5FT	11/28/00	7.23	2.0E+01	0.6	0.0	9.3	9.9	3.2	3.9	387

A SUMP

Location	Date	pH	FC #/100 ml	DON (mg/l)	NH_4 (mg/l)	NO_x (mg/l)	Total Nitrogen (mg/l)	PO_4 (mg/l)	TDP (mg/l)	Sp Cond (uS)
A SUMP	9/22/99	6.58	5.0E+00	0.3	0.0	11.7	12.0	2.2		368
A SUMP	10/13/99	6.52	1.0E+01	0.0	0.0	11.3	11.3	2.4		
A SUMP	11/3/99	6.68	5.0E+00		0.0	11.9	11.9	2.4		
A SUMP	11/18/99	6.68	5.0E+00	2.7	0.0	9.7	12.4	2.9		334
A SUMP	12/21/99	6.71	5.0E+00	0.3	0.0	11.7	12.1	2.5		336
A SUMP	1/12/00	6.68	5.0E+00	0.0	0.0	6.8	6.8	2.7		303
A SUMP	2/2/00	6.67	3.0E+01	0.6	0.1	11.3	11.9	2.9		429
A SUMP	2/16/00	6.66	5.0E+00	5.0	0.3	11.9	17.2	3.2		464
A SUMP	3/1/00	6.46	4.0E+01	1.3	0.0	9.3	10.6	2.6		430
A SUMP	3/15/00	6.20	5.0E+00	1.7	0.0	9.4	11.1	3.2		404
A SUMP	3/28/00	6.58	5.0E+00	0.1	0.0	9.0	9.0	3.0		426
A SUMP	4/11/00	6.85	1.0E+01	0.6	0.0	10.7	11.3	2.9		398
A SUMP	5/2/00	6.48	1.7E+02	0.0	0.0	12.4	12.4	1.8		317
A SUMP	5/17/00	6.68	5.0E+00		0.0		0.0	2.9	3.2	366
A SUMP	5/31/00	6.77	5.0E+00	0.1	0.0	7.6	7.7	3.1	3.4	381
A SUMP	6/14/00	6.74	1.0E+01	0.3	0.0	7.7	7.9	3.1		391
A SUMP	6/28/00	6.68	1.3E+02	2.3	0.0	8.0	10.3	3.8		412
A SUMP	7/12/00	6.65	5.0E+00	0.7	0.0	11.2	11.9	3.5	3.5	416
A SUMP	7/26/00	6.59		1.1	0.0	13.5	14.6	3.7		479
A SUMP	8/9/00	6.63	5.0E+00	0.2	0.0	10.9	11.1	3.4	3.5	425

A SUMP

Location	Date	pH	FC #/100 ml	DON (mg/l)	NH_4 (mg/l)	NO_x (mg/l)	Total Nitrogen (mg/l)	PO_4 (mg/l)	TDP (mg/l)	Sp Cond (uS)
A SUMP	8/23/00	6.55	5.0E+00	0.3	0.0	9.3	9.6	2.8	2.8	387
A SUMP	9/6/00	6.75	5.0E+00	0.4	0.0	8.8	9.2	3.1	3.1	449
A SUMP	9/20/00	6.78	5.0E+00	0.1	0.0	13.4	13.5	2.9		433
A SUMP	10/3/00	6.82	5.0E+00	0.4	0.0	11.3	11.7	3.1	3.1	442
A SUMP	10/17/00	6.80	5.0E+00	0.1	0.0	12.5	12.6	2.8		404
A SUMP	10/30/00	6.80	5.0E+00	0.5	0.0	13.8	14.3	3.1	3.5	394
A SUMP	11/14/00	6.72	5.0E+00	0.5	0.0	11.2	11.8	2.4	2.9	316
A SUMP	11/28/00	6.71	4.0E+01	0.7	0.1	12.2	13.1	2.4	3.1	355
A SUMP	12/12/00	6.58	1.0E+01	0.8	0.2	16.9	17.9	2.8	3.0	379
A SUMP	12/26/00	6.53	1.0E+01	1.0	0.0	13.5	14.5	2.1	2.1	319
A SUMP	1/9/01	6.59	3.0E+01	0.7	0.0	15.5	16.3	2.8	2.7	399
A SUMP	1/23/01	6.28	5.0E+00		0.0	17.6	17.6	3.2	3.5	408
A SUMP	2/6/01	6.75	5.0E+00	2.0	3.6	10.0	15.6	2.8	2.9	449
A SUMP	2/20/01	6.77	5.2E+03	2.1	8.6	8.1	18.8	3.1	3.4	446
A SUMP	3/13/01	6.89	5.0E+01	1.4	8.0	7.0	16.4	1.9	2.7	445
A SUMP	3/27/01	6.58	5.0E+00	0.7	6.0	7.6	14.2	2.0	2.3	248
A SUMP	4/10/01	6.31	1.6E+01			6.3	6.3	2.3	2.4	283
A SUMP	4/24/01	6.18	2.0E+00	2.5	0.4	12.5	15.3	2.4	2.9	345
A SUMP	5/8/01	6.21	1.0E+00	1.5	0.0	11.6	13.1	3.3	3.4	370
A SUMP	5/22/01	6.50	1.0E+00	11.5	0.0	14.8	26.3	3.6	3.7	401
A SUMP	6/5/01	6.40	1.0E+00	2.9	0.0	3.6	6.5	3.0	3.5	339
A SUMP	6/19/01	6.40	1.0E+00	1.2	0.1	5.8	7.1	3.2	3.5	293
A SUMP	7/2/01	6.34	1.0E+00	7.1	0.0	20.1	27.3	3.8	3.8	365
A SUMP	7/17/01	6.49	1.0E+00	6.5	0.0	8.7	15.2	3.8	4.2	392