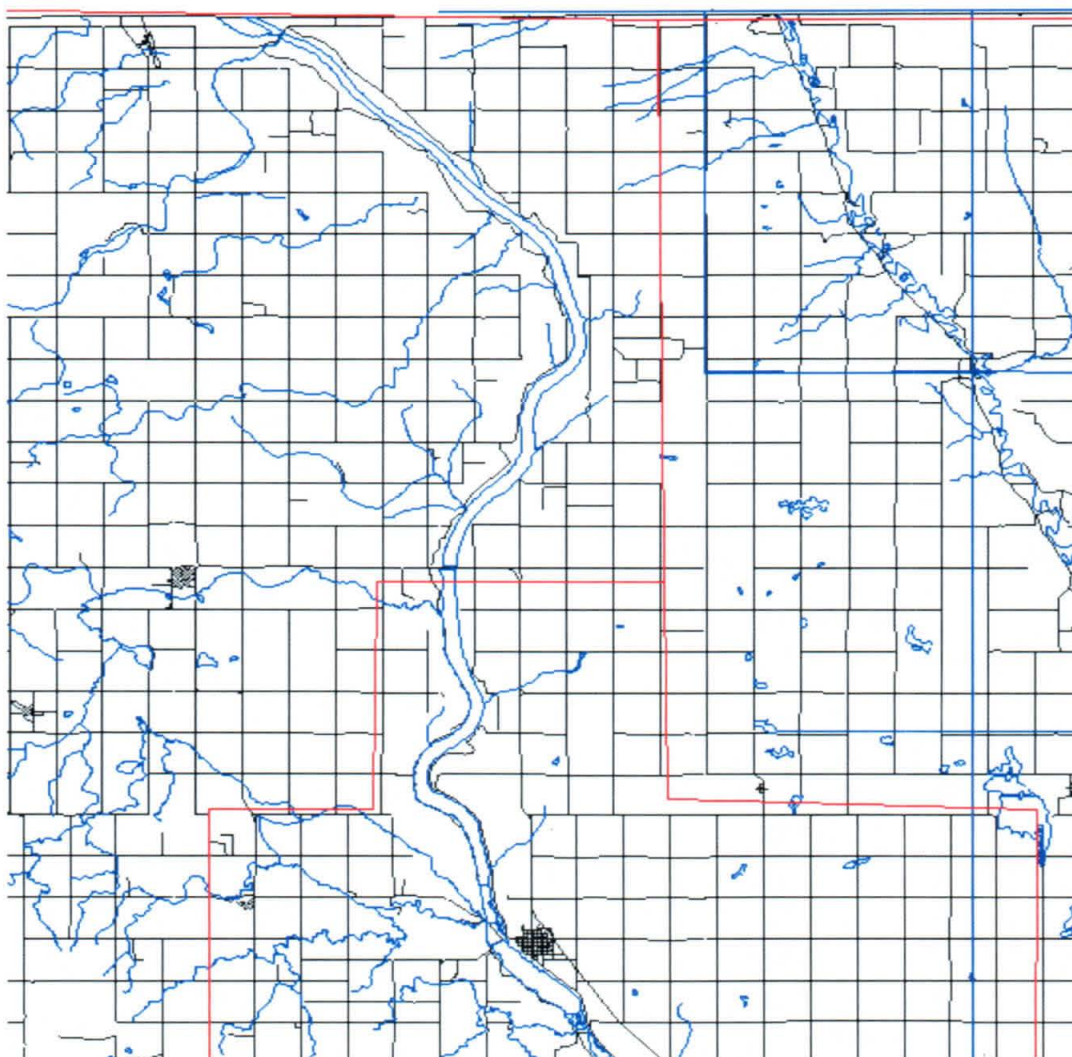


**1997-1998
Lake Water Quality Assessment
for
Upper Des Lacs Lake**



**September 1999
North Dakota Department of Health
Division of Water Quality**

1997-1998 Lake Water Quality Assessment for Upper Des Lacs Lake, North Dakota

By Peter Wax

North Dakota Department of Health, Division of Water Quality, Surface Water Program

Division Director
Dennis R. Fewless

Program Manager
Michael J. Ell

North Dakota Department of Health
Division of Water Quality
September 1999

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**NORTH DAKOTA DEPARTMENT OF HEALTH
Environmental Health Section**

Location:

1200 Missouri Avenue
Bismarck, ND 58504-5264

Fax #:

701-328-5200

Mailing Address:

P.O. Box 5520
Bismarck, ND 58506-5520

October 8, 1999

RECEIVED
OCT 12 1999

DES LACS NWR COMPLEX

Fred Giese
Des Lac NWR Complex Manager
Box 578
Kenmare, ND 58746

Dear Mr. Giese:

Enclosed is a summary of the water quality, biological and sediment data collected from Upper Des Lacs lake during the summer of 1997 and winter 1998. Due to time constraints, this document has more function and less flash than I originally envisioned. If you have any questions or comments, please contact me at the address above or by calling (701) 328-5268.

Sincerely,

Peter Wax
Environmental Scientist
Division of Water Quality

PW:dlp
Encl:

Acknowledgments

Numerous scientists and technicians have made major contributions to the Lake Water Quality Assessment Project. Funds were provided through a grant from the United States Environmental Protection Agency. Appreciation is extended to the North Dakota Department of Health's, Division of Chemistry for their accurate analysis of all samples, to Eric Hoggarth, Jon Long, and Seth Stroup for sample collection, and data entry, and lastly to Dan Severson and Fred Giese for allowing us access to the refuge.

Table 1. Upper Des Lacs Lake's Statistics

<u>Location</u>	
State:	North Dakota
County:	Ward, Burke
Nearest Municipality:	Kenmare
Ownership:	US Fish & Wildlife Service
<u>Physical Description</u>	
Surface Area:	4,292 acres
Major Tributary:	Des Lacs River
Major Basin:	Hudson Bay
Drainage Area:	602 square miles
Maximum Depth:	13 feet
Type of Water Body:	Reservoir
Fishery Type:	Intermittent northern pike, yellow perch, bullhead.
Trophic Condition:	Hypereutrophic
<u>Facilities</u>	
Public Facilities:	1 lake access point with boat ramp and parking, 2 picnic areas, Fishing areas, hunting access, auto tour, hiking paths, information center, refuge head quarters. Note: All public use and access rights are limited and controlled by the Des Lacs National Wildlife Refuge. For open periods and list of restrictions contact the Des Lacs National Wildlife Refuge.
<u>Beneficial uses</u>	
Classified beneficial uses ¹ :	Recreation/agricultural/aquatic life/municipal/water supply.

¹based on classified uses as defined in the "Standards of Water Quality for the State for the State of North Dakota", February 1, 1991.

Introduction

This is a summary of the data collected on Upper Des Lacs Lake as part of the State's Lake Water Quality Assessment Project. The Project is designed to characterize the Upper Des Lacs lake's baseline chemical, physical, and biological condition. The assessment is not intended to pinpoint sources or causes of lake condition and lacks the intensity to do so. Data was collected from Upper Des Lacs Lake at 2 location (Figure 1) and on 4 discrete dates (May 21, August 12, September 7, 1997, and February 23, 1998).

The Upper Des Lacs Lake is located in North Central North Dakota near the town of Kenmare in Ward and Burke Counties. It is a U.S. Fish and Wildlife Service (USFW) dam built for water supply, wildlife propagation, and waterfowl staging and resting. Nearly all of the reservoir lies within the boundary of the Des Lacs National Wildlife Refuge (NWR) with a small portion extending into Saskatchewan Canada.

Upper Des Lacs Lake is one of three man-made reservoirs in the NWR. The lake is long and narrow with a surface area 4,292 acres and a maximum depth of 14 feet. Upper Des Lacs Lake's drainage area is approximately 597 square miles of which 365 lie in North Dakota and the remaining 232 in Saskatchewan Canada. A significant amount of the Upper Des Lacs watershed is composed of noncontributing terminal drainages typical of the prairie pot hole region of the Northern Glaciated Plains.

Due to it's shallow depth and frequent fish kills, the North Dakota Department of Health (NDDH) does not classify the Upper Des Lacs Lake as a fishery, however, there is most likely a permanent or semi-permanent population of small species such as shiners, minnows, white suckers and bullheads. During periods of high water the Upper Des Lacs Lake sustains temporary populations of northern pike and yellow perch.

Public facilities on the Upper Des Lacs Lake include 1 lake access points with day use picnic area, auto routes, and hiking trails. Boating and refuge access are controlled by the NWR with restrictive operational times and seasons. For information on restrictions and recreational opportunities contact the NWR head quarters.

Water Quality

Lake water quality assessment data was collected on Upper Des Lacs Lake during the summer of 1997 and winter of 1997-98. Data collected included water quality chemistry (Table 2), phytoplankton species identification and population enumeration, and sediment analysis. The data will be used to evaluate Upper Des Lacs Lake's physical, chemical, and biological condition over the sampling period of May 21, 1997 through February 24, 1998.

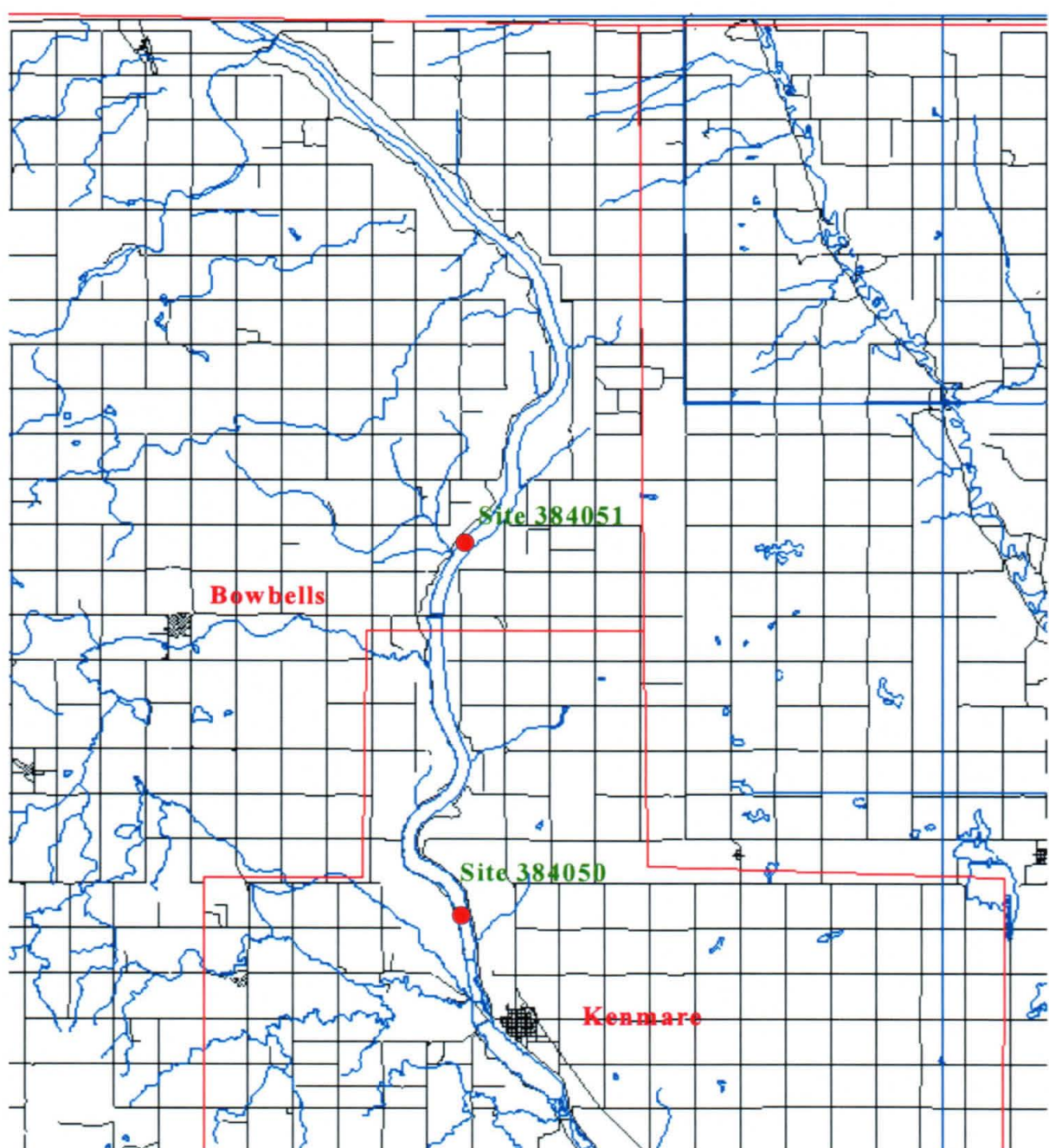


Figure 1. Map of Upper Des Lacs Lake and sampling locations.

Table 2. Water Quality Parameters

Analyte	Unit	Analyte	Unit
Temperature	C	Spc. Conductance	umhos/cm
Total Alkalinity	ppm	Bicarbonate	ppm
Carbonate	ppm	Total Ammonia	ppm
Total Kjeldahl Nitrogen	ppm	Nitrate + Nitrite as N	ppm
Total Phosphorus as P	ppm	Dissolved Phosphorus	ppm
Total Hardness as Ca	ppm	Calcium	ppm
Magnesium	ppm	Sodium	ppm
Potassium	ppm	Potassium	ppm
Iron	ppm	Manganese	ppm
Chlorides	ppm	Sulfates	ppm
Total Dissolved Solids	ppm	Boron	ppb
Aluminum	ppb	Potassium	ppm
Beryllium	ppb	Chromium	ppb
Nickel	ppb	Copper	ppb
Zinc	ppb	Arsenic	ppb
Selenium	ppb	Silver	ppb
Cadmium	ppb	Antimony	ppb
Barium	ppb	Thallium	ppb
Lead	ppb	pH	

Water quality samples were collected from Upper Des Lacs Lake on 4 separate occasions and at 2 locations. Sampling times were May 21, August 12, and September 7, 1997, and February 23, 1998. Sampling locations are approximately ½ miles upstream from the control structure, site 384050, and approximately 1½ miles north of HWY 5, site 384051 (Figure 1). Water samples were collected over the thalway at the 2 discrete depths of ½ meter below the surface and ½ meter above the lake floor on each sampling visit.

At no time during the investigation was Upper Des Lacs Lake thermally stratified (Figures 2, 4, 6, 8). For the length of the project, dissolved oxygen concentrations remained above the State's Standards of 5 mg L⁻¹ for a recreational fishery with a single exception on February 23, when the site above Hwy 5 (site 384051) dipped to 1.83 mg L⁻¹ at a 2 meter depth (Figures 3, 5, 7, 9). This is not unusual in North Dakota with most water bodies experiencing rapid dissolved oxygen depletion and a greater number of violations under ice cover conditions (Ell et. al 1993, Wax 1996).

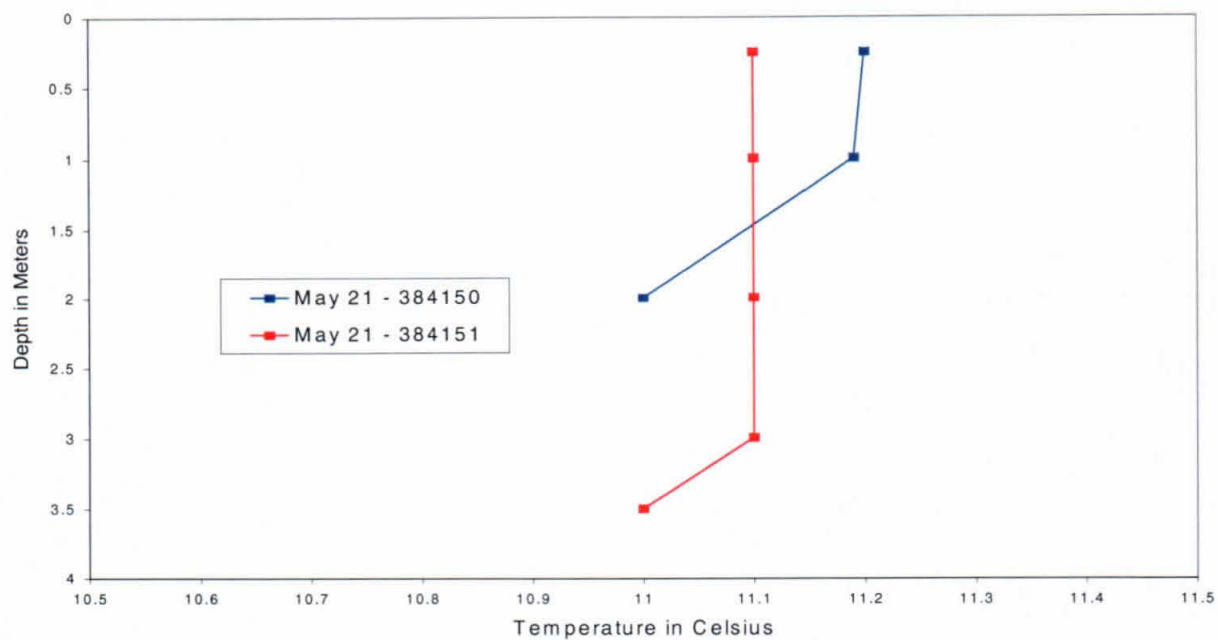


Figure 2. May 21, 1997 Upper Des Lacs Lake's temperature profiles

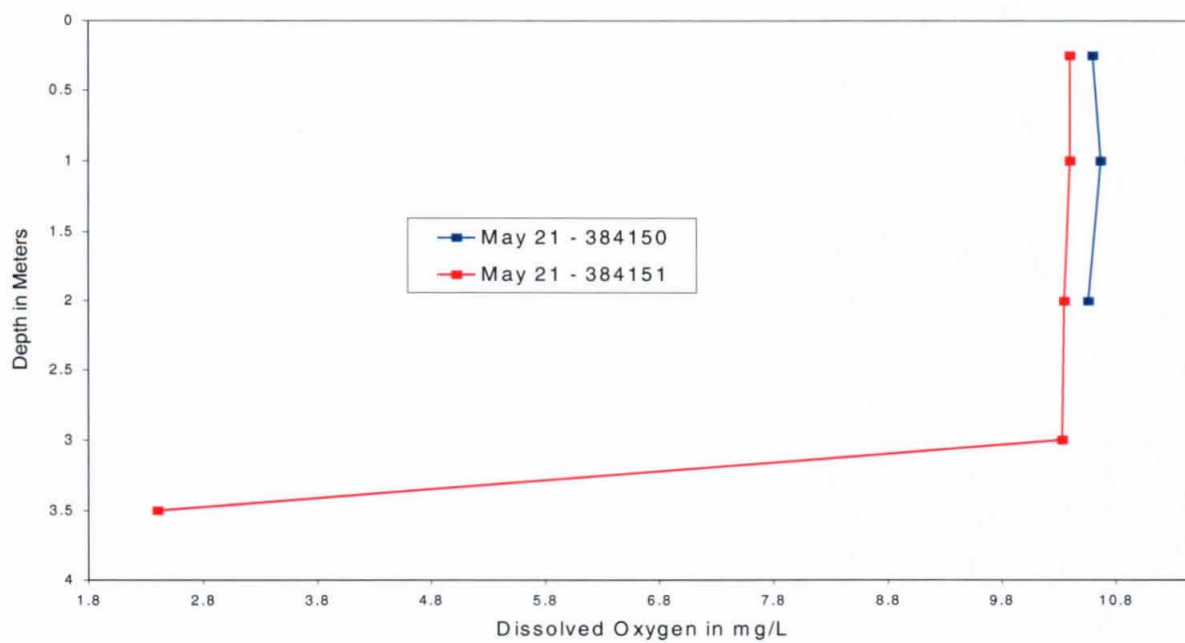


Figure 3. May 21, 1997 Upper Des Lacs Lake's oxygen profiles.

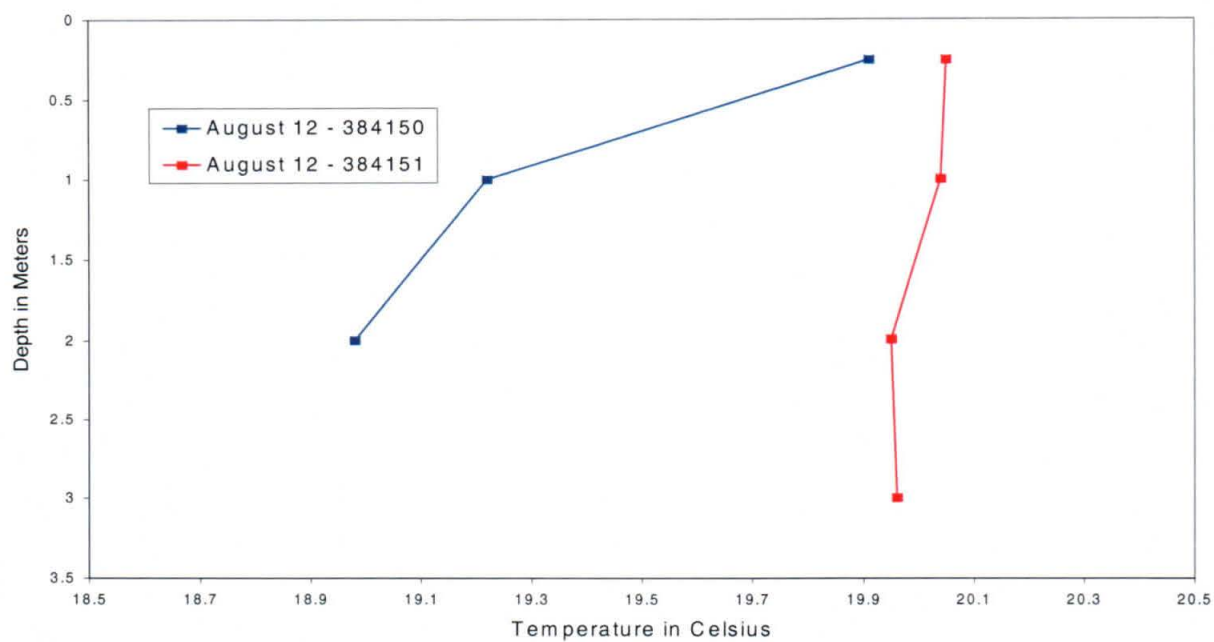


Figure 4. August 12, 1997 Upper Des Lacs Lake's temperature profiles.

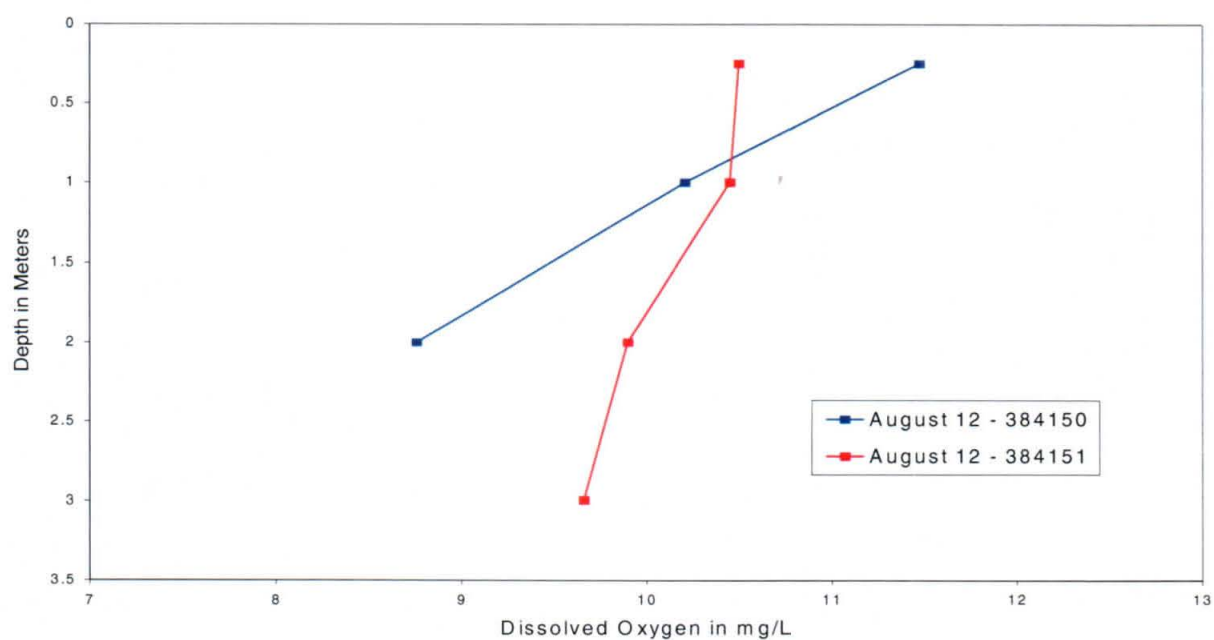


Figure 5. August 12, 1997 Upper Des Lacs Lake's oxygen Profiles.

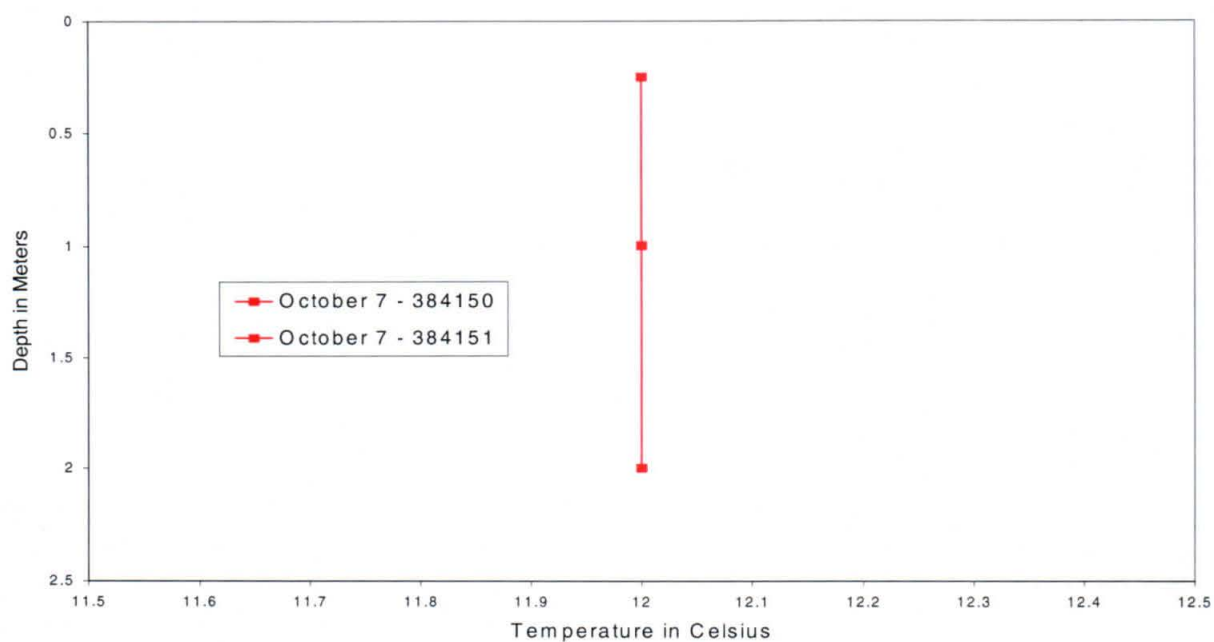


Figure 6. September 7, 1997 Upper Des Lacs Lake's Temperature profile.

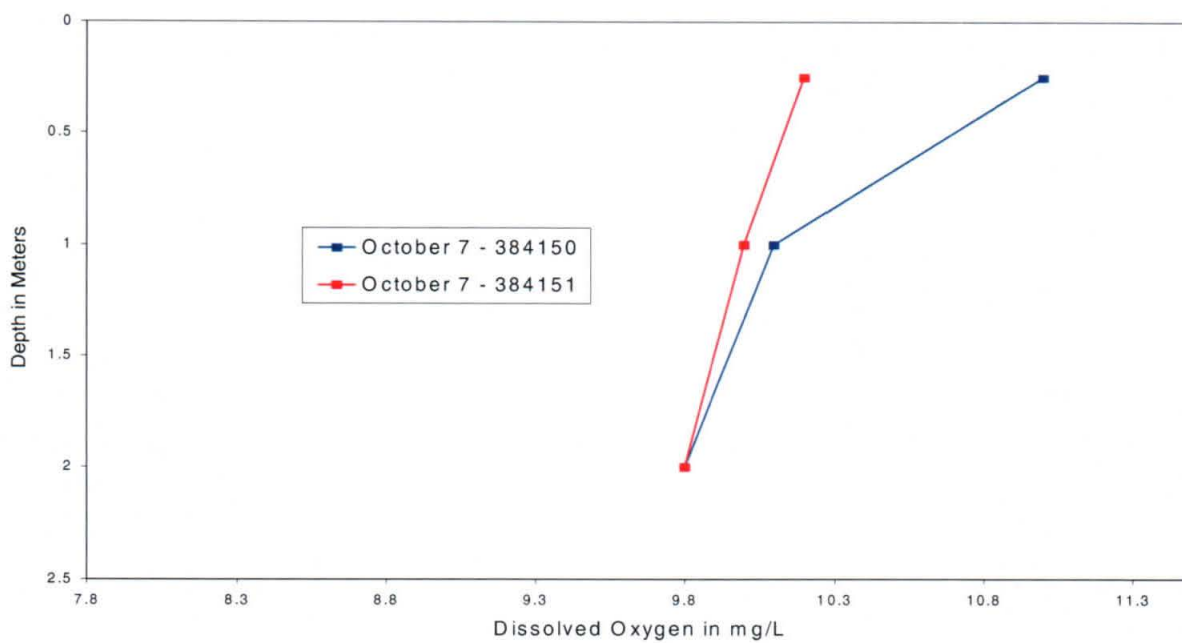


Figure 7. September 7, 1997 Upper Des Lacs Lake's oxygen profiles.

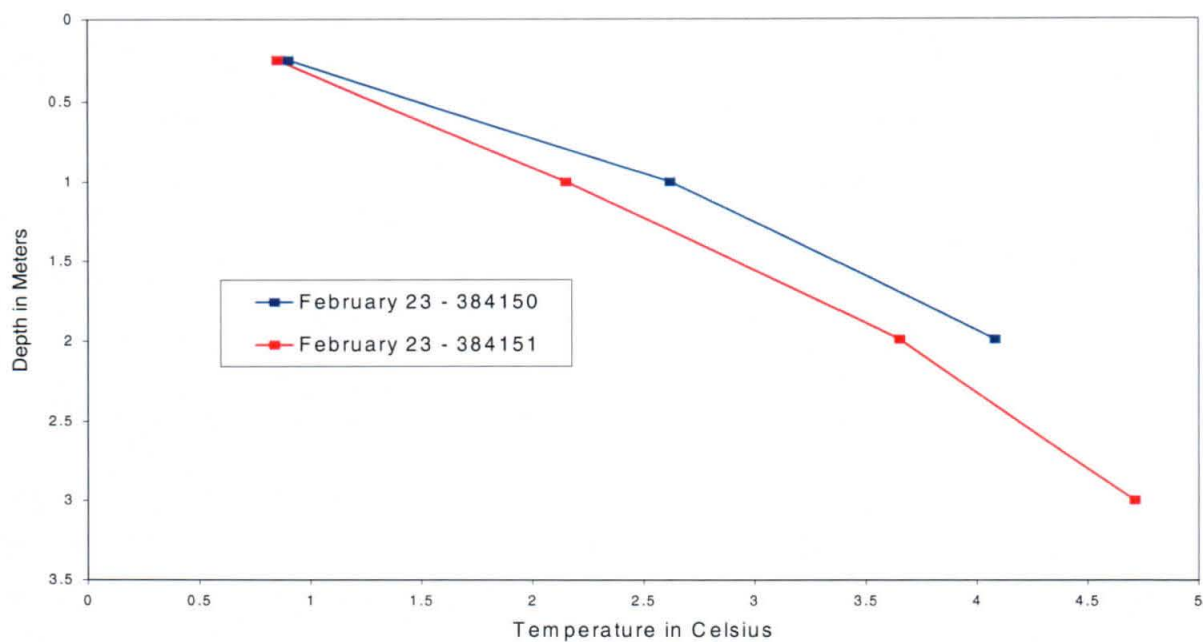


Figure 8. February 23, 1998 Upper Des Lacs Lake's temperature profiles.

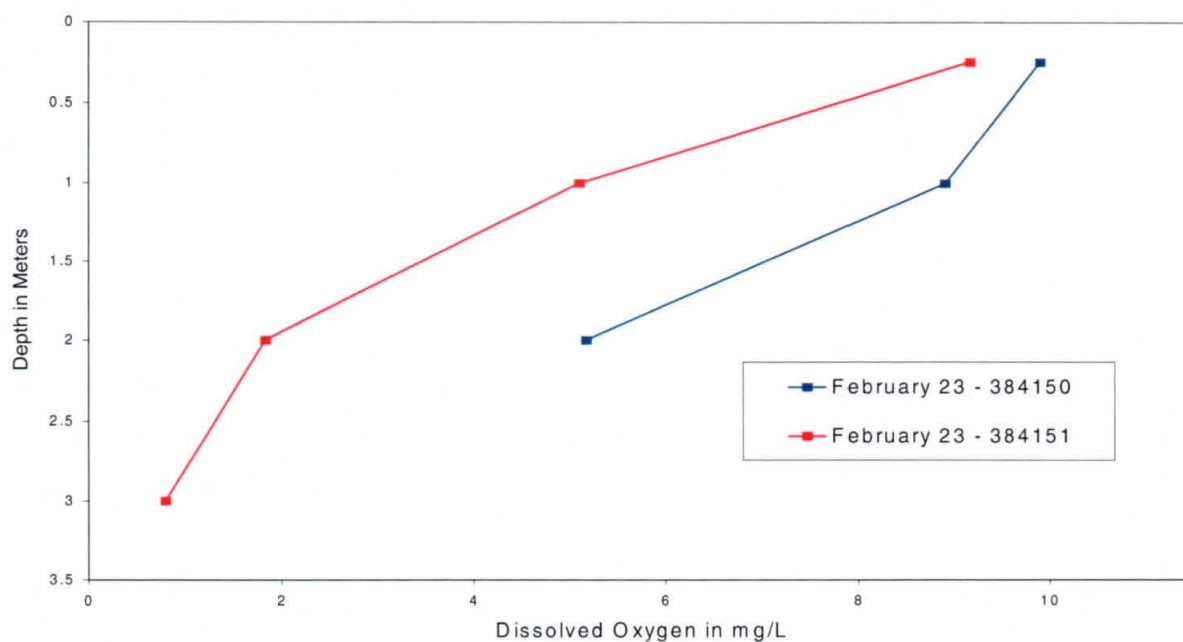


Figure 9. February 23, 1998 Upper Des Lacs Lake's oxygen profiles.

Water quality samples collected from Upper Des Lacs Lake describe a well buffered hypereutrophic reservoir. Total alkalinity as calcium ranged from 152 to 266 mg L⁻¹ with a mean of 214 mg L⁻¹. The dominate anions within the water column are bicarbonates and sulfates. Bicarbonates ranged from 188 to 324 mg L⁻¹ with a mean of 205 mg L⁻¹, while sulfates ranged between 202 and 293 mg L⁻¹ with a mean of 234 mg L⁻¹. Table 3 contains ranges for selected parameters within Upper Des Lacs Lake during the assessment project and North Dakota's arithmetic mean or all lakes and reservoirs sampled between 1985 and 1995.

Table 3. Concentration ranges for select parameters within Upper Des Lacs Lake and the North Dakota arithmetic mean for all lakes sampled between 1985 and 1995.

Parameter	Des Lacs Lake's Range	1985-1995 mean	Unit
Total Dissolved Solids	475-715	1271	mg L ⁻¹
Hardness as Calcium	168-253	428	mg L ⁻¹
Sulfate as SO ₄	202-293	408	mg L ⁻¹
Chlorides	5.9-21.2	234	mg L ⁻¹
Total Alkalinity as Calcium	152-266	309	mg L ⁻¹
Bicarbonate as HCO ₃	188-324	348	mg L ⁻¹
Conductivity	787-1120	1801	Omhos/cm
Total phosphorus as phosphate	0.11-0.385	0.295	mg L ⁻¹
Nitrate + Nitrite as Nitrogen	0.02-0.030	0.137	mg L ⁻¹
Total Ammonia as Nitrogen	0.01-0.637	0.269	mg L ⁻¹
Total Kjeldahl Nitrogen	1.760-3.160	2.204	mg L ⁻¹

Total nitrogen as nitrogen and total phosphorus as phosphate concentrations ranged from 0.020 to 0.030 mg L⁻¹, and 0.11 to 0.385 mg L⁻¹, respectively, with mean concentrations of 0.020 and 0.233 mg L⁻¹. Total nitrogen to total phosphorus ratios ranged from 4.5:1 at site 384151 on August 12, 1997 to 18:1 at site 384150 on September 7, 1997. The 1997-98 annual nitrogen and phosphorus ratio for all 3 sites is 11:1, indicating that for most of the year and particularly during the productive times of the year Upper Des Lacs Lake is nitrogen limited. For purposes of this assessment a waterbody is assumed to be in nutrient equilibrium at a ration of nitrogen to phosphorus of 15:1 with a greater ratio indicating it is phosphorus limited and a smaller ratio nitrogen limited. When nitrogen becomes the limiting nutrient primary production is not limited but altered. The altered condition favors certain species of primary producers that are either able to affix nitrogen or are tolerant of low nitrogen conditions.

During the 1997-1998 investigation Upper Des Lacs Lake's trophic status was assessed as hypereutrophic. Trophic status is an estimation of a lake or reservoir's productivity. In general, as a lake ages it becomes more productive (eutrophication). When this maturing process reaches an advanced stage it is usually identified by loss of lake depth through sedimentation, and becomes less esthetically pleasing due to frequent algal blooms. When a lake is hypereutrophic it often also exhibit a foul order, suffer frequent fish kills, and have a rapid oxygen depletion during

thermal stratification and under ice cover conditions. Reservoirs which inundate large areas of deep fertile soils covered with organic growth are especially susceptible to rapid eutrophication and often begin life over productive.

For purposes of this project trophic status is measured using Carlson's Trophic Status Index (TSI) (Carlson 1977). Carlson's TSI was selected because of its common use among limnologists and because it was developed for Minnesota lakes, a region close to North Dakota geographically.

Carlson's TSI uses a mathematical relationship based on secchi disk transparency, concentrations of total phosphorus at the surface, and chlorophyll-a concentrations. This numerical value then corresponds to a trophic condition ranging from 0 to 100 with increasing values indicating a more eutrophic condition. Carlson's TSI ranges are visually displayed in Figure 10.

Accurate trophic status assessment are essential in making sound management decisions. In order

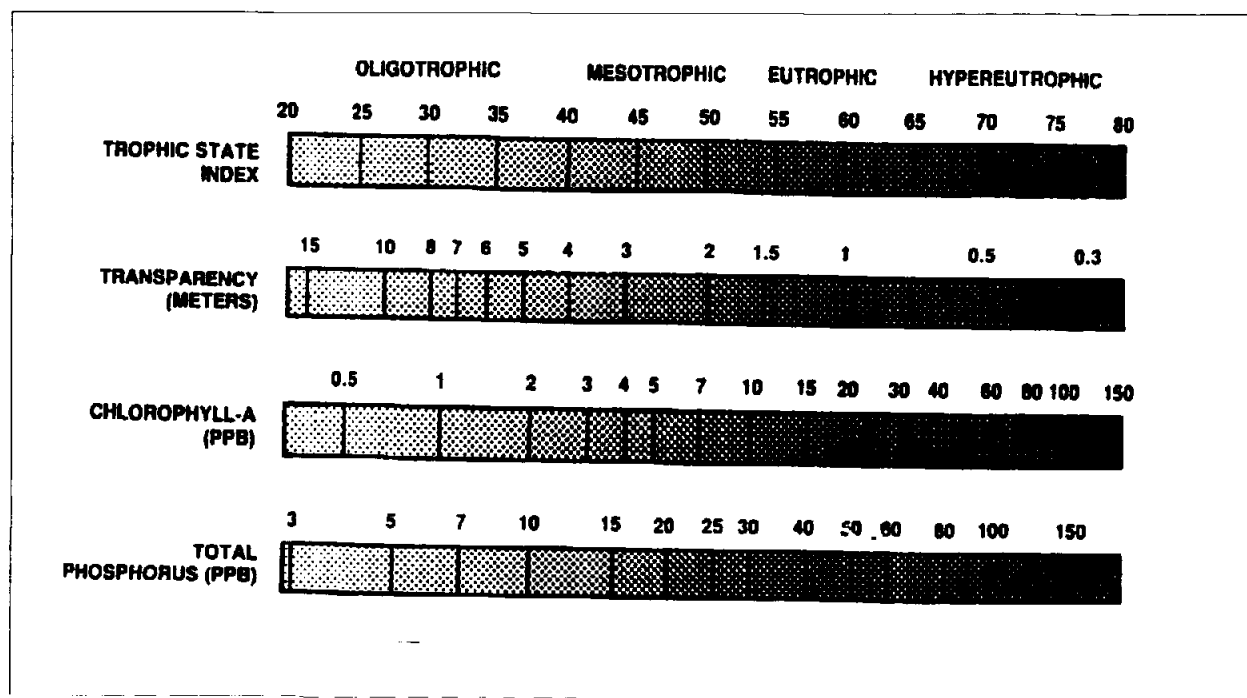


Figure 10. A graphic representation of Carlson's Trophic Status Index.

to ensure an accurate assessment has been made, usually 2 consecutive years of monitoring are desired and a multiple indicators approach should be used. The term indicator is used, as trophic status can be seasonally and annually variable, creating a situation where it can be easily misidentified. Because this project lacks the resources for a second year of investigation, the trophic status assessment should be viewed with cautious skepticism.

Beyond general chemistry Des Lacs Lake was sampled for an array of trace elements and metals of these cadmium, copper, chromium, lead, nickel, silver, and zinc have both a chronic and acute limits set in the Standards of Water Quality for the State of North Dakota. The standard is hardness dependant and is calculated using the equations in Table 4.

Table 4. Trace element acute and chronic water quality standards for State of North Dakota.

Acute = $\exp(\text{ma}(\ln(\text{hardness}))+\text{ba})$				
Chronic = $\exp(\text{mc}(\ln(\text{hardness}))+\text{bc})$ Where;				
<u>Element</u>	<u>ma</u>	<u>ba</u>	<u>mc</u>	<u>bc</u>
Cadmium	1.1280	-3.828	0.7852	-3.490
Copper	0.9422	-1.464	0.8545	-1.465
Chromium	0.8190	3.688	0.8190	1.561
Lead	1.2780	-1.460	1.2780	-4.705
Nickel	0.8460	3.361	0.8460	1.165
Silver	1.7200	-6.520	NA	NA
Zinc	0.8473	0.860	0.8473	0.7614

While none of the trace elements exceeded the State's acute standard, copper exceeded the State's chronic concentrations in 7 of 11 water samples analyzed. The accedence ranged from 3.1 to 11 $\mu\text{g L}^{-1}$. The 4 samples that did not exceed the State standard were significantly below, ranging between and 4.25 and 9.66 $\mu\text{g L}^{-1}$. A complete listing of all water quality data is contained in Appendix A.

Phytoplankton

Des Lacs Lake's Phytoplankton community was sampled twice during the summer of 1997. Des Lacs Lake's phytoplankton community is relatively diverse with representation from 7 orders and 56 genera (Appendix B). Phytoplankton can be used as indicators of nutrient availability and the trophic condition of a waterbody.

The order cyanophyceae, and bacillariophyceae dominated the population by density followed by chlorophyceae, cryptophyceae, chrysophyceae, euglenophyceae, and dinophyceae (Table 5) Order densities ranged from a low of none present for euglenophyceae and dinophyceae at the site above highway 5 (site 384051) to high of 256,998,000 cells/ml of cyanophyceae. In general, densities were highest above highway 5 (Figure 11).

Table 5. Mean algae densities for Upper Des Lacs Lake sampled August 12 and September 7, 1997.

Order	Near Dam (384050)	Above Hwy 5 (384051)
Chlorophyceae	4,372,000	8,523,200
Cryptophyceae	500,733	854,600
Cyanophyceae	124,800,484	175,917,500
Euglenophyceae	1,000	0
Dinophyceae	1,000	0
Chrysophyceae	128,567	776,475
Bacillariophyceae	44,956,902	2,659,800

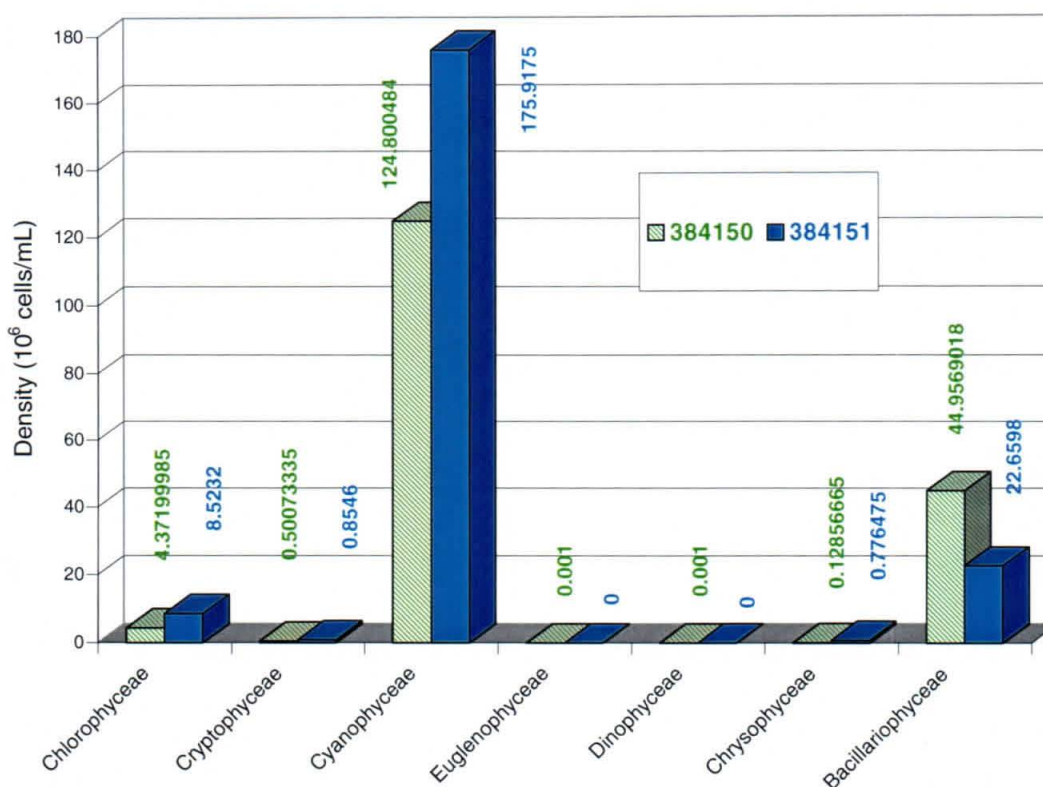
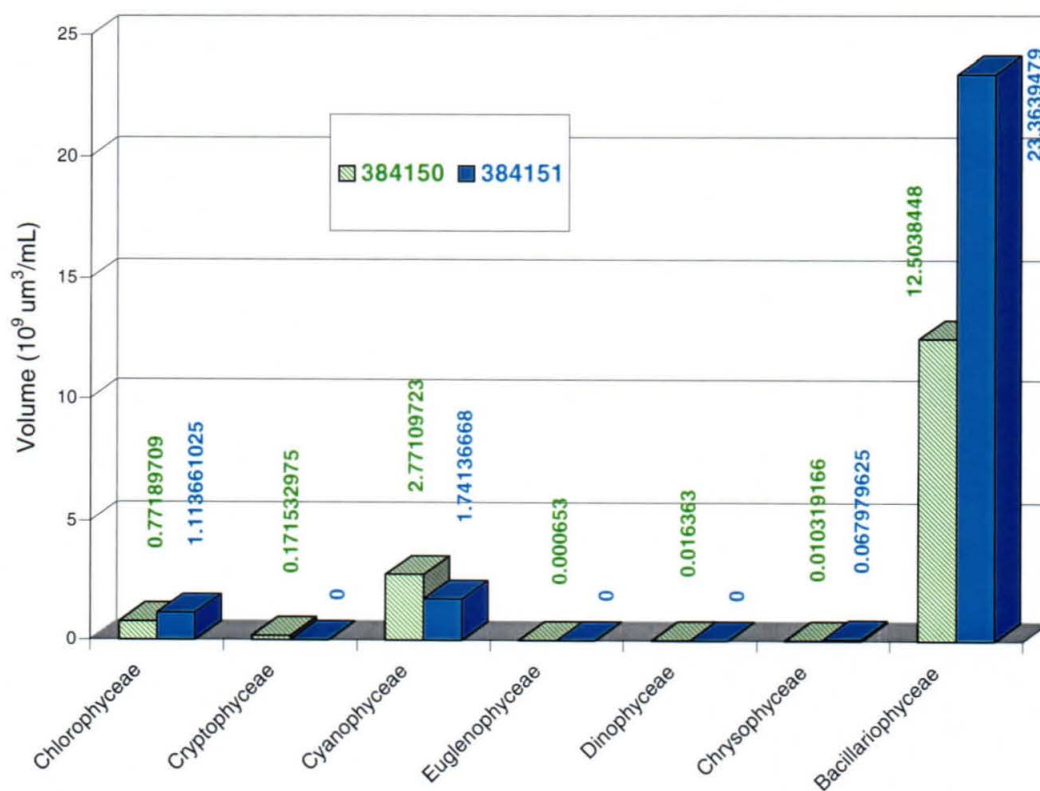


Figure 11. Mean algal densities expressed as cells/mL for August 12, and September 7, 1997.

The phytoplankton population by volume, expressed as cubic micrometers of algae per mL, is dominated by the order bacillariophyceae followed by cyanophyceae, chlorophyceae, cryptophyceae, chrysophyceae, dinophyceae, and euglenophyceae (Table 6, Figure 12). The order bacillariophyceae occupies a significantly large portion of the phytoplankton population by volume, and cyanophyceae a relatively small portion. This is opposite to the concentration of individual organism per mL of lake water (density) and is due to the relatively large size of the organisms in the order bacillariophyceae (Diatoms) and small size of the organisms in the order cyanophyceae (blue-green algae).

Table 6. Mean algae volumes for Upper Des Lacs Lake sampled August 12 and September 7, 1997.

Order	Near Dam (384050)	Above Hwy 5 (384051)
Chlorophyceae	771,897,090	1,113,661,025
Cryptophyceae	177,532,975	34,558,948
Cyanophyceae	2,771,097,230	1,741,366,680
Euglenophyceae	653,000	0
Dinophyceae	16,363,000	0
Chrysophyceae	10,319,167	67,979,625
Bacillariophyceae	12,503,844,798	23,363,947,900

Figure 12. Mean algal volumes expressed as $\mu\text{m}^3/\text{mL}$ for August 12, and September 7, 1997.

Sediment Analysis

Sediment samples were collected from Upper Des Lacs Lake at both water quality monitoring sites (Figure 1). Sediments were collected using a 1 inch core sampler, and sampling a minimum of the top six inches of sediments. Sediments have been analyzed for 12 elements and 14 pesticides (Table 7).

Table 7. List of analytes completed for sediment samples collected from Upper Des Lacs Lake in 1997.

Analyte	Analyte	Analyte
Aluminum (Al)	Manganese (Mn)	Iron (Fe)
Copper (Cu)	Zinc (Zn)	Barium (Ba)
Chromium (Cd)	Lead (Pb)	Mercury (Hg)
Hoelon	2-4-D	Dicamba
Dinoseb	MCPA	Tordon
2-4-5-T	Silvex	Pentachlorobenzoic Acid
Bromoxynil	Dichlorprop	Bentazon

Reported concentrations of trace elements in Upper Des Lacs Lake's deep water sediments are contained in Table 8. Sediment samples collected from Des Lacs Lake contained detectable levels of all elements analyzed for. In order to evaluate the sediment data for Upper Des Lacs Lake the results are compared to the deep water sediment samples collected from 87 North Dakota lakes and reservoirs between 1991 and 1995.

In summary, the reported concentrations are relatively high in comparison to the 50th and 100th percentiles of 87 deep water sediments collected from select North Dakota lakes and reservoirs. The reported concentrations of copper, barium, arsenic, selenium, lead, cadmium, and mercury all exceeded the 50th percentile, and zinc, and chromium exceeded the 100th percentile both samples collected (Table 8). No pesticide were detected in either sample collected.

Table 8. Reported concentration's of trace elements in Upper Des Lacs Lake's sediment and the 100th and 50th percentile from 87 sediment samples collected from select North Dakota lakes and reservoirs between 1991 and 1994.

Elements	1991-94 percentiles n=87		Upper Des Lacs Lake sediment results	
	50TH	100TH	Near Dam (384050)	Above Hwy 5 (384051)
Aluminum	Not sampled	Not sampled	11,600.00	10,200.00
Manganese	Not sampled	Not sampled	547.00	665.00
Iron	Not sampled	Not sampled	18,100.00	17,900.00
Copper	5.48	25.80	14.30	15.40
Zinc	22.20	41.00	58.90	61.80
Barium	56.60	165.00	128.00	163.00
Chromium	4.82	14.10	18.60	23.10
Arsenic	1.61	5.71	4.24	4.85
Selenium	0.158	1.88	1.19	1.56
Lead	4.49	33.80	10.10	12.80
Cadmium	0.21	0.97	0.426	0.524
Mercury	<0.01	0.044	0.040	0.060
Concentrations in micrograms/gram wet weight (ppb)				

APPENDIX A
WATER QUALITY DATA

97WQDATA

PROJECT	LONG NAME	STORET	DATE	RESULT2	UNITS	DEPTH
RLWQ97	Alkalinity (CaCO3)(Total)	384150	05/21/97	187 mg/L		
RLWQ97	Alkalinity (CaCO3)(Total)	384150	05/21/97	190 mg/L		
RLWQ97	Alkalinity (CaCO3)(Total)	384150	08/12/97	232 mg/L		
RLWQ97	Alkalinity (CaCO3)(Total)	384150	10/07/97	228 mg/L		2.
RLWQ97	Alkalinity (CaCO3)(Total)	384150	02/23/98	266 mg/L		1.5
RAWQM	Alkalinity (CaCO3)(Total)	384151	05/21/97	152 mg/L		
RLWQ97	Alkalinity (CaCO3)(Total)	384151	05/21/97	191 mg/L		
RLWQ97	Alkalinity (CaCO3)(Total)	384151	08/12/97	215 mg/L		
RLWQ97	Alkalinity (CaCO3)(Total)	384151	08/12/97	218 mg/L		
RLWQ97	Alkalinity (CaCO3)(Total)	384151	10/06/97	221 mg/L		2.
RLWQ97	Alkalinity (CaCO3)(Total)	384151	02/23/98	251 mg/L		1.5
RLWQ97	Aluminum (Al)	384150	05/21/97	65 ug/L		
RLWQ97	Aluminum (Al)	384150	05/21/97	50 ug/L		
RLWQ97	Aluminum (Al)	384150	08/12/97	118 ug/L		
RLWQ97	Aluminum (Al)	384150	02/23/98	50 ug/L		1.5
RLWQ97	Aluminum (Al)	384151	05/21/97	50 ug/L		
RAWQM	Aluminum (Al)	384151	05/21/97	50 ug/L		
RLWQ97	Aluminum (Al)	384151	08/12/97	83 ug/L		
RLWQ97	Aluminum (Al)	384151	08/12/97	91 ug/L		
RLWQ97	Aluminum (Al)	384151	02/23/98	58 ug/L		1.5
RLWQ97	Ammonia (N)	384150	05/21/97	0.016 mg/L		
RLWQ97	Ammonia (N)	384150	05/21/97	0.05 mg/L		
RLWQ97	Ammonia (N)	384150	08/12/97	0.01 mg/L		
RLWQ97	Ammonia (N)	384150	10/07/97	0.01 mg/L		2.
RLWQ97	Ammonia (N)	384150	02/23/98	0.637 mg/L		1.5
RAWQM	Ammonia (N)	384151	05/21/97	0.01 mg/L		
RLWQ97	Ammonia (N)	384151	05/21/97	0.01 mg/L		
RLWQ97	Ammonia (N)	384151	08/12/97	0.01 mg/L		
RLWQ97	Ammonia (N)	384151	08/12/97	0.01 mg/L		
RLWQ97	Ammonia (N)	384151	10/06/97	0.01 mg/L		2.
RLWQ97	Ammonia (N)	384151	02/23/98	0.533 mg/L		1.5
RLWQ97	Anion Sum	384150	05/21/97	8.827 me/L		
RLWQ97	Anion Sum	384150	05/21/97	9.516 me/L		
RLWQ97	Anion Sum	384150	08/12/97	10.19 me/L		
RLWQ97	Anion Sum	384150	10/07/97	10.23 me/L		2.
RLWQ97	Anion Sum	384150	02/23/98	12.23 me/L		1.5
RLWQ97	Anion Sum	384151	05/21/97	8.807 me/L		
RAWQM	Anion Sum	384151	05/21/97	7.988 me/L		
RLWQ97	Anion Sum	384151	08/12/97	8.998 me/L		
RLWQ97	Anion Sum	384151	08/12/97	9.043 me/L		
RLWQ97	Anion Sum	384151	10/06/97	9.262 me/L		2.
RLWQ97	Anion Sum	384151	02/23/98	11.16 me/L		1.5

97WQDATA

PROJECT	LONG NAME	STORET	DATE	RESULT2	UNITS	DEPTH
RLWQ97	Antimony (Sb)	384150	05/21/97	0.44 ug/L		
RLWQ97	Antimony (Sb)	384150	05/21/97	2.57 ug/L		
RLWQ97	Antimony (Sb)	384150	08/12/97	1 ug/L		
RLWQ97	Antimony (Sb)	384150	02/23/98	1 ug/L		1.5
RLWQ97	Antimony (Sb)	384151	05/21/97	0.52 ug/L		
RAWQM	Antimony (Sb)	384151	05/21/97	0.55 ug/L		
RLWQ97	Antimony (Sb)	384151	08/12/97	1 ug/L		
RLWQ97	Antimony (Sb)	384151	08/12/97	1 ug/L		
RLWQ97	Antimony (Sb)	384151	02/23/98	1 ug/L		1.5
RLWQ97	Arsenic (As)	384150	05/21/97	5.4 ug/L		
RLWQ97	Arsenic (As)	384150	05/21/97	4.3 ug/L		
RLWQ97	Arsenic (As)	384150	08/12/97	4.4 ug/L		
RLWQ97	Arsenic (As)	384150	02/23/98	3.4 ug/L		1.5
RLWQ97	Arsenic (As)	384151	05/21/97	2.34 ug/L		
RAWQM	Arsenic (As)	384151	05/21/97	3.63 ug/L		
RLWQ97	Arsenic (As)	384151	08/12/97	3.62 ug/L		
RLWQ97	Arsenic (As)	384151	08/12/97	3.47 ug/L		
RLWQ97	Arsenic (As)	384151	02/23/98	2.77 ug/L		1.5
RLWQ97	Barium (Ba)	384150	05/21/97	58.1 ug/L		
RLWQ97	Barium (Ba)	384150	05/21/97	58.3 ug/L		
RLWQ97	Barium (Ba)	384150	08/12/97	97.9 ug/L		
RLWQ97	Barium (Ba)	384150	02/23/98	96.8 ug/L		1.5
RAWQM	Barium (Ba)	384151	05/21/97	61.7 ug/L		
RLWQ97	Barium (Ba)	384151	05/21/97	65.3 ug/L		
RLWQ97	Barium (Ba)	384151	08/12/97	81.7 ug/L		
RLWQ97	Barium (Ba)	384151	08/12/97	82.8 ug/L		
RLWQ97	Barium (Ba)	384151	02/23/98	82.9 ug/L		1.5
RLWQ97	Beryllium (Be)	384150	05/21/97	0.2 ug/L		
RLWQ97	Beryllium (Be)	384150	05/21/97	0.2 ug/L		
RLWQ97	Beryllium (Be)	384150	08/12/97	1 ug/L		
RLWQ97	Beryllium (Be)	384150	02/23/98	1 ug/L		1.5
RAWQM	Beryllium (Be)	384151	05/21/97	0.2 ug/L		
RLWQ97	Beryllium (Be)	384151	05/21/97	0.2 ug/L		
RLWQ97	Beryllium (Be)	384151	08/12/97	1 ug/L		
RLWQ97	Beryllium (Be)	384151	08/12/97	1 ug/L		
RLWQ97	Beryllium (Be)	384151	02/23/98	1 ug/L		1.5
RLWQ97	Bicarbonate (HCO3)	384150	05/21/97	149 mg/L		
RLWQ97	Bicarbonate (HCO3)	384150	05/21/97	145 mg/L		
RLWQ97	Bicarbonate (HCO3)	384150	08/12/97	214 mg/L		
RLWQ97	Bicarbonate (HCO3)	384150	10/07/97	207 mg/L		2.
RLWQ97	Bicarbonate (HCO3)	384150	02/23/98	325 mg/L		1.5
RAWQM	Bicarbonate (HCO3)	384151	05/21/97	185 mg/L		
RLWQ97	Bicarbonate (HCO3)	384151	05/21/97	148 mg/L		
RLWQ97	Bicarbonate (HCO3)	384151	08/12/97	207 mg/L		
RLWQ97	Bicarbonate (HCO3)	384151	08/12/97	200 mg/L		

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PROJECT	LONG NAME	STORET	DATE	RESULT2	UNITS	DEPTH
RLWQ97	Bicarbonate (HCO3)	384151	10/06/97	191 mg/L		2.
RLWQ97	Bicarbonate (HCO3)	384151	02/23/98	288 mg/L		1.5
RLWQ97	Boron (B)	384150	05/21/97	144 ug/L		
RLWQ97	Boron (B)	384150	05/21/97	168 ug/L		
RLWQ97	Boron (B)	384150	08/12/97	159 ug/L		
RLWQ97	Boron (B)	384150	02/23/98	139 ug/L		1.5
RAWQM	Boron (B)	384151	05/21/97	152 ug/L		
RLWQ97	Boron (B)	384151	05/21/97	174 ug/L		
RLWQ97	Boron (B)	384151	08/12/97	143 ug/L		
RLWQ97	Boron (B)	384151	08/12/97	157 ug/L		
RLWQ97	Boron (B)	384151	02/23/98	130 ug/L		1.5
RLWQ97	Cadmium (Cd)	384150	05/21/97	0.02 ug/L		
RLWQ97	Cadmium (Cd)	384150	05/21/97	0.02 ug/L		
RLWQ97	Cadmium (Cd)	384150	08/12/97	1 ug/L		
RLWQ97	Cadmium (Cd)	384150	02/23/98	1 ug/L		1.5
RAWQM	Cadmium (Cd)	384151	05/21/97	0.02 ug/L		
RLWQ97	Cadmium (Cd)	384151	05/21/97	0.02 ug/L		
RLWQ97	Cadmium (Cd)	384151	08/12/97	1 ug/L		
RLWQ97	Cadmium (Cd)	384151	08/12/97	1 ug/L		
RLWQ97	Cadmium (Cd)	384151	02/23/98	1 ug/L		1.5
RLWQ97	Calcium (Ca)	384150	05/21/97	27.4 mg/L		
RLWQ97	Calcium (Ca)	384150	05/21/97	25.9 mg/L		
RLWQ97	Calcium (Ca)	384150	08/12/97	35.1 mg/L		
RLWQ97	Calcium (Ca)	384150	10/07/97	32.8 mg/L		2.
RLWQ97	Calcium (Ca)	384150	02/23/98	35.9 mg/L		1.5
RLWQ97	Calcium (Ca)	384151	05/21/97	26.9 mg/L		
RAWQM	Calcium (Ca)	384151	05/21/97	26.5 mg/L		
RLWQ97	Calcium (Ca)	384151	08/12/97	32.2 mg/L		
RLWQ97	Calcium (Ca)	384151	08/12/97	33 mg/L		
RLWQ97	Calcium (Ca)	384151	10/06/97	32.1 mg/L		2.
RLWQ97	Calcium (Ca)	384151	02/23/98	34.3 mg/L		1.5
RLWQ97	Carbonate (CO3)	384150	05/21/97	41 mg/L		
RLWQ97	Carbonate (CO3)	384150	05/21/97	41 mg/L		
RLWQ97	Carbonate (CO3)	384150	08/12/97	34 mg/L		
RLWQ97	Carbonate (CO3)	384150	10/07/97	35 mg/L		2.
RLWQ97	Carbonate (CO3)	384150	02/23/98	1 mg/L		1.5

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PROJECT	LONG NAME	STORET	DATE	RESULT2	UNITS	DEPTH
RAWQM	Carbonate (CO3)	384151	05/21/97	1 mg/L		
RLWQ97	Carbonate (CO3)	384151	05/21/97	42 mg/L		
RLWQ97	Carbonate (CO3)	384151	08/12/97	29 mg/L		
RLWQ97	Carbonate (CO3)	384151	08/12/97	31 mg/L		
RLWQ97	Carbonate (CO3)	384151	10/06/97	39 mg/L		2.
RLWQ97	Carbonate (CO3)	384151	02/23/98	10 mg/L		1.5
RLWQ97	Cation Sum	384150	05/21/97	8.646 me/L		
RLWQ97	Cation Sum	384150	05/21/97	8.145 me/L		
RLWQ97	Cation Sum	384150	08/12/97	9.53 me/L		
RLWQ97	Cation Sum	384150	10/07/97	9.943 me/L		2.
RLWQ97	Cation Sum	384150	02/23/98	11.44 me/L		1.5
RAWQM	Cation Sum	384151	05/21/97	7.503 me/L		
RLWQ97	Cation Sum	384151	05/21/97	7.633 me/L		
RLWQ97	Cation Sum	384151	08/12/97	8.286 me/L		
RLWQ97	Cation Sum	384151	08/12/97	8.567 me/L		
RLWQ97	Cation Sum	384151	10/06/97	8.903 me/L		2.
RLWQ97	Cation Sum	384151	02/23/98	9.918 me/L		1.5
RLWQ97	Chloride	384150	05/21/97	20 mg/L		
RLWQ97	Chloride	384150	05/21/97	17.1 mg/L		
RLWQ97	Chloride	384150	08/12/97	16.7 mg/L		
RLWQ97	Chloride	384150	10/07/97	6.2 mg/L		2.
RLWQ97	Chloride	384150	02/23/98	21.2 mg/L		1.5
RLWQ97	Chloride	384151	05/21/97	17.9 mg/L		
RAWQM	Chloride	384151	05/21/97	18 mg/L		
RLWQ97	Chloride	384151	08/12/97	14.8 mg/L		
RLWQ97	Chloride	384151	08/12/97	14.7 mg/L		
RLWQ97	Chloride	384151	10/06/97	5.9 mg/L		2.
RLWQ97	Chloride	384151	02/23/98	18.9 mg/L		1.5
RLWQ97	Chlorophyll A	384150	05/21/97	3 ug/L		
RLWQ97	Chlorophyll A	384150	08/12/97	83 ug/L		
RLWQ97	Chlorophyll A	384151	05/21/97	9 ug/L		
RLWQ97	Chlorophyll A	384151	08/12/97	52 ug/L		
RLWQ97	Chlorophyll B	384150	05/21/97	1 ug/L		
RLWQ97	Chlorophyll B	384150	08/12/97	1 ug/L		
RLWQ97	Chlorophyll B	384151	05/21/97	1 ug/L		
RLWQ97	Chlorophyll B	384151	08/12/97	1 ug/L		
RLWQ97	Chromium (Cr)	384150	05/21/97	28.5 ug/g		
RLWQ97	Chromium (Cr)	384150	05/21/97	0.2 ug/L		
RLWQ97	Chromium (Cr)	384150	05/21/97	26.8 ug/g		
RLWQ97	Chromium (Cr)	384150	05/21/97	0.72 ug/L		
RLWQ97	Chromium (Cr)	384150	08/12/97	31.2 ug/g		
RLWQ97	Chromium (Cr)	384150	08/12/97	1.02 ug/L		
RLWQ97	Chromium (Cr)	384150	10/07/97	32.6 ug/g		2.
RLWQ97	Chromium (Cr)	384150	02/23/98	1 ug/L		1.5
RLWQ97	Chromium (Cr)	384150	02/23/98	39.6 ug/g		1.5

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PROJECT	LONG NAME	STORET	DATE	RESULT2	UNITS	DEPTH
RLWQ97	Chromium (Cr)	384151	05/21/97	25 ug/g		
RLWQ97	Chromium (Cr)	384151	05/21/97	0.2 ug/L		
RAWQM	Chromium (Cr)	384151	05/21/97	0.2 ug/L		
RAWQM	Chromium (Cr)	384151	05/21/97	24.7 ug/g		
RLWQ97	Chromium (Cr)	384151	08/12/97	1 ug/L		
RLWQ97	Chromium (Cr)	384151	08/12/97	27 ug/g		
RLWQ97	Chromium (Cr)	384151	08/12/97	27.8 ug/g		
RLWQ97	Chromium (Cr)	384151	08/12/97	1 ug/L		
RLWQ97	Chromium (Cr)	384151	10/06/97	29.1 ug/g		2.
RLWQ97	Chromium (Cr)	384151	02/23/98	1 ug/L		1.5
RLWQ97	Chromium (Cr)	384151	02/23/98	33.9 ug/g		1.5
RLWQ97	Conductivity	384150	05/21/97	864 umhos/c		
RLWQ97	Conductivity	384150	05/21/97	857 umhos/c		
RLWQ97	Conductivity	384150	08/12/97	941 umhos/c		
RLWQ97	Conductivity	384150	10/07/97	999 umhos/c		2.
RLWQ97	Conductivity	384150	02/23/98	1120 umhos/c		1.5
RAWQM	Conductivity	384151	05/21/97	787 umhos/c		
RLWQ97	Conductivity	384151	05/21/97	795 umhos/c		
RLWQ97	Conductivity	384151	08/12/97	847 umhos/c		
RLWQ97	Conductivity	384151	08/12/97	846 umhos/c		
RLWQ97	Conductivity	384151	10/06/97	895 umhos/c		2.
RLWQ97	Conductivity	384151	02/23/98	1040 umhos/c		1.5
RLWQ97	Copper (Cu)	384150	05/21/97	26.8 ug/g		
RLWQ97	Copper (Cu)	384150	05/21/97	28.5 ug/g		
RLWQ97	Copper (Cu)	384150	05/21/97	9.66 ug/L		
RLWQ97	Copper (Cu)	384150	05/21/97	4.25 ug/L		
RLWQ97	Copper (Cu)	384150	08/12/97	5.25 ug/L		
RLWQ97	Copper (Cu)	384150	08/12/97	31.2 ug/g		
RLWQ97	Copper (Cu)	384150	10/07/97	32.6 ug/g		2.
RLWQ97	Copper (Cu)	384150	02/23/98	39.6 ug/g		1.5
RLWQ97	Copper (Cu)	384150	02/23/98	6.54 ug/L		1.5
RLWQ97	Copper (Cu)	384151	05/21/97	3.66 ug/L		
RLWQ97	Copper (Cu)	384151	05/21/97	25 ug/g		
RAWQM	Copper (Cu)	384151	05/21/97	24.7 ug/g		
RAWQM	Copper (Cu)	384151	05/21/97	3.59 ug/L		
RLWQ97	Copper (Cu)	384151	08/12/97	4.74 ug/L		
RLWQ97	Copper (Cu)	384151	08/12/97	5.73 ug/L		
RLWQ97	Copper (Cu)	384151	08/12/97	27 ug/g		
RLWQ97	Copper (Cu)	384151	08/12/97	27.8 ug/g		
RLWQ97	Copper (Cu)	384151	10/06/97	29.1 ug/g		2.
RLWQ97	Copper (Cu)	384151	02/23/98	33.9 ug/g		1.5
RLWQ97	Copper (Cu)	384151	02/23/98	5.75 ug/L		1.5
RLWQ97	Difference	384150	05/21/97	-0.87 me/L		
RLWQ97	Difference	384150	05/21/97	-0.682 me/L		
RLWQ97	Difference	384150	08/12/97	-0.683 me/L		
RLWQ97	Difference	384150	10/07/97	-0.29 me/L		2.
RLWQ97	Difference	384150	02/23/98	-0.791 me/L		1.5

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PROJECT	LONG NAME	STORET	DATE	RESULT2	UNITS	DEPTH
RLWQ97	Difference	384151	05/21/97	-1.174 me/L		
RAWQM	Difference	384151	05/21/97	-0.485 me/L		
RLWQ97	Difference	384151	08/12/97	-0.757 me/L		
RLWQ97	Difference	384151	08/12/97	-0.431 me/L		
RLWQ97	Difference	384151	10/06/97	-0.359 me/L		2.
RLWQ97	Difference	384151	02/23/98	-1.238 me/L		1.5
RLWQ97	Dissolved Phosphorus as P	384150	05/21/97	0.099 mg/L		
RLWQ97	Dissolved Phosphorus as P	384150	05/21/97	0.103 mg/L		
RLWQ97	Dissolved Phosphorus as P	384150	08/12/97	0.27 mg/L		
RLWQ97	Dissolved Phosphorus as P	384150	02/23/98	0.379 mg/L		1.5
RAWQM	Dissolved Phosphorus as P	384151	05/21/97	0.153 mg/L		
RLWQ97	Dissolved Phosphorus as P	384151	05/21/97	0.157 mg/L		
RLWQ97	Dissolved Phosphorus as P	384151	08/12/97	0.316 mg/L		
RLWQ97	Dissolved Phosphorus as P	384151	08/12/97	0.298 mg/L		
RLWQ97	Dissolved Phosphorus as P	384151	02/23/98	0.157 mg/L		1.5
RLWQ97	Dissolved Solids(C)-Total	384150	05/21/97	558 mg/L		
RLWQ97	Dissolved Solids(C)-Total	384150	05/21/97	517 mg/L		
RLWQ97	Dissolved Solids(C)-Total	384150	08/12/97	594 mg/L		
RLWQ97	Dissolved Solids(C)-Total	384150	10/07/97	610 mg/L		2.
RLWQ97	Dissolved Solids(C)-Total	384150	02/23/98	715 mg/L		1.5
RLWQ97	Dissolved Solids(C)-Total	384151	05/21/97	504 mg/L		
RAWQM	Dissolved Solids(C)-Total	384151	05/21/97	475 mg/L		
RLWQ97	Dissolved Solids(C)-Total	384151	08/12/97	524 mg/L		
RLWQ97	Dissolved Solids(C)-Total	384151	08/12/97	520 mg/L		
RLWQ97	Dissolved Solids(C)-Total	384151	10/06/97	545 mg/L		2.
RLWQ97	Dissolved Solids(C)-Total	384151	02/23/98	640 mg/L		1.5
RLWQ97	Hardness Total (as CaCO3)	384150	05/21/97	186 mg/L		
RLWQ97	Hardness Total (as CaCO3)	384150	05/21/97	175 mg/L		
RLWQ97	Hardness Total (as CaCO3)	384150	08/12/97	216 mg/L		
RLWQ97	Hardness Total (as CaCO3)	384150	10/07/97	216 mg/L		2.
RLWQ97	Hardness Total (as CaCO3)	384150	02/23/98	253 mg/L		1.5
RAWQM	Hardness Total (as CaCO3)	384151	05/21/97	168 mg/L		
RLWQ97	Hardness Total (as CaCO3)	384151	05/21/97	170 mg/L		
RLWQ97	Hardness Total (as CaCO3)	384151	08/12/97	192 mg/L		
RLWQ97	Hardness Total (as CaCO3)	384151	08/12/97	197 mg/L		
RLWQ97	Hardness Total (as CaCO3)	384151	10/06/97	200 mg/L		2.
RLWQ97	Hardness Total (as CaCO3)	384151	02/23/98	225 mg/L		1.5
RLWQ97	Hydroxide (OH)	384150	05/21/97	1 mg/L		
RLWQ97	Hydroxide (OH)	384150	05/21/97	1 mg/L		
RLWQ97	Hydroxide (OH)	384150	08/12/97	1 mg/L		
RLWQ97	Hydroxide (OH)	384150	10/07/97	1 mg/L		2.
RLWQ97	Hydroxide (OH)	384150	02/23/98	1 mg/L		1.5
RAWQM	Hydroxide (OH)	384151	05/21/97	1 mg/L		
RLWQ97	Hydroxide (OH)	384151	05/21/97	1 mg/L		
RLWQ97	Hydroxide (OH)	384151	08/12/97	1 mg/L		
RLWQ97	Hydroxide (OH)	384151	08/12/97	1 mg/L		
RLWQ97	Hydroxide (OH)	384151	10/06/97	1 mg/L		2.
RLWQ97	Hydroxide (OH)	384151	02/23/98	1 mg/L		1.5

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PROJECT	LONG NAME	STORET	DATE	RESULT2	UNITS	DEPTH
RLWQ97	Iron (Fe)	384150	05/21/97	0.095 mg/L		
RLWQ97	Iron (Fe)	384150	05/21/97	0.071 mg/L		
RLWQ97	Iron (Fe)	384150	08/12/97	0.193 mg/L		
RLWQ97	Iron (Fe)	384150	10/07/97	0.376 mg/L		2.
RLWQ97	Iron (Fe)	384150	02/23/98	0.033 mg/L		1.5
RAWQM	Iron (Fe)	384151	05/21/97	0.017 mg/L		
RLWQ97	Iron (Fe)	384151	05/21/97	0.016 mg/L		
RLWQ97	Iron (Fe)	384151	08/12/97	0.143 mg/L		
RLWQ97	Iron (Fe)	384151	08/12/97	0.137 mg/L		
RLWQ97	Iron (Fe)	384151	10/06/97	0.142 mg/L		2.
RLWQ97	Iron (Fe)	384151	02/23/98	0.014 mg/L		1.5
RLWQ97	Lead (Pb)	384150	05/21/97	0.73 ug/L		
RLWQ97	Lead (Pb)	384150	05/21/97	0.2 ug/L		
RLWQ97	Lead (Pb)	384150	08/12/97	5.49 ug/L		
RLWQ97	Lead (Pb)	384150	02/23/98	1.52 ug/L		1.5
RLWQ97	Lead (Pb)	384151	05/21/97	1.4 ug/L		
RAWQM	Lead (Pb)	384151	05/21/97	0.33 ug/L		
RLWQ97	Lead (Pb)	384151	08/12/97	1 ug/L		
RLWQ97	Lead (Pb)	384151	08/12/97	3.61 ug/L		
RLWQ97	Lead (Pb)	384151	02/23/98	1.24 ug/L		1.5
RLWQ97	Magnesium (Mg)	384150	05/21/97	26.8 mg/L		
RLWQ97	Magnesium (Mg)	384150	05/21/97	28.5 mg/L		
RLWQ97	Magnesium (Mg)	384150	08/12/97	31.2 mg/L		
RLWQ97	Magnesium (Mg)	384150	10/07/97	32.6 mg/L		2.
RLWQ97	Magnesium (Mg)	384150	02/23/98	39.6 mg/L		1.5
RLWQ97	Magnesium (Mg)	384151	05/21/97	25 mg/L		
RAWQM	Magnesium (Mg)	384151	05/21/97	24.7 mg/L		
RLWQ97	Magnesium (Mg)	384151	08/12/97	27.8 mg/L		
RLWQ97	Magnesium (Mg)	384151	08/12/97	27 mg/L		
RLWQ97	Magnesium (Mg)	384151	10/06/97	29.1 mg/L		2.
RLWQ97	Magnesium (Mg)	384151	02/23/98	33.9 mg/L		1.5
RLWQ97	Manganese (Mn)	384150	05/21/97	0.027 mg/L		
RLWQ97	Manganese (Mn)	384150	05/21/97	0.022 mg/L		
RLWQ97	Manganese (Mn)	384150	08/12/97	0.105 mg/L		
RLWQ97	Manganese (Mn)	384150	10/07/97	0.071 mg/L		2.
RLWQ97	Manganese (Mn)	384150	02/23/98	0.221 mg/L		1.5
RLWQ97	Manganese (Mn)	384151	05/21/97	0.044 mg/L		
RAWQM	Manganese (Mn)	384151	05/21/97	0.044 mg/L		
RLWQ97	Manganese (Mn)	384151	08/12/97	0.157 mg/L		
RLWQ97	Manganese (Mn)	384151	08/12/97	0.152 mg/L		
RLWQ97	Manganese (Mn)	384151	10/06/97	0.062 mg/L		2.
RLWQ97	Manganese (Mn)	384151	02/23/98	0.037 mg/L		1.5
RLWQ97	Nickel (Ni)	384150	05/21/97	13.9 ug/L		
RLWQ97	Nickel (Ni)	384150	05/21/97	1.97 ug/L		
RLWQ97	Nickel (Ni)	384150	08/12/97	2.47 ug/L		
RLWQ97	Nickel (Ni)	384150	02/23/98	2.63 ug/L		1.5

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PROJECT	LONG NAME	STORET	DATE	RESULT2	UNITS	DEPTH
RLWQ97	Nickel (Ni)	384151	05/21/97	1.83 ug/L		
RAWQM	Nickel (Ni)	384151	05/21/97	1.78 ug/L		
RLWQ97	Nickel (Ni)	384151	08/12/97	2.69 ug/L		
RLWQ97	Nickel (Ni)	384151	08/12/97	2.51 ug/L		
RLWQ97	Nickel (Ni)	384151	02/23/98	2.36 ug/L		1.5
RLWQ97	Nitrate + Nitrite (N)	384150	05/21/97	0.02 mg/L		
RLWQ97	Nitrate + Nitrite (N)	384150	05/21/97	0.02 mg/L		
RLWQ97	Nitrate + Nitrite (N)	384150	08/12/97	0.02 mg/L		
RLWQ97	Nitrate + Nitrite (N)	384150	10/07/97	0.03 mg/L		2.
RLWQ97	Nitrate + Nitrite (N)	384150	02/23/98	0.02 mg/L		1.5
RAWQM	Nitrate + Nitrite (N)	384151	05/21/97	0.02 mg/L		
RLWQ97	Nitrate + Nitrite (N)	384151	05/21/97	0.02 mg/L		
RLWQ97	Nitrate + Nitrite (N)	384151	08/12/97	0.02 mg/L		
RLWQ97	Nitrate + Nitrite (N)	384151	08/12/97	0.02 mg/L		
RLWQ97	Nitrate + Nitrite (N)	384151	10/06/97	0.02 mg/L		2.
RLWQ97	Nitrate + Nitrite (N)	384151	02/23/98	0.02 mg/L		1.5
RLWQ97	Nitrogen (Total Kjeldahl)	384150	05/21/97	1.97 mg/L		
RLWQ97	Nitrogen (Total Kjeldahl)	384150	05/21/97	1.96 mg/L		
RLWQ97	Nitrogen (Total Kjeldahl)	384150	08/12/97	2.02 mg/L		
RLWQ97	Nitrogen (Total Kjeldahl)	384150	10/07/97	1.95 mg/L		2.
RLWQ97	Nitrogen (Total Kjeldahl)	384150	02/23/98	3.16 mg/L		1.5
RAWQM	Nitrogen (Total Kjeldahl)	384151	05/21/97	1.75 mg/L		
RLWQ97	Nitrogen (Total Kjeldahl)	384151	05/21/97	1.93 mg/L		
RLWQ97	Nitrogen (Total Kjeldahl)	384151	08/12/97	1.85 mg/L		
RLWQ97	Nitrogen (Total Kjeldahl)	384151	08/12/97	1.76 mg/L		
RLWQ97	Nitrogen (Total Kjeldahl)	384151	10/06/97	1.87 mg/L		2.
RLWQ97	Nitrogen (Total Kjeldahl)	384151	02/23/98	2.8 mg/L		1.5
RLWQ97	Percent Difference	384150	05/21/97	-4.79 %		
RLWQ97	Percent Difference	384150	05/21/97	-4.02 %		
RLWQ97	Percent Difference	384150	08/12/97	-3.36 %		
RLWQ97	Percent Difference	384150	10/07/97	-1.44 %		2.
RLWQ97	Percent Difference	384150	02/23/98	-3.34 %		1.5
RAWQM	Percent Difference	384151	05/21/97	-3.13 %		
RLWQ97	Percent Difference	384151	05/21/97	-7.14 %		
RLWQ97	Percent Difference	384151	08/12/97	-2.45 %		
RLWQ97	Percent Difference	384151	08/12/97	-4.37 %		
RLWQ97	Percent Difference	384151	10/06/97	-1.98 %		2.
RLWQ97	Percent Difference	384151	02/23/98	-5.87 %		1.5
RLWQ97	Percent Sodium	384150	05/21/97	50.2 %		
RLWQ97	Percent Sodium	384150	05/21/97	50.2 %		
RLWQ97	Percent Sodium	384150	08/12/97	47.8 %		
RLWQ97	Percent Sodium	384150	10/07/97	49.8 %		2.
RLWQ97	Percent Sodium	384150	02/23/98	49.4 %		1.5

97WQDATA

PROJECT	LONG NAME	STORET	DATE	RESULT2	UNITS	DEPTH
RLWQ97	Percent Sodium	384151	05/21/97	48.2 %		
RAWQM	Percent Sodium	384151	05/21/97	48 %		
RLWQ97	Percent Sodium	384151	08/12/97	46.8 %		
RLWQ97	Percent Sodium	384151	08/12/97	46.5 %		
RLWQ97	Percent Sodium	384151	10/06/97	48 %		2.
RLWQ97	Percent Sodium	384151	02/23/98	47.7 %		1.5
RLWQ97	pH	384150	05/21/97	9.33		
RLWQ97	pH	384150	05/21/97	9.32		
RLWQ97	pH	384150	08/12/97	9.1		
RLWQ97	pH	384150	10/07/97	9.22		2.
RLWQ97	pH	384150	02/23/98	8.23		1.5
RAWQM	pH	384151	05/21/97	9.33		
RLWQ97	pH	384151	05/21/97	9.33		
RLWQ97	pH	384151	08/12/97	9.12		
RLWQ97	pH	384151	08/12/97	9.06		
RLWQ97	pH	384151	10/06/97	9.3		2.
RLWQ97	pH	384151	02/23/98	8.36		1.5
RLWQ97	Phosphorus (Total) (P)	384150	05/21/97	0.136 mg/L		
RLWQ97	Phosphorus (Total) (P)	384150	05/21/97	0.117 mg/L		
RLWQ97	Phosphorus (Total) (P)	384150	08/12/97	0.347 mg/L		
RLWQ97	Phosphorus (Total) (P)	384150	10/07/97	0.111 mg/L		2.
RLWQ97	Phosphorus (Total) (P)	384150	02/23/98	0.384 mg/L		1.5
RAWQM	Phosphorus (Total) (P)	384151	05/21/97	0.175 mg/L		
RLWQ97	Phosphorus (Total) (P)	384151	05/21/97	0.173 mg/L		
RLWQ97	Phosphorus (Total) (P)	384151	08/12/97	0.379 mg/L		
RLWQ97	Phosphorus (Total) (P)	384151	08/12/97	0.385 mg/L		
RLWQ97	Phosphorus (Total) (P)	384151	10/06/97	0.138 mg/L		2.
RLWQ97	Phosphorus (Total) (P)	384151	02/23/98	0.222 mg/L		1.5
RLWQ97	Potassium (K)	384150	05/21/97	22.4 mg/L		
RLWQ97	Potassium (K)	384150	05/21/97	21.1 mg/L		
RLWQ97	Potassium (K)	384150	08/12/97	24.7 mg/L		
RLWQ97	Potassium (K)	384150	10/07/97	25.5 mg/L		2.
RLWQ97	Potassium (K)	384150	02/23/98	28 mg/L		1.5
RLWQ97	Potassium (K)	384151	05/21/97	21.1 mg/L		
RAWQM	Potassium (K)	384151	05/21/97	20.8 mg/L		
RLWQ97	Potassium (K)	384151	08/12/97	23.7 mg/L		
RLWQ97	Potassium (K)	384151	08/12/97	23 mg/L		
RLWQ97	Potassium (K)	384151	10/06/97	24.2 mg/L		2.
RLWQ97	Potassium (K)	384151	02/23/98	25.9 mg/L		1.5
RLWQ97	Selenium (Se)	384150	05/21/97	5.37 ug/L		
RLWQ97	Selenium (Se)	384150	05/21/97	1.05 ug/L		
RLWQ97	Selenium (Se)	384150	08/12/97	1 ug/L		
RLWQ97	Selenium (Se)	384150	02/23/98	1.5 ug/L		1.5
RLWQ97	Selenium (Se)	384151	05/21/97	0.2 ug/L		
RAWQM	Selenium (Se)	384151	05/21/97	2.27 ug/L		
RLWQ97	Selenium (Se)	384151	08/12/97	1 ug/L		
RLWQ97	Selenium (Se)	384151	08/12/97	1 ug/L		
RLWQ97	Selenium (Se)	384151	02/23/98	1 ug/L		1.5

97WQDATA

PROJECT	LONG NAME	STORET	DATE	RESULT2	UNITS	DEPTH
RLWQ97	Silver (Ag)	384150	05/21/97	0.04 ug/L		
RLWQ97	Silver (Ag)	384150	05/21/97	0.37 ug/L		
RLWQ97	Silver (Ag)	384150	08/12/97	1 ug/L		
RLWQ97	Silver (Ag)	384150	02/23/98	1 ug/L		1.5
RAWQM	Silver (Ag)	384151	05/21/97	0.04 ug/L		
RLWQ97	Silver (Ag)	384151	05/21/97	0.04 ug/L		
RLWQ97	Silver (Ag)	384151	08/12/97	1 ug/L		
RLWQ97	Silver (Ag)	384151	08/12/97	1 ug/L		
RLWQ97	Silver (Ag)	384151	02/23/98	5 ug/L		1.5
RLWQ97	Sodium (Na)	384150	05/21/97	94.2 mg/L		
RLWQ97	Sodium (Na)	384150	05/21/97	100 mg/L		
RLWQ97	Sodium (Na)	384150	08/12/97	105 mg/L		
RLWQ97	Sodium (Na)	384150	10/07/97	114 mg/L		2.
RLWQ97	Sodium (Na)	384150	02/23/98	130 mg/L		1.5
RLWQ97	Sodium (Na)	384151	05/21/97	84.7 mg/L		
RAWQM	Sodium (Na)	384151	05/21/97	82.9 mg/L		
RLWQ97	Sodium (Na)	384151	08/12/97	92.3 mg/L		
RLWQ97	Sodium (Na)	384151	08/12/97	88.7 mg/L		
RLWQ97	Sodium (Na)	384151	10/08/97	98.3 mg/L		2.
RLWQ97	Sodium (Na)	384151	02/23/98	109 mg/L		1.5
RLWQ97	Sodium Adsorption Ratio	384150	05/21/97	3.19		
RLWQ97	Sodium Adsorption Ratio	384150	05/21/97	3.1		
RLWQ97	Sodium Adsorption Ratio	384150	08/12/97	3.11		
RLWQ97	Sodium Adsorption Ratio	384150	10/07/97	3.37		2.
RLWQ97	Sodium Adsorption Ratio	384150	02/23/98	3.58		1.5
RLWQ97	Sodium Adsorption Ratio	384151	05/21/97	2.82		
RAWQM	Sodium Adsorption Ratio	384151	05/21/97	2.78		
RLWQ97	Sodium Adsorption Ratio	384151	08/12/97	2.88		
RLWQ97	Sodium Adsorption Ratio	384151	08/12/97	2.79		
RLWQ97	Sodium Adsorption Ratio	384151	10/06/97	3.02		2.
RLWQ97	Sodium Adsorption Ratio	384151	02/23/98	3.16		1.5
RLWQ97	Sulfate as (SO4)	384150	05/21/97	244 mg/L		
RLWQ97	Sulfate as (SO4)	384150	05/21/97	218 mg/L		
RLWQ97	Sulfate as (SO4)	384150	08/12/97	241 mg/L		
RLWQ97	Sulfate as (SO4)	384150	10/07/97	261 mg/L		2.
RLWQ97	Sulfate as (SO4)	384150	02/23/98	298 mg/L		1.5
RAWQM	Sulfate as (SO4)	384151	05/21/97	209 mg/L		
RLWQ97	Sulfate as (SO4)	384151	05/21/97	212 mg/L		
RLWQ97	Sulfate as (SO4)	384151	08/12/97	202 mg/L		
RLWQ97	Sulfate as (SO4)	384151	08/12/97	202 mg/L		
RLWQ97	Sulfate as (SO4)	384151	10/06/97	221 mg/L		2.
RLWQ97	Sulfate as (SO4)	384151	02/23/98	268 mg/L		1.5
RLWQ97	Thallium (Tl)	384150	05/21/97	0.03 ug/L		
RLWQ97	Thallium (Tl)	384150	05/21/97	0.03 ug/L		
RLWQ97	Thallium (Tl)	384150	08/12/97	1 ug/L		
RLWQ97	Thallium (Tl)	384150	02/23/98	1 ug/L		1.5

97WQDATA

PROJECT	LONG NAME	STORET	DATE	RESULT2	UNITS	DEPTH
RLWQ97	Thallium (Tl)	384151	05/21/97	0.03 ug/L		
RAWQM	Thallium (Tl)	384151	05/21/97	0.03 ug/L		
RLWQ97	Thallium (Tl)	384151	08/12/97	1 ug/L		
RLWQ97	Thallium (Tl)	384151	08/12/97	1 ug/L		
RLWQ97	Thallium (Tl)	384151	02/23/98	1 ug/L		1.5
RLWQ97	Zinc (Zn)	384150	05/21/97	65 ug/g		
RLWQ97	Zinc (Zn)	384150	05/21/97	107 ug/L		
RLWQ97	Zinc (Zn)	384150	05/21/97	0.2 ug/L		
RLWQ97	Zinc (Zn)	384150	05/21/97	50 ug/g		
RLWQ97	Zinc (Zn)	384150	08/12/97	118 ug/g		
RLWQ97	Zinc (Zn)	384150	08/12/97	16 ug/L		
RLWQ97	Zinc (Zn)	384150	02/23/98	4.95 ug/L		1.5
RLWQ97	Zinc (Zn)	384150	02/23/98	50 ug/g		1.5
RLWQ97	Zinc (Zn)	384151	05/21/97	0.2 ug/L		
RAWQM	Zinc (Zn)	384151	05/21/97	0.2 ug/L		
RAWQM	Zinc (Zn)	384151	05/21/97	50 ug/g		
RLWQ97	Zinc (Zn)	384151	05/21/97	50 ug/g		
RLWQ97	Zinc (Zn)	384151	08/12/97	91 ug/g		
RLWQ97	Zinc (Zn)	384151	08/12/97	83 ug/g		
RLWQ97	Zinc (Zn)	384151	08/12/97	25.1 ug/L		
RLWQ97	Zinc (Zn)	384151	08/12/97	18.3 ug/L		
RLWQ97	Zinc (Zn)	384151	02/23/98	9.15 ug/L		1.5
RLWQ97	Zinc (Zn)	384151	02/23/98	58 ug/g		1.5

APPENDIX B
PHYTOPLANKTON DATA

		DL 384150	8/12/97
Chlorophyta	Botryococcus sp.		0
	Choricystis minor		0
	Closterium sp. 1		
	Coelastrum sp.	24000	1944000
	Dictyosphaerium pulcherrum	32000	268800
	Elakatothrix gelatinosa		0
	Kirchneriella sp.	609000	1278900
	Monoraphidium contortum		0
	Monoraphidium minutum		0
	Monoraphidium pusillum	609000	17052000
	Monoraphidium tortile	243600	1583400
	Oocystis nodulosa	365400	550657800
	Oocystis solitaire		0
	Pediastrum boryanum		0
	Pediastrum duplex	96000	27648000
	Pyramimonas sp. 1	121800	34225800
	Quadrigula closteroides	487200	19488000
	Raphidonema sp. 1		0
	Raphidonema sp. 2		0
	Scenedesmus diamorphus		0
	Totals	2588000	654146700
Cryptophyceae			
	Chroomonas acuta	243600	67233600
	Cryptomonas erosa	121800	158949000
	Cryptomonas gracilis		0
	Cryptomonas marssonii		0
	Rhodomonas minuta	243600	41412000
	Rhodomonas minuta v. nannoplantica	121800	767340
	Rhodomonas pusilla		0
	Totals	730800	268361940
Cyanophyceae			
	Anabaena spiroides	6000	756000
	Aphanizomenon flos-aquae	121800	91837200
	Aphanocapsa delicatissima		0
	Aphanothece sp.	80000	280000
	Chroococcus minor	974400	13739040
	Coelosphaerium pallidum		0
	Gloeocapsa aeruginosa		0
	Gloeocapsa sp.		0
	Gomphosphaeria aponina		0
	Gomphosphaeria lacustris v. compacta		0
	Lyngbya contorta		0
	Merismopedia tenuissima	5481000	9865800
	Microcystis aeruginosa	524000	7336000
	Microcystis incerta		0
	Oscillatoria augustissima	243600	2752680
	Oscillatoria limnetica	6000	756000
	Oscillatoria minima		0

	Totals	7436800	127322720
Euglenophyceae	Euglena rostrata	2000	1306000
	Totals	2000	1306000
Dinophyceae	Ceratium hirundinella	2000	32726000
	Totals	2000	32726000
Chrysophyceae			
	Ochromonas minuta		0
	Ochromonas sp. 1		
	Synura sp.	121800	11571000
	Totals	121800	11571000
Bacillariophyceae			
	Aulacoseira granulata	2557800	4018303800
	Aulacoseira granulata v. augustissima	50181600	7075605600
	Cyclostephanos sp.	852600	172225200
	Cyclotella meneghiana		0
	Nitzschia acicularis		0
	Nitzschia inconspicua	121800	2923200
	Stephanodiscus rotula	20000	502660000
	Totals	53733800	11771717800
	Chlorophyta	2588000	
	Cyanophyceae	7436800	
	Euglenophyceae	2000	
	Dinophyceae	2000	
	Chrysophyceae	121800	
	Bacillariophyceae	53733800	
	Chlorophyta	654146700	
	Cyanophyceae	127322720	
	Euglenophyceae	1306000	
	Dinophyceae	32726000	
	Chrysophyceae	11571000	
	Bacillariophyceae	11771717800	
		DL 384150	10/7/97
Chlorophyta	Botryococcus sp.		0
	Choricystis minor		0
	Closterium sp. 1	2000	818000
	Coelastrum sp.	20000	1620000
	Dictyosphaerium pulcherrum	2977333	25009597.2

	Elakatothrix gelatinosa		0
	Kirchneriella sp.	406000	852600
	Monoraphidium contortum	270666.7	622533.41
	Monoraphidium minutum	270666.7	866133.44
	Monoraphidium pusillum		0
	Monoraphidium tortile	406000	2639000
	Oocystis nodulosa	541333.3	815789283.1
	Oocystis solitaire		0
	Pediastrum boryanum		0
	Pediastrum duplex	44000	12672000
	Pyramimonas sp. 1		0
	Quadrigula closteroides	541333.3	21653332
	Raphidonema sp. 1		0
	Raphidonema sp. 2	676666.7	7105000.35
	Scenedesmus diamorphus		0
	Totals	6155999.7	889647479.5
Cryptophyceae			
	Chroomonas acuta	270666.7	74704009.2
	Cryptomonas erosa		0
	Cryptomonas gracilis		0
	Cryptomonas marssonii		0
	Rhodomonas minuta		0
	Rhodomonas minuta v. nannoplanctica		0
	Rhodomonas pusilla		0
	Totals	270666.7	74704009.2
Cyanophyceae			
	Anabaena spiroides	2000	252000
	Aphanizomenon flos-aquae	6225334	4693901836
	Aphanocapsa delicatissima	27405000	230202000
	Aphanothece sp.	160000	560000
	Chroococcus minor	541333.3	7632799.53
	Coelosphaerium pallidum	2706667	9473334.5
	Gloeocapsa aeruginosa	128194500	230750100
	Gloeocapsa sp.		0
	Gomphosphaeria aponina	60000	1680000
	Gomphosphaeria lacustris v. compacta	2706667	12721334.9
	Lyngbya contorta	406000	7186200
	Merismopedia tenuissima	57246000	103042800
	Microcystis aeruginosa	8120000	113680000
	Microcystis incerta	8120000	730800
	Oscillatoria augustissima	270666.7	3058533.71
	Oscillatoria limnetica		
	Oscillatoria minima		0
	Totals	242164168	5414871739
Euglenophyceae			
	Euglena rostrata		0
	Totals		0
Dinophyceae			
	Ceratium hirundinella		0
	Totals		0

Chrysophyceae			
	Ochromonas minuta	135333.3	9067331.1
	Ochromonas sp. 1	135333.3	
	Synura sp.		0
	Totals	135333.3	9067331.1
Bacillariophyceae			
	Aulacoseira granulata	4060000	6378260000
	Aulacoseira granulata v. augustissima	29096670	4102630470
	Cyclostephanos sp.	2300667	464734734
	Cyclotella meneghiana	541333.3	1105943932
	Nitzschia acicularis	135333.3	28284659.7
	Nitzschia inconspicua		0
	Stephanodiscus rotula	46000	1156118000
	Totals	36180003.6	13235971796
		DL 384151	8/12/97
Chlorophyta			
	Botryococcus sp.		0
	Choricystis minor	121800	4579680
	Closterium sp. 1	2000	818000
	Coelastrum sp.		0
	Dictyosphaerium pulcherrum	1583400	13300560
	Elakatothrix gelatinosa		0
	Kirchneriella sp.	0	0
	Monoraphidium contortum	609000	1400700
	Monoraphidium minutum	1096200	3507840
	Monoraphidium pusillum	121800	3410400
	Monoraphidium tortile	852600	5541900
	Oocystis nodulosa		0
	Oocystis solitaire		0
	Pediastrum boryanum	44000	26400000
	Pediastrum duplex	64000	18432000
	Pyramimonas sp. 1		0
	Quadrigula closteroides	487200	19488000
	Raphidonema sp. 1	365400	1571220
	Raphidonema sp. 2		0
	Scenedesmus diamorphus	609000	122409000
	Totals	5956400	220859300
Cryptophyceae			
	Chroomonas acuta		0
	Cryptomonas erosa	2000	2610000
	Cryptomonas gracilis		0
	Cryptomonas marssonii	2000	2164000
	Rhodomonas minuta	121800	20706000
	Rhodomonas minuta v. nannoplanctica	365400	2302020
	Rhodomonas pusilla		0

	Totals	491200	27782020
Cyanophyceae			
	Anabaena spiroides	32000	4032000
	Aphanizomenon flos-aquae	2000	1508000
	Aphanocapsa delicatissima		0
	Aphanothece sp.		0
	Chroococcus minor	1583400	22325940
	Coelosphaerium pallidum		0
	Gloeocapsa aeruginosa		0
	Gloeocapsa sp.	3897600	2728320
	Gomphosphaeria aponina		0
	Gomphosphaeria lacustris v. compacta		0
	Lyngbya contorta		0
	Merismopedia tenuissima	89320000	160776000
	Microcystis aeruginosa		0
	Microcystis incerta		0
	Oscillatoria augustissima	2000	22600
	Oscillatoria limnetica		0
	Oscillatoria minima		0
	Totals	94837000	191392860
Euglenophyceae	Euglena rostrata		0
	Totals		0
Dinophyceae	Ceratium hirundinella		0
	Totals		0
Chrysophyceae			
	Ochromonas minuta		0
	Ochromonas sp. 1	121800	
	Synura sp.	365400	34713000
	Totals	487200	34713000
Bacillariophyceae			
	Aulacoseira granulata	12545400	19708823400
	Aulacoseira granulata v. augustissima	4019400	566735400
	Cyclostephanos sp.	487200	98414400
	Cyclotella meneghiana	121800	248837400
	Nitzschia acicularis		0
	Nitzschia inconspicua	121800	2923200
	Stephanodiscus rotula	10000	251330000
	Totals	17305600	20877063800
		DL384151	10/7/97
Chlorophyta	Botryococcus sp.	913500	30602250
	Choricystis minor	456750	17173800

	Closterium sp. 1	8000	3272000
	Coelastrum sp.	16000	1296000
	Dictyosphaerium pulcherrum	2436000	20462400
	Elakatothrix gelatinosa	609000	21315000
	Kirchneriella sp.		0
	Monoraphidium contortum	913500	2101050
	Monoraphidium minutum	1522500	4872000
	Monoraphidium pusillum	456750	12789000
	Monoraphidium tortile	761250	4948125
	Oocystis nodulosa	1218000	1835526000
	Oocystis solitaire		0
	Pediastrum boryanum	32000	19200000
	Pediastrum duplex	64000	18432000
	Pyramimonas sp. 1		0
	Quadrigula closteroides		0
	Raphidonema sp. 1	761250	3273375
	Raphidonema sp. 2	913500	9591750
	Scenedesmus diamorphus	8000	1608000
	Totals	11090000	2006462750
Cryptophyceae			
	Chroomonas acuta		0
	Cryptomonas erosa		0
	Cryptomonas gracilis	152250	7003500
	Cryptomonas marssonii		0
	Rhodomonas minuta		0
	Rhodomonas minuta v. nannoplanctica	761250	4795875
	Rhodomonas pusilla	304500	29536500
	Totals	1218000	41335875
Cyanophyceae			
	Anabaena spiroides		0
	Aphanizomenon flos-aquae	3349500	2525523000
	Aphanocapsa delicatissima	36540000	306936000
	Aphanothece sp.		0
	Chroococcus minor	8982750	126656775
	Coelosphaerium pallidum	2436000	8526000
	Gloeocapsa aeruginosa		0
	Gloeocapsa sp.	39280500	27496350
	Gomphosphaeria aponina		0
	Gomphosphaeria lacustris v. compacta		0
	Lyngbya contorta	761250	13474125
	Merismopedia tenuissima	136416000	245548800
	Microcystis aeruginosa		0
	Microcystis incerta	27405000	2466450
	Oscillatoria augustissima		0
	Oscillatoria limnetica		0
	Oscillatoria minima	1827000	34713000
	Totals	256998000	3291340500
Euglenophyceae			
	Euglena rostrata		0
	Totals		0

Dinophyceae	Ceratium hirundinella		0
	Totals		0
Chrysophyceae			
	Ochromonas minuta		0
	Ochromonas sp. 1		
	Synura sp.	1065750	101246250
	Totals	1065750	101246250
Bacillariophyceae			
	Aulacoseira granulata	304500	478369500
	Aulacoseira granulata v. augustissima	23294250	3284489250
	Cyclostephanos sp.	1979250	399808500
	Cyclotella meneghiana	1218000	2488374000
	Nitzschia acicularis	304500	63640500
	Nitzschia inconspicua	152250	3654000
	Stephanodiscus rotula	761250	19132496250
	Totals	28014000	25850832000

APPENDIX C
SEDIMENT DATA

North Dakota Department of Health
Chemistry Division

Page: 1

Original Report Date: 9/27/99

Report Date: 9/27/99

Log Number: 97-R2098

Date Collected: 8/11/97

Time Collected: 13:30

Collected By: Long/Stroup

Date Received: 8/13/97

Time Received: 14:00

Project Code: RLW097

Site Code: 384140

Project: LAKE WATER QUALITY ASSESSMENT 1997

Site: LAKE DARLING - DEEPEST IN FRONT OF DAM RIVER CHANNEL

Comments:

Approved by:

Organic

Approved by:

Inorganic

Analyte		Result	Detect Level	Units	1 SD (%)	Date	Time	Analyst
Aluminum (Al)	(1413)	10100	500.	ug/g	10.	1/23/98	10:31	Carol
Manganese (Mn)	(1425)	307.	4.00	ug/g	6.7	1/23/98	10:31	Carol
Iron (Fe)	(1426)	15800	500.	ug/g	7.4	1/23/98	10:31	Carol
Copper (Cu)	(1429)	9.98	1.00	ug/g	7.5	1/22/98	10:19	Carol
Zinc (Zn)	(1430)	41.0	4.00	ug/g	6.7	1/22/98	10:19	Carol
Barium (Ba)	(1456)	99.6	1.00	ug/g	8.0	1/22/98	10:19	Carol
Chromium (Cr)	(2424)	16.8		ug/g		1/21/98	9:00	Mike
Arsenic (As)	(2433)	4.86		ug/g		1/21/98	9:00	Mike
Selenium (Se)	(2434)	0.750		ug/g		1/21/98	9:00	Mike
Cadmium (Cd)	(2448)	0.253		ug/g		1/21/98	9:00	Mike
Lead (Pb)	(2482)	7.97		ug/g		1/21/98	9:00	Mike
Mercury (Hg)	(3480)	0.030		ug/g	9.9	3/10/98	8:00	Carol
Slits Content, Ambient	(6620)	42.31		%		10/10/97	13:08	Eric
Endrin	(26111)	Not Entered	0.150					
BHC (Alpha)	(26116)	Not Entered	0.030					
BHC (Beta)	(26121)	Not Entered	0.030					
BHC (Delta)	(26126)	Not Entered	0.030					
Lindane	(26131)	Not Entered	0.030					
DDD	(26141)	Not Entered	0.050					
DE	(26146)	Not Entered	0.050					
DT	(26151)	Not Entered	0.050					
Dieldrin	(26156)	Not Entered	0.040					
Endosulfan I	(26161)	Not Entered	0.050					
Endosulfan II	(26166)	Not Entered	0.050					
Endosulfan Sulfate	(26171)	Not Entered	0.050					
Endrin	(26176)	Not Entered	0.050					
Endrin Aldehyde	(26181)	Not Entered	0.050					
Heptachlor	(26186)	Not Entered	0.030					
Heptachlor Epoxide	(26191)	Not Entered	0.030					
Methoxychlor	(26196)	Not Entered	0.100					
Endosulfan	(26201)	ND	0.010	ug/g		10/15/97	10:00	Sujit
Toxaphene	(26211)	Not Entered	0.250					
Chlordane (gamma)	(26256)	Not Entered	0.050					
Chlordane (alpha)	(26261)	Not Entered	0.050					

North Dakota Department of Health
Chemistry Division

Page: 2

Original Report Date: 9/27/99

Report Date: 9/27/99

Log Number: 97-R2098 cont'd

97-R2098

Analyte	Result	Detect Level	Units	1 SD (%)	Date	Time	Analyst
trans-Nonachlor	{26266}	Not Entered	0.030				
Drin Ketone	{26271}	Not Entered	0.050				
Acachlor	{26276}	Not Entered	0.150				
Chlorpyrifos	{26311}	Not Entered	0.050				
iazinon	{26316}	Not Entered	0.050				
lathion	{26326}	Not Entered	0.100				
Parathion Ethyl	{26331}	Not Entered	0.100				
Parathion Methyl	{26336}	Not Entered	0.100				
invalerate	{26371}	Not Entered	0.250				
Cyanazine	{26721}	Not Entered	0.200				
Ear-Go (Triallate)	{26726}	Not Entered	0.040				
teflan (Trifluralin)	{26731}	Not Entered	0.030				
umazine	{26736}	Not Entered	1.25				
Ethalfuralin	{26746}	Not Entered	0.030				
razine	{26811}	Not Entered	1.25				
owl	{26831}	Not Entered	0.050				
Metribuzine	{26941}	Not Entered	0.100				
tolachlor	{26946}	Not Entered	0.44				
4-D	{28616}	ND	0.010	ug/g	10/15/97	10:00	Sujit
Dicamba	{28621}	ND	0.010	ug/g	10/15/97	10:00	Sujit
Dinoseb	{28626}	ND	1.00	ug/g	10/15/97	10:00	Sujit
CPA	{28631}	ND	5.00	ug/g	10/15/97	10:00	Sujit
ordon	{28636}	ND	0.010	ug/g	10/15/97	10:00	Sujit
2,4,5-T	{28641}	ND	0.010	ug/g	10/15/97	10:00	Sujit
lvex (2,4,5-TP)	{28646}	ND	0.02	ug/g	10/15/97	10:00	Sujit
entachlorophenol	{28651}	ND	0.500	ug/g	10/15/97	10:00	Sujit
Acifluorfen	{28666}	ND	0.020	ug/g	10/15/97	10:00	Sujit
2,5 Dichlorobenzoic Acid	{28671}	ND	0.050	ug/g	10/15/97	10:00	Sujit
omoxynil	{30601}	ND	0.010	ug/g	10/15/97	10:00	Sujit
Dichlorprop	{30946}	ND	0.02	ug/g	10/15/97	10:00	Sujit
Bentazon	{30956}	ND	0.05	ug/g	10/15/97	10:00	Sujit
rochlor 1016	{43311}	Not Entered					
rochlor 1221	{43321}	Not Entered					
Arochlor 1232	{43331}	Not Entered					
rochlor 1242	{43341}	Not Entered					
rochlor 1248	{43351}	Not Entered					
Arochlor 1254	{43361}	Not Entered					
rochlor 1260	{43371}	Not Entered					
rochlor 1262	{43381}	Not Entered					
soil Prep-Metal	{44516}	done			1/ 8/98	11:07	Dean W
Soil Prep-Mercury	{44519}	Prepared			3/11/98	8:00	Carol

North Dakota Department of Health
Chemistry Division

Page: 3

Original Report Date: 9/27/99

Report Date: 9/27/99

Log Number: 97-R2098 cont'd

97-R2098

ND = Not Detected

NOTE: With the exception of VOC analytes # 40000 - 41999,
weight to weight unit analytes are reported as dry weight.
Use percent solids data to convert to wet weight if necessary.

NOTE: This report represents the current state of work in progress.
Additional analyses may change some of the results reported.

North Dakota Department of Health
Chemistry Division

Page: 1

Original Report Date: 9/27/99

Report Date: 9/27/99

Log Number: 97-R2099

Sample Collected: 8/11/97

Time Collected: 13:30

Collected By: Long/Stroup

Sample Received: 8/13/97

Time Received: 14:00

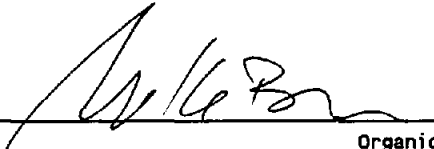
Project Code: RLWQ97

Site Code: 389999

Project: LAKE WATER QUALITY ASSESSMENT 1997

Site: SAMPLE DUPLICATE LOCATION:

Comments: 384140

Approved by:  Organic

Approved by:  Inorganic

Analyte		Result	Detect Level	Units	1 SD (%)	Date	Time	Analyst
Aluminum (Al)	(1413)	7890	500.	ug/g	10.	1/23/98	10:31	Carol
Manganese (Mn)	(1425)	271.	4.00	ug/g	6.7	1/23/98	10:31	Carol
Iron (Fe)	(1426)	13800	500.	ug/g	7.4	1/23/98	10:31	Carol
Copper (Cu)	(1429)	9.47	1.00	ug/g	7.5	1/22/98	10:19	Carol
Zinc (Zn)	(1430)	38.7	4.00	ug/g	6.7	1/22/98	10:19	Carol
Barium (Ba)	(1456)	95.7	1.00	ug/g	8.0	1/22/98	10:19	Carol
Chromium (Cr)	(2424)	13.6		ug/g		1/21/98	9:00	Mike
Arsenic (As)	(2433)	3.97		ug/g		1/21/98	9:00	Mike
Selenium (Se)	(2434)	0.651		ug/g		1/21/98	9:00	Mike
Cadmium (Cd)	(2448)	0.240		ug/g		1/21/98	9:00	Mike
Lead (Pb)	(2482)	7.33		ug/g		1/21/98	9:00	Mike
Mercury (Hg)	(3480)	0.030		ug/g	9.9	3/10/98	8:00	Carol
Solids Content, Ambient	(6620)	47.90		%		10/10/97	13:08	Eric
Dieldrin	(26111)	Not Entered	0.150					
BHC (Alpha)	(26116)	Not Entered	0.030					
BHC (Beta)	(26121)	Not Entered	0.030					
BHC (Delta)	(26126)	Not Entered	0.030					
Lindane	(26131)	Not Entered	0.030					
DDD	(26141)	Not Entered	0.050					
DE	(26146)	Not Entered	0.050					
DDT	(26151)	Not Entered	0.050					
Dieldrin	(26156)	Not Entered	0.040					
Endosulfan I	(26161)	Not Entered	0.050					
Endosulfan II	(26166)	Not Entered	0.050					
Endosulfan Sulfate	(26171)	Not Entered	0.050					
Endrin	(26176)	Not Entered	0.050					
Endrin Aldehyde	(26181)	Not Entered	0.050					
Heptachlor	(26186)	Not Entered	0.030					
Heptachlor Epoxide	(26191)	Not Entered	0.030					
Methoxychlor	(26196)	Not Entered	0.100					
Moelox	(26201)	ND	0.010	ug/g		10/15/97	10:00	Sujit
Toxaphene	(26211)	Not Entered	0.250					
Chlordane (gamma)	(26256)	Not Entered	0.050					
Chlordane (alpha)	(26261)	Not Entered	0.050					

North Dakota Department of Health
Chemistry Division

Page: 2

Original Report Date: 9/27/99

Report Date: 9/27/99

Log Number: 97-R2099 cont'd

97-R2099

Analyte	Result	Detect Level	Units	1 SD (%)	Date	Time	Analyst
trans-Nonachlor	{26266}	Not Entered	0.030				
Drin Ketone	{26271}	Not Entered	0.050				
Alachlor	{26276}	Not Entered	0.150				
Chlorpyrifos	{26311}	Not Entered	0.050				
Azinon	{26316}	Not Entered	0.050				
Malathion	{26326}	Not Entered	0.100				
Parathion Ethyl	{26331}	Not Entered	0.100				
Parathion Methyl	{26336}	Not Entered	0.100				
Provalerate	{26371}	Not Entered	0.250				
Cyanazine	{26721}	Not Entered	0.200				
Car-Go (Triallate)	{26726}	Not Entered	0.040				
Trifluralin	{26731}	Not Entered	0.030				
Simazine	{26736}	Not Entered	1.25				
Ethalfuralin	{26746}	Not Entered	0.030				
Terbufos	{26811}	Not Entered	1.25				
Terbufos	{26831}	Not Entered	0.050				
Metribuzine	{26941}	Not Entered	0.100				
Metolachlor	{26946}	Not Entered	0.44				
4-D	{28616}	ND	0.010	ug/g	10/15/97	10:00	Sujit
Dicamba	{28621}	ND	0.010	ug/g	10/15/97	10:00	Sujit
Dinoseb	{28626}	ND	1.00	ug/g	10/15/97	10:00	Sujit
PA	{28631}	ND	5.00	ug/g	10/15/97	10:00	Sujit
Flonon	{28636}	ND	0.010	ug/g	10/15/97	10:00	Sujit
2,4,5-T	{28641}	ND	0.010	ug/g	10/15/97	10:00	Sujit
Flux (2,4,5-TP)	{28646}	ND	0.02	ug/g	10/15/97	10:00	Sujit
Endochlorophenol	{28651}	ND	0.500	ug/g	10/15/97	10:00	Sujit
Acifluorfen	{28666}	ND	0.020	ug/g	10/15/97	10:00	Sujit
2,5 Dichlorobenzoic Acid	{28671}	ND	0.050	ug/g	10/15/97	10:00	Sujit
Flomoxynil	{30601}	ND	0.010	ug/g	10/15/97	10:00	Sujit
Dichlorprop	{30946}	ND	0.02	ug/g	10/15/97	10:00	Sujit
Bentazon	{30956}	ND	0.05	ug/g	10/15/97	10:00	Sujit
Prochlor 1016	{43311}	Not Entered					
Prochlor 1221	{43321}	Not Entered					
Prochlor 1232	{43331}	Not Entered					
Prochlor 1242	{43341}	Not Entered					
Prochlor 1248	{43351}	Not Entered					
Prochlor 1254	{43361}	Not Entered					
Prochlor 1260	{43371}	Not Entered					
Prochlor 1262	{43381}	Not Entered					
Soil Prep-Metal	{44516}	done			1/ 8/98	11:07	Dean W
Soil Prep-Mercury	{44519}	Prepared			3/11/98	8:00	Carol

North Dakota Department of Health
Chemistry Division

Page: 3

Original Report Date: 9/27/99

Report Date: 9/27/99

Log Number: 97-R2099 cont'd

97-R2099

ND = Not Detected

NOTE: With the exception of VOC analytes # 40000 - 41999,
weight to weight unit analytes are reported as dry weight.
Use percent solids data to convert to wet weight if necessary.

NOTE: This report represents the current state of work in progress.
Additional analyses may change some of the results reported.

North Dakota Department of Health
Chemistry Division

Page: 1

Original Report Date: 9/27/99

Report Date: 9/27/99

Log Number: 97-R2100

Sample Collected: 8/12/97

Time Collected: 9:45

Collected By: Long/Stroup

Sample Received: 8/13/97

Time Received: 14:00

Project Code: RLWQ97

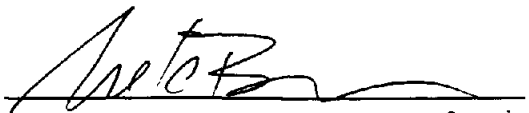
Site Code: 384151

Project: LAKE WATER QUALITY ASSESSMENT 1997

Site: UPPER DES LACS - N OF HWY 5 1 MILE N OF HWY 5

Comments:

Approved by:


Organic

Approved by:


Inorganic

Analyte		Result	Detect Level	Units	1 SD (%)	Date	Time	Analyst
Aluminum (Al)	(1413)	10200	500.	ug/g	10.	1/23/98	10:31	Carol
Manganese (Mn)	(1425)	665.	4.00	ug/g	6.7	1/23/98	10:31	Carol
Iron (Fe)	(1426)	17900	500.	ug/g	7.4	1/23/98	10:31	Carol
Copper (Cu)	(1429)	15.4	1.00	ug/g	7.5	1/22/98	10:19	Carol
Zinc (Zn)	(1430)	61.8	4.00	ug/g	6.7	1/22/98	10:19	Carol
Barium (Ba)	(1456)	163.	1.00	ug/g	8.0	1/22/98	10:19	Carol
Chromium (Cr)	(2424)	23.1		ug/g		1/21/98	9:00	Mike
Arsenic (As)	(2433)	4.85		ug/g		1/21/98	9:00	Mike
Selenium (Se)	(2434)	1.56		ug/g		1/21/98	9:00	Mike
Cadmium (Cd)	(2448)	0.524		ug/g		1/21/98	9:00	Mike
Lead (Pb)	(2482)	12.8		ug/g		1/21/98	9:00	Mike
Mercury (Hg)	(3480)	0.060		ug/g	9.9	3/10/98	8:00	Carol
Solids Content, Ambient	(6620)	17.52		%		10/10/97	13:08	Eric
Dieldrin	(26111)	Not Entered	0.150					
BHC (Alpha)	(26116)	Not Entered	0.030					
BHC (Beta)	(26121)	Not Entered	0.030					
BHC (Delta)	(26126)	Not Entered	0.030					
Lindane	(26131)	Not Entered	0.030					
DDD	(26141)	Not Entered	0.050					
DDE	(26146)	Not Entered	0.050					
DDT	(26151)	Not Entered	0.050					
Dieldrin	(26156)	Not Entered	0.040					
Endosulfan I	(26161)	Not Entered	0.050					
Endosulfan II	(26166)	Not Entered	0.050					
Endosulfan Sulfate	(26171)	Not Entered	0.050					
Endrin	(26176)	Not Entered	0.050					
Endrin Aldehyde	(26181)	Not Entered	0.050					
Heptachlor	(26186)	Not Entered	0.030					
Heptachlor Epoxide	(26191)	Not Entered	0.030					
Methoxychlor	(26196)	Not Entered	0.100					
Heolon	(26201)	ND	0.010	ug/g		10/15/97	10:00	Sujit
Toxaphene	(26211)	Not Entered	0.250					
Chlordane (gamma)	(26256)	Not Entered	0.050					
Chlordane (alpha)	(26261)	Not Entered	0.050					

North Dakota Department of Health
Chemistry Division

Page: 2

Original Report Date: 9/27/99

Report Date: 9/27/99

Log Number: 97-R2100 cont'd

97-R2100

Analyte	Result	Detect Level	Units	1 SD (%)	Date	Time	Analyst
trans-Nonachlor	(26266)	Not Entered	0.030				
drin Ketone	(26271)	Not Entered	0.050				
alachlor	(26276)	Not Entered	0.150				
Chlorpyrifos	(26311)	Not Entered	0.050				
azinon	(26316)	Not Entered	0.050				
lathion	(26326)	Not Entered	0.100				
Parathion Ethyl	(26331)	Not Entered	0.100				
Parathion Methyl	(26336)	Not Entered	0.100				
invalerate	(26371)	Not Entered	0.250				
Cyanazine	(26721)	Not Entered	0.200				
Ear-Go (Triallate)	(26726)	Not Entered	0.040				
teflan (Trifluralin)	(26731)	Not Entered	0.030				
Simazine	(26736)	Not Entered	1.25				
Ethalfuralin	(26746)	Not Entered	0.030				
trazine	(26811)	Not Entered	1.25				
rowl	(26831)	Not Entered	0.050				
Metribuzine	(26941)	Not Entered	0.100				
etolachlor	(26946)	Not Entered	0.44				
4-D	(28616)	ND	0.010	ug/g	10/15/97	10:00	Sujit
Dicamba	(28621)	ND	0.010	ug/g	10/15/97	10:00	Sujit
Dinoseb	(28626)	ND	1.00	ug/g	10/15/97	10:00	Sujit
CPA	(28631)	ND	5.00	ug/g	10/15/97	10:00	Sujit
ordon	(28636)	ND	0.010	ug/g	10/15/97	10:00	Sujit
2,4,5-T	(28641)	ND	0.010	ug/g	10/15/97	10:00	Sujit
ilvex (2,4,5-TP)	(28646)	ND	0.02	ug/g	10/15/97	10:00	Sujit
entachlorophenol	(28651)	ND	0.500	ug/g	10/15/97	10:00	Sujit
Acifluorfen	(28666)	ND	0.020	ug/g	10/15/97	10:00	Sujit
2,5 Dichlorobenzoic Acid	(28671)	ND	0.050	ug/g	10/15/97	10:00	Sujit
romoxynil	(30601)	ND	0.010	ug/g	10/15/97	10:00	Sujit
Dichlorprop	(30946)	ND	0.02	ug/g	10/15/97	10:00	Sujit
Bentazon	(30956)	ND	0.05	ug/g	10/15/97	10:00	Sujit
rochlor 1016	(43311)	Not Entered					
rochlor 1221	(43321)	Not Entered					
rochlor 1232	(43331)	Not Entered					
rochlor 1242	(43341)	Not Entered					
rochlor 1248	(43351)	Not Entered					
rochlor 1254	(43361)	Not Entered					
rochlor 1260	(43371)	Not Entered					
rochlor 1262	(43381)	Not Entered					
soil Prep-Metal	(44516)	done			1/ 8/98	11:07	Dean W
Soil Prep-Mercury	(44519)	Prepared			3/11/98	8:00	Carol

North Dakota Department of Health
Chemistry Division

Page: 3

Original Report Date: 9/27/99

Report Date: 9/27/99

Log Number: 97-R2100 cont'd

97-R2100

ND = Not Detected

NOTE: With the exception of VOC analytes # 40000 - 41999,
weight to weight unit analytes are reported as dry weight.
Use percent solids data to convert to wet weight if necessary.

NOTE: This report represents the current state of work in progress.
Additional analyses may change some of the results reported.

North Dakota Department of Health
Chemistry Division

Page: 1

Original Report Date: 9/27/99

Report Date: 9/27/99

Log Number: 97-R2101

Site Collected: 8/12/97

Time Collected: 11:30

Collected By: Long/Stroup

Site Received: 8/13/97

Time Received: 14:00

Project Code: RLWQ97

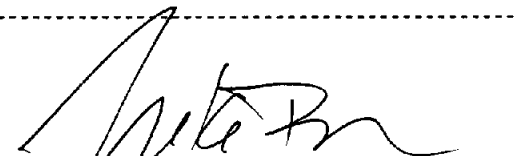
Site Code: 384150

Project: LAKE WATER QUALITY ASSESSMENT 1997

Site: UPPER DES LACS - DEEPEST 1/2 MILE ABOVE DAM

Comments:

Approved by:



Organic

Approved by:



Inorganic

Analyte		Result	Detect Level	Units	1 SD (%)	Date	Time	Analyst
Aluminum (Al)	(1413)	11600	500.	ug/g	10.	1/23/98	10:31	Carol
Manganese (Mn)	(1425)	547.	4.00	ug/g	6.7	1/23/98	10:31	Carol
Iron (Fe)	(1426)	18100	500.	ug/g	7.4	1/23/98	10:31	Carol
Copper (Cu)	(1429)	14.3	1.00	ug/g	7.5	1/22/98	10:19	Carol
Zinc (Zn)	(1430)	58.9	4.00	ug/g	6.7	1/22/98	10:19	Carol
Barium (Ba)	(1456)	128.	1.00	ug/g	8.0	1/22/98	10:19	Carol
Chromium (Cr)	(2424)	18.6		ug/g		1/21/98	9:00	Mike
Arsenic (As)	(2433)	4.24		ug/g		1/21/98	9:00	Mike
Selenium (Se)	(2434)	1.19		ug/g		1/21/98	9:00	Mike
Cadmium (Cd)	(2448)	0.426		ug/g		1/21/98	9:00	Mike
Lead (Pb)	(2482)	10.1		ug/g		1/21/98	9:00	Mike
Mercury (Hg)	(3480)	0.040		ug/g	9.9	3/10/98	8:00	Carol
Solids Content, Ambient	(6620)	25.50		%		10/10/97	13:08	Eric
Dieldrin	(26111)	Not Entered	0.150					
BHC (Alpha)	(26116)	Not Entered	0.030					
BHC (Beta)	(26121)	Not Entered	0.030					
BHC (Delta)	(26126)	Not Entered	0.030					
Lindane	(26131)	Not Entered	0.030					
DDD	(26141)	Not Entered	0.050					
DE	(26146)	Not Entered	0.050					
DT	(26151)	Not Entered	0.050					
Dieldrin	(26156)	Not Entered	0.040					
Endosulfan I	(26161)	Not Entered	0.050					
Endosulfan II	(26166)	Not Entered	0.050					
Endosulfan Sulfate	(26171)	Not Entered	0.050					
Endrin	(26176)	Not Entered	0.050					
Endrin Aldehyde	(26181)	Not Entered	0.050					
Heptachlor	(26186)	Not Entered	0.030					
Heptachlor Epoxide	(26191)	Not Entered	0.030					
Methoxychlor	(26196)	Not Entered	0.100					
Polon	(26201)	ND	0.010	ug/g		10/15/97	10:00	Sujit
Toxaphene	(26211)	Not Entered	0.250					
Chlordane (gamma)	(26256)	Not Entered	0.050					
Chlordane (alpha)	(26261)	Not Entered	0.050					

North Dakota Department of Health
Chemistry Division

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Original Report Date: 9/27/99

Report Date: 9/27/99

Log Number: 97-R2101 cont'd

97-R2101

Analyte		Result	Detect Level	Units	1 SD (%)	Date	Time	Analyst
trans-Nonachlor	{26266}	Not Entered	0.030					
Endrin Ketone	{26271}	Not Entered	0.050					
Alachlor	{26276}	Not Entered	0.150					
Chlorpyrifos	{26311}	Not Entered	0.050					
Azinon	{26316}	Not Entered	0.050					
Malathion	{26326}	Not Entered	0.100					
Parathion Ethyl	{26331}	Not Entered	0.100					
Parathion Methyl	{26336}	Not Entered	0.100					
Benvalerate	{26371}	Not Entered	0.250					
Cyanazine	{26721}	Not Entered	0.200					
Car-Go (Triallate)	{26726}	Not Entered	0.040					
Proflar (Trifluralin)	{26731}	Not Entered	0.030					
Simazine	{26736}	Not Entered	1.25					
Ethalfuralin	{26746}	Not Entered	0.030					
Terazine	{26811}	Not Entered	1.25					
Profl	{26831}	Not Entered	0.050					
Metribuzine	{26941}	Not Entered	0.100					
Metolachlor	{26946}	Not Entered	0.44					
2,4-D	{28616}	ND	0.010	ug/g		10/15/97	10:00	Sujit
Dicamba	{28621}	ND	0.010	ug/g		10/15/97	10:00	Sujit
Dinoseb	{28626}	ND	1.00	ug/g		10/15/97	10:00	Sujit
CPA	{28631}	ND	5.00	ug/g		10/15/97	10:00	Sujit
Prodon	{28636}	ND	0.010	ug/g		10/15/97	10:00	Sujit
2,4,5-T	{28641}	ND	0.010	ug/g		10/15/97	10:00	Sujit
Flvex (2,4,5-TP)	{28646}	ND	0.02	ug/g		10/15/97	10:00	Sujit
pentachlorophenol	{28651}	ND	0.500	ug/g		10/15/97	10:00	Sujit
Acifluorfen	{28666}	ND	0.020	ug/g		10/15/97	10:00	Sujit
2,5 Dichlorobenzoic Acid	{28671}	ND	0.050	ug/g		10/15/97	10:00	Sujit
Proxynil	{30601}	ND	0.010	ug/g		10/15/97	10:00	Sujit
Dichlorprop	{30946}	ND	0.02	ug/g		10/15/97	10:00	Sujit
Bentazon	{30956}	ND	0.05	ug/g		10/15/97	10:00	Sujit
Prochlor 1016	{43311}	Not Entered						
Prochlor 1221	{43321}	Not Entered						
Prochlor 1232	{43331}	Not Entered						
Prochlor 1242	{43341}	Not Entered						
Prochlor 1248	{43351}	Not Entered						
Prochlor 1254	{43361}	Not Entered						
Prochlor 1260	{43371}	Not Entered						
Prochlor 1262	{43381}	Not Entered						
Soil Prep-Metal	{44516}	done				1/ 8/98	11:07	Dean W
Soil Prep-Mercury	{44519}	Prepared				3/11/98	8:00	Carol

North Dakota Department of Health
Chemistry Division

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Original Report Date: 9/27/99

Report Date: 9/27/99

Log Number: 97-R2101 cont'd

97-R2101

ND = Not Detected

NOTE: With the exception of VOC analytes # 40000 - 41999,
weight to weight unit analytes are reported as dry weight.
Use percent solids data to convert to wet weight if necessary.

NOTE: This report represents the current state of work in progress.
Additional analyses may change some of the results reported.

North Dakota Department of Health
Chemistry Division

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Original Report Date: 9/27/99

Report Date: 9/27/99

Log Number: 97-R2102

Date Collected: 8/12/97

Time Collected: 14:00

Collected By: Long/Stroup

Date Received: 8/13/97

Time Received: 14:00

Project Code: RLWQ97

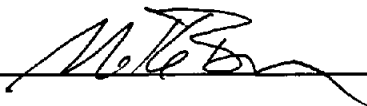
Site Code: 384142

Project: LAKE WATER QUALITY ASSESSMENT 1997

Site: LAKE DARLING - S OF GRAND XING 1 MI N OF GREEN CROSSING

Comments:

Approved by: 
Organic

Approved by: 
Inorganic

Analyte		Result	Detect Level	Units	1 SD (%)	Date	Time	Analyst
Aluminum (Al)	(1413)	19500	500.	ug/g	10.	1/23/98	10:31	Carol
Manganese (Mn)	(1425)	564.	4.00	ug/g	6.7	1/23/98	10:31	Carol
Iron (Fe)	(1426)	26000	500.	ug/g	7.4	1/23/98	10:31	Carol
Copper (Cu)	(1429)	17.7	1.00	ug/g	7.5	1/22/98	10:19	Carol
Zinc (Zn)	(1430)	74.0	4.00	ug/g	6.7	1/22/98	10:19	Carol
Barium (Ba)	(1456)	182.	1.00	ug/g	8.0	1/22/98	10:19	Carol
Chromium (Cr)	(2424)	38.7		ug/g		1/21/98	9:00	Mike
Arsenic (As)	(2433)	3.87		ug/g		1/21/98	9:00	Mike
Selenium (Se)	(2434)	1.02		ug/g		1/21/98	9:00	Mike
Cadmium (Cd)	(2448)	0.475		ug/g		1/21/98	9:00	Mike
Lead (Pb)	(2482)	13.2		ug/g		1/21/98	9:00	Mike
Mercury (Hg)	(3480)	0.040		ug/g	9.9	3/10/98	8:00	Carol
Slids Content, Ambient	(6620)	34.11		%		10/10/97	13:08	Eric
Dieldrin	(26111)	Not Entered	0.150					
BHC (Alpha)	(26116)	Not Entered	0.030					
BHC (Beta)	(26121)	Not Entered	0.030					
BHC (Delta)	(26126)	Not Entered	0.030					
Lindane	(26131)	Not Entered	0.030					
DDD	(26141)	Not Entered	0.050					
DE	(26146)	Not Entered	0.050					
DDT	(26151)	Not Entered	0.050					
Dieldrin	(26156)	Not Entered	0.040					
Endosulfan I	(26161)	Not Entered	0.050					
Endosulfan II	(26166)	Not Entered	0.050					
Endosulfan Sulfate	(26171)	Not Entered	0.050					
Endrin	(26176)	Not Entered	0.050					
Endrin Aldehyde	(26181)	Not Entered	0.050					
Heptachlor	(26186)	Not Entered	0.030					
Heptachlor Epoxide	(26191)	Not Entered	0.030					
Methoxychlor	(26196)	Not Entered	0.100					
Nonachlor	(26201)	ND	0.010	ug/g		10/15/97	10:00	Sujit
Toxaphene	(26211)	Not Entered	0.250					
Chlordane (gamma)	(26256)	Not Entered	0.050					
Chlordane (alpha)	(26261)	Not Entered	0.050					

North Dakota Department of Health
Chemistry Division

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Original Report Date: 9/27/99

Report Date: 9/27/99

Log Number: 97-R2102 cont'd

97-R2102

Analyte		Result	Detect Level	Units	1 SD (%)	Date	Time	Analyst
trans-Nonachlor	{26266}	Not Entered	0.030					
Endrin Ketone	{26271}	Not Entered	0.050					
Alachlor	{26276}	Not Entered	0.150					
Chlorpyrifos	{26311}	Not Entered	0.050					
Diazinon	{26316}	Not Entered	0.050					
Malathion	{26326}	Not Entered	0.100					
Parathion Ethyl	{26331}	Not Entered	0.100					
Parathion Methyl	{26336}	Not Entered	0.100					
Permethrin	{26371}	Not Entered	0.250					
Cyanazine	{26721}	Not Entered	0.200					
Carbofuran (Triallate)	{26726}	Not Entered	0.040					
Trifluralin (Trifluralin)	{26731}	Not Entered	0.030					
Simazine	{26736}	Not Entered	1.25					
Ethionazine	{26746}	Not Entered	0.030					
Terbufos	{26811}	Not Entered	1.25					
Profluthion	{26831}	Not Entered	0.050					
Metribuzine	{26941}	Not Entered	0.100					
Metolachlor	{26946}	Not Entered	0.44					
2,4-D	{28616}	ND	0.010	ug/g		10/15/97	10:00	Sujit
Dicamba	{28621}	ND	0.010	ug/g		10/15/97	10:00	Sujit
Picloram	{28626}	ND	1.00	ug/g		10/15/97	10:00	Sujit
MCPA	{28631}	ND	5.00	ug/g		10/15/97	10:00	Sujit
Picloram	{28636}	ND	0.010	ug/g		10/15/97	10:00	Sujit
2,4,5-T	{28641}	ND	0.010	ug/g		10/15/97	10:00	Sujit
Silvex (2,4,5-TP)	{28646}	ND	0.02	ug/g		10/15/97	10:00	Sujit
Pentachlorophenol	{28651}	ND	0.500	ug/g		10/15/97	10:00	Sujit
Acifluorfen	{28666}	ND	0.020	ug/g		10/15/97	10:00	Sujit
3,5 Dichlorobenzoic Acid	{28671}	0.050		ug/g		10/15/97	10:00	Sujit
Bromoxynil	{30601}	ND	0.010	ug/g		10/15/97	10:00	Sujit
Dichlorprop	{30946}	ND	0.02	ug/g		10/15/97	10:00	Sujit
Bentazon	{30956}	ND	0.05	ug/g		10/15/97	10:00	Sujit
Arochlor 1016	{43311}	Not Entered						
Arochlor 1221	{43321}	Not Entered						
Arochlor 1232	{43331}	Not Entered						
Arochlor 1242	{43341}	Not Entered						
Arochlor 1248	{43351}	Not Entered						
Arochlor 1254	{43361}	Not Entered						
Arochlor 1260	{43371}	Not Entered						
Arochlor 1262	{43381}	Not Entered						
Soil Prep-Metal	{44516}	done				1/ 8/98	11:07	Dean W
Soil Prep-Mercury	{44519}	Prepared				3/11/98	8:00	Carol

North Dakota Department of Health
Chemistry Division

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Original Report Date: 9/27/99

Report Date: 9/27/99

Log Number: 97-R2102 cont'd

97-R2102

ND = Not Detected

NOTE: With the exception of VOC analytes # 40000 - 41999,
weight to weight unit analytes are reported as dry weight.
Use percent solids data to convert to wet weight if necessary.

NOTE: This report represents the current state of work in progress.
Additional analyses may change some of the results reported.

North Dakota Department of Health
Chemistry Division

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Original Report Date: 9/27/99

Report Date: 9/27/99

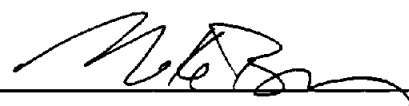
Log Number: 97-R2103

Sample Collected: 8/12/97 Time Collected: 15:00
Sample Received: 8/13/97 Time Received: 14:00
Site Code: 384141

Collected By: Long/Stroup
Project Code: RLWQ97
Project: LAKE WATER QUALITY ASSESSMENT 1997

Site: LAKE DARLING - S OF GRANO XING 2 MI S OF GRANO CROSSING
Comments:

Approved by: 
Organic

Approved by: 
Inorganic

Analyte	Result	Detect Level	Units	1 SD (%)	Date	Time	Analyst
Aluminum (Al)	(1413)	9680	500.	ug/g	10.	1/23/98 10:31	Carol
Manganese (Mn)	(1425)	872.	4.00	ug/g	6.7	1/23/98 10:31	Carol
Iron (Fe)	(1426)	19500	500.	ug/g	7.4	1/23/98 10:31	Carol
Copper (Cu)	(1429)	14.7	1.00	ug/g	7.5	1/22/98 10:19	Carol
Zinc (Zn)	(1430)	56.8	4.00	ug/g	6.7	1/22/98 10:19	Carol
Barium (Ba)	(1456)	166.	1.00	ug/g	8.0	1/22/98 10:19	Carol
Chromium (Cr)	(2424)	18.0		ug/g		1/21/98 9:00	Mike
Arsenic (As)	(2433)	4.10		ug/g		1/21/98 9:00	Mike
Selenium (Se)	(2434)	0.818		ug/g		1/21/98 9:00	Mike
Cadmium (Cd)	(2448)	0.425		ug/g		1/21/98 9:00	Mike
Lead (Pb)	(2482)	11.6		ug/g		1/21/98 9:00	Mike
Mercury (Hg)	(3480)	0.030		ug/g	9.9	3/10/98 8:00	Carol
Slids Content, Ambient	(6620)	31.85	%			10/10/97 13:08	Eric
Dieldrin	(26111)	Not Entered	0.150				
BHC (Alpha)	(26116)	Not Entered	0.030				
BHC (Beta)	(26121)	Not Entered	0.030				
BHC (Delta)	(26126)	Not Entered	0.030				
Lindane	(26131)	Not Entered	0.030				
DDD	(26141)	Not Entered	0.050				
DE	(26146)	Not Entered	0.050				
DDT	(26151)	Not Entered	0.050				
Dieldrin	(26156)	Not Entered	0.040				
Endosulfan I	(26161)	Not Entered	0.050				
Endosulfan II	(26166)	Not Entered	0.050				
Endosulfan Sulfate	(26171)	Not Entered	0.050				
Dieldrin	(26176)	Not Entered	0.050				
Dieldrin Aldehyde	(26181)	Not Entered	0.050				
Heptachlor	(26186)	Not Entered	0.030				
Heptachlor Epoxide	(26191)	Not Entered	0.030				
Heptachlor	(26196)	Not Entered	0.100				
Heptachlor	(26201)	ND	0.010	ug/g		10/15/97 10:00	Sujit
Toxaphene	(26211)	Not Entered	0.250				
Heptachlor (gamma)	(26256)	Not Entered	0.050				
Heptachlor (alpha)	(26261)	Not Entered	0.050				

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Chemistry Division

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Original Report Date: 9/27/99

Report Date: 9/27/99

Log Number: 97-R2103 cont'd

97-R2103

Alyte	Result	Detect Level	Units	1 SD (%)	Date	Time	Analyst
trans-Nonachlor	(26266)	Not Entered	0.030				
Drin Ketone	(26271)	Not Entered	0.050				
Alachlor	(26276)	Not Entered	0.150				
Chlorpyrifos	(26311)	Not Entered	0.050				
Flazinin	(26316)	Not Entered	0.050				
Malathion	(26326)	Not Entered	0.100				
Parathion Ethyl	(26331)	Not Entered	0.100				
Parathion Methyl	(26336)	Not Entered	0.100				
Phthalate	(26371)	Not Entered	0.250				
Cyanazine	(26721)	Not Entered	0.200				
Tri-Go (Triallate)	(26726)	Not Entered	0.040				
Trifluralin	(26731)	Not Entered	0.030				
Simazine	(26736)	Not Entered	1.25				
Ethalfuralin	(26746)	Not Entered	0.030				
Terbufos	(26811)	Not Entered	1.25				
Terbufos	(26831)	Not Entered	0.050				
Metribuzine	(26941)	Not Entered	0.100				
Metolachlor	(26946)	Not Entered	0.44				
4-D	(28616)	ND	0.010	ug/g	10/15/97	10:00	Sujit
Dicamba	(28621)	ND	0.010	ug/g	10/15/97	10:00	Sujit
Pinoseb	(28626)	ND	1.00	ug/g	10/15/97	10:00	Sujit
PA	(28631)	ND	5.00	ug/g	10/15/97	10:00	Sujit
lordon	(28636)	ND	0.010	ug/g	10/15/97	10:00	Sujit
2,4,5-T	(28641)	ND	0.010	ug/g	10/15/97	10:00	Sujit
lhex (2,4,5-TP)	(28646)	ND	0.02	ug/g	10/15/97	10:00	Sujit
ntachlorophenol	(28651)	ND	0.500	ug/g	10/15/97	10:00	Sujit
Acifluorfen	(28666)	ND	0.020	ug/g	10/15/97	10:00	Sujit
5 Dichlorobenzoic Acid	(28671)	ND	0.050	ug/g	10/15/97	10:00	Sujit
omoxynil	(30601)	ND	0.010	ug/g	10/15/97	10:00	Sujit
Dichlorprop	(30946)	ND	0.02	ug/g	10/15/97	10:00	Sujit
Pentazon	(30956)	ND	0.05	ug/g	10/15/97	10:00	Sujit
ochlor 1016	(43311)	Not Entered					
ochlor 1221	(43321)	Not Entered					
ochlor 1232	(43331)	Not Entered					
ochlor 1242	(43341)	Not Entered					
ochlor 1248	(43351)	Not Entered					
ochlor 1254	(43361)	Not Entered					
ochlor 1260	(43371)	Not Entered					
ochlor 1262	(43381)	Not Entered					
Soil Prep-Metal	(44516)	done			1/ 8/98	11:07	Dean W
Soil Prep-Mercury	(44519)	Prepared			3/11/98	8:00	Carol

North Dakota Department of Health
Chemistry Division

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Original Report Date: 9/27/99

Report Date: 9/27/99

Log Number: 97-R2103 cont'd

97-R2103

ND = Not Detected

NOTE: With the exception of VOC analytes # 40000 - 41999,
weight to weight unit analytes are reported as dry weight.
Use percent solids data to convert to wet weight if necessary.

NOTE: This report represents the current state of work in progress.
Additional analyses may change some of the results reported.