



Meeting Date: March 24, 2014  
 Agenda Item No:

**Kitsap County Board of Commissioners**

**Department:** Commissioners Office  
**Staff Contact:** Eric Baker, Special Projects Manager  
**Title:** Lake Management District for Long Lake Resolution

**Recommended Action:** Approve Resolution setting a public hearing on a Lake Management District for Long Lake

<b>Summary:</b>	Long Lake has been suffering for years with significant water quality issues that have promoted the growth of invasive aquatic plants and toxic algae blooms. These issues come from past land use practices on shoreline and upland lots, surrounding soil conditions and natural lake processes. These have been addressed in the past through state-funded management activities to reduce the accessibility of phosphorous and other nutrients within Long Lake. To fund future management activities, private funding will be necessary. To this end, the community and Kitsap County is proposing a lake management district for properties surrounding the Lake. Through annual assessments, properties within the proposed District boundary may fund lake management activities shown in the attached scope of work. Approval of such a District first requires a public hearing noticed to all property owners within the boundary and then a mail election of these same property owners. Only after majority approval at such an election can a District be formed to fund these improvements.
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<b>Attachments:</b>	1) Resolution w/ Attachments
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**Fiscal Impact**

<b>Expenditure required for this specific action:</b>	0
<b>Total cost including all related costs:</b>	0
<b>Related Revenue:</b>	0
<b>Cost Savings:</b>	0
<b>Total Fiscal Impact:</b>	0
<b>Source of Funds:</b>	N/A

**Fiscal Impact (DAS) Review**

**Departmental Coordination**

Department	Representative	Recommendation/Comments
Parks Department	Jim Dunwiddie	
Public Works	Jon Brand	

**Contract Information**

Contract Number	Date Original Contract or Amendment Approved	Amount of Original Contract Amendment	Total Amount of Amended Contract

**RESOLUTION \_\_\_\_\_**  
**INTENTION TO FORM LAKE MANAGEMENT DISTRICT NO. 3 FOR LONG LAKE**

WHEREAS, Kitsap County's lakes provide environmental, recreational, economic and aesthetic benefits to the residents of Kitsap County, nearby property owners and the region; and

WHEREAS, Long Lake is Kitsap's largest lake, with substantial recreational and economic value from its shoreline improvements including a Kitsap County park and public boat launch; and

WHEREAS, the condition of Long Lake has been affected by decades of shoreline and watershed land uses as well as natural lake and soil conditions; and

WHEREAS, Long Lake's water quality issues have fueled toxic algae blooms and invasive species of water plants; and

WHEREAS, these algae blooms are harmful to the public, pets and wildlife often requiring the closure of the lake by the Kitsap Health District for recreational uses; and

WHEREAS, these invasive species of plants affect recreational uses including swimming and boating as well as creating additional water quality issues through their natural processes; and

WHEREAS, these various issues are not amenable to a single remedy and will require ongoing maintenance to address their impacts; and

WHEREAS, past maintenance efforts within the Lake, such as water quality testing and alum treatments, have made significant progress in reducing levels of phosphorous and other nutrients that led to algae blooms and the expansion of invasive vegetation; and

WHEREAS, these prior efforts were funded through 2010 by a \$1 million capital expenditure by the Washington State legislature; and

WHEREAS, the Kitsap County Surface and Storm Water Division and Kitsap Public Health District have expended significant resources in addressing contaminant discharges within the watershed that have contributed to Long Lake's issues; and

WHEREAS, property owners along the Long Lake shoreline, with special shoreline access or within a close proximity of the Lake enjoy great economic, recreational and aesthetical benefits from the Lake;

WHEREAS, the Citizens for Improving Long Lake (CILL) and other community groups have worked with Kitsap County, Washington State and the community for over 20 years to increase awareness of lake issues and promote the funding for past efforts; and

WHEREAS, CILL, in collaboration with TetraTech, have proposed a 10-year lake management strategy to address water quality issues and reduce the growth of toxic algae and invasive species; and

WHEREAS, this strategy has been reviewed by the Kitsap Health District and other Kitsap agencies for its applicability to the Lake's issues; and

WHEREAS, this strategy carries a cost of \$956,000 for the 10-year period; and

WHEREAS, Washington State statutes, RCW 36.61.010 *et seq.*, authorize the creation of a Lake Management District (LMD), including special assessments to address lake and beach issues; and

WHEREAS, such a District may engage in maintenance activities including improving water quality and/or controlling or removing aquatic vegetation; and

WHEREAS, the formation of a LMD requires many steps including the establishment of a specific boundary, determining special assessment amounts, public hearings and ultimately a vote of the property owners with a specified district boundary; and

WHEREAS, Washington State officials have indicated that the formation of a LMD is a prerequisite to acquiring any future state funding of algae and invasive species management.

**THEREFORE, BE IT RESOLVED:**

1. Intent to Form LMD. The Kitsap County Board of County Commissioners intends to form Lake Management District No. 3 for Long Lake.

2. Nature of Activities Proposed to be Financed under the LMD. The issues affecting Long Lake are predominantly excess phosphorus and other nutrients from adjacent and nearby land uses, ongoing loading from existing lake vegetation and surrounding soil conditions. These conditions, their impacts to the Lake and its uses and past efforts to enhance and maintain water quality are fully described in the December 2010, Final Report on Water Quality 2006-2010 (Attachment A).

Based on the findings of the December 2010 Report, future activities have been identified. A future LMD will implement specific management efforts including, but not limited to:

- Long-term water quality monitoring
- Phosphorus inactivation through sediment large treatment and annual water column stripping
- Aquatic plant management
- Planning and permitting of maintenance activities
- Public education and outreach through public meetings and school programs
- Overall project management and transparent reporting.

Additional specific information regarding the LMD's proposed maintenance activities are included in the Lake Management Scope of Work (Attachment B), attached hereto and incorporated herein by this reference.

3. Funding of the LMD through Special Assessments. Based upon the proposed actions included in the Scope of Work, ongoing maintenance activities in Long Lake will cost an average of \$95,600 annually over a 10-year period, totaling \$956,000. The proposed LMD is intended to fund these costs in their entirety.

4. Proposed Boundaries and Annual Assessments of the LMD. The boundary of the Long Lake LMD was developed to take into consideration properties with shoreline adjacency, special shoreline access or close proximity to the Lake. The properties within the boundary are estimated to receive certain benefits from the Lake and its amenities and/or have potentially impacted its health with past land use activities. The proposed boundary is shown in Attachment C, attached hereto and incorporated herein by this reference, and is color-coded based upon:

- Properties adjacent to the shoreline – Class I (green parcels)
- Properties with special access rights to the Lake – Class II (blue parcels)
- Properties in close proximity to the Lake and its amenities – Class III (yellow parcels)

Annual assessments for each property classification within the LMD boundary to fund the activities located in the Scope of Work (Attachment B) shall be as follows:

- Properties with shoreline adjacency – Class I (green parcels) = \$252.00
- Properties with special access rights to the lake – Class II (blue parcels) = \$144.00
- Properties in close proximity to the Lake and its amenities – Class III (yellow parcels) = \$50.00

5. Duration of Lake Management District. Assessments to properties within the district shall be paid annually. The assessments shall be imposed over a 10-year period (2014 to 2023).

6. Public Hearing regarding the Formation of the Lake Management District. A public hearing on the proposal to form an LMD for Long Lake shall be held on **April 28th** at 5:30PM in the Commissioners Chambers at the Kitsap County Administration Building located at 619 Division Street, Port Orchard, WA.

Resolved this \_\_\_ day of \_\_\_\_\_, 2014.

**BOARD OF COUNTY COMMISSIONERS  
KITSAP COUNTY, WASHINGTON**

\_\_\_\_\_  
**CHARLOTTE GARRIDO**, Chair

\_\_\_\_\_  
**ROBERT GELDER**, Commissioner

\_\_\_\_\_  
**LINDA STREISSGUTH**, Commissioner

ATTEST:

\_\_\_\_\_  
Dana Daniels, Clerk of the Board

ATTACHMENT A

# **Final Report on Long Lake Water Quality**

**2006-2010**

**December 2010**

Kitsap, WA

Prepared for:  
Kitsap County and CILL

**Prepared by:**  
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## **Acknowledgement**

### **CENTENNIAL CLEAN WATER FUND/CLEAN WATER ACT SECTION 319 GRANT / STATE REVOLVING FUND**

**Grant Recipient:** Kitsap County  
**Grant Number:** G0600178  
**Project Title:** Long Lake Integrated Management Program  
**Funding:** Total Budget: \$950,000  
**Project Period:** Start date 1/13/06 End date 12/31/2010

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## TABLE OF CONTENTS

<b>1. INTRODUCTION</b> .....	<b>1</b>
<b>2. RESTORATION HISTORY</b> .....	<b>1</b>
<b>3. METHODS</b> .....	<b>5</b>
<b>4. RESULTS</b> .....	<b>9</b>
ALGAE AND WATER QUALITY.....	9
PHOSPHORUS MASS BALANCE.....	17
AQUATIC: PLANT MANAGEMENT.....	24
<b>5. DISCUSSION</b> .....	<b>31</b>
<b>6. SUMMARY</b> .....	<b>33</b>
<b>7. RECOMMENDATIONS</b> .....	<b>34</b>
<b>8. REFERENCES</b> .....	<b>35</b>
<b>APPENDIX A – FIELD DATA</b> .....	<b>36</b>
<b>APPENDIX B – LABORATORY DATA</b> .....	<b>66</b>
<b>APPENDIX C – PHYTOPLANKTON DATA</b> .....	<b>78</b>
<b>APPENDIX D – PHOSPHORUS BUDGET</b> .....	<b>151</b>
<b>APPENDIX E ALUM TREATMENT SUMMARY</b> .....	<b>160</b>
<b>APPENDIX F HERBICIDE TREATMENTS SUMMARY</b> .....	<b>162</b>

## TABLE OF FIGURES

FIGURE 1. LOCATION MAP OF LONG LAKE. ....	3
FIGURE 2. MEAN WHOLE-LAKE SUMMER (JUNE-SEPTEMBER) TP, CHL AND SECCHI TRANSPARENCY FOR GROUPS OF STUDY YEARS BEFORE AND AFTER THREE ALUM TREATMENTS IN LONG LAKE, KITSAP. PRE 2006 DATA FROM WELCH (1996). DATA FOR 2006 SERVES AS A PARTIAL REFERENCE FOR POST-ALUM YEARS 2007-2010. ....	4
FIGURE 3. SUMMER (JUNE-SEPTEMBER) MEANS FOR WHOLE-LAKE TP, CHL AND TRANSPARENCY (SECCHI DISC DEPTH) DURING THE 25 YEARS OF MONITORING LONG LAKE. ....	7
FIGURE 4. LONG LAKE, KITSAP COUNTY, SHOWING WATER SAMPLING LOCATIONS AND TRIBUTARY STREAMS.....	9
FIGURE 5. MEAN WHOLE LAKE SURFACE TP CONCENTRATIONS IN LONG LAKE AND IN THE PRINCIPAL INFLOW STREAM DURING 2006-2010. THE LOW DOSE (2.5 MG/L AL) ALUM TREATMENT OCCURRED 8/1-4/06 AND THE HIGH DOSE (17.5 MG/L AL) DURING 4/11-14/07. ....	11
FIGURE 6. SURFACE TP AND CHL AT THE MID-LAKE STATION IN LONG LAKE, AND INFLOW TP DURING SPRING-SUMMER 2006-2010.....	13
FIGURE 7. PHYTOPLANKTON CELL CONCENTRATION AT THE MIDLAKE STATION AT 1.M DEPTH DURING 2006 THROUGH 2010. ....	15
FIGURE 8. PHYTOPLANKTON CELL VOLUME (BIOMASS) AT THE MID-LAKE STATION AT 1 METER DEPTH DURING 2006 THROUGH 2010. ....	16
FIGURE 9. LONG LAKE TOTAL PHOSPHORUS INFLOWS, 2006. ....	19
FIGURE 10. LONG LAKE TOTAL PHOSPHORUS INFLOWS, 2007. ....	20
FIGURE 11. LONG LAKE TOTAL PHOSPHORUS INFLOWS, 2008. ....	21
FIGURE 12. LONG LAKE TOTAL PHOSPHORUS INFLOWS, 2009. ....	22
FIGURE 13. LONG LAKE TOTAL PHOSPHORUS INFLOWS, 2010. ....	23
FIGURE 14. LONG LAKE AQUATIC PLANT MAP SPRING 2006 & TREATMENT ZONES FOR 2006 IN SUMMER.....	26

FIGURE 15. LONG LAKE AQUATIC PLANT MAP SUMMER 2006 & PROPOSED TREATMENT ZONES FOR 2007. ....27

FIGURE 16. LONG LAKE AQUATIC PLANT MAP FALL 2007 AND PROPOSED TREATMENT ZONES FOR 2008. ....28

FIGURE 17. LONG LAKE AQUATIC MAP FALL 2008 AND PROPOSED TREATMENT ZONES FOR 2009. ....29

FIGURE 18. LONG LAKE AQUATIC MAP 2010.....30

**LIST OF TABLES**

TABLE 1. WATER QUALITY MONITORING PARAMETER.....8

TABLE 2. SUMMER NET INTERNAL P LOADING IN LONG LAKE .....18

TABLE 3. AQUATIC PLANT SPECIES OBSERVED IN LONG LAKE IN 2008 AND 2009. ....31



## **1. Introduction**

This report covers five years (2006-2010) of monitoring water quality and managing rooted aquatic plants (macrophytes) in Long Lake, Kitsap County (Figure 1). The water quality data shows the lake's response to two alum treatments: a low dose during summer 2006 and a second, high dose during spring 2007. The low dose was designed to strip the water column of phosphorus to minimize that summer's algae bloom, while the purpose of the high dose was to inactivate mobile phosphorus (P) in the sediment for long-term control. Some sediment inactivation benefit probably resulted from the low-dose as well. Therefore, there are now four years of post-alum lake quality data to compare with the nearly pre-treatment conditions in 2006. However, the low dose in August 2006 minimized the late summer increase in total phosphorus (TP) that otherwise probably would have occurred. That is, the 2006 "pre-treatment" water quality is likely not a worst-case condition that had occurred during the decade prior to 2006, when complaints of large algal blooms arose and prompted action leading to this project.

The adaptive management plan for aquatic plants has been under way for five years. The purpose is to control Brazilian Elodea (*Egeria Densa*) in recreational use zones and eradicate Eurasian Water Milfoil (*Myriophyllum spicatum*) from the lake. This procedure was expected to encourage less objectionable native plants to increase and replace Milfoil and Elodea. Brazilian Elodea also occurs in deep, low-use areas of the lake and is considered to be beneficial because it tends to inhibit sediment disturbance by wind and therefore minimize re-suspension of sediment and recycling of re-suspension of phosphorus. (Jacoby et al., 2001).

## **2. Restoration History**

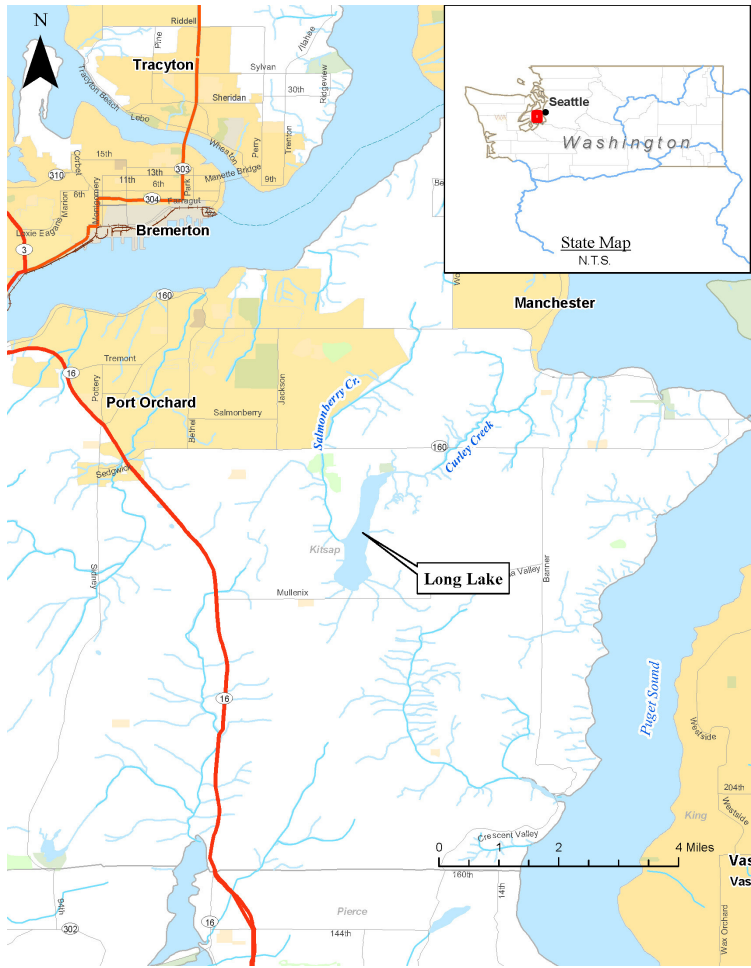
Long Lake was studied by personnel from the University of Washington for 20 consecutive years from 1976 to 1995 to evaluate the effectiveness of several restoration techniques (Welch, 1996). The lake water level was drawn down about 6 feet (1.8 m) during the summer of 1979 to desiccate previously submersed rooted plants and to consolidate the flocculent sediment. While lake sediment substantially dried in laboratory experiments, they failed to consolidate over the 40% of lake sediments exposed, because seepage water prevented sediment drying. Although

exposed plants desiccated and biomass was low the following year (1980), they began to recover by 1981 and were back to maximum biomass by 1984 (Jacoby et al., 1982). Also a small area in the north end was dredged during the 1979 drawdown to widen and deepen the outlet although this was too localized to affect internal phosphorus (P) loading throughout the lake.

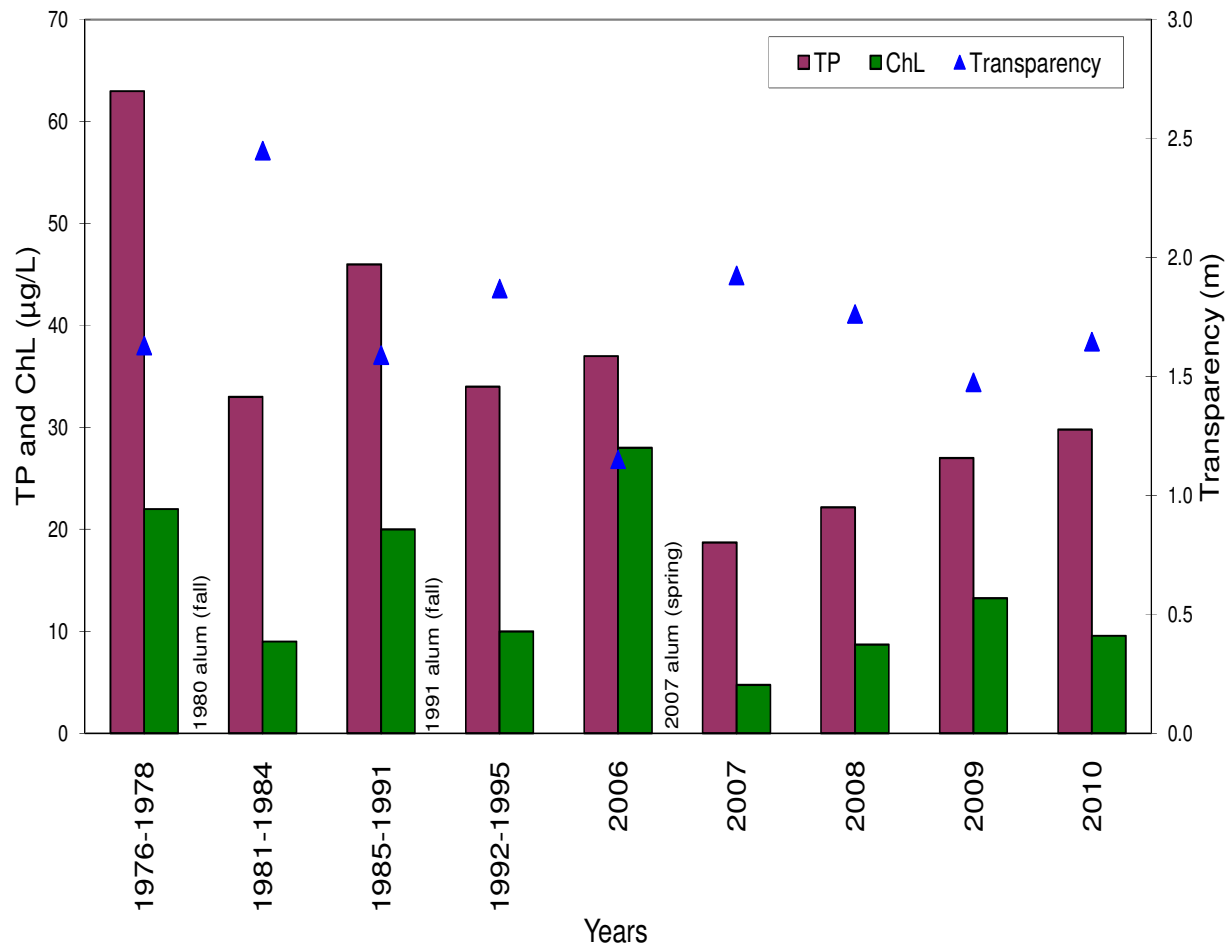
The lake was treated to inactivate sediment P with alum in the fall of 1980 with a dose of 5.5 mg/L Al and again at the same time and concentration in 1991. In the mean time, rooted plants were mowed with a harvester during the summer of 1988, 1989 and 1990, removing 10, 43 and 69% of the peak plant biomass per year, respectively.

The first alum treatment was highly effective for the first four years and maintained modest water quality improvement on average for the next seven years, compared to pretreatment TP (Figure 2). The high summer mean TPs of 69 and 78  $\mu\text{g/L}$ , which occurred in 1977 and 1978, did not recur during that eleven-year period, although TP and chlorophyll (chl) were rather high (66 and 36  $\mu\text{g/L}$ , respectively) in 1985, due mostly to a rooted plant-die-off, and in 1990 (55 and 40  $\mu\text{g/L}$ ), prior to the second alum treatment (Figure 3). These were the highest chl concentrations during the twenty-year period. Note that transparency varied in inversely with chl, with the highest transparency occurring with the lowest chl (Figure 3). Transparency also varied directly with macrophyte biomass (Jacoby et al., 2001).

The second alum treatment was applied in late summer 1991 at 5.5 mg/L Al. The following summer TP averaged only 20  $\mu\text{g/L}$ , the lowest summer mean ever. The summer mean for the four-year post treatment was slightly above 30  $\mu\text{g/L}$  and chl averaged less than 10  $\mu\text{g/L}$ , similar to the four-year mean following the 1980 treatment (Figure 2).



**Figure 1. Location map of Long Lake.**



**Figure 2. Mean whole-lake summer (June-September) TP, chl and Secchi transparency for groups of study years before and after three alum treatments in Long Lake, Kitsap. Pre 2006 data from Welch (1996). Data for 2006 serves as a partial reference for post-alum years 2007-2010.**

Monitoring of the lake by UW ceased after 1995, but was resumed in 2006 as part of a long-term project by Kitsap County and CILL to improve the lake’s quality. As part of the planned control measures, alum was again added to the lake at a low dose of 2.5 mg/L Al during August 1-4, 2006 to achieve short term control of TP and minimize late summer algal blooms. Alum was applied again during April 11-14, 2007 at a high dose of 17.5 mg/L Al, based on sediment P concentration, for long-term control.

Sampling of Long Lake for the current long-term project by Kitsap County and CILL was continued through 2010. Historical data were compared with 2006-2009 data in the annual

report on Long Lake Water Quality, February 2010. For this report, 2010 data were integrated with 2006-2009 data to show that summer TP is gradually increasing, but is still below the 2006 pretreatment level, while chl has remained well below pretreatment levels averaging less than 10 µg/L (Figure 2). Transparency has averaged about 0.5 m greater during the past four years than the pretreatment depth of visibility in 2006.

Possible causes for trends in trophic state indicator levels will be discussed. The findings reported in the 2010 report are to a large extent repeated here so this report treats all years comprehensively.

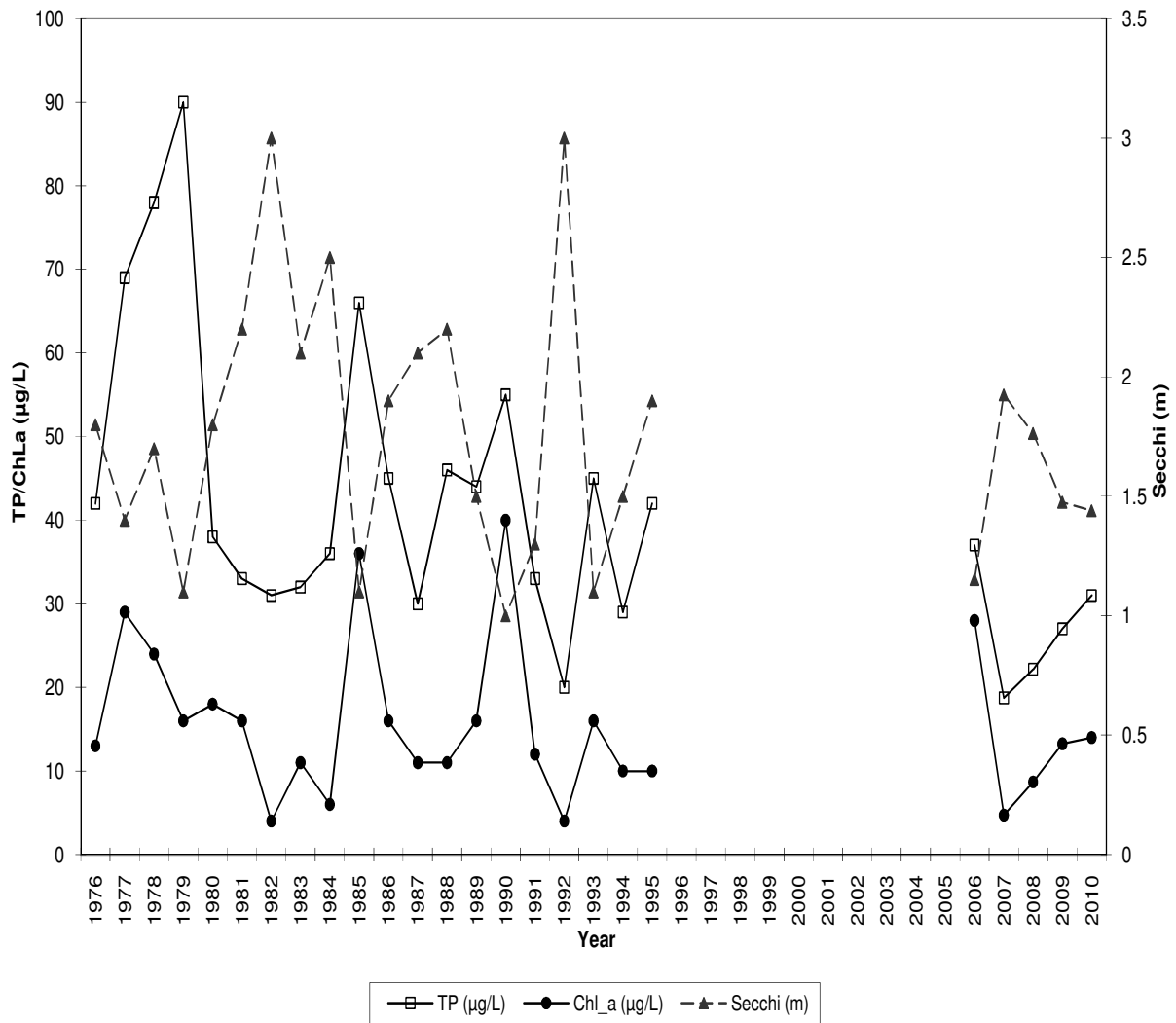
### **3. Methods**

Water samples were collected from three parts (north, middle, south; Figure 4) of the lake and from the inflow on a roughly three-week basis during the summer and monthly the rest of the year. Samples were analyzed for TP, soluble reactive P (SRP), chlorophyll (chl), algal cell and biomass (cell volume) concentration, and percent biomass composition. Phosphorus was determined to 2 µg/L and chl to 0.1 µg/L according to APHA (1998). Secchi transparency was also determined along with dissolved oxygen (DO), temperature, conductivity and pH. Some constituents were volume-weighted assuming that the three sample sites represented, respectively, 15% (north), 50% (middle) and 35% (south) of the whole lake, for comparison with historical means.

Water quality parameters and field observation were recorded by field technicians during each sampling event. A summary of the procedures used during each event has been outlined below:

- *In-situ Water Quality Data Collection* - In-situ data for temperature, pH, and DO were collected using a Hydrolab MS5 multiprobe water quality sampling instrument. Calibration and sampling was performed per the manufacturer's specifications (Hach, 2006). There were no recorded problems with the calibration. The Hydrolab MS5 multiprobe was lowered through the water column either by hand or a reel system and measurements were recorded every meter. Secchi transparency (depth) was measured using Ecology's Citizen's Guide to Understanding and Monitoring Lakes and Streams protocol (Michaud, 1994).

- Water Quality Grab Samples for Lab Analysis - Water quality grab samples for laboratory analysis of TP, SRP, and chl were collected with a 3.2-liter vertical Van-Dorn bottle. Samples were collected in polyethylene bottles previously acid (HCl) washed and rinsed with distilled-water. The Van-Dorn and sampling bottles were rinsed several times with lake water to minimize cross contamination between sampling stations. Table 1 summarizes the containers, preservation techniques, as well as recommended maximum holding times for samples. A small amount of magnesium carbonate was added to the chl sample bottles for preservation and filtering efficiency.
- Phytoplankton Samples - Recommended sample sizes, containers, preservation techniques, and holding times for phytoplankton are listed in Table 1. Samples were collected at 1-meter below the surface with a Van-Dorn bottle, concurrently with other in-situ water quality samples, preserved with Lugol's solution and subsequently sent to a taxonomist for analysis.
- Flow Measurements - Measurements of discharge were recorded using a Marsh McBirney Flo-mate 2000 Portable Flowmeter. Calibration of the meter was conducted in accordance with the user manual (Marsh-McBirney, 1990). Discharge measurements were recorded using protocol established by the US Geological Survey (Rantz et al., 1983).



**Figure 3. Summer (June-September) means for whole-lake TP, chl and transparency (Secchi disc depth) during the 25 years of monitoring Long Lake.**

**Table 1. Water Quality Monitoring Parameter.**

<b>Parameters</b>	<b>Sample Container</b>	<b>Sample Volume</b>	<b>Detection Limit</b>	<b>Preservation</b>	<b>Recommended Holding Time</b>	<b>Maximum Holding Time</b>
Chlorophyll- <i>a</i>	Polyethylene	1,000 ml	±0.0001 mg/L	Saturated MgCO <sub>3</sub> in sample w/o filter.	24 hours for filtration/freezing	28 days frozen/filtered sample
Nutrients (SRP)	Polyethylene	100-250 ml	±0.002 mg/L	Cool, 4°C	24 hours	24 hours
Nutrients (TP)	Polyethylene	100-250 ml	±0.002 mg/L	Cool, 4°C	48 hours	28 days
Phytoplankton	Polyethylene	500 ml	---	Cool, 4°C Preserve Lugol's solution	60 days	6 months



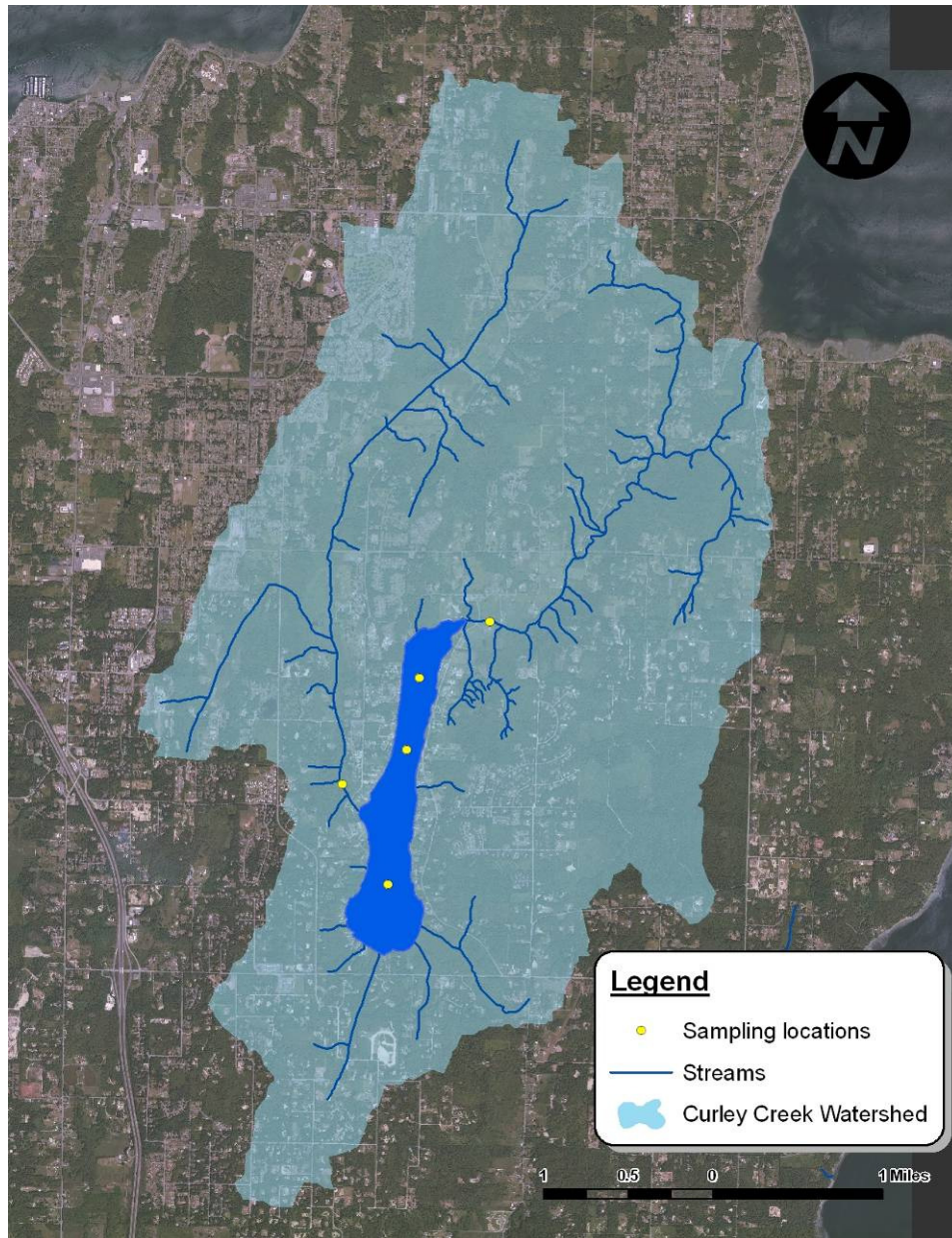


Figure 4. Long Lake, Kitsap County, showing water sampling locations and tributary streams.

## 4. Results

### *Algae and Water Quality*

The summer of 2006 represented a reference point from which to judge the effect of management actions in Long Lake. However, summer average TP was not exceptionally high during 2006, compared to the past pre-alum years (Figure 2). That was partly due to TP

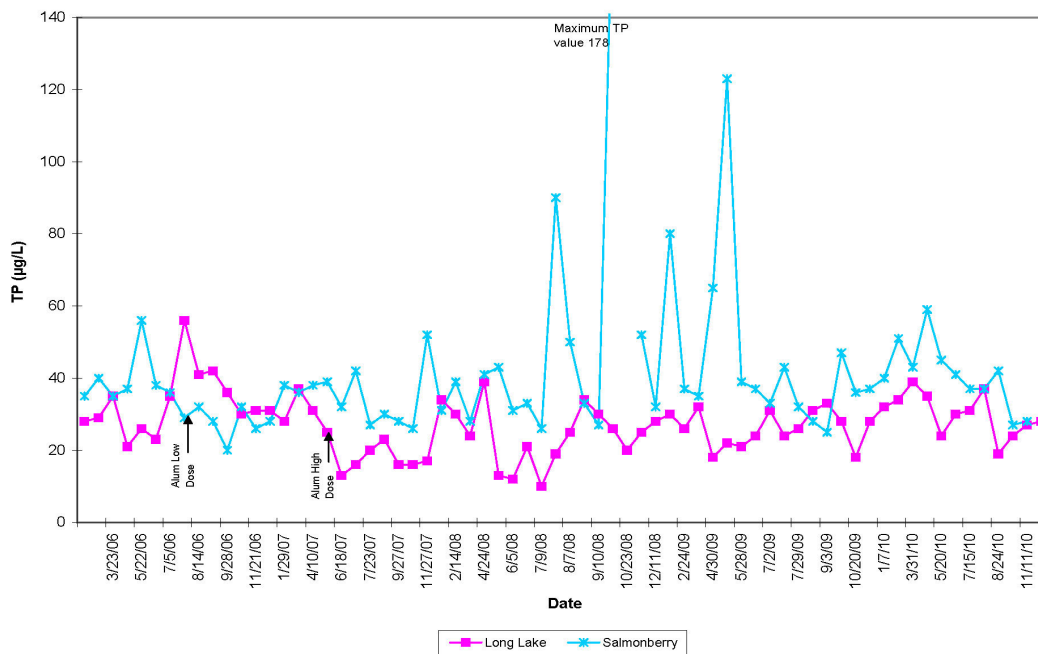
reduction by the August low-dose alum treatment. Nevertheless, large algal blooms did occur in July and August of that year.

The addition of the low dose of alum during August 1-4, 2006 was less effective than expected. While mean TP gradually declined following the treatment (Figure 5), chl subsequently reached a high peak of 55  $\mu\text{g/L}$  on August 14 and was still 43  $\mu\text{g/L}$  on September 6. Nevertheless, TP did not continue to increase during August and September, 2006 (Figure 5). The ineffectiveness of alum stripping of the water column to a lower TP level (to 20  $\mu\text{g/L}$  or less) may have been due to the time needed to treat the lake. Treatment was expected to take one day but five days were necessary. Even if the water column were effectively stripped in one day in a section, nominally one-fifth of the lake, wind would have tended to redistribute algae and their P and chl from other parts of the lake into the treated section by the following day. Cyanobacteria are highly susceptible to transport by wind because they are buoyant and tend to accumulate at the surface. The high-dose alum treatment in April 2007 was over three times that applied in 1980 and 1991. The purpose of this treatment was to inactivate sediment P and thereby reduce internal loading. That the sediments are a major source of P during the summer is illustrated by comparing the inflow TP concentration with the lake concentration in 2006 (Figure 5). If the whole lake, summer mean TP concentration were due to the inflow only, then the lake concentration would have been less than one half or two thirds of the inflow (36  $\mu\text{g/L}$ ), with the difference due to TP lost to sedimentation. However, the lake concentration averaged 37  $\mu\text{g/L}$ , so the difference (37 – 18 or 24  $\mu\text{g/L}$ ) was due to internal loading. Inflow-outflow mass balance analyses during pre-treatment years in the 1970s showed that 50% of the summer TP loading was internal (Welch and Jacoby, 2001). As those data show, maximum TP concentrations in the lake were usually over 100  $\mu\text{g/L}$  during summer in the 1970s, due mostly to internal loading. Without the August low dose alum treatment, maximum TP may well have been that high in 2006.

During summer 2007, after the high-dose alum treatment, lake TP concentrations were well below inflow concentrations, because internal loading had been largely curtailed (Figure 5). The treatment was highly effective, reducing TP to about the same level as in 1992, the year after the last full treatment (20, versus 21  $\mu\text{g/L}$  in 2007; Figure 3). Correspondingly, chl concentrations

for 1992 and 2007 were low at, respectively, 4 and 5  $\mu\text{g/L}$ , although, average transparency was 3 m in 1992 and only 1.9 m in 2007 (Figure 3).

Summer TP concentrations continued to be much lower than the inflow concentration in 2008, 2009 and 2010, despite much higher inflow concentrations that were over 100  $\mu\text{g/L}$  during fall and winter of 2008-2009 (Figure 5). While, high inflow in August 2008 may have partially caused the summer peak in the lake, the inflow did not reach such high concentrations in 2010, yet lake TP remained at about the same level as in 2009 (Figure 5). Therefore, lake TP is rather insensitive to large short-term fluctuations in inflow concentration.



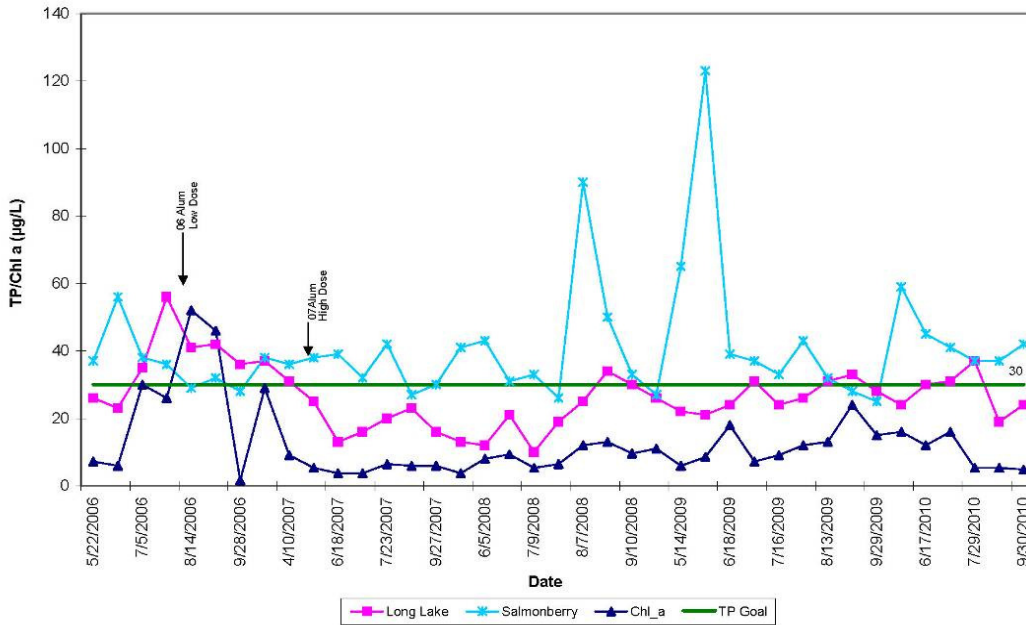
**Figure 5. Mean whole lake surface TP concentrations in Long Lake and in the principal inflow stream during 2006-2010. The low dose (2.5 mg/L Al) alum treatment occurred 8/1-4/06 and the high dose (17.5 mg/L Al) during 4/11-14/07.**

The whole-lake, mean surface TP concentration (weighed for volume) during the summers of 2008, 2009 and 2010 has progressively increased over that in 2007, subsequent to the 2007 spring alum treatment (Figure 2, 3). Surface mean TP was still near the goal of 30 µg/L in 2010, which is less than half the level in 1976 – 1978, before any treatment of the lake (Figure 2, 3). Moreover, the four-year mean TP in 2007-2010 is less than the four-year means following alum treatments in 1980 and 1991. That may be due to the higher total dose of 20 mg/L Al in 2006 and 2007 than those earlier doses (5.5 mg/L Al). Also, the low dose treatment in August 2006 probably minimized the summer mean TP in 2006. That is, had 2006 been a true non-treatment, reference year, without the alum low dose, 2006 mean TP would probably have been higher, resulting in a greater high dose effectiveness.

Except for single samples in each of 2008, 2009 and 2010, all summer values for TP were at or below the goal of 30 µg/L (Figure 6). The higher-than-30 µg/L TPs during summer 2006 were the result of internal loading and have not recurred the past four years. This means that the alum treatment has reduced internal loading and that the treatment has persisted.

Mean whole-lake summer chl increased from 2007 to 2009, but was lower in 2010 despite the increase in TP content (Figure 2). Summer mean chl has remained less than one half the 2006 level and less than the post alum treatments in 1980 and 1991 (Figure 2, 3). However, summer maximum chl levels were higher in 2009 than in 2007-2008, but the 2009 mean was still less than one half the 2006 mean (Figure 2, 6).

The risk for algal blooms to be composed of buoyant, nuisance cyanobacterial species is much reduced if the summer mean chl is less than 10 µg/L (Downing et al., 2001). Note that the whole-lake summer mean chls in 2007-2010 were all less than half the 2006 level (Figure 2), and there were no massive blooms those years (Figure 6). That is in contrast to the maximums of 55 µg/L chl and 180,000 cells/ml (“pea soup”) in 2006 when mean chl was nearly 30 µg/L (Figures 2, 6). The highest maximum since treatment was in 2009 when mean chl was also highest at 14 µg/L (Figures 2 and 6).



**Figure 6. Surface TP and chl at the mid-lake station in Long Lake, and inflow TP during spring-summer 2006-2010.**

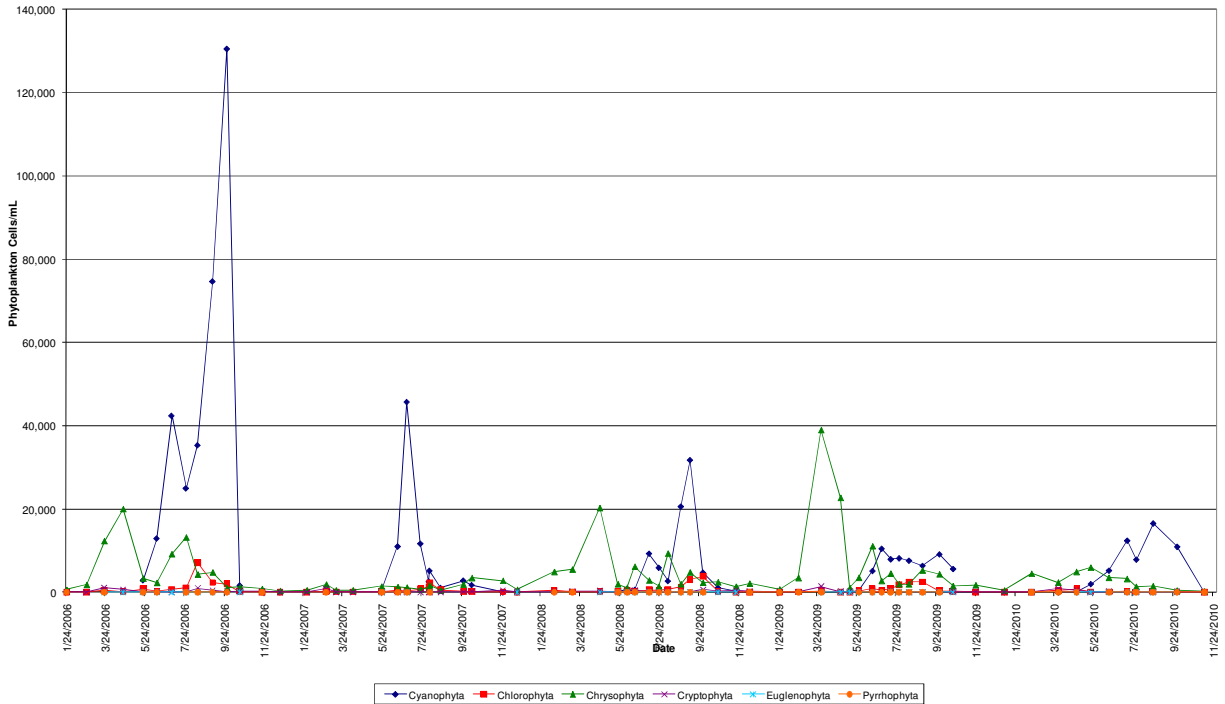
Another approach to evaluate treatment effectiveness is to compare inflow TP concentration with lake concentration. If there were no internal P loading (i.e., no internal source from bottom sediment), then average lake TP concentration should equal average inflow concentration, minus loss to the sediment. Since the time needed for inflows to replace the lake’s volume is only 0.2 of a year, lake TP concentration should reach equilibrium with inflow concentration in less than a year. So lake concentration should be less than inflow TP without internal loading.

Note the relatively slight and delayed effect of the spikes in inflow TP on lake TP during August–September, 2008 (Figure 6). Such higher inflow concentrations would need to persist much longer to substantially raise the lake TP level because the accumulation of inflow volume over a short time is much less than the lake volume. Those spikes in inflow TP may have been

partly responsible for the higher average summer TP concentrations than that in 2007. Thus, the higher 2008 TP was probably not all due to decreased effectiveness of alum.

Average, flow-weighted inflow TP concentration has historically been around 35-40  $\mu\text{g/L}$ , which is consistent with levels observed during 2006–2010 (Figures 5 and 6). Accounting for loss to sediment, the mean summer lake concentration on average should be between about 20 and 25  $\mu\text{g/L}$ . Since lake concentration averaged below 25  $\mu\text{g/L}$  during the summers of 2007-2010 (Figure 2), most of the source of lake TP must have come from the inflow, with little coming from the internal sediment source. The alum addition in spring 2007 appears to have largely arrested the internal P source. However, the gradual increase in summer mean TP, exceeding 30  $\mu\text{g/L}$  in 2010, indicates that some of the TP may now be coming from sediments. Without further treatment, lake TP will probably increase gradually over the next several years, although the 2007 treatment should last longer, given the more than 3-fold greater dose in 2007 than for the two earlier treatments in 1980 and 1991.

During the summer of 2006, the reference "pretreatment" year, the total average algal biomass was 10.5  $\text{mm}^3/\text{L}$ , 4.9  $\text{mm}^3/\text{L}$  of which was cyanobacteria (formerly called blue green algae) at an average cell density of 53,500 /ml (Figures 7 and 8). That is the group that contains taxa that produce toxins. During September 2006, cyanobacteria bloom represented 70% of the algal biomass with a maximum cell density of 130,000 /ml. The World Health organization recommends careful surveillance if cell abundance exceeds 10,000/ml, due to the potential of toxic bloom events occurring.



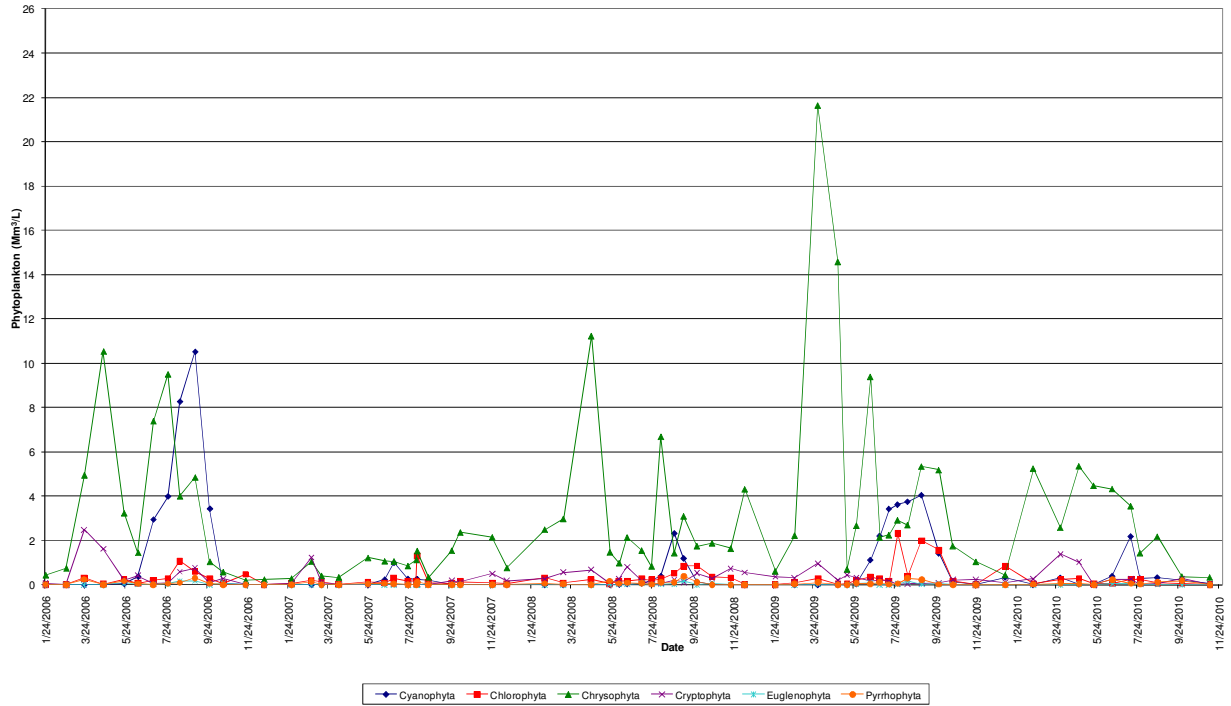
**Figure 7. Phytoplankton cell concentration at the midlake station at 1.0 m depth during 2006 through 2010.**

In summer 2007, after the high-dose alum treatment, cyanobacteria averaged only 18% of biomass at 0.32 mm<sup>3</sup>/L with a cell concentration of 11,400/ml and were comprised of small, non-nuisance, non-toxic taxa (Figures 7 and 8). Cell and biomass concentrations in 2007 were one fifth and one fifteenth those in 2006. More importantly, maximum cell density of these cyanobacteria in 2007 was much less at 45,000 /ml – one third the level in 2006 (Figure 7). Therefore, cyanobacteria were no longer dominant.

The cell and biomass concentrations of cyanobacteria during the summers of 2008, 2009 and 2010 continued to be much reduced from that in 2006 (Figure 7 and 8). Concentrations had increased slightly in 2009, but were back down in 2010, consistent with chl (Figure 2). Also, cyanobacteria were still sub-dominant in summer, with average biomass and cell concentrations for cyanobacteria in 2008, 2009 and 2010 of 0.55, 2.8 and 0.80 mm<sup>3</sup>/L and 9,600, 7,800 and 10,000/ml, respectively (Figure 7 and 8). Cyanobacteria averaged 14.7, 33.7 and 19.4 % of biomass for those years.

The risk of plankton algae to be dominated by cyanobacteria increases with the TP and algae (chl) concentration, which reflects the dependence of algae on TP. So reducing TP is the

effective way to not only reduce total algal biomass but also the fraction composed of cyanobacteria and the possibility of bloom toxicity. This is apparently what happened in Long Lake following the alum treatment.



**Figure 8. Phytoplankton cell volume (biomass) at the mid-lake station at 1 meter depth during 2006 through 2010.**

Mean, whole-lake summer transparency decreased slightly during 2007 to 2009, and then increased in 2010, consistent with changes in mean chl. Transparency is still well above that in 2006 (Figure 2, 3). Pretreatment transparency in 2006 was even lower than in 1976–1978 before any treatment (Figure 2, 3). However, transparency was not as high in 2007, after the alum treatment as it was following the 1980 and 1991 treatments (Figure 3). Long Lake contains naturally occurring algal substances that impart a brown color to the water. That may lower transparency at times, even if chl is low, especially during high flow in winter.

Dissolved oxygen decreased to around 4 mg/L near the lake bottom on a couple of occasions during summer 2006 and down to 1-2 mg/L during 2007-2010. At the times of blooms in 2006, pH levels exceeded 8 but never reached 9. In pretreatment years (1977-1978), pH reached levels of 9.3-10.3 during algal blooms (Welch, 1996). In 2008-2010, pH levels above 8 occurred, but



were fewer. Therefore, alum treatments have lowered photosynthetic activity – the cause for high pH levels.

### ***Phosphorus Mass Balance***

Mass balances for TP were completed for all five years (Appendix D). The relative contributions from the various sources are graphically shown in Figures 9-13.

Net internal loading was calculated for the summer (June-September) period, as was done for most years between 1936 and 1992 (Table 2). Internal loading was well over 100 kg during the pretreatment summer of 1973-1978; but had decreased markedly after the first alum treatment (Table 2). Internal loading was zero after the 1992 treatment. The 62 kg in 2006 is probably an underestimate because in-lake TP concentrations decreased after the August low-dose alum treatment (see earlier discussions). Nevertheless, subsequent internal loading was much reduced from 2006, and was zero in 2009 and 2010 (Table 2 and Figures 9-13). These are encouraging signs that the 2007 high-dose, alum treatment may persist longer than the previous two low doses in 1980 and 1991.

**Table 2. Summer Net Internal P Loading in Long Lake**

<b>Year</b>	<b>Summer Net Internal P Loading (kg)</b>
1977	164.7
1978	189.4
Alum	
1981	35.7
1985	127.9
1986	54.2
1987	94.9
1988	90.6
1989	13.2
1990	83.2
1991	53.6
Alum	
1992	0.0
2006	62*
Alum	
2007	16.0
2008	41.0
2009	0.0
2010	1.0

\* Lower than actual due to August, low-dose alum treatment

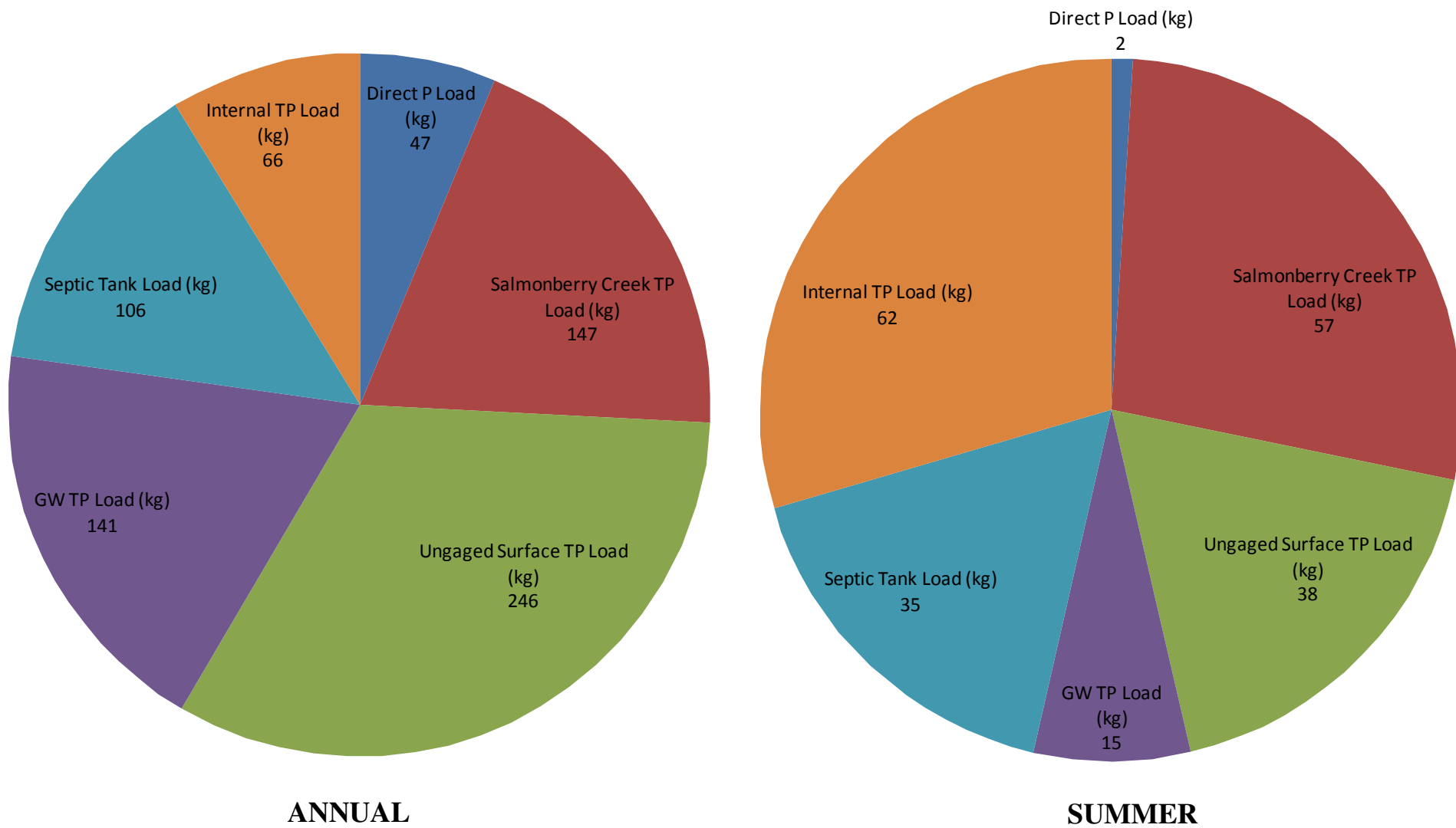


Figure 9. Long Lake Total Phosphorus Inflows, 2006.

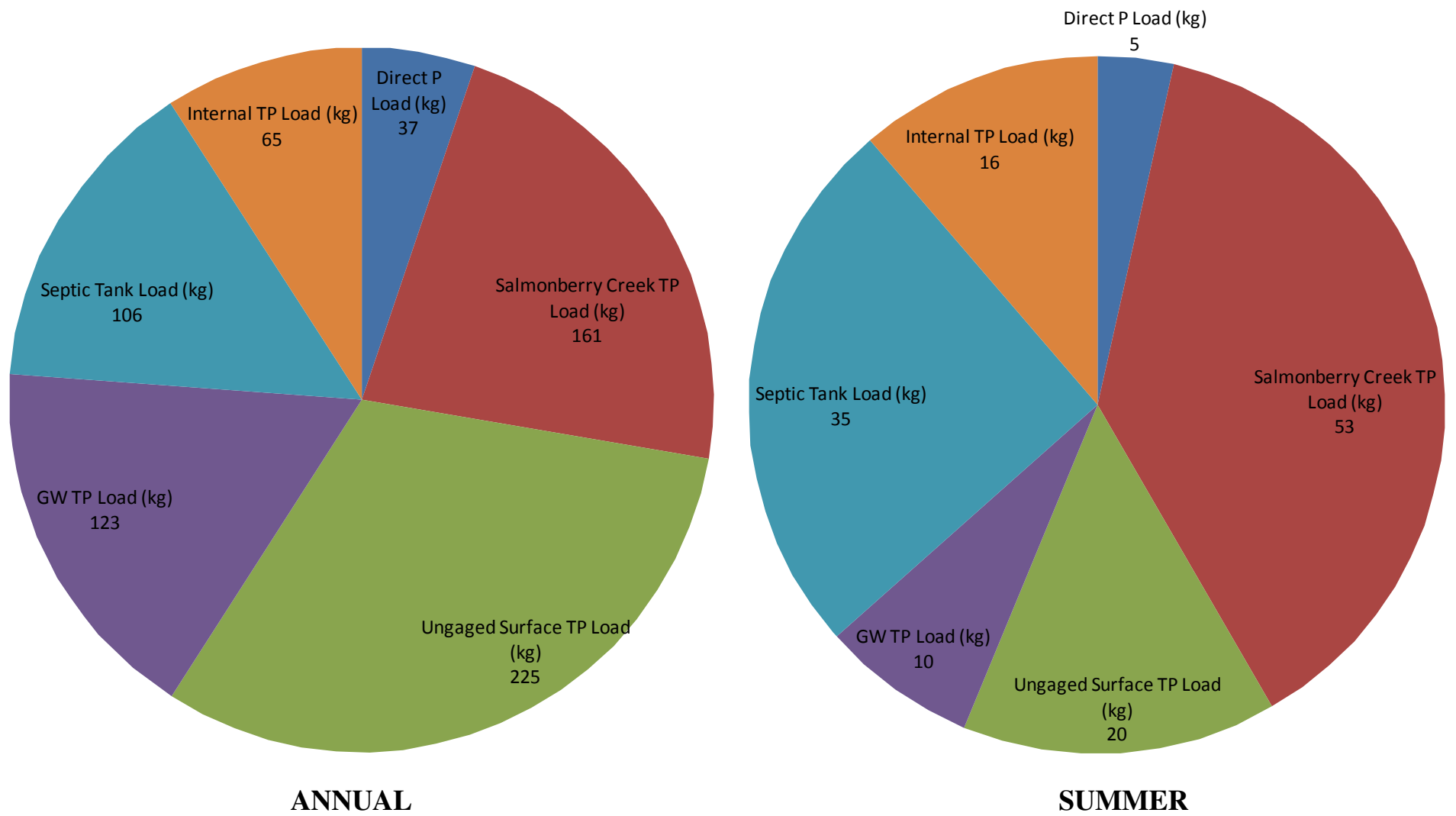


Figure 10. Long Lake Total Phosphorus Inflows, 2007.

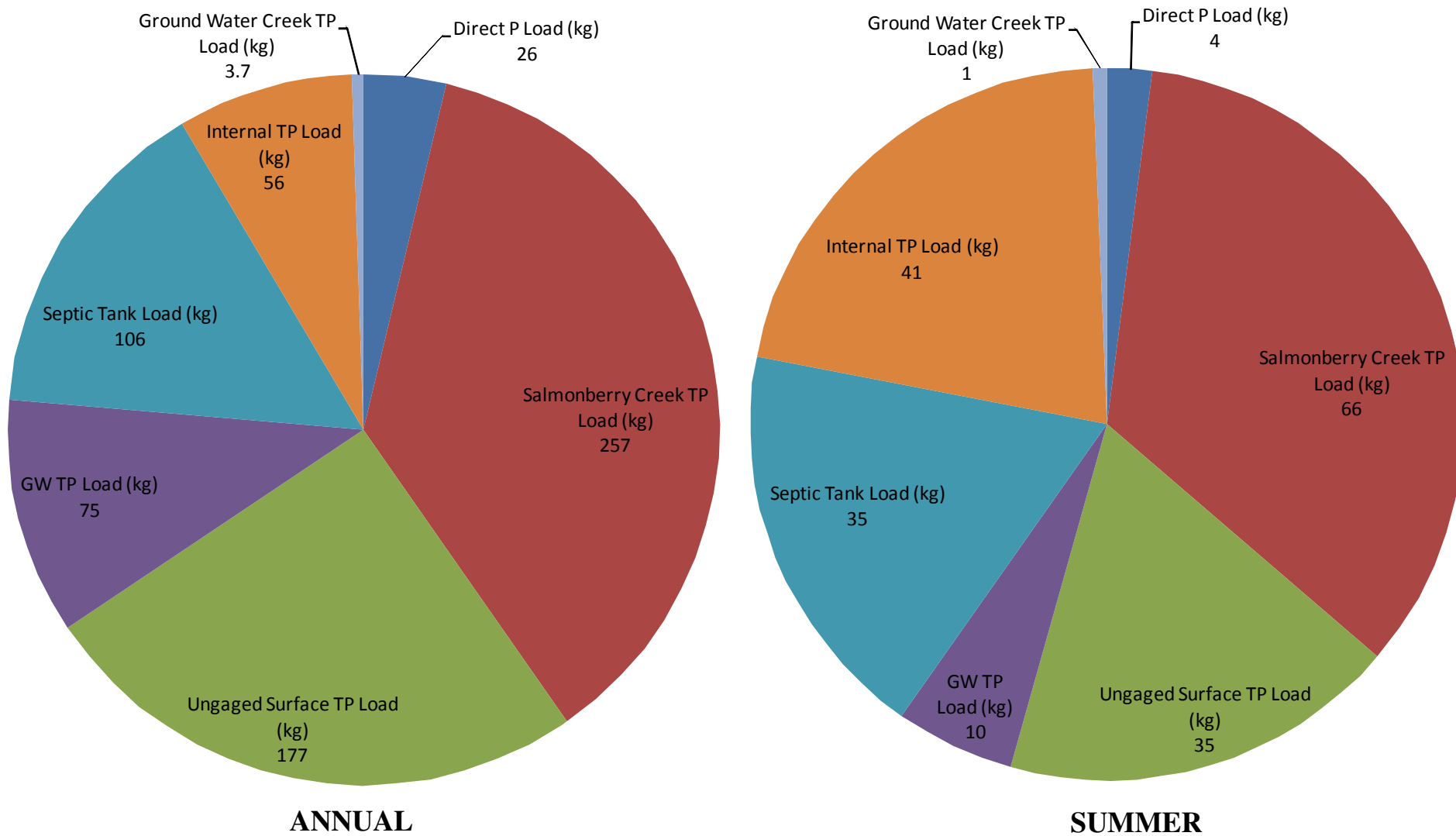


Figure 11. Long Lake Total Phosphorus Inflows, 2008.

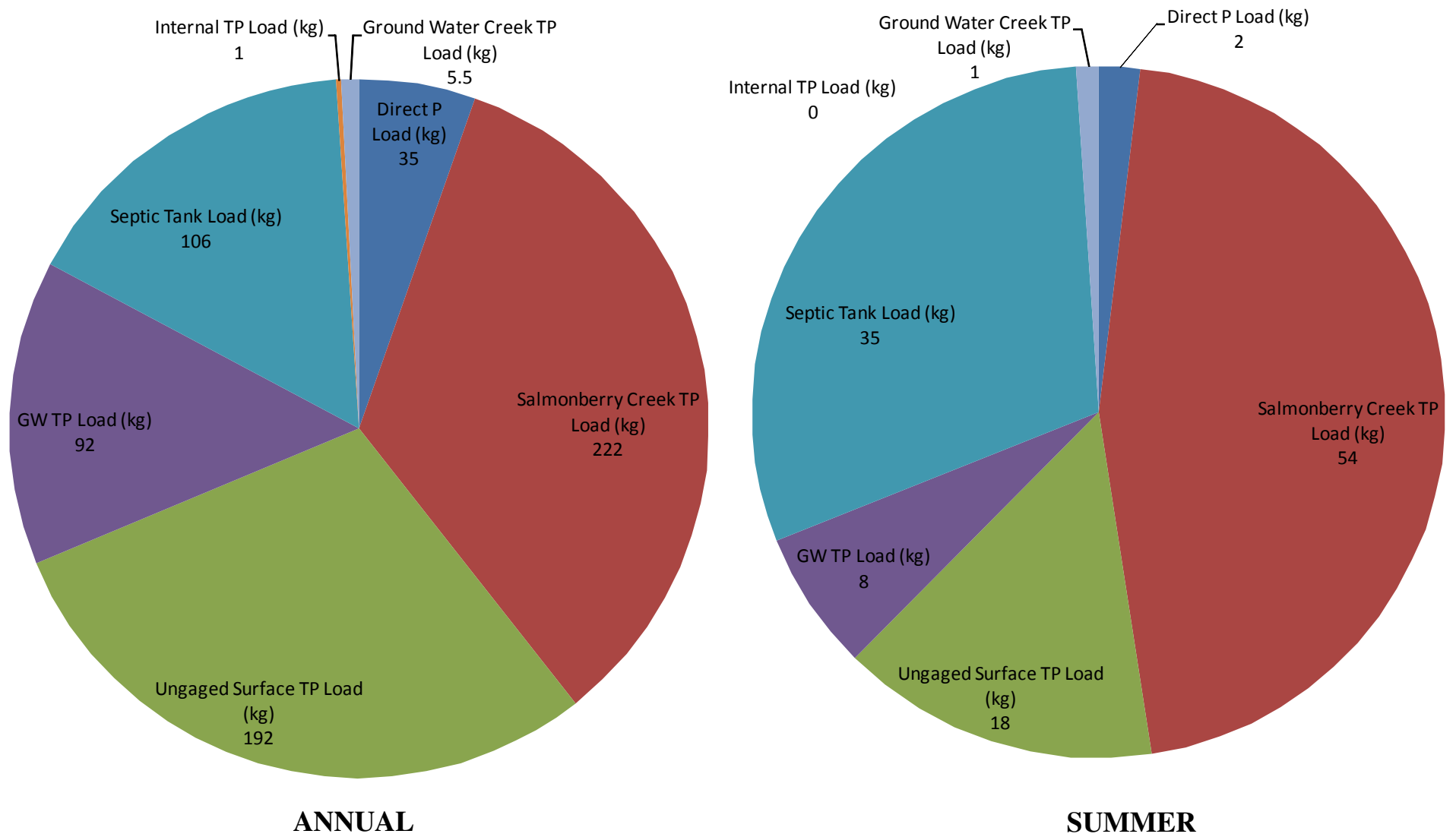


Figure 12. Long Lake Total Phosphorus Inflows, 2009.

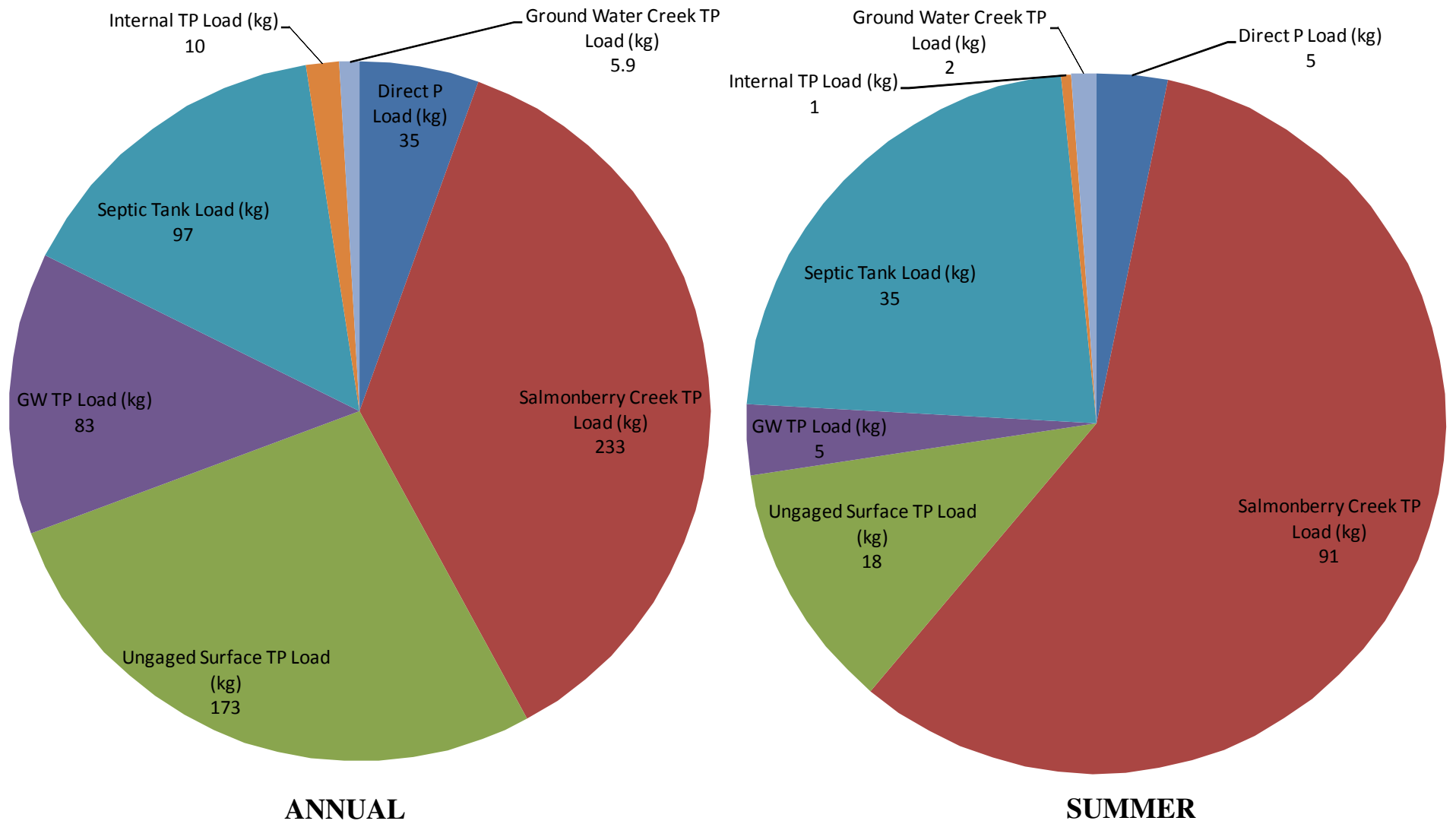


Figure 13. Long Lake Total Phosphorus Inflows, 2010.

## ***Aquatic: Plant Management***

The adaptive plant management plan was designed to control the exotic plant Brazilian Elodea (*E. densa*) in areas that interfere most with habitat and recreation as well as to eliminate Eurasian water milfoil. Also by design of management activities and application location, the less nuisance causing, endemic species of pond weeds will re-establish in areas where non-native plant have been controlled. There was no attempt to eradicate Elodea because it protects sediment from re-suspension and provides surface for nutrient trapping, resulting in low TP in the south end. Removal of Elodea from the south end would risk increased internal P loading. Moreover, Elodea does not reach the water surface throughout the lake so it does not markedly interfere with boating, areas where it does interfere with recreation have been prioritized for management activities.

Brazilian Elodea has apparently existed in the lake for 40 years. This plant was not noticeable in the south end of the lake in the mid 1960s where endemic pond weeds were more abundant. The exotic Elodea allegedly was introduced around 1970. During the 20-year study by UW, this plant composed at least 2/3 of the total plant mass (dry weight) and much of that time over 3/4 of the biomass (Welch, 1996). In 1985, its abundance dropped to only 10% of total mass and summer TP and chl averaged 66 and 36  $\mu\text{g/L}$ , respectively due to increased internal loading. Harvesting in the 1990s had no effect on the dominance of Brazilian Elodea. Eurasian water milfoil was not present during the 20-year UW study, but it was observed in the 1996 IAVMP so it is a recent invader.

Management procedures and responses of plant species distribution and abundance are described chronologically. During 2006, high use zones around the boat-launch area and to the south, as well as along the eastern shore, were treated with the herbicide sonar (Figure 14 and 15). These are areas where Brazilian Elodea and to some extent endemic pond weeds, interfered with recreation. Also, water milfoil was present in one small area along the east shore (orange in Figure 15).



Elodea was present throughout the lake in spring 2006 and the mixed community of Elodea and pond weeds represented only a small band along the shore on each side of the lake (blue band in Figure 14). After treatment during summer 2006, the mixed-community band had shrunk slightly (Figure 15). Therefore, the treatment zone proposed for 2007 was reduced in width, but extended in length to encompass other areas interfering with recreation (Figure 15).

After the second treatment in 2007, the mixed community of plants expanded (blue band in Figure 16). While Elodea was still part of the mixed community, its foliage was restricted more to near the bottom, interfering less with recreation (Figure 16). Nevertheless, treatment of a broader band along the eastern shore is proposed for 2008. The purpose for a more extensive treatment area is to improve space for boating activity. Further, expansion of the mixed community is expected.

For most of the lake, the distribution of plant species had changed little from spring 2006 to fall 2007. Elodea continued to dominate throughout the lake. However, treatment in the narrow shoreline areas has apparently encouraged endemic pond weed species to expand creating a wider band of the mixed community (Figure 16). Milfoil was nearly eliminated with only a small spot remaining. Also, the mixed lily area had shrunk by a small fraction.

As noted above, Elodea has varied naturally in abundance and distribution from year-to-year during UW's 20-year study. Except for the treated areas, this plant's distribution elsewhere in the lake remained rather constant during 2006, through 2008. The emergent bulrush, *Scirpus*, became prevalent at the north end in summer 2006 and along east and west shores in southern areas in fall 2007 (yellow in Figures 15 and 16). That change was probably unrelated to the treatments.

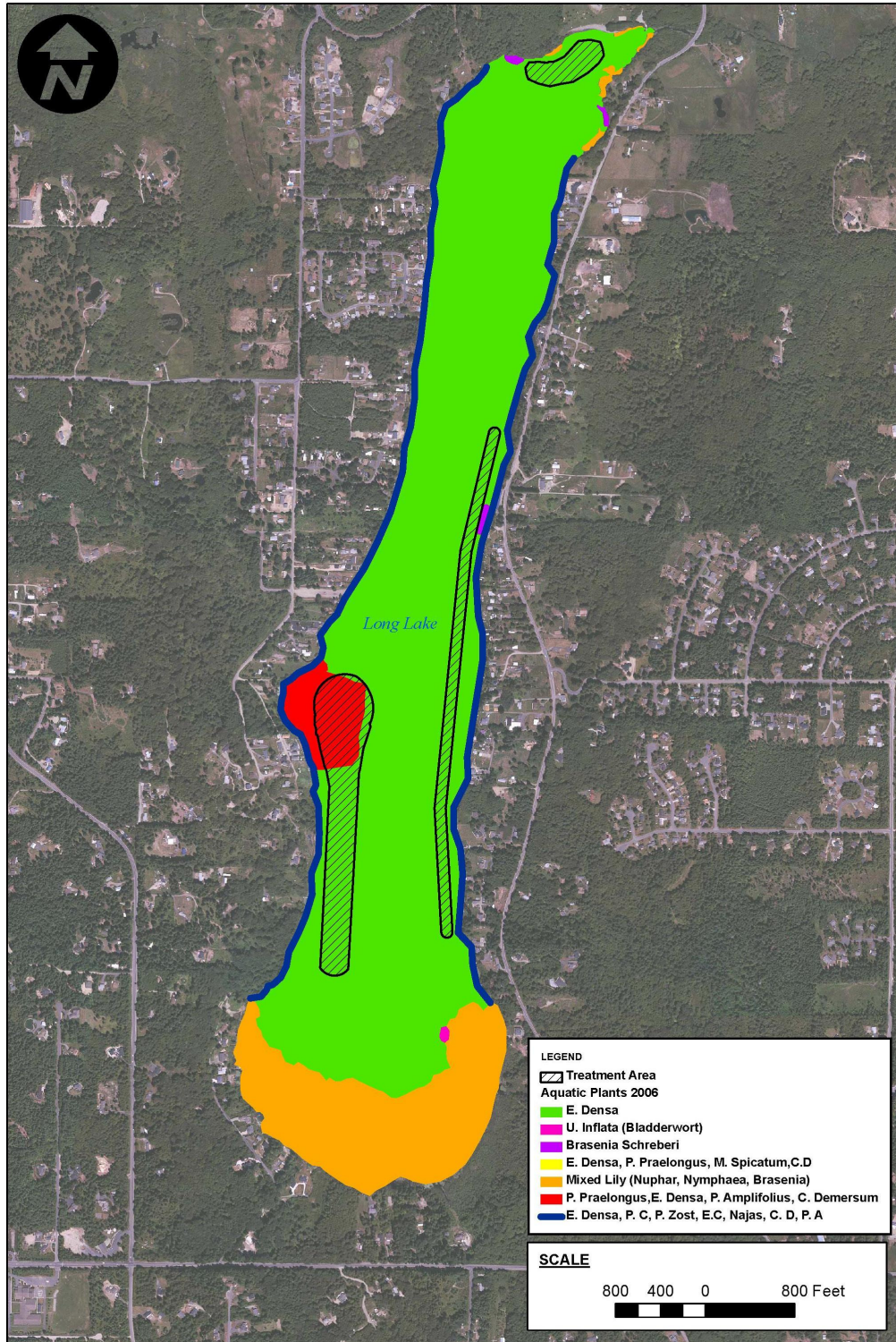


Figure 14. Long Lake aquatic plant map Spring 2006 & treatment zones for 2006 in Summer.

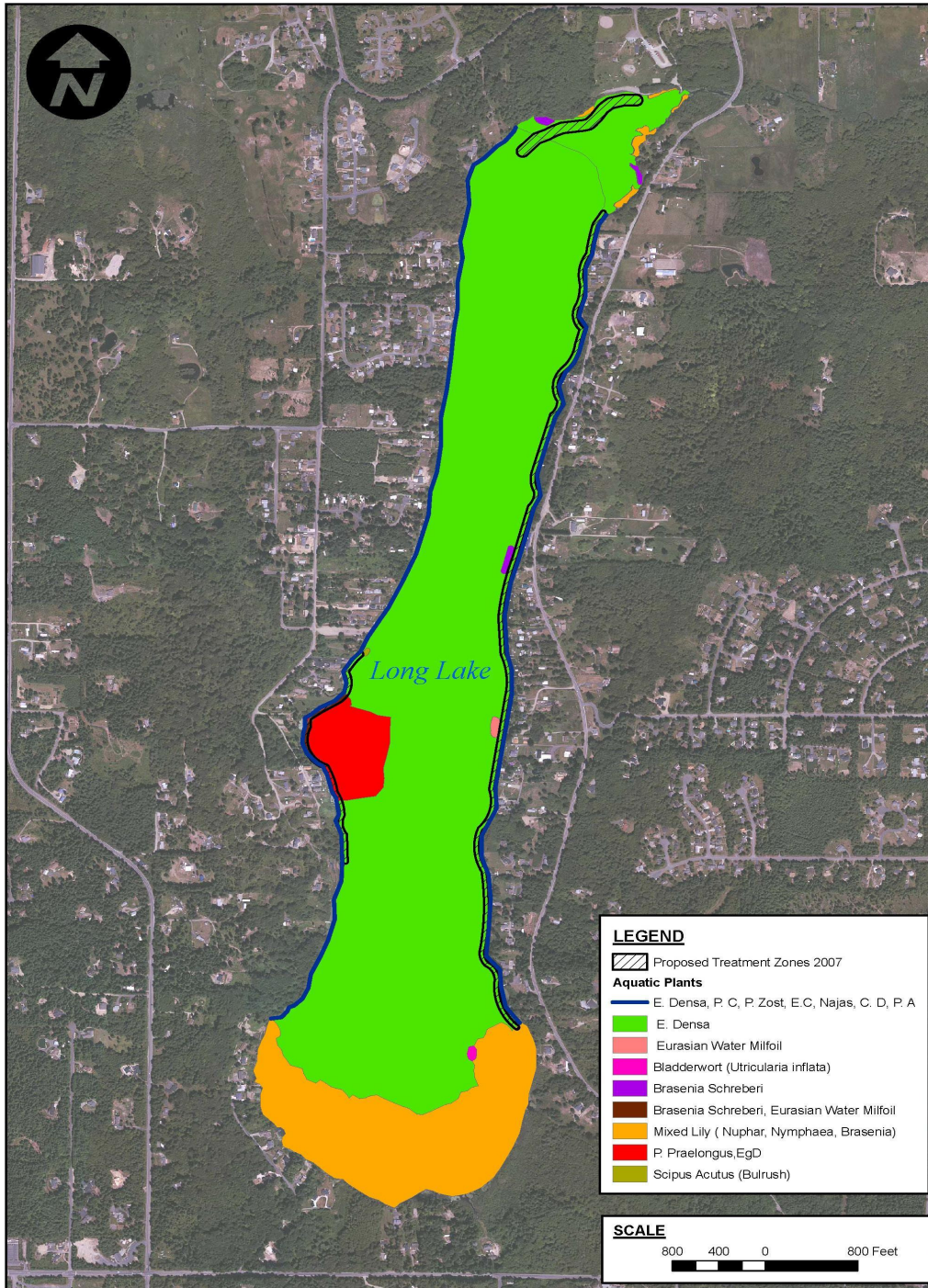


Figure 15. Long Lake aquatic plant map Summer 2006 & proposed treatment zones for 2007.

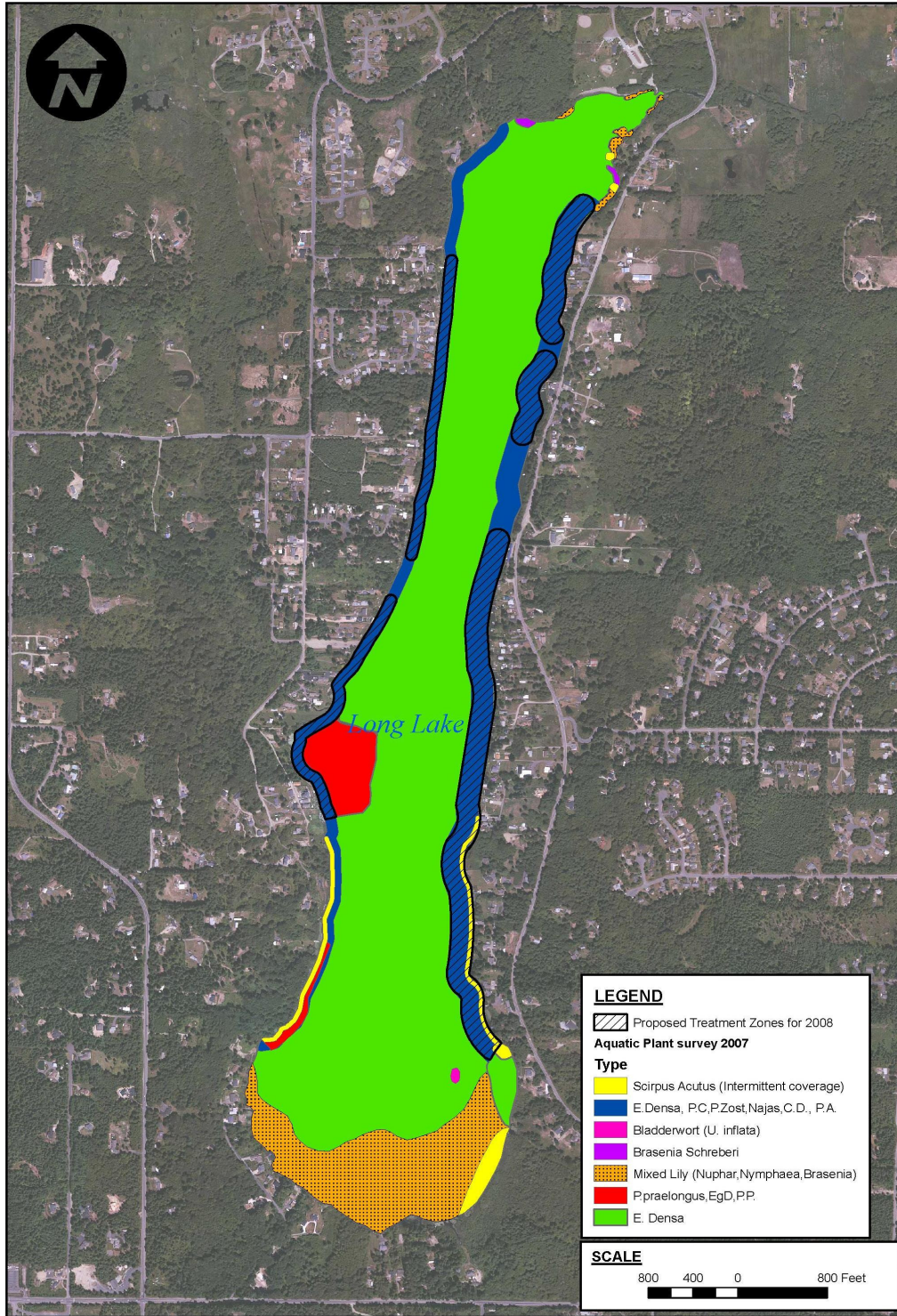


Figure 16. Long Lake aquatic plant map Fall 2007 and proposed treatment zones for 2008.

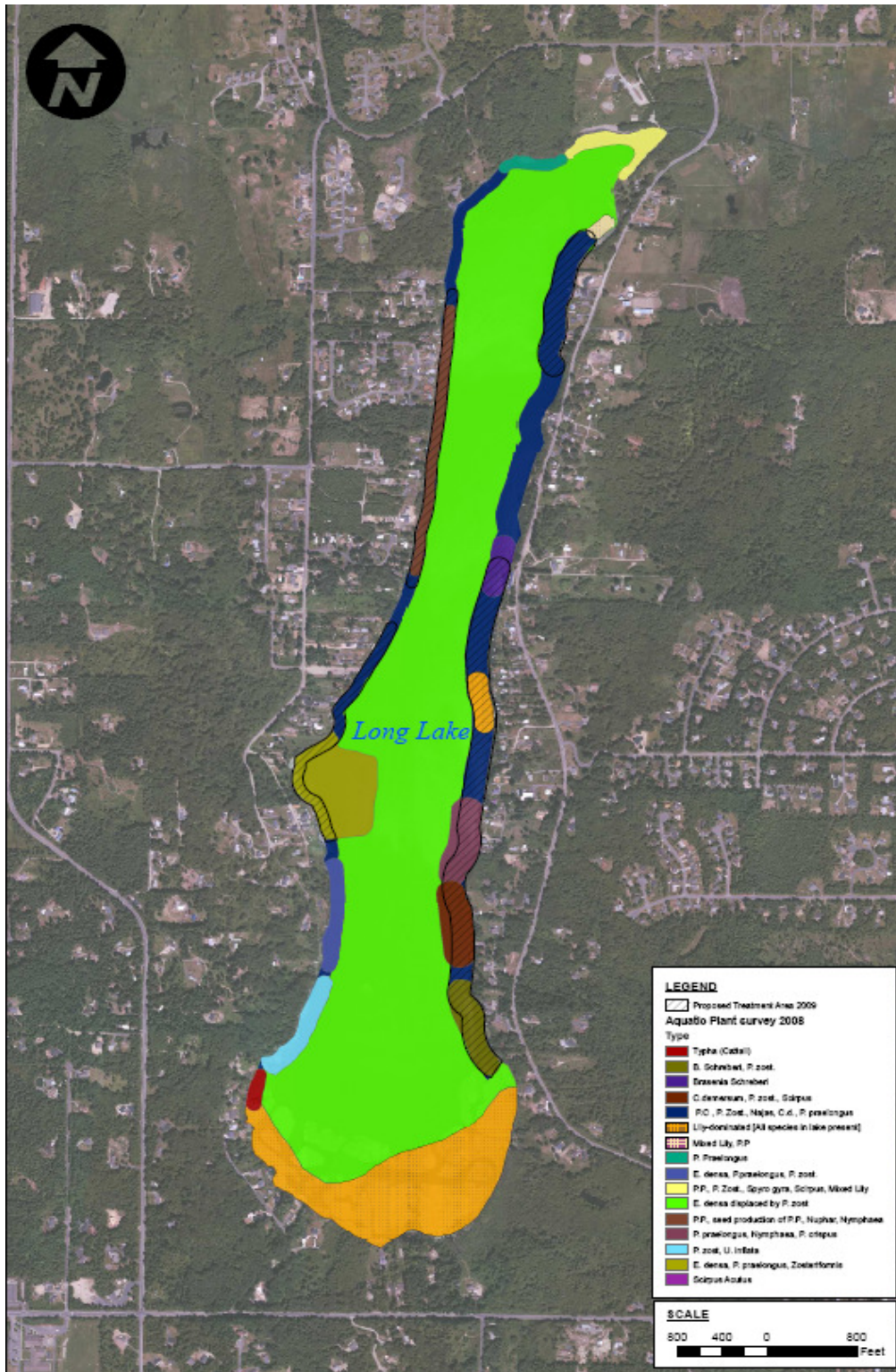


Figure 17. Long Lake aquatic map Fall 2008 and proposed treatment zones for 2009.

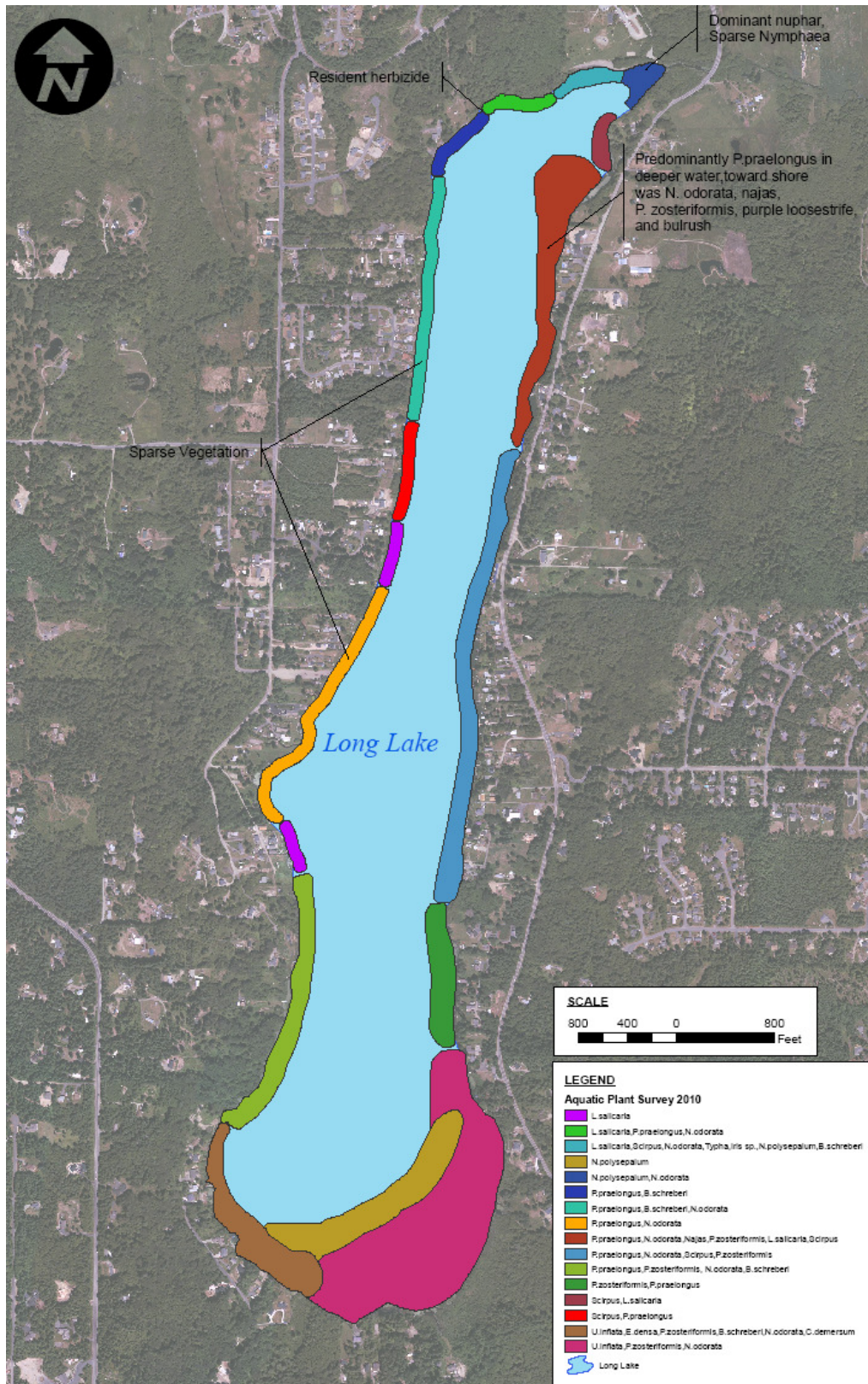


Figure 18. Long Lake aquatic map 2010.

Species diversity expanded by fall 2008, occupying a wider swath along the shoreline (Figure 17). As a result, the treatment area was less extensive in 2008 and was even less in 2009. *Egeria* and native species along the shore areas were less dense and diversity had increased. That necessitates reduction in the treatment area so that the plant diversity persists. Table 3 is a list of the species. Macrophytes were as diverse in 2010 and 2009 as in 2008, while the density of populations and percent cover was less on both sides of the lake in 2010 (Figure 18). As a result, treatment in 2010 was be confined to narrower and shorter strips on the east side and at the north east end (Figure 18). There was no treatment on the west side of the lake. Macrophyte populations have responded to this adaptive procedure with greater diversity and less density of native species and near elimination of non-native milfoil.

**Table 3. Aquatic Plant Species Observed in Long Lake in 2008, 2009 and 2010.**

Species Name	Common Name	Community Relative Abundance
<i>Egeria Densa</i>	Brazilian elodea	Dominant
<i>Typha sp.</i>	Cattail	Limited
<i>Brasenia Schreberi</i>	Water shield	Dominant
<i>Potamogeton zosteriformis</i>	Flat-Stem Pondweed	Moderate
<i>Potamogeton crispus</i>	Curly Leaf Pondweed	Limited
<i>Potamogeton Praelongus</i>	White-Stemmed Pondweed	Dominant
<i>Ceratophyllum demersum</i>	Coontail	Moderate
<i>Scirpus acutus</i>	Hardstem Bulrush	Limited
<i>Najas flexilis</i>	Slender water-nymph	Moderate
<i>Nuphar polysepala</i>	Spatterdock	Dominate
<i>Nymphaea odorata</i>	Fragrant Waterlily	Dominate
<i>Myriophyllum spicatum</i>	Eurasian watermilfoil	Limited
<i>Utricularia inflata</i>	Swollen Bladderwort	Limited

## 5. Discussion

The high-dose alum treatment in April 2007, combined with the low dose in August 2006, worked well to greatly reduce internal P loading. That resulted in a summer mean lake TP and chl reduction to 21 and 5 µg/L, respectively. That was an 82% reduction in chl from 2006 and about a 62% reduction in the mean summer fraction of the algal volume (biomass) composed of cyanobacteria. Chl increased some in 2008 and 2009, but was lower in 2010 and overall still two thirds less than in 2006, before treatment. Cyanobacteria cell and biomass concentrations also remained much less in all four post-alum years than in pretreatment 2006 and the lake was not closed due to cyanobacterial toxins as was the case the previous six years.

Cyanobacteria biomass in 2009 was higher than in 2007 and 2008, but declined to low levels in 2010, consistent with lower chl. Controlling algal biomass (chl), and the fraction that is nuisance cyanobacteria, can be effectively achieved by reducing P. Where summer loading comes mostly from recycling sediment P (internal loading), which is the case in Long Lake, sediment P inactivation with alum will and did effectively reduce lake TP, algal biomass and cyanobacteria.

TP levels in 2008-2010 showed signs of treatment effectiveness waning. Mean summer TP has increased about 50% since 2006. However, chl increased during 2007-2009 but decreased in 2010, and overall, still less than one half the 2006 pretreatment level. Nevertheless, the gradual increase in mean summer TP, exceeding 30 µg/L in 2010, suggests that some of the TP may now be coming from sediments. That is not unusual because alum sinks and can be resuspended and redistributed in shallow lakes. However, TP mass balance indicates no net internal loading in 2009 or 2010.

The algal group Chrysophyta has always represented a large percent of the cell biomass and chl in Long Lake. These are diatoms and small, flagellated algae that are not considered a nuisance; they do not form surface scums or produce toxicity. That group averaged 45, 59, 62, 51% and 70% of the summer algal biomass in 2006-2010, respectively, and large spring peaks in biomass are a common occurrence (Figures 7 and 8). These and other groups usually represent most of the biomass in low nutrient conditions, but become subdominant as lakes become eutrophic. That has obviously occurred in Long Lake as a result of the alum treatment. In order that these non-nuisance algae remain dominant, with cyanobacteria comprising only a small fraction of the biomass, mean summer chl should be around 10 µg/L or less and TP around 20 µg/L and less.

The question is; how long will the Al-bound sediment P in the recent treatment remain inactivated? Past results from successful alum treatments suggest about ten years (Cooke et al., 2005). The 1980 alum treatment in Long Lake was effective for at least eleven years, but the effect waned during the latter part of that period in 1985-1991 (Figure 2). Longevity of the 1991 treatment is unknown because monitoring was terminated in 1995. The 2007 treatment dose was over three times the 1980 and 1991 doses, and theoretically should have a greater longevity.



That seems to be happening, because the current four-year post-treatment mean TP was less than 30  $\mu\text{g/L}$ , while the four-year post-treatment levels in 1981-1984 and 1992-1995 were greater than 30  $\mu\text{g/L}$ . Also, four-year post treatment mean chl was about equal to the previous four-year, post-treatment means. Nevertheless, the effect of this latest treatment is expected to eventually wane as well (Figure 2).

Why did effectiveness of the past treatments eventually wane? Part of the reason is that the sediment Al-P fraction formed with the treatment sinks, is covered with new sediment and new untreated-uncomplexed P can diffuse from depth into the surficial sediments. The 1991 alum treatment was detected at a depth of 5 cm in cores taken in 1998 and remains of the 1980 treatment were undetected in the top 15 cm (Rydin et al., 2000). Alum floc layers have typically moved downward at a little more than about 1 cm/year (Cooke et al., 2005). The rate of movement downward in Long Lake is apparently similar.

The source of some of the new sediment in Long Lake may be from dead and partly decayed plant material, largely from the south end, being distributed in a northerly direction during the windy winter months. High TP concentrations at 2.5 m in the deep (3 m) through of 70  $\mu\text{g/L}$  in fall 2009 may be due to that source. Also, these macrophytes have their P needs supplied from the sediment via their roots. Such a distribution of plant material would effectively be another source of uncomplexed P to surficial sediments. So reducing macrophytes may lengthen the longevity of alum treatments. However, eradication of macrophytes in the South lake area is not recommended because doing so would expose bare sediments probably enhancing internal loading directly, which was the case in 1985 when macrophyte biomass naturally decreased by 90%, broad areas of sediment was exposed and TP and chl were the highest since the 1980 treatment (Figure 3).

## **6. Summary**

The inactivation of sediment P with alum in spring 2007 effectively reduced internal P loading in Long Lake. Four-year mean lake TP concentrations were reduced to levels less than those following two earlier treatments in 1980 and 1991. As a result, algal chl has remained two-thirds

less than the pre-treatment 2006 level. Also, the mean cell and biomass concentrations of nuisance cyanobacteria, have remained about 80% less than pretreatment levels and there have been no large "pea soup" blooms as occurred in 2000-2006. However, effectiveness of the recent alum treatment has shown signs of gradual waning, which is to be expected.

The density of native macrophyte species in heavy boat use areas has declined while the diversity (number of species) has increased over the past four years. Eurasian water milfoil has nearly disappeared. Thus, the indicial use of herbicides has been successful in changing the rooted macrophyte populations to a less objectionable state. At the same time the Brazilian Elodea population in the open lake and south end has remained stable. That is recommended; because long-term observations have shown that plant cover to mitigate internal P loading, despite this partial decline and decay in late fall and winter.

## **7. Recommendations**

In-lake management activities at Long Lake have demonstrated that with the implementation of a planned integrated program the water quality, habitat, and recreational uses of the lake can be enhanced and maintained. It is recommended that lake monitoring and adaptive management activities be continued to ensure the usability of the lake and to safe guard public health. Specifically, sustainable funding for a long-term program should be established, for example, the formation of a LMD (Lake Management District) through the County. This would lay the groundwork for citizen input, integrated County oversight and implementation, while allowing for the seeking of additional funding through grants. For the past 5 years the effort has centered on in-lake activities and public education, this should be continued for all future management. Although, watershed activities have not been specific drivers in the overall decline in the lake's quality, certainly watershed education and pollution prevention should also be included.

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## **Appendix A – Field Data**

**Table A-1. Field Data for Long Lake Middle Station, 2006-2010.**

Date	Station	Time	Depth (m)	Temperature (°C)	DO (mg/l)	Sp Conductivity (µS/cm)	pH (units)
1/24/06	middle	12:47	0.2	6.97	10.98	51.7	6.94
1/24/06	middle	12:47	0.7	6.84	10.74	51.7	6.93
1/24/06	middle	12:47	1.2	6.84	10.04	52.0	6.93
1/24/06	middle	12:47	1.7	6.85	9.87	52.0	6.91
1/24/06	middle	12:47	2.2	6.79	9.79	52.0	6.91
1/24/06	middle	12:47	2.7	6.75	10.13	52.0	6.91
1/24/06	middle	12:47	3.2	6.64	10.13	52.0	6.89
1/24/06	middle	12:47	3.7	6.64	9.78	52.3	6.89
2/24/06	middle	12:30	0.1	5.12	12.95	50.8	7.05
2/24/06	middle	12:30	0.6	5.11	11.84	50.8	7.03
2/24/06	middle	12:30	1.1	5.08	11.74	50.9	7.02
2/24/06	middle	12:30	1.6	4.89	11.56	51.0	6.99
2/24/06	middle	12:30	2.1	4.82	11.47	51.1	6.97
2/24/06	middle	12:30	2.6	4.77	11.34	51.4	6.95
2/24/06	middle	12:30	3.1	4.77	11.28	51.4	6.94
2/24/06	middle	12:30	3.6	4.76	11.05	51.3	6.92
3/23/06	middle	11:30	0	9.12	10.73	57.9	7.31
3/23/06	middle	11:30	0.5	8.99	10.29	57.8	7.31
3/23/06	middle	11:30	1.0	8.86	9.84	57.4	7.28
3/23/06	middle	11:30	1.5	8.83	10.21	57.8	7.24
3/23/06	middle	11:30	2.0	8.81	10.16	58.1	7.20
3/23/06	middle	11:30	2.5	8.80	10.07	58.0	7.19
3/23/06	middle	11:30	3.0	8.79	9.58	58.4	8.78
4/21/06	middle	1:45	0	14.31	8.88	66.3	8.05
4/21/06	middle	1:45	0.5	13.57	9.00	66.7	8.08
4/21/06	middle	1:45	1.0	13.25	8.95	62.3	8.03
4/21/06	middle	1:45	1.5	13.12	8.88	67.4	7.97
4/21/06	middle	1:45	2.0	12.91	8.68	66.9	7.88
4/21/06	middle	1:45	2.5	12.48	8.13	70.2	7.53
4/21/06	middle	1:45	3.0	11.84	6.87	69.1	7.22
4/21/06	middle	1:45	3.5	11.62	7.32	74.8	7.32
5/22/06	middle		0	19.16	8.89	79.5	7.25
5/22/06	middle		0.5	19.17	9.17	79.5	7.27
5/22/06	middle		1.0	19.17	8.79	79.9	7.26
5/22/06	middle		1.5	19.17	8.96	79.9	7.25
5/22/06	middle		2.0	19.16	8.85	80.1	7.24
5/22/06	middle		2.5	19.16	8.43	79.8	7.23
5/22/06	middle		3.0	19.10	7.54	81.1	7.09
6/12/06	middle		0	19.36	8.82	82.7	7.39
6/12/06	middle		0.5	19.34	9.09	82.8	7.38
6/12/06	middle		1.0	19.31	9.30	82.8	7.37
6/12/06	middle		1.5	19.29	9.04	82.7	7.36
6/12/06	middle		2.0	19.26	9.52	82.7	7.43
6/12/06	middle		2.5	19.27	9.41	82.8	7.42
7/5/06	middle	9:37	0	22.84	8.14	90.4	7.57

Date	Station	Time	Depth (m)	Temperature (°C)	DO (mg/l)	Sp Conductivity (µS/cm)	pH (units)
7/5/06	middle	9:37	0.5	22.88	7.87	90.2	7.61
7/5/06	middle	9:37	1.0	22.89	8.71	89.8	7.62
7/5/06	middle	9:37	1.5	22.88	8.56	90.1	7.63
7/5/06	middle	9:37	2.0	22.85	8.25	90.3	7.62
7/5/06	middle	9:37	2.5	22.85	7.90	90.7	7.64
7/5/06	middle	9:37	3.0	22.84	8.16	90.6	7.65
7/27/06	middle		0	25.47	8.13	97.7	8.34
7/27/06	middle		1.0	24.88	7.90	97.5	8.33
7/27/06	middle		2.0	24.71	7.18	97.1	7.96
7/27/06	middle		3.0	23.31	7.08	104.5	6.98
8/14/06	middle	10:30	0	21.96	10.02	100.6	7.8
8/14/06	middle	10:30	0.5	21.38	8.71	100.9	7.68
8/14/06	middle	10:30	1.0	21.21	8.06	101.1	7.48
8/14/06	middle	10:30	1.5	21.10	7.81	101.2	7.38
8/14/06	middle	10:30	2.0	21.05	7.85	101.3	7.38
8/14/06	middle	10:30	2.5	21.06	7.03	101.6	7.25
8/14/06	middle	10:30	3.0	20.97	5.08	101.4	7.02
9/6/06	middle		0	22.01	10.13	103.6	8.02
9/6/06	middle		0.5	21.04	9.36	103.4	8.01
9/6/06	middle		1.0	20.77	9.30	103.3	7.93
9/6/06	middle		1.5	20.49	8.43	103.5	7.61
9/6/06	middle		2.0	20.35	7.99	103.4	7.49
9/6/06	middle		2.5	20.19	5.86	104.5	7.15
9/6/06	middle		3.0	20.04	3.89	104.7	6.96
9/28/06	middle		0	18.54	9.54		7.84
9/28/06	middle		0.5	18.48	9.54		7.84
9/28/06	middle		1.0	18.25	9.50		7.80
9/28/06	middle		1.5	17.99	9.44		7.78
9/28/06	middle		2.0	17.13	6.99		7.16
9/28/06	middle		2.5	16.85	6.61		7.14
9/28/06	middle		3.0	16.81	7.29		7.17
10/31/06	middle		0	10.16	7.33	104.2	7.33
10/31/06	middle		0.5	10.17	7.32	103.9	7.32
10/31/06	middle		1.0	10.20	7.32	104.5	7.32
10/31/06	middle		1.5	10.19	7.31	104.3	7.31
10/31/06	middle		2.0	10.19	7.32	104.3	7.32
10/31/06	middle		2.5	10.19	7.32	104.1	7.32
11/21/06	middle		0	8.13	13.07	75.1	6.99
11/21/06	middle		1.0	8.13	10.38	74.7	6.97
11/21/06	middle		2.0	8.12	10.22	74.0	6.75
12/09/06	center		0.0	4.58	11.51	57.6	6.78
12/09/06	center		0.5	4.56	10.61	57.2	6.75
12/09/06	center		1.0	4.54	10.56	57.0	6.73
12/09/06	center		1.5	4.56	10.23	57.2	6.74
12/09/06	center		2.0	4.52	10.22	56.8	6.74
12/9/06	center		2.5	4.52	10.00	57.7	6.73
12/09/06	center		3.0	4.50	9.83	57.7	6.73

Date	Station	Time	Depth (m)	Temperature (°C)	DO (mg/l)	Sp Conductivity (µS/cm)	pH (units)
12/09/06	center		3.5	4.50	9.83	56.9	6.72
1/29/07	center		0.0	4.57	13.57	53.4	6.81
1/29/07	center		0.5	4.61	13.18	52.9	6.79
1/29/07	center		1.0	4.59	13.24	52.8	6.78
1/29/07	center		1.5	4.56	13.10	52.9	6.78
1/29/07	center		2.0	4.57	13.20	52.2	6.78
1/29/07	center		2.5	4.51	13.01	54.6	6.76
1/29/07	center		3.0	4.51	12.78	53.5	6.75
1/29/07	center		3.5	4.56	12.94	53.8	6.74
2/28/07	center		0	6.53	12.25	57.9	6.89
2/28/07	center		0.5	6.53	11.22	57.7	6.85
2/28/07	center		1.0	6.51	10.98	57.8	6.86
2/28/07	center		1.5	6.49	10.81	57.8	6.83
2/28/07	center		2.0	6.52	10.74	57.7	6.84
2/28/07	center		2.5	6.49	10.79	57.7	6.84
3/15/07	center		0	9.07	10.49	56.7	6.94
3/15/07	center		0.5	9.02	10.16	56.8	6.90
3/15/07	center		1.0	9.00	9.80	57.0	6.88
3/15/07	center		1.5	8.98	9.76	57.0	6.87
3/15/07	center		2.0	8.94	9.51	56.7	6.83
3/15/07	center		2.5	8.89	9.04	57.2	6.81
3/15/07	center		3.0	8.84	9.42	56.9	6.80
4/10/07	center	08:00	0	12.70	9.31	83.4	7.20
4/10/07	center	08:00	0.5	12.74	9.27	82.7	7.18
4/10/07	center	08:00	1.0	12.69	9.23	82.7	7.17
4/10/07	center	08:00	1.5	12.68	9.21	83.0	7.17
4/10/07	center	08:00	2.0	12.68	9.21	82.5	7.17
4/10/07	center	08:00	2.5	12.67	9.20	82.6	7.16
4/10/07	center	08:00	3.0	12.60	9.16	82.7	7.16
4/10/07	center	08:00	3.5	12.63	8.85	82.6	7.14
4/10/07	center	09:00	0	12.29	9.23	82.9	7.06
4/10/07	center	09:00	0.5	12.26	9.16	82.9	7.10
4/10/07	center	09:00	1.0	12.25	9.13	83.0	7.15
4/10/07	center	09:00	1.5	12.26	9.10	82.8	7.16
4/10/07	center	09:00	2.0	12.25	9.10	82.9	7.20
4/10/07	center	09:00	2.5	12.25	9.10	82.9	7.19
4/10/07	center	16:00	0.5	13.13	9.82	83.3	7.13
5/24/07	center		0	18.12	10.11	134.3	7.71
5/24/07	center		0.5	18.18	10.11	135.0	7.56
5/24/07	center		1.0	18.00	10.10	134.7	7.57
5/24/07	center		1.5	17.89	10.10	134.7	7.50
5/24/07	center		2.0	16.83	10.18	132.3	7.31
5/24/07	center		2.5	16.32	9.60	126.5	6.90
5/24/07	center		3.0	16.08	8.83	129.0	6.83
5/24/07	center		3.5	15.93	8.76	130.6	6.82
6/18/07	middle		0.0	17.70	8.61	135.2	7.31
6/18/07	middle		0.5	17.73	8.59	135.3	7.31

Date	Station	Time	Depth (m)	Temperature (°C)	DO (mg/l)	Sp Conductivity (µS/cm)	pH (units)
6/18/07	middle		1.0	17.74	8.57	135.2	7.32
6/18/07	middle		1.5	17.73	8.56	135.2	7.32
6/18/07	middle		2.0	17.73	8.56	135.3	7.32
6/18/07	middle		2.5	17.72	8.53	135.4	7.33
6/18/07	middle		3.0	17.67	8.47	135.3	7.32
6/18/07	middle		3.5	17.66	8.36	135.3	7.30
7/2/07	middle		0.0	20.47	8.82	136.4	7.35
7/2/07	middle		0.5	20.48	8.80	136.2	7.43
7/2/07	middle		1.0	20.49	8.79	136.6	7.46
7/2/07	middle		1.5	20.47	8.77	136.6	7.47
7/2/07	middle		2.0	20.44	8.77	136.2	7.48
7/2/07	middle		2.5	20.35	8.68	136.5	7.46
7/2/07	middle		3.0	20.34	8.53	136.3	7.42
7/2/07	middle		3.5	20.31	8.36	136.7	7.39
7/23/07	middle		0.0	21.58	8.10	139.6	7.44
7/23/07	middle		0.5	21.60	8.07	139.4	7.43
7/23/07	middle		1.0	21.60	8.03	139.1	7.43
7/23/07	middle		1.5	21.61	8.02	139.3	7.43
7/23/07	middle		2.0	21.60	8.01	139.3	7.43
7/23/07	middle		2.5	21.60	7.98	139.2	7.43
7/23/07	middle		3.0	21.56	7.97	139.3	7.43
7/23/07	middle		3.5	21.57	7.85	139.3	7.41
8/6/07	middle		0.0	22.28	7.99	142.4	7.39
8/6/07	middle		0.5	22.28	7.97	142.2	7.38
8/6/07	middle		1.0	22.27	7.96	142.2	7.39
8/6/07	middle		1.5	22.27	7.98	142.2	7.41
8/6/07	middle		2.0	22.27	7.85	142.2	7.38
8/6/07	middle		2.5	22.29	7.86	142.5	7.39
8/6/07	middle		3.0	22.29	7.83	142.3	7.38
8/23/07	middle		0.0	21.17	9.01	143.7	7.76
8/23/07	middle		0.5	21.13	9.02	143.5	7.77
8/23/07	middle		1.0	21.09	9.00	143.6	7.78
8/23/07	middle		1.5	20.92	9.00	143.1	7.76
8/23/07	middle		2.0	20.84	8.96	143.2	7.75
8/23/07	middle		2.5	20.76	8.87	143.5	7.74
8/23/07	middle		3.0	20.71	8.87	143.2	7.71
8/23/07	middle		3.5	20.59	8.10	143.2	7.47
9/5/07	middle		0.0	21.20	8.71	145.4	7.48
9/5/07	middle		0.5	21.16	8.69	145.3	7.60
9/5/07	middle		1.0	21.11	8.70	145.3	7.63
9/5/07	middle		1.5	21.08	8.67	145.6	7.63
9/5/07	middle		2.0	21.07	8.60	145.5	7.62
9/5/07	middle		2.5	21.05	8.49	145.4	7.60
9/5/07	middle		3.0	21.05	8.45	145.5	7.60
9/5/07	middle		3.5	21.04	8.26	145.4	7.52
9/27/07	middle		0	16.23	9.36	150.0	8.15
9/27/07	middle		0.5	16.24	9.32	150.0	8.17



Date	Station	Time	Depth (m)	Temperature (°C)	DO (mg/l)	Sp Conductivity (µS/cm)	pH (units)
9/27/07	middle		1	16.22	9.31	150.0	8.21
9/27/07	middle		1.5	16.21	9.35	150.4	8.23
9/27/07	middle		2.0	16.20	9.32	149.9	8.27
9/27/07	middle		2.5	16.2	9.3	150.3	8.25
9/27/07	middle		3.0	16.19	9.3	150.0	8.27
9/27/07	middle		3.5	16.24	2.00	150.3	7.57
10/10/07	middle		0	12.97	10.01	141.3	7.54
10/10/07	middle		0.5	12.97	9.98	141.6	7.61
10/10/07	middle		1.0	12.96	9.96	141.2	7.64
10/10/07	middle		1.5	12.94	9.95	141.6	7.67
10/10/07	middle		2.0	12.95	9.91	141.5	7.69
10/10/07	middle		2.5	12.95	9.92	141.6	7.67
10/10/07	middle		3.0	12.95	9.9	141.2	7.67
10/10/07	middle		3.5	12.95	9.36	141.2	7.55
11/27/07	middle		0	5.78	10.37	125.4	7.35
11/27/07	middle		0.5	5.75	10.04	125.7	7.36
11/27/07	middle		1.0	5.75	9.96	126.0	7.37
11/27/07	middle		1.5	5.71	9.91	125.8	7.37
11/27/07	middle		2.0	5.65	9.84	125.8	7.37
11/27/07	middle		2.5	5.63	9.77	126.1	7.36
11/27/07	middle		3.0	5.61	9.81	126.3	7.36
11/27/07	middle		3.5	5.62	8.49	126.1	7.32
12/19/07	middle		0	4.79	11.50	88.7	7.05
12/19/07	middle		0.5	4.79	11.37	88.6	7.03
12/19/07	middle		1.0	4.79	11.34	88.5	7.02
12/19/07	middle		1.5	4.79	11.31	88.2	7.00
12/19/07	middle		2.0	4.8	11.3	88.2	6.98
12/19/07	middle		2.5	4.81	11.27	88.1	6.96
12/19/07	middle		3.0	4.82	11.24	88.2	6.95
12/19/07	middle		3.5	4.97	11.06	87.7	6.92
2/14/08	middle		0	5.8	12.78	88.8	7.39
2/14/08	middle		0.5	5.67	12.87	88.8	7.43
2/14/08	middle		1.0	5.57	12.87	88.8	7.43
2/14/08	middle		1.5	5.53	12.75	88.8	7.43
2/14/08	middle		2.0	5.47	12.71	88.8	7.42
2/14/08	middle		2.5	5.38	12.55	88.9	7.40
2/14/08	middle		3.0	5.33	12.20	88.9	7.36
2/14/08	middle		3.5	5.32	11.8	89.5	7.31
3/13/08	middle		0	9.2	11.91	87.9	7.98
3/13/08	middle		0.5	9.21	11.91	87.8	8.0
3/13/08	middle		1.0	9.22	11.89	87.8	8.0
3/13/08	middle		1.5	9.24	11.92	87.7	8.0
3/13/08	middle		2.0	9.22	11.85	88.1	7.97
3/13/08	middle		2.5	9.08	11.47	88.5	7.98
3/13/08	middle		3.0	8.94	11.07	88.6	7.65
3/13/08	middle		3.5	8.71	10.53	90.6	7.46
4/24/08	middle		0	10.98	11.51	101.2	7.72

Date	Station	Time	Depth (m)	Temperature (°C)	DO (mg/l)	Sp Conductivity (µS/cm)	pH (units)
4/24/08	middle		0.5	11.01	11.49	101.1	8.08
4/24/08	middle		1	11.02	11.53	101.3	8.08
4/24/08	middle		1.5	11.02	11.54	101.1	8.09
4/24/08	middle		2.0	11.02	11.54	101.1	8.09
4/24/08	middle		2.5	11.01	11.53	101.2	8.08
4/24/08	middle		3.0	11.01	11.52	100.8	8.06
4/24/08	middle		3.5	10.93	11.33	101.1	7.96
5/22/08	middle		0	10.98	11.51	101.2	7.72
5/22/08	middle		0.5	11.01	11.49	101.1	8.08
5/22/08	middle		1	11.02	11.53	101.3	8.08
5/22/08	middle		1.5	11.02	11.54	100.9	8.09
5/22/08	middle		2.0	11.02	11.54	101.1	8.09
5/22/08	middle		2.5	11.01	11.53	101.2	8.08
5/22/08	middle		3	11.01	11.52	100.8	8.06
5/22/08	middle		3.5	10.93	11.33	101.1	7.96
6/5/08	middle		0	16.07	8.96	112.3	7.21
6/5/08	middle		0.5	16.08	8.99	111.9	7.29
6/5/08	middle		1	16.08	8.96	112.0	7.32
6/5/08	middle		1.5	16.10	8.96	112.0	7.37
6/5/08	middle		2	16.10		111.9	7.41
6/5/08	middle		2.5	16.09		112.2	7.43
6/5/08	middle		3.0	16.08		111.9	7.45
6/5/08	middle		3.5	16.08		112.0	7.47
6/17/08	middle		0	17.35	9.97	110.9	7.72
6/17/08	middle		0.5	17.36	9.97	111.0	7.76
6/17/08	middle		1.0	17.33	9.94	110.4	7.79
6/17/08	middle		1.5	17.34	9.93	111.2	7.8
6/17/08	middle		2.0	17.31	9.88	110.4	7.79
6/17/08	middle		2.5	17.29	9.85	111.0	7.79
6/17/08	middle		3.0	17.22	9.77	110.9	7.76
6/17/08	middle		3.5	17.15	8.98	110.9	7.64
7/9/08	middle		0	23.04	8.58	116.2	7.54
7/9/08	middle		1.0	22.72	8.53	115.7	7.55
7/9/08	middle		1.5	22.44	8.52	116.0	7.53
7/9/08	middle		2.0	22.36	8.47	115.9	7.53
7/9/08	middle		2.5	22.29	8.41	116.0	7.51
7/9/08	middle		3.0	22.07	8.33	115.6	7.55
7/9/08	middle		3.5	21.76	5.38	121.4	7.20
7/24/08	middle		0	20.42	8.44	120.7	7.50
7/24/08	middle		0.5	20.43	8.42	120.4	7.52
7/24/08	middle		1.0	20.37	8.45	120.3	7.53
7/24/08	middle		1.5	20.31	8.46	120.7	7.57
7/24/08	middle		2.0	20.23	8.49	120.5	7.60
7/24/08	middle		2.5	20.20	8.53	120.7	7.61
7/24/08	middle		3.0	20.16	8.51	120.2	7.61
7/24/08	middle		3.5	20.00	0.73	120.2	7.46
8/7/08	middle		0	22.08	9.42	123.5	7.74

Date	Station	Time	Depth (m)	Temperature (°C)	DO (mg/l)	Sp Conductivity (µS/cm)	pH (units)
8/7/08	middle		0.5	22.10	9.43	123.8	7.84
8/7/08	middle		1	22.08	9.41	123.8	7.89
8/7/08	middle		1.5	22.06	9.38	123.8	7.89
8/7/08	middle		2.0	22.03	9.33	123.8	7.90
8/7/08	middle		2.5	22.04	9.33	123.8	7.93
8/7/08	middle		3.0	22.00	9.21	123.9	7.88
8/7/08	middle		3.5	21.71	5.65	125.7	7.67
8/27/08	middle		0	19.79	8.58	127.3	7.65
8/27/08	middle		0.5	19.83	8.60	127.0	7.69
8/27/08	middle		1.0	19.85	8.59	127.2	7.72
8/27/08	middle		1.5	19.84	8.57	127.1	7.72
8/27/08	middle		2.0	19.81	8.56	127.1	7.72
8/27/08	middle		2.5	19.79	8.55	127.0	7.71
8/27/08	middle		3.0	19.75	8.54	127.0	7.71
8/27/08	middle		3.5	19.75	8.42	127.4	7.70
9/10/08	middle		0	20.29	8.98	130.6	7.62
9/10/08	middle		0.5	20.28	8.94	130.6	7.68
9/10/08	middle		1.0	20.25	8.80	130.8	7.67
9/10/08	middle		1.5	19.80	8.81	130.5	7.69
9/10/08	middle		2.0	19.77	8.90	130.3	7.73
9/10/08	middle		2.5	19.76	8.77	130.3	7.74
9/10/08	middle		3.0	19.67	8.59	130.2	7.70
9/10/08	middle		3.5	19.60	1.70	130.4	7.45
9/30/08	middle		0	16.80	9.18	133.0	7.39
9/30/08	middle		0.5	16.76	9.17	133.0	7.46
9/30/08	middle		1	16.72	9.14	133.0	7.51
9/30/08	middle		1.5	16.71	9.11	132.8	7.52
9/30/08	middle		2.0	16.68	9.08	133.0	7.54
9/30/08	middle		2.5	16.67	8.99	133.6	7.53
9/30/08	middle		3.0	16.62	8.37	133.4	7.46
9/30/08	middle		3.5	16.57	7.45	133.8	7.33
10/23/08	middle		0	12.06	9.93	130.2	7.32
10/23/08	middle		0.5	12.04	9.90	130.3	7.35
10/23/08	middle		1.0	12.04	9.89	130.3	7.39
10/23/08	middle		1.5	12.03	9.88	130.3	7.41
10/23/08	middle		2.0	12.02	9.89	130.4	7.43
10/23/08	middle		2.5	11.99	9.86	130.2	7.43
10/23/08	middle		3.0	11.94	9.69	130.7	7.39
10/23/08	middle		3.5	11.76	9.03	130.7	7.31
11/20/08	middle		0	9.56	8.75	113.4	6.84
11/20/08	middle		0.5	9.58	8.64	113.2	6.89
11/20/08	middle		1.0	9.58	8.61	113.7	6.89
11/20/08	middle		1.5	9.58	8.60	113.4	6.91
11/20/08	middle		2.0	9.58	8.59	113.6	6.92
11/20/08	middle		2.5	9.60	8.59	113.2	6.93
11/20/08	middle		3.0	9.6	8.55	113.6	6.94
11/20/08	middle		3.5	9.6	8.09	113.6	6.92

Date	Station	Time	Depth (m)	Temperature (°C)	DO (mg/l)	Sp Conductivity (µS/cm)	pH (units)
12/11/08	middle		0	7.08	10.00	110.4	7.22
12/11/08	middle		0.5	7.05	9.67	110.3	7.26
12/11/08	middle		1.0	7.05	9.64	110.2	7.27
12/11/08	middle		1.5	7.04	9.62	110.2	7.29
12/11/08	middle		2.0	7.03	9.60	110.3	7.26
12/11/08	middle		2.5	7.04	9.59	110.8	7.20
12/11/08	middle		3.0	7.03	9.55	110.7	7.26
1/26/09	middle		0	3.50	10.74	92.5	7.21
1/26/09	middle		0.5	3.49	10.55	92.4	7.22
1/26/09	middle		1.0	3.48	10.51	92.3	7.23
1/26/09	middle		1.5	3.46	10.47	92.8	7.24
1/26/09	middle		2.0	3.48	10.44	92.8	7.25
1/26/09	middle		2.5	3.47	10.45	92.9	7.24
1/26/09	middle		3.0	3.49	10.4	92.6	7.26
1/26/09	middle		3.5	3.87	9.97	113.8	7.24
2/24/09	middle		0	5.85	10.86	97.7	6.92
2/24/09	middle		0.5	5.83	10.72	98.0	6.91
2/24/09	middle		1.0	5.82	10.72	98.0	6.91
2/24/09	middle		1.5	5.82	10.69	97.6	6.91
2/24/09	middle		2.0	5.81	10.65	97.8	6.89
2/24/09	middle		2.5	5.81	10.62	97.3	6.89
3/31/09	middle		0	8.26	12.35	95.4	7.92
3/31/09	middle		0.5	8.20	12.45	95.8	8.03
3/31/09	middle		1.0	8.10	12.39	95.7	8.06
3/31/09	middle		1.5	8.09	12.38	95.6	8.08
3/31/09	middle		2.0	8.07	12.34	95.5	8.08
3/31/09	middle		2.5	8.04	12.29	95.6	8.06
3/31/09	middle		3.0	8.02	12.18	95.6	8.03
3/31/09	middle		3.5	8.02	12.13	95.6	8.01
4/30/09	middle		0	14.99	10.22	99.5	7.40
4/30/09	middle		0.5	14.38	10.24	99.0	7.44
4/30/09	middle		1.0	14.02	10.11	99.3	7.44
4/30/09	middle		1.5	13.87	10.03	99.3	7.45
4/30/09	middle		2.0	13.82	9.98	99.2	7.45
4/30/09	middle		2.5	13.36	8.27	101.6	7.30
4/30/09	middle		3.0	12.83	5.59	103.2	7.10
4/30/09	middle		3.5	12.5	3.40	110.8	6.99
5/14/09	middle		0	13.77	8.82	95.4	7.24
5/14/09	middle		0.5	13.62	8.80	95	7.28
5/14/09	middle		1	13.57	8.78	95.6	7.27
5/14/09	middle		1.5	13.55	8.76	95.3	7.27
5/14/09	middle		2.0	13.53	8.74	95.8	7.28
5/14/09	middle		2.5	13.52	8.72	96.0	7.27
5/14/09	middle		3.0	13.42	8.36	96.8	7.23
5/28/09	middle		0	20.35	9.12	97.6	7.57
5/28/09	middle		0.5	19.34	9.31	97.6	7.62
5/28/09	middle		1.0	18.85	9.25	97.7	7.61

Date	Station	Time	Depth (m)	Temperature (°C)	DO (mg/l)	Sp Conductivity (µS/cm)	pH (units)
5/28/09	middle		1.5	18.78	9.22	97.8	7.58
5/28/09	middle		2.0	18.72	9.17	98.1	7.57
5/28/09	middle		2.5	18.66	9.11	97.5	7.56
5/28/09	middle		3.0	18.53	8.86	97.0	7.52
5/28/09	middle		3.5	18.25	6.35	99.1	7.25
6/18/09	middle		0	21.3	7.91	105.3	7.4
6/18/09	middle		0.5	21.3	7.85	105.5	7.41
6/18/09	middle		1.0	21.28	7.79	105.1	7.41
6/18/09	middle		1.5	21.27	7.72	105.2	7.41
6/18/09	middle		2.0	21.25	7.70	105.2	7.39
6/18/09	middle		2.5	21.22	7.56	105.2	7.37
6/18/09	middle		3.0	21.21	7.45	105.2	7.36
6/18/09	middle		3.5	21.01	5.14	106.5	7.28
7/2/09	middle		0	21.18	7.77	106.0	7.31
7/2/09	middle		0.5	21.20	7.75	106.2	7.25
7/2/09	middle		1.0	21.21	7.75	106.1	7.23
7/2/09	middle		1.5	20.93	7.65	106.3	7.23
7/2/09	middle		2.0	20.84	7.62	106.0	7.22
7/2/09	middle		2.5	20.81	7.60	106.0	7.20
7/2/09	middle		3.0	20.78	7.43	106.0	7.18
7/2/09	middle		3.5	20.78	7.10	106.0	7.11
7/16/09	middle		0	21.13	8.42	109.1	7.33
7/16/09	middle		0.5	21.10	8.29	109.1	7.35
7/16/09	middle		1.0	21.03	8.29	109.4	7.38
7/16/09	middle		1.5	20.64	8.21	109.3	7.38
7/16/09	middle		2.0	20.60	8.07	109.2	7.35
7/16/09	middle		2.5	20.51	7.94	109.4	7.33
7/16/09	middle		3.0	19.81	6.63	108.7	7.25
7/16/09	middle		3.5	19.84	6.01	109.8	7.16
7/29/09	middle		0	26.32	7.69	115.6	7.25
7/29/09	middle		0.5	26.43	7.61	115.4	7.25
7/29/09	middle		1.0	26.29	7.73	115.2	7.32
7/29/09	middle		1.5	26.13	7.71	115.1	7.31
7/29/09	middle		2.0	25.90	7.5	115.1	7.30
7/29/09	middle		2.5	25.44	7.03	115.5	7.27
7/29/09	middle		3.0	23.99	4.33	118.6	7.17
7/29/09	middle		3.5	23.83	2.65	140.7	7.06
8/13/09	middle		0	20.4	7.76	119.5	7.21
8/13/09	middle		0.5	20.4	7.74	119.2	7.26
8/13/09	middle		1.0	20.41	7.74	119.1	7.29
8/13/09	middle		1.5	20.40	7.74	119.3	7.29
8/13/09	middle		2.0	20.40	7.72	119.2	7.30
8/13/09	middle		2.5	20.38	7.57	119.1	7.29
8/13/09	middle		3.0	20.37	6.87	120.1	7.26
8/13/09	middle		3.5	20.26	5.62	121.4	7.18
9/3/09	middle		0	20.01	8.49	123.4	7.59
9/3/09	middle		0.5	20.13	8.46	123.2	7.63

Date	Station	Time	Depth (m)	Temperature (°C)	DO (mg/l)	Sp Conductivity (µS/cm)	pH (units)
9/3/09	middle		1.0	20.11	8.45	123.2	7.64
9/3/09	middle		1.5	20.09	8.44	123.4	7.63
9/3/09	middle		2.0	20.08	8.43	123.2	7.63
9/3/09	middle		2.5	20.09	8.40	122.8	7.63
9/3/09	middle		3.0	20.08	8.39	122.9	7.63
9/3/09	middle		3.5	20.03	5.92	123.4	7.54
9/29/09	middle		0	16.40	8.79	127.0	7.27
9/29/09	middle		0.5	16.4	8.72	126.7	7.34
9/29/09	middle		1.0	16.4	8.71	126.8	7.36
9/29/09	middle		1.5	16.4	8.71	126.5	7.40
9/29/09	middle		2.0	16.38	8.71	126.8	7.42
9/29/09	middle		2.5	16.39	8.68	127.0	7.43
9/29/09	middle		3.0	16.38	8.66	127.0	7.43
9/29/09	middle		3.5	16.39	7.97	127.5	7.41
10/20/09	middle		0	12.98	9.46	124.1	7.02
10/20/09	middle		0.5	13.01	9.38	123.6	7.10
10/20/09	middle		1.0	12.96	9.35	124.1	7.13
10/20/09	middle		1.5	12.95	9.27	123.7	7.15
10/20/09	middle		2.0	12.95	9.19	124.4	7.17
10/20/09	middle		2.5	12.94	9.13	123.9	7.18
10/20/09	middle		3.0	12.89	9.01	123.8	7.18
10/20/09	middle		3.5	12.89	8.65	124.3	7.17
11/24/09	middle		0	7.08	10.85	93.6	7.27
11/24/09	middle		0.5	7.03	10.59	93.6	7.21
11/24/09	middle		1.0	7.02	10.51	93.2	7.18
11/24/09	middle		1.5	7.0	10.49	93.1	7.16
11/24/09	middle		2.0	7.0	10.45	93.1	7.15
11/24/09	middle		2.5	7.00	10.45	92.7	7.13
11/24/09	middle		3.0	7.0	10.43	92.7	7.12
11/24/09	middle		3.5	7.0	10.43	92.8	7.11
11/24/09	middle		4.0	7.01	10.39	92.5	7.10
1/7/10	middle		0	5.33	11.05	89.7	7.43
1/7/10	middle		0.5	5.31	11.00	90.0	7.40
1/7/10	middle		1.0	5.29	10.97	90.1	7.39
1/7/10	middle		1.5	5.29	10.98	90.0	7.37
1/7/10	middle		2.0	5.28	10.96	90.0	7.36
1/7/10	middle		2.5	5.27	10.95	89.6	7.35
1/7/10	middle		3.0	5.26	10.91	90.0	7.34
1/7/10	middle		3.5	5.26	10.90	90.0	7.34
1/7/10	middle		4.0	5.26	10.87	89.6	7.34
2/18/10	middle		0	7.86	11.05	80.7	7.17
2/18/10	middle		0.5	7.88	11.06	80.7	7.16
2/18/10	middle		1.0	7.85	11.04	80.9	7.15
2/18/10	middle		1.5	7.87	10.99	80.6	7.13
2/18/10	middle		2.0	7.85	11.0	80.3	7.14
2/18/10	middle		2.5	7.85	10.96	80.5	7.15
2/18/10	middle		3.0	7.83	10.94	80.3	7.13

Date	Station	Time	Depth (m)	Temperature (°C)	DO (mg/l)	Sp Conductivity (µS/cm)	pH (units)
2/18/10	middle		3.5	7.84	10.93	80.6	7.13
2/18/10	middle		4.0	7.84	10.52	80.3	7.16
3/31/10	middle		0	9.67	10.04	83.0	7.24
3/31/10	middle		0.5	9.67	9.92	83.0	7.25
3/31/10	middle		1.0	9.64	9.88	82.9	7.24
3/31/10	middle		1.5	9.65	9.83	83.2	7.24
3/31/10	middle		2.0	9.6	9.82	83.1	7.25
3/31/10	middle		2.5	9.61	9.81	83.1	7.25
3/31/10	middle		3.0	9.65	9.78	83.2	7.25
3/31/10	middle		3.3	9.51	9.67	83.6	7.24
4/28/10	middle		0.0	12.57	9.81	87.3	7.41
4/28/10	middle		0.5	12.58	9.81	87.1	7.44
4/28/10	middle		1.0	12.62	9.85	86.8	7.46
4/28/10	middle		1.5	12.61	9.86	87.0	7.46
4/28/10	middle		2.0	12.59	9.81	86.9	7.47
4/28/10	middle		2.5	12.59	9.77	86.7	7.46
4/28/10	middle		3.0	12.61	9.73	86.7	7.45
4/28/10	middle		3.5	12.60	9.61	86.3	7.46
5/20/10	middle		0	16.14	9.05	92.3	7.22
5/20/10	middle		0.5	16.16	8.96	92.8	7.25
5/20/10	middle		1.0	16.16	8.94	92.6	7.29
5/20/10	middle		1.5	16.15	8.92	92.6	7.31
5/20/10	middle		2.0	16.14	8.92	93.1	7.33
5/20/10	middle		2.5	16.14	8.91	92.7	7.34
5/20/10	middle		3.0	16.14	8.91	92.6	7.34
6/17/10	middle		0	17.36	8.72	98.0	7.27
6/17/10	middle		0.5	17.38	8.69	98.0	7.29
6/17/10	middle		1.0	17.39	8.69	98.0	7.31
6/17/10	middle		1.5	17.38	8.65	97.6	7.30
6/17/10	middle		2.0	17.39	8.63	97.6	7.30
6/17/10	middle		2.5	17.37	8.65	97.8	7.29
6/17/10	middle		3.0	17.34	8.57	97.7	7.29
6/17/10	middle		3.5	17.32	8.38	98.1	7.27
7/15/10	middle		0	22.11	8.18	108.1	7.49
7/15/10	middle		0.5	21.91	8.14	108.3	7.45
7/15/10	middle		1.0	21.75	8.05	108.3	7.43
7/15/10	middle		1.5	21.68	7.98	108.1	7.44
7/15/10	middle		2.0	21.62	8.00	108.2	7.46
7/15/10	middle		2.5	21.49	7.92	108.5	7.39
7/15/10	middle		3.0	20.72	4.99	110.1	7.08
7/15/10	middle		3.5	20.44	3.31	115.7	6.98
7/29/10	middle		0	22.08	8.3	112.5	7.2
7/29/10	middle		0.5	22.13	8.14	112.7	7.25
7/29/10	middle		1.0	22.14	8.14	112.9	7.27
7/29/10	middle		1.5	22.15	8.14	112.5	7.3
7/29/10	middle		2.0	22.15	8.12	112.9	7.31
7/29/10	middle		2.5	22.10	8.06	112.6	7.31

Date	Station	Time	Depth (m)	Temperature (°C)	DO (mg/l)	Sp Conductivity (µS/cm)	pH (units)
7/29/10	middle		3.0	22.09	8.04	112.8	7.32
7/29/10	middle		3.5	21.99	7.60	113.1	7.26
8/24/10	middle		0	20.73	8.13	119.4	7.49
8/24/10	middle		0.5	20.72	8.12	119.0	7.48
8/24/10	middle		1.0	20.67	8.08	119.4	7.47
8/24/10	middle		1.5	20.63	8.02	119.4	7.47
8/24/10	middle		2.0	20.54	7.88	119.1	7.43
8/24/10	middle		2.5	20.43	7.52	119.0	7.42
8/24/10	middle		3.0	20.41	0.22	130.8	7.15
9/30/10	middle		0	17.42	8.10	122.7	7.33
9/30/10	middle		0.5	17.42	8.09	122.3	7.27
9/30/10	middle		1.0	17.38	8.04	122.0	6.60
9/30/10	middle		1.5	17.37	8.05	122.3	2.60
9/30/10	middle		2.0	17.33	8.04	122.6	2.60
9/30/10	middle		2.5	17.28	8.0	122.5	2.61
9/30/10	middle		3.0	17.23	7.95	122.6	2.70
9/30/10	middle		3.5	17.21	7.84	122.2	2.60
11/11/10	middle		0	9.7	9.35	103.8	7.14
11/11/10	middle		0.5	9.7	9.31	103.8	7.08
11/11/10	middle		1.0	9.70	9.32	103.9	7.06
11/11/10	middle		1.5	9.69	9.28	103.7	7.06
11/11/10	middle		2.0	9.69	9.27	104.2	7.06
11/11/10	middle		2.5	9.69	9.27	103.8	7.07
11/11/10	middle		3.0	9.69	9.24	104.1	7.05
11/11/10	middle		3.5	9.90	8.95	104.6	7.03

**Table A-2. Field Data for Long Lake North Station, 2006-2010.**

Date	Station	Time	Depth (m)	Temperature (°C)	DO (mg/l)	Sp Conductivity (µS/cm)	pH (units)
1/24/06	north	13:32	0.2	7.05	11.33	49.8	6.99
1/24/06	north	13:32	0.7	7.03	11.05	50.7	6.98
1/24/06	north	13:32	1.2	6.99	10.90	50.8	6.97
1/24/06	north	13:32	1.7	6.84	10.87	51.0	6.96
1/24/06	north	13:32	2.2	6.69	10.52	51.2	6.95
1/24/06	north	13:32	2.7	6.65	10.45	51.2	6.94
2/24/06	north	12:25	0.1	5.46	11.40	49.0	7.41
2/24/06	north	12:25	0.6	4.98	11.62	49.7	7.24
2/24/06	north	12:25	1.1	5.01	11.18	49.8	7.15
2/24/06	north	12:25	1.6	4.77	11.30	49.7	7.10
2/24/06	north	12:25	2.1	4.75	11.16	49.6	7.06
2/24/06	north	12:25	2.5	4.76	10.95	49.7	7.00
3/23/06	north	11:15	0	9.21	10.35	56.3	7.38
3/23/06	north	11:15	0.5	8.93	10.59	56.3	7.38
3/23/06	north	11:15	1.0	8.93	10.59	56.3	7.31
3/23/06	north	11:15	1.5	8.75	9.81	57.1	7.25
3/23/06	north	11:15	2.0	8.68	9.89	57.1	7.21
3/23/06	north	11:15	2.5	8.66	9.76	57.1	7.17



Date	Station	Time	Depth (m)	Temperature (°C)	DO (mg/l)	Sp Conductivity (µS/cm)	pH (units)
4/21/06	north	2:05	0	13.92	9.34	66.7	8.02
4/21/06	north	2:05	0.5	13.65	8.89	66.4	8.0
4/21/06	north	2:05	1	13.35	8.87	66.5	8.01
4/21/06	north	2:05	1.5	12.69	8.45	66.5	7.70
4/21/06	north	2:05	2	12.55	8.21	66.4	7.50
4/21/06	north	2:05	2.5	12.41	7.28	67.3	7.27
5/22/06	north		0	19.16	9.71	79.5	7.30
5/22/06	north		0.5	19.16	9.12	79.7	7.30
5/22/06	north		1.0	19.16	9.18	79.5	7.30
5/22/06	north		1.5	19.14	8.64	79.5	7.26
5/22/06	north		2.0	18.94	7.78	79.7	7.18
6/12/06	north		0	20.01	9.17	83.2	7.65
6/12/06	north		0.5	19.70	9.48	83.6	7.59
6/12/06	north		1.0	19.24	11.27	83.6	7.50
6/12/06	north		1.5	19.14	11.08	83.4	7.58
7/5/06	north	10:00	0	22.26	8.67	90.0	8.03
7/5/06	north	10:00	0.5	22.27	8.37	90.1	7.96
7/5/06	north	10:00	1.0	22.24	8.16	90.0	7.99
7/5/06	north	10:00	1.5	22.28	8.36	90.7	7.96
7/5/06	north	10:00	2.0	22.79	8.52	90.8	7.76
7/27/06	north		0	24.80	8.07	98.1	8.2
7/27/06	north		1.0	24.29	8.1	97.9	8.09
7/27/06	north		2.0	23.74	3.90	98.0	7.26
8/14/06	north	10:40	0	21.66	8.91	101.9	7.57
8/14/06	north	10:40	0.5	20.99	8.87	101.8	7.72
8/14/06	north	10:40	1.0	20.68	8.35	101.8	7.61
8/14/06	north	10:40	1.5	20.56	7.28	102.0	7.33
8/14/06	north	10:40	2.0	20.49	4.68	103.5	6.99
9/6/06	north		0	20.64	9.48	103.5	8.02
9/6/06	north		0.5	20.27	9.50	103.5	8.06
9/6/06	north		1.0	20.04	9.46	103.5	8.02
9/6/06	north		1.5	19.92	9.33	103.5	7.98
9/6/06	north		2.0	19.62	7.46	104.3	7.33
9/28/06	north		0	18.01	9.39		7.81
9/28/06	north		0.5	17.83	9.38		7.81
9/28/06	north		1.0	17.59	9.47		7.94
9/28/06	north		1.5	17.06	9.05		7.86
10/31/06	north		0	10.03	7.40	105.3	7.40
10/31/06	north		0.5	10.03	7.40	105.7	7.40
10/31/06	north		1.0	10.03	7.41	105.7	7.41
10/31/06	north		1.5	10.04	7.42	105.9	7.42
11/21/06	north		0	8.18	10.62	76.1	7.03
11/21/06	north		0.5	8.18	10.22	75.8	7.02
11/21/06	north		1.0	8.18	10.19	75.9	7.02
11/21/06	north		1.5	8.18	10.03	75.9	7.02
12/09/06	north	11:14	0.0	4.64	11.52	60.7	6.78
12/09/06	north	11:14	0.5	4.62	14.18	60.6	6.77

Date	Station	Time	Depth (m)	Temperature (°C)	DO (mg/l)	Sp Conductivity (µS/cm)	pH (units)
12/09/06	north	11:14	1.0	4.59	12.69	60.5	6.76
12/09/06	north	11:14	1.5	4.56	10.40	60.9	6.76
12/09/06	north	11:14	2.0	4.54	9.98	61.1	6.74
1/29/07	north		0.0	4.55	13.86	52.3	6.81
1/29/07	north		0.5	4.51	13.27	52.5	6.79
1/29/07	north		1.0	4.48	13.10	52.5	6.79
1/29/07	north		1.5	4.50	13.43	52.5	6.78
1/29/07	north		2.0	4.31	13.17	52.6	6.76
2/28/07	north		0	6.60	10.70	57.0	6.91
2/28/07	north		0.5	6.58	11.37	56.6	6.90
2/28/07	north		1.0	6.54	11.15	56.9	6.90
2/28/07	north		1.5	6.54	10.81	57.2	6.89
3/15/07	north		0	9.12	9.88	57.7	6.89
3/15/07	north		0.5	9.01	9.44	57.4	6.87
3/15/07	north		1.0	8.95	9.36	57.3	6.83
3/15/07	north		1.5	8.91	9.23	57.6	6.83
3/15/07	north		2.0	8.82	9.11	57.6	6.79
4/10/07	north	08:00	0	12.79	9.37	82.6	7.15
4/10/07	north	08:00	0.5	12.79	9.33	82.7	7.17
4/10/07	north	08:00	1.0	12.78	9.33	82.6	7.19
4/10/07	north	08:00	1.5	12.77	9.29	82.8	7.17
4/10/07	north	09:00	0	12.31	9.17	82.8	7.11
4/10/07	north	09:00	0.5	12.27	9.07	82.8	7.17
4/10/07	north	09:00	1.0	12.28	9.05	82.3	7.24
4/10/07	north	09:00	1.5	12.30	9.02	82.4	7.20
4/10/07	north	16:00	0.5	13.51	9.86	82.6	7.21
5/24/07	north		0	17.52	9.64	135.2	7.07
5/24/07	north		0.5	17.60	9.58	135.2	7.10
5/24/07	north		1.0	17.49	9.50	134.8	7.09
5/24/07	north		1.5	16.49	9.67	133.9	7.13
5/24/07	north		2.0	16.44	9.63	132.8	7.10
5/24/07	north		2.5	16.45	9.57	133.2	7.10
6/18/07	north		0.0	17.48	8.40	135.0	7.29
6/18/07	north		0.5	17.44	8.20	135.0	7.23
6/18/07	north		1.0	17.44	8.17	135.0	7.22
6/18/07	north		1.5	17.44	8.20	135.0	7.23
6/18/07	north		2.0	17.44	8.23	135.0	7.24
6/18/07	north		2.5	17.45	8.12	135.0	7.20
7/2/07	north		0.0	20.53	8.87	136.6	7.43
7/2/07	north		0.5	20.53	8.87	136.6	7.50
7/2/07	north		1.0	20.54	8.87	136.6	7.49
7/2/07	north		1.5	20.53	8.89	136.6	7.52
7/2/07	north		2.0	20.44	9.16	136.5	7.63
7/23/07	north		0.0	21.58	7.85	139.5	7.37
7/23/07	north		0.5	21.58	7.80	139.5	7.38
7/23/07	north		1.0	21.57	7.79	139.5	7.37
7/23/07	north		1.5	21.57	7.77	139.8	7.38

Date	Station	Time	Depth (m)	Temperature (°C)	DO (mg/l)	Sp Conductivity (µS/cm)	pH (units)
7/23/07	north		2.0	21.57	7.71	139.8	7.36
8/6/07	north		0.0	21.97	8.03	142.1	7.38
8/6/07	north		0.5	21.97	8.03	141.7	7.39
8/6/07	north		1.0	21.97	8.02	141.7	7.40
8/6/07	north		1.5	21.96	8.01	141.6	7.40
8/6/07	north		2.0	21.96	8.01	142.0	7.40
8/6/07	north		2.3	21.95	7.95	142.0	7.40
8/23/07	north		0.0	21.33	8.88	143.5	7.71
8/23/07	north		0.5	21.07	8.81	143.8	7.71
8/23/07	north		1.0	20.86	8.81	143.2	7.71
8/23/07	north		1.5	20.64	8.80	143.2	7.69
8/23/07	north		2.0	20.60	8.76	143.5	7.66
8/23/07	north		2.5	20.57	8.47	146.2	7.56
9/5/07	north		0.0	21.17	8.67	145.1	7.62
9/5/07	north		0.5	21.16	8.71	145.1	7.70
9/5/07	north		1.0	21.07	8.75	145.2	7.74
9/5/07	north		1.5	21.04	8.77	145.2	7.75
9/5/07	north		2.0	21.02	8.74	144.9	7.75
9/5/07	north		2.5	21.02	8.24	146.0	7.68
9/27/07	north		0	16.3	9.53	150.5	8.28
9/27/07	north		0.5	16.28	9.57	149.9	8.33
9/27/07	north		1.0	16.18	9.71	150.3	8.41
9/27/07	north		1.5	16.15	9.72	150.2	8.44
9/27/07	north		2.0	16.14	9.71	149.9	8.46
9/27/07	north		2.5	16.22	0.47	150.0	7.66
10/10/07	north		0	13.11	10.13	142.3	7.73
10/10/07	north		0.5	13.10	10.13	142.2	7.75
10/10/07	north		1	13.09	10.10	142.3	7.77
10/10/07	north		1.5	13.09	10.10	142.3	7.78
10/10/07	north		2.0	13.08	10.09	142.7	7.78
10/10/07	north		2.5	13.10	9.94	142.3	7.79
11/27/07	north		0	5.82	10.08	125.5	7.41
11/27/07	north		0.5	5.78	9.94	125.6	7.39
11/27/07	north		1.0	5.68	9.86	125.8	7.37
11/27/07	north		1.5	5.56	9.81	126.3	7.36
11/27/07	north		2	5.52	9.76	126.5	7.36
11/27/07	north		2.5	5.52	9.74	126.7	7.34
12/19/07	north		0	4.8	11.53	88.4	7.03
12/19/07	north		0.5	4.8	11.39	88.5	7.02
12/19/07	north		1.0	4.81	11.36	88.4	7.02
12/19/07	north		1.5	4.81	11.34	88.2	7.01
12/19/07	north		2.0	4.82	11.23	88.2	7.01
2/14/08	north		0	5.72	12.76	88.9	7.57
2/14/08	north		0.5	5.73	13.06	88.4	7.59
2/14/08	north		1.0	5.62	13.05	88.6	7.59
2/14/08	north		1.5	5.54	13.0	88.9	7.58
2/14/08	north		2.0	5.48	12.68	88.9	7.54

Date	Station	Time	Depth (m)	Temperature (°C)	DO (mg/l)	Sp Conductivity (µS/cm)	pH (units)
2/14/08	north		2.5	5.43	12.62	89.2	7.51
3/13/08	north		0	9.07	11.82	87.3	7.99
3/13/08	north		0.5	9.08	11.88	87.3	8.03
3/13/08	north		1.0	9.06	11.89	87.7	8.06
3/13/08	north		1.5	9.00	11.62	88.0	7.97
3/13/08	north		2.0	8.89	11.2	87.7	7.75
3/13/08	north		2.5	8.88	11.02	88.1	7.66
4/24/08	north		0	10.93	11.45	101.5	8.09
4/24/08	north		0.5	10.99	11.54	101.0	8.08
4/24/08	north		1.0	10.99	11.55	101.4	8.09
4/24/08	north		1.5	10.99	11.57	100.9	8.10
4/24/08	north		2.0	11.00	11.57	101.4	8.09
4/24/08	north		2.5	11.00	11.20	100.9	8.08
5/22/08	north		0	10.93	11.45	101.5	8.09
5/22/08	north		0.5	10.99	11.54	101.0	8.08
5/22/08	north		1	10.99	11.55	101.4	8.09
5/22/08	north		1.5	10.99	11.57	100.9	8.1
5/22/08	north		2	11.0	11.57	101.4	8.09
5/22/08	north		2.5	11.00	11.2	100.9	8.08
6/5/08	north		0	15.97		112.0	7.53
6/5/08	north		0.5	15.94		112.0	7.55
6/5/08	north		1.0	15.94		111.8	7.56
6/5/08	north		1.5	15.92		111.8	7.56
6/5/08	north		2.0	15.9		112.0	7.56
6/5/08	north		2.5	15.85		112.0	7.42
6/17/08	north		0	17.3	10.16	111.0	7.89
6/17/08	north		0.5	17.3	10.26	111.0	7.94
6/17/08	north		1.0	17.3	10.23	110.4	7.95
6/17/08	north		1.5	17.3	10.21	110.4	7.96
6/17/08	north		2.0	17.3	10.24	110.2	7.96
6/17/08	north		2.5	17.29	10.00	110.4	7.89
7/9/08	north		0	22.76	8.63	115.4	7.64
7/9/08	north		0.5	22.73	8.61	115.2	7.62
7/9/08	north		1.0	22.66	8.55	115.3	7.62
7/9/08	north		1.5	22.35	8.46	115.2	7.61
7/9/08	north		2.0	21.85	8.2	115.0	7.51
7/9/08	north		2.5	21.82	8.26	115.0	7.54
7/24/08	north		0	20.10	8.25	120.1	7.53
7/24/08	north		0.5	20.09	8.25	119.7	7.55
7/24/08	north		1.0	20.02	8.21	119.8	7.56
7/24/08	north		1.5	20.02	8.22	120.0	7.56
7/24/08	north		2.0	19.95	8.25	120.0	7.58
7/24/08	north		2.5	19.84	8.14	120.0	7.32
8/7/08	north		0	21.98	9.34	123.8	7.96
8/7/08	north		0.5	21.97	9.35	123.6	7.98
8/7/08	north		1.0	21.95	9.35	123.6	8.00
8/7/08	north		1.5	21.99	9.34	123.7	8.00

Date	Station	Time	Depth (m)	Temperature (°C)	DO (mg/l)	Sp Conductivity (µS/cm)	pH (units)
8/7/08	north		2.0	21.93	9.33	123.7	7.98
8/7/08	north		2.3	21.90	1.23	125.2	7.43
8/27/08	north		0	19.74	8.65	127.2	7.73
8/27/08	north		0.5	19.76	8.66	127.2	7.75
8/27/08	north		1.0	19.75	8.66	127.2	7.76
8/27/08	north		1.5	19.73	8.59	127.2	7.76
8/27/08	north		2.0	19.65	8.40	127.1	7.70
8/27/08	north		2.5	19.61	8.15	127.0	7.63
9/10/08	north		0	19.88	8.98	130.4	7.69
9/10/08	north		0.5	19.92	8.94	130.6	7.74
9/10/08	north		1.0	19.67	9.01	130.4	7.77
9/10/08	north		1.5	19.04	8.86	130.2	7.75
9/10/08	north		2.0	18.96	8.68	130.3	7.62
9/10/08	north		2.5	18.94	8.75	130.9	7.64
9/30/08	north		0	16.70	8.96	132.6	7.59
9/30/08	north		0.5	16.47	8.97	132.7	7.56
9/30/08	north		1.0	16.36	8.98	132.7	7.58
9/30/08	north		1.5	16.26	9.05	132.8	7.60
9/30/08	north		2.0	16.20	8.86	132.6	7.58
9/30/08	north		2.5	16.20	2.50	132.4	7.53
10/23/08	north		0	12.23	9.65	130.2	7.41
10/23/08	north		0.5	12.24	9.65	130.2	7.43
10/23/08	north		1.0	12.22	9.61	129.8	7.43
10/23/08	north		1.5	12.23	9.62	130.0	7.43
10/23/08	north		2.0	12.23	9.59	130.0	7.43
10/23/08	north		2.5	12.21	9.52	129.8	7.42
10/23/08	north		3.0	12.26	6.45	128.1	7.00
11/20/08	north		0	9.43	6.99	113.3	7.00
11/20/08	north		0.5	9.43	8.31	113.4	6.97
11/20/08	north		1	9.43	8.28	113.5	6.97
11/20/08	north		1.5	9.43	8.24	113.3	6.97
11/20/08	north		2.0	9.44	8.22	113.2	6.95
11/20/08	north		2.5	9.45	6.91	113.5	6.87
12/11/08	north		0	7.08	9.78	109.8	7.27
12/11/08	north		0.5	7.07	9.51	109.9	7.24
12/11/08	north		1.0	7.07	9.47	109.4	7.24
12/11/08	north		1.5	7.07	9.43	109.8	7.24
12/11/08	north		2.0	7.07	9.42	109.8	7.23
1/26/09	north		0	3.49	10.94	92.4	7.35
1/26/09	north		0.5	3.47	10.73	92.1	7.32
1/26/09	north		1.0	3.47	10.65	92.1	7.34
1/26/09	north		1.5	3.47	10.65	92.1	7.34
1/26/09	north		2.0	3.48	10.57	92.1	7.33
2/24/09	north		0	5.85	10.74	96.9	6.99
2/24/09	north		0.5	5.85	10.73	96.8	6.99
2/24/09	north		1.0	5.85	10.74	96.7	6.98
2/24/09	north		1.5	5.87	10.74	97.0	6.99

Date	Station	Time	Depth (m)	Temperature (°C)	DO (mg/l)	Sp Conductivity (µS/cm)	pH (units)
3/31/09	north		0	8.34	11.89	95.8	8.21
3/31/09	north		0.5	8.33	12.41	95.6	8.27
3/31/09	north		1.0	8.24	12.46	95.7	8.28
3/31/09	north		1.5	8.18	12.44	95.4	8.27
3/31/09	north		2.0	8.18	12.44	95.3	8.27
3/31/09	north		2.5	8.16	12.38	95.4	8.24
4/30/09	north		0	14.72	10.04	99.5	7.43
4/30/09	north		0.5	14.32	10.11	99.4	7.49
4/30/09	north		1.0	13.89	10.22	99.4	7.52
4/30/09	north		1.5	13.74	9.94	99.1	7.50
4/30/09	north		2.0	13.62	9.96	99.0	7.50
4/30/09	north		2.5	13.33	5.72	103.0	7.27
5/14/09	north		0	14.37	9.24	95.2	7.34
5/14/09	north		0.5	14.22	9.09	95.0	7.36
5/28/09	north		0	19.37	8.91	97.5	7.56
5/28/09	north		0.5	19.22	8.90	97.5	7.44
5/28/09	north		1.0	18.70	8.53	97.7	7.43
5/28/09	north		1.5	18.52	8.49	97.9	7.41
5/28/09	north		2.0	18.12	8.39	97.1	7.38
5/28/09	north		2.4	17.97	8.11	97.5	7.33
6/18/09	north		0	21.5	7.64	105.0	7.42
6/18/09	north		0.5	21.5	7.67	104.9	7.42
6/18/09	north		1.0	21.4	7.67	104.9	7.41
6/18/09	north		1.5	21.44	7.59	104.7	7.40
6/18/09	north		2.0	21.40	7.06	104.5	7.29
7/2/09	north		0	21.07	7.77	106.2	7.26
7/2/09	north		0.5	21.00	7.65	105.9	7.23
7/2/09	north		1.0	20.86	7.66	106.4	7.22
7/2/09	north		1.5	20.81	7.67	106.1	7.21
7/2/09	north		2.0	20.28	7.60	105.0	7.22
7/16/09	north		0	20.93	8.51	109.0	7.45
7/16/09	north		0.5	20.74	8.47	108.8	7.47
7/16/09	north		1.0	20.19	8.52	108.7	7.48
7/16/09	north		1.5	20.03	8.42	108.4	7.48
7/16/09	north		2.0	19.84	8.26	108.1	7.47
7/16/09	north		2.5	19.73	7.00	110.2	7.36
7/29/09	north		0	25.93	7.69	115.6	7.34
7/29/09	north		0.5	25.83	7.71	115.1	7.34
7/29/09	north		1.0	25.63	7.77	115.2	7.35
7/29/09	north		1.5	25.44	7.80	115.0	7.36
7/29/09	north		2.0	25.36	7.24	116.3	7.38
8/13/09	north		0	20.13	7.16	119.1	7.24
8/13/09	north		0.5	20.14	7.13	119.5	7.25
8/13/09	north		1.0	20.14	7.10	119.5	7.25
8/13/09	north		1.5	20.12	7.08	119.5	7.24
8/13/09	north		2.0	20.12	7.07	119.2	7.23
8/13/09	north		2.5	20.13	6.92	120.0	7.22

Date	Station	Time	Depth (m)	Temperature (°C)	DO (mg/l)	Sp Conductivity (µS/cm)	pH (units)
9/3/09	north		0	20.12	8.74	122.9	7.72
9/3/09	north		0.5	20.10	8.7	123.0	7.72
9/3/09	north		1.0	20.11	8.71	122.8	7.73
9/3/09	north		1.5	20.10	8.70	123.2	7.73
9/3/09	north		2.0	20.08	8.62	123.3	7.72
9/29/09	north		0	16.26	8.81	126.6	7.51
9/29/09	north		0.5	16.25	8.64	126.9	7.50
9/29/09	north		1	16.24	8.62	126.5	7.5
9/29/09	north		1.5	16.23	8.60	126.1	7.50
9/29/09	north		2.0	16.16	8.57	126.4	7.49
9/29/09	north		2.5	16.14	8.44	126.0	7.49
10/20/09	north		0	13.12	9.77	124.6	7.40
10/20/09	north		0.5	13.08	9.61	124.0	7.40
10/20/09	north		1	12.98	9.53	124.0	7.41
10/20/09	north		1.5	12.94	9.47	123.9	7.42
10/20/09	north		2.0	12.91	9.37	124.3	7.42
10/20/09	north		2.5	12.91	9.17	123.9	7.4
11/24/09	north		0	7.18	10.98	96.2	7.24
11/24/09	north		0.5	7.07	10.64	96.0	7.22
11/24/09	north		1.0	7.03	10.59	96.0	7.21
11/24/09	north		1.5	7.01	10.55	96.0	7.2
11/24/09	north		2.0	7.01	10.53	96.4	7.19
11/24/09	north		2.5	7.01	10.51	96.4	7.18
11/24/09	north		3.0	7.00	10.45	96.7	7.18
1/7/10	north		0	5.16	11.37	90.6	7.47
1/7/10	north		0.5	5.13	11.01	90.3	7.43
1/7/10	north		1.0	5.10	10.93	90.3	7.40
1/7/10	north		1.5	5.11	10.92	90.7	7.39
1/7/10	north		2.0	5.10	10.91	91.0	7.38
1/7/10	north		2.5	5.09	10.70	90.8	7.36
1/7/10	north		3.0	5.09	10.79	90.9	7.35
2/18/10	north		0	7.97	11.18	80.7	7.18
2/18/10	north		0.5	7.97	11.20	80.7	7.17
2/18/10	north		1.0	7.96	11.20	81.0	7.18
2/18/10	north		1.5	7.90	11.19	80.9	7.17
2/18/10	north		2.0	7.93	11.18	80.5	7.15
2/18/10	north		2.5	7.89	10.71	80.5	7.14
2/18/10	north		3.0	7.88	10.88	80.7	7.12
3/31/10	north		0	9.93	10.26	83.9	7.32
3/31/10	north		0.5	9.92	10.02	83.7	7.32
3/31/10	north		1.0	9.92	9.93	83.4	7.33
3/31/10	north		1.5	9.82	9.82	83.6	7.33
3/31/10	north		2.0	9.81	9.79	84.0	7.31
3/31/10	north		2.5	9.68	9.73	83.6	7.32
4/28/10	north		0	12.72	9.95	85.8	7.51
4/28/10	north		0.5	12.72	9.94	85.8	7.52
4/28/10	north		1.0	12.71	9.93	85.9	7.55

Date	Station	Time	Depth (m)	Temperature (°C)	DO (mg/l)	Sp Conductivity (µS/cm)	pH (units)
4/28/10	north		1.5	12.69	9.90	86.2	7.55
4/28/10	north		2.0	12.68	9.89	85.8	7.56
4/28/10	north		2.5	12.69	5.00	86.0	7.59
5/20/10	north		0	16.09	9.08	91.6	7.39
5/20/10	north		0.5	16.18	9.02	91.3	7.40
5/20/10	north		1.0	16.17	8.99	91.7	7.41
5/20/10	north		1.5	16.18	8.99	91.3	7.44
5/20/10	north		2.0	16.19	8.98	91.7	7.44
5/20/10	north		2.5	16.2	8.07	91.6	7.44
6/17/10	north		0	17.35	8.77	97.7	7.43
6/17/10	north		0.5	17.35	8.77	97.5	7.41
6/17/10	north		1.0	17.35	8.76	97.6	7.39
6/17/10	north		1.5	17.35	8.76	97.5	7.39
6/17/10	north		2.0	17.33	8.68	97.2	7.38
6/17/10	north		2.5	17.31	8.1	97.7	7.35
7/15/10	north		0	21.63	7.87	107.7	7.44
7/15/10	north		0.5	21.18	7.83	107.9	7.41
7/15/10	north		1.0	21.00	7.78	708.3	7.35
7/15/10	north		1.5	21.08	7.55	108.1	7.35
7/15/10	north		2.0	20.76	7.53	107.3	7.36
7/15/10	north		2.5	20.62	7.4	107.3	7.31
7/29/10	north		0	22.14	8.23	112.6	7.35
7/29/10	north		0.5	22.17	8.25	112.5	7.39
7/29/10	north		1.0	22.16	8.25	112.5	7.39
7/29/10	north		1.5	22.15	8.24	112.9	7.41
7/29/10	north		2.0	22.12	8.18	112.5	7.41
7/29/10	north		2.5	22.12	6.72	113.4	7.22
8/24/10	north		0	20.56	8.18	119.0	7.55
8/24/10	north		0.5	20.54	8.13	118.8	7.57
8/24/10	north		1.0	20.33	8.06	118.6	7.54
8/24/10	north		1.5	20.21	8.01	119.0	7.53
8/24/10	north		2.0	20.02	0.42	119.1	7.45
9/30/10	north		0	17.49	8.4	122.6	7.39
9/30/10	north		0.5	17.5	8.01	122.8	6.51
9/30/10	north		1.0	17.45	7.87	122.8	2.62
9/30/10	north		1.5	17.44	7.85	122.5	2.61
9/30/10	north		2.0	17.44	7.83	123.1	2.61
9/30/10	north		2.5	17.43	7.53	122.4	2.61
11/11/10	north		0	9.74	9.69	104.1	7.28
11/11/10	north		0.5	9.73	9.41	104.2	7.20
11/11/10	north		1.0	9.72	9.35	104.3	7.15
11/11/10	north		1.5	9.71	9.33	104.7	7.14
11/11/10	north		2.0	9.7	9.29	104.7	7.12
11/11/10	north		2.5	9.7	9.27	104.6	7.11

**Table A-3. Field Data for Long Lake South Station, 2006-2010.**



Date	Station	Time	Depth (m)	Temperature (°C)	DO (mg/l)	Sp Conductivity (µS/cm)	pH (units)
1/24/06	south	11:25	0.2	6.73	10.15	51.5	7.03
1/24/06	south	11:25	0.7	6.73	9.81	51.5	6.99
1/24/06	south	11:25	1.2	6.69	9.94	51.8	6.95
1/24/06	south	11:25	1.7	6.70	9.66	51.2	6.94
1/24/06	south	11:25	2.2	6.69	9.75	51.4	6.92
1/24/06	south	11:25	2.5	6.68	9.54	51.6	6.88
2/24/06	south	1:00	0.1	5.54	13.42	48.9	6.97
2/24/06	south	1:00	0.6	5.20	13.03	49.2	6.96
2/24/06	south	1:00	1.1	4.98	12.45	49.0	6.94
2/24/06	south	1:00	1.6	4.73	11.66	49.0	6.91
2/24/06	south	1:00	2.1	4.62	11.30	49.2	6.88
2/24/06	south	1:00	2.5	4.61	11.18	49.2	6.86
3/23/06	south	10:51	0.0	10.04	11.18	57.2	7.60
3/23/06	south	10:51	0.5	9.61	11.15	58.0	7.52
3/23/06	south	10:51	1.0	9.49	10.9	58.0	7.48
3/23/06	south	10:51	1.5	9.30	10.48	57.8	7.33
3/23/06	south	10:51	2.0	9.18	9.75	58.0	7.23
3/23/06	south	10:51	2.5	9.17	9.32	58.2	7.17
4/21/06	south	1:03	0	13.41	8.66	66.1	7.85
4/21/06	south	1:03	0.5	13.43	8.76	66.6	7.88
4/21/06	south	1:03	1	13.32	8.85	66.5	7.88
4/21/06	south	1:03	1.5	12.8	8.70	66.3	7.76
4/21/06	south	1:03	2.0	12.28	8.33	66.7	7.55
4/21/06	south	1:03	2.5	12.23	5.51	66.5	7.34
5/22/06	south		0	18.96	9.47	78.5	7.24
5/22/06	south		0.5	19.00	9.02	78.8	7.27
5/22/06	south		1.0	19.00	9.18	79.3	7.28
5/22/06	south		1.5	18.98	8.89	79.3	7.28
5/22/06	south		2.0	18.97	7.42	79.5	7.16
6/12/06	south		0	19.84	10.40	81.1	7.51
6/12/06	south		0.5	19.84	9.86	81.4	7.51
6/12/06	south		1.0	19.79	9.61	81.5	7.50
6/12/06	south		1.5	19.74	9.97	81.6	7.49
6/12/06	south		2.0	19.47	7.42	81.4	7.20
7/5/06	south	9:15	0	22.53	7.26	90.1	7.24
7/5/06	south	9:15	0.5	22.56	6.97	90.1	7.31
7/5/06	south	9:15	1.0	22.55	7.09	90.5	7.30
7/5/06	south	9:15	1.5	22.54	7.03	90.7	7.34
7/5/06	south	9:15	2.0	22.55	6.88	90.7	7.35
7/5/06	south	9:15	2.5	22.58	6.82	90.8	7.32
7/27/06	south	10:00	0	25.4	8.73	95.9	8.6
7/27/06	south	10:00	1.0	25.25	8.8	96.0	8.6
7/27/06	south	10:00	2.0	25	7.3	95	7.5
8/14/06	south	10:15	0	22.53	10.57	10.05	8.63
8/14/06	south	10:15	0.5	21.72	10.59	99.9	8.60
8/14/06	south	10:15	1.0	21.61	10.69	99.8	8.64
8/14/06	south	10:15	1.5	21.28	9.21	99.7	8.34

Date	Station	Time	Depth (m)	Temperature (°C)	DO (mg/l)	Sp Conductivity (µS/cm)	pH (units)
8/14/06	south	10:15	2.0	20.30	3.62	97.7	6.68
9/6/06	south	11:35	0	21.73	10.28	103.1	8.28
9/6/06	south	11:35	0.5	21.10	10.08	102.8	8.17
9/6/06	south	11:35	1.0	21.05	9.86	103.1	8.12
9/6/06	south	11:35	1.5	21.03	9.67	103.1	8.07
9/6/06	south	11:35	2.0	20.04	4.89	104.3	6.95
9/28/06	south		0	19.07	11.12		8.38
9/28/06	south		0.5	18.98	11.15		8.47
9/28/06	south		1.0	18.89	11.45		8.59
9/28/06	south		1.5	18.37	11.61		8.31
9/28/06	south		2.0	17.55			7.48
10/31/06	south		0	9.92	10.12	103.5	7.33
10/31/06	south		0.5	9.89	10.10	103.3	7.35
10/31/06	south		1.0	9.91	10.00	103.5	7.38
10/31/06	south		1.5	9.84	9.86	103.5	7.40
10/31/06	south		2.0	9.79	9.69	103.5	7.36
11/21/06	south	9:55	0	8.07	9.50	73.1	6.89
11/21/06	south	9:55	0.5	8.08	9.60	73.7	6.92
11/21/06	south	9:55	1.0	8.10	9.82	73.9	6.95
11/21/06	south	9:55	1.5	8.09	9.77	74.1	6.96
12/19/06	south	10:45	0.0	4.58	12.30	53.7	6.64
12/19/06	south	10:45	0.5	4.51	9.93	54.8	6.66
12/09/06	south	10:45	1.0	4.49	10.12	53.3	6.65
12/09/06	south	10:45	1.5	4.49	10.83	52.8	6.65
12/09/06	south	10:45	2.0	4.49	10.59	53.4	6.64
12/09/06	south	10:45	2.5	4.52	9.64	53.7	6.61
1/29/07	south		0.0	4.73	13.06	54.2	6.74
1/29/07	south		0.5	4.68	12.74	54.4	6.75
1/29/07	south		1.0	4.68	12.70	54.4	6.76
1/29/07	south		1.5	4.64	12.88	54.2	6.74
1/29/07	south		2.0	4.63	12.76	54.4	6.73
1/29/07	south		2.5	4.63	12.51	54.4	6.72
2/28/07	south		0	6.47	10.53	60.2	6.85
2/28/07	south		0.5	6.48	10.84	57.7	6.85
2/28/07	south		1	6.47	10.66	57.4	6.83
2/28/07	south		1.5	6.46	10.84	57.5	6.81
2/28/07	south		2.0	6.47	10.53	57.5	6.81
3/15/07	south		0	9.17	9.68	56.0	6.94
3/15/07	south		0.5	9.10	9.42	56.2	6.94
3/15/07	south		1.0	9.06	9.25	56.4	6.80
3/15/07	south		1.5	9.01	9.21	56.5	6.80
3/15/07	south		2.0	9.00	9.14	56.4	6.79
4/10/07	south	08:00	0	12.51	8.69	83.5	6.79
4/10/07	south	08:00	0.5	12.48	8.67	83.5	6.81
4/10/07	south	08:00	1.0	12.44	8.66	83.3	6.93
4/10/07	south	08:00	1.5	12.44	8.67	83.1	7.03
4/10/07	south	08:00	2.0	12.40	8.63	83.3	7.00

Date	Station	Time	Depth (m)	Temperature (°C)	DO (mg/l)	Sp Conductivity (µS/cm)	pH (units)
4/10/07	south	09:00	0	11.73	8.86	83.7	6.79
4/10/07	south	09:00	0.5	12.06	8.75	83.7	6.83
4/10/07	south	09:00	1.0	12.07	8.67	83.6	7.02
4/10/07	south	09:00	1.5	12.08	8.65	83.7	7.07
4/10/07	south	16:00	0	13.55	9.31	83.6	6.72
4/10/07	south	16:00	1.0	13.31	9.12	83.5	6.88
4/10/07	south	16:00	1.5	12.34			6.84
5/24/07	south		0	19.09	10.20	134.7	7.08
5/24/07	south		0.5	19.06	10.20	134.7	7.25
5/24/07	south		1.0	19.00	10.18	134.7	7.36
5/24/07	south		1.5	18.88	10.25	134.4	7.39
5/24/07	south		2.0	17.19	10.65	129.1	7.16
6/18/07	south		0.0	17.76	8.26	133.7	7.11
6/18/07	south		0.5	17.81	8.22	133.5	7.12
6/18/07	south		1.0	17.81	8.20	133.7	7.15
6/18/07	south		1.5	17.79	8.20	133.5	7.17
6/18/07	south		2.0	17.78	8.20	133.5	7.18
6/18/07	south		2.5	17.8	7.92	133.3	7.05
7/2/07	south		0.0	20.38	8.67	134.4	7.15
7/2/07	south		0.5	20.40	8.70	134.2	7.18
7/2/07	south		1.0	20.41	8.74	134.3	7.25
7/2/07	south		1.5	20.43	8.74	133.9	7.28
7/2/07	south		2.0	20.43	8.77	133.9	7.30
7/2/07	south		2.5	20.20	8.66	133.9	7.29
7/23/07	south		0.0	21.55	7.62	137.9	7.25
7/23/07	south		0.5	21.46	7.63	138.4	7.25
7/23/07	south		1.0	21.45	7.62	138.2	7.26
7/23/07	south		1.5	21.46	7.63	138.4	7.28
7/23/07	south		2.0	21.42	7.42	137.9	7.23
7/23/07	south		2.5	21.43	7.10	138.1	7.19
8/6/07	south		0.0	22.16	8.46	139.0	7.26
8/6/07	south		0.5	22.18	9.37	139.2	7.28
8/6/07	south		1.0	22.16	8.35	139.5	7.32
8/6/07	south		1.5	22.15	8.30	139.5	7.34
8/6/07	south		2.0	22.19	8.27	139.4	7.34
8/6/07	south		2.4	22.21	8.16	139.7	7.33
8/23/07	south		0.0	21.18	9.09	140.3	7.35
8/23/07	south		0.5	20.92	8.43	139.7	7.19
8/23/07	south		1.0	20.42	8.02	138.5	7.06
8/23/07	south		1.5	20.23	6.22	139.5	6.77
8/23/07	south		2.0	19.63	0.80	153.0	6.48
8/23/07	south		2.5	19.45	0.35	158.0	6.43
9/5/07	south		0.0	20.86	7.76	143.2	7.16
9/5/07	south		0.5	20.84	7.65	142.8	6.92
9/5/07	south		1.0	20.78	7.72	142.4	7.11
9/5/07	south		1.5	20.73	7.54	142.5	7.15
9/5/07	south		2.0	20.70	6.88	142.1	7.08

Date	Station	Time	Depth (m)	Temperature (°C)	DO (mg/l)	Sp Conductivity (µS/cm)	pH (units)
9/5/07	south		2.3	20.71	6.95	142.3	7.10
9/27/07	south		0	15.9	97.8	147.9	7.99
9/27/07	south		0.5	15.89	97.0	147.3	8.03
9/27/07	south		1.0	15.92	102.2	106.1	8.44
9/27/07	south		1.5	15.9	103.9	148.3	8.51
9/27/07	south		2	15.85	100.6	147.9	8.36
9/27/07	south		2.5	15.88	46.7	148.0	7.96
10/10/07	south		0	12.71	9.35	134.9	6.86
10/10/07	south		0.5	12.7	9.38	135.7	7.08
10/10/07	south		1	12.67	9.72	135.8	7.3
10/10/07	south		1.5	12.68	9.61	136.1	7.44
10/10/7	south		2.0	12.68	9.45	135.6	7.43
10/10/07	south		2.5	12.7	9.34	135.7	7.32
11/27/07	south		0	5.36	8.77	119.6	7.05
11/27/07	south		0.5	5.3	8.74	119.7	7.08
11/27/07	south		1	5.3	8.81	119.7	7.10
11/27/07	south		1.5	5.24	8.78	119.9	7.14
11/27/07	south		2.0	5.24	8.64	119.7	7.15
11/27/07	south		2.5	5.28	8.31	119.6	7.13
12/19/07	south		0	4.55	10.11	90.5	7.02
12/19/07	south		0.5	4.54	10.08	90.4	6.94
12/19/07	south		1.0	4.54	10.12	90.6	6.93
12/19/07	south		1.5	4.55	10.14	90.6	6.92
12/19/07	south		2.0	4.52	9.36	90.4	6.85
12/19/07	south		2.5	4.52	10.03	90.1	6.85
2/14/08	south		0	5.66	11.81	89.0	6.78
2/14/08	south		0.5	5.53	11.78	88.6	7.03
2/14/08	south		1.0	5.40	11.83	88.5	7.11
2/14/08	south		1.5	5.29	11.82	88.8	7.14
2/14/08	south		2.0	5.25	11.63	88.5	7.15
2/14/08	south		2.5	5.3	8.5	88.9	7.14
3/13/08	south		0	9.26	11.44	88.1	7.42
3/13/08	south		0.5	9.24	11.25	87.8	7.51
3/13/08	south		1.0	9.24	11.28	88.2	7.59
3/13/08	south		1.5	9.26	11.48	88.1	7.62
3/13/08	south		2.0	9.25	11.44	88.0	7.62
3/13/08	south		2.5	9.17	10.98	88.1	7.51
4/24/08	south		0	11.0	10.8	101.8	6.77
4/24/08	south		0.5	10.98	10.76	100.9	6.68
4/24/08	south		1.0	10.96	10.73	100.9	6.98
4/24/08	south		1.5	10.95	10.74	101.2	7.28
4/24/08	south		2.0	10.93	10.72	101.2	7.35
4/24/08	south		2.5	10.92	5.00	101.3	7.06
5/22/08	south		0	17.32	9.10	109.9	6.36
5/22/08	south		0.5	17.28	9.06	109.8	6.69
5/22/08	south		1	17.23	9.08	109.8	6.9
5/22/08	south		1.5	17.16	9.07	109.7	7.08

Date	Station	Time	Depth (m)	Temperature (°C)	DO (mg/l)	Sp Conductivity (µS/cm)	pH (units)
5/22/08	south		2	17.14	9.02	109.9	7.17
5/22/08	south		2.5	17.06	5.43	117.0	7.00
6/5/08	south		0	15.75	8.95	109.1	6.32
6/5/08	south		0.5	15.76	8.52	108.7	6.51
6/5/08	south		1	15.76	8.48	109.2	6.68
6/5/08	south		1.5	15.78	8.53	109.5	6.81
6/5/08	south		2.0	15.78	8.59	109.6	6.88
6/5/08	south		2.5	15.77	8.52	109.6	6.92
6/17/08	south		0	16.3	10.36	106.8	7.51
6/17/08	south		0.5	16.33	10.41	107.2	7.46
6/17/08	south		1	16.33	10.37	107.2	7.57
6/17/08	south		1.5	16.31	10.11	107.1	7.62
6/17/08	south		2.0	16.00	9.39	107.8	7.49
6/17/08	south		2.5	15.77	9.11	107.8	7.32
7/9/08	south		0	23.88	8.40	115.7	7.44
7/9/08	south		0.5	23.82	8.37	115.7	7.32
7/9/08	south		1.0	23.2	8.05	115.2	7.26
7/9/08	south		1.5	22.84	7.76	114.7	7.17
7/9/08	south		2.0	22.67	7.22	114.7	7.16
7/9/08	south		2.5	22.26	4.49	114.8	6.92
7/24/08	south		0	20.21	8.13	118.4	7.08
7/24/08	south		0.5	20.18	8.04	118.2	7.08
7/24/08	south		1.0	19.80	7.42	117.2	7.13
7/24/08	south		1.5	19.75	7.33	117.3	7.10
7/24/08	south		2.0	19.76	7.39	117.3	7.11
8/7/08	south		0	21.91	8.99	122.2	6.68
8/7/08	south		0.5	21.90	9.03	122.2	6.89
8/7/08	south		1.0	21.90	9.01	122.3	7.06
8/7/08	south		1.5	21.87	8.87	122.2	7.10
8/7/08	south		2.0	21.85	8.74	122.5	7.17
8/7/08	south		2.5	21.04	2.50	123.7	6.92
8/27/08	south		0	19.35	7.43	126.4	7.20
8/27/08	south		0.5	19.36	7.45	126.3	7.20
8/27/08	south		1.0	19.37	7.48	126.4	7.26
8/27/08	south		1.5	19.37	7.52	126.5	7.30
8/27/08	south		2.0	19.38	7.54	126.2	7.34
8/27/08	south		2.5	19.37	7.53	126.2	7.33
9/10/08	south		0	20.48	8.73	130.2	7.45
9/10/08	south		0.5	20.47	8.75	129.6	7.47
9/10/08	south		1.0	20.20	8.76	129.5	7.50
9/10/08	south		1.5	19.91	8.54	129.2	7.48
9/10/08	south		2.0	19.83	8.28	129.1	7.44
9/10/08	south		2.5	19.81	5.74	131.2	6.98
9/30/08	south		0	16.70	8.77	132.7	6.85
9/30/08	south		0.5	16.67	8.67	132.8	6.97
9/30/08	south		1	16.65	8.65	132.8	7.03
9/30/08	south		1.5	16.63	8.61	132.7	7.08

Date	Station	Time	Depth (m)	Temperature (°C)	DO (mg/l)	Sp Conductivity (µS/cm)	pH (units)
9/30/08	south		2.0	16.43	5.74	132.9	6.95
9/30/08	south		2.5	16.41	4.74	135.0	6.76
10/23/08	south		0	11.53	7.98	127.3	6.28
10/23/08	south		0.5	11.49	7.82	127.4	6.46
10/23/08	south		1.0	11.41	7.78	127.5	6.58
10/23/08	south		1.5	11.34	7.61	128.0	6.68
10/23/08	south		2.0	11.32	7.53	128.0	6.76
10/23/08	south		2.5	11.34	5.10	128.0	6.58
11/20/08	south		0	9.31	6.94	113.6	6.42
11/20/08	south		0.5	9.3	6.93	113.6	6.51
11/20/08	south		1.0	9.3	6.92	113.6	6.54
11/20/08	south		1.5	9.3	6.81	113.7	6.59
11/20/08	south		2.0	9.29	6.72	113.6	6.60
11/20/08	south		2.5	9.33	5.00	114.2	6.46
12/11/08	south		0	6.74	8.60	110.2	7.25
12/11/08	south		0.5	6.71	8.44	110.8	7.08
12/11/08	south		1.0	6.69	8.38	110.9	7.11
12/11/08	south		1.5	6.69	8.33	110.5	7.11
12/11/08	south		2.0	6.68	8.12	111.0	7.12
1/26/09	south		0	2.83	102.9	94.9	6.97
1/26/09	south		0.5	3.00	10.03	93.4	6.98
1/26/09	south		1	3.51	10.15	93.1	7.00
1/26/09	south		1.5	3.66	10.42	94.0	7.01
1/26/09	south		2.0	3.57	10.42	94.0	7.01
1/26/09	south		2.5	3.59	10.49	95	7.06
2/24/09	south		0	6.69	10.85	97.8	6.33
2/24/09	south		0.5	6.45	10.62	97.5	6.44
2/24/09	south		1.0	6.44	10.61	97.6	6.50
2/24/09	south		1.5	6.41	10.61	97.9	6.57
2/24/09	south		2.0	6.39	10.61	97.4	6.62
2/24/09	south		2.5	6.37	10.39	97.7	6.65
3/31/09	south		0	8.02	12.16	95.6	6.76
3/31/09	south		0.5	7.98	12.32	95.4	7.03
3/31/09	south		1.0	7.92	12.30	95.3	7.19
3/31/09	south		1.5	7.91	12.27	95.3	7.29
3/31/09	south		2.0	7.83	12.24	95.7	7.38
3/31/09	south		2.3	7.83	11.69	95.4	2.39
4/30/09	south		0	15.22	9.93	99.3	7.38
4/30/09	south		0.5	14.49	9.97	99.4	7.40
4/30/09	south		1.0	14.31	9.94	99.1	7.41
4/30/09	south		1.5	14.24	9.92	99.1	7.39
4/30/09	south		2.0	13.35	8.64	99.1	7.23
4/30/09	south		2.5	13.42	5.17	87.7	6.97
5/14/09	south		0	13.84	8.45	94.5	7.30
5/14/09	south		0.5	13.60	8.33	94.8	7.26
5/14/09	south		1.0	13.52	8.29	94.2	7.25
5/14/09	south		1.5	13.48	8.22	94.3	7.23

Date	Station	Time	Depth (m)	Temperature (°C)	DO (mg/l)	Sp Conductivity (µS/cm)	pH (units)
5/14/09	south		2.0	13.41	8.13	94.6	7.21
5/14/09	south		2.5	13.41	7.18	94.3	7.13
5/28/09	south		0	20.31	9.71	97.7	7.70
5/28/09	south		0.5	19.98	9.85	97.6	7.80
5/28/09	south		1.0	19.66	9.99	97.3	7.94
5/28/09	south		1.5	19.49	9.82	97.5	7.86
5/28/09	south		2.0	18.58	9.03	95.0	7.60
5/28/09	south		2.5	17.41	2.46	109.1	7.19
6/18/09	south		0	20.52	8.54	103.5	7.20
6/18/09	south		0.5	20.52	8.56	103.2	7.27
6/18/09	south		1.0	20.52	8.55	103.6	7.34
6/18/09	south		1.5	20.52	8.45	103.5	7.36
6/18/09	south		2.0	20.44	6.93	103.2	7.21
6/18/09	south		2.5	20.21	2.20	106.7	7.01
7/2/09	south		0	21.78	9.14	106.6	7.28
7/2/09	south		0.5	21.74	9.2	106.6	7.38
7/2/09	south		1.0	21.64	9.25	107.0	7.48
7/2/09	south		1.5	21.46	9.23	106.3	7.48
7/2/09	south		2.0	21.11	5.62	107.1	7.25
7/16/09	south		0	21.96	8.90	109.4	7.37
7/16/09	south		0.5	21.95	8.92	109.0	7.49
7/16/09	south		1.0	21.91	9.00	109.0	7.57
7/16/09	south		1.5	21.53	8.63	109.2	7.46
7/16/09	south		2.0	20.13	2.93	109.7	7.03
7/16/09	south		2.5	19.57	0.82	111.9	6.81
7/29/09	south		0	27.36	7.86	115.1	7.30
7/29/09	south		0.5	27.26	7.90	115.0	7.33
7/29/09	south		1.0	26.87	7.92	114.6	7.32
7/29/09	south		1.5	26.67	6.98	114.8	7.22
7/29/09	south		2.0	25.61	3.24	113.6	6.97
8/13/09	south		0	20.43	7.75	119.1	6.58
8/13/09	south		0.5	20.42	7.75	119.5	6.69
8/13/09	south		1.0	20.40	7.55	119.1	6.82
8/13/09	south		1.5	20.34	7.00	119.3	6.86
8/13/09	south		2.0	19.77	1.79	120.4	6.73
8/13/09	south		2.5	19.77	0.81	120.7	6.57
9/3/09	south		0	19.81	8.67	122.4	7.28
9/3/09	south		0.5	19.83	8.59	122.2	7.35
9/3/09	south		1.0	19.86	8.53	122.9	7.38
9/3/09	south		1.5	19.82	8.35	122.6	7.37
9/3/09	south		2.0	19.70	6.90	121.0	7.35
9/3/09	south		2.5	19.69	6.99	122.9	7.20
9/29/09	south		0	16.21	8.45	125.5	6.33
9/29/09	south		0.5	16.20	8.43	125.8	6.53
9/29/09	south		1.0	16.18	8.44	126.1	6.71
9/29/09	south		1.5	16.18	8.41	126.0	6.82
9/29/09	south		2.0	16.17	7.92	126.0	6.87

Date	Station	Time	Depth (m)	Temperature (°C)	DO (mg/l)	Sp Conductivity (µS/cm)	pH (units)
10/20/09	south		0	12.67	7.71	123.3	6.33
10/20/09	south		0.5	12.60	7.48	123.1	6.41
10/20/09	south		1.0	12.53	7.22	123.6	6.47
10/20/09	south		1.5	12.54	7.16	123.4	6.52
10/20/09	south		2.0	12.49	7.13	123.4	6.56
10/20/09	south		2.5	12.50	6.79	123.6	6.58
11/24/09	south		0	7.39	10.27	96.2	7.23
11/24/09	south		0.5	7.01	10.10	96.2	7.21
11/24/09	south		1.0	7.05	10.05	96.7	7.20
11/24/09	south		1.5	7.01	10.02	96.5	7.19
11/24/09	south		2.0	6.99	9.97	96.3	7.18
11/24/09	south		2.5	6.96	10.02	96.7	7.15
11/24/09	south		3.0	6.97	8.18	96.4	7.13
1/7/10	south		0	5.65	9.32	89.9	6.67
1/7/10	south		0.5	5.54	9.25	89.9	6.78
1/7/10	south		1.0	5.49	9.25	90.1	7.00
1/7/10	south		1.5	5.49	9.22	89.8	7.22
1/7/10	south		2.0	5.50	9.20	89.8	7.31
1/7/10	south		2.5	5.50	9.11	90.2	7.29
2/18/10	south		0	7.85	11.12	80.3	6.37
2/18/10	south		0.5	7.84	11.14	80.5	6.62
2/18/10	south		1.0	7.85	11.15	80.4	6.78
2/18/10	south		1.5	7.83	11.08	80.3	7.27
2/18/10	south		2.0	7.84	11.04	80.5	7.17
2/18/10	south		2.5	7.83	8.60	80.7	6.98
3/31/10	south		0.0	9.92	9.75	84.0	6.95
3/31/10	south		0.5	9.89	9.74	83.9	7.02
3/31/10	south		1.0	9.87	9.73	83.7	7.18
3/31/10	south		1.5	9.78	9.71	84.0	7.22
3/31/10	south		2.0	9.72	9.55	83.8	7.21
3/31/10	south		2.5	9.87	4.37	83.4	7.07
4/28/10	south		0	12.75	9.72	86.6	7.08
4/28/10	south		0.5	12.70	9.67	86.4	6.75
4/28/10	south		1.0	12.67	9.65	86.8	6.98
4/28/10	south		1.5	12.66	9.58	86.3	7.11
4/28/10	south		2.0	12.66	9.58	86.5	7.23
4/28/10	south		2.5	12.62	7.81	86.4	7.18
5/20/10	south		0	15.78	8.91	92.8	7.00
5/20/10	south		0.5	15.79	8.86	92.8	7.06
5/20/10	south		1.0	15.82	8.86	92.9	7.12
5/20/10	south		1.5	15.83	8.83	92.5	7.14
5/20/10	south		2.0	15.83	8.82	92.4	7.15
5/20/10	south		2.5	15.86	8.60	92.5	7.17
6/17/10	south		0	16.77	7.04	99.4	6.63
6/17/10	south		0.5	16.78	6.95	99.8	6.48
6/17/10	south		1.0	16.77	6.89	99.4	6.60
6/17/10	south		1.5	16.76	6.90	99.6	6.74



Date	Station	Time	Depth (m)	Temperature (°C)	DO (mg/l)	Sp Conductivity (µS/cm)	pH (units)
6/17/10	south		2.0	16.75	6.91	99.4	6.82
6/17/10	south		2.5	16.10	4.51	100.0	6.76
7/15/10	south		0	22.97	8.5	108.4	7.10
7/15/10	south		0.5	22.87	8.53	108.5	7.24
7/15/10	south		1.0	22.49	8.6	107.8	7.31
7/15/10	south		1.5	22.22	7.99	107.8	7.26
7/15/10	south		2.0	20.32	1.83	110.3	6.66
7/29/10	south		0	21.39	7.72	113.0	6.83
7/29/10	south		0.5	21.42	7.70	113.1	6.72
7/29/10	south		1.0	21.42	7.60	112.7	6.86
7/29/10	south		1.5	21.41	7.55	112.7	6.96
7/29/10	south		2.0	21.4	7.70	112.7	7.10
8/24/10	south		0	20.91	8.26	118.9	7.35
8/24/10	south		0.5	20.85	8.25	119.0	7.35
8/24/10	south		1.0	20.62	8.11	118.8	7.28
8/24/10	south		1.5	20.09	6.95	118.5	7.17
8/24/10	south		2.0	19.56	2.36	117.9	6.84
9/30/10	south		0.0	16.97	7.60	123.1	7.3
9/30/10	south		0.5	16.95	7.57	122.9	7.32
9/30/10	south		1.0	16.88	7.55	123.3	7.3
9/30/10	south		1.5	16.84	7.48	122.7	6.48
9/30/10	south		2.0	16.78	5.86	124.2	16.27
11/11/10	south		0.0	9.46	7.15	103.3	6.76
11/11/10	south		0.5	9.45	7.17	103.7	6.78
11/11/10	south		1.0	9.46	7.23	103.7	6.77
11/11/10	south		1.5	9.47	7.28	103.6	6.76
11/11/10	south		2.0	9.47	7.29	103.8	6.76
11/11/10	south		2.5	9.48	7.29	103.6	6.77

## **Appendix B – Laboratory Data**

**Table B-1. Analytical Data for Long Lake Middle Station, 2006-2010.**

Date	Station	Depth (m)	TP (mg/l)	TP (ug/l)	SRP (mg/l)	Phaeo_a (ug/l)	Alkalinity (CaCO3/mL)	Chl_a (ug/l)
24-Jan-06	Middle	0.5	0.028	28	0.012	< 0.1	-	7.5
24-Feb-06	Middle	0.5	0.029	29	0.05	3.4	-	13
23-Mar-06	Middle	0.5	0.035	35	0.003	5.7	-	36
21-Apr-06	Middle	0.5	0.021	21	0.002	3.6	-	17
22-May-06	Middle	1	0.026	26	0.002	4.2	40.8	7.2
12-Jun-06	Middle	0.5	0.023	23	0.001	7.6	-	5.9
05-Jul-06	Middle	0.5	0.035	35	<0.001	3.2	-	30
27-Jul-06	Middle	0.5	0.056	56	>0.001	6.5	-	26
14-Aug-06	Middle	0.5	0.041	41	0.001	4.1	-	52
06-Sep-06	Middle	0.5	0.042	42	<0.001	4.8	-	46
28-Sep-06	Middle	0.5	0.036	36	0.001	16	-	1.6
31-Oct-06	Middle	0.5	0.030	30	0.001	2.6	-	11
21-Nov-06	Middle	0.5	0.031	31	0.010	2.3	-	3.5
19-Dec-06	Middle	0.5	0.031	31	0.008	1.7	-	2.9
22-May-06	Middle	3	0.026	26	<0.001	-	-	-
12-Jun-06	Middle	2.5	0.027	27	0.002	-	-	-
05-Jul-06	Middle	2.5	0.043	43	<0.001	-	-	-
27-Jul-06	Middle	2.5	0.047	47	0.001	-	-	-
14-Aug-06	Middle	2.5	0.044	44	0.001	-	-	-
06-Sep-06	Middle	2.5	0.052	52	<0.001	-	-	-
28-Sep-06	Middle	2.5	0.041	41	0.001	-	-	-
29-Jan-07	Middle	0.5	0.028	28	0.009	1.3	-	6.4
28-Feb-07	Middle	0.5	0.034	34	0.005	7.2	-	21
15-Mar-07	Middle	0.5	0.037	37	0.004	3.9	-	29
10-Apr-07	Middle	0.5	0.031	31	0.003	6.6	-	9.1
24-May-07	Middle	0.5	0.025	25	<0.001	2.1	-	5.3
18-Jun-07	Middle	0.5	0.013	13	0.002	2.2	-	3.7
02-Jul-07	Middle	0.5	0.016	16	<0.001	0.6	-	3.7
23-Jul-07	Middle	0.5	0.020	20	<0.001	1.8	-	6.4
05-Sep-07	Middle	1.0	0.023	23	<0.001	0.9	-	5.9
27-Sep-07	Middle	1.0	0.016	16	0.003	3.5	-	5.9
10-Oct-07	Middle	1.0	0.016	16	0.001	2.9	-	12
27-Nov-07	Middle	0.5	0.017	17	0.001	3.4	-	8.5
19-Dec-07	Middle	1.0	0.034	34	0.009	4.9	-	4.8

Date	Station	Depth (m)	TP (mg/l)	TP (ug/l)	SRP (mg/l)	Phaeo_a (ug/l)	Alkalinity (CaCO3/mL)	Chl_a (ug/l)
28-Feb-07	Middle	2.5	0.034	36	0.004	4.2		23
24-May-07	Middle	2.5	0.025	25	0.001	4.0	-	9.1
18-Jun-07	Middle	2.5	0.026	26	0.002	6.6	-	4.8
02-Jul-07	Middle	2.5	0.019	19	<0.001	0.8	-	4.3
23-Jul-07	Middle	2.5	0.020	20	<0.001	1.6	-	9.6
05-Sep-07	Middle	2.5	0.020	20	<0.001	1.6	-	5.9
27-Sep-07	Middle	2.5	0.021	21	0.003	3.5	-	5.9
10-Oct-07	Middle	2.5	0.016	16	0.001	3.5	-	14
27-Nov-07	Middle	2.5	0.018	18	0.001	2.7	-	7.7
19-Dec-07	Middle	2.5	0.037	37	0.009	6.1	-	3.2
14-Feb-08	Center	1.0	0.030	30	0.003	1.9	-	27
13-Mar-08	Middle	1.0	0.024	24	0.004	7.6	-	36
24-Apr-08	Middle	1.0	0.039	39	0.001	4.9	-	22
22-May-08	Middle	1.0	0.013	13	<0.001	3.7	-	3.7
05-Jun-08	Middle	1.0	0.012	12	0.001	4.3	-	8.0
17-Jun-08	Middle	1.0	0.021	21	0.002	2.4	-	9.3
09-Jul-08	Middle	1.0	0.010	10	0.001	4.8	-	5.3
24-Jul-08	Middle	1.0	0.019	19	<0.001	0.7	-	6.4
07-Aug-08	Middle	1.0	0.025	25	0.002	2.1	-	12
27-Aug-08	Middle	1.0	0.034	34	0.001	4.0	-	13
10-Sep-08	Middle	1.0	0.030	30	0.001	2.3	-	9.6
30-Sep-08	Middle	1.0	0.026	26	0.002	2.4	-	11
23-Oct-08	Middle	1.0	0.020	20	0.002	0.1	-	11
20-Nov-08	Middle	1.0	0.025	25	0.003	2.9	-	11
11-Dec-08	Middle	1.0	0.028	28	0.002	3.8	-	17
14-Feb-08	Center	2.9	0.028	28	0.003	1.0	-	19
13-Mar-08	Middle	2.5	0.023	23	0.003	6.1	-	17
24-Apr-08	Middle	2.5	0.020	20	0.001	4.8	-	24
22-May-08	Middle	2.5	0.049	49	0.001	3.2	-	4.3
05-Jun-08	Middle	2.5	0.029	29	0.001	4.5	-	7.5
17-Jun-08	Middle	2.5	0.030	30	0.002	3.1	-	7.2
09-Jul-08	Middle	2.5	0.24	240	<0.001	4.0	-	5.3
24-Jul-08	Middle	2.5	0.028	28	<0.001	0.4	-	7.5
07-Aug-08	Middle	2.5	0.042	42	0.005	3.0	-	12
27-Aug-08	Middle	2.5	0.057	57	0.001	4.9	-	12
10-Sep-08	Middle	2.5	0.049	49	0.002	3.1	-	9.6
30-Sep-08	Middle	2.5	0.054	54	<0.001	3.4	-	9.6

Date	Station	Depth (m)	TP (mg/l)	TP (ug/l)	SRP (mg/l)	Phaeo_a (ug/l)	Alkalinity (CaCO3/mL)	Chl_a (ug/l)
23-Oct-08	Middle	2.5	0.027	27	0.001	0.7	-	7.5
20-Nov-08	Middle	2.5	0.003	3	0.003	2.9	-	10
11-Dec-08	Middle	2.5	0.036	36	0.002	3.6	-	16
26-Jan-09	Middle	1.0	0.030	30	0.008	lab error	-	lab error
24-Feb-09	Middle	1.0	0.026	26	0.002	2.4	-	5.6
31-Mar-09	Middle	1.0	0.032	32	0.002	4.4	-	51
30-Apr-09	Middle	1.0	0.0018	1.8	0.001	3.0	-	9.3
14-May-09	Middle	1.0	0.022	22	0.003	0.9	-	5.9
28-May-09	Middle	1.0	0.021	21	0.001	3.2	-	8.5
18-Jun-09	Middle	1.0	0.024	24	0.001	2.4	-	18
02-Jul-09	Middle	1.0	0.031	31	0.001	2.5	-	7.2
16-Jul-09	Middle	1.0	0.024	24	0.001	4.0	-	9.1
29-Jul-09	Middle	1.0	0.026	26	0.001	3.2	-	12
13-Aug-09	Middle	1.0	0.031	31	0.001	4.0	-	13
03-Sep-09	Middle	1.0	0.033	33	0.001	2.3	-	24
29-Sep-09	Middle	1.0	0.028	28	0.001	5.2	-	15
20-Oct-09	Middle	1.0	0.018	18	0.001	4.4	-	10
24-Nov-09	Middle	1.0	0.028	28	0.005	3.4	-	5.6
26-Jan-09	Middle	2.5	0.039	39	0.008	lab error	-	lab error
24-Feb-09	Middle	2.5	0.083	83	0.001	4.1	-	10
31-Mar-09	Middle	2.5	0.042	42	0.002	4.3	-	48
30-Apr-09	Middle	2.5	0.068	68	0.001	2.1	-	9.9
14-May-09	Middle	2.5	0.025	25	0.004	3.3	-	5.3
28-May-09	Middle	2.5	0.037	37	0.001	3.2	-	8.5
18-Jun-09	Middle	2.5	0.030	30	0.001	3.5	-	17
02-Jul-09	Middle	2.5	0.046	46	0.002	2.1	-	7.5
16-Jul-09	Middle	2.5	0.054	54	0.001	3.4	-	11
29-Jul-09	Middle	2.5	0.046	46	0.001	4.6	-	11
13-Aug-09	Middle	2.5	0.040	40	0.001	2.8	-	12
03-Sep-09	Middle	2.5	0.045	45	0.001	3.5	-	21
29-Sep-09	Middle	2.5	0.040	40	0.001	4.9	-	15
20-Oct-09	Middle	2.5	0.026	26	0.004	3.7	-	6.9
24-Nov-09	Middle	2.5	0.036	36	0.006	3.3	-	5.3
07-Jan-10	Middle	1.0	0.032	32	0.013	1.6	-	4.5

Date	Station	Depth (m)	TP (mg/l)	TP (ug/l)	SRP (mg/l)	Phaeo_a (ug/l)	Alkalinity (CaCO3/mL)	Chl_a (ug/l)
18-Feb-10	Middle	1.0	0.034	34	0.003	3.6	-	31
31-Mar-10	Middle	1.0	0.039	39	0.002	4.2	-	20
28-Apr-10	Middle	1.0	0.035	35	0.002	5.7	-	23
20-May-10	Middle	1.0	0.024	24	0.002	4.3	-	15
17-Jun-10	Middle	1.0	0.030	30	0.002	4.1	-	15
15-Jul-10	Middle	1.0	0.031	31	0.001	4.3	-	14
29-Jul-10	Middle	1.0	0.037	37	0.001	3.6	-	5.3
24-Aug-10	Middle	1.0	0.019	19	0.002	5.1	-	5.3
30-Sep-10	Middle	1	0.024	24	0.002	1.5	-	4.8
11-Nov-10	Middle	1	0.027	27	0.002	4	-	5.3
07-Jan-10	Middle	2.5	0.074	74	0.010	1.6	-	4.5
18-Feb-10	Middle	2.5	0.042	42	0.004	2.9	-	34
31-Mar-10	Middle	2.5	0.041	41	0.002	4.3	-	15
28-Apr-10	Middle	2.5	0.048	48	0.001	7.6	-	21
20-May-10	Middle	2.5	0.031	31	0.002	4.2	-	16
17-Jun-10	Middle	2.5	0.057	57	0.002	4.9	-	12
15-Jul-10	Middle	2.5	0.046	46	0.001	4.5	-	16
29-Jul-10	Middle	2.5	0.024	24	0.001	3.6	-	5.3
24-Aug-10	Middle	2.5	0.023	23	0.001	3.5	-	5.9
30-Sep-10	Middle	2.5	0.025	25	0.001	2	-	4.5
11-Nov-10	Middle	2.5	0.033	33	0.003	2.7	-	5.9

**Table B-2. Analytical Data for Long Lake North Station, 2006-2010.**

Date	Station	Depth (m)	TP (mg/l)	TP (ug/L)	SRP (mg/l)	Phaeo_a (ug/l)	Alkalinity (CaCO3/mL)	Chl_a (ug/l)
24-Jan-06	North	0.5	0.029	29	0.011	0.3	-	6.4
24-Feb-06	North	0.5	0.029	29	0.04	2.9	-	18
23-Mar-06	North	0.5	0.032	32	0.004	3.4	-	30
21-Apr-06	North	0.5	0.026	26	0.002	2.3	-	18
22-May-06	North	1	0.031	31	0.002	3.9	41.0	6.4
12-Jun-06	North	0.5	0.023	23	0.002	3.1	-	6.4
05-Jul-06	North	0.5	0.041	41	0.001	4.6	-	25
27-Jul-06	North	0.5	0.037	37	0.001	3.9	-	29
14-Aug-06	North	0.5	0.044	44	0.001	5.6	-	52
06-Sep-06	North	0.5	0.042	42	<0.001	5.1	-	42
28-Sep-06	North	0.5	0.034	34	0.002	13	-	2.0
31-Oct-06	North	0.5	0.023	23	0.001	2.8	-	7.5

Date	Station	Depth (m)	TP (mg/l)	TP (ug/L)	SRP (mg/l)	Phaeo_a (ug/l)	Alkalinity (CaCO3/mL)	Chl_a (ug/l)
21-Nov-06	North	0.5	0.027	27	0.009	2.3	-	2.4
19-Dec-06	North	0.5	0.031	31	0.008	2.0	-	4.5
05-Jul-06	North	2.5	0.078	78	<0.001	-	-	-
06-Sep-06	North	2.0	0.040	40	<0.001	-	-	-
28-Sep-06	North	2.0	0.102	102	0.002	-	-	-
29-Jan-07	North	0.5	0.028	28	0.009	1.0	-	6.7
28-Feb-07	North	0.5	0.034	34	0.005	6.1	-	26
15-Mar-07	North	0.5	0.031	31	0.003	3.7	-	18
10-Apr-07	North	0.5	0.029	29	0.003	6.6	-	9.1
24-May-07	North	0.5	0.025	25	0.001	3.4	-	7.5
18-Jun-07	North	0.5	0.073	73	0.002	1.9	-	2.9
02-Jul-07	North	0.5	0.015	15	<0.001	0.4	-	3.7
23-Jul-07	North	0.5	0.017	17	<0.001	2.0	-	6.9
05-Sep-07	North	0.5	0.014	14	<0.001	1.7	-	4.3
27-Sep-07	North	1.0	0.016	16	0.003	2.7	-	4.8
10-Oct-07	North	0.5	0.014	14	<0.001	2.3	-	10
27-Nov-07	North	0.5	0.017	17	0.002	2.9	-	8.5
19-Dec-07	North	1.0	0.038	38	0.009	4.6	-	5.9
14-Feb-08	North	1.0	0.030	30	0.003	2.1	-	28
13-Mar-08	North	1.0	0.025	25	0.003	5.6	-	34
24-Apr-08	North	1.0	0.026	26	0.001	6.2	-	23
22-May-08	North	1.0	0.014	14	0.001	4.1	-	3.7
05-Jun-08	North	1.0	0.012	12	0.002	2.6	-	10
17-Jun-08	North	1.0	0.015	15	0.002	2.4	-	8.8
09-Jul-08	North	1.0	0.014	14	<0.001	4.5	-	3.7
24-Jul-08	North	1.0	0.017	17	<0.001	<0.1	-	4.8
07-Aug-08	North	1.0	0.027	27	0.002	2.5	-	12
27-Aug-08	North	1.0	0.029	29	0.002	5.1	-	12
10-Sep-08	North	1.0	0.024	24	0.001	3.5	-	9.6
30-Sep-08	North	1.0	0.022	22	0.002	2.0	-	9.6
23-Oct-08	North	1.0	0.017	17	0.002	0.1	-	9.6
20-Nov-08	North	1.0	0.021	21	0.003	2.9	-	6.4
11-Dec-08	North	1.0	0.026	26	0.002	3.9	-	16
26-Jan-09	North	1.0	0.030	30	0.007	lab error	-	lab error
24-Feb-09	North	1.0	0.027	27	0.002	4.2	-	9.1
31-Mar-09	North	1.0	0.037	37	0.002	5.1	-	50
30-Apr-09	North	1.0	0.019	19	0.001	2.5	-	11

Date	Station	Depth (m)	TP (mg/l)	TP (ug/L)	SRP (mg/l)	Phaeo_a (ug/l)	Alkalinity (CaCO3/mL)	Chl_a (ug/l)
14-May-09	North	1.0	0.030	30	0.003	2.3	-	13
28-May-09	North	1.0	0.019	19	0.001	3.1	-	11
18-Jun-09	North	1.0	0.026	26	0.023	3.2	-	15
02-Jul-09	North	1.0	0.023	23	0.002	2.6	-	7.5
16-Jul-09	North	1.0	0.024	24	0.001	2.1	-	9.1
29-Jul-09	North	1.0	0.024	24	0.001	2.7	-	9.6
13-Aug-09	North	1.0	0.027	27	0.001	5.6	-	14
03-Sep-09	North	1.0	0.028	28	0.001	2.5	-	24
29-Sep-09	North	1.0	0.022	22	0.001	5.2	-	14
20-Oct-09	North	1.0	0.025	25	0.001	4.4	-	15
24-Nov-09	North	1.0	0.026	26	0.004	2.4	-	6.4
07-Jan-10	North	1.0	0.031	31	0.009	1.5	-	3.2
18-Feb-10	North	1.0	0.031	31	0.003	2.9	-	32
31-Mar-10	North	1.0	0.037	37	0.002	2.7	-	20
28-Apr-10	North	1.0	0.036	36	0.001	6.9	-	23
20-May-10	North	1.0	0.063	63	0.002	4.2	-	17
17-Jun-10	North	1.0	0.038	38	0.013	5.4	-	19
15-Jul-10	North	1.0	0.031	31	0.001	2.4	-	14
29-Jul-10	North	1.0	0.031	31	0.001	3.3	-	6.4
24-Aug-10	North	1.0	0.034	34	0.001	3.1	-	5.9
30-Sep-10	North	1	0.017	17	0.001	2.2	-	6.4
11-Nov-10	North	1.0	0.026	26	0.002	4	-	5.3

**Table B-3. Analytical Data for Long Lake South Station, 2006-2010.**

Date	Station	Depth (m)	TP (mg/l)	TP (ug/L)	SRP (mg/l)	Phaeo_a (ug/l)	Alkalinity (CaCO3/mL)	Chl_a (ug/l)
24-Jan-06	South	0.5	0.026	26	0.012	< 0.1	-	5.9
24-Feb-06	South	0.5	0.029	29	0.05	2.7	-	13
23-Mar-06	South	0.5	0.038	38	0.005	6.2	-	38
21-Apr-06	South	0.5	0.032	32	0.002	2.4	-	15
22-May-06	South	1	0.025	25	0.001	3.4	40.8	7.2
12-Jun-06	South	0.5	0.026	26	0.001	2.2	-	9.3
05-Jul-06	South	0.5	0.041	41	0.001	4.6	-	54
27-Jul-06	South	0.5	0.030	30	0.001	2.3	-	16
14-Aug-06	South	0.5	0.040	40	0.001	4.4	-	59
06-Sep-06	South	0.5	0.038	38	<0.001	3.5	-	37



Date	Station	Depth (m)	TP (mg/l)	TP (ug/L)	SRP (mg/l)	Phaeo_a (ug/l)	Alkalinity (CaCO3/mL)	Chl_a (ug/l)
28-Sep-06	South	0.5	0.034	34	0.002	11	-	1.9
31-Oct-06	South	0.5	0.032	32	0.002	3.5	-	7.7
21-Nov-06	South	0.5	0.032	32	0.010	3.3	-	2.7
19-Dec-06	South	0.5	0.029	29	0.009	1.8	-	3.5
05-Jul-06	South	2.5	0.067	67	0.002	-	-	-
27-Jul-06	South	2.5	0.216	216	0.002	-	-	-
06-Sep-06	South	2.0	0.137	137	0.001	-	-	-
28-Sep-06	South	2.0	0.042	42	0.002	-	-	-
29-Jan-07	South	0.5	0.041	41	0.011	1.7	-	8.8
28-Feb-07	South	0.5	0.038	38	0.005	9.3	-	25
15-Mar-07	South	0.5	0.040	40	0.005	-	-	-
10-Apr-07	South	0.5	0.032	32	0.003	7.3	-	6.9
24-May-07	South	0.5	0.019	19	<0.001	4.8	-	2.7
18-Jun-07	South	0.5	0.017	17	0.002	1.7	-	3.7
02-Jul-07	South	0.5	0.018	18	0.001	1.3	-	4.3
23-Jul-07	South	0.5	0.021	21	0.001	5.1	-	5.3
05-Sep-07	South	0.5	0.014	14	<0.001	1.1	-	3.7
27-Sep-07	South	1.0	0.014	14	0.004	2.1	-	4.3
10-Oct-07	South	0.5	0.010	10	<0.001	2.3	-	4.8
27-Nov-07	South	0.5	0.015	15	0.002	2.9	-	4.8
19-Dec-07	South	1.0	0.028	28	0.009	6.1	-	5.9
14-Feb-08	South	1.0	0.025	25	0.003	1.5	-	19
13-Mar-08	South	1.0	0.028	28	0.003	5.9	-	25
24-Apr-08	South	1.0	0.019	19	0.001	3.8	-	13
22-May-08	South	1.0	0.018	18	<0.001	4.5	-	4.8
05-Jun-08	South	1.0	0.016	16	0.002	3.4	-	8.5
17-Jun-08	South	1.0	0.022	22	0.003	3.2	-	12
09-Jul-08	South	1.0	0.014	14	<0.001	3.6	-	4.3
24-Jul-08	South	1.0	0.017	17	<0.001	1.7	-	6.9
07-Aug-08	South	1.0	0.035	35	0.002	3.2	-	8.0
27-Aug-08	South	1.0	0.033	33	0.001	4.9	-	11
10-Sep-08	South	1.0	0.030	30	0.004	2.0	-	6.9
30-Sep-08	South	1.0	0.018	18	<0.001	0.4	-	8.5
23-Oct-08	South	1.0	0.023	23	0.001	0.1	-	8.5
20-Nov-08	South	1.0	0.030	30	0.003	3.6	-	20
11-Dec-08	South	1.0	0.046	46	0.003	7.3	-	45
26-Jan-09	South	1.0	0.031	31	0.009	lab error	-	lab error

Date	Station	Depth (m)	TP (mg/l)	TP (ug/L)	SRP (mg/l)	Phaeo_a (ug/l)	Alkalinity (CaCO3/mL)	Chl_a (ug/l)
24-Feb-09	South	1.0	0.026	26	0.001	4.2	-	12
31-Mar-09	South	1.0	0.033	33	0.002	4.5	-	46
30-Apr-09	South	1.0	0.021	21	0.001	2.4	-	8.8
14-May-09	South	1.0	0.023	23	0.003	1.5	-	8.5
28-May-09	South	1.0	0.022	22	0.002	3.3	-	14
18-Jun-09	South	1.0	0.027	27	0.001	2.8	-	14
02-Jul-09	South	1.0	0.021	21	0.002	2.1	-	6.7
16-Jul-09	South	1.0	0.025	25	0.001	3.0	-	8.5
29-Jul-09	South	1.0	0.024	24	0.001	4.1	-	7.5
13-Aug-09	South	1.0	0.032	32	0.001	3.9	-	18
03-Sep-09	South	1.0	0.032	32	0.001	2.6	-	19
29-Sep-09	South	1.0	0.023	23	0.001	5.2	-	11
20-Oct-09	South	1.0	0.021	21	0.001	3.3	-	5.1
24-Nov-09	South	1.0	0.031	31	0.008	2.5	-	5.3
07-Jan-10	South	1.0	0.031	31	0.010	1.8	-	4.5
18-Feb-10	South	1.0	0.036	36	0.003	3.7	-	35
31-Mar-10	South	1.0	0.032	32	0.002	4.6	-	21
28-Apr-10	South	1.0	0.037	37	0.001	7.5	-	22
20-May-10	South	1.0	0.026	26	0.002	4.6	-	17
17-Jun-10	South	1.0	0.031	31	0.001	3.9	-	11
15-Jul-10	South	1.0	0.029	29	0.001	2.8	-	12
29-Jul-10	South	1.0	0.023	23	0.001	5.0	-	5.9
24-Aug-10	South	1.0	0.033	33	0.001	6.4	-	4.4
30-Sep-10	South	1.0	0.019	19	0.001	2.3	-	4.8
11-Nov-10	South	1.0	0.026	26	0.003	4.4	-	5.3

**Table B-4. Analytical Data for Salmonberry Creek, 2006-2010.**

Date	Station	TP (mg/l)	TP (ug/L)	SRP (mg/l)
24-Feb-06	Salmonberry	0.035	35	0.011
23-Mar-06	Salmonberry	0.040	40	-
21-Apr-06	Salmonberry	0.035	35	-
22-May-06	Salmonberry	0.037	37	-
12-Jun-06	Salmonberry	0.056	56	0.019
05-Jul-06	Salmonberry	0.038	38	0.021
27-Jul-06	Salmonberry	0.036	36	0.022
14-Aug-06	Salmonberry	0.029	29	0.018
06-Sep-06	Salmonberry	0.032	32	0.016

Date	Station	TP (mg/l)	TP (ug/L)	SRP (mg/l)
28-Sep-06	Salmonberry	0.028	28	0.013
31-Oct-06	Salmonberry	0.020	20	0.007
21-Nov-06	Salmonberry	0.032	32	0.010
19-Dec-06	Salmonberry	0.026	26	0.009
29-Jan-07	Salmonberry	0.028	28	0.012
28-Feb-07	Salmonberry	0.037	37	0.01
15-Mar-07	Salmonberry	0.038	38	0.008
10-Apr-07	Salmonberry	0.036	36	0.010
24-May-07	Salmonberry	0.038	38	0.013
18-Jun-07	Salmonberry	0.039	39	0.016
02-Jul-07	Salmonberry	0.032	32	0.019
23-Jul-07	Salmonberry	0.042	42	0.021
05-Sep-07	Salmonberry	0.027	27	0.017
27-Sep-07	Salmonberry	0.030	30	0.021
10-Oct-07	Salmonberry	0.028	28	0.012
27-Nov-07	Salmonberry	0.026	26	0.008
19-Dec-07	Salmonberry	0.052	52	0.011
14-Feb-08	Salmonberry	0.031	31	0.011
13-Mar-08	Salmonberry	0.039	39	0.011
24-Apr-08	Salmonberry	0.028	28	0.007
22-May-08	Salmonberry	0.041	41	0.013
05-Jun-08	Salmonberry	0.043	43	0.013
17-Jun-08	Salmonberry	0.031	31	0.021
09-Jul-08	Salmonberry	0.033	33	0.019
24-Jul-08	Salmonberry	0.026	26	0.016
07-Aug-08	Salmonberry	0.090	90	0.021
27-Aug-08	Salmonberry	0.050	50	0.020
10-Sep-08	Salmonberry	0.033	33	0.018
30-Sep-08	Salmonberry	0.027	27	0.014
23-Oct-08	Salmonberry	0.178	178	0.012
20-Nov-08	Salmonberry	0.041	41	0.017
11-Dec-08	Salmonberry	0.052	52	0.015
26-Jan-09	Salmonberry	0.032	32	0.011
24-Feb-09	Salmonberry	0.080	80	0.011
31-Mar-09	Salmonberry	0.037	37	0.010
30-Apr-09	Salmonberry	0.035	35	0.009
14-May-09	Salmonberry	0.065	65	0.013
28-May-09	Salmonberry	0.123	123	0.016
18-Jun-09	Salmonberry	0.039	39	0.018
02-Jul-09	Salmonberry	0.037	37	0.022
16-Jul-09	Salmonberry	0.033	33	0.019

Date	Station	TP (mg/l)	TP (ug/L)	SRP (mg/l)
29-Jul-09	Salmonberry	0.043	43	0.026
13-Aug-09	Salmonberry	0.032	32	0.018
03-Sep-09	Salmonberry	0.028	28	0.018
29-Sep-09	Salmonberry	0.025	25	0.012
20-Oct-09	Salmonberry	0.047	47	0.010
24-Nov-09	Salmonberry	0.036	36	0.012
07-Jan-10	Salmonberry	0.037	37	0.012
18-Feb-10	Salmonberry	0.040	40	0.012
31-Mar-10	Salmonberry	0.051	51	0.008
28-Apr-10	Salmonberry	0.043	43	0.009
20-May-10	Salmonberry	0.059	59	0.013
17-Jun-10	Salmonberry	0.045	45	0.017
15-Jul-10	Salmonberry	0.041	41	0.017
29-Jul-10	Salmonberry	0.037	37	0.018
24-Aug-10	Salmonberry	0.037	37	0.014
30-Sep-10	Salmonberry	0.042	42	0.17
11-Nov-10	Salmonberry	0.042	42	0.011

**Table B-5. Analytical Data for GroundWater Creek, 2006-2010.**

Date	Station	TP (mg/l)	TP (ug/L)	SRP (mg/l)
14-Aug-06	GW Creek	0.027	27	0.020
28-Sep-06	GW Creek	0.050	50	0.018
31-Oct-06	GW creek	0.023	23	0.013
21-Nov-06	GW creek	0.009	9	0.007
24-May-07	GW Creek	0.021	21	-
18-Jun-07	GW Creek	0.028	28	0.020
02-Jul-07	GW Creek	0.028	28	0.019
23-Jul-07	GW Creek	0.031	31	0.022
05-Sep-07	GW Creek	0.031	31	0.021
27-Sep-07	GW Creek	0.028	28	0.027
10-Oct-07	GW Creek	0.025	25	0.017
27-Nov-07	GW Creek	0.017	17	0.013
19-Dec-07	GW Creek	0.020	20	0.011
14-Feb-08	GW Creek	0.023	23	0.017
13-Mar-08	GW Creek	0.023	23	0.017
24-Apr-08	GW Creek	0.024	24	0.016
22-May-08	GW Creek	0.030	30	0.020
05-Jun-08	GW Creek	0.030	30	0.021
17-Jun-08	GW Creek	0.031	31	0.022

Date	Station	TP (mg/l)	TP (ug/L)	SRP (mg/l)
09-Jul-08	GW Creek	0.026	26	0.022
24-Jul-08	GW Creek	0.026	26	0.019
07-Aug-08	GW Creek	0.039	39	0.021
27-Aug-08	GW Creek	0.033	33	0.021
10-Sep-08	GW Creek	0.031	31	0.021
30-Sep-08	GW Creek	0.031	31	0.017
23-Oct-08	GW Creek	0.027	27	0.016
20-Nov-08	GW Creek	0.029	29	0.013
11-Dec-08	GW Creek	0.027	27	0.015
26-Jan-09	GW Creek	0.019	19	0.015
24-Feb-09	GW Creek	0.043	43	0.016
31-Mar-09	GW Creek	0.026	26	0.017
30-Apr-09	GW Creek	0.030	30	0.016
14-May-09	GW Creek	0.029	29	0.019
28-May-09	GW Creek	0.028	28	0.019
18-Jun-09	GW Creek	0.033	33	0.019
02-Jul-09	GW Creek	0.059	59	0.022
16-Jul-09	GW Creek	0.032	32	0.020
29-Jul-09	GW Creek	0.050	50	0.022
13-Aug-09	GW Creek	0.028	28	0.020
03-Sep-09	GW Creek	0.032	32	0.020
29-Sep-09	GW Creek	0.026	26	0.018
20-Oct-09	GW Creek	0.026	26	0.017
24-Nov-09	GW Creek	0.018	18	0.009
07-Jan-10	GW Creek	0.039	39	0.013
18-Feb-10	GW Creek	0.024	24	0.014
31-Mar-10	GW Creek	0.022	22	0.013
28-Apr-10	GW Creek	0.030	30	0.016
20-May-10	GW Creek	0.048	48	0.022
17-Jun-10	GW Creek	0.035	35	0.022
15-Jul-10	GW Creek	0.034	34	0.022
29-Jul-10	GW Creek	0.032	32	0.022
24-Aug-10	GW Creek	0.028	28	0.020
30-Sep-10	GW Creek	0.031	31	0.017
11-Nov-10	GW Creek	0.024	24	0.012

## **Appendix C – Phytoplankton Data**

**Table C-1. Phytoplankton Data for Long Lake Middle Station, 2006.**

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 01/24/2006	SAMPLE STATUS: Lugols preserved by client			
STATION: center-1m	NOTE:			
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<b>Chlorophyta</b>				
<i>Closterium sp.</i>	2.00	916	1,832	
unicell (sph) nannoplktn	2.00	1,436.03	2,872	dense chloroplast
<b>Taxon Subtotal</b>	<b>4.00</b>		<b>4,704</b>	
<b>Chrysophyta</b>				
<i>Dinobryon sp.</i>	2.00	1,046.67	2,093	
<i>Dinobryon bavaricum</i>	6.00	457.92	2,748	
filamentous chrysophyte	32.00	621.72	19,895	
chrysophyte (flagel-unicell)	176.00	179.50	31,593	ovoid cell
chrysophyte (flagel-unicell)	308.00	678.24	208,898	
Bacillariophyceae				
<i>Cyclotella sp.</i>	4.00	200.96	804	small cells<10um diam
<i>Cyclotella sp.</i>	2.00	769.30	1,539	
<i>Fragilaria crotonensis</i>	20.00	720.00	14,400	
<i>Melosira sp.</i>	70.00	2,260.80	158,256	
<i>Navicula sp.</i>	2.00	753.60	1,507	
<i>Synedra sp.</i>	2.00	83.34	167	
<b>Taxon Subtotal</b>	<b>624</b>		<b>441,899</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas ovata+spp.</i>	14.00	2,637.60	36,926	
<i>Cryptomonas sp.</i>	2.00	5,934.60	11,869	
<i>Rhodomonas sp.</i>	88.00	214.31	18,859	
<b>Taxon Subtotal</b>	<b>104.00</b>		<b>67,654</b>	
<b>Euglenophyta</b>				
<b>Pyrrhophyta</b>				
small dinoflagellate	2.00	2,260.80	4,522	
dinoflagellate	2.00	9,231.60	18,463	
<b>Taxon Subtotal</b>	<b>4.00</b>		<b>22,985</b>	
<b>Other</b>				
undeter unicell	4.00	10,597.50	42,390	dense cell contents
<b>Taxon Subtotal</b>	<b>4.00</b>		<b>42,390</b>	
			(µm <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
<b>Total Number/ml</b>	<b>740</b>	<b>Total Volume</b>	<b>579,632</b>	<b>0.580</b>
Percent Chlorophyta	<b>0.54</b>	Percent Chlorophyta	<b>0.81</b>	
Percent Chrysophyta	<b>84.32</b>	Percent Chrysophyta	<b>76.24</b>	
Percent Cryptophyta	<b>14.05</b>	Percent Cryptophyta	<b>11.67</b>	
Percent Pyrrhophyta	<b>0.54</b>	Percent Pyrrhophyta	<b>3.97</b>	
Percent Other	<b>0.54</b>	Percent Other	<b>7.31</b>	
*= colony	+=filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 02/24/2006		SAMPLE STATUS: Lugols preserved by client		
STATION: center-0.5m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	2.00	128	256	
<i>Oocystis</i> sp.	2.00	1,013.17	2,026	unicell
undet green filament	14.00	392.50	5,495	
unicell (sph) nannoplktn	2.00	1,436.03	2,872	dense chloroplast
<b>Taxon Subtotal</b>	<b>20.00</b>		<b>10,650</b>	
<b>Chrysophyta</b>				
<i>Dinobryon</i> sp.	8.00	1,046.67	8,373	
<i>Dinobryon bavaricum</i>	6.00	457.92	2,748	
<i>Mallomonas</i> sp.	2.00	1,959.36	3,919	
filamentous chrysophyte	50.00	621.72	31,086	
chrysophyte (flagel-unicell)	968.00	179.50	173,759	ovoid cell
chrysophyte (flagel-unicell)	352.00	678.24	238,740	
Bacillariophyceae				
<i>Asterionella formosa</i>	256.00	420.00	107,520	
<i>Cyclotella</i> sp.	2.00	2,826.00	5,652	
<i>Cyclotella</i> sp.	80.00	286.13	22,891	small cells<10um diam
<i>Cyclotella</i> sp.	8.00	769.30	6,154	
<i>Fragilaria crotonensis</i>	50.00	576.00	28,800	
<i>Melosira</i> sp.	40.00	1,588.06	63,522	
<i>Nitzschia</i> sp.	2.00	541.65	1,083	
<i>Synedra</i> sp.	4.00	96.16	385	
<i>Synedra</i> sp.	2.00	199.47	399	
<i>Synedra</i> sp.	2.00	402.97	806	
undet pennate diatom	6.00	6,930.00	41,580	
<i>Tabellaria fenestrata</i>	2.00	4,640.00	9,280	
<b>Taxon Subtotal</b>	<b>1840</b>		<b>746,697</b>	
<b>Cryptophyta</b>				
<i>Rhodomonas</i> sp.	10.00	214.31	2,143	
<b>Taxon Subtotal</b>	<b>10.00</b>		<b>2,143</b>	
<b>Euglenophyta</b>				
<b>Pyrrhophyta</b>				
<b>Other</b>				
			(µm <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
<b>Total Number/ml</b>	<b>1870</b>	<b>Total Volume</b>	<b>759,490</b>	<b>0.759</b>
Percent Chlorophyta	1.07	Percent Chlorophyta	1.40	
Percent Chrysophyta	98.40	Percent Chrysophyta	98.32	
Percent Cryptophyta	0.53	Percent Cryptophyta	0.28	
*= colony	+ =filament			



PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 03/23/2006		SAMPLE STATUS: Lugols preserved by client		
STATION: center-0.5m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<b>Chlorophyta</b>				
<i>Eudorina elegans</i>	64.00	1,436.03	91,906	
<i>Eudorina/Eudorina spp. asmblg</i>	352.00	334.93	117,897	colonies collapsed
unicell (sph) nannoplktn	33.00	3,052.08	100,719	flagellate?
<b>Taxon Subtotal</b>	<b>449.00</b>		<b>310,521</b>	
<b>Chrysophyta</b>				
<i>Dinobryon sp.</i>	440.00	1,151.33	506,587	
<i>Dinobryon bavaricum</i>	1,320.00	444.83	587,180	
<i>Dinobryon divergens</i>	2,530.00	636.37	1,610,025	
<i>Mallomonas sp.</i>	33.00	2,299.53	75,884	
<i>Mallomonas sp.</i>	11.00	3,537.73	38,915	
filamentous chrysophyte	70.00	621.72	43,520	
chrysophyte (flagel-unicell)	6,050.00	179.50	1,085,995	ovoid cell
chrysophyte (flagel-unicell)	220.00	791.28	174,082	
Bacillariophyceae				
<i>Asterionella formosa</i>	1,540.00	450.00	693,000	
<i>Cyclotella sp.</i>	33.00	769.30	25,387	
<i>Melosira sp.</i>	30.00	1,306.24	39,187	
<i>Melosira sp.</i>	44.00	547.11	24,073	
<i>Synedra sp.</i>	11.00	3,974.72	43,722	<i>S. acus-like</i>
<i>Synedra sp.</i>	11.00	96.16	1,058	
<b>Taxon Subtotal</b>	<b>12343</b>		<b>4,948,615</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas ovata+spp.</i>	770.00	2,637.60	2,030,952	
<i>Cryptomonas sp.</i>	55.00	5,934.60	326,403	
cryptomonad	66.00	1,102.14	72,741	
<i>Rhodomonas sp.</i>	242.00	202.06	48,898	
<b>Taxon Subtotal</b>	<b>1,133.00</b>		<b>2,478,995</b>	
<b>Euglenophyta</b>				
<i>Trachelomonas sp. (sph)</i>	2.00	2,571.14	5,142	smooth wall
<b>Taxon Subtotal</b>	<b>2</b>		<b>5,142</b>	
<b>Pyrrhophyta</b>				
small dinoflagellate	11.00	4,144.80	45,593	
dinoflagellate	11.00	17,935.68	197,292	
<b>Taxon Subtotal</b>	<b>22.00</b>		<b>242,885</b>	
<b>Other</b>				
undeter unicell	11.00	19,270.18	211,972	dense cell contents
<b>Taxon Subtotal</b>	<b>11.00</b>		<b>211,972</b>	
			(µm <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
<b>Total Number/ml</b>	<b>13960</b>	<b>Total Volume</b>	<b>8,198,130</b>	<b>8.198</b>
Percent Chlorophyta	3.22	Percent Chlorophyta	3.79	
Percent Chrysophyta	88.42	Percent Chrysophyta	60.36	
Percent Cryptophyta	8.12	Percent Cryptophyta	30.24	
Percent Euglenophyta	0.01	Percent Euglenophyta	0.06	
Percent Pyrrhophyta	0.16	Percent Pyrrhophyta	2.96	
Percent Other	0.08	Percent Other	2.59	
*= colony	+=filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 04/21/2006		SAMPLE STATUS: Lugols preserved by client		
STATION: center		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<b>Chlorophyta</b>				
<i>Dictyosphaerium sp.</i>	128.00	136.78	17,508	
colonial (sph) nannoplktn	16.00	381.51	6,104	
unicell (sph) nannoplktn	2.00	1,436.03	2,872	gelatinous envel
<b>Taxon Subtotal</b>	<b>146.00</b>		<b>26,484</b>	
<b>Chrysophyta</b>				
<i>Dinobryon sp.</i>	20.00	1,151.33	23,027	
<i>Dinobryon divergens</i>	400.00	636.37	254,549	
<i>Mallomonas sp.</i>	110.00	2,872.05	315,926	
<i>Ulenella/Uroglenopsis spp. asmb/g</i>	200.00	942.00	188,400	colonies disrupted
filamentous chrysophyte	292.00	621.72	181,542	
chrysophyte (flagel-unicell)	1,320.00	179.50	236,944	ovoid cell
chrysophyte (flagel-unicell)	33.00	791.28	26,112	
Bacillariophyceae				
<i>Asterionella formosa</i>	17,600.00	525.00	9,240,000	
<i>Melosira sp.</i>	55.00	1,306.24	71,843	
<i>Synedra sp.</i>	2.00	2,198.00	4,396	<i>S. acus-like</i>
<b>Taxon Subtotal</b>	<b>20032</b>		<b>10,542,740</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas ovata+spp.</i>	440.00	2,637.60	1,160,544	
<i>Cryptomonas sp. (large)</i>	33.00	12,572.56	414,894	
cryptomonad	11.00	1,224.60	13,471	
<i>Rhodomonas sp.</i>	165.00	202.06	33,340	
<b>Taxon Subtotal</b>	<b>649.00</b>		<b>1,622,249</b>	
<b>Euglenophyta</b>				
<i>Trachelomonas sp.(sph)</i>	11.00	523.33	5,757	tiny cell;smooth wall
<b>Taxon Subtotal</b>	<b>11</b>		<b>5,757</b>	
<b>Pyrrhophyta</b>				
<b>Other</b>				
undeter colony*	11.00	17,898.00	196,878	irreg yel/grn colony
<b>Taxon Subtotal</b>	<b>11.00</b>		<b>196,878</b>	
			(µm <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
<b>Total Number/ml</b>	<b>20849</b>	<b>Total Volume</b>	<b>12,394,107</b>	<b>12.394</b>
Percent Chlorophyta	0.70	Percent Chlorophyta	0.21	
Percent Chrysophyta	96.08	Percent Chrysophyta	85.06	
Percent Cryptophyta	3.11	Percent Cryptophyta	13.09	
Percent Euglenophyta	0.05	Percent Euglenophyta	0.05	
Percent Other	0.05	Percent Other	1.59	
*= colony	+= filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 05/22/2006		SAMPLE STATUS: Lugols preserved by client		
STATION: center-1m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<i>Anacystis</i> spp.	1,100.00	4.19	4,605	
<i>Chroococcus</i> sp.	44.00	227.96	10,030	
<i>Spirillum/Snowella</i> spp. asmbig	1,760.00	22.44	39,491	cells @col edge,fibrils?
<b>Taxon Subtotal</b>	<b>2904</b>		<b>54,126</b>	
<b>Chlorophyta</b>				
<i>Dictyosphaerium</i> sp.	352.00	136.78	48,146	
<i>Oocystis pusilla/parva</i> grp	22.00	105.98	2,331	
<i>Oocystis</i> sp.	44.00	1,013.17	44,580	unicell
<i>Pediastrum duplex</i>	2.00	4,102.93	8,206	
<i>Quadrigula</i> sp.	44.00	251.20	11,053	
<i>Scenedesmus quadricauda</i>	2.00	1,823.71	3,647	4-cell colony
<i>S. paradoxum/pingue</i> asmbig	2.00	5,111.87	10,224	
<i>Tetraedron</i> sp.	11.00	3,109.87	34,209	
<i>Tetraedron</i> sp.	2.00	1,582.56	3,165	
colonial (ell) nannoplktn	44.00	226.08	9,948	
colonial (sph) nannoplktn	44.00	523.33	23,027	
colonial (sph) nannoplktn	88.00	113.04	9,948	cell pairs
colonial (sph) nannoplktn	88.00	33.49	2,947	
unicell (sph) nannoplktn	22.00	267.95	5,895	gelatinous envel
unicell (sph) nannoplktn	22.00	1,436.03	31,593	dense chloroplast
<b>Taxon Subtotal</b>	<b>789.00</b>		<b>248,917</b>	
<b>Chrysophyta</b>				
<i>Gloeobotrys</i> sp.	528.00	113.04	59,685	cells disrupted
<i>Mallomonas</i> sp.	11.00	2,666.91	29,336	
filamentous chrysophyte	735.00	621.72	456,964	
chrysophyte (flagel-unicell)	176.00	179.50	31,593	ovoid cell
chrysophyte (flagel-unicell)	154.00	2,289.06	352,515	
chrysophyte (flagel-unicell)	154.00	791.28	121,857	
<b>Bacillariophyceae</b>				
<i>Asterionella formosa</i>	660.00	495.00	326,700	
<i>Fragilaria crotonensis</i>	330.00	576.00	190,080	
<i>Fragilaria crotonensis</i>	110.00	1,008.00	110,880	
<i>Melosira</i> sp.	412.00	3,165.12	1,304,029	some w/term spine
<i>Navicula</i> sp.	11.00	1,256.00	13,816	
<i>Synedra</i> sp.	11.00	2,826.00	31,086	<i>S. acus-like</i>
<i>Synedra</i> sp.	11.00	89.75	987	
<i>Synedra</i> sp.	11.00	269.26	2,962	
undet pennate diatom	22.00	6,930.00	152,460	
<i>Tabellaria fenestrata</i>	11.00	4,640.00	51,040	
<b>Taxon Subtotal</b>	<b>3347</b>		<b>3,235,991</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas ovata</i>	11.00	5,086.80	55,955	
small cryptomonad	22.00	423.90	9,326	
cryptomonad	100.00	1,224.60	122,460	
<i>Rhodomonas</i> sp.	44.00	202.06	8,891	
<b>Taxon Subtotal</b>	<b>177.00</b>		<b>196,631</b>	
<b>Euglenophyta</b>				
<i>Euglena</i> sp.	2.00	2,260.80	4,522	
<i>Phacus</i> sp.	2.00	3,014.40	6,029	
<i>Trachelomonas</i> sp. (sph)	11.00	2,571.14	28,283	smooth wall
<i>Trachelomonas</i> sp. (sph)	11.00	4,186.67	46,053	
<b>Taxon Subtotal</b>	<b>26</b>		<b>84,886</b>	
<b>Pyrrhophyta</b>				
small dinoflagellate	11.00	2,260.80	24,869	
small dinoflagellate	11.00	4,521.60	49,738	
dinoflagellate	11.00	8,440.32	92,844	
<b>Taxon Subtotal</b>	<b>33.00</b>		<b>167,450</b>	
<b>Other</b>				
undeter unicell	2.00	14,130.00	28,260	dense cell contents
undeter colony*	11.00	18,840.00	207,240	irreg yel-gr colony
<b>Taxon Subtotal</b>	<b>13.00</b>		<b>235,500</b>	
			(µm <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
<b>Total Number/ml</b>	<b>7289</b>	<b>Total Volume</b>	<b>4,223,502</b>	<b>4.224</b>
Percent Cyanophyta	39.84	Percent Cyanophyta	1.28	
Percent Chlorophyta	10.82	Percent Chlorophyta	5.89	
Percent Chrysophyta	45.92	Percent Chrysophyta	76.62	
Percent Cryptophyta	2.43	Percent Cryptophyta	4.66	
Percent Euglenophyta	0.36	Percent Euglenophyta	2.01	
Percent Pyrrhophyta	0.45	Percent Pyrrhophyta	3.96	
Percent Other	0.18	Percent Other	5.58	
*= colony	+= filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 06/12/2006		SAMPLE STATUS: Lugols preserved by client		
STATION: center-0.5m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<i>Anabaena sp.</i>	90.00	150.72	13,565	irreg, crimped coils
<i>Anabaena circinalis/flos-aquae grp</i>	210.00	113.04	23,738	reg, loose coils ; heterocysts
<i>Anabaena sp.</i>	200.00	65.42	13,083	short loose coils ; no gonidia
<i>Anabaena sp.</i>	200.00	256.43	51,287	linear, compres cells
<i>Anabaena spiroides</i>	30.00	696.56	20,897	
<i>Anacystis spp.</i>	1,600.00	4.19	6,699	
<i>Chroococcus sp.</i>	16.00	227.96	3,647	
<i>lospphaerium/Snowella spp. asmblg</i>	10,600.00	22.44	237,842	cells @col edge; fibrils?
<b>Taxon Subtotal</b>	<b>12946</b>		<b>370,758</b>	
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	10.00	103	1,026	
<i>Cosmarium sp.</i>	2.00	3,077.20	6,154	
<i>Pandorina sp.</i>	32.00	886.53	28,369	
* <i>Pediastrum duplex</i>	2.00	2,093.33	4,187	
* <i>Scenedesmus quadricauda</i>	2.00	3,024.87	6,050	4-cell colony
colonial (sph) nannoplktn	16.00	381.51	6,104	
colonial (sph) nannoplktn	176.00	47.69	8,393	
unicell (sph) nannoplktn	2.00	267.95	536	gelatinous sheath
unicell (sph) nannoplktn	4.00	1,436.03	5,744	dense chloroplast
<b>Taxon Subtotal</b>	<b>246.00</b>		<b>66,563</b>	
<b>Chrysophyta</b>				
<i>Dinobryon divergens</i>	560.00	487.22	272,845	
<i>Mallomonas sp.</i>	6.00	4,308.08	25,848	
filamentous chrysophyte	600.00	621.72	373,032	
chrysophyte (flagel-unicell)	550.00	179.50	98,727	ovoid cell
chrysophyte (flagel-unicell)	6.00	4,578.12	27,469	long flagellum
chrysophyte (flagel-unicell)	20.00	1,945.75	38,915	
chrysophyte (flagel-unicell)	33.00	791.28	26,112	
Bacillariophyceae				
<i>Asterionella formosa</i>	16.00	495.00	7,920	
<i>Cyclotella sp.</i>	2.00	769.30	1,539	
<i>Fragilaria crotonensis</i>	220.00	648.00	142,560	
<i>Fragilaria crotonensis</i>	60.00	1,008.00	60,480	
<i>Melosira sp.</i>	150.00	1,153.95	173,093	some w/term spine
<i>Melosira sp.</i>	82.00	2,486.88	203,924	some w/term spine
undet pennate diatom	2.00	615.44	1,231	
<b>Taxon Subtotal</b>	<b>2307</b>		<b>1,453,695</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas ovata+spp.</i>	82.00	2,461.76	201,864	
<i>Cryptomonas sp.</i>	28.00	5,934.60	166,169	
<i>Cryptomonas sp. (large)</i>	2.00	12,572.56	25,145	
small cryptomonad	14.00	423.90	5,935	
cryptomonad	6.00	932.58	5,595	
<i>Rhodomonas sp.</i>	12.00	202.06	2,425	
<b>Taxon Subtotal</b>	<b>144.00</b>		<b>407,133</b>	
<b>Euglenophyta</b>				
<i>Trachelomonas volvocina</i>	6.00	2,571.14	15,427	smooth wall
<b>Taxon Subtotal</b>	<b>6</b>		<b>15,427</b>	
<b>Pyrrhophyta</b>				
<i>Ceratium hirundinella</i>	1.00	60,000.00	60,000	
<b>Taxon Subtotal</b>	<b>1.00</b>		<b>60,000</b>	
<b>Other</b>				
undeter unicell	14.00	1,607.68	22,508	dense cell contents
undeter unicell	2.00	14,130.00	28,260	dense obovate cell
undeter colony*	6.00	18,840.00	113,040	irreg yel-gr colony
<b>Taxon Subtotal</b>	<b>22.00</b>		<b>163,808</b>	
			(µm <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
<b>Total Number/ml</b>	<b>15672</b>	<b>Total Volume</b>	<b>2,537,383</b>	<b>2.537</b>
Percent Cyanophyta	82.61	Percent Cyanophyta	14.61	
Percent Chlorophyta	1.57	Percent Chlorophyta	2.62	
Percent Chrysophyta	14.72	Percent Chrysophyta	57.29	
Percent Cryptophyta	0.92	Percent Cryptophyta	16.05	
Percent Euglenophyta	0.04	Percent Euglenophyta	0.61	
Percent Pyrrhophyta	0.01	Percent Pyrrhophyta	2.36	
Percent Other	0.14	Percent Other	6.46	
*= colony	+= filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 07/05/2006		SAMPLE STATUS: Lugols preserved by client		
STATION: center-0.5m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<i>Anabaena circinalis/flos-aquae grp</i>	180.00	113.04	20,347	reg,loose coils; heterocysts pres
<i>Anabaena sp.</i>	180.00	65.42	11,775	short loose coils;no gonidia
<i>Anabaena sp.</i>	8,400.00	256.43	2,154,040	linear,compres cells;many decaying
<i>Anabaena circinalis/spiroides asmbig</i>	1,650.00	179.50	296,181	reg coils, many decaying
<i>Aphanizomenon flos-aquae</i>	300.00	269.26	80,777	many filaments decaying
<i>Anacystis spp.</i>	880.00	6.28	5,526	
<i>Anacystis spp.</i>	17,600.00	4.19	73,685	
<i>Chroococcus sp.</i>	44.00	227.96	10,030	
<i>Coelosphaerium/Snowella spp. asmbig</i>	13,200.00	22.44	296,181	cells @col edge;fibrils?
<b>Taxon Subtotal</b>	<b>42434</b>		<b>2,948,542</b>	
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	22.00	103	2,257	
<i>Ankistrodesmus falcatus</i>	2.00	251	502	
* <i>Botryococcus sp.</i>	2.00	9,420.00	18,840	
<i>Cosmarium sp.</i>	2.00	6,154.40	12,309	coarse,punctate wall
<i>Dictyosphaerium sp.</i>	64.00	136.78	8,754	
<i>Nephrocytium sp.</i>	8.00	669.87	5,359	col tightly packed w/cells
<i>Oocystis sp.</i>	16.00	1,139.82	18,237	unicell
* <i>Pandorina sp.</i>	2.00	6,028.80	12,058	small-cell colonies
* <i>Scenedesmus quadricauda</i>	2.00	256.43	513	4-cell colony
* <i>Scenedesmus quadricauda</i>	4.00	3,024.87	12,099	4-cell colony
<i>Tetraedron sp.</i>	2.00	3,109.87	6,220	
colonial (ell) nannoplktn	22.00	133.97	2,947	flagellate pairs
colonial (ell) nannoplktn	16.00	189.97	3,040	
colonial (sph) nannoplktn	88.00	423.90	37,303	
colonial (sph) nannoplktn	352.00	113.04	39,790	
unicell (sph) nannoplktn	11.00	523.33	5,757	mucous sheath
unicell (sph) nannoplktn	11.00	2,143.57	23,579	mucous sheath
<b>Taxon Subtotal</b>	<b>626.00</b>		<b>209,564</b>	
<b>Chrysophyta</b>				
<i>Dinobryon cylindricum</i>	4.00	1,151.33	4,605	
<i>Dinobryon divergens</i>	40.00	487.22	19,489	
<i>Mallomonas sp.</i>	11.00	1,646.41	18,110	
filamentous chrysophyte	484.00	621.72	300,912	
chrysophyte (flagel-unicell)	330.00	179.50	59,236	ovoid cell
chrysophyte (flagel-unicell)	66.00	791.28	52,224	
Bacillariophyceae				
<i>Asterionella formosa</i>	16.00	495.00	7,920	
<i>Epithemia sp.</i>	2.00	5,861	11,723	
<i>Fragilaria sp.</i>	154.00	630.00	97,020	
<i>Fragilaria crotonensis</i>	6,050.00	648.00	3,920,400	
<i>Melosira sp.</i>	2,060.00	1,406.72	2,897,843	some w/term spine
<i>Synedra sp.</i>	11.00	320.54	3,526	
<b>Taxon Subtotal</b>	<b>9228</b>		<b>7,393,010</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas ovata+spp.</i>	11.00	2,461.76	27,079	
small cryptomonad	11.00	423.90	4,663	
cryptomonad	11.00	932.58	10,258	
<i>Rhodomonas sp.</i>	11.00	202.06	2,223	
<b>Taxon Subtotal</b>	<b>44.00</b>		<b>44,223</b>	
<b>Euglenophyta</b>				
<i>Euglena sp.</i>	2.00	2,486.88	4,974	
<i>Trachelomonas volvocina</i>	2.00	2,571.14	5,142	smooth wall
<i>Trachelomonas sp.(sph)</i>	2.00	7,234.56	14,469	
<b>Taxon Subtotal</b>	<b>6</b>		<b>24,585</b>	
<b>Pyrrhophyta</b>				
<b>Other</b>				
undeter unicell	11.00	2,289.06	25,180	dense cell contents
undeter unicell	11.00	14,130.00	155,430	dense obovate cell
undeter colony*	11.00	18,840.00	207,240	irreg yel-gr colony
<b>Taxon Subtotal</b>	<b>33.00</b>		<b>387,850</b>	
			(µm <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
<b>Total Number/ml</b>	<b>52371</b>	<b>Total Volume</b>	<b>11,007,773</b>	<b>11.008</b>
Percent Cyanophyta	<b>81.03</b>	Percent Cyanophyta	<b>26.79</b>	
Percent Chlorophyta	<b>1.20</b>	Percent Chlorophyta	<b>1.90</b>	
Percent Chrysophyta	<b>17.62</b>	Percent Chrysophyta	<b>67.16</b>	
Percent Cryptophyta	<b>0.08</b>	Percent Cryptophyta	<b>0.40</b>	
Percent Euglenophyta	<b>0.01</b>	Percent Euglenophyta	<b>0.22</b>	
Percent Other	<b>0.06</b>	Percent Other	<b>3.52</b>	
*= colony	+=filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 07/27/2006		SAMPLE STATUS: Lugols preserved by client		
STATION: center-0.5m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<i>Anabaena circinalis/flos-aquae</i> grp	1,210.00	267.95	324,215	reg,loose coils ; most decaying
<i>Anabaena</i> sp.	10,310.00	256.43	2,643,828	linear,compres cells;most decaying
<i>Anabaena spiroides</i>	1,800.00	381.51	686,718	reg coils, most decaying
<i>Aphanizomenon flos-aquae</i>	330.00	269.26	88,854	many filaments decaying
<i>Aphanocapsa</i> sp.	200.00	65.42	13,083	cells w/pseudovacuoles
<i>Anacystis</i> spp.	2,800.00	4.19	11,723	
<i>Chroococcus</i> sp.	128.00	227.96	29,179	
<i>Chroococcus</i> sp.	8.00	334.93	2,679	
<i>Selosphaerium/Snowella</i> spp. asmblg	6,600.00	22.44	148,090	cells @col edge;fibrils ?
<i>Woronichinia (Coelosiph Naegel)</i>	1,600.00	25.64	41,029	
<b>Taxon Subtotal</b>	<b>24986</b>		<b>3,989,400</b>	
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	20.00	103	2,051	
<i>Asterococcus limneticus</i>	8.00	1,436.03	11,488	
<i>Dictyosphaerium</i> sp.	288.00	136.78	39,392	
<i>Kirchneriella</i> sp.	32.00	167	5,359	
<i>Oocystis</i> sp.	4.00	2,051.47	8,206	
<i>Oocystis</i> sp.	32.00	1,013.17	32,422	
* <i>Pandorina/Eudorina</i> spp. asmblg	2.00	8,205.87	16,412	small-cell colonies
* <i>Pediastrum duplex</i>	2.00	9,231.60	18,463	
<i>Quadrigula</i> sp.	8.00	251.20	2,010	
* <i>Scenedesmus quadricauda</i>	4.00	837.33	3,349	4-cell colony
<i>Schroederia (Ankyra)</i> sp.	10.00	167.47	1,675	
<i>Pediastrum paradoxum/pingue</i> asmblg	6.00	6,652.56	39,915	
<i>Tetraedron</i> sp.	2.00	11,475.00	22,950	large cell
<i>Tetraedron limneticum</i>	2.00	9,848.04	19,696	
colonial (sph) nannoplktn	32.00	150.46	4,815	
colonial (sph) nannoplktn	656.00	65.42	42,913	
unicell (sph) nannoplktn	6.00	2,143.57	12,861	muc sheath;unicell/pairs
unicell (sph) nannoplktn	2.00	1,436.03	2,872	dense cell
<b>Taxon Subtotal</b>	<b>1,116.00</b>		<b>286,850</b>	
<b>Chrysophyta</b>				
<i>Mallomonas</i> sp.	2.00	6,443.28	12,887	
<i>Mallomonas</i> sp.	54.00	2,653.30	143,278	
filamentous chrysophyte	850.00	621.72	528,462	
chrysophyte (flagel-unicell)	440.00	179.50	78,981	ovoid cell
chrysophyte (flagel-unicell)	330.00	791.28	261,122	
<b>Bacillariophyceae</b>				
<i>Asterionella formosa</i>	240.00	495.00	118,800	
<i>Fragilaria</i> sp.	28.00	490.00	13,720	
<i>Fragilaria crotonensis</i>	9,900.00	648.00	6,415,200	
<i>Melosira</i> sp.	1,375.00	1,406.72	1,934,240	some w/term spine
<i>Synedra</i> sp.	1.00	2,747.50	2,748	<i>S. acus-like</i>
<i>Synedra</i> sp.	6.00	199.47	1,197	
<b>Taxon Subtotal</b>	<b>13226</b>		<b>9,510,635</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas ovata+spp.</i>	24.00	2,461.76	59,082	
cryptomonad	10.00	932.58	9,326	
<i>Rhodomonas</i> sp.	165.00	176.63	29,143	
<b>Taxon Subtotal</b>	<b>199.00</b>		<b>97,551</b>	
<b>Euglenophyta</b>				
<i>Trachelomonas volvocina</i>	6.00	2,571.14	15,427	smooth wall
<i>Trachelomonas</i> sp.(sph)	6.00	5,572.45	33,435	
<b>Taxon Subtotal</b>	<b>12</b>		<b>48,862</b>	
<b>Pyrrhophyta</b>				
<i>Ceratium hirundinella</i>	1.00	60,000.00	60,000	
<b>Taxon Subtotal</b>	<b>1.00</b>		<b>60,000</b>	
<b>Other</b>				
undeter unicell	10.00	2,289.06	22,891	dense cell contents
undeter unicell	2.00	11,304.00	22,608	dense ovate cell
<b>Taxon Subtotal</b>	<b>12.00</b>		<b>45,499</b>	
<b>Total Number/ml</b>	<b>39552</b>	<b>Total Volume</b>	<b>14,038,796</b>	<b>14.039</b>
			(µm <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
Percent Cyanophyta	63.17	Percent Cyanophyta	28.42	
Percent Chlorophyta	2.82	Percent Chlorophyta	2.04	
Percent Chrysophyta	33.44	Percent Chrysophyta	67.75	
Percent Cryptophyta	0.50	Percent Cryptophyta	0.69	
Percent Euglenophyta	0.03	Percent Euglenophyta	0.35	
Percent Pyrrhophyta	0.00	Percent Pyrrhophyta	0.43	
Percent Other	0.03	Percent Other	0.32	
*= colony	+=filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 08/14/2006		SAMPLE STATUS: Lugols preserved by client		
STATION: center-0.5m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<i>Anabaena circinalis/flos-aquae grp</i>	440.00	267.95	117,897	reg,loose coils
<i>Anabaena sp.</i>	16,500.00	423.90	6,994,350	linear,compres cells;most decaying
<i>Anabaena spiroides</i>	1,650.00	381.51	629,492	reg coils
<i>Aphanizomenon flos-aquae</i>	200.00	269.26	53,851	heterocysts pres
<i>Aphanocapsa sp.</i>	500.00	65.42	32,708	cells w/pseudovacuoles
<i>Anacystis spp.</i>	2,200.00	4.19	9,211	
<i>Chroococcus sp.</i>	352.00	227.96	80,243	
<i>Leiosphaerium/Snowella spp. asmbig</i>	13,200.00	22.44	296,181	cells @col edge:fibrils?
+ <i>Oscillatoria sp.</i>	11.00	879.20	9,671	
<i>Stis aeruginosa/weisenbergii asmbig</i>	300.00	150.46	45,137	robust cells;clathrate col;thick muc
<b>Taxon Subtotal</b>	<b>35353</b>		<b>8,268,740</b>	
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	11.00	103	1,128	
<i>Ankistrodesmus falcatus</i>	11.00	352	3,868	
* <i>Botryococcus sp.</i>	4.00	9,420.00	37,680	
<i>Dictyosphaerium sp.</i>	704.00	136.78	96,292	
<i>Kirchneriella sp.</i>	44.00	167	7,369	
<i>Oocystis sp.</i>	44.00	2,051.47	90,265	
* <i>Pediastrum duplex</i>	1.00	9,231.60	9,232	
<i>Quadrigula sp.</i>	44.00	326.56	14,369	
* <i>Scenedesmus bijuga</i>	11.00	256.43	2,821	4-cell colony
* <i>Scenedesmus quadricauda</i>	11.00	2,051.47	22,566	4-cell colony
<i>Schroederia (Ankya) sp.</i>	22.00	234.45	5,158	
<i>Tetrastrum paradoxum/pingue asmbig</i>	2.00	6,652.56	13,305	
<i>Tetraedron sp.</i>	11.00	3,109.87	34,209	
<i>Tetraedron limneticum</i>	4.00	9,848.04	39,392	
colonial (ell) nannoplktn	5,984.00	94.99	568,390	
colonial (ell) nannoplktn	44.00	158.31	6,966	
colonial (sph) nannoplktn	88.00	381.51	33,573	
unicell (sph) nannoplktn	33.00	267.95	8,842	mucous sheath
unicell (sph) nannoplktn	33.00	2,143.57	70,738	dense cell
<b>Taxon Subtotal</b>	<b>7,106.00</b>		<b>1,066,162</b>	
<b>Chrysophyta</b>				
filamentous chrysophyte	1,260.00	621.72	783,367	
chrysophyte (flagel-unicell)	220.00	267.95	58,948	ovoid cell
chrysophyte (flagel-unicell)	110.00	791.28	87,041	
<b>Bacillariophyceae</b>				
<i>Asterionella formosa</i>	44.00	495.00	21,780	
<i>Cyclotella sp.</i>	11.00	769.30	8,462	
<i>Epithemia sp.</i>	11.00	2,198	24,178	
<i>Fragilaria crotonensis</i>	880.00	604.80	532,224	
<i>Melosira sp.</i>	1,760.00	1,406.72	2,475,827	some w/term spine
<i>Nitzschia sp.</i>	2.00	2,884.88	5,770	
<i>Synedra sp.</i>	11.00	199.47	2,194	
<i>Synedra sp.</i>	11.00	366.33	4,030	
<b>Taxon Subtotal</b>	<b>4320</b>		<b>4,003,821</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas ovata+spp.</i>	132.00	2,285.92	301,741	
cryptomonad	242.00	733.98	177,622	
<i>Rhodomonas sp.</i>	616.00	169.56	104,449	
<b>Taxon Subtotal</b>	<b>990.00</b>		<b>583,812</b>	
<b>Euglenophyta</b>				
<i>Trachelomonas sp.(ell)</i>	1.00	9,905.65	9,906	
<i>Trachelomonas volvocina</i>	33.00	2,571.14	84,848	smooth wall
<i>Trachelomonas sp.(sph)</i>	11.00	7,234.56	79,580	
<b>Taxon Subtotal</b>	<b>45</b>		<b>174,333</b>	
<b>Pyrrhophyta</b>				
dinoflagellate	11.00	8,440.32	92,844	
<b>Taxon Subtotal</b>	<b>11.00</b>		<b>92,844</b>	
<b>Other</b>				
undeter colony*	33.00	15,260.40	503,593	sph interconnected col
<b>Taxon Subtotal</b>	<b>33.00</b>		<b>503,593</b>	
			(µm <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
<b>Total Number/ml</b>	<b>47858</b>	<b>Total Volume</b>	<b>14,693,305</b>	<b>14.693</b>
Percent Cyanophyta	73.87	Percent Cyanophyta	56.28	
Percent Chlorophyta	14.85	Percent Chlorophyta	7.26	
Percent Chrysophyta	9.03	Percent Chrysophyta	27.25	
Percent Cryptophyta	2.07	Percent Cryptophyta	3.97	
Percent Euglenophyta	0.09	Percent Euglenophyta	1.19	
Percent Pyrrhophyta	0.02	Percent Pyrrhophyta	0.63	
Percent Other	0.07	Percent Other	3.43	
*= colony	+=filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 09/6/2006		SAMPLE STATUS: Lugols preserved by client		
STATION: center-0.5m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<i>abaena circinalis/spiroides asmbig</i>	360.00	523.33	188,400	reg,loose coils
<i>Anabaena sp.</i>	21,100.00	423.90	8,944,290	linear.compres cells;most decaying
<i>Anabaena spiroides</i>	70.00	381.51	26,706	reg coils
<i>Aphanizomenon flos-aquae</i>	140.00	269.26	37,696	heterocysts pres
<i>Anacystis spp.</i>	1,400.00	4.19	5,861	
<i>Chroococcus sp.</i>	44.00	227.96	10,030	
<i>losphaerium/Snowella spp. asmbig</i>	48,400.00	22.44	1,085,995	cells @col edge;fibrils?
<i>Woronichinia (Coelosph Naegel)</i>	1,500.00	25.64	38,465	
<i>Gomphosphaeria sp.</i>	704.00	25.64	18,053	
+ <i>Oscillatoria sp.</i>	11.00	343.44	3,778	threadlike filaments
<i>is aeruginosa/weisenbergii asmbig</i>	1,000.00	150.46	150,456	robust cells;clathrate col;thick muc
<b>Taxon Subtotal</b>	<b>74729</b>		<b>10,509,730</b>	
<b>Chlorophyta</b>				
* <i>Botryococcus sp.</i>	33.00	2,930.67	96,712	
* <i>Crucigenia quadrata</i>	11.00	803.84	8,842	4-cell colony
<i>Dictyosphaerium sp.</i>	704.00	136.78	96,292	
<i>Kirchneriella sp.</i>	32.00	131	4,187	
<i>Nephrocytium sp.</i>	88.00	226.08	19,895	
<i>Oocystis pusilla/parva grp</i>	22.00	116.57	2,565	
* <i>Scenedesmus bijuga</i>	11.00	401.92	4,421	4-cell colony
<i>nedesmus arcuatus/bijuga asmbig</i>	11.00	334.93	3,684	8-cell colony
<i>rastrum paradoxum/pingue asmbig</i>	2.00	7,436.64	14,873	
<i>Tetraedron minimum</i>	2.00	720.00	1,440	
<i>Tetraedron limneticum</i>	2.00	9,848.04	19,696	
undet green filament	8.00	883.13	7,065	cell collapsed
colonial (ell) nannoplktn	704.00	94.99	66,869	
colonial (ell) nannoplktn	88.00	158.31	13,931	
colonial (sph) nannoplktn	88.00	381.51	33,573	
colonial (sph) nannoplktn	44.00	179.50	7,898	
colonial (sph) nannoplktn	352.00	65.42	23,027	
unicell (sph) nannoplktn	55.00	381.51	20,983	mucous sheath
unicell (sph) nannoplktn	11.00	3,052.08	33,573	dense cell
unicell (sph) nannoplktn	55.00	2,143.57	117,897	dense cell
<b>Taxon Subtotal</b>	<b>2,323.00</b>		<b>597,423</b>	
<b>Chrysophyta</b>				
<i>Dinobryon sp.</i>	60.00	502.40	30,144	
<i>Dinobryon bavaricum</i>	24.00	444.83	10,676	
<i>Mallomonas sp.</i>	11.00	3,391.20	37,303	
filamentous chrysophyte	700.00	621.72	435,204	
chrysophyte (flagel-unicell)	132.00	267.95	35,369	ovoid cell
chrysophyte (flagel-unicell)	110.00	791.28	87,041	
Bacillariophyceae				
<i>Asterionella formosa</i>	220.00	495.00	108,900	
<i>Fragilaria crotonensis</i>	1,100.00	604.80	665,280	
<i>Melosira sp.</i>	2,338.00	1,406.72	3,288,911	some w/term spine
<i>Synedra sp.</i>	2.00	2,747.50	5,495	<i>S. acus-like</i>
<i>Synedra sp.</i>	143.00	199.47	28,524	
undet pennate diatom	11.00	11,200.00	123,200	
<b>Taxon Subtotal</b>	<b>4851</b>		<b>4,856,047</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas ovata+spp.</i>	308.00	2,285.92	704,063	
cryptomonad	44.00	733.98	32,295	
<i>Rhodomonas sp.</i>	88.00	169.56	14,921	
<b>Taxon Subtotal</b>	<b>440.00</b>		<b>751,280</b>	
<b>Euglenophyta</b>				
<i>Euglena sp.</i>	11.00	5,934.60	65,281	
<i>Trachelomonas sp.(ell)</i>	11.00	5,024.00	55,264	
<i>Trachelomonas sp.(ell)</i>	1.00	12,308.80	12,309	
<i>Trachelomonas volvocina</i>	22.00	2,571.14	56,565	smooth wall
<b>Taxon Subtotal</b>	<b>45</b>		<b>189,418</b>	
<b>Pyrrhophyta</b>				
<i>Ceratium hirundinella</i>	5.00	60,000.00	300,000	
dinoflagellate	2.00	8,440.32	16,881	
<b>Taxon Subtotal</b>	<b>7.00</b>		<b>316,881</b>	
<b>Other</b>				
undet unicell	1.00	30,144.00	30,144	dense sph cell
undet colony*	16.00	15,260.40	244,166	sph interconnected col
<b>Taxon Subtotal</b>	<b>17.00</b>		<b>274,310</b>	
			(µm <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
<b>Total Number/ml</b>	<b>82412</b>	<b>Total Volume</b>	<b>17,495,090</b>	<b>17.495</b>
Percent Cyanophyta	90.68	Percent Cyanophyta	60.07	
Percent Chlorophyta	2.82	Percent Chlorophyta	3.41	
Percent Chrysophyta	5.89	Percent Chrysophyta	27.76	
Percent Cryptophyta	0.53	Percent Cryptophyta	4.29	
Percent Euglenophyta	0.05	Percent Euglenophyta	1.08	
Percent Pyrrhophyta	0.01	Percent Pyrrhophyta	1.81	
Percent Other	0.02	Percent Other	1.57	
*= colony	+=filament			



PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 09/28/2006		SAMPLE STATUS: Lugols preserved by client		
STATION: center-0.5m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<i>Anabaena sp.</i>	1,020.00	334.93	341,632	linear,compres cells;most decaying
<i>Aphanizomenon flos-aquae</i>	130.00	269.26	35,003	heterocysts pres
<i>Anacystis spp.</i>	1,400.00	4.19	5,861	
<i>Chroococcus sp.</i>	112.00	334.93	37,513	
<i>Coelosphaerium/Snowella spp. asmblg</i>	115,500.00	22.44	2,591,579	cells @col edge;fibrils?
<i>Woronichinia (Coelosph Naegel)</i>	600.00	25.64	15,386	
<i>Gomphosphaeria sp.</i>	11,000.00	25.64	282,077	
<i>Microcystis aeruginosa/weisenbergii asmblg</i>	850.00	150.46	127,888	robust cells;clathrate col;thick muc
<b>Taxon Subtotal</b>	<b>130612</b>		<b>3,436,939</b>	
<b>Chlorophyta</b>				
* <i>Botryococcus sp.</i>	4.00	2,930.67	11,723	
<i>Dictyosphaerium sp.</i>	864.00	136.78	118,177	
<i>Oocystis pusilla/parva grp</i>	8.00	116.57	933	
* <i>Pandorina/Eudorina spp. asmblg</i>	2.00	8,205.87	16,412	small-cell colonies
* <i>Pediastrum duplex</i>	1.00	13,083.33	13,083	
* <i>Scenedesmus arcuatus/bijuga asmblg</i>	2.00	179.50	359	8-cell colony
<i>Tetraedron sp.</i>	2.00	1,311.98	2,624	
colonial (ell) nannoplktn	8.00	628.00	5,024	
colonial (ell) nannoplktn	384.00	94.99	36,474	
colonial (ell) nannoplktn	656.00	58.61	38,450	
colonial (sph) nannoplktn	16.00	381.51	6,104	
colonial (sph) nannoplktn	24.00	179.50	4,308	
unicell (sph) nannoplktn	8.00	1,436.03	11,488	mucous sheath
unicell (sph) nannoplktn	10.00	381.51	3,815	dense cell
<b>Taxon Subtotal</b>	<b>1,989.00</b>		<b>268,974</b>	
<b>Chrysophyta</b>				
<i>Dinobryon sp.</i>	40.00	785.00	31,400	
<i>Mallomonas sp.</i>	2.00	2,110.08	4,220	
<i>Rhizochrysis sp.</i>	2.00	9,420.00	18,840	
filamentous chrysophyte	166.00	621.72	103,206	
chrysophyte (flagel-unicell)	66.00	267.95	17,684	ovoid cell
chrysophyte (flagel-unicell)	44.00	791.28	34,816	
Bacillariophyceae				
<i>Asterionella formosa</i>	144.00	495.00	71,280	
<i>Cyclotella sp.</i>	2.00	2,198.00	4,396	
<i>Cyclotella sp.</i>	4.00	769.30	3,077	
<i>Fragilaria crotonensis</i>	140.00	604.80	84,672	
<i>Melosira sp.</i>	475.00	1,406.72	668,192	some w/term spine
<i>Melosira sp.</i>	12.00	410.34	4,924	
<i>Synedra sp.</i>	4.00	199.47	798	
<b>Taxon Subtotal</b>	<b>1101</b>		<b>1,047,506</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas ovata+spp.</i>	22.00	2,285.92	50,290	
cryptomonad	12.00	733.98	8,808	
<i>Rhodomonas sp.</i>	110.00	169.56	18,652	
<b>Taxon Subtotal</b>	<b>144.00</b>		<b>77,750</b>	
<b>Euglenophyta</b>				
<b>Pyrrhophyta</b>				
<i>Ceratium hirundinella</i>	1.00	60,000.00	60,000	
<b>Taxon Subtotal</b>	<b>1.00</b>		<b>60,000</b>	
<b>Other</b>				
undeter colony*	64.00	15,260.40	976,666	sph interconnected col
<b>Taxon Subtotal</b>	<b>64.00</b>		<b>976,666</b>	
<b>Total Number/ml</b>	<b>133911</b>	<b>Total Volume</b>	<b>5,867,834</b>	<b>5.868</b>
			(µm <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
Percent Cyanophyta	97.54	Percent Cyanophyta	58.57	
Percent Chlorophyta	1.49	Percent Chlorophyta	4.58	
Percent Chrysophyta	0.82	Percent Chrysophyta	17.85	
Percent Cryptophyta	0.11	Percent Cryptophyta	1.33	
Percent Pyrrhophyta	0.00	Percent Pyrrhophyta	1.02	
Percent Other	0.05	Percent Other	16.64	
*= colony	+ = filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 10/18/2006		SAMPLE STATUS: Lugols preserved by client		
STATION: center-0.5m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<i>Anacystis</i> spp.	200.00	4.19	837	
chroococcaceae	1,440.00	25.64	36,926	cells embed in thick mucous
filamentous cyanophyte+	2.00	879.20	1,758	thin sheath?
<b>Taxon Subtotal</b>	<b>1642</b>		<b>39,522</b>	
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	40.00	192	7,693	
* <i>Botryococcus</i> sp.	2.00	8,205.87	16,412	
<i>Dictyosphaerium</i> sp.	64.00	136.78	8,754	
<i>Oocystis</i> sp.	4.00	2,051.47	8,206	
<i>Oocystis</i> sp.	22.00	244.92	5,388	
* <i>Pediastrum</i> sp.	1.00	2,532.93	2,533	
<i>Quadrigula</i> sp.	4.00	251.20	1,005	
colonial (ell) nannoplktn	8.00	74.18	593	
colonial (sph) nannoplktn	32.00	179.50	5,744	
unicell (sph) nannoplktn	16.00	381.51	6,104	mucous sheath
unicell (sph) nannoplktn	8.00	1,436.03	11,488	dense cell
<b>Taxon Subtotal</b>	<b>201.00</b>		<b>73,920</b>	
<b>Chrysophyta</b>				
<i>Dinobryon bavaricum</i>	40.00	392.50	15,700	
<i>Dinobryon divergens</i>	10.00	487.22	4,872	
filamentous chrysophyte	40.00	621.72	24,869	
chrysophyte (flagel-unicell)	726.00	267.95	194,529	
chrysophyte (flagel-unicell)	50.00	791.28	39,564	
Bacillariophyceae				
<i>Asterionella formosa</i>	32.00	495.00	15,840	
<i>Cyclotella</i> sp.	2.00	769.30	1,539	
<i>Fragilaria crotonensis</i>	120.00	604.80	72,576	
<i>Melosira</i> sp.	195.00	1,000.09	195,018	some w/term spine
<i>Melosira</i> sp.	12.00	341.95	4,103	
<i>Synedra</i> sp.	1.00	3,077.20	3,077	
<i>Synedra</i> sp.	4.00	199.47	798	
<i>Synedra</i> sp.	4.00	476.23	1,905	
undet pennate diatom	2.00	837.33	1,675	naviculoid shape
<b>Taxon Subtotal</b>	<b>1238</b>		<b>576,064</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas ovata</i> +spp.	84.00	2,285.92	192,017	
<i>Cryptomonas</i> sp.	2.00	8,704.08	17,408	
small cryptomonad	110.00	423.90	46,629	
<i>Rhodomonas</i> sp.	165.00	169.56	27,977	
<b>Taxon Subtotal</b>	<b>361.00</b>		<b>284,032</b>	
<b>Euglenophyta</b>				
<i>Euglena</i> sp.	1.00	55,389.60	55,390	
<i>Trachelomonas</i> sp.(ell)	2.00	6,280.00	12,560	
<i>Trachelomonas volvocina</i>	2.00	2,571.14	5,142	smooth wall
<i>Trachelomonas</i> sp.(sph)	4.00	523.33	2,093	tiny cell;smooth wall
<b>Taxon Subtotal</b>	<b>9</b>		<b>75,185</b>	
<b>Pyrrhophyta</b>				
<b>Other</b>				
undeter unicell	10.00	5,425.92	54,259	dense cell contents
<b>Taxon Subtotal</b>	<b>10.00</b>		<b>54,259</b>	
			(µm <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
<b>Total Number/ml</b>	<b>3461</b>	<b>Total Volume</b>	<b>1,102,983</b>	<b>1.103</b>
Percent Cyanophyta	47.44	Percent Cyanophyta	3.58	
Percent Chlorophyta	5.81	Percent Chlorophyta	6.70	
Percent Chrysophyta	35.77	Percent Chrysophyta	52.23	
Percent Cryptophyta	10.43	Percent Cryptophyta	25.75	
Percent Euglenophyta	0.26	Percent Euglenophyta	6.82	
Percent Other	0.29	Percent Other	4.92	
*= colony	+ =filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 11/21/2006		SAMPLE STATUS: Lugols preserved by client		
STATION: center-0.5m		NOTE:		
Taxon	Cells/ml	$\mu\text{m}^3/\text{cell}$	$\mu\text{m}^3/\text{ml}$	comments
<b>Cyanophyta</b>				
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	4.00	160	641	
<i>Ankistrodesmus falcatus</i>	8.00	256	2,051	
<i>Oocystis sp.</i>	2.00	1,205.76	2,412	
<i>Quadrigula sp.</i>	4.00	251.20	1,005	
* <i>Scenedesmus quadricauda</i>	2.00	401.92	804	4-cell colony
colonial (sph) nannoplktn	16.00	113.04	1,809	
unicell (sph) nannoplktn	12.00	523.33	6,280	mucous sheath
<b>Taxon Subtotal</b>	<b>48.00</b>		<b>15,001</b>	
<b>Chrysophyta</b>				
<i>Dinobryon sp.</i>	2.00	1,046.67	2,093	
filamentous chrysophyte	96.00	621.72	59,685	
chrysophyte (flagel-unicell)	374.00	267.95	100,212	
chrysophyte (flagel-unicell)	44.00	791.28	34,816	
Bacillariophyceae				
<i>Asterionella formosa</i>	48.00	495.00	23,760	
<i>Cyclotella sp.</i>	2.00	1,004.80	2,010	
<i>Fragilaria crotonensis</i>	100.00	604.80	60,480	
<i>Melosira sp.</i>	130.00	1,077.02	140,013	some w/term spine
<i>Melosira sp.</i>	20.00	686.88	13,738	some w/term spine
<i>Melosira sp.</i>	4.00	341.95	1,368	
<i>Melosira sp.</i>	12.00	2,712.96	32,556	
undet pennate diatom	2.00	1,406.72	2,813	
<b>Taxon Subtotal</b>	<b>834</b>		<b>473,543</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas ovata+spp.</i>	60.00	2,285.92	137,155	
<i>Cryptomonas sp.</i>	2.00	8,704.08	17,408	
cryptomonad	16.00	733.98	11,744	
<i>Rhodomonas sp.</i>	154.00	169.56	26,112	
<b>Taxon Subtotal</b>	<b>232.00</b>		<b>192,419</b>	
<b>Euglenophyta</b>				
<b>Pyrrhophyta</b>				
dinoflagellate	2.00	8,440.32	16,881	
<b>Taxon Subtotal</b>	<b>2.00</b>		<b>16,881</b>	
<b>Other</b>				
			( $\mu\text{m}^3/\text{ml}$ )	( $\text{mm}^3/\text{L}$ )
<b>Total Number/ml</b>	<b>1116</b>	<b>Total Volume</b>	<b>697,844</b>	<b>0.698</b>
Percent Chlorophyta	4.30	Percent Chlorophyta	2.15	
Percent Chrysophyta	74.73	Percent Chrysophyta	67.86	
Percent Cryptophyta	20.79	Percent Cryptophyta	27.57	
Percent Pyrrhophyta	0.18	Percent Pyrrhophyta	2.42	
*= colony	+=filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 12/19/2006		SAMPLE STATUS: Lugols preserved by client		
STATION: center-0.5m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
+ <i>Oscillatoria sp.</i>	4.00	686.88	2,748	threadlike filaments
<b>Taxon Subtotal</b>	<b>4</b>		<b>2,748</b>	
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	6.00	160	962	
<i>Ankistrodesmus falcatus</i>	8.00	256	2,051	
<i>Oocystis sp.</i>	2.00	732.67	1,465	
<i>Quadrigula sp.</i>	2.00	251.20	502	
* <i>Scenedesmus quadricauda</i>	2.00	468.91	938	4-cell colony
<i>Schroederia (Ankyra) sp.</i>	2.00	151.98	304	very small cell
colonial (ell) nannoplktn	16.00	83.73	1,340	
unicell (sph) nannoplktn	3.00	904.32	2,713	mucous sheath
<b>Taxon Subtotal</b>	<b>41.00</b>		<b>10,275</b>	
<b>Chrysophyta</b>				
<i>Dinobryon sp.</i>	2.00	1,046.67	2,093	
<i>Dinobryon divergens</i>	1.00	487.22	487	
<i>Mallomonas sp.</i>	1.00	6,443.28	6,443	
filamentous chrysophyte	120.00	621.72	74,606	
chrysophyte (flagel-unicell)	77.00	267.95	20,632	
chrysophyte (flagel-unicell)	24.00	791.28	18,991	
Bacillariophyceae				
<i>Asterionella formosa</i>	12.00	495.00	5,940	
<i>Cyclotella sp.</i>	2.00	1,004.80	2,010	
<i>Fragilaria crotonensis</i>	70.00	604.80	42,336	
<i>Melosira sp.</i>	42.00	588.75	24,728	some w/term spine
<i>Melosira sp.</i>	15.00	2,939.04	44,086	
<i>Synedra sp.</i>	1.00	239.36	239	
<b>Taxon Subtotal</b>	<b>367</b>		<b>242,591</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas ovata+spp.</i>	2.00	2,285.92	4,572	
<i>Rhodomonas sp.</i>	10.00	169.56	1,696	
<b>Taxon Subtotal</b>	<b>12.00</b>		<b>6,267</b>	
<b>Euglenophyta</b>				
<b>Pyrrhophyta</b>				
<b>Other</b>				
			(µm <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
<b>Total Number/ml</b>	<b>424</b>	<b>Total Volume</b>	<b>261,881</b>	<b>0.262</b>
Percent Cyanophyta	<b>0.94</b>	Percent Cyanophyta	<b>1.05</b>	
Percent Chlorophyta	<b>9.67</b>	Percent Chlorophyta	<b>3.92</b>	
Percent Chrysophyta	<b>86.56</b>	Percent Chrysophyta	<b>92.63</b>	
Percent Cryptophyta	<b>2.83</b>	Percent Cryptophyta	<b>2.39</b>	
*= colony	<b>+=filament</b>			

**Table C-2. Phytoplankton Data for Long Lake Middle Station, 2007.**

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 1/29/2007		SAMPLE STATUS: Lugols preserved by client		
STATION: center-0.5m		NOTE:		
Taxon	Cells/ml	$\mu\text{m}^3/\text{cell}$	$\mu\text{m}^3/\text{ml}$	comments
<b>Cyanophyta</b>				
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	1.00	293	293	
<i>Ankistrodesmus falcatus</i>	35.00	282	9,873	
<i>Oocystis sp.</i>	3.00	593.46	1,780	
unicell (sph) nannoplktn	20.00	3,052.08	61,042	dense cell
<b>Taxon Subtotal</b>	<b>59.00</b>		<b>72,988</b>	
<b>Chrysophyta</b>				
<i>Dinobryon sp.</i>	12.00	1,203.67	14,444	
Synurophyceae	4.00	2,679.47	10,718	colonies disrupted
filamentous chrysophyte	36.00	621.72	22,382	
chrysophyte (flagel-unicell)	110.00	267.95	29,474	ovoid cell
chrysophyte (flagel-unicell)	8.00	209.33	1,675	
chrysophyte (flagel-unicell)	5.00	678.24	3,391	
Bacillariophyceae				
<i>Asterionella formosa</i>	288.00	495.00	142,560	
<i>Cyclotella sp.</i>	16.00	1,004.80	16,077	
<i>Fragilaria crotonensis</i>	30.00	604.80	18,144	
<i>Melosira sp.</i>	12.00	1,884.00	22,608	
<i>Synedra sp.</i>	1.00	2,355.00	2,355	<i>S. acus-like</i>
<i>Synedra sp.</i>	2.00	241.78	484	
undet centric diatom	10.00	226.08	2,261	
undet pennate diatom	1.00	2,813.44	2,813	
<b>Taxon Subtotal</b>	<b>535</b>		<b>289,385</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas sp.</i>	3.00	1,450.68	4,352	
<i>Cryptomonas ovata+spp.</i>	16.00	2,285.92	36,575	
<i>Rhodomonas sp.</i>	10.00	169.56	1,696	
<b>Taxon Subtotal</b>	<b>29.00</b>		<b>42,622</b>	
<b>Euglenophyta</b>				
<b>Pyrrhophyta</b>				
<b>Other</b>				
			( $\mu\text{m}^3/\text{ml}$ )	( $\text{mm}^3/\text{L}$ )
<b>Total Number/ml</b>	<b>623</b>	<b>Total Volume</b>	<b>404,995</b>	<b>0.405</b>
Percent Chlorophyta	9.47	Percent Chlorophyta	18.02	
Percent Chrysophyta	85.87	Percent Chrysophyta	71.45	
Percent Cryptophyta	4.65	Percent Cryptophyta	10.52	
*= colony	+ = filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 2/28/2007		SAMPLE STATUS: Lugols preserved by client		
STATION: center-0.5m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	11.00	224	2,468	
colonial (sph) nannoplktn	88.00	381.51	33,573	
unicell (sph) nannoplktn	22.00	4,186.67	92,107	mucous sheath
unicell (sph) nannoplktn	33.00	2,143.57	70,738	dense cell
<b>Taxon Subtotal</b>	<b>154.00</b>		<b>198,886</b>	
<b>Chrysoophyta</b>				
<i>Dinobryon sp.</i>	11.00	1,046.67	11,513	
<i>Dinobryon bavaricum</i>	11.00	392.50	4,318	
<i>Mallomonas sp.</i>	11.00	4,102.93	45,132	
filamentous chrysophyte	70.00	621.72	43,520	
chrysophyte (flagel-unicell)	1,210.00	267.95	324,215	ovoid cell
chrysophyte (flagel-unicell)	110.00	791.28	87,041	
Bacillariophyceae				
<i>Asterionella formosa</i>	88.00	495.00	43,560	
<i>Cyclotella sp.</i>	77.00	1,004.80	77,370	
<i>Fragilaria crotonensis</i>	110.00	900.00	99,000	
<i>Melosira sp.</i>	148.00	510.25	75,517	
<i>Melosira sp.</i>	55.00	3,165.12	174,082	
<i>Synedra sp.</i>	1.00	3,297.00	3,297	<i>S. acus-like</i>
<i>Synedra sp.</i>	11.00	181.34	1,995	
undet pennate diatom	11.00	5,376.00	59,136	
<b>Taxon Subtotal</b>	<b>1924</b>		<b>1,049,696</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas ovata+spp.</i>	495.00	2,285.92	1,131,530	
small cryptomonad	55.00	423.90	23,315	
cryptomonad	33.00	777.15	25,646	
<i>Rhodomonas sp.</i>	330.00	169.56	55,955	
<b>Taxon Subtotal</b>	<b>913.00</b>		<b>1,236,446</b>	
<b>Euglenophyta</b>				
<b>Pyrrhophyta</b>				
small dinoflagellate	1.00	1,582.56	1,583	
small dinoflagellate	4.00	5,652.00	22,608	
dinoflagellate	8.00	14,770.56	118,164	
<b>Taxon Subtotal</b>	<b>13.00</b>		<b>142,355</b>	
<b>Other</b>				
			(µm <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
<b>Total Number/ml</b>	<b>3004</b>	<b>Total Volume</b>	<b>2,627,382</b>	<b>2.627</b>
Percent Chlorophyta	<b>5.13</b>	Percent Chlorophyta	<b>7.57</b>	
Percent Chrysoophyta	<b>64.05</b>	Percent Chrysoophyta	<b>39.95</b>	
Percent Cryptophyta	<b>30.39</b>	Percent Cryptophyta	<b>47.06</b>	
Percent Pyrrhophyta	<b>0.43</b>	Percent Pyrrhophyta	<b>5.42</b>	
*= colony	+ = filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 3/15/2007		SAMPLE STATUS: Lugols lightly preser by client		
STATION: center-0.5m		NOTE:		
Taxon	Cells/ml	$\mu\text{m}^3/\text{cell}$	$\mu\text{m}^3/\text{ml}$	comments
<b>Cyanophyta</b>				
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	1.00	160	160	
<i>Oocystis pusilla/parva grp</i>	4.00	116.57	466	
colonial (sph) nannoplktn	48.00	904.32	43,407	
unicell (sph) nannoplktn	3.00	523.33	1,570	mucous sheath
unicell (sph) nannoplktn	43.00	2,143.57	92,174	mucous sheath
<b>Taxon Subtotal</b>	<b>99.00</b>		<b>137,778</b>	
<b>Chrysophyta</b>				
<i>Dinobryon sp.</i>	1.00	1,046.67	1,047	
filamentous chrysophyte	52.00	621.72	32,329	
chrysophyte (flagel-unicell)	110.00	267.95	29,474	ovoid cell
chrysophyte (flagel-unicell)	110.00	791.28	87,041	
<b>Bacillariophyceae</b>				
<i>Asterionella formosa</i>	92.00	495.00	45,540	
<i>Cyclotella sp.</i>	8.00	1,004.80	8,038	
<i>Epithemia sp.</i>	1.00	5,861	5,861	
<i>Fragilaria crotonensis</i>	40.00	604.80	24,192	
<i>Melosira sp.</i>	52.00	1,077.02	56,005	
<i>Melosira sp.</i>	16.00	5,224.96	83,599	
<i>Synedra sp.</i>	5.00	3,297.00	16,485	<i>S. acus-like</i>
<i>Synedra ulna</i>	1.00	8,750.00	8,750	slight bow in frustule/valve
<i>Synedra sp.</i>	2.00	120.89	242	
<i>Synedra sp.</i>	3.00	192.33	577	
undet pennate diatom	1.00	5,544.00	5,544	
<b>Taxon Subtotal</b>	<b>494</b>		<b>404,725</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas ovata+spp.</i>	45.00	2,285.92	102,866	
<b>Taxon Subtotal</b>	<b>45.00</b>		<b>102,866</b>	
<b>Euglenophyta</b>				
<b>Pyrrhophyta</b>				
<b>Other</b>				
undeter unicell	110.00	329.70	36,267	flagellate
<b>Taxon Subtotal</b>	<b>110.00</b>		<b>36,267</b>	
			( $\mu\text{m}^3/\text{ml}$ )	( $\text{mm}^3/\text{L}$ )
<b>Total Number/ml</b>	<b>748</b>	<b>Total Volume</b>	<b>681,636</b>	<b>0.682</b>
Percent Chlorophyta	13.24	Percent Chlorophyta	20.21	
Percent Chrysophyta	66.04	Percent Chrysophyta	59.38	
Percent Cryptophyta	6.02	Percent Cryptophyta	15.09	
Percent Other	14.71	Percent Other	5.32	
*= colony	+ = filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 4/10/2007		SAMPLE STATUS: Lugols lightly preser by client		
STATION: center-0.5m		NOTE:		
Taxon	Cells/ml	$\mu\text{m}^3/\text{cell}$	$\mu\text{m}^3/\text{ml}$	comments
<b>Cyanophyta</b>				
<b>Chlorophyta</b>				
<i>Dictyosphaerium sp.</i>	96.00	136.78	13,131	
unicell (sph) nannoplktn	1.00	1,436.03	1,436	mucous sheath
unicell (sph) nannoplktn	1.00	1,436.03	1,436	dense cell
<b>Taxon Subtotal</b>	<b>98.00</b>		<b>16,003</b>	
<b>Chrysophyta</b>				
<i>Rhizochrysis sp.</i>	1.00	25,848.48	25,848	
filamentous chrysophyte	102.00	621.72	63,415	
chrysophyte (flagel-unicell)	110.00	267.95	29,474	ovoid cell
chrysophyte (flagel-unicell)	11.00	1,406.72	15,474	
Bacillariophyceae				
<i>Asterionella formosa</i>	256.00	495.00	126,720	
<i>Fragilaria crotonensis</i>	30.00	604.80	18,144	
<i>Melosira sp.</i>	10.00	1,406.72	14,067	
<i>Rhizosolenia sp.</i>	5.00	9,420.00	47,100	delicate cells w/long spines
<b>Taxon Subtotal</b>	<b>525</b>		<b>340,243</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas ovata+spp.</i>	3.00	2,285.92	6,858	
cryptomonad	1.00	777.15	777	
<b>Taxon Subtotal</b>	<b>4.00</b>		<b>7,635</b>	
<b>Euglenophyta</b>				
<b>Pyrrhophyta</b>				
<b>Other</b>				
			( $\mu\text{m}^3/\text{ml}$ )	( $\text{mm}^3/\text{L}$ )
<b>Total Number/ml</b>	<b>627</b>	<b>Total Volume</b>	<b>363,881</b>	<b>0.364</b>
Percent Chlorophyta	15.63	Percent Chlorophyta	4.40	
Percent Chrysophyta	83.73	Percent Chrysophyta	93.50	
Percent Cryptophyta	0.64	Percent Cryptophyta	2.10	
*= colony	+=filament			



PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 5/24/2007		SAMPLE STATUS: Lugols preserved		
STATION: center-0.5m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<i>Coelosphaerium/Snowella spp. assemblg</i>	320.00	22.44	7,180	cells @col edge;fibrils?
<b>Taxon Subtotal</b>	<b>320</b>		<b>7,180</b>	
<b>Chlorophyta</b>				
<i>Cosmarium sp.</i>	10.00	5,744.11	57,441	coarse,punctate wall
<i>Dictyosphaerium sp.</i>	72.00	136.78	9,848	
<i>Oocystis sp.</i>	2.00	1,013.17	2,026	
<i>Quadrigula sp.</i>	4.00	226.08	904	
<i>Tetraedron sp.</i>	6.00	3,109.87	18,659	
colonial (sph) nannoplktn	24.00	65.42	1,570	
unicell (sph) nannoplktn	20.00	1,436.03	28,721	dense cell
<b>Taxon Subtotal</b>	<b>138.00</b>		<b>119,170</b>	
<b>Chrysophyta</b>				
<i>Dinobryon spp.</i>	750.00	942.00	706,500	
chrysophyte (unicell)	2.00	5,065.87	10,132	
filamentous chrysophyte	108.00	678.24	73,250	
chrysophyte (flagel-unicell)	176.00	267.95	47,159	ovoid cell
chrysophyte (flagel-unicell)	11.00	1,436.03	15,796	
Bacillariophyceae				
<i>Asterionella formosa</i>	176.00	487.50	85,800	
<i>Cocconeis sp.</i>	4.00	1,734.85	6,939	
<i>Cyclotella sp.</i>	8.00	862.32	6,899	small cells<14um diam
<i>Fragilaria crotonensis</i>	60.00	900.00	54,000	
<i>Melosira sp.</i>	88.00	1,507.20	132,634	some w/ term spine
<i>Melosira sp.</i>	8.00	686.88	5,495	
<i>Melosira sp.</i>	15.00	4,308.08	64,621	
<i>Synedra sp.</i>	1.00	2,747.50	2,748	
<i>Synedra sp.</i>	24.00	84.62	2,031	
<i>Synedra sp.</i>	8.00	126.93	1,015	
<i>Synedra sp.</i>	10.00	269.26	2,693	
<i>Synedra sp.</i>	4.00	395.64	1,583	
<b>Taxon Subtotal</b>	<b>1453</b>		<b>1,219,293</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas spp.</i>	4.00	2,637.60	10,550	
cryptomonad	2.00	777.15	1,554	
<b>Taxon Subtotal</b>	<b>6.00</b>		<b>12,105</b>	
<b>Euglenophyta</b>				
<i>Euglena sp.</i>	2.00	8,011.71	16,023	
<b>Taxon Subtotal</b>	<b>2</b>		<b>16,023</b>	
<b>Pyrrhophyta</b>				
small dinoflagellate	10.00	1,582.56	15,826	
small dinoflagellate	6.00	4,898.40	29,390	
<b>Taxon Subtotal</b>	<b>16.00</b>		<b>45,216</b>	
<b>Other</b>				
			(µm <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
<b>Total Number/ml</b>	<b>1935</b>	<b>Total Volume</b>	<b>1,418,987</b>	<b>1.419</b>
Percent Cyanophyta	16.54	Percent Cyanophyta	0.51	
Percent Chlorophyta	7.13	Percent Chlorophyta	8.40	
Percent Chrysophyta	75.09	Percent Chrysophyta	85.93	
Percent Cryptophyta	0.31	Percent Cryptophyta	0.85	
Percent Euglenophyta	0.10	Percent Euglenophyta	1.13	
Percent Pyrrhophyta	0.83	Percent Pyrrhophyta	3.19	
Percent Other	0.00	Percent Other	0.00	
*= colony	+=filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 5/24/2007		SAMPLE STATUS: Lugols preserved		
STATION: center-2.5m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<i>Coelosphaerium/Snowella spp. asmblg</i>	160.00	22.44	3,590	cells @col edge:fibrils?
+ <i>Oscillatoria sp.</i>	2.00	686.88	1,374	threadlike filaments
<b>Taxon Subtotal</b>	<b>162</b>		<b>4,964</b>	
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	2.00	91	182	
<i>Cosmarium sp.</i>	4.00	5,744.11	22,976	coarse,punctate wall
<i>Dictyosphaerium sp.</i>	32.00	136.78	4,377	
<i>Oocystis pusilla/parva grp</i>	4.00	116.57	466	
<i>Oocystis sp.</i>	8.00	359.01	2,872	
* <i>Scenedesmus quadricauda</i>	2.00	732.67	1,465	4-cell colony
<i>Tetraedron sp.</i>	2.00	9,066.67	18,133	
colonial (sph) nannoplktn	32.00	65.42	2,093	
unicell (sph) nannoplktn	55.00	523.33	28,783	mucous sheath
unicell (sph) nannoplktn	33.00	1,766.25	58,286	dense cell
<b>Taxon Subtotal</b>	<b>174.00</b>		<b>139,636</b>	
<b>Chrysophyta</b>				
<i>Dinobryon spp.</i>	350.00	602.88	211,008	
colonial chrysophyte	16.00	267.95	4,287	
filamentous chrysophyte	135.00	678.24	91,562	
chrysophyte (unicell)	2.00	5,065.87	10,132	
chrysophyte (flagel-unicell)	550.00	179.50	98,727	ovoid cell
chrysophyte (flagel-unicell)	165.00	1,149.76	189,711	
<b>Bacillariophyceae</b>				
<i>Asterionella formosa</i>	104.00	487.50	50,700	
<i>Cyclotella sp.</i>	2.00	5,837.26	11,675	
<i>Cyclotella sp.</i>	20.00	1,205.76	24,115	
<i>Cymbella sp.</i>	1.00	24,178.00	24,178	
<i>Fragilaria crotonensis</i>	70.00	604.80	42,336	
<i>Melosira sp.</i>	110.00	1,406.72	154,739	some w/ term spine
<i>Melosira sp.</i>	65.00	4,000.36	260,023	
<i>Synedra sp.</i>	4.00	2,289.58	9,158	
<i>Synedra sp.</i>	8.00	126.93	1,015	
<i>Synedra sp.</i>	4.00	307.72	1,231	
<i>Synedra sp.</i>	2.00	448.76	898	
<i>Synedra sp.</i>	4.00	1,413.00	5,652	
undet pennate diatom	2.00	366.33	733	naviculoid cell
<b>Taxon Subtotal</b>	<b>1614</b>		<b>1,191,880</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas sp.</i>	70.00	1,582.56	110,779	
<i>Cryptomonas spp.</i>	20.00	5,934.60	118,692	
small cryptomonad	40.00	452.16	18,086	
<i>Rhodomonas sp.</i>	10.00	141.30	1,413	
<b>Taxon Subtotal</b>	<b>140.00</b>		<b>248,971</b>	
<b>Euglenophyta</b>				
<i>Trachelomonas volvocina</i>	2.00	2,571.14	5,142	smooth wall
<b>Taxon Subtotal</b>	<b>2</b>		<b>5,142</b>	
<b>Pyrrhophyta</b>				
small dinoflagellate	2.00	1,582.56	3,165	
small dinoflagellate	2.00	7,912.80	15,826	
dinoflagellate	2.00	29,673.00	59,346	embedded in mucous
<b>Taxon Subtotal</b>	<b>6.00</b>		<b>78,337</b>	
<b>Other</b>				
			(µm <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
<b>Total Number/ml</b>	<b>2098</b>	<b>Total Volume</b>	<b>1,668,929</b>	<b>1.669</b>
Percent Cyanophyta	7.72	Percent Cyanophyta	0.30	
Percent Chlorophyta	8.29	Percent Chlorophyta	8.37	
Percent Chrysophyta	76.93	Percent Chrysophyta	71.42	
Percent Cryptophyta	6.67	Percent Cryptophyta	14.92	
Percent Euglenophyta	0.10	Percent Euglenophyta	0.31	
Percent Pyrrhophyta	0.29	Percent Pyrrhophyta	4.69	
Percent Other	0.00	Percent Other	0.00	
*= colony	+ = filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 6/18/2007		SAMPLE STATUS: Lugols preserved		
STATION: center-0.5m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<i>Anabaena spiroides</i>	80.00	381.51	30,521	reg coils
<i>Anacystis (Anathece/Aphanothece) spp.</i>	2,000.00	2.68	5,359	
<i>Chroococcus sp.</i>	32.00	41.87	1,340	
<i>Coelosphaerium/Snowella spp. asmblg</i>	8,800.00	22.44	197,454	cells @col edge,fibrils?
<i>Gomphosphaeria sp.</i>	120.00	4.19	502	fibrils
<b>Taxon Subtotal</b>	<b>11032</b>		<b>235,176</b>	
<b>Chlorophyta</b>				
* <i>Botryococcus sp.</i>	2.00	8,205.87	16,412	col<30 um diam
<i>Dictyosphaerium sp.</i>	64.00	113.04	7,235	
<i>Oocystis sp.</i>	20.00	226.08	4,522	
<i>Oocystis sp.</i>	8.00	949.85	7,599	
<i>Quadrigula sp.</i>	4.00	226.08	904	
* <i>Scenedesmus quadricauda</i>	6.00	732.67	4,396	4-cell colony
<i>Tetraedron sp.</i>	2.00	7,773.53	15,547	
colonial (sph) nannoplktn	8.00	1,055.04	8,440	
colonial (sph) nannoplktn	288.00	65.42	18,840	
unicell (sph) nannoplktn	6.00	2,143.57	12,861	mucous sheath
<b>Taxon Subtotal</b>	<b>408.00</b>		<b>96,756</b>	
<b>Chrysophyta</b>				
<i>Dinobryon spp.</i>	100.00	1,046.67	104,667	
<i>Dinobryon bavaricum</i>	40.00	392.50	15,700	
<i>Dinobryon divergens</i>	20.00	669.87	13,397	
chrysophyte (unicell)	6.00	5,065.87	30,395	
filamentous chrysophyte	324.00	678.24	219,750	
chrysophyte (flagel-unicell)	66.00	179.50	11,847	ovoid cell
chrysophyte (flagel-unicell)	22.00	1,436.03	31,593	
Bacillariophyceae				
<i>Asterionella formosa</i>	384.00	487.50	187,200	
<i>Cyclotella sp.</i>	4.00	2,198.00	8,792	
<i>Cyclotella sp.</i>	12.00	862.32	10,348	small cells<14um diam
<i>Fragilaria crotonensis</i>	80.00	604.80	48,384	
<i>Melosira sp.</i>	135.00	1,306.24	176,342	some w/ term spine
<i>Melosira sp.</i>	8.00	686.88	5,495	
<i>Melosira sp.</i>	65.00	2,939.04	191,038	
<i>Synedra sp.</i>	12.00	169.25	2,031	
<i>Synedra sp.</i>	20.00	224.38	4,488	
undet pennate diatom	2.00	4,615.80	9,232	naviculoid cell
<b>Taxon Subtotal</b>	<b>1300</b>		<b>1,070,698</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas spp.</i>	10.00	2,285.92	22,859	
<i>Cryptomonas sp.</i>	2.00	5,934.60	11,869	
cryptomonad	24.00	777.15	18,652	
<i>Rhodomonas sp.</i>	10.00	141.30	1,413	
<b>Taxon Subtotal</b>	<b>46.00</b>		<b>54,793</b>	
<b>Euglenophyta</b>				
<b>Pyrrhophyta</b>				
small dinoflagellate	2.00	6,286.28	12,573	
<i>Ceratium hirundinella(cyst)</i>	1.00	40,000.00	40,000	
<b>Taxon Subtotal</b>	<b>3.00</b>		<b>52,573</b>	
<b>Other</b>				
			(µm <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
<b>Total Number/ml</b>	<b>12789</b>	<b>Total Volume</b>	<b>1,509,995</b>	<b>1.510</b>
Percent Cyanophyta	86.26	Percent Cyanophyta	15.57	
Percent Chlorophyta	3.19	Percent Chlorophyta	6.41	
Percent Chrysophyta	10.16	Percent Chrysophyta	70.91	
Percent Cryptophyta	0.36	Percent Cryptophyta	3.63	
Percent Euglenophyta	0.00	Percent Euglenophyta	0.00	
Percent Pyrrhophyta	0.02	Percent Pyrrhophyta	3.48	
Percent Other	0.00	Percent Other	0.00	
*= colony	+=filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 7/2/2007		SAMPLE STATUS: Lugols preserved		
STATION: center-0.5m		NOTE:		
Taxon	Cells/ml	$\mu\text{m}^3/\text{cell}$	$\mu\text{m}^3/\text{ml}$	comments
<b>Cyanophyta</b>				
<i>Anacystis (Anathece/Aphanothece) spp.</i>	400.00	2.68	1,072	
<i>Chroococcus sp.</i>	8.00	58.61	469	
<i>Chroococcus sp.</i>	16.00	256.43	4,103	
<i>Coelosphaerium/Snowella spp. asmb/g</i>	44,000.00	22.44	987,268	cells @col edge:fibrils?
<i>Gomphosphaeria sp.</i>	1,320.00	4.19	5,526	fibrils
<b>Taxon Subtotal</b>	<b>45744</b>		<b>998,438</b>	
<b>Chlorophyta</b>				
* <i>Botryococcus sp.</i>	2.00	8,205.87	16,412	col<30 um diam
* <i>Botryococcus sp.</i>	6.00	33,233.76	199,403	col<45 um diam
<i>Cosmarium sp.</i>	2.00	5,744.11	11,488	coarse,punctate wall
<i>Dictyosphaerium sp.</i>	160.00	113.04	18,086	
<i>Oocystis sp.</i>	12.00	319.15	3,830	
* <i>Oocystis sp.</i>	2.00	5,861.33	11,723	
<i>Quadrigula sp.</i>	4.00	226.08	904	
* <i>Scenedesmus bijuga</i>	2.00	401.92	804	4-cell colony
<i>Tetraedron sp.</i>	2.00	3,825.00	7,650	
<i>Tetraedron limneticum</i>	2.00	2,769.48	5,539	
colonial (ell) nannoplktn	8.00	183.17	1,465	
colonial (sph) nannoplktn	16.00	65.42	1,047	
unicell (sph) nannoplktn	16.00	904.32	14,469	mucous sheath
unicell (sph) nannoplktn	4.00	2,143.57	8,574	dense cell
<b>Taxon Subtotal</b>	<b>238.00</b>		<b>301,394</b>	
<b>Chrysophyta</b>				
<i>Dinobryon bavaricum</i>	300.00	392.50	117,750	
<i>Dinobryon divergens</i>	20.00	669.87	13,397	
<i>Gloeobotrys sp.</i>	96.00	113.04	10,852	cells disrupted
chrysophyte (unicell)	2.00	9,847.04	19,694	
filamentous chrysophyte	140.00	678.24	94,954	
chrysophyte (flagel-unicell)	88.00	179.50	15,796	ovoid cell
chrysophyte (flagel-unicell)	33.00	1,436.03	47,389	
Bacillariophyceae				
<i>Asterionella formosa</i>	128.00	525.00	67,200	
<i>Epithemia sp.</i>	2.00	5,861	11,723	
<i>Fragilaria crotonensis</i>	160.00	604.80	96,768	
<i>Melosira sp.</i>	84.00	1,607.68	135,045	some w/ term spine
<i>Melosira varians</i>	6.00	8,792.00	52,752	large cell
<i>Melosira sp.</i>	120.00	3,077.20	369,264	
<i>Nitzschia sp.</i>	2.00	1,994.69	3,989	
<i>Synedra sp.</i>	2.00	169.25	338	
<i>Synedra sp.</i>	14.00	224.38	3,141	
undet pennate diatom	2.00	1,483.65	2,967	naviculoid cell
<b>Taxon Subtotal</b>	<b>1199</b>		<b>1,063,020</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas spp.</i>	6.00	2,461.76	14,771	
small cryptomonad	2.00	285.74	571	
cryptomonad	4.00	777.15	3,109	
<b>Taxon Subtotal</b>	<b>12.00</b>		<b>18,451</b>	
<b>Euglenophyta</b>				
<i>Trachelomonas volvocina</i>	2.00	2,571.14	5,142	smooth wall
<b>Taxon Subtotal</b>	<b>2</b>		<b>5,142</b>	
<b>Pyrrhophyta</b>				
<i>Ceratium hirundinella(cyst)</i>	1.00	40,000.00	40,000	
<b>Taxon Subtotal</b>	<b>1.00</b>		<b>40,000</b>	
<b>Other</b>				
			( $\mu\text{m}^3/\text{ml}$ )	( $\text{mm}^3/\text{L}$ )
<b>Total Number/ml</b>	<b>47196</b>	<b>Total Volume</b>	<b>2,426,445</b>	<b>2.426</b>
Percent Cyanophyta	96.92	Percent Cyanophyta	41.15	
Percent Chlorophyta	0.50	Percent Chlorophyta	12.42	
Percent Chrysophyta	2.54	Percent Chrysophyta	43.81	
Percent Cryptophyta	0.03	Percent Cryptophyta	0.76	
Percent Euglenophyta	0.00	Percent Euglenophyta	0.21	
Percent Pyrrhophyta	0.00	Percent Pyrrhophyta	1.65	
Percent Other	0.00	Percent Other	0.00	
*= colony	+=filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 7/23/2007		SAMPLE STATUS: Lugols preserved		
STATION: center-0.5m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<i>Anabaena sp.</i>	10.00	188.40	1,884	ellip cells;short crimped coils
<i>Anabaena sp.</i>	150.00	47.69	7,153	tiny cells;linear chains
<i>Chroococcus sp.</i>	8.00	150.72	1,206	
<i>Coelosphaerium/Snowella spp. asmb/g</i>	11,520.00	22.44	258,485	cells @col edge;fibrils?
<b>Taxon Subtotal</b>	<b>11688</b>		<b>268,728</b>	
<b>Chlorophyta</b>				
* <i>Botryococcus sp.</i>	14.00	3,349.33	46,891	col<20 um diam
* <i>Crucigenia quadrata</i>	8.00	452.16	3,617	4-cell colony
<i>Dictyosphaerium sp.</i>	608.00	113.04	68,728	
<i>Kirchneriella sp.</i>	16.00	74	1,187	
<i>Oocystis pusilla/parva grp</i>	4.00	116.57	466	
<i>Oocystis sp.</i>	4.00	2,051.47	8,206	
* <i>Pediastrum Boryanum</i>	2.00	1,570.00	3,140	
<i>Quadrigula sp.</i>	16.00	326.56	5,225	
* <i>Scenedesmus bijuga</i>	2.00	732.67	1,465	4-cell colony
<i>Tetraedron sp.</i>	4.00	3,825.00	15,300	
colonial (ell) nannoplktn	8.00	127.17	1,017	
colonial (sph) nannoplktn	8.00	523.33	4,187	
colonial (sph) nannoplktn	96.00	65.42	6,280	
<b>Taxon Subtotal</b>	<b>790.00</b>		<b>165,710</b>	
<b>Chrysophyta</b>				
<i>Dinobryon bavaricum</i>	150.00	392.50	58,875	
chrysophyte (unicell)	2.00	3,349.33	6,699	
filamentous chrysophyte	130.00	678.24	88,171	
chrysophyte (flagel-unicell)	77.00	179.50	13,822	ovoid cell
chrysophyte (flagel-unicell)	6.00	4,578.12	27,469	long flagellum
<b>Bacillariophyceae</b>				
<i>Asterionella formosa</i>	80.00	450.00	36,000	
<i>Cyclotella sp.</i>	2.00	1,205.76	2,412	
<i>Fragilaria crotonensis</i>	40.00	604.80	24,192	
<i>Melosira sp.</i>	80.00	1,406.72	112,538	some w/ term spine
<i>Melosira sp.</i>	120.00	4,000.36	480,043	
<i>Synedra cyclosum</i>	2.00	659.40	1,319	
<i>Synedra sp.</i>	2.00	126.93	254	
<i>Synedra sp.</i>	8.00	224.38	1,795	
<b>Taxon Subtotal</b>	<b>699</b>		<b>853,587</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas spp.</i>	2.00	2,461.76	4,924	
<b>Taxon Subtotal</b>	<b>2.00</b>		<b>4,924</b>	
<b>Euglenophyta</b>				
<b>Pyrrhophyta</b>				
<b>Other</b>				
* undeter colony	2.00	15,260.40	30,521	
<b>Taxon Subtotal</b>	<b>2.00</b>		<b>30,521</b>	
			(um <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
<b>Total Number/ml</b>	<b>13181</b>	<b>Total Volume</b>	<b>1,323,469</b>	<b>1.323</b>
Percent Cyanophyta	88.67	Percent Cyanophyta	20.30	
Percent Chlorophyta	5.99	Percent Chlorophyta	12.52	
Percent Chrysophyta	5.30	Percent Chrysophyta	64.50	
Percent Cryptophyta	0.02	Percent Cryptophyta	0.37	
Percent Euglenophyta	0.00	Percent Euglenophyta	0.00	
Percent Pyrrhophyta	0.00	Percent Pyrrhophyta	0.00	
Percent Other	0.02	Percent Other	2.31	
*= colony	+=filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 8/5/2007		SAMPLE STATUS: Lugols preserved		
STATION: center-0.5m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<i>Anabaena sp.</i>	650.00	334.93	217,707	linear,compres cells
<i>Anacystis (Aphanothece/Anathece spp.)</i>	320.00	6.28	2,010	
<i>Anacystis spp.</i>	1,000.00	4.19	4,187	
<i>Chroococcus sp.</i>	64.00	58.61	3,751	
<i>Coelosphaerium/Snowella spp. asmbig</i>	320.00	22.44	7,180	cells @col edge;fibrils?
+ <i>Oscillatoria sp.</i>	2.00	1,030.31	2,061	threadlike filaments
<i>Microcystis spp. asmbig(tenta)</i>	200.00	87.07	17,414	cells w/aerotopes;clath col;faint muc
<b>Taxon Subtotal</b>	<b>2556</b>		<b>254,309</b>	
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	10.00	96	962	
* <i>Crucigenia quadrata</i>	2.00	803.84	1,608	4-cell colony
<i>Dictyosphaerium sp.</i>	192.00	113.04	21,704	
<i>Oocystis sp.</i>	2.00	1,076.50	2,153	
<i>Oocystis sp.</i>	12.00	273.56	3,283	
* <i>Pediastrum Boryanum</i>	2.00	12,308.80	24,618	
* <i>Pediastrum duplex</i>	2.00	2,532.93	5,066	
* <i>Pediastrum duplex</i>	4.00	6,410.83	25,643	
<i>Quadrigula sp.</i>	16.00	200.96	3,215	
<i>Quadrigula sp.</i>	32.00	251.20	8,038	
<i>Staurastrum sp.</i>	2.00	3,390.80	6,782	triangular
colonial (ell) nannoplktn	80.00	105.98	8,478	
colonial (sph) nannoplktn	880.00	33.49	29,474	tiny actively-dividing cells
colonial (sph) nannoplktn	80.00	113.04	9,043	
unicell (sph) nannoplktn	10.00	904.32	9,043	mucous sheath
unicell (sph) nannoplktn	8.00	1,436.03	11,488	dense cell
<b>Taxon Subtotal</b>	<b>1,334.00</b>		<b>170,598</b>	
<b>Chrysophyta</b>				
<i>Dinobryon bavaricum</i>	2.00	457.92	916	
<i>Dinobryon divergens</i>	56.00	559.31	31,322	
<i>Rhizochrysis sp.</i>	4.00	8,205.87	32,823	
filamentous chrysophyte	180.00	621.72	111,910	
colonial chrysophyte	80.00	75.99	6,079	delicate vasselike lorica
chrysophyte (flagel-unicell)	33.00	267.95	8,842	ovoid cell
chrysophyte (flagel-unicell)	4.00	3,751.25	15,005	
chrysophyte (flagel-unicell)	10.00	791.28	7,913	
<b>Bacillariophyceae</b>				
<i>Asterionella formosa</i>	48.00	450.00	21,600	
<i>Cocconeis sp.</i>	2.00	1,632.80	3,266	
<i>Fragilaria crotonensis</i>	500.00	900.00	450,000	
<i>Melosira sp.</i>	115.00	1,406.72	161,773	some w/term spines
<i>Melosira sp.</i>	80.00	2,939.04	235,123	some w/term spines
<i>Rhizosolenia sp.</i>	4.00	7,850.00	31,400	delicate cells w/long spines
<i>Synedra ulna</i>	1.00	11,550.00	11,550	
<i>Synedra sp.</i>	2.00	211.56	423	
<i>Synedra sp.</i>	2.00	256.43	513	
<b>Taxon Subtotal</b>	<b>1123</b>		<b>1,130,457</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas +spp.</i>	2.00	2,461.76	4,924	
cryptomonad	8.00	932.58	7,461	
<i>Rhodomonas sp.</i>	33.00	141.30	4,663	
<b>Taxon Subtotal</b>	<b>43.00</b>		<b>17,047</b>	
<b>Euglenophyta</b>				
<b>Pyrrhophyta</b>				
<b>Undetermined</b>				
* undeter colony	24.00	14,130.00	339,120	rough col investment
<b>Taxon Subtotal</b>	<b>24.00</b>		<b>339,120</b>	
<b>PHYTOPLANKTON Con't</b>				
LONG LAKE (Kitsap Co., WA)				
DATE: 8/5/2007				
STATION: center-0.5m				
<b>Total Number/ml</b>	<b>5080</b>	<b>Total Volume</b>	<b>(µm<sup>3</sup>/ml)</b>	<b>(mm<sup>3</sup>/L)</b>
Percent Cyanophyta	50.31	Percent Cyanophyta	13.30	
Percent Chlorophyta	26.26	Percent Chlorophyta	8.92	
Percent Chrysophyta	22.11	Percent Chrysophyta	59.14	
Percent Cryptophyta	0.85	Percent Cryptophyta	0.89	
Percent Euglenophyta	0.00	Percent Euglenophyta	0.00	
Percent Pyrrhophyta	0.00	Percent Pyrrhophyta	0.00	
Percent Undetermined	0.47	Percent Undetermined	17.74	
*= colony	+=filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 8/6/2007		SAMPLE STATUS: Lugols preserved		
STATION: center-0.5m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<i>Anabaena sp.</i>	250.00	150.72	37,680	irreg, crimped coils
<i>Anabaena sp.</i>	400.00	334.93	133,973	linear, compres cells
<i>Anacystis (Aphanothece/Anathece spp.)</i>	200.00	6.28	1,256	
<i>Anacystis spp.</i>	1,000.00	4.19	4,187	
<i>Chroococcus sp.</i>	16.00	58.61	938	
<i>Coelosphaerium/Snowella spp. asmb/g</i>	3,200.00	22.44	71,801	cells @col edge; fibrils?
+ <i>Oscillatoria sp.</i>	11.00	343.44	3,778	threadlike filaments
<i>Microcystis spp. asmb/g(tenta)</i>	100.00	87.07	8,707	cellsw/aerotopes; clath col; faint muc
<b>Taxon Subtotal</b>	<b>5177</b>		<b>262,320</b>	
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	8.00	96	769	
* <i>Botryococcus sp.</i>	20.00	8,205.87	164,117	col<30 um diam
* <i>Botryococcus sp.</i>	1.00	820,586.67	820,587	col-140 um diam
* <i>Crucigenia quadrata</i>	2.00	803.84	1,608	4-cell colony
<i>Dictyosphaerium sp.</i>	1,800.00	113.04	203,472	
<i>Nephrocitium sp.</i>	8.00	157.00	1,256	
<i>Oocystis sp.</i>	20.00	593.46	11,869	
<i>Quadrigula sp.</i>	20.00	200.96	4,019	
* <i>Scenedesmus sp.</i>	4.00	256.43	1,026	4-cell colony
<i>Staurastrum sp.</i>	2.00	5,948.04	11,896	
<i>Tetraedron limneticum</i>	2.00	9,848.04	19,696	
undet green filament	2.00	7,912.80	15,826	
colonial (ell) nannoplktn	8.00	75.36	603	
colonial (ell) nannoplktn	128.00	83.73	10,718	lunate cells
colonial (sph) nannoplktn	96.00	113.04	10,852	
colonial (sph) nannoplktn	128.00	150.46	19,258	clumped cells
unicell (sph) nannoplktn	4.00	1,436.03	5,744	dense cell
<b>Taxon Subtotal</b>	<b>2,253.00</b>		<b>1,303,316</b>	
<b>Chrysophyta</b>				
<i>Dinobryon bavaricum</i>	300.00	457.92	137,375	
<i>Dinobryon divergens</i>	700.00	559.31	391,519	
<i>Rhizochrysis sp.</i>	2.00	3,768.00	7,536	
filamentous chrysophyte	320.00	621.72	198,950	
colonial chrysophyte	40.00	75.99	3,040	delicate vasselike lorica
chrysophyte (flagel-unicell)	20.00	267.95	5,359	ovoid cell
chrysophyte (flagel-unicell)	2.00	791.28	1,583	
<b>Bacillariophyceae</b>				
<i>Asterionella formosa</i>	80.00	450.00	36,000	
<i>Cocconeis sp.</i>	2.00	1,632.80	3,266	
<i>Fragilaria crotonensis</i>	60.00	576.00	34,560	
<i>Melosira sp.</i>	140.00	1,406.72	196,941	some w/term spines
<i>Melosira sp.</i>	70.00	2,260.80	158,256	some w/term spines
<i>Rhizosolenia sp.</i>	2.00	7,850.00	15,700	delicate cells w/long spines
<i>Suirella sp.</i>	2.00	158,760.00	317,520	large cells
<i>Synedra ulna</i>	1.00	12,600.00	12,600	
<i>Synedra sp.</i>	2.00	169.25	338	
<i>Synedra sp.</i>	2.00	402.97	806	
undet pennate diatom	2.00	846.23	1,692	
undet pennate diatom	2.00	435.20	870	
<i>Tabellaria fenestrata</i>	2.00	3,500.00	7,000	
<b>Taxon Subtotal</b>	<b>1751</b>		<b>1,530,911</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas +spp.</i>	10.00	2,285.92	22,859	
<i>Rhodomonas sp.</i>	25.00	141.30	3,533	
<b>Taxon Subtotal</b>	<b>35.00</b>		<b>26,392</b>	
<b>Euglenophyta</b>				
<b>Pyrrhophyta</b>				
<i>Ceratium hirundinella</i>	2.00	60,000.00	120,000	
<b>Taxon Subtotal</b>	<b>2.00</b>		<b>120,000</b>	
<b>Undetermined</b>				
* undeter colony	6.00	20,347.20	122,083	rough col investment
<b>Taxon Subtotal</b>	<b>6.00</b>		<b>122,083</b>	
PHYTOPLANKTON Con't				
LONG LAKE (Kitsap Co., WA)				
DATE: 8/6/2007				
STATION: center-0.5m				
<b>Total Number/ml</b>	<b>9224</b>	<b>Total Volume</b>	<b>3,365,022</b>	<b>3.365</b>
Percent Cyanophyta	56.13	Percent Cyanophyta	7.80	
Percent Chlorophyta	24.43	Percent Chlorophyta	38.73	
Percent Chrysophyta	18.98	Percent Chrysophyta	45.49	
Percent Cryptophyta	0.38	Percent Cryptophyta	0.78	
Percent Euglenophyta	0.00	Percent Euglenophyta	0.00	
Percent Pyrrhophyta	0.02	Percent Pyrrhophyta	3.57	
Percent Undetermined	0.07	Percent Undetermined	3.63	
*= colony		+ = filament		

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 8/23/2007		SAMPLE STATUS: Lugols preserved		
STATION: center-1m		NOTE:		
Taxon	Cells/ml	$\mu\text{m}^3/\text{cell}$	$\mu\text{m}^3/\text{ml}$	comments
<b>Cyanophyta</b>				
<i>Anabaena sp.</i>	100.00	91.58	9,158	irreg. crimped coils
<i>Anabaena sp.</i>	600.00	334.93	200,960	linear, compres cells
<i>Aphanocapsa sp.</i>	250.00	65.42	16,354	cells w/aerotopes?
<i>nacystis (Aphanothece/Anathece spp.)</i>	100.00	4.19	419	
<i>Chroococcus sp.</i>	8.00	58.61	469	
+ <i>Oscillatoria sp.</i>	1.00	343.44	343	threadlike filaments
<b>Taxon Subtotal</b>	<b>1059</b>		<b>227,704</b>	
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	3.00	96	288	
* <i>Botryococcus sp.</i>	1.00	2,930.67	2,931	col<20 um diam
* <i>Botryococcus sp.</i>	2.00	8,205.87	16,412	col<30 um diam
<i>Dictyosphaerium sp.</i>	128.00	113.04	14,469	
<i>Oocystis sp.</i>	2.00	2,051.47	4,103	
<i>Quadrigula sp.</i>	2.00	351.68	703	
* <i>Scenedesmus sp.</i>	1.00	256.43	256	4-cell colony
* <i>Scenedesmus sp.</i>	1.00	732.67	733	4-cell colony
<i>Tetraedron minimum</i>	1.00	500.00	500	
colonial (ell) nannoplktn	8.00	75.36	603	cell pairs
colonial (ell) nannoplktn	8.00	183.17	1,465	
colonial (sph) nannoplktn	320.00	113.04	36,173	
colonial (sph) nannoplktn	64.00	267.95	17,149	
unicell (sph) nannoplktn	16.00	523.33	8,373	mucous sheath
unicell (sph) nannoplktn	6.00	1,436.03	8,616	dense cell
<b>Taxon Subtotal</b>	<b>563.00</b>		<b>112,774</b>	
<b>Chrysophyta</b>				
<i>Dinobryon divergens</i>	20.00	500.44	10,009	
<i>Rhizochrysis sp.</i>	1.00	9,420.00	9,420	
filamentous chrysophyte	44.00	621.72	27,356	
chrysophyte (flagel-unicell)	132.00	179.50	23,694	ovoid cell
chrysophyte (flagel-unicell)	1.00	3,306.42	3,306	long flagellum
chrysophyte (flagel-unicell)	55.00	791.28	43,520	
Bacillariophyceae				
<i>Asterionella formosa</i>	8.00	525.00	4,200	
<i>Cyclotella sp.</i>	1.00	2,198.00	2,198	
<i>Fragilaria crotonensis</i>	120.00	900.00	108,000	
<i>Melosira sp.</i>	30.00	2,198.00	65,940	some w/term spines
<i>Melosira sp.</i>	50.00	847.80	42,390	
<i>Synedra sp.</i>	1.00	227.96	228	
<i>Synedra sp.</i>	3.00	224.38	673	
undet pennate diatom	1.00	615.44	615	
<b>Taxon Subtotal</b>	<b>467</b>		<b>341,550</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas +spp.</i>	3.00	2,285.92	6,858	
small cryptomonad	3.00	423.90	1,272	
<i>Rhodomonas sp.</i>	10.00	141.30	1,413	
<b>Taxon Subtotal</b>	<b>16.00</b>		<b>9,542</b>	
<b>Euglenophyta</b>				
<b>Pyrrhophyta</b>				
<b>Undetermined</b>				
* undeter colony	1.00	11,304.00	11,304	rough col investment
<b>Taxon Subtotal</b>	<b>1.00</b>		<b>11,304</b>	
<b>Total Number/ml</b>		<b>Total Volume</b>		
<b>2106</b>		<b>702,875</b>		
				( $\mu\text{m}^3/\text{ml}$ )
				( $\text{mm}^3/\text{L}$ )
Percent Cyanophyta	<b>50.28</b>	Percent Cyanophyta	<b>32.40</b>	
Percent Chlorophyta	<b>26.73</b>	Percent Chlorophyta	<b>16.04</b>	
Percent Chrysophyta	<b>22.17</b>	Percent Chrysophyta	<b>48.59</b>	
Percent Cryptophyta	<b>0.76</b>	Percent Cryptophyta	<b>1.36</b>	
Percent Euglenophyta	<b>0.00</b>	Percent Euglenophyta	<b>0.00</b>	
Percent Pyrrhophyta	<b>0.00</b>	Percent Pyrrhophyta	<b>0.00</b>	
Percent Undetermined	<b>0.05</b>	Percent Undetermined	<b>1.61</b>	
*= colony	+=filament			



PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 9/27/2007		SAMPLE STATUS: Lugols preserved		
STATION: center-1m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<i>Anacystis (Aphanothece/Anathece spp.)</i>	400.00	6.28	2,512	
<i>Anacystis (Aphanothece/Anathece spp.)</i>	2,400.00	4.19	10,048	
<i>Chroococcus sp.</i>	16.00	256.43	4,103	
<b>Taxon Subtotal</b>	<b>2816</b>		<b>16,663</b>	
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	10.00	224	2,244	
<i>Ankistrodesmus falcatus</i>	2.00	96	192	
* <i>Botryococcus sp.</i>	2.00	8,205.87	16,412	col<30 um diam
<i>Dictyosphaerium sp.</i>	192.00	113.04	21,704	
* <i>Pediastrum duplex</i>	2.00	6,410.83	12,822	
* <i>Scenedesmus sp.</i>	2.00	256.43	513	4-cell colony
* <i>Scenedesmus sp.</i>	2.00	732.67	1,465	4-cell colony
<i>Tetraedron sp.</i>	2.00	3,360.00	6,720	
colonial (sph) nannoplktn	48.00	47.69	2,289	
unicell (sph) nannoplktn	6.00	904.32	5,426	dense cell
<b>Taxon Subtotal</b>	<b>268.00</b>		<b>69,786</b>	
<b>Chrysophyta</b>				
<i>Dinobryon sociale</i>	200.00	593.46	118,692	
<i>Dinobryon bavaricum</i>	20.00	457.92	9,158	
<i>Dinobryon divergens</i>	100.00	636.37	63,637	
<i>Mallomonas sp.</i>	2.00	2,712.96	5,426	
filamentous chrysophyte	116.00	621.72	72,120	
chrysophyte (flagel-unicell)	154.00	179.50	27,644	ovoid cell
chrysophyte (flagel-unicell)	2.00	4,069.44	8,139	long flagellum
chrysophyte (flagel-unicell)	66.00	791.28	52,224	
<b>Bacillariophyceae</b>				
<i>Asterionella formosa</i>	768.00	450.00	345,600	
<i>Cocconeis sp.</i>	2.00	1,099.00	2,198	
<i>Cyclotella sp.</i>	6.00	769.30	4,616	
<i>Fragilaria crotonensis</i>	160.00	604.80	96,768	
<i>Melosira sp.</i>	294.00	2,355.00	692,370	some w/term spines
<i>Nitzschia sp.</i>	2.00	16,200.00	32,400	
<i>Synedra sp.</i>	24.00	224.38	5,385	
<i>Synedra sp.</i>	2.00	307.72	615	
undet pennate diatom	2.00	2,260.80	4,522	
<b>Taxon Subtotal</b>	<b>1920</b>		<b>1,541,514</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas +spp.</i>	60.00	2,461.76	147,706	
cryptomonad	42.00	777.15	32,640	
<i>Rhodomonas sp.</i>	22.00	141.30	3,109	
<b>Taxon Subtotal</b>	<b>124.00</b>		<b>183,455</b>	
<b>Euglenophyta</b>				
<b>Pyrrhophyta</b>				
<b>Undetermined</b>				
* undeter colony	24.00	20,347.20	488,333	rough col investment
<b>Taxon Subtotal</b>	<b>24.00</b>		<b>488,333</b>	
			(um <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
<b>Total Number/ml</b>	<b>5152</b>	<b>Total Volume</b>	<b>2,299,751</b>	<b>2.300</b>
Percent Cyanophyta	54.66	Percent Cyanophyta	0.72	
Percent Chlorophyta	5.20	Percent Chlorophyta	3.03	
Percent Chrysophyta	37.27	Percent Chrysophyta	67.03	
Percent Cryptophyta	2.41	Percent Cryptophyta	7.98	
Percent Euglenophyta	0.00	Percent Euglenophyta	0.00	
Percent Pyrrhophyta	0.00	Percent Pyrrhophyta	0.00	
Percent Undetermined	0.47	Percent Undetermined	21.23	
*= colony	+ = filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 10/10/2007		SAMPLE STATUS: Lugols preserved		
STATION: center-1m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<i>Anacystis (Aphanothece/Anathece spp.)</i>	1,600.00	4.19	6,699	
<i>Coelosphaerium/Snowella spp. asmblg</i>	160.00	22.44	3,590	cells @col edge;fibrils?
<b>Taxon Subtotal</b>	<b>1760</b>		<b>10,289</b>	
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	6.00	224	1,346	
* <i>Botryococcus sp.</i>	4.00	27,694.80	110,779	col<40 um diam
* <i>Crucigenia quadrata</i>	2.00	314.00	628	4-cell colony
<i>Quadrigula sp.</i>	4.00	326.56	1,306	
* <i>Scenedesmus bijuga</i>	2.00	401.92	804	4-cell colony
colonial (sph) nannoplktn	32.00	65.42	2,093	quad arranged col
colonial (sph) nannoplktn	64.00	47.69	3,052	
colonial (sph) nannoplktn	16.00	267.95	4,287	cell pairs
unicell (sph) nannoplktn	20.00	904.32	18,086	some w/lt mucous sheath
<b>Taxon Subtotal</b>	<b>150.00</b>		<b>142,383</b>	
<b>Chrysophyta</b>				
<i>Dinobryon sociale</i>	1,900.00	732.67	1,392,067	
<i>Dinobryon divergens</i>	120.00	636.37	76,365	
<i>Mallomonas sp.</i>	4.00	2,863.68	11,455	
<i>Rhizochrysis sp.</i>	2.00	4,823.04	9,646	
filamentous chrysophyte	82.00	621.72	50,981	
chrysophyte (flagel-unicell)	88.00	179.50	15,796	ovoid cell
chrysophyte (flagel-unicell)	40.00	863.50	34,540	
chrysophyte (flagel-unicell)	12.00	4,186.67	50,240	
chrysophyte (flagel-unicell)	110.00	791.28	87,041	
Bacillariophyceae				
<i>Asterionella formosa</i>	960.00	450.00	432,000	
<i>Cyclotella sp.</i>	2.00	452.16	904	
<i>Cyclotella sp.</i>	6.00	883.13	5,299	
<i>Fragilaria crotonensis</i>	60.00	604.80	36,288	
<i>Melosira sp.</i>	75.00	1,153.95	86,546	
<i>Melosira sp.</i>	20.00	3,384.92	67,698	
<i>Pinnularia/Rhopalodia spp.asmblg</i>	2.00	4,396.00	8,792	
<i>Synedra sp.</i>	2.00	410.29	821	
<b>Taxon Subtotal</b>	<b>3485</b>		<b>2,366,479</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas +spp.</i>	40.00	2,461.76	98,470	
cryptomonad	10.00	777.15	7,772	
<i>Rhodomonas sp.</i>	100.00	129.53	12,953	
<b>Taxon Subtotal</b>	<b>150.00</b>		<b>119,194</b>	
<b>Euglenophyta</b>				
<b>Pyrrhophyta</b>				
<b>Undetermined</b>				
			(µm <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
<b>Total Number/ml</b>	<b>5545</b>	<b>Total Volume</b>	<b>2,638,344</b>	<b>2.638</b>
Percent Cyanophyta	31.74	Percent Cyanophyta	0.39	
Percent Chlorophyta	2.71	Percent Chlorophyta	5.40	
Percent Chrysophyta	62.85	Percent Chrysophyta	89.70	
Percent Cryptophyta	2.71	Percent Cryptophyta	4.52	
Percent Euglenophyta	0.00	Percent Euglenophyta	0.00	
Percent Pyrrhophyta	0.00	Percent Pyrrhophyta	0.00	
Percent Undetermined	0.00	Percent Undetermined	0.00	
*= colony	+=filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 11/27/2007		SAMPLE STATUS: Lugols preserved		
STATION: center-1m		NOTE:		
Taxon	Cells/ml	$\mu\text{m}^3/\text{cell}$	$\mu\text{m}^3/\text{ml}$	comments
<b>Cyanophyta</b>				
+ <i>Oscillatoria sp.</i>	1.00	1,717.19	1,717	threadlike filaments
<b>Taxon Subtotal</b>	<b>1</b>		<b>1,717</b>	
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	44.00	288	12,693	
* <i>Botryococcus sp.</i>	2.00	8,205.87	16,412	col<30 um diam
<i>Cosmarium sp.</i>	2.00	1,570.00	3,140	
<i>Pandorina sp.</i>	32.00	886.53	28,369	
<i>Quadrigula sp.</i>	8.00	251.20	2,010	
* <i>Scenedesmus sp.</i>	2.00	256.43	513	4-cell colony
colonial (sph) nannoplktn	16.00	150.46	2,407	
unicell (sph) nannoplktn	20.00	904.32	18,086	some w/lt mucous sheath
<b>Taxon Subtotal</b>	<b>126.00</b>		<b>83,630</b>	
<b>Chrysophyta</b>				
<i>Dinobryon sociale</i>	2,200.00	732.67	1,611,867	
<i>Mallomonas sp.</i>	6.00	1,646.41	9,878	
<i>Mallomonas sp.</i>	4.00	3,360.85	13,443	
filamentous chrysophyte	60.00	621.72	37,303	
chrysophyte (flagel-unicell)	275.00	179.50	49,363	ovoid cell
chrysophyte (flagel-unicell)	22.00	4,186.67	92,107	
chrysophyte (flagel-unicell)	132.00	791.28	104,449	
<b>Bacillariophyceae</b>				
<i>Asterionella formosa</i>	8.00	450.00	3,600	
<i>Cyclotella sp.</i>	44.00	452.16	19,895	
<i>Fragilaria crotonensis</i>	10.00	604.80	6,048	
<i>Melosira sp.</i>	22.00	1,000.09	22,002	
<i>Melosira sp.</i>	24.00	7,536.00	180,864	
<i>Synedra sp.</i>	2.00	224.38	449	
<b>Taxon Subtotal</b>	<b>2809</b>		<b>2,151,269</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas +spp.</i>	165.00	2,461.76	406,190	
<i>Cryptomonas sp. (large)</i>	2.00	12,572.56	25,145	
small cryptomonad	20.00	423.90	8,478	
cryptomonad	44.00	777.15	34,195	
<i>Rhodomonas sp.</i>	220.00	141.30	31,086	
<b>Taxon Subtotal</b>	<b>451.00</b>		<b>505,094</b>	
<b>Euglenophyta</b>				
<b>Pyrrhophyta</b>				
small dinoflagellate	2.00	6,123.00	12,246	
<b>Taxon Subtotal</b>	<b>2.00</b>		<b>12,246</b>	
<b>Undetermined</b>				
			( $\mu\text{m}^3/\text{ml}$ )	( $\text{mm}^3/\text{L}$ )
<b>Total Number/ml</b>	<b>3389</b>	<b>Total Volume</b>	<b>2,753,956</b>	<b>2.754</b>
Percent Cyanophyta	0.03	Percent Cyanophyta	0.06	
Percent Chlorophyta	3.72	Percent Chlorophyta	3.04	
Percent Chrysophyta	82.89	Percent Chrysophyta	78.12	
Percent Cryptophyta	13.31	Percent Cryptophyta	18.34	
Percent Euglenophyta	0.00	Percent Euglenophyta	0.00	
Percent Pyrrhophyta	0.06	Percent Pyrrhophyta	0.44	
Percent Undetermined	0.00	Percent Undetermined	0.00	
*= colony	+=filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 12/19/2007		SAMPLE STATUS: Lugols preserved		
STATION: center-1m		NOTE:		
Taxon	Cells/ml	$\mu\text{m}^3/\text{cell}$	$\mu\text{m}^3/\text{ml}$	comments
<b>Cyanophyta</b>				
+ <i>Oscillatoria sp.</i>	2.00	1,758.40	3,517	
+ <i>Oscillatoria sp.</i>	2.00	343.44	687	threadlike filaments
<b>Taxon Subtotal</b>	<b>4</b>		<b>4,204</b>	
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	22.00	279	6,129	
<i>Ankistrodesmus falcatus</i>	8.00	135	1,077	
* <i>Botryococcus sp.</i>	2.00	2,930.67	5,861	col<20 $\mu\text{m}$ diam
* <i>Crucigenia quadrata</i>	2.00	615.44	1,231	4-cell colony
<i>Quadrigula sp.</i>	4.00	326.56	1,306	
colonial (sph) nannoplktn	8.00	267.95	2,144	cell pairs
unicell (sph) nannoplktn	16.00	1,436.03	22,976	dense cell
<b>Taxon Subtotal</b>	<b>62.00</b>		<b>40,725</b>	
<b>Chrysophyta</b>				
<i>Mallomonas sp.</i>	2.00	1,519.76	3,040	
filamentous chrysophyte	58.00	621.72	36,060	
chrysophyte (flagel-unicell)	110.00	179.50	19,745	ovoid cell
chrysophyte (flagel-unicell)	2.00	5,086.80	10,174	long flagellum
chrysophyte (flagel-unicell)	2.00	2,411.52	4,823	
chrysophyte (flagel-unicell)	330.00	791.28	261,122	
Bacillariophyceae				
<i>Asterionella formosa</i>	24.00	450.00	10,800	
<i>Cocconeis sp.</i>	2.00	1,099.00	2,198	
<i>Cyclotella sp.</i>	2.00	2,198.00	4,396	
<i>Cyclotella sp.</i>	40.00	663.33	26,533	
<i>Fragilaria crotonensis</i>	50.00	604.80	30,240	
<i>Melosira sp.</i>	35.00	4,823.04	168,806	
<i>Synedra ulna</i>	1.00	19,600.00	19,600	
<i>Synedra sp.</i>	2.00	410.29	821	
<i>Suirella sp.</i>	1.00	162,476.16	162,476	
undet pennate diatom	2.00	1,130.40	2,261	
<b>Taxon Subtotal</b>	<b>663</b>		<b>763,095</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas +spp.</i>	68.00	2,461.76	167,400	
cryptomonad	12.00	777.15	9,326	
<i>Rhodomonas sp.</i>	66.00	141.30	9,326	
<b>Taxon Subtotal</b>	<b>146.00</b>		<b>186,051</b>	
<b>Euglenophyta</b>				
<i>Trachelomonas sp.(ell)</i>	2.00	9,905.65	19,811	
<b>Taxon Subtotal</b>	<b>2</b>		<b>19,811</b>	
<b>Pyrrhophyta</b>				
<b>Undetermined</b>				
			( $\mu\text{m}^3/\text{ml}$ )	( $\text{mm}^3/\text{L}$ )
<b>Total Number/ml</b>	<b>877</b>	<b>Total Volume</b>	<b>1,013,885</b>	<b>1.014</b>
Percent Cyanophyta	0.46	Percent Cyanophyta	0.41	
Percent Chlorophyta	7.07	Percent Chlorophyta	4.02	
Percent Chrysophyta	75.60	Percent Chrysophyta	75.26	
Percent Cryptophyta	16.65	Percent Cryptophyta	18.35	
Percent Euglenophyta	0.23	Percent Euglenophyta	1.95	
Percent Pyrrhophyta	0.00	Percent Pyrrhophyta	0.00	
Percent Undetermined	0.00	Percent Undetermined	0.00	
*= colony	+ = filament			

**Table C-3. Phytoplankton Data for Long Lake Middle Station, 2008.**

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 2/14/2008		SAMPLE STATUS: Lugols preserved		
STATION: center-0.5m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	60.00	430	25,792	
<i>Ankistrodesmus falcatus</i>	30.00	120	3,590	
<i>Closterium</i> sp.	2.00	1,393	2,787	
* <i>Crucigenia quadrata</i>	2.00	615.44	1,231	4-cell colony
* <i>Pandorina/Eudorina</i> spp. asmbig	2.00	8,205.87	16,412	small-cell colonies
<i>Pandorina</i> sp.	192.00	628.00	120,576	
<i>Quadrígula</i> sp.	4.00	251.20	1,005	
<i>Schroederia (Ankyra)</i> sp.	2.00	370.91	742	
colonial (ell) nannoplktn	4.00	273.56	1,094	
colonial (sph) nannoplktn	40.00	65.42	2,617	
colonial (sph) nannoplktn	32.00	523.33	16,747	
colonial (sph) nannoplktn	16.00	2,143.57	34,297	
unicell (sph) nannoplktn	10.00	904.32	9,043	dense cell
unicell (sph) nannoplktn	24.00	3,052.08	73,250	dense cell
<b>Taxon Subtotal</b>	<b>420.00</b>		<b>309,182</b>	
<b>Chrysochyta</b>				
<i>Dinobryon</i> sp.	40.00	1,266.47	50,659	
<i>Mallomonas</i> sp.	6.00	4,308.08	25,848	
<i>Rhizochrysis</i> sp.	6.00	9,420.00	56,520	
filamentous chrysochyte	28.00	621.72	17,408	
colonial chrysochyte	32.00	65.42	2,093	colonies disrupted
chrysochyte (flagel-unicell)	880.00	159.57	140,426	ovoid cell
chrysochyte (flagel-unicell)	440.00	703.36	309,478	lat compres cell;flagel
chrysochyte (flagel-unicell)	33.00	678.24	22,382	
<b>Bacillariophyceae</b>				
<i>Asterionella formosa</i>	2,200.00	450.00	990,000	
<i>Cocconeis</i> sp.	2.00	1,758.40	3,517	
<i>Cyclotella</i> sp.	1,100.00	663.33	729,658	small cells<15µm diam
<i>Fragilaria crotonensis</i>	20.00	504.00	10,080	
<i>Melosira</i> sp.	14.00	1,507.20	21,101	some w/term spines
<i>Melosira</i> sp.	108.00	621.72	67,146	
<i>Synedra ulna</i>	2.00	17,500.00	35,000	
<i>Synedra</i> sp.	2.00	3,052.08	6,104	
<i>Synedra</i> sp.	1.00	2,449.20	2,449	
<i>Synedra</i> sp.	2.00	224.38	449	
<i>Synedra</i> sp.	12.00	410.29	4,924	
undet pennate diatom	2.00	235.50	471	
<b>Taxon Subtotal</b>	<b>4930</b>		<b>2,495,712</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas</i> +spp.	104.00	2,461.76	256,023	
<i>Cryptomonas</i> sp.	2.00	8,704.08	17,408	
<i>Rhodomonas</i> sp.	33.00	141.30	4,663	
<b>Taxon Subtotal</b>	<b>139.00</b>		<b>278,094</b>	
<b>Euglenophyta</b>				
<b>Pyrrhophyta</b>				
small dinoflagellate	2.00	5,714.80	11,430	
dinoflagellate	4.00	11,869.20	47,477	
<b>Taxon Subtotal</b>	<b>6.00</b>		<b>58,906</b>	
<b>Undetermined</b>				
			(µm <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
<b>Total Number/ml</b>	<b>5495</b>	<b>Total Volume</b>	<b>3,141,895</b>	<b>3.142</b>
Percent Cyanophyta	0.00	Percent Cyanophyta	0.00	
Percent Chlorophyta	7.64	Percent Chlorophyta	9.84	
Percent Chrysochyta	89.72	Percent Chrysochyta	79.43	
Percent Cryptophyta	2.53	Percent Cryptophyta	8.85	
Percent Euglenophyta	0.00	Percent Euglenophyta	0.00	
Percent Pyrrhophyta	0.11	Percent Pyrrhophyta	1.87	
Percent Undetermined	0.00	Percent Undetermined	0.00	
*= colony	+=filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 3/13/2008		SAMPLE STATUS: Lugols preserved		
STATION: center-1m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	10.00	120	1,197	
* <i>Pandorina/Eudorina spp. asmbig</i>	2.00	7,075.47	14,151	small-cell colonies
colonial (ell) nannoplktn	32.00	150.72	4,823	cell pairs
colonial (sph) nannoplktn	28.00	523.33	14,653	
colonial (sph) nannoplktn	32.00	301.44	9,646	
unicell (sph) nannoplktn	16.00	2,143.57	34,297	dense cell
<b>Taxon Subtotal</b>	<b>120.00</b>		<b>78,767</b>	
<b>Chrysophyta</b>				
<i>Dinobryon sp.</i>	40.00	994.33	39,773	
<i>Rhizochrysis sp.</i>	2.00	5,425.92	10,852	
filamentous chrysophyte	20.00	621.72	12,434	
chrysophyte (flagel-unicell)	1,100.00	159.57	175,532	ovoid cell
chrysophyte (flagel-unicell)	264.00	703.36	185,687	lat compres cell;flagel
chrysophyte (flagel-unicell)	10.00	7,234.56	72,346	rough cell wall
<b>Bacillariophyceae</b>				
<i>Asterionella formosa</i>	3,520.00	450.00	1,584,000	
<i>Cocconeis sp.</i>	4.00	1,758.40	7,034	
<i>Cyclotella sp.</i>	22.00	663.33	14,593	small cells<15um diam
<i>Melosira sp.</i>	156.00	706.50	110,214	
<i>Rhizosolenia sp.</i>	300.00	1,962.50	588,750	delicate cells w/long spines
<i>Synedra ulna</i>	2.00	12,600.00	25,200	
<i>Synedra sp.</i>	84.00	1,798.96	151,113	
<i>Synedra sp.</i>	2.00	224.38	449	
<i>Synedra sp.</i>	2.00	410.29	821	
undet pennate diatom	2.00	457.92	916	
undet pennate diatom	2.00	209.33	419	
<b>Taxon Subtotal</b>	<b>5532</b>		<b>2,980,132</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas +spp.</i>	220.00	2,461.76	541,587	
cryptomonad	24.00	777.15	18,652	
<i>Rhodomonas sp.</i>	33.00	141.30	4,663	
<b>Taxon Subtotal</b>	<b>277.00</b>		<b>564,902</b>	
<b>Euglenophyta</b>				
<b>Pyrrhophyta</b>				
small dinoflagellate	2.00	3,108.60	6,217	
small dinoflagellate	4.00	5,714.80	22,859	
<b>Taxon Subtotal</b>	<b>6.00</b>		<b>29,076</b>	
<b>Undetermined</b>				
			(um <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
<b>Total Number/ml</b>	<b>5935</b>	<b>Total Volume</b>	<b>3,652,877</b>	<b>3.653</b>
Percent Cyanophyta	0.00	Percent Cyanophyta	0.00	
Percent Chlorophyta	2.02	Percent Chlorophyta	2.16	
Percent Chrysophyta	93.21	Percent Chrysophyta	81.58	
Percent Cryptophyta	4.67	Percent Cryptophyta	15.46	
Percent Euglenophyta	0.00	Percent Euglenophyta	0.00	
Percent Pyrrhophyta	0.10	Percent Pyrrhophyta	0.80	
Percent Undetermined	0.00	Percent Undetermined	0.00	
*= colony	+=filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 4/24/2008		SAMPLE STATUS: Lugols preserved		
STATION: center-1m		NOTE:		
Taxon	Cells/ml	$\mu\text{m}^3/\text{cell}$	$\mu\text{m}^3/\text{ml}$	comments
<b>Cyanophyta</b>				
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	2.00	171	342	
<i>Cosmarium sp.</i>	2.00	6,154.40	12,309	coarse,punctate wall
<i>Eudorina sp.</i>	64.00	523.33	33,493	
<i>Pandorina/Eudorina spp. asmblg</i>	32.00	334.93	10,718	colonies collapsed
* <i>Scenedesmus sp.</i>	2.00	593.46	1,187	4-cell colony
undet green filament	7.00	392.50	2,748	
colonial (ell) nannoplktn	16.00	205.15	3,282	cell pairs
unicell (sph) nannoplktn	22.00	1,436.03	31,593	mucous sheath
unicell (sph) nannoplktn	44.00	3,052.08	134,292	faint mucous sheath
<b>Taxon Subtotal</b>	<b>191.00</b>		<b>229,963</b>	
<b>Chrysophyta</b>				
<i>Dinobryon sociale</i>	1,100.00	732.67	805,933	
<i>Dinobryon divergens</i>	50.00	669.87	33,493	
<i>Mallomonas sp.</i>	220.00	1,519.76	334,347	
<i>Rhizochrysis sp.</i>	11.00	7,075.47	77,830	
filamentous chrysophyte	128.00	621.72	79,580	
chrysophyte (flagel-unicell)	495.00	159.57	78,990	ovoid cell
chrysophyte (flagel-unicell)	66.00	3,391.20	223,819	
chrysophyte (flagel-unicell)	55.00	678.24	37,303	
Bacillariophyceae				
<i>Asterionella formosa</i>	18,040.00	525.00	9,471,000	
<i>Melosira sp.</i>	120.00	628.00	75,360	
<i>Melosira varians</i>	2.00	7,121.52	14,243	large cell
<i>Synedra sp.</i>	1.00	2,093.33	2,093	<i>S. acus-like</i>
<i>Synedra sp.</i>	1.00	410.29	410	
undet pennate diatom	1.00	569.91	570	
<b>Taxon Subtotal</b>	<b>20290</b>		<b>11,234,973</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas sp.</i>	66.00	1,036.20	68,389	
<i>Cryptomonas +spp.</i>	165.00	2,461.76	406,190	
<i>Cryptomonas sp.</i>	33.00	5,934.60	195,842	
<i>Rhodomonas sp.</i>	100.00	141.30	14,130	
<b>Taxon Subtotal</b>	<b>364.00</b>		<b>684,551</b>	
<b>Euglenophyta</b>				
<i>Trachelomonas sp.(ell)</i>	1.00	8,440.32	8,440	
<i>Trachelomonas volvocina</i>	1.00	2,571.14	2,571	smooth wall
<b>Taxon Subtotal</b>	<b>2</b>		<b>11,011</b>	
<b>Pyrrhophyta</b>				
<b>Undetermined</b>				
			( $\mu\text{m}^3/\text{ml}$ )	( $\text{mm}^3/\text{L}$ )
<b>Total Number/ml</b>	<b>20847</b>	<b>Total Volume</b>	<b>12,160,498</b>	<b>12.160</b>
Percent Cyanophyta	0.00	Percent Cyanophyta	0.00	
Percent Chlorophyta	0.92	Percent Chlorophyta	1.89	
Percent Chrysophyta	97.33	Percent Chrysophyta	92.39	
Percent Cryptophyta	1.75	Percent Cryptophyta	5.63	
Percent Euglenophyta	0.01	Percent Euglenophyta	0.09	
Percent Pyrrhophyta	0.00	Percent Pyrrhophyta	0.00	
Percent Undetermined	0.00	Percent Undetermined	0.00	
*= colony	+=filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 5/22/2008		SAMPLE STATUS: Lugols preserved		
STATION: center-0.5m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<i>Anabaena sp.</i>	120.00	91.58	10,990	short crimped coils
<b>Taxon Subtotal</b>	<b>120</b>		<b>10,990</b>	
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	2.00	120	239	
<i>Cosmarium sp.</i>	14.00	1,884.00	26,376	
<i>Dictyosphaerium sp.</i>	96.00	87.07	8,359	
* <i>Oocystis sp.</i>	2.00	2,051.47	4,103	
<i>Oocystis sp.</i>	4.00	635.85	2,543	small colonies
<i>Quadrigula sp.</i>	4.00	251.20	1,005	
<i>Schroederia (Ankyra) sp.</i>	2.00	251.20	502	
colonial (sph) nannoplktn	16.00	113.04	1,809	cell pairs/quads
unicell (sph) nannoplktn	2.00	904.32	1,809	
<b>Taxon Subtotal</b>	<b>142.00</b>		<b>46,745</b>	
<b>Chrysophyta</b>				
<i>Dinobryon sociale</i>	400.00	732.67	293,067	
<i>Dinobryon divergens</i>	20.00	669.87	13,397	
<i>Rhizochrysis sp.</i>	10.00	2,930.67	29,307	
filamentous chrysophyte	40.00	621.72	24,869	
chrysophyte (flagel-unicell)	330.00	159.57	52,660	ovoid cell
chrysophyte (flagel-unicell)	11.00	703.36	7,737	lat compres cell;flagel
chrysophyte (flagel-unicell)	132.00	678.24	89,528	
Bacillariophyceae				
<i>Asterionella formosa</i>	880.00	525.00	462,000	
<i>Cyclotella sp.</i>	2.00	1,205.76	2,412	
<i>Fragilaria crotonensis</i>	20.00	990.00	19,800	
<i>Melosira sp.</i>	88.00	4,923.52	433,270	some w/term spines
<i>Melosira sp.</i>	48.00	678.24	32,556	
<i>Nitzschia sp.</i>	2.00	824.25	1,649	
<i>Synedra sp.</i>	1.00	1,570.00	1,570	<i>S. acus-like</i>
<i>Synedra sp.</i>	4.00	824.25	3,297	
<i>Synedra sp.</i>	2.00	211.56	423	
<i>Synedra sp.</i>	2.00	329.70	659	
<i>Synedra sp.</i>	2.00	359.01	718	
undet pennate diatom	1.00	569.91	570	
<b>Taxon Subtotal</b>	<b>1995</b>		<b>1,469,487</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas +spp.</i>	16.00	2,461.76	39,388	
<i>Cryptomonas sp.</i>	2.00	5,652.00	11,304	
cryptomonad	16.00	777.15	12,434	
<i>Rhodomonas sp.</i>	33.00	141.30	4,663	
<b>Taxon Subtotal</b>	<b>67.00</b>		<b>67,789</b>	
<b>Euglenophyta</b>				
<i>Euglena sp.</i>	2.00	3,461.85	6,924	
<i>Trachelomonas sp.(ell)</i>	2.00	6,585.63	13,171	
<i>Trachelomonas volvocina</i>	4.00	2,571.14	10,285	smooth wall
<i>Trachelomonas sp.(sph)</i>	2.00	696.56	1,393	tiny cell;smooth wall
<b>Taxon Subtotal</b>	<b>10</b>		<b>31,773</b>	
<b>Pyrrhophyta</b>				
dinoflagellate	8.00	21,100.80	168,806	
<b>Taxon Subtotal</b>	<b>8.00</b>		<b>168,806</b>	
<b>Undetermined</b>				
undeter unicell	6.00	27,129.60	162,778	dense ovate cell
<b>Taxon Subtotal</b>	<b>6.00</b>		<b>162,778</b>	
			(µm <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
<b>Total Number/ml</b>	<b>2348</b>	<b>Total Volume</b>	<b>1,958,367</b>	<b>1.958</b>
Percent Cyanophyta	5.11	Percent Cyanophyta	0.56	
Percent Chlorophyta	6.05	Percent Chlorophyta	2.39	
Percent Chrysophyta	84.97	Percent Chrysophyta	75.04	
Percent Cryptophyta	2.85	Percent Cryptophyta	3.46	
Percent Euglenophyta	0.43	Percent Euglenophyta	1.62	
Percent Pyrrhophyta	0.34	Percent Pyrrhophyta	8.62	
Percent Undetermined	0.26	Percent Undetermined	8.31	
*= colony	+=filament			



PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 6/5/2008		SAMPLE STATUS: Lugols preserved		
STATION: center-0.5m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<i>Anabaena sp.</i>	100.00	91.58	9,158	short crimped coils
<i>Anacystis (Aphanothece/Anathece spp.)</i>	400.00	6.28	2,512	
<i>Anacystis (Aphanothece/Anathece spp.)</i>	200.00	4.19	837	
<i>Chroococcus sp.</i>	8.00	256.43	2,051	
<i>Coelosphaerium/Snowella spp. asmblg</i>	80.00	22.44	1,795	cells @col edge:fibrils?
<b>Taxon Subtotal</b>	<b>788</b>		<b>16,354</b>	
<b>Chlorophyta</b>				
* <i>Botryococcus sp.</i>	4.00	9,420.00	37,680	col<30 um diam
<i>Crucigenia sp.</i>	8.00	263.76	2,110	
<i>Dictyosphaerium sp.</i>	192.00	87.07	16,717	
* <i>Oocystis sp.</i>	6.00	2,051.47	12,309	
<i>Oocystis sp.</i>	16.00	678.24	10,852	small colonies
* <i>Pediastrum sp.</i>	2.00	1,177.50	2,355	
* <i>Scenedesmus sp.</i>	2.00	2,051.47	4,103	4-cell colony
* <i>Scenedesmus sp.</i>	6.00	593.46	3,561	4-cell colony
<i>Schroederia (Ankyra) sp.</i>	10.00	167.47	1,675	
<i>Tetraedron sp.</i>	2.00	1,311.98	2,624	
<i>Tetraedron limneticum</i>	2.00	8,138.88	16,278	
undet green filament	21.00	392.50	8,243	
colonial (sph) nannoplktn	80.00	65.42	5,233	
colonial (sph) nannoplktn	8.00	523.33	4,187	
unicell (sph) nannoplktn	16.00	1,149.76	18,396	
unicell (sph) nannoplktn	2.00	3,052.08	6,104	faint mucous sheath
<b>Taxon Subtotal</b>	<b>377.00</b>		<b>152,426</b>	
<b>Chrysophyta</b>				
<i>Dinobryon sociale</i>	100.00	732.67	73,267	
<i>Dinobryon divergens</i>	120.00	669.87	80,384	
<i>Gloeobotrys sp.</i>	16.00	113.04	1,809	cells disrupted
<i>Mallomonas sp.</i>	2.00	1,393.11	2,786	
filamentous chrysophyte	134.00	621.72	83,310	
chrysophyte (flagel-unicell)	308.00	159.57	49,149	ovoid cell
chrysophyte (flagel-unicell)	6.00	2,154.04	12,924	long flagellum
chrysophyte (flagel-unicell)	2.00	2,143.57	4,287	
chrysophyte (flagel-unicell)	132.00	678.24	89,528	
Bacillariophyceae				
<i>Asterionella formosa</i>	32.00	487.50	15,600	
<i>Melosira sp.</i>	52.00	904.32	47,025	
<i>Melosira sp.</i>	230.00	2,198.00	505,540	
<i>Rhizosolenia sp.</i>	2.00	8,077.65	16,155	delicate cells w/long spines
<i>Synedra sp.</i>	2.00	90.67	181	
<i>Synedra sp.</i>	4.00	224.38	898	
<i>Synedra sp.</i>	4.00	320.54	1,282	
<b>Taxon Subtotal</b>	<b>1146</b>		<b>984,125</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas sp.</i>	60.00	1,582.56	94,954	
<i>Cryptomonas sp.</i>	4.00	5,652.00	22,608	
cryptomonad	187.00	777.15	145,327	
<i>Rhodomonas sp.</i>	66.00	129.53	8,549	
<b>Taxon Subtotal</b>	<b>317.00</b>		<b>271,437</b>	
<b>Euglenophyta</b>				
<i>Euglena sp.</i>	2.00	1,780.38	3,561	
<i>Trachelomonas sp. (ell)</i>	2.00	5,024.00	10,048	
<b>Taxon Subtotal</b>	<b>4</b>		<b>13,609</b>	
<b>Pyrrhophyta</b>				
small dinoflagellate	6.00	1,582.56	9,495	
small dinoflagellate	10.00	4,144.80	41,448	
<b>Taxon Subtotal</b>	<b>16.00</b>		<b>50,943</b>	
<b>Undetermined</b>				
			(µm <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
<b>Total Number/ml</b>	<b>2648</b>	<b>Total Volume</b>	<b>1,488,895</b>	<b>1.489</b>
Percent Cyanophyta	29.76	Percent Cyanophyta	1.10	
Percent Chlorophyta	14.24	Percent Chlorophyta	10.24	
Percent Chrysophyta	43.28	Percent Chrysophyta	66.10	
Percent Cryptophyta	11.97	Percent Cryptophyta	18.23	
Percent Euglenophyta	0.15	Percent Euglenophyta	0.91	
Percent Pyrrhophyta	0.60	Percent Pyrrhophyta	3.42	
Percent Undetermined	0.00	Percent Undetermined	0.00	
*= colony	+=filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 6/17/2008		SAMPLE STATUS: Lugols preserved		
STATION: center-1m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<i>Anabaena sp.</i>	200.00	91.58	18,317	short crimped coils
<i>Anacystis (Aphanothece/Anathece spp.)</i>	80.00	6.28	502	
<i>Anacystis (Aphanothece/Anathece spp.)</i>	100.00	4.19	419	
<i>Chroococcus sp.</i>	4.00	1,436.03	5,744	
<i>Chroococcus sp.</i>	16.00	256.43	4,103	
<i>Coelosphaerium/Snowella spp. asmbig</i>	200.00	22.44	4,488	cells @col edge;fibrils?
<b>Taxon Subtotal</b>	<b>600</b>		<b>33,572</b>	
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	10.00	120	1,197	
* <i>Botryococcus sp.</i>	2.00	2,930.67	5,861	col<20 um diam
* <i>Botryococcus sp.</i>	2.00	27,694.80	55,390	col<40 um diam
* <i>Crucigenia quadrata</i>	2.00	615.44	1,231	4-cell colony
<i>Dictyosphaerium sp.</i>	96.00	87.07	8,359	
<i>Oocystis sp.</i>	40.00	837.33	33,493	small colonies
<i>Quadrigula sp.</i>	4.00	226.08	904	
* <i>Scenedesmus sp.</i>	2.00	307.72	615	4-cell colony
* <i>Scenedesmus sp.</i>	4.00	837.33	3,349	4-cell colony
undet green filament	80.00	508.68	40,694	
colonial (sph) nannoplktn	32.00	65.42	2,093	
colonial (sph) nannoplktn	32.00	113.04	3,617	cell pairs
unicell (sph) nannoplktn	6.00	1,149.76	6,899	
<b>Taxon Subtotal</b>	<b>312.00</b>		<b>163,703</b>	
<b>Chrysophyta</b>				
<i>Dinobryon sociale</i>	300.00	732.67	219,800	
<i>Dinobryon bavaricum</i>	40.00	392.50	15,700	
<i>Dinobryon divergens</i>	1,100.00	669.87	736,853	
<i>Rhizochrysis sp.</i>	2.00	7,075.47	14,151	
filamentous chrysophyte	128.00	621.72	79,580	
chrysophyte (flagel-unicell)	4,235.00	159.57	675,799	ovoid cell
chrysophyte (flagel-unicell)	11.00	5,572.45	61,297	
chrysophyte (flagel-unicell)	154.00	678.24	104,449	
Bacillariophyceae				
<i>Asterionella formosa</i>	32.00	525.00	16,800	
<i>Cyclotella sp.</i>	2.00	663.33	1,327	small cells<15um diam
<i>Fragilaria crotonensis</i>	60.00	990.00	59,400	
<i>Melosira sp.</i>	75.00	1,780.38	133,529	
<i>Synedra sp.</i>	2.00	126.93	254	
<i>Synedra sp.</i>	2.00	224.38	449	
<i>Synedra sp.</i>	68.00	288.49	19,617	stellate col
undet pennate diatom	2.00	1,465.33	2,931	
<b>Taxon Subtotal</b>	<b>6213</b>		<b>2,141,935</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas +spp.</i>	220.00	2,461.76	541,587	
<i>Cryptomonas sp.</i>	22.00	5,652.00	124,344	
cryptomonad	176.00	777.15	136,778	
<i>Rhodomonas sp.</i>	66.00	141.30	9,326	
<b>Taxon Subtotal</b>	<b>484.00</b>		<b>812,035</b>	
<b>Euglenophyta</b>				
<i>Trachelomonas sp.(ell)</i>	2.00	6,280.00	12,560	
<i>Trachelomonas volvocina</i>	2.00	2,571.14	5,142	smooth wall
<b>Taxon Subtotal</b>	<b>4</b>		<b>17,702</b>	
<b>Pyrrhophyta</b>				
small dinoflagellate	12.00	1,582.56	18,991	
small dinoflagellate	10.00	4,490.20	44,902	
dinoflagellate	2.00	13,564.80	27,130	embedded in mucous
<b>Taxon Subtotal</b>	<b>24.00</b>		<b>91,022</b>	
<b>Undetermined</b>				
* undeter colony	6.00	20,347.20	122,083	rough col investment
<b>Taxon Subtotal</b>	<b>6.00</b>		<b>122,083</b>	
			(um <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
<b>Total Number/ml</b>	<b>7643</b>	<b>Total Volume</b>	<b>3,382,054</b>	<b>3.382</b>
Percent Cyanophyta	7.85	Percent Cyanophyta	0.99	
Percent Chlorophyta	4.08	Percent Chlorophyta	4.84	
Percent Chrysophyta	81.29	Percent Chrysophyta	63.33	
Percent Cryptophyta	6.33	Percent Cryptophyta	24.01	
Percent Euglenophyta	0.05	Percent Euglenophyta	0.52	
Percent Pyrrhophyta	0.31	Percent Pyrrhophyta	2.69	
Percent Undetermined	0.08	Percent Undetermined	3.61	
*= colony	+=filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 7/9/2008		SAMPLE STATUS: Lugols preserved		
STATION: center-1m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<i>Anabaena</i> sp.	20.00	104.67	2,093	short crimped coils
<i>Anacystis</i> ( <i>Aphanothece</i> / <i>Anathece</i> spp.)	8,000.00	4.19	33,493	
<i>Coelosphaerium</i> / <i>Snowella</i> spp. assemblg	1,280.00	22.44	28,721	cells @col edge:fibrils?
+ Oscillatoriaceae	2.00	343.44	687	threadlike filaments
<b>Taxon Subtotal</b>	<b>9302</b>		<b>64,994</b>	
<b>Chlorophyta</b>				
<i>Ankistrodesmus</i> <i>falcatus</i>	4.00	251	1,003	
* <i>Botryococcus</i> sp.	8.00	8,205.87	65,647	col<30 um diam
<i>Botryococcus</i> <i>protuberans</i>	64.00	150.72	9,646	ovoid cell clusters w/fibrils
<i>Characium</i> sp.	2.00	1,172.27	2,345	
<i>Cosmarium</i> sp.	4.00	2,260.80	9,043	
* <i>Crucigenia</i> <i>quadrata</i>	2.00	615.44	1,231	4-cell colony
<i>Dictyosphaerium</i> sp.	192.00	87.07	16,717	
<i>Oocystis</i> sp.	24.00	1,013.17	24,316	small colonies
* <i>Pediastrum</i> sp.	2.00	523.33	1,047	
<i>Quadrigula</i> sp.	32.00	222.55	7,122	
* <i>Scenedesmus</i> sp.	28.00	732.67	20,515	4-cell colony
* <i>Scenedesmus</i> sp.	4.00	837.33	3,349	4-cell colony
<i>Tetraedron</i> <i>regulare</i>	2.00	2,295.00	4,590	
undet green filament	10.00	423.90	4,239	
colonial (ell) nannoplktn	16.00	319.15	5,106	
colonial (ell) nannoplktn	32.00	1,591.98	50,943	clumped cells -Crucigenia sp.?
colonial (sph) nannoplktn	16.00	113.04	1,809	
colonial (sph) nannoplktn	128.00	65.42	8,373	cell pairs/quartets
unicell (sph) nannoplktn	6.00	3,589.54	21,537	
unicell (sph) nannoplktn	4.00	904.32	3,617	
unicell (sph) nannoplktn	2.00	179.50	359	faint mucous sheath
<b>Taxon Subtotal</b>	<b>582.00</b>		<b>262,555</b>	
<b>Chrysophyta</b>				
<i>Dinobryon</i> <i>sociale</i> / <i>sertularia</i> assemblg	100.00	732.67	73,267	
<i>Dinobryon</i> <i>bavaricum</i>	180.00	392.50	70,650	
<i>Dinobryon</i> <i>divergens</i>	400.00	669.87	267,947	
<i>Mallomonas</i> sp.	2.00	4,308.08	8,616	
<i>Mallomonas</i> sp.	6.00	2,476.41	14,858	
<i>Rhizochrysis</i> sp.	2.00	7,075.47	14,151	
Tribonematales	125.00	621.72	77,715	
chrysophyte (flagel-unicell)	330.00	159.57	52,660	ovoid cell
chrysophyte (flagel-unicell)	66.00	791.28	52,224	
Bacillariophyceae				
<i>Asterionella</i> <i>formosa</i>	1,600.00	525.00	840,000	
<i>Cyclotella</i> sp.	2.00	663.33	1,327	small cells<15um diam
<i>Fragilaria</i> sp.	20.00	735.00	14,700	
<i>Fragilaria</i> <i>crotonensis</i>	40.00	604.80	24,192	
<i>Melosira</i> sp.	20.00	1,406.72	28,134	
<i>Rhizosolenia</i> sp.	2.00	5,652.00	11,304	delicate cells w/long spines
<i>Synedra</i> sp.	8.00	192.33	1,539	stellate col
<i>Synedra</i> sp.	2.00	269.26	539	
<b>Taxon Subtotal</b>	<b>2905</b>		<b>1,553,822</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas</i> +spp.	40.00	2,461.76	98,470	
<i>Cryptomonas</i> sp.	4.00	5,934.60	23,738	
small cryptomonad	22.00	452.16	9,948	
cryptomonad	20.00	777.15	15,543	
<i>Rhodomonas</i> sp.	100.00	141.30	14,130	
<b>Taxon Subtotal</b>	<b>186.00</b>		<b>161,829</b>	
<b>Euglenophyta</b>				
<i>Euglena</i> sp.	2.00	25,434.00	50,868	
<i>Euglena</i> sp.	6.00	2,423.30	14,540	
<i>Phacus</i> sp.	2.00	2,449.20	4,898	
<b>Taxon Subtotal</b>	<b>10</b>		<b>70,306</b>	
<b>Pyrrhophyta</b>				
small dinoflagellate	2.00	3,108.60	6,217	
small dinoflagellate	2.00	6,286.28	12,573	
dinoflagellate	2.00	27,299.16	54,598	embedded in mucous
<b>Taxon Subtotal</b>	<b>6.00</b>		<b>73,388</b>	
<b>Undetermined</b>				
<b>Total Number/ml</b>	<b>12991</b>	<b>Total Volume</b>	<b>2,186,895</b>	<b>2.187</b>
Percent Cyanophyta	71.60	Percent Cyanophyta	2.97	
Percent Chlorophyta	4.48	Percent Chlorophyta	12.01	
Percent Chrysophyta	22.36	Percent Chrysophyta	71.05	
Percent Cryptophyta	1.43	Percent Cryptophyta	7.40	
Percent Euglenophyta	0.08	Percent Euglenophyta	3.21	
Percent Pyrrhophyta	0.05	Percent Pyrrhophyta	3.36	
Percent Undetermined	0.00	Percent Undetermined	0.00	
*= colony	+ = filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 7/24/2008		SAMPLE STATUS: Lugols preserved		
STATION: center-1m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<i>Anabaena sp.</i>	50.00	79.48	3,974	short crimped coils
<i>Anabaena sp.</i>	270.00	334.93	90,432	linear compres barrel cells
<i>Anacystis (Aphanothece/Anathece spp.)</i>	400.00	6.28	2,512	
<i>Anacystis (Aphanothece/Anathece spp.)</i>	1,000.00	4.19	4,187	
<i>Chroococcus sp.</i>	8.00	307.72	2,462	
<i>Coelosphaerium/Snowella spp. asmbig</i>	880.00	22.44	19,745	cells @col edge:fibrils?
<i>Snowella spp.</i>	3,300.00	22.44	74,045	cells @col edge;thin fibrils evid
<b>Taxon Subtotal</b>	<b>5908</b>		<b>197,357</b>	
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	22.00	120	2,633	
* <i>Botryococcus sp.</i>	8.00	8,205.87	65,647	col<30 um diam
<i>Crucigenia sp.</i>	24.00	58.61	1,407	4-cell colony
* <i>Crucigenia quadrata</i>	8.00	615.44	4,924	4-cell colony
<i>Kirchneriella sp.</i>	16.00	59	938	
<i>Oocystis sp.</i>	20.00	1,013.17	20,263	small colonies
* <i>Pediastrum Boryanum</i>	2.00	6,280.00	12,560	
* <i>Pediastrum duplex</i>	4.00	2,307.90	9,232	
<i>Quadrigula sp.</i>	12.00	125.60	1,507	
* <i>Scenedesmus sp.</i>	4.00	2,051.47	8,206	4-cell colony
* <i>Scenedesmus sp.</i>	2.00	732.67	1,465	4-cell colony
* <i>Scenedesmus sp.</i>	12.00	334.93	4,019	4-cell colony
<i>Schroederia (Ankyra) sp.</i>	4.00	296.73	1,187	
<i>Spondylosium sp.</i>	4.00	718.01	2,872	
<i>Tetraedron regulare</i>	2.00	2,295.00	4,590	
undet green filament	10.00	423.90	4,239	
colonial (ell) nannoplktn	64.00	50.24	3,215	cell clumps w/fibrils
colonial (ell) nannoplktn	112.00	226.08	25,321	
colonial (sph) nannoplktn	96.00	113.04	10,852	
colonial (sph) nannoplktn	32.00	267.95	8,574	
unicell (sph) nannoplktn	24.00	1,436.03	34,465	
<b>Taxon Subtotal</b>	<b>482.00</b>		<b>228,116</b>	
<b>Chrysophyta</b>				
<i>Dinobryon sociale/sertularia asmbig</i>	800.00	732.67	586,133	
Tribonematales	40.00	621.72	24,869	
chrysophyte (flagel-unicell)	440.00	159.57	70,213	ovoid cell
chrysophyte (flagel-unicell)	6.00	5,572.45	33,435	
chrysophyte (flagel-unicell)	2.00	2,143.57	4,287	
chrysophyte (flagel-unicell)	66.00	791.28	52,224	
Bacillariophyceae				
<i>Asterionella formosa</i>	32.00	525.00	16,800	
<i>Cyclotella sp.</i>	2.00	663.33	1,327	small cells<15um diam
<i>Cyclotella sp.</i>	2.00	2,198.00	4,396	
<i>Fragilaria crotonensis</i>	20.00	604.80	12,096	
<i>Melosira sp.</i>	18.00	471.00	8,478	
<i>Melosira sp.</i>	10.00	2,198.00	21,980	
<i>Synedra sp.</i>	2.00	224.38	449	
<b>Taxon Subtotal</b>	<b>1440</b>		<b>836,687</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas +spp.</i>	8.00	2,461.76	19,694	
cryptomonad	2.00	777.15	1,554	
<i>Rhodomonas sp.</i>	55.00	129.53	7,124	
<b>Taxon Subtotal</b>	<b>65.00</b>		<b>28,372</b>	
<b>Euglenophyta</b>				
<i>Euglena sp.</i>	4.00	2,423.30	9,693	
<i>Trachelomonas sp.(ell)</i>	2.00	5,024.00	10,048	
<i>Trachelomonas volvocina</i>	2.00	2,571.14	5,142	smooth wall
<b>Taxon Subtotal</b>	<b>8</b>		<b>24,883</b>	
<b>Pyrrhophyta</b>				
small dinoflagellate	4.00	2,260.80	9,043	
small dinoflagellate	2.00	6,286.28	12,573	
<b>Taxon Subtotal</b>	<b>6.00</b>		<b>21,616</b>	
<b>Undetermined</b>				
* undeter colony	2.00	15,005.01	30,010	rough col investment
<b>Taxon Subtotal</b>	<b>2.00</b>		<b>30,010</b>	
<b>Total Number/ml</b>	<b>7911</b>	<b>Total Volume</b>	<b>1,367,041</b>	<b>1.367</b>
Percent Cyanophyta	<b>74.68</b>	Percent Cyanophyta	<b>14.44</b>	
Percent Chlorophyta	<b>6.09</b>	Percent Chlorophyta	<b>16.69</b>	
Percent Chrysophyta	<b>18.20</b>	Percent Chrysophyta	<b>61.20</b>	
Percent Cryptophyta	<b>0.82</b>	Percent Cryptophyta	<b>2.08</b>	
Percent Euglenophyta	<b>0.10</b>	Percent Euglenophyta	<b>1.82</b>	
Percent Pyrrhophyta	<b>0.08</b>	Percent Pyrrhophyta	<b>1.58</b>	
Percent Undetermined	<b>0.03</b>	Percent Undetermined	<b>2.20</b>	
*= colony		+=filament		

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 8/7/2008		SAMPLE STATUS: Lugols preserved		
STATION: center-1m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<i>Anabaena</i> sp.	10.00	169.56	1,696	short crimped coils;ellip cells
<i>Anabaena</i> sp.	870.00	368.43	320,531	linear compres barrel cells
<i>Anabaena spiroides</i>	10.00	381.51	3,815	short spiral coils
<i>Anacystis (Aphanothece/Anathece spp.)</i>	200.00	4.19	837	
<i>Chroococcus</i> sp.	4.00	307.72	1,231	
<i>Gomphosphaeria</i> sp.	160.00	25.64	4,103	small col;thick stalks
+ <i>Oscillatoriaceae</i>	2.00	15,825.60	31,651	
<i>Snowella</i> spp.	1,440.00	22.44	32,311	cells @col edge,thin fibrils evid
<b>Taxon Subtotal</b>	<b>2696</b>		<b>396,175</b>	
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	33.00	120	3,949	
* <i>Botryococcus</i> sp.	4.00	8,205.87	32,823	col<30 um diam
* <i>Botryococcus</i> sp.	2.00	6,280.00	12,560	col<20 um diam
<i>Botryococcus protuberans</i>	256.00	78.50	20,096	ovoid cell clusters w/fibrils
<i>Crucigenia</i> sp.	24.00	28.85	692	4-cell colony
* <i>Crucigenia quadrata</i>	48.00	615.44	29,541	4-cell colony
<i>Dictyosphaerium</i> sp.	32.00	87.07	2,786	
<i>Nephrocytium /Kirchneriella spp.asmbig</i>	8.00	263.76	2,110	
<i>Nephrocytium</i> sp.	8.00	847.80	6,782	
<i>Oocystis</i> sp.	12.00	226.08	2,713	
<i>Oocystis</i> sp.	2.00	1,013.17	2,026	small colonies
* <i>Pediastrum Boryanum</i>	4.00	6,280.00	25,120	
* <i>Pediastrum</i> sp.	2.00	256.43	513	
* <i>Pediastrum duplex</i>	2.00	13,083.33	26,167	
<i>Quadrigula</i> sp.	4.00	125.60	502	
<i>Quadrigula</i> sp.	16.00	85.49	1,368	
* <i>Scenedesmus</i> sp.	2.00	2,051.47	4,103	4-cell colony
* <i>Scenedesmus</i> sp.	16.00	256.43	4,103	4-cell colony
<i>Spondyliosium</i> sp.	70.00	718.01	50,261	
<i>Tetraedron regulare</i>	2.00	2,295.00	4,590	
colonial (sph) nannoplktn	64.00	65.42	4,187	
colonial (sph) nannoplktn	32.00	179.50	5,744	cell pairs/quartets
unicell (sph) nannoplktn	4.00	3,589.54	14,358	
<b>Taxon Subtotal</b>	<b>647.00</b>		<b>257,096</b>	
<b>Chrysophyta</b>				
<i>Dinobryon sociale/serularia asmbig</i>	8,800.00	732.67	6,447,467	
Tribonematales	160.00	621.72	99,475	
chrysophyte (flagel-unicell)	264.00	159.57	42,128	ovoid cell
chrysophyte (flagel-unicell)	88.00	678.24	59,685	
<b>Bacillariophyceae</b>				
<i>Fragilaria crotonensis</i>	20.00	604.80	12,096	
<i>Melosira</i> sp.	10.00	2,198.00	21,980	
<i>Synedra</i> sp.	2.00	126.93	254	
<i>Synedra</i> sp.	6.00	224.38	1,346	
undet pennate diatom	2.00	1,465.33	2,931	
undet pennate diatom	2.00	300.92	602	
<b>Taxon Subtotal</b>	<b>9354</b>		<b>6,687,963</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas +spp.</i>	8.00	2,285.92	18,287	
<i>Cryptomonas</i> sp.	2.00	5,934.60	11,869	
small cryptomonad	2.00	452.16	904	
cryptomonad	2.00	777.15	1,554	
<i>Rhodomonas</i> sp.	132.00	141.30	18,652	
<b>Taxon Subtotal</b>	<b>146.00</b>		<b>51,267</b>	
<b>Euglenophyta</b>				
<i>Euglena</i> sp.	2.00	2,423.30	4,847	
<i>Trachelomonas sp.(ell)</i>	2.00	5,861.33	11,723	
<b>Taxon Subtotal</b>	<b>4</b>		<b>16,569</b>	
<b>Pyrrhophyta</b>				
small dinoflagellate	6.00	2,260.80	13,565	
small dinoflagellate	4.00	7,912.80	31,651	
<i>Ceratium hirundinella</i>	1.00	60,000.00	60,000	
<b>Taxon Subtotal</b>	<b>11.00</b>		<b>105,216</b>	
<b>Undetermined</b>				
* undeter colony	16.00	11,304.00	180,864	rough col investment
<b>Taxon Subtotal</b>	<b>16.00</b>		<b>180,864</b>	
			(um <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
<b>Total Number/ml</b>	<b>12874</b>	<b>Total Volume</b>	<b>7,695,150</b>	<b>7.695</b>
Percent Cyanophyta	20.94	Percent Cyanophyta	5.15	
Percent Chlorophyta	5.03	Percent Chlorophyta	3.34	
Percent Chrysophyta	72.66	Percent Chrysophyta	86.91	
Percent Cryptophyta	1.13	Percent Cryptophyta	0.67	
Percent Euglenophyta	0.03	Percent Euglenophyta	0.22	
Percent Pyrrhophyta	0.09	Percent Pyrrhophyta	1.37	
Percent Undetermined	0.12	Percent Undetermined	2.35	
*= colony	+ = filament			

PHYTOPLANKTON					
LONG LAKE (Kitsap Co., WA)					
DATE: 8/27/2008		SAMPLE STATUS: Lugols preserved			
STATION: center-1m		NOTE:			
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments	
<b>Cyanophyta</b>					
<i>Anabaena sp.</i>	100.00	169.56	16,956	short crimped coils;ellip cells	
<i>Anabaena circinalis/spiroides asmbig</i>	210.00	523.33	109,900	loose spirals/coils	
<i>Anabaena sp.</i>	5,040.00	368.43	1,856,870	linear compres barrel cells	
<i>Anabaena spiroides</i>	80.00	696.56	55,725	short spiral coils	
<i>Anacystis (Aphanothece/Anathece spp.)</i>	4,400.00	4.19	18,421		
<i>Chroococcus sp.</i>	16.00	58.61	938		
<i>Gomphosphaeria sp.</i>	160.00	25.64	4,103	small col;thick stalks	
+	Oscillatoriaceae	4.00	1,758.40	7,034	
+	Oscillatoriaceae	44.00	441.56	19,429	threadlike filaments
	<i>Snowella spp.</i>	10,560.00	22.44	236,944	cells @col edge;thin fibrils evd
<b>Taxon Subtotal</b>	<b>20614</b>		<b>2,326,320</b>		
<b>Chlorophyta</b>					
<i>Ankistrodesmus falcatus</i>	55.00	120	6,582		
*	<i>Botryococcus sp.</i>	4.00	40,526.93	162,108	col<45 um diam
	<i>Botryococcus protuberans</i>	320.00	78.50	25,120	ovoid cell clusters w/fibrils
	<i>Closterium sp.</i>	1.00	29,673.00	29,673	
	<i>Crucigenia sp.</i>	32.00	28.85	923	4-cell colony
*	<i>Crucigenia quadrata</i>	40.00	615.44	24,618	4-cell colony
*	<i>Crucigenia tetrapedia</i>	16.00	784.00	12,544	4-cell colony
	<i>Dictyosphaerium sp.</i>	192.00	87.07	16,717	
	<i>Kirchneriella sp.</i>	16.00	50	804	
	<i>Nephroclytium /Kirchneriella spp.asmbig</i>	8.00	263.76	2,110	
	<i>Oocystis sp.</i>	24.00	319.15	7,660	
*	<i>Pediastrum tetras</i>	8.00	769.30	6,154	
*	<i>Pediastrum duplex</i>	2.00	6,410.83	12,822	
	<i>Quadrigula sp.</i>	80.00	251.20	20,096	
	<i>Quadrigula sp.</i>	44.00	136.78	6,018	
*	<i>Scenedesmus sp.</i>	8.00	837.33	6,699	4-cell colony
*	<i>Scenedesmus sp.</i>	2.00	523.33	1,047	4-cell colony
*	<i>Scenedesmus sp.</i>	10.00	256.43	2,564	4-cell colony
*	<i>Scenedesmus arcuatus/bijuga asmbig</i>	2.00	179.50	359	8-cell colony
	<i>Schroederia (Ankya) sp.</i>	8.00	296.73	2,374	
	<i>Spondylosium sp.</i>	60.00	718.01	43,081	
	<i>Staurastrum sp.</i>	4.00	5,838.75	23,355	triangular
	<i>Tetraedron minimum</i>	8.00	720.00	5,760	
	<i>Tetraedron regulare</i>	2.00	2,295.00	4,590	
	colonial (sph) nannoplktn	128.00	65.42	8,373	
	colonial (sph) nannoplktn	176.00	381.51	67,146	cell pairs/quartets
	unicell (sph) nannoplktn	4.00	523.33	2,093	
	unicell (sph) nannoplktn	4.00	1,436.03	5,744	
	unicell (sph) nannoplktn	2.00	904.32	1,809	faint mucous sheath
<b>Taxon Subtotal</b>	<b>1,260.00</b>		<b>508,943</b>		
<b>Chrysophyta</b>					
<i>Dinobryon sociale/sertularia asmbig</i>	400.00	732.67	293,067		
	<i>Dinobryon bavaricum</i>	36.00	392.50	14,130	
	<i>Rhizochrysis sp.</i>	4.00	7,075.47	28,302	
	Tribonematales	525.00	621.72	326,403	
	chrysophyte (flagel-unicell)	440.00	159.57	70,213	ovoid cell
	chrysophyte (flagel-unicell)	4.00	4,832.46	19,330	long flagellum
	chrysophyte (flagel-unicell)	2.00	2,143.57	4,287	
	chrysophyte (flagel-unicell)	2.00	593.46	1,187	
	chrysophyte (flagel-unicell)	165.00	678.24	111,910	
Bacillariophyceae					
	<i>Asterionella formosa</i>	32.00	450.00	14,400	
	<i>Cocconeis sp.</i>	4.00	1,978.20	7,913	
	<i>Epithemia sp.</i>	2.00	3,517	7,034	
	<i>Fragilaria crotonensis</i>	20.00	504.00	10,080	
	<i>Melosira varians</i>	4.00	22,155.84	88,623	large cell
	<i>Melosira sp.</i>	290.00	1,406.72	407,949	
	<i>Synedra sp.</i>	6.00	1,962.50	11,775	<i>S. acus-like</i>
	<i>Synedra sp.</i>	16.00	460.53	7,369	
	<i>Synedra sp.</i>	2.00	126.93	254	
	<i>Synedra sp.</i>	24.00	179.50	4,308	
	<i>Synedra sp.</i>	34.00	224.38	7,629	stellate colonies
<b>Taxon Subtotal</b>	<b>2012</b>		<b>1,436,161</b>		
<b>Cryptophyta</b>					
<i>Cryptomonas sp.</i>	20.00	1,036.20	20,724		
<i>Cryptomonas +spp.</i>	70.00	2,461.76	172,323		
cryptomonad	28.00	777.15	21,760		
<i>Rhodomonas sp.</i>	44.00	141.30	6,217		
<b>Taxon Subtotal</b>	<b>162.00</b>		<b>221,025</b>		
<b>Euglenophyta</b>					
<i>Phacus sp.</i>	8.00	3,108.60	24,869		
<i>Trachelomonas sp.(ell)</i>	4.00	5,652.00	22,608		
<i>Trachelomonas sp.(sph)</i>	4.00	696.56	2,786	tiny cell;smooth wall	
<b>Taxon Subtotal</b>	<b>16</b>		<b>50,263</b>		
<b>Pyrrhophyta</b>					
small dinoflagellate	14.00	7,912.80	110,779		
<b>Taxon Subtotal</b>	<b>14.00</b>		<b>110,779</b>		
			(µm <sup>3</sup> /ml)	(mm <sup>3</sup> /L)	
<b>Total Number/ml</b>	<b>24078</b>	<b>Total Volume</b>	<b>4,653,490</b>	<b>4.653</b>	
Percent Cyanophyta	85.61	Percent Cyanophyta	49.99		
Percent Chlorophyta	5.23	Percent Chlorophyta	10.94		
Percent Chrysophyta	8.36	Percent Chrysophyta	30.86		
Percent Cryptophyta	0.67	Percent Cryptophyta	4.75		
Percent Euglenophyta	0.07	Percent Euglenophyta	1.08		
Percent Pyrrhophyta	0.06	Percent Pyrrhophyta	2.38		
Percent Undetermined	0.00	Percent Undetermined	0.00		
*= colony	+=filament				

PHYTOPLANKTON					
LONG LAKE (Kitsap Co., WA)					
DATE: 9/10/2008		SAMPLE STATUS: Lugols preserved			
STATION: center-1m		NOTE:			
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments	
<b>Cyanophyta</b>					
<i>Anabaena</i> sp.	1,500.00	368.43	552,640	linear compres barrel cells	
<i>Anabaena macrospora</i> (tenta)	50.00	124.34	6,217	ellip cells angular gonidia	
<i>Anabaena spiroides</i>	10.00	696.56	6,966	short spiral coils	
<i>Aphanocapsa</i> sp.	400.00	33.49	13,397	deterior colonies	
<i>Anacystis</i> ( <i>Aphanothece</i> / <i>Anathece</i> spp.)	5,500.00	4.19	23,027		
<i>Chroococcus</i> sp.	88.00	58.61	5,158		
<i>Coelosphaerium</i> / <i>Snowella</i> spp. asmbig	24,200.00	22.44	542,998	cells @col edge fibrils?	
+	Oscillatoriaceae	22.00	1,758.40	38,685	
+	Oscillatoriaceae	11.00	343.44	3,778	threadlike filaments
<b>Taxon Subtotal</b>	<b>31781</b>		<b>1,192,865</b>		
<b>Chlorophyta</b>					
<i>Ankistrodesmus falcatus</i>	11.00	103	1,128		
* <i>Botryococcus</i> sp.	22.00	8,205.87	180,529	col<30 um diam	
<i>Botryococcus protuberans</i>	1,232.00	78.50	96,712	ovoid cell clusters w/fibrils	
<i>Cosmarium</i> sp.	2.00	2,041.00	4,082		
<i>Crucigenia</i> sp.	44.00	28.85	1,269	4-cell colony	
* <i>Crucigenia quadrata</i>	220.00	615.44	135,397	4-cell colony	
<i>Dictyosphaerium</i> sp.	256.00	87.07	22,290		
<i>Kirchneriella</i> sp.	88.00	50	4,421		
* <i>Oocystis</i> sp.	11.00	2,051.47	22,566		
<i>Oocystis</i> sp.	22.00	635.85	13,989		
* <i>Pediastrum tetras</i>	11.00	769.30	8,462		
<i>Quadrigula</i> sp.	44.00	251.20	11,053		
* <i>Scenedesmus</i> sp.	11.00	1,458.97	16,049	4-cell colony	
* <i>Scenedesmus</i> sp.	11.00	256.43	2,821	4-cell colony	
<i>Spondylium</i> sp.	44.00	718.01	31,593		
<i>Tetraedron regulare</i>	11.00	2,295.00	25,245		
undet green filament	55.00	423.90	23,315		
colonial (ell) nannoplktn	44.00	75.36	3,316		
colonial (sph) nannoplktn	352.00	65.42	23,027		
colonial (sph) nannoplktn	462.00	381.51	176,258	cell pairs/quartets	
unicell (sph) nannoplktn	11.00	2,143.57	23,579		
unicell (sph) nannoplktn	110.00	179.50	19,745	faint mucous sheath	
<b>Taxon Subtotal</b>	<b>3,074.00</b>		<b>846,845</b>		
<b>Chrysophyta</b>					
<i>Dinobryon sociale</i> / <i>sertularia</i> asmbig	440.00	732.67	322,373		
<i>Dinobryon divergens</i>	1,100.00	669.87	736,853		
<i>Rhizochrysis</i> sp.	33.00	7,075.47	233,490		
Tribonematales	525.00	621.72	326,403		
chrysophyte (flagel-unicell)	550.00	159.57	87,766	ovoid cell	
chrysophyte (flagel-unicell)	11.00	5,086.80	55,955	long flagellum	
chrysophyte (flagel-unicell)	11.00	2,143.57	23,579	rough cell wall	
chrysophyte (flagel-unicell)	33.00	678.24	22,382		
Bacillariophyceae					
<i>Asterionella formosa</i>	1,408.00	525.00	739,200		
<i>Attheya</i> sp.	2.00	15,360.00	30,720	delicate.spined cells	
<i>Cyclotella</i> sp.	22.00	1,205.76	26,527		
<i>Fragilaria crotonensis</i>	80.00	604.80	48,384		
<i>Melosira</i> sp.	66.00	341.95	22,568		
<i>Melosira</i> sp.	140.00	1,406.72	196,941		
<i>Rhizosolenia</i> sp.	10.00	5,652.00	56,520	delicate cells w/long spines	
<i>Synedra</i> sp.	7.00	2,289.58	16,027	<i>S. acus-like</i>	
<i>Synedra</i> sp.	1.00	1,962.50	1,963	<i>S. acus-like</i>	
<i>Synedra</i> sp.	11.00	110.53	1,216		
<i>Synedra</i> sp.	352.00	224.38	78,981	stellate colonies	
<i>Tabellaria fenestrata</i>	16.00	4,410.00	70,560		
<b>Taxon Subtotal</b>	<b>4818</b>		<b>3,098,409</b>		
<b>Cryptophyta</b>					
<i>Cryptomonas</i> sp.	11.00	1,036.20	11,398		
<i>Cryptomonas</i> +spp.	44.00	2,285.92	100,580		
<i>Rhodomonas</i> sp.	20.00	141.30	2,826		
<b>Taxon Subtotal</b>	<b>75.00</b>		<b>114,805</b>		
<b>Euglenophyta</b>					
<i>Euglena</i> sp.	1.00	48,356.00	48,356	bent tail-piece	
<i>Euglena</i> sp.	2.00	21,364.56	42,729		
<i>Trachelomonas</i> sp.(ell)	11.00	4,747.68	52,224		
<i>Trachelomonas volvocina</i>	11.00	2,571.14	28,283	smooth wall	
<b>Taxon Subtotal</b>	<b>25</b>		<b>171,592</b>		
<b>Pyrrhophyta</b>					
<i>Ceratium hirundinella</i>	3.00	60,000.00	180,000		
dinoflagellate	8.00	25,999.20	207,994	embedded in mucous	
<b>Taxon Subtotal</b>	<b>11.00</b>		<b>387,994</b>		
<b>Undetermined</b>					
<b>Total Number/ml</b>	<b>39784</b>	<b>Total Volume</b>	<b>5,812,509</b>	<b>5.813</b>	
Percent Cyanophyta	79.88	Percent Cyanophyta	20.52		
Percent Chlorophyta	7.73	Percent Chlorophyta	14.57		
Percent Chrysophyta	12.11	Percent Chrysophyta	53.31		
Percent Cryptophyta	0.19	Percent Cryptophyta	1.98		
Percent Euglenophyta	0.06	Percent Euglenophyta	2.95		
Percent Pyrrhophyta	0.03	Percent Pyrrhophyta	6.68		
Percent Undetermined	0.00	Percent Undetermined	0.00		
*= colony	+=filament				

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 9/30/2008		SAMPLE STATUS: Lugols preserved		
STATION: center-1m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<i>Anabaena circinalis/flos-aquae grp</i>	600.00	113.04	67,824	loose coils
<i>Anabaena sp.</i>	100.00	368.43	36,843	linear compres barrel cells
<i>Anacystis (Aphanothece/Anathece spp.)</i>	1,100.00	6.28	6,908	
<i>Anacystis (Aphanothece/Anathece spp.)</i>	2,200.00	4.19	9,211	
<i>Chroococcus sp.</i>	88.00	58.61	5,158	
<i>Coelosphaerium/Snowella spp. asmbig</i>	660.00	22.44	14,809	cells @col edge,fibrils?
<b>Taxon Subtotal</b>	<b>4748</b>		<b>140,752</b>	
<b>Chlorophyta</b>				
* <i>Botryococcus sp.</i>	10.00	8,205.87	82,059	col<30 um diam
* <i>Botryococcus sp.</i>	1.00	153,860.00	153,860	col<70 um diam
<i>Cosmarium sp.</i>	11.00	3,077.20	33,849	
<i>Crucigenia sp.</i>	88.00	62.80	5,526	4-cell colony
<i>Crucigenia sp.</i>	308.00	58.61	18,053	4-cell colony
* <i>Crucigenia quadrata</i>	88.00	615.44	54,159	4-cell colony
<i>Dictyosphaerium sp.</i>	2,288.00	87.07	199,215	
<i>Nephrocytium /Kirchneriella spp.asmbig</i>	44.00	157.00	6,908	
<i>Oocystis sp.</i>	44.00	127.17	5,595	
<i>Oocystis sp.</i>	11.00	1,205.76	13,263	
<i>Oocystis sp.</i>	44.00	273.56	12,036	
* <i>Pediastrum Boryanum</i>	11.00	4,019.20	44,211	
* <i>Pediastrum tetras</i>	22.00	769.30	16,925	
<i>Quadrigula sp.</i>	176.00	170.97	30,091	
* <i>Scenedesmus sp.</i>	11.00	837.33	9,211	4-cell colony
* <i>Scenedesmus sp.</i>	11.00	256.43	2,821	4-cell colony
<i>Staurastrum sp.</i>	1.00	11,210.40	11,210	triangular
<i>Tetraedron regulare</i>	11.00	2,295.00	25,245	
colonial (ell) nannoplktn	352.00	78.50	27,632	cell clumps w/fibrils
colonial (ell) nannoplktn	88.00	58.61	5,158	lunate cells
colonial (sph) nannoplktn	132.00	381.51	50,359	cell pairs/quartets
unicell (sph) nannoplktn	22.00	1,436.03	31,593	
unicell (sph) nannoplktn	22.00	523.33	11,513	faint mucous sheath
<b>Taxon Subtotal</b>	<b>3,796.00</b>		<b>850,494</b>	
<b>Chrysophyta</b>				
<i>Dinobryon sociale/sertularia asmbig</i>	270.00	732.67	197,820	
<i>Dinobryon divergens</i>	550.00	669.87	368,427	
<i>Rhizochrysis sp.</i>	11.00	7,075.47	77,830	
Tribonematales	245.00	621.72	152,321	
chrysophyte (flagel-unicell)	440.00	159.57	70,213	ovoid cell
chrysophyte (flagel-unicell)	22.00	6,280.00	138,160	long flagellum
chrysophyte (flagel-unicell)	242.00	678.24	164,134	
Bacillariophyceae				
<i>Asterionella formosa</i>	132.00	450.00	59,400	
<i>Cyclotella sp.</i>	11.00	1,205.76	13,263	
<i>Fragilaria crotonensis</i>	100.00	504.00	50,400	
<i>Melosira sp.</i>	110.00	410.34	45,137	
<i>Melosira sp.</i>	165.00	1,406.72	232,109	
<i>Rhizosolenia sp.</i>	11.00	5,652.00	62,172	delicate cells w/long spines
<i>Synedra sp.</i>	50.00	2,289.58	114,479	<i>S. acus-like</i>
<i>Synedra sp.</i>	22.00	224.38	4,936	
<b>Taxon Subtotal</b>	<b>2381</b>		<b>1,750,802</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas +spp.</i>	77.00	2,285.92	176,016	
<i>Cryptomonas sp.</i>	11.00	5,934.60	65,281	
cryptomonad	330.00	777.15	256,460	
<i>Rhodomonas sp.</i>	220.00	141.30	31,086	
<b>Taxon Subtotal</b>	<b>638.00</b>		<b>528,842</b>	
<b>Euglenophyta</b>				
<i>Trachelomonas sp.(ell)</i>	1.00	5,024.00	5,024	
<b>Taxon Subtotal</b>	<b>1</b>		<b>5,024</b>	
<b>Pyrrhophyta</b>				
<i>Ceratium hirundinella</i>	2.00	60,000.00	120,000	
<b>Taxon Subtotal</b>	<b>2.00</b>		<b>120,000</b>	
<b>Undetermined</b>				
undeter unicell	1.00	11,320.75	11,321	dense ovate cell
<b>Taxon Subtotal</b>	<b>1.00</b>		<b>11,321</b>	
			(um <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
<b>Total Number/ml</b>	<b>11567</b>	<b>Total Volume</b>	<b>3,407,234</b>	<b>3.407</b>
Percent Cyanophyta	41.05	Percent Cyanophyta	4.13	
Percent Chlorophyta	32.82	Percent Chlorophyta	24.96	
Percent Chrysophyta	20.58	Percent Chrysophyta	51.38	
Percent Cryptophyta	5.52	Percent Cryptophyta	15.52	
Percent Euglenophyta	0.01	Percent Euglenophyta	0.15	
Percent Pyrrhophyta	0.02	Percent Pyrrhophyta	3.52	
Percent Undetermined	0.01	Percent Undetermined	0.33	
*= colony	+ = filament			



PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 10/23/2008		SAMPLE STATUS: Lugols preserved		
STATION: center-1m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<i>Anabaena circinalis/flos-aquae/spiroides asmblg</i>	80.00	267.95	21,436	loose coils
<i>Anacystis (Aphanothece/Anathece spp.)</i>	1,000.00	4.19	4,187	
<b>Taxon Subtotal</b>	<b>1080</b>		<b>25,622</b>	
<b>Chlorophyta</b>				
* <i>Botryococcus sp.</i>	2.00	153,860.00	307,720	col<70 um diam
<i>Crucigenia sp.</i>	96.00	58.61	5,627	4-cell colony
<i>Dictyosphaerium sp.</i>	40.00	87.07	3,483	
<i>Oocystis sp.</i>	8.00	116.57	933	
<i>Quadrigula sp.</i>	8.00	395.14	3,161	
<i>Quadrigula sp.</i>	16.00	192.33	3,077	
* <i>Scenedesmus sp.</i>	4.00	256.43	1,026	4-cell colony
colonial (ell) nannoplktn	8.00	529.35	4,235	
colonial (sph) nannoplktn	32.00	113.04	3,617	
colonial (sph) nannoplktn	32.00	696.56	22,290	cell pairs/quartets
unicell (sph) nannoplktn	2.00	1,436.03	2,872	
unicell (sph) nannoplktn	2.00	523.33	1,047	faint mucous sheath
<b>Taxon Subtotal</b>	<b>250.00</b>		<b>359,087</b>	
<b>Chrysophyta</b>				
<i>Dinobryon sociale/serularia asmblg</i>	2,000.00	732.67	1,465,333	
Tribonematales	20.00	621.72	12,434	
chrysophyte (flagel-unicell)	220.00	159.57	35,106	ovoid cell
chrysophyte (flagel-unicell)	14.00	6,280.00	87,920	long flagellum
chrysophyte (flagel-unicell)	88.00	678.24	59,685	
Bacillariophyceae				
<i>Asterionella formosa</i>	64.00	495.00	31,680	
<i>Cyclotella sp.</i>	20.00	134.63	2,693	small cells<10um diam
<i>Cyclotella sp.</i>	20.00	663.33	13,267	small cells<15um diam
<i>Fragilaria crotonensis</i>	10.00	900.00	9,000	
<i>Melosira sp.</i>	5.00	1,406.72	7,034	
<i>Rhizosolenia sp.</i>	8.00	5,652.00	45,216	delicate cells w/long spines
<i>Synedra sp.</i>	15.00	7,475.03	112,125	<i>S. acus-like</i>
<i>Synedra sp.</i>	4.00	179.50	718	
<b>Taxon Subtotal</b>	<b>2488</b>		<b>1,882,211</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas +spp.</i>	100.00	2,285.92	228,592	
small cryptomonad	33.00	452.16	14,921	
cryptomonad	30.00	777.15	23,315	
<i>Rhodomonas sp.</i>	132.00	141.30	18,652	
<b>Taxon Subtotal</b>	<b>295.00</b>		<b>285,479</b>	
<b>Euglenophyta</b>				
<i>Euglena sp.</i>	1.00	52,752.00	52,752	bent tail-piece
<i>Trachelomonas sp.(sph)</i>	1.00	5,572.45	5,572	
<b>Taxon Subtotal</b>	<b>2</b>		<b>58,324</b>	
<b>Pyrrhophyta</b>				
<b>Undetermined</b>				
			(um <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
<b>Total Number/ml</b>	<b>4115</b>	<b>Total Volume</b>	<b>2,610,725</b>	<b>2.611</b>
Percent Cyanophyta	<b>26.25</b>	Percent Cyanophyta	<b>0.98</b>	
Percent Chlorophyta	<b>6.08</b>	Percent Chlorophyta	<b>13.75</b>	
Percent Chrysophyta	<b>60.46</b>	Percent Chrysophyta	<b>72.10</b>	
Percent Cryptophyta	<b>7.17</b>	Percent Cryptophyta	<b>10.93</b>	
Percent Euglenophyta	<b>0.05</b>	Percent Euglenophyta	<b>2.23</b>	
Percent Pyrrhophyta	<b>0.00</b>	Percent Pyrrhophyta	<b>0.00</b>	
Percent Undetermined	<b>0.00</b>	Percent Undetermined	<b>0.00</b>	
*= colony	+=filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 11/20/2008		SAMPLE STATUS: Lugols preserved		
STATION: center-1m		NOTE:		
Taxon	Cells/ml	$\mu\text{m}^3/\text{cell}$	$\mu\text{m}^3/\text{ml}$	comments
<b>Cyanophyta</b>				
<i>Woronichinia (Coelosph Naegel)</i>	250.00	25.64	6,411	
<b>Taxon Subtotal</b>	<b>250</b>		<b>6,411</b>	
<b>Chlorophyta</b>				
* <i>Botryococcus sp.</i>	2.00	153,860.00	307,720	col<70 um diam
<i>Crucigenia sp.</i>	16.00	50.24	804	4-cell colony
<i>Quadrigula sp.</i>	4.00	395.14	1,581	
* <i>Scenedesmus sp.</i>	2.00	837.33	1,675	4-cell colony
* <i>Scenedesmus sp.</i>	2.00	256.43	513	4-cell colony
colonial (sph) nannoplktn	8.00	113.04	904	
unicell (sph) nannoplktn	22.00	267.95	5,895	faint mucous sheath
<b>Taxon Subtotal</b>	<b>56.00</b>		<b>319,091</b>	
<b>Chrysophyta</b>				
<i>Dinobryon sociale/sertularia asmbly</i>	600.00	732.67	439,600	
<i>Dinobryon divergens</i>	10.00	669.87	6,699	
<i>Mallomonas sp.</i>	2.00	5,626.88	11,254	
<i>Mallomonas sp.</i>	2.00	2,653.30	5,307	
Synurophyceae	400.00	2,051.47	820,587	colonies disrupted
Tribonematales	20.00	621.72	12,434	
chrysophyte (flagel-unicell)	242.00	159.57	38,617	ovoid cell
chrysophyte (flagel-unicell)	28.00	6,280.00	175,840	long flagellum
Bacillariophyceae				
<i>Asterionella formosa</i>	32.00	495.00	15,840	
<i>Cyclotella sp.</i>	22.00	134.63	2,962	small cells<10um diam
<i>Cyclotella sp.</i>	2.00	663.33	1,327	small cells<15um diam
<i>Melosira sp.</i>	28.00	2,260.80	63,302	
<i>Melosira sp.</i>	10.00	588.75	5,888	
<i>Synedra ulna</i>	2.00	20,580.00	41,160	
<i>Synedra sp.</i>	2.00	224.38	449	
<b>Taxon Subtotal</b>	<b>1402</b>		<b>1,641,264</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas +spp.</i>	250.00	2,637.60	659,400	
<i>Cryptomonas sp. (large)</i>	2.00	12,572.56	25,145	
small cryptomonad	22.00	452.16	9,948	
cryptomonad	10.00	777.15	7,772	
<i>Rhodomonas sp.</i>	220.00	141.30	31,086	
<b>Taxon Subtotal</b>	<b>504.00</b>		<b>733,350</b>	
<b>Euglenophyta</b>				
<i>Trachelomonas volvocina</i>	2.00	3,052.08	6,104	smooth wall
<b>Taxon Subtotal</b>	<b>2</b>		<b>6,104</b>	
<b>Pyrrhophyta</b>				
<b>Undetermined</b>				
			( $\mu\text{m}^3/\text{ml}$ )	( $\text{mm}^3/\text{L}$ )
<b>Total Number/ml</b>	<b>2214</b>	<b>Total Volume</b>	<b>2,706,221</b>	<b>2.706</b>
Percent Cyanophyta	11.29	Percent Cyanophyta	0.24	
Percent Chlorophyta	2.53	Percent Chlorophyta	11.79	
Percent Chrysophyta	63.32	Percent Chrysophyta	60.65	
Percent Cryptophyta	22.76	Percent Cryptophyta	27.10	
Percent Euglenophyta	0.09	Percent Euglenophyta	0.23	
Percent Pyrrhophyta	0.00	Percent Pyrrhophyta	0.00	
Percent Undetermined	0.00	Percent Undetermined	0.00	
*= colony	+=filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 12/11/2008		SAMPLE STATUS: Lugols preserved		
STATION: center-1m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<b>Chlorophyta</b>				
<i>Quadrigula sp.</i>	4.00	251.20	1,005	
unicell (sph) nannoplktn	2.00	4,186.67	8,373	
unicell (sph) nannoplktn	2.00	267.95	536	faint mucous sheath
<b>Taxon Subtotal</b>	<b>8.00</b>		<b>9,914</b>	
<b>Chrysophyta</b>				
<i>Dinobryon sociale/sertularia asmbly</i>	10.00	732.67	7,327	
<i>Dinobryon divergens</i>	10.00	669.87	6,699	
<i>Mallomonas sp.</i>	2.00	2,653.30	5,307	
<i>Synura sp.</i>	1,980.00	2,051.47	4,061,904	colonies disrupted
Tribonematales	32.00	621.72	19,895	
chrysophyte (flagel-unicell)	55.00	159.57	8,777	ovoid cell
chrysophyte (flagel-unicell)	20.00	6,280.00	125,600	long flagellum
chrysophyte (flagel-unicell)	2.00	248.58	497	
Bacillariophyceae				
<i>Asterionella formosa</i>	8.00	420.00	3,360	
<i>Cocconeis sp.</i>	2.00	628.00	1,256	
<i>Cyclotella sp.</i>	2.00	663.33	1,327	small cells<15um diam
<i>Fragilaria crotonensis</i>	10.00	604.80	6,048	
<i>Melosira sp.</i>	5.00	3,391.20	16,956	
<i>Melosira sp.</i>	20.00	1,406.72	28,134	
<i>Synedra ulna</i>	2.00	12,600.00	25,200	
<i>Synedra sp.</i>	2.00	307.72	615	
<b>Taxon Subtotal</b>	<b>2162</b>		<b>4,318,901</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas +spp.</i>	152.00	2,637.60	400,915	
<i>Cryptomonas sp.</i>	12.00	5,934.60	71,215	
<i>Cryptomonas sp. (large)</i>	4.00	12,572.56	50,290	
cryptomonad	36.00	863.50	31,086	
<i>Rhodomonas sp.</i>	22.00	141.30	3,109	
<b>Taxon Subtotal</b>	<b>226.00</b>		<b>556,615</b>	
<b>Euglenophyta</b>				
<b>Pyrrhophyta</b>				
small dinoflagellate	2.00	2,260.80	4,522	
<b>Taxon Subtotal</b>	<b>2.00</b>		<b>4,522</b>	
<b>Undetermined</b>				
			(µm <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
<b>Total Number/ml</b>	<b>2398</b>	<b>Total Volume</b>	<b>4,889,952</b>	<b>4.890</b>
Percent Cyanophyta	0.00	Percent Cyanophyta	0.00	
Percent Chlorophyta	0.33	Percent Chlorophyta	0.20	
Percent Chrysophyta	90.16	Percent Chrysophyta	88.32	
Percent Cryptophyta	9.42	Percent Cryptophyta	11.38	
Percent Euglenophyta	0.00	Percent Euglenophyta	0.00	
Percent Pyrrhophyta	0.08	Percent Pyrrhophyta	0.09	
Percent Undetermined	0.00	Percent Undetermined	0.00	
*= colony	+=filament			

**Table C-4. Phytoplankton Data for Long Lake Middle Station, 2009.**

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 1/26/2009		SAMPLE STATUS: Lugols preserved		
STATION: center-1m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	1.00	236	236	
* <i>Scenedesmus sp.</i>	1.00	1,371.89	1,372	4-cell colony
unicell (sph) nannoplktn	7.00	1,436.03	10,052	
<b>Taxon Subtotal</b>	<b>9.00</b>		<b>11,660</b>	
<b>Chrysophyta</b>				
<i>Dinobryon sociale/serutalaria asmbtg</i>	5.00	785.00	3,925	
<i>Mallomonas sp.</i>	1.00	4,308.08	4,308	
Tribonematales	16.00	621.72	9,948	
chrysophyte (flagel-unicell)	66.00	159.57	10,532	ovoid cell
chrysophyte (flagel-unicell)	440.00	1,172.27	515,797	lat compres cell;flagel
chrysophyte (flagel-unicell)	132.00	196.25	25,905	
chrysophyte (flagel-unicell)	1.00	1,607.68	1,608	
<b>Bacillariophyceae</b>				
<i>Amphiprora sp.</i>	1.00	17,309.25	17,309	
<i>Asterionella formosa</i>	40.00	495.00	19,800	
<i>Fragilaria crotonensis</i>	10.00	720.00	7,200	
<i>Melosira sp.</i>	20.00	549.50	10,990	
<i>Synedra sp.</i>	1.00	126.93	127	
undet pennate diatom	1.00	523.33	523	
<b>Taxon Subtotal</b>	<b>734</b>		<b>610,663</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas +spp.</i>	102.00	2,637.60	269,035	
<i>Cryptomonas sp.</i>	14.00	5,934.60	83,084	
cryptomonad	8.00	1,036.20	8,290	
<i>Rhodomonas sp.</i>	22.00	141.30	3,109	
<b>Taxon Subtotal</b>	<b>146.00</b>		<b>363,518</b>	
<b>Euglenophyta</b>				
<b>Pyrrhophyta</b>				
small dinoflagellate	2.00	1,582.56	3,165	
<b>Taxon Subtotal</b>	<b>2.00</b>		<b>3,165</b>	
<b>Undetermined</b>				
undeter unicell	3.00	4,186.67	12,560	dense ovate cell
<b>Taxon Subtotal</b>	<b>3.00</b>		<b>12,560</b>	
			(µm <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
<b>Total Number/ml</b>	<b>894</b>	<b>Total Volume</b>	<b>1,001,565</b>	<b>1.002</b>
Percent Cyanophyta	0.00	Percent Cyanophyta	0.00	
Percent Chlorophyta	1.01	Percent Chlorophyta	1.16	
Percent Chrysophyta	82.10	Percent Chrysophyta	60.97	
Percent Cryptophyta	16.33	Percent Cryptophyta	36.29	
Percent Euglenophyta	0.00	Percent Euglenophyta	0.00	
Percent Pyrrhophyta	0.22	Percent Pyrrhophyta	0.32	
Percent Undetermined	0.34	Percent Undetermined	1.25	
*= colony	+=filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 2/24/2009		SAMPLE STATUS: Lugols preserved		
STATION: center-1m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	28.00	212	5,935	
<i>Ankistrodesmus falcatus</i>	16.00	399	6,383	
* <i>Pediastrum duplex</i>	2.00	6,410.83	12,822	
<i>Quadrigula sp.</i>	24.00	317.93	7,630	
unicell (sph) nannoplktn	20.00	1,766.25	35,325	
unicell (sph) nannoplktn	8.00	4,186.67	33,493	
<b>Taxon Subtotal</b>	<b>98.00</b>		<b>101,588</b>	
<b>Chrysophyta</b>				
<i>Dinobryon sociale/serularia asmblg</i>	460.00	1,046.67	481,467	
<i>Dinobryon sociale/serularia asmblg</i>	320.00	785.00	251,200	
<i>Mallomonas sp.</i>	12.00	4,513.23	54,159	
<i>Mallomonas sp.</i>	10.00	2,653.30	26,533	
Tribonematales	12.00	621.72	7,461	
chrysophyte (flagel-unicell)	440.00	159.57	70,213	ovoid cell
chrysophyte (flagel-unicell)	132.00	1,055.04	139,265	
chrysophyte (flagel-unicell)	10.00	196.25	1,963	
chrysophyte (flagel-unicell)	77.00	1,607.68	123,791	
<b>Bacillariophyceae</b>				
<i>Asterionella formosa</i>	1,808.00	495.00	894,960	
<i>Cyclotella sp.</i>	132.00	663.33	87,559	small cells<15um diam
<i>Melosira sp.</i>	45.00	549.50	24,728	
<i>Synedra sp.</i>	1.00	7,475.03	7,475	<i>S. acus-like</i>
<i>Synedra ulna</i>	1.00	24,255.00	24,255	
<i>Synedra sp.</i>	6.00	1,118.63	6,712	
<i>Synedra sp.</i>	2.00	659.40	1,319	
<i>Tabellaria fenestrata</i>	6.00	3,920.00	23,520	
<b>Taxon Subtotal</b>	<b>3474</b>		<b>2,226,578</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas +spp.</i>	54.00	2,637.60	142,430	
<i>Cryptomonas sp.</i>	12.00	8,704.08	104,449	
<i>Cryptomonas sp. (large)</i>	4.00	12,572.56	50,290	
cryptomonad	16.00	1,036.20	16,579	
<i>Rhodomonas sp.</i>	12.00	202.06	2,425	
<b>Taxon Subtotal</b>	<b>98.00</b>		<b>316,174</b>	
<b>Euglenophyta</b>				
<b>Pyrrhophyta</b>				
small dinoflagellate	2.00	1,582.56	3,165	
small dinoflagellate	2.00	4,144.80	8,290	
dinoflagellate	2.00	11,209.80	22,420	
<b>Taxon Subtotal</b>	<b>6.00</b>		<b>33,874</b>	
<b>Undetermined</b>				
			(um <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
<b>Total Number/ml</b>	<b>3676</b>	<b>Total Volume</b>	<b>2,678,214</b>	<b>2.678</b>
Percent Cyanophyta	0.00	Percent Cyanophyta	0.00	
Percent Chlorophyta	2.67	Percent Chlorophyta	3.79	
Percent Chrysophyta	94.50	Percent Chrysophyta	83.14	
Percent Cryptophyta	2.67	Percent Cryptophyta	11.81	
Percent Euglenophyta	0.00	Percent Euglenophyta	0.00	
Percent Pyrrhophyta	0.16	Percent Pyrrhophyta	1.26	
Percent Undetermined	0.00	Percent Undetermined	0.00	
*= colony	+ =filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE:	3/31/2009	SAMPLE STATUS: Lugols preserved		
STATION:	center-1m	NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	2.00	99	198	
<i>Closterium sp.</i>	2.00	3,191	6,383	
<i>Dictyosphaerium sp.</i>	176.00	87.07	15,324	
<i>Pandorina/Eudorina spp. assemblg</i>	96.00	301.44	28,938	colonies collapsed
<i>Pandorina sp.</i>	32.00	2,411.52	77,169	
* <i>Scenedesmus sp.</i>	2.00	837.33	1,675	4-cell colony
unicell (sph) nannoplktn	22.00	1,766.25	38,858	
unicell (sph) nannoplktn	22.00	4,186.67	92,107	
unicell (sph) nannoplktn	33.00	523.33	17,270	faint mucous sheath
<b>Taxon Subtotal</b>	<b>387.00</b>		<b>277,921</b>	
<b>Chrysophyta</b>				
<i>Dinobryon sociale/serularia assemblg</i>	110.00	1,046.67	115,133	
<i>Dinobryon sociale/serularia assemblg</i>	2,860.00	785.00	2,245,100	
<i>Dinobryon divergens</i>	20.00	669.87	13,397	
<i>Mallomonas sp.</i>	20.00	2,653.30	53,066	
chrysophyte (flagel-unicell)	330.00	159.57	52,660	ovoid cell
chrysophyte (flagel-unicell)	132.00	1,172.27	154,739	lat compres cell;flagel
chrysophyte (flagel-unicell)	110.00	1,055.04	116,054	
chrysophyte (flagel-unicell)	44.00	1,607.68	70,738	
<b>Bacillariophyceae</b>				
<i>Asterionella formosa</i>	35,200.00	525.00	18,480,000	
<i>Cymbella sp.</i>	2.00	22,608.00	45,216	
<i>Epithemia sp.</i>	2.00	4,396	8,792	
<i>Fragilaria crotonensis</i>	20.00	604.80	12,096	
<i>Gomphonema sp.</i>	2.00	2,800.00	5,600	
<i>Melosira sp.</i>	35.00	621.72	21,760	
<i>Melosira sp.</i>	15.00	2,198.00	32,970	
<i>Synedra sp.</i>	16.00	2,912.35	46,598	
<i>Synedra ulna</i>	9.00	15,592.50	140,333	
<i>Synedra sp.</i>	48.00	224.38	10,770	
<i>Synedra sp.</i>	2.00	307.72	615	
undet pennate diatom	2.00	5,544.00	11,088	
undet pennate diatom	2.00	5,376.00	10,752	
<b>Taxon Subtotal</b>	<b>38981</b>		<b>21,647,478</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas +spp.</i>	242.00	2,461.76	595,746	
<i>Cryptomonas sp.</i>	16.00	6,217.20	99,475	
<i>Cryptomonas sp. (large)</i>	2.00	12,572.56	25,145	
cryptomonad	16.00	1,036.20	16,579	
<i>Rhodomonas sp.</i>	1,100.00	202.06	222,265	
<b>Taxon Subtotal</b>	<b>1,376.00</b>		<b>959,210</b>	
<b>Euglenophyta</b>				
<i>Euglena sp.</i>	2.00	11,539.50	23,079	
<i>Trachelomonas volvocina</i>	2.00	3,052.08	6,104	smooth wall
<b>Taxon Subtotal</b>	<b>4</b>		<b>29,183</b>	
<b>Pyrrhophyta</b>				
<i>Peridinium sp.</i>	1.00	51,696.96	51,697	lateral compres cell
small dinoflagellate	6.00	1,582.56	9,495	
small dinoflagellate	14.00	3,108.60	43,520	
<b>Taxon Subtotal</b>	<b>21.00</b>		<b>104,713</b>	
<b>Undetermined</b>				
<b>Total Number/ml</b>	<b>40769</b>	<b>Total Volume</b>	<b>23,018,505</b>	<b>23.019</b>
Percent Cyanophyta	0.00	Percent Cyanophyta	0.00	
Percent Chlorophyta	0.95	Percent Chlorophyta	1.21	
Percent Chrysophyta	95.61	Percent Chrysophyta	94.04	
Percent Cryptophyta	3.38	Percent Cryptophyta	4.17	
Percent Euglenophyta	0.01	Percent Euglenophyta	0.13	
Percent Pyrrhophyta	0.05	Percent Pyrrhophyta	0.45	
Percent Undetermined	0.00	Percent Undetermined	0.00	
*= colony	+ = filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 4/30/2009		SAMPLE STATUS: Lugols preserved		
STATION: center-1m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<b>Chlorophyta</b>				
<i>Cosmarium sp.</i>	4.00	5,744.11	22,976	
<i>Dictyosphaerium sp.</i>	16.00	87.07	1,393	
* <i>Pandorina/Eudorina spp. asmb/g</i>	2.00	5,065.87	10,132	small-cell colonies
colonial (sph) nannoplktn	4.00	696.56	2,786	cell pairs/quartets
unicell (sph) nannoplktn	2.00	179.50	359	mucous sheath
<b>Taxon Subtotal</b>	<b>28.00</b>		<b>37,647</b>	
<b>Chrysophyta</b>				
<i>Dinobryon sociale/sertularia asmb/g</i>	10.00	785.00	7,850	
<i>Dinobryon bavaricum</i>	40.00	366.33	14,653	
<i>Dinobryon divergens</i>	180.00	669.87	120,576	
<i>Mallomonas sp.</i>	1.00	2,653.30	2,653	
<i>Rhizochrysis sp.</i>	10.00	9,420.00	94,200	
chrysophyte (flagel-unicell)	154.00	159.57	24,575	ovoid cell
chrysophyte (flagel-unicell)	11.00	1,172.27	12,895	lat compres cell;flagel
<b>Bacillariophyceae</b>				
<i>Asterionella formosa</i>	22,000.00	630.00	13,860,000	
<i>Fragilaria sp.</i>	220.00	808.50	177,870	
<i>Fragilaria crotonensis</i>	50.00	604.80	30,240	
<i>Melosira sp.</i>	2.00	1,153.95	2,308	
<i>Synedra ulna</i>	21.00	11,025.00	231,525	
<i>Synedra sp.</i>	1.00	126.93	127	
<i>Synedra sp.</i>	1.00	307.72	308	
undet pennate diatom	1.00	3,072.00	3,072	
<b>Taxon Subtotal</b>	<b>22702</b>		<b>14,582,852</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas +spp.</i>	52.00	2,461.76	128,012	
cryptomonad	66.00	1,036.20	68,389	
<i>Rhodomonas sp.</i>	55.00	202.06	11,113	
<b>Taxon Subtotal</b>	<b>173.00</b>		<b>207,514</b>	
<b>Euglenophyta</b>				
<i>Trachelomonas sp.(ell)</i>	2.00	7,092.21	14,184	
<i>Trachelomonas volvocina</i>	2.00	3,052.08	6,104	smooth wall
<b>Taxon Subtotal</b>	<b>4</b>		<b>20,289</b>	
<b>Pyrrhophyta</b>				
<b>Undetermined</b>				
			(um <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
<b>Total Number/ml</b>	<b>22907</b>	<b>Total Volume</b>	<b>14,848,301</b>	<b>14.848</b>
Percent Cyanophyta	0.00	Percent Cyanophyta	0.00	
Percent Chlorophyta	0.12	Percent Chlorophyta	0.25	
Percent Chrysophyta	99.11	Percent Chrysophyta	98.21	
Percent Cryptophyta	0.76	Percent Cryptophyta	1.40	
Percent Euglenophyta	0.02	Percent Euglenophyta	0.14	
Percent Pyrrhophyta	0.00	Percent Pyrrhophyta	0.00	
Percent Undetermined	0.00	Percent Undetermined	0.00	
*= colony	+ = filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 5/14/2009		SAMPLE STATUS: Lugols preserved		
STATION: center-1m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<b>Chlorophyta</b>				
<i>Cosmarium sp.</i>	4.00	5,744.11	22,976	coarse,punctate wall
* <i>Pandorina/Eudorina spp. asmblg</i>	1.00	8,205.87	8,206	small-cell colonies
<i>Quadrigula sp.</i>	2.00	413.30	827	
colonial (sph) nannoplktn	24.00	696.56	16,717	
unicell (sph) nannoplktn	7.00	1,436.03	10,052	
<b>Taxon Subtotal</b>	<b>38.00</b>		<b>58,778</b>	
<b>Chrysophyta</b>				
<i>Dinobryon sociale/sertularia asmblg</i>	50.00	1,046.67	52,333	
<i>Dinobryon bavaricum</i>	5.00	366.33	1,832	
<i>Dinobryon divergens</i>	440.00	669.87	294,741	
<i>Mallomonas sp.</i>	5.00	2,299.53	11,498	
Tribonematales	5.00	621.72	3,109	
chrysophyte (flagel-unicell)	88.00	159.57	14,043	ovoid cell
chrysophyte (flagel-unicell)	10.00	1,205.76	12,058	ovoid cell w/ basal thread
<b>Bacillariophyceae</b>				
<i>Asterionella formosa</i>	344.00	525.00	180,600	
<i>Fragilaria crotonensis</i>	110.00	604.80	66,528	
<i>Melosira sp.</i>	24.00	1,025.84	24,620	
<i>Synedra ulna</i>	2.00	18,000.00	36,000	
<i>Synedra sp.</i>	1.00	126.93	127	
<b>Taxon Subtotal</b>	<b>1084</b>		<b>697,488</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas +spp.</i>	80.00	2,637.60	211,008	
<i>Cryptomonas sp.</i>	5.00	5,934.60	29,673	
<i>Cryptomonas sp. (large)</i>	2.00	12,572.56	25,145	
cryptomonad	132.00	1,139.82	150,456	
<i>Rhodomonas sp.</i>	100.00	178.04	17,804	
<b>Taxon Subtotal</b>	<b>319.00</b>		<b>434,086</b>	
<b>Euglenophyta</b>				
<i>Trachelomonas volvocina</i>	1.00	3,052.08	3,052	smooth wall
<b>Taxon Subtotal</b>	<b>1</b>		<b>3,052</b>	
<b>Pyrrhophyta</b>				
<b>Undetermined</b>				
			(µm <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
<b>Total Number/ml</b>	<b>1442</b>	<b>Total Volume</b>	<b>1,193,404</b>	<b>1.193</b>
Percent Cyanophyta	0.00	Percent Cyanophyta	0.00	
Percent Chlorophyta	2.64	Percent Chlorophyta	4.93	
Percent Chrysophyta	75.17	Percent Chrysophyta	58.45	
Percent Cryptophyta	22.12	Percent Cryptophyta	36.37	
Percent Euglenophyta	0.07	Percent Euglenophyta	0.26	
Percent Pyrrhophyta	0.00	Percent Pyrrhophyta	0.00	
Percent Undetermined	0.00	Percent Undetermined	0.00	
*= colony		+=filament		



PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 5/28/2009		SAMPLE STATUS: Lugols preserved		
STATION: center-1m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<i>Anabaena</i> sp.	220.00	142.48	31,345	short coils; ellip cells
<i>Anabaena circinalis</i> /flos-aquae/spiroides asmb/g	20.00	179.50	3,590	short loose coils; no gonidia
<i>Woronichinia</i> ( <i>Coelospha</i> Naegel)	200.00	25.64	5,129	disintegrated colonies
<b>Taxon Subtotal</b>	<b>440</b>		<b>40,064</b>	
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	22.00	99	2,176	
<i>Cosmarium</i> sp.	8.00	4,615.80	36,926	
<i>Crucigenia</i> sp.	8.00	55.26	442	4-cell colony
* <i>Crucigenia tetrapedia</i>	2.00	576.00	1,152	4-cell colony
<i>Oocystis</i> sp.	20.00	1,013.17	20,263	
* <i>Pandorina/Eudorina</i> spp. asmb/g	2.00	3,349.33	6,699	small-cell colonies
* <i>Scenedesmus</i> sp.	2.00	1,200.40	2,401	4-cell colony
<i>Tetraedron</i> sp.	2.00	3,920.00	7,840	
colonial (ell) nannoplktn	16.00	593.46	9,495	compressed cells
colonial (ell) nannoplktn	8.00	197.82	1,583	
colonial (sph) nannoplktn	20.00	267.95	5,359	cell pairs
colonial (sph) nannoplktn	112.00	150.46	16,851	
colonial (sph) nannoplktn	40.00	267.95	10,718	
colonial (sph) nannoplktn	8.00	904.32	7,235	
unicell (sph) nannoplktn	26.00	1,766.25	45,923	
unicell (sph) nannoplktn	2.00	7,234.56	14,469	
unicell (sph) nannoplktn	50.00	381.51	19,076	mucous sheath
<b>Taxon Subtotal</b>	<b>348.00</b>		<b>208,607</b>	
<b>Chrysophyta</b>				
<i>Dinobryon sociale/serularia</i> asmb/g	400.00	1,046.67	418,667	
<i>Dinobryon sociale/serularia</i> asmb/g	500.00	785.00	392,500	
<i>Dinobryon bavaricum</i>	400.00	366.33	146,533	
<i>Dinobryon divergens</i>	20.00	669.87	13,397	
<i>Gloeobotrys</i> sp.	128.00	113.04	14,469	cells disrupted
<i>Mallomonas</i> sp.	14.00	2,872.05	40,209	
<i>Rhizochrysis</i> sp.	6.00	8,205.87	49,235	
<i>Uroglena/Uroglenopsis</i> spp. (tenta)	1,600.00	628.00	1,004,800	colonies disrupted
Tribonematales	14.00	621.72	8,704	
chrysophyte (flagel-unicell)	110.00	159.57	17,553	ovoid cell
chrysophyte (flagel-unicell)	2.00	5,086.80	10,174	long flagellum
chrysophyte (flagel-unicell)	12.00	2,666.91	32,003	
chrysophyte (flagel-unicell)	176.00	1,205.76	212,214	ovoid cell w/ basal thread
<b>Bacillariophyceae</b>				
<i>Asterionella formosa</i>	80.00	525.00	42,000	
<i>Fragilaria crotonensis</i>	80.00	604.80	48,384	
<i>Melosira</i> sp.	3.00	3,077.20	9,232	
<i>Synedra ulna</i>	12.00	18,000.00	216,000	
<i>Synedra</i> sp.	2.00	224.38	449	
<b>Taxon Subtotal</b>	<b>3559</b>		<b>2,676,522</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas</i> +spp.	48.00	2,637.60	126,605	
<i>Cryptomonas</i> sp.	6.00	5,934.60	35,608	
<i>Cryptomonas</i> sp. (large)	4.00	12,572.56	50,290	
cryptomonad	66.00	1,139.82	75,228	
<i>Rhodomonas</i> sp.	200.00	178.04	35,608	
<b>Taxon Subtotal</b>	<b>324.00</b>		<b>323,338</b>	
<b>Euglenophyta</b>				
<i>Euglena</i> sp.	4.00	4,846.59	19,386	
<i>Trachelomonas volvocina</i>	10.00	3,052.08	30,521	smooth wall
<b>Taxon Subtotal</b>	<b>14</b>		<b>49,907</b>	
<b>Pyrrhophyta</b>				
small dinoflagellate	6.00	4,041.18	24,247	
<i>Ceratium hirundinella</i> (cyst)	1.00	40,000.00	40,000	
<b>Taxon Subtotal</b>	<b>7.00</b>		<b>64,247</b>	
<b>Undetermined</b>				
			(µm <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
<b>Total Number/ml</b>	<b>4692</b>	<b>Total Volume</b>	<b>3,362,686</b>	<b>3.363</b>
Percent Cyanophyta	9.38	Percent Cyanophyta	1.19	
Percent Chlorophyta	7.42	Percent Chlorophyta	6.20	
Percent Chrysophyta	75.85	Percent Chrysophyta	79.59	
Percent Cryptophyta	6.91	Percent Cryptophyta	9.62	
Percent Euglenophyta	0.30	Percent Euglenophyta	1.48	
Percent Pyrrhophyta	0.15	Percent Pyrrhophyta	1.91	
Percent Undetermined	0.00	Percent Undetermined	0.00	
*= colony	+=filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 6/18/2009		SAMPLE STATUS: Lugols preserved		
STATION: center-1m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<i>Anabaena sp.</i>	30.00	110.82	3,324	short coils;ellip cells
<i>Anabaena sp.</i>	2,900.00	368.43	1,068,437	linear compres barrel cells
<i>Anacystis (Aphanothece/Anathece spp.)</i>	400.00	4.19	1,675	
<i>Chroococcus sp.</i>	44.00	256.43	11,283	
<i>Coelosphaerium/Snowella spp. asmbig</i>	1,320.00	22.44	29,618	cells @col edge;fibrils?
<i>Gomphosphaeria sp.</i>	440.00	11.45	5,037	small col;thin stalks
<b>Taxon Subtotal</b>	<b>5134</b>		<b>1,119,375</b>	
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	11.00	99	1,088	
* <i>Botryococcus sp.</i>	1.00	8,205.87	8,206	col<30 um diam
* <i>Botryococcus sp.</i>	1.00	75,360.00	75,360	col<70 um diam
<i>Dictyosphaerium sp.</i>	176.00	87.07	15,324	
<i>Nephrocytium /Kirchneriella spp.asmbig</i>	44.00	263.76	11,605	
<i>Oocystis sp.</i>	44.00	1,013.17	44,580	
<i>Quadrigula sp.</i>	22.00	276.32	6,079	
* <i>Scenedesmus sp.</i>	22.00	732.67	16,119	4-cell colony
* <i>Scenedesmus arcuatus/bijuga asmbig</i>	11.00	368.43	4,053	8-cell colony
<i>Schroederia (Ankyra) sp.</i>	11.00	151.98	1,672	very small cell
<i>Selenastrum sp.</i>	88.00	54.43	4,790	
colonial (sph) nannoplktn	88.00	150.46	13,240	
colonial (sph) nannoplktn	176.00	182.37	32,097	
colonial (sph) nannoplktn	88.00	904.32	79,580	
unicell (sph) nannoplktn	33.00	1,436.03	47,389	
<b>Taxon Subtotal</b>	<b>816.00</b>		<b>361,181</b>	
<b>Chrysophyta</b>				
<i>Dinobryon sociale/seretularia asmbig</i>	9,350.00	785.00	7,339,750	
<i>Dinobryon bavaricum</i>	66.00	457.92	30,223	
<i>Dinobryon divergens</i>	110.00	669.87	73,685	
<i>Gloeobotrys sp.</i>	88.00	113.04	9,948	cells disrupted
<i>Mallomonas sp.</i>	11.00	1,657.92	18,237	
<i>Rhizochrysis sp.</i>	11.00	8,205.87	90,265	
Tribonematales	128.00	621.72	79,580	
chrysophyte (flagel-unicell)	110.00	159.57	17,553	ovoid cell
chrysophyte (flagel-unicell)	10.00	4,832.46	48,325	long flagellum
chrysophyte (flagel-unicell)	660.00	1,205.76	795,802	ovoid cell w/basal thread;disrup col?
<b>Bacillariophyceae</b>				
<i>Asterionella formosa</i>	352.00	600.00	211,200	
<i>Fragilaria crotonensis</i>	160.00	810.00	129,600	
<i>Melosira sp.</i>	40.00	2,747.50	109,900	
<i>Synedra ulna</i>	23.00	18,000.00	414,000	
<i>Synedra sp.</i>	11.00	224.38	2,468	
<i>Tabellaria fenestrata</i>	4.00	5,880.00	23,520	
<b>Taxon Subtotal</b>	<b>11134</b>		<b>9,394,055</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas spp.</i>	55.00	1,857.31	102,152	
<i>Cryptomonas sp.</i>	11.00	5,934.60	65,281	
cryptomonad	11.00	1,036.20	11,398	
<i>Rhodomonas sp.</i>	55.00	178.04	9,792	
<b>Taxon Subtotal</b>	<b>132.00</b>		<b>188,623</b>	
<b>Euglenophyta</b>				
<i>Euglena sp.</i>	1.00	30,144.00	30,144	bent tail-piece
<i>Euglena sp.</i>	1.00	9,231.60	9,232	spiral
<i>Trachelomonas sp. (ell)</i>	2.00	5,024.00	10,048	
<i>Trachelomonas volvocina</i>	6.00	2,571.14	15,427	smooth wall
<i>Trachelomonas sp. (sph)</i>	2.00	9,198.11	18,396	
<b>Taxon Subtotal</b>	<b>12</b>		<b>83,247</b>	
<b>Pyrrhophyta</b>				
dinoflagellate	4.00	11,209.80	44,839	
<b>Taxon Subtotal</b>	<b>4.00</b>		<b>44,839</b>	
<b>Undetermined</b>				
			(um <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
<b>Total Number/ml</b>	<b>17232</b>	<b>Total Volume</b>	<b>11,191,320</b>	<b>11.191</b>
Percent Cyanophyta	29.79	Percent Cyanophyta	10.00	
Percent Chlorophyta	4.74	Percent Chlorophyta	3.23	
Percent Chrysophyta	64.61	Percent Chrysophyta	83.94	
Percent Cryptophyta	0.77	Percent Cryptophyta	1.69	
Percent Euglenophyta	0.07	Percent Euglenophyta	0.74	
Percent Pyrrhophyta	0.02	Percent Pyrrhophyta	0.40	
Percent Undetermined	0.00	Percent Undetermined	0.00	
*= colony	+=filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 7/2/2009		SAMPLE STATUS: Lugols preserved		
STATION: center-1m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<i>Anabaena circinalis/flos-aquae/spiroides asmbig</i>	60.00	179.50	10,770	short loose coils:no gonidia
<i>Anabaena sp.</i>	220.00	401.92	88,422	linear compres barrel cells
<i>Anacystis (Aphanothece/Anathece spp.)</i>	200.00	6.28	1,256	
<i>Anacystis (Aphanothece/Anathece spp.)</i>	600.00	4.19	2,512	
<i>Chroococcus sp.</i>	32.00	256.43	8,206	
<i>Chroococcus sp.</i>	32.00	58.61	1,876	
<i>Coelosphaerium/Snowella spp. asmbig</i>	9,000.00	22.44	201,941	cells @col edge:fibrils?
<i>Gomphosphaeria sp.</i>	320.00	11.45	3,663	small col:thin stalks
* <i>Woronichinia spp.(incl Coelos. Naegel)</i>	6.00	314,000	1,884,000	disintegr colonies<100um diam
<b>Taxon Subtotal</b>	<b>10470</b>		<b>2,202,647</b>	
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	40.00	80	3,203	
* <i>Botryococcus sp.</i>	4.00	27,694.80	110,779	col<50 um diam
<i>Crucigenia sp.</i>	8.00	197.82	1,583	2-cell colony
<i>Crucigenia rectangularis/irregularis asmbig</i>	32.00	55.26	1,768	4-cell colony
<i>Dictyosphaerium sp.</i>	96.00	87.07	8,359	
<i>Oocystis sp.</i>	4.00	1,013.17	4,053	
<i>Oocystis sp.</i>	32.00	435.41	13,933	
<i>Oocystis sp.</i>	8.00	2,679.47	21,436	
<i>Quadrigula sp.</i>	4.00	251.20	1,005	
* <i>Scenedesmus sp.</i>	2.00	680.33	1,361	4-cell colony
<i>Schroederia (Ankyra) sp.</i>	20.00	167.47	3,349	
colonial (ell) nannoplktn	16.00	130.83	2,093	
colonial (sph) nannoplktn	224.00	150.46	33,702	
colonial (sph) nannoplktn	8.00	1,436.03	11,488	
unicell (sph) nannoplktn	40.00	904.32	36,173	
unicell (sph) nannoplktn	2.00	5,572.45	11,145	
<b>Taxon Subtotal</b>	<b>540.00</b>		<b>265,430</b>	
<b>Chrysophyta</b>				
<i>Dinobryon sociale/sertularia asmbig</i>	40.00	785.00	31,400	
<i>Dinobryon bavaricum</i>	60.00	392.50	23,550	
<i>Dinobryon divergens</i>	2,000.00	669.87	1,339,733	
<i>Gloeobotrys sp.</i>	88.00	113.04	9,948	cells disrupted
<i>Mallomonas sp.</i>	2.00	3,537.73	7,075	
<i>Mallomonas sp.</i>	2.00	2,122.64	4,245	
<i>Rhizochrysis sp.</i>	2.00	8,205.87	16,412	
Tribonematales	40.00	621.72	24,869	
chrysophyte (flagel-unicell)	20.00	646.82	12,936	ovoid cell
chrysophyte (flagel-unicell)	20.00	117.23	2,345	
chrysophyte (flagel-unicell)	33.00	1,205.76	39,790	ovoid cell w/basal thread;disrup col?
<b>Bacillariophyceae</b>				
<i>Asterionella formosa</i>	192.00	525.00	100,800	
<i>Fragilaria crotonensis</i>	200.00	900.00	180,000	
<i>Melosira sp.</i>	22.00	1,607.68	35,369	
<i>Melosira sp.</i>	50.00	4,000.36	200,018	
<i>Synedra sp.</i>	2.00	224.38	449	
<i>Tabellaria fenestrata</i>	24.00	4,900.00	117,600	
<b>Taxon Subtotal</b>	<b>2797</b>		<b>2,146,539</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas spp.</i>	28.00	2,637.60	73,853	
<i>Cryptomonas sp.</i>	8.00	5,934.60	47,477	
<i>Cryptomonas sp. (large)</i>	4.00	12,572.56	50,290	
cryptomonad	30.00	1,036.20	31,086	
<i>Rhodomonas sp.</i>	10.00	178.04	1,780	
<b>Taxon Subtotal</b>	<b>80.00</b>		<b>204,486</b>	
<b>Euglenophyta</b>				
<b>Pyrrhophyta</b>				
dinoflagellate	10.00	11,209.80	112,098	
<b>Taxon Subtotal</b>	<b>10.00</b>		<b>112,098</b>	
<b>Undetermined</b>				
			(um <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
<b>Total Number/ml</b>	<b>13897</b>	<b>Total Volume</b>	<b>4,931,199</b>	<b>4.931</b>
Percent Cyanophyta	75.34	Percent Cyanophyta	44.67	
Percent Chlorophyta	3.89	Percent Chlorophyta	5.38	
Percent Chrysophyta	20.13	Percent Chrysophyta	43.53	
Percent Cryptophyta	0.58	Percent Cryptophyta	4.15	
Percent Euglenophyta	0.00	Percent Euglenophyta	0.00	
Percent Pyrrhophyta	0.07	Percent Pyrrhophyta	2.27	
Percent Undetermined	0.00	Percent Undetermined	0.00	
*= colony	+=filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 7/16/2009				
STATION: center-1m				
SAMPLE STATUS: Lugols preserved				
NOTE:				
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<i>Anabaena sp.</i>	210.00	110.82	23,271	short crimped coils/knots;ellip cells
<i>Anabaena circinalis/flos-aquae/spiroides asmb/g</i>	600.00	220.78	132,469	short loose coils;no gonidia
<i>Aphanocapsa sp.</i>	40.00	33.49	1,340	small deter col;s cat cells<5um
<i>Anacystis (Aphanothece/Anathece spp.)</i>	300.00	6.28	1,884	
<i>Anacystis (Aphanothece/Anathece spp.)</i>	400.00	4.19	1,675	
<i>Chroococcus sp.</i>	20.00	58.61	1,172	
<i>Coelosphaerium/Snowella spp. asmb/g</i>	4,600.00	22.44	103,214	cells @col edge;fibrils?
<i>Gomphosphaeria sp.</i>	1,760.00	11.45	20,148	small col;thin stalks
* <i>Woronichinia spp. (incl Coelos. Naegel)</i>	10.00	314,000	3,140,000	disintegr colonies<100um diam
+ Oscillatoriales	1.00	494.55	495	threadlike fil<3.5um wide;no sheath evid
<b>Taxon Subtotal</b>	<b>7941</b>		<b>3,425,668</b>	
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	22.00	80	1,762	
<i>Cosmarium sp.</i>	2.00	1,570.00	3,140	
<i>Crucigenia rectangularis/irregularis asmb/g</i>	24.00	183.69	4,409	2.4-cell colony
* <i>Crucigenia quadrata</i>	2.00	615.44	1,231	4-cell colony
<i>Dictyosphaerium sp.</i>	384.00	87.07	33,435	
<i>Nephrocytium sp.</i>	8.00	1,360.67	10,885	
<i>Oocystis sp.</i>	32.00	95.38	3,052	
<i>Oocystis sp.</i>	20.00	1,013.17	20,263	
<i>Oocystis sp.</i>	8.00	468.91	3,751	
<i>Oocystis sp.</i>	2.00	2,355.00	4,710	
* <i>Pediastrum Boryanum</i>	2.00	6,923.70	13,847	
<i>Schroederia (Ankyra) sp.</i>	22.00	167.47	3,684	
<i>Schroederia (Ankyra) sp.</i>	2.00	443.26	887	
colonial (sph) nannoplktn	32.00	381.51	12,208	cell pairs
colonial (sph) nannoplktn	288.00	150.46	43,331	
unicell (sph) nannoplktn	10.00	904.32	9,043	
<b>Taxon Subtotal</b>	<b>860.00</b>		<b>169,639</b>	
<b>Chrysophyta</b>				
<i>Gloeobotrys sp.</i>	3,520.00	113.04	397,901	cells disrupted
<i>Mallomonas sp.</i>	8.00	2,299.53	18,396	
Tribonematales	20.00	621.72	12,434	
chrysophyte (flagel-unicell)	66.00	646.82	42,690	ovoid cell
chrysophyte (flagel-unicell)	2.00	1,172.27	2,345	lat compres cell;flagel
<b>Bacillariophyceae</b>				
<i>Fragilaria crotonensis</i>	400.00	900.00	360,000	
<i>Melosira sp.</i>	160.00	686.88	109,900	
<i>Melosira sp.</i>	125.00	1,907.55	238,444	
<i>Melosira sp.</i>	90.00	3,384.92	304,643	
<i>Synedra ulna</i>	5.00	18,000.00	90,000	
<i>Synedra sp.</i>	12.00	307.72	3,693	stellate colonies
<i>Tabellaria fenestrata</i>	136.00	4,900.00	666,400	
<b>Taxon Subtotal</b>	<b>4544</b>		<b>2,246,845</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas sp.</i>	44.00	1,714.44	75,435	
<i>Cryptomonas sp.</i>	2.00	5,934.60	11,869	
cryptomonad	40.00	1,036.20	41,448	
<i>Rhodomonas sp.</i>	220.00	169.56	37,303	
<b>Taxon Subtotal</b>	<b>306.00</b>		<b>166,056</b>	
<b>Euglenophyta</b>				
<i>Euglena sp.</i>	2.00	4,846.59	9,693	
<i>Trachelomonas volvocina</i>	2.00	2,571.14	5,142	smooth wall
<b>Taxon Subtotal</b>	<b>4</b>		<b>14,835</b>	
<b>Pyrrhophyta</b>				
<b>Undetermined</b>				
			(um <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
<b>Total Number/ml</b>	<b>13655</b>	<b>Total Volume</b>	<b>6,023,043</b>	<b>6.023</b>
Percent Cyanophyta	58.15	Percent Cyanophyta	56.88	
Percent Chlorophyta	6.30	Percent Chlorophyta	2.82	
Percent Chrysophyta	33.28	Percent Chrysophyta	37.30	
Percent Cryptophyta	2.24	Percent Cryptophyta	2.76	
Percent Euglenophyta	0.03	Percent Euglenophyta	0.25	
Percent Pyrrhophyta	0.00	Percent Pyrrhophyta	0.00	
Percent Undetermined	0.00	Percent Undetermined	0.00	
*= colony	+=filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 7/29/2009		SAMPLE STATUS: Lugols preserved		
STATION: center-1m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<i>Anabaena sp.</i>	140.00	110.82	15,514	short crimped coils/knots;ellip cells
<i>Anabaena circinalis/flos-aquae/spiroides asmb/g</i>	2,800.00	267.95	750,251	loose coils&spirals;no gonidia
<i>Anabaena sp.</i>	440.00	401.92	176,845	linear compres barrel cells
<i>Anabaena spiroides</i>	80.00	759.88	60,790	short spiral coils
<i>Aphanocapsa (Microcystis) pulchra-like sp.</i>	230.00	87.07	20,026	deter col<100 scat cells<5um;aerotopes?:faint muc
<i>Anacystis (Aphanothece/Anathece spp.)</i>	300.00	6.28	1,884	
<i>Anacystis (Aphanothece/Anathece spp.)</i>	1,000.00	4.19	4,187	
<i>Chroococcus sp.</i>	64.00	58.61	3,751	
<i>Coelosphaerium/Snowella spp. asmb/g</i>	2,400.00	22.44	53,851	cells @col edge;fibrils?
<i>Gomphosphaeria sp.</i>	448.00	11.45	5,129	small col;thin stalks
* <i>Woronichinia spp.(incl Coelos. Naegel)</i>	8.00	314,000	2,512,000	disintegr colonies<100um diam
+ <i>Oscillatoriales</i>	4.00	494.55	1,978	threadlike fil<3.5um wide;no sheath evid
<i>Microcystis spp. asmb/g(tenta)</i>	150.00	87.07	13,060	ovate col>100cells w/aerotopes;faint muc
filamentous cyanophyte	100.00	25.64	2,564	minute subsp cells
<b>Taxon Subtotal</b>	<b>8164</b>		<b>3,621,831</b>	
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	2.00	80	160	
* <i>Botryococcus sp.</i>	8.00	52,333.33	418,667	col<50 um diam
* <i>Botryococcus sp.</i>	2.00	820,586.67	1,641,173	col-140 um diam
<i>Dictyosphaerium sp.</i>	704.00	87.07	61,297	
<i>Kirchneriella sp.</i>	8.00	42	335	
<i>Nephrocytium sp.</i>	8.00	763.02	6,104	
* <i>Oocystis sp.</i>	2.00	4,186.67	8,373	small colonies
<i>Oocystis sp.</i>	8.00	143.92	1,151	
<i>Oocystis sp.</i>	4.00	1,013.17	4,053	
<i>Oocystis sp.</i>	4.00	2,355.00	9,420	
<i>Pandorina sp.</i>	16.00	334.93	5,359	
* <i>Pediastrum Boryanum</i>	1.00	14,130.00	14,130	
* <i>Pediastrum tetras</i>	2.00	769.30	1,539	
* <i>Pediastrum duplex</i>	2.00	2,307.90	4,616	
<i>Quadrigula sp.</i>	4.00	251.20	1,005	
* <i>Scenedesmus sp.</i>	2.00	837.33	1,675	4-cell colony
* <i>Scenedesmus sp.</i>	2.00	256.43	513	4-cell colony
<i>Staurastrum sp.</i>	2.00	5,948.04	11,896	
colonial (sph) nannoplktn	960.00	87.07	83,587	
colonial (sph) nannoplktn	4.00	1,436.03	5,744	
unicell (sph) nannoplktn	33.00	904.32	29,843	
unicell (sph) nannoplktn	2.00	5,572.45	11,145	
<b>Taxon Subtotal</b>	<b>1,780.00</b>		<b>2,321,784</b>	
<b>Chrysophyta</b>				
<i>Dinobryon sociale/sertularia asmb/g</i>	800.00	785.00	628,000	
<i>Dinobryon divergens</i>	10.00	669.87	6,699	
<i>Gloeobotrys sp.</i>	288.00	113.04	32,556	cells disrupted
<i>Mallomonas sp.</i>	4.00	2,122.64	8,491	
<i>Tribonematales</i>	8.00	621.72	4,974	
chrysophyte (flagel-unicell)	385.00	646.82	249,025	ovoid cell
chrysophyte (flagel-unicell)	2.00	3,215.36	6,431	long flagellum
Bacillariophyceae				
<i>Fragilaria crotonensis</i>	120.00	900.00	108,000	
<i>Melosira sp.</i>	30.00	1,588.06	47,642	
<i>Synedra sp.</i>	2.00	307.72	615	
<i>Tabellaria fenestrata</i>	372.00	4,900.00	1,822,800	
<b>Taxon Subtotal</b>	<b>2021</b>		<b>2,915,232</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas sp.</i>	6.00	1,714.44	10,287	
small cryptomonad	16.00	452.16	7,235	
<i>Rhodomonas sp.</i>	66.00	169.56	11,191	
<b>Taxon Subtotal</b>	<b>88.00</b>		<b>28,712</b>	
<b>Euglenophyta</b>				
<i>Euglena sp.</i>	4.00	4,846.59	19,386	
<i>Trachelomonas sp.(sph)</i>	2.00	5,572.45	11,145	
<b>Taxon Subtotal</b>	<b>6</b>		<b>30,531</b>	
<b>Pyrrhophyta</b>				
small dinoflagellate	2.00	3,108.60	6,217	
dinoflagellate	4.00	11,869.20	47,477	embedded in mucous
<b>Taxon Subtotal</b>	<b>6.00</b>		<b>53,694</b>	
<b>Undetermined</b>				

<b>PHYTOPLANKTON</b>				
<b>LONG LAKE (Kitsap Co., WA)</b>				
<b>DATE: 7/29/2009</b>				
<b>STATION: center-1m</b>				
<b>page 2</b>				
			(um3/ml)	(mm3/L)
<b>Total Number/ml</b>	<b>12065</b>	<b>Total Volume</b>	<b>8,971,783</b>	<b>8.972</b>
Percent Cyanophyta	67.67	Percent Cyanophyta	40.37	
Percent Chlorophyta	14.75	Percent Chlorophyta	25.88	
Percent Chrysophyta	16.75	Percent Chrysophyta	32.49	
Percent Cryptophyta	0.73	Percent Cryptophyta	0.32	
Percent Euglenophyta	0.05	Percent Euglenophyta	0.34	
Percent Pyrrhophyta	0.05	Percent Pyrrhophyta	0.60	
Percent Undetermined	0.00	Percent Undetermined	0.00	
*= colony	+ = filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 8/13/2009		SAMPLE STATUS: Lugols preserved		
STATION: center-1m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<i>Anabaena circinalis/flos-aquae/spiroides</i> asmblg	700.00	267.95	187,563	loose coils&spirals:no gonidia
<i>Anabaena</i> sp.	520.00	368.43	191,582	linear compres barrel cells
<i>Anabaena spiroides</i>	80.00	759.88	60,790	short spiral coils
<i>Aphanocapsa (Microcystis) pulchra-like</i> sp.	60.00	87.07	5,224	deter col<100 scat cells<5um;aerotopes?:faint muc
<i>Anacystis (Aphanothece/Anathece</i> spp.)	100.00	6.28	628	
<i>Anacystis (Aphanothece/Anathece</i> spp.)	500.00	4.19	2,093	
<i>Chroococcus</i> sp.	128.00	256.43	32,823	
<i>Chroococcus</i> sp.	72.00	58.61	4,220	
<i>Coelosphaerium/Snowella</i> spp. asmblg	3,500.00	22.44	78,533	cells @col edge:fibrils?
<i>Gomphosphaeria</i> sp.	1,600.00	11.45	18,317	small col;thin stalks
* <i>Woronichinia</i> spp.(incl <i>Coelos. Naegel</i> )	10.00	314,000	3,140,000	disintegr colonies<100um diam
<i>Microcystis</i> spp. asmblg(tenta)	350.00	87.07	30,474	cellsw/aerotopes:ovate col w/faint muc
<b>Taxon Subtotal</b>	<b>7620</b>		<b>3,752,248</b>	
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	10.00	80	801	
* <i>Botryococcus</i> sp.	2.00	8,205.87	16,412	col<30 um diam
* <i>Crucigenia quadrata</i>	2.00	615.44	1,231	4-cell colony
<i>Dictyosphaerium</i> sp.	2,144.00	87.07	186,677	
<i>Nephroclytium /Kirchneriella</i> spp.asmblg	8.00	127.17	1,017	
<i>Oocystis</i> sp.	16.00	95.38	1,526	
<i>Oocystis</i> sp.	8.00	1,013.17	8,105	
<i>Oocystis</i> sp.	10.00	2,355.00	23,550	
* <i>Scenedesmus</i> sp.	2.00	6,966.61	13,933	robust 4-cell colony
<i>Spondylosium</i> sp.	10.00	2,093.33	20,933	
<i>Staurastrum</i> sp.	2.00	7,907.40	15,815	
<i>Tetraedron minimum</i>	2.00	720.00	1,440	
colonial (sph) nannoplktn	64.00	523.33	33,493	cell pairs
colonial (sph) nannoplktn	224.00	87.07	19,504	
colonial (sph) nannoplktn	24.00	1,238.21	29,717	
unicell (sph) nannoplktn	10.00	904.32	9,043	
<b>Taxon Subtotal</b>	<b>2,538.00</b>		<b>383,198</b>	
<b>Chrysophyta</b>				
<i>Chrysidium</i> sp.	2.00	7,385.28	14,771	
<i>Dinobryon sociale/sertularia</i> asmblg	1,400.00	785.00	1,099,000	
<i>Dinobryon divergens</i>	10.00	669.87	6,699	
<i>Mallomonas</i> sp.	2.00	1,798.96	3,598	
Tribonematales	24.00	621.72	14,921	
chrysophyte (flagel-unicell)	110.00	646.82	71,150	ovoid cell
<b>Bacillariophyceae</b>				
<i>Fragilaria crotonensis</i>	120.00	604.80	72,576	
<i>Melosira</i> sp.	16.00	686.88	10,990	
<i>Melosira</i> sp.	35.00	1,780.38	62,313	
<i>Synedra ulna</i>	4.00	18,000.00	72,000	
<i>Synedra</i> sp.	1.00	126.93	127	
<i>Synedra</i> sp.	1.00	366.33	366	
<i>Tabellaria fenestrata</i>	260.00	4,900.00	1,274,000	
<b>Taxon Subtotal</b>	<b>1985</b>		<b>2,702,511</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas</i> sp.	14.00	1,714.44	24,002	
cryptomonad	20.00	690.80	13,816	
<i>Rhodomonas</i> sp.	20.00	175.21	3,504	
<b>Taxon Subtotal</b>	<b>54.00</b>		<b>41,322</b>	
<b>Euglenophyta</b>				
<i>Euglena</i> sp.	1.00	92,316.00	92,316	bent tail-piece
<i>Euglena</i> sp.	2.00	20,096.00	40,192	
<i>Trachelomonas</i> sp.(ell)	2.00	5,024.00	10,048	
<i>Trachelomonas volvocina</i>	6.00	2,571.14	15,427	smooth wall
<i>Trachelomonas</i> sp.(sph)	2.00	696.56	1,393	tiny cell;smooth wall
<b>Taxon Subtotal</b>	<b>13</b>		<b>159,376</b>	
<b>Pyrrhophyta</b>				
<i>Ceratium hirundinella</i>	3.00	60,000.00	180,000	
dinoflagellate	10.00	11,869.20	118,692	embedded in mucous
<b>Taxon Subtotal</b>	<b>13.00</b>		<b>298,692</b>	
<b>Undetermined</b>				
<b>Total Number/ml</b>	<b>12223</b>	<b>Total Volume</b>	<b>7,337,347</b>	<b>7.337</b>
Percent Cyanophyta	62.34	Percent Cyanophyta	51.14	
Percent Chlorophyta	20.76	Percent Chlorophyta	5.22	
Percent Chrysophyta	16.24	Percent Chrysophyta	36.83	
Percent Cryptophyta	0.44	Percent Cryptophyta	0.56	
Percent Euglenophyta	0.11	Percent Euglenophyta	2.17	
Percent Pyrrhophyta	0.11	Percent Pyrrhophyta	4.07	
Percent Undetermined	0.00	Percent Undetermined	0.00	
*= colony	+=filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 9/3/2009				
STATION: center-1m				
			SAMPLE STATUS: Lugols preserved	
			NOTE:	
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<i>Anabaena sp.</i>	20.00	110.82	2,216	short crimped coils/knots;ellip cells
<i>Anabaena circinalis/flos-aquae/spiroides asmbgl</i>	1,500.00	267.95	401,920	loose coils&spirals;suasage-sh gonidia
<i>Anabaena sp.</i>	1,400.00	368.43	515,797	linear compres barrel cells
<i>Anabaena spiroides</i>	350.00	759.88	265,958	short spiral coils
<i>Anacystis (Aphanothece/Anathece spp.)</i>	2,000.00	4.19	8,373	
<i>Chroococcus sp.</i>	16.00	256.43	4,103	
<i>Coelosphaerium/Snowella spp. asmbgl</i>	840.00	22.44	18,848	cells @col edge;fibrils?
<i>Gomphosphaeria sp.</i>	256.00	11.45	2,931	small col;thin stalks
* <i>Woronichinia spp.(incl Coelos. Naegel)</i>	9.00	314,000	2,826,000	disintegr colonies<100um diam
<b>Taxon Subtotal</b>	<b>6391</b>		<b>4,046,146</b>	
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	10.00	80	801	
* <i>Botryococcus sp.</i>	1.00	6,028.80	6,029	col<30 um diam
* <i>Botryococcus sp.</i>	2.00	820,586.67	1,641,173	col-140 um diam
* <i>Crucigenia sp.</i>	4.00	384.00	1,536	4-cell colony
<i>Dictyosphaerium sp.</i>	2,100.00	87.07	182,846	
* <i>Oocystis sp.</i>	2.00	4,186.67	8,373	small colonies
<i>Oocystis sp.</i>	8.00	244.92	1,959	
<i>Oocystis sp.</i>	8.00	1,013.17	8,105	
<i>Oocystis sp.</i>	8.00	468.91	3,751	
* <i>Pandorina/Eudorina spp. asmbgl</i>	2.00	6,564.69	13,129	small-cell colonies
* <i>Pediastrum tetras</i>	2.00	1,271.70	2,543	
<i>Quadrigula sp.</i>	8.00	226.08	1,809	
* <i>Scenedesmus sp.</i>	4.00	256.43	1,026	4-cell colony
<i>Schroederia (Ankyra) sp.</i>	4.00	167.47	670	
<i>Staurastrum sp.</i>	2.00	5,838.75	11,678	triangular
colonial (sph) nannoplktn	112.00	381.51	42,729	cell pairs/quads
colonial (sph) nannoplktn	224.00	87.07	19,504	
unicell (sph) nannoplktn	20.00	1,436.03	28,721	
unicell (sph) nannoplktn	2.00	5,572.45	11,145	
unicell (sph) nannoplktn	20.00	381.51	7,630	some w/mucous sheath
<b>Taxon Subtotal</b>	<b>2,543.00</b>		<b>1,995,157</b>	
<b>Chrysophyta</b>				
<i>Dinobryon sociale/seretularia asmbgl</i>	3,500.00	732.67	2,564,333	
<i>Dinobryon bavaricum</i>	36.00	392.50	14,130	
<i>Dinobryon divergens</i>	20.00	669.87	13,397	
Tribonematales	330.00	621.72	205,168	
chrysophyte (flagel-unicell)	44.00	646.82	28,460	ovoid cell
<b>Bacillariophyceae</b>				
<i>Asterionella formosa</i>	64.00	450.00	28,800	
<i>Fragilaria crotonensis</i>	800.00	648.00	518,400	
<i>Melosira sp.</i>	160.00	1,780.38	284,861	
<i>Melosira sp.</i>	95.00	3,384.92	321,567	
<i>Synedra sp.</i>	20.00	5,699.10	113,982	S. acus-like;frustule slight bow
<i>Synedra sp.</i>	4.00	2,901.36	11,605	S. acus-like
<i>Synedra ulna</i>	6.00	23,625.00	141,750	
<i>Synedra sp.</i>	2.00	126.93	254	
<i>Tabellaria fenestrata</i>	224.00	4,900.00	1,097,600	
<b>Taxon Subtotal</b>	<b>5305</b>		<b>5,344,308</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas spp.</i>	20.00	2,461.76	49,235	
cryptomonad	12.00	690.80	8,290	
<i>Rhodomonas sp.</i>	44.00	175.21	7,709	
<b>Taxon Subtotal</b>	<b>76.00</b>		<b>65,234</b>	
<b>Euglenophyta</b>				
<i>Trachelomonas sp.(ell)</i>	2.00	5,024.00	10,048	
<i>Trachelomonas sp.(sph)</i>	2.00	5,572.45	11,145	smooth wall
<i>Trachelomonas sp.(sph)</i>	2.00	1,149.76	2,300	tiny cell;smooth wall
<b>Taxon Subtotal</b>	<b>6</b>		<b>23,492</b>	
<b>Pyrrhophyta</b>				
<i>Ceratium hirundinella</i>	4.00	60,000.00	240,000	
<b>Taxon Subtotal</b>	<b>4.00</b>		<b>240,000</b>	
<b>Undetermined</b>				
			(um <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
<b>Total Number/ml</b>	<b>14325</b>	<b>Total Volume</b>	<b>11,714,338</b>	<b>11.714</b>
Percent Cyanophyta	44.61	Percent Cyanophyta	34.54	
Percent Chlorophyta	17.75	Percent Chlorophyta	17.03	
Percent Chrysophyta	37.03	Percent Chrysophyta	45.62	
Percent Cryptophyta	0.53	Percent Cryptophyta	0.56	
Percent Euglenophyta	0.04	Percent Euglenophyta	0.20	
Percent Pyrrhophyta	0.03	Percent Pyrrhophyta	2.05	
Percent Undetermined	0.00	Percent Undetermined	0.00	
*= colony	+=filament			



PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 9/29/2009		SAMPLE STATUS: Lugols preserved		
STATION: center-1m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<i>Anabaena sp.</i>	100.00	110.82	11,082	short crimped coils/knots;ellip cells
<i>Anabaena circinalis/flos-aquae/spiroides assemblg</i>	30.00	150.46	4,514	loose coils&spirals;no gonidia
<i>Anabaena sp.</i>	1,700.00	334.93	569,387	linear compres barrel cells
<i>Anabaena spiroides</i>	70.00	759.88	53,192	short spiral coils
<i>Aphanizomenon flos-aquae</i>	20.00	137.38	2,748	heterocysts absent
<i>Anacystis (Aphanothece/Anathece spp.)</i>	1,000.00	4.19	4,187	
<i>Coelosphaerium/Snowella spp. assemblg</i>	6,160.00	22.44	138,218	cells @col edge:fibrils?
* <i>Woronichinia spp.(incl Coelos. Naegel)</i>	2.00	314,000	628,000	disintegr colonies<100um diam
<i>Microcystis spp. assemblg(tenta)</i>	50.00	87.07	4,353	cells w/aerotopes;ovate col w/faint muc
+ filamentous cyanophyte1	1.00	3,365.69	3,366	short fil.ends taper, Aphaniz-like
<b>Taxon Subtotal</b>	<b>9133</b>		<b>1,419,044</b>	
<b>Chlorophyta</b>				
* <i>Botryococcus sp.</i>	2.00	52,333.33	104,667	col<50 um diam
* <i>Botryococcus sp.</i>	1.00	418,666.67	418,667	col<100 um diam
* <i>Botryococcus sp.</i>	1.00	820,586.67	820,587	col<140 um diam
* <i>Crucigenia sp.</i>	4.00	320.00	1,280	4-cell colony
<i>Dictyosphaerium sp.</i>	48.00	87.07	4,179	
<i>Oocystis sp.</i>	16.00	244.92	3,919	
<i>Oocystis sp.</i>	4.00	1,013.17	4,053	
* <i>Pediastrum duplex</i>	3.00	8,373.33	25,120	
* <i>Pediastrum duplex</i>	1.00	18,840.00	18,840	
<i>Quadrigula sp.</i>	2.00	301.44	603	
<i>Quadrigula sp.</i>	8.00	192.33	1,539	
* <i>Scenedesmus sp.</i>	3.00	628.00	1,884	4-cell colony
<i>Staurastrum sp.</i>	1.00	2,169.17	2,169	
<i>Tetraedron minimum</i>	1.00	720.00	720	
<i>Tetraedron regulare</i>	2.00	979.20	1,958	
undet green filament	60.00	395.64	23,738	collapsed cells
colonial (sph) nannoplktn	24.00	267.95	6,431	cell pairs/quads
colonial (sph) nannoplktn	88.00	113.04	9,948	
unicell (sph) nannoplktn	77.00	1,436.03	110,574	
<b>Taxon Subtotal</b>	<b>346.00</b>		<b>1,560,875</b>	
<b>Chrysophyta</b>				
<i>Dinobryon sociale/serularia assemblg</i>	1,210.00	732.67	886,527	
<i>Dinobryon divergens</i>	40.00	669.87	26,795	
Tribonematales	875.00	621.72	544,005	
<b>Bacillariophyceae</b>				
<i>Asterionella formosa</i>	440.00	487.50	214,500	
<i>Cyclotella sp.</i>	22.00	663.33	14,593	small cells<15um diam
<i>Epithemia sp.</i>	1.00	4,103	4,103	
<i>Fragilaria crotonensis</i>	550.00	648.00	356,400	
<i>Melosira sp.</i>	715.00	1,780.38	1,272,972	
<i>Melosira sp.</i>	110.00	410.34	45,137	
<i>Pinnularia/Rhopalodia spp.assemblg</i>	1.00	3,140.00	3,140	
<i>Synedra sp.</i>	33.00	5,699.10	188,070	S. acus-like;frustule slight bow
<i>Synedra sp.</i>	66.00	366.33	24,178	
undet pennate diatom	11.00	3,077.20	33,849	
<i>Tabellaria fenestrata</i>	320.00	4,900.00	1,568,000	
<b>Taxon Subtotal</b>	<b>4394</b>		<b>5,182,268</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas spp.</i>	28.00	2,461.76	68,929	
small cryptomonad	10.00	452.16	4,522	
cryptomonad	10.00	1,036.20	10,362	
<i>Rhodomonas sp.</i>	22.00	175.21	3,855	
<b>Taxon Subtotal</b>	<b>70.00</b>		<b>87,668</b>	
<b>Euglenophyta</b>				
<i>Euglena sp.</i>	2.00	11,539.50	23,079	
<i>Phacus sp.</i>	2.00	2,449.20	4,898	
<i>Trachelomonas sp.(ell)</i>	2.00	5,024.00	10,048	
<i>Trachelomonas sp.(sph)</i>	2.00	1,149.76	2,300	tiny cell;smooth wall
<b>Taxon Subtotal</b>	<b>8</b>		<b>40,325</b>	
<b>Pyrrhophyta</b>				
dinoflagellate	2.00	11,209.80	22,420	
<b>Taxon Subtotal</b>	<b>2.00</b>		<b>22,420</b>	
<b>Undetermined</b>				
* undeter colony	44.00	7,065.00	310,860	col packed w/compres cells-yg?
<b>Taxon Subtotal</b>	<b>44.00</b>		<b>310,860</b>	
<b>Total Number/ml</b>	<b>13997</b>	<b>Total Volume</b>	<b>8,623,459</b>	<b>8.623</b>
Percent Cyanophyta	65.25	Percent Cyanophyta	16.46	
Percent Chlorophyta	2.47	Percent Chlorophyta	18.10	
Percent Chrysophyta	31.39	Percent Chrysophyta	60.10	
Percent Cryptophyta	0.50	Percent Cryptophyta	1.02	
Percent Euglenophyta	0.06	Percent Euglenophyta	0.47	
Percent Pyrrhophyta	0.01	Percent Pyrrhophyta	0.26	
Percent Undetermined	0.31	Percent Undetermined	3.60	
*= colony	+=filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 10/20/2009		SAMPLE STATUS: Lugols preserved		
STATION: center-1m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<i>Anabaena</i> sp.	200.00	334.93	66,987	linear compres barrel cells
<i>Anabaena spiroides</i>	10.00	759.88	7,599	short spiral coils
<i>Anacystis</i> ( <i>Aphanothece</i> / <i>Anathece</i> spp.)	3,000.00	4.19	12,560	
<i>Chroococcus</i> sp.	8.00	78.50	628	
<i>Coelosphaerium</i> / <i>Snowella</i> spp. asmblg	2,400.00	22.44	53,851	cells @col edge;fibrils?
<b>Taxon Subtotal</b>	<b>5618</b>		<b>141,624</b>	
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	10.00	171	1,710	
* <i>Botryococcus</i> sp.	2.00	52,333.33	104,667	col<50 um diam
* <i>Crucigenia</i> sp.	2.00	426.67	853	4-cell colony
<i>Dictyosphaerium</i> sp.	144.00	87.07	12,538	
* <i>Scenedesmus</i> sp.	1.00	1,055.04	1,055	4-cell colony
colonial (sph) nannoplktn	48.00	381.51	18,312	cell pairs/quads
colonial (sph) nannoplktn	16.00	150.46	2,407	
unicell (sph) nannoplktn	16.00	1,436.03	22,976	
<b>Taxon Subtotal</b>	<b>239.00</b>		<b>164,519</b>	
<b>Chrysophyta</b>				
<i>Dinobryon sociale</i> / <i>sertularia</i> asmblg	120.00	732.67	87,920	
<i>Dinobryon divergens</i>	400.00	669.87	267,947	
<i>Mallomonas</i> sp.	2.00	4,019.20	8,038	
Tribonematales	108.00	621.72	67,146	
chrysophyte (flagel-unicell)	55.00	646.82	35,575	ovoid cell
chrysophyte (flagel-unicell)	2.00	6,280.00	12,560	long flagellum
chrysophyte (flagel-unicell)	10.00	3,052.08	30,521	
<b>Bacillariophyceae</b>				
<i>Amphora</i> sp.	2.00	1,483.65	2,967	
<i>Asterionella formosa</i>	400.00	487.50	195,000	
<i>Cyclotella</i> sp.	2.00	1,205.76	2,412	
<i>Cyclotella</i> sp.	20.00	663.33	13,267	small cells<15um diam
<i>Fragilaria crotonensis</i>	160.00	648.00	103,680	
<i>Melosira</i> sp.	100.00	1,780.38	178,038	
<i>Melosira</i> sp.	16.00	4,000.36	64,006	
<i>Rhizosolenia</i> sp.	1.00	5,652.00	5,652	delicate cells w/long spines
<i>Synedra</i> sp.	2.00	5,181.00	10,362	S. acus-like;frustule slight bow
<i>Synedra</i> sp.	2.00	1,854.56	3,709	
<i>Synedra</i> sp.	2.00	366.33	733	
<i>Tabellaria fenestrata</i>	136.00	4,900.00	666,400	
<b>Taxon Subtotal</b>	<b>1540</b>		<b>1,752,964</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas</i> spp.	48.00	2,461.76	118,164	
<i>Cryptomonas</i> sp.	2.00	4,295.52	8,591	
small cryptomonad	10.00	452.16	4,522	
cryptomonad	77.00	1,036.20	79,787	
<i>Rhodomonas</i> sp.	55.00	175.21	9,637	
<b>Taxon Subtotal</b>	<b>192.00</b>		<b>220,701</b>	
<b>Euglenophyta</b>				
<i>Phacus</i> sp.	2.00	2,449.20	4,898	
<i>Trachelomonas</i> sp.(ell)	2.00	5,024.00	10,048	
<i>Trachelomonas volvocina</i>	2.00	2,571.14	5,142	smooth wall
<b>Taxon Subtotal</b>	<b>6</b>		<b>20,089</b>	
<b>Pyrrhophyta</b>				
<b>Undetermined</b>				
			(um <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
<b>Total Number/ml</b>	<b>7595</b>	<b>Total Volume</b>	<b>2,299,898</b>	<b>2.300</b>
Percent Cyanophyta	73.97	Percent Cyanophyta	6.16	
Percent Chlorophyta	3.15	Percent Chlorophyta	7.15	
Percent Chrysophyta	20.28	Percent Chrysophyta	76.22	
Percent Cryptophyta	2.53	Percent Cryptophyta	9.60	
Percent Euglenophyta	0.08	Percent Euglenophyta	0.87	
Percent Pyrrhophyta	0.00	Percent Pyrrhophyta	0.00	
Percent Undetermined	0.00	Percent Undetermined	0.00	
*= colony	+=filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 11/24/2009		SAMPLE STATUS: Lugols preserved		
STATION: center-1m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<b>Chlorophyta</b>				
unicell (sph) nannoplktn	2.00	1,436.03	2,872	
<b>Taxon Subtotal</b>	<b>2.00</b>		<b>2,872</b>	
<b>Chrysophyta</b>				
<i>Dinobryon sociale/sertularia asmblg</i>	60.00	732.67	43,960	
<i>Mallomonas sp.</i>	1.00	4,952.83	4,953	
<i>Mallomonas sp.</i>	2.00	3,537.73	7,075	
<i>Mallomonas sp.</i>	1.00	2,461.76	2,462	
<i>Mallomonas sp.</i>	1.00	4,823.04	4,823	
<i>Rhizochrysis sp.</i>	2.00	8,205.87	16,412	
Tribonematales	24.00	621.72	14,921	
chrysophyte (flagel-unicell)	22.00	646.82	14,230	ovoid cell
chrysophyte (flagel-unicell)	6.00	6,280.00	37,680	long flagellum
chrysophyte (flagel-unicell)	15.00	1,205.76	18,086	ovoid cell w/basal thread;disrup col?
<b>Bacillariophyceae</b>				
<i>Asterionella formosa</i>	1,600.00	487.50	780,000	
<i>Fragilaria crotonensis</i>	10.00	900.00	9,000	
<i>Melosira sp.</i>	3.00	1,780.38	5,341	
<i>Synedra sp.</i>	1.00	224.38	224	
<i>Tabellaria fenestrata</i>	18.00	4,550.00	81,900	
<b>Taxon Subtotal</b>	<b>1766</b>		<b>1,041,068</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas spp.</i>	60.00	2,461.76	147,706	
<i>Cryptomonas sp.</i>	6.00	5,652.00	33,912	
small cryptomonad	33.00	452.16	14,921	
cryptomonad	24.00	1,036.20	24,869	
<i>Rhodomonas sp.</i>	66.00	175.21	11,564	
<b>Taxon Subtotal</b>	<b>189.00</b>		<b>232,972</b>	
<b>Euglenophyta</b>				
<b>Pyrrhophyta</b>				
<b>Undetermined</b>				
undeter unicell	1.00	11,488.21	11,488	dense ovate cell
<b>Taxon Subtotal</b>	<b>1.00</b>		<b>11,488</b>	
			(µm <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
<b>Total Number/ml</b>	<b>1958</b>	<b>Total Volume</b>	<b>1,288,400</b>	<b>1.288</b>
Percent Cyanophyta	0.00	Percent Cyanophyta	0.00	
Percent Chlorophyta	0.10	Percent Chlorophyta	0.22	
Percent Chrysophyta	90.19	Percent Chrysophyta	80.80	
Percent Cryptophyta	9.65	Percent Cryptophyta	18.08	
Percent Euglenophyta	0.00	Percent Euglenophyta	0.00	
Percent Pyrrhophyta	0.00	Percent Pyrrhophyta	0.00	
Percent Undetermined	0.05	Percent Undetermined	0.89	
*= colony	+=filament			

**Table C-5. Phytoplankton Data for Long Lake Middle Station, 2010.**

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 1/7/2010		SAMPLE STATUS: Lugols preserved		
STATION: center-1m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
* colonial cyanophyte	1.00	339,120.00	339,120	disintegr colonies<100um diam
<b>Taxon Subtotal</b>	<b>1</b>		<b>339,120</b>	
<b>Chlorophyta</b>				
* <i>Botryococcus sp.</i>	2.00	418,666.67	837,333	col<100 um diam
* <i>Scenedesmus sp.</i>	1.00	256.43	256	4-cell colony
unicell (sph) nannoplktn	2.00	1,436.03	2,872	
unicell (sph) nannoplktn	2.00	381.51	763	
<b>Taxon Subtotal</b>	<b>7.00</b>		<b>841,225</b>	
<b>Chrysophyta</b>				
<i>Mallomonas sp.</i>	1.00	5,090.99	5,091	
Tribonematales	12.00	621.72	7,461	
chrysophyte (flagel-unicell)	55.00	381.51	20,983	ovoid cell
chrysophyte (flagel-unicell)	77.00	1,172.27	90,265	Chromulina/Ochromonas-like
<b>Bacillariophyceae</b>				
<i>Asterionella formosa</i>	240.00	487.50	117,000	
<i>Epithemia sp.</i>	1.00	2,257	2,257	
<i>Fragilaria sp.</i>	12.00	693.00	8,316	
<i>Fragilaria crotonensis</i>	30.00	900.00	27,000	
<i>Melosira sp.</i>	5.00	1,153.95	5,770	
<i>Melosira sp.</i>	38.00	1,780.38	67,654	
<i>Tabellaria fenestrata</i>	18.00	4,900.00	88,200	
undet pennate diatom	1.00	3,590.07	3,590	
undet pennate diatom	2.00	188.40	377	
<b>Taxon Subtotal</b>	<b>492</b>		<b>443,963</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas spp.</i>	28.00	2,461.76	68,929	
<i>Cryptomonas sp.</i>	3.00	5,652.00	16,956	
cryptomonad	20.00	1,036.20	20,724	
<i>Rhodomonas sp.</i>	10.00	175.21	1,752	
<b>Taxon Subtotal</b>	<b>61.00</b>		<b>108,361</b>	
<b>Euglenophyta</b>				
<b>Pyrrhophyta</b>				
<b>Undetermined</b>				
undeter unicell	1.00	11,488.21	11,488	dense ovate cell
<b>Taxon Subtotal</b>	<b>1.00</b>		<b>11,488</b>	
			(µm <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
<b>Total Number/ml</b>	<b>562</b>	<b>Total Volume</b>	<b>1,744,157</b>	<b>1.744</b>
Percent Cyanophyta	0.18	Percent Cyanophyta	19.44	
Percent Chlorophyta	1.25	Percent Chlorophyta	48.23	
Percent Chrysophyta	87.54	Percent Chrysophyta	25.45	
Percent Cryptophyta	10.85	Percent Cryptophyta	6.21	
Percent Euglenophyta	0.00	Percent Euglenophyta	0.00	
Percent Pyrrhophyta	0.00	Percent Pyrrhophyta	0.00	
Percent Undetermined	0.18	Percent Undetermined	0.66	
*= colony	+=filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 2/18/2010		SAMPLE STATUS: Lugols preserved		
STATION: center-1m		NOTE:		
Taxon	Cells/ml	$\mu\text{m}^3/\text{cell}$	$\mu\text{m}^3/\text{ml}$	comments
<b>Cyanophyta</b>				
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	4.00	80	320	
<i>Ankistrodesmus falcatus</i>	1.00	171	171	
<i>Quadrigula sp.</i>	2.00	301.44	603	
colonial (sph) nannoplktn	4.00	1,149.76	4,599	
unicell (sph) nannoplktn	35.00	1,436.03	50,261	
<b>Taxon Subtotal</b>	<b>46.00</b>		<b>55,954</b>	
<b>Chrysophyta</b>				
<i>Dinobryon sp.</i>	20.00	669.87	13,397	solitary deterior cells
Tribonematales	20.00	621.72	12,434	
chrysophyte (flagel-unicell)	4,235.00	1,172.27	4,964,549	Chromulina/Ochromonas-like
chrysophyte (flagel-unicell)	7.00	3,052.08	21,365	
chrysophyte (flagel-unicell)	1.00	2,562.24	2,562	
chrysophyte (flagel-unicell)	10.00	196.25	1,963	
chrysophyte (flagel-unicell)	110.00	1,205.76	132,634	ovoid cell;basal thread;disrup col?
<b>Bacillariophyceae</b>				
<i>Asterionella formosa</i>	32.00	525.00	16,800	
<i>Cyclotella sp.</i>	1.00	769.30	769	small cells<15um diam
<i>Fragilaria crotonensis</i>	30.00	900.00	27,000	
<i>Melosira sp.</i>	45.00	1,153.95	51,928	
<i>Nitzschia sp.</i>	1.00	769.30	769	
<i>Nitzschia sp.</i>	1.00	719.58	720	
<i>Synedra sp.</i>	1.00	269.26	269	
<i>Tabellaria fenestrata</i>	1.00	4,900.00	4,900	
undet pennate diatom	1.00	196.25	196	
<b>Taxon Subtotal</b>	<b>4516</b>		<b>5,252,255</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas spp.</i>	104.00	2,461.76	256,023	
<i>Cryptomonas sp.</i>	2.00	5,652.00	11,304	
cryptomonad	6.00	1,036.20	6,217	
<i>Rhodomonas sp.</i>	10.00	175.21	1,752	
<b>Taxon Subtotal</b>	<b>122.00</b>		<b>275,296</b>	
<b>Euglenophyta</b>				
<i>Trachelomonas sp.(sph)</i>	1.00	5,572.45	5,572	smooth wall
<b>Taxon Subtotal</b>	<b>1</b>		<b>5,572</b>	
<b>Pyrrhophyta</b>				
small dinoflagellate	2.00	3,108.60	6,217	
dinoflagellate	1.00	9,891.00	9,891	
<b>Taxon Subtotal</b>	<b>3.00</b>		<b>16,108</b>	
<b>Undetermined</b>				
			( $\mu\text{m}^3/\text{ml}$ )	( $\text{mm}^3/\text{L}$ )
<b>Total Number/ml</b>	<b>4688</b>	<b>Total Volume</b>	<b>5,605,187</b>	<b>5.605</b>
Percent Cyanophyta	0.00	Percent Cyanophyta	0.00	
Percent Chlorophyta	0.98	Percent Chlorophyta	1.00	
Percent Chrysophyta	96.33	Percent Chrysophyta	93.70	
Percent Cryptophyta	2.60	Percent Cryptophyta	4.91	
Percent Euglenophyta	0.02	Percent Euglenophyta	0.10	
Percent Pyrrhophyta	0.06	Percent Pyrrhophyta	0.29	
Percent Undetermined	0.00	Percent Undetermined	0.00	
*= colony	+=filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 3/31/2010		SAMPLE STATUS: Lugols preserved		
STATION: center-1m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
* <i>Woronichinia spp. (incl Coel. Naegel)</i>	1.00	314,000	314,000	disintegr colonies<100um diam
<b>Taxon Subtotal</b>	<b>1</b>		<b>314,000</b>	
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	165.00	160	26,330	
<i>Ankistrodesmus falcatus</i>	55.00	399	21,942	
<i>Closterium sp.</i>	12.00	628	7,536	
<i>Closterium sp.</i>	2.00	2,553	5,106	
* <i>Pandorina/Eudorina spp. asmb/g</i>	2.00	4,823.04	9,646	small-cell colonies
<i>Pandorina sp.</i>	32.00	205.15	6,565	
<i>Quadrigula sp.</i>	2.00	153.86	308	
colonial (sph) nannoplktn	112.00	904.32	101,284	
unicell (sph) nannoplktn	40.00	1,436.03	57,441	
<b>Taxon Subtotal</b>	<b>422.00</b>		<b>236,157</b>	
<b>Chrysophyta</b>				
<i>Mallomonas sp.</i>	12.00	3,714.62	44,575	
<i>Mallomonas sp.</i>	30.00	3,487.49	104,625	
<i>Uroglena/Uroglenopsis spp. (tenta)</i>	64.00	179.50	11,488	colonies disrupted
colonial chrysophyte	32.00	150.46	4,815	colonies disrupted
chrysophyte (flagel-unicell)	1,320.00	1,172.27	1,547,392	Chromulina/Ochromonas-like
chrysophyte (flagel-unicell)	4.00	6,280.00	25,120	
<b>Bacillariophyceae</b>				
<i>Asterionella formosa</i>	576.00	525.00	302,400	
<i>Cyclotella sp.</i>	2.00	883.13	1,766	small cells<15um diam
<i>Fragilaria crotonensis</i>	100.00	900.00	90,000	
<i>Melosira sp.</i>	90.00	431.75	38,858	
<i>Melosira sp.</i>	125.00	1,701.49	212,686	
<i>Rhizosolenia sp.</i>	30.00	5,652.00	169,560	delicate cells w/long spines
<i>Synedra sp.</i>	2.00	4,144.80	8,290	
<i>Synedra sp.</i>	2.00	224.38	449	
<i>Synedra sp.</i>	10.00	320.54	3,205	
<i>Tabellaria fenestrata</i>	2.00	5,880.00	11,760	
undet pennate diatom	2.00	1,381.60	2,763	
undet pennate diatom	2.00	2,564.33	5,129	
<b>Taxon Subtotal</b>	<b>2405</b>		<b>2,584,880</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas spp.</i>	484.00	2,461.76	1,191,492	
<i>Cryptomonas sp.</i>	10.00	5,934.60	59,346	
small cryptomonad	20.00	565.20	11,304	
cryptomonad	44.00	1,036.20	45,593	
<i>Rhodomonas sp.</i>	330.00	202.06	66,679	
<b>Taxon Subtotal</b>	<b>888.00</b>		<b>1,374,414</b>	
<b>Euglenophyta</b>				
<b>Pyrrhophyta</b>				
small dinoflagellate	16.00	3,108.60	49,738	
dinoflagellate	2.00	6,857.76	13,716	
<b>Taxon Subtotal</b>	<b>18.00</b>		<b>63,453</b>	
<b>Undetermined</b>				
<b>Total Number/ml</b>	<b>3734</b>	<b>Total Volume</b>	<b>4,572,905</b>	<b>(mm<sup>3</sup>/L)</b>
Percent Cyanophyta	0.03	Percent Cyanophyta	6.87	
Percent Chlorophyta	11.30	Percent Chlorophyta	5.16	
Percent Chrysophyta	64.41	Percent Chrysophyta	56.53	
Percent Cryptophyta	23.78	Percent Cryptophyta	30.06	
Percent Euglenophyta	0.00	Percent Euglenophyta	0.00	
Percent Pyrrhophyta	0.48	Percent Pyrrhophyta	1.39	
Percent Undetermined	0.00	Percent Undetermined	0.00	
*= colony	+=filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 4/28/2010		SAMPLE STATUS: Lugols preserved		
STATION: center-1m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<i>Anabaena sp.</i>	50.00	368.43	18,421	linear compres barrel cells
<i>Anabaena spiroides</i>	20.00	759.88	15,198	short spiral coils
+ Oscillatoriales	1.00	1,483.65	1,484	threadlike fil-3.5µm wide;no sheath evid
<b>Taxon Subtotal</b>	<b>71</b>		<b>35,103</b>	
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	33.00	80	2,642	
<i>Ankistrodesmus falcatus</i>	10.00	224	2,244	
<i>Ankistrodesmus falcatus</i>	55.00	370	20,374	
<i>Cosmarium sp.</i>	3.00	5,744.11	17,232	
<i>Dictyosphaerium sp.</i>	368.00	87.07	32,042	
<i>Oocystis sp.</i>	8.00	244.92	1,959	
<i>Quadrigula sp.</i>	12.00	251.20	3,014	
* <i>Scenedesmus sp.</i>	4.00	732.67	2,931	4-cell colony
colonial (sph) nannoplktn	160.00	150.46	24,073	
colonial (sph) nannoplktn	16.00	904.32	14,469	
unicell (sph) nannoplktn	77.00	1,436.03	110,574	
unicell (sph) nannoplktn	6.00	5,572.45	33,435	
unicell (sph) nannoplktn	22.00	1,055.04	23,211	
<b>Taxon Subtotal</b>	<b>774.00</b>		<b>288,201</b>	
<b>Chrysophyta</b>				
<i>Dinobryon sociale/sertularia asmblg</i>	30.00	1,046.67	31,400	
<i>Mallomonas sp.</i>	18.00	2,872.05	51,697	
<i>Rhizochrysis sp.</i>	2.00	4,559.28	9,119	
Tribonematales	76.00	621.72	47,251	
chrysophyte (flagel-unicell)	154.00	1,436.03	221,148	
<b>Bacillariophyceae</b>				
<i>Asterionella formosa</i>	2,024.00	420.00	850,080	
<i>Asterionella formosa</i>	44.00	630.00	27,720	
<i>Cyclotella sp.</i>	6.00	883.13	5,299	small cells<15µm diam
<i>Fragilaria crotonensis</i>	1,100.00	576.00	633,600	
<i>Gomphonema sp.</i>	2.00	3,920.00	7,840	
<i>Melosira sp.</i>	165.00	791.28	130,561	
<i>Melosira sp.</i>	20.00	1,615.53	32,311	
<i>Melosira sp.</i>	8.00	205.17	1,641	
<i>Navicula sp.</i>	2.00	392.50	785	
<i>Nitzschia sp.</i>	2.00	575.67	1,151	
<i>Rhizosolenia sp.</i>	330.00	5,652.00	1,865,160	delicate cells w/long spines
<i>Synedra sp.</i>	6.00	4,662.90	27,977	frustule slight bow
<i>Synedra sp.</i>	2.00	2,072.40	4,145	frustule slight bow
<i>Synedra ulna</i>	12.00	14,175.00	170,100	
<i>Synedra sp.</i>	22.00	1,854.56	40,800	
<i>Synedra sp.</i>	8.00	126.93	1,015	
<i>Synedra sp.</i>	715.00	352.60	252,106	
<i>Tabellaria fenestrata</i>	192.00	4,900.00	940,800	
undet pennate diatom	2.00	1,575.00	3,150	
undet pennate diatom	10.00	196.25	1,963	
<b>Taxon Subtotal</b>	<b>4952</b>		<b>5,358,819</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas spp.</i>	385.00	2,461.76	947,778	
<i>Cryptomonas sp.</i>	1.00	5,934.60	5,935	
small cryptomonad	44.00	565.20	24,869	
cryptomonad	22.00	1,036.20	22,796	
<i>Rhodomonas sp.</i>	88.00	202.06	17,781	
<b>Taxon Subtotal</b>	<b>540.00</b>		<b>1,019,159</b>	
<b>Euglenophyta</b>				
<i>Euglena sp.</i>	1.00	5,887.50	5,888	
euglenoid	2.00	7,347.60	14,695	
<i>Trachelomonas sp. (ell)</i>	2.00	5,024.00	10,048	
<i>Trachelomonas volvocina</i>	2.00	2,571.14	5,142	smooth wall
<b>Taxon Subtotal</b>	<b>7</b>		<b>35,773</b>	
<b>Pyrrhophyta</b>				
small dinoflagellate	6.00	3,108.60	18,652	
dinoflagellate	2.00	11,209.80	22,420	
<b>Taxon Subtotal</b>	<b>8.00</b>		<b>41,071</b>	
<b>Undetermined</b>				
<b>Total Number/ml</b>	<b>6352</b>	<b>Total Volume</b>	<b>6,778,125</b>	<b>6.778</b>
Percent Cyanophyta	1.12	Percent Cyanophyta	0.52	
Percent Chlorophyta	12.19	Percent Chlorophyta	4.25	
Percent Chrysophyta	77.96	Percent Chrysophyta	79.06	
Percent Cryptophyta	8.50	Percent Cryptophyta	15.04	
Percent Euglenophyta	0.11	Percent Euglenophyta	0.53	
Percent Pyrrhophyta	0.13	Percent Pyrrhophyta	0.61	
Percent Undetermined	0.00	Percent Undetermined	0.00	
*= colony		+=filament		

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 5/20/2010		SAMPLE STATUS: Lugols preserved		
STATION: center-1m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<i>Anabaena sp.</i>	70.00	110.82	7,757	short crimped coils;ellip cells
<i>Anabaena circinalis/flos-aquae/spiroides asmb/g</i>	10.00	267.95	2,679	loose coils;no gonidia
<i>Coelosphaerium/Snowella spp. asmb/g</i>	256.00	22.44	5,744	cells @col edge;fibrils?
<i>Gomphosphaeria sp.</i>	1,664.00	11.45	19,049	small col;thin stalks
+ <i>Oscillatoriales</i>	1.00	1,483.65	1,484	threadlike fil<3.5um wide;no sheath evid
<b>Taxon Subtotal</b>	<b>2001</b>		<b>36,714</b>	
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	2.00	80	160	
<i>Ankistrodesmus falcatus</i>	1.00	212	212	
<i>Oocystis sp.</i>	12.00	130.83	1,570	
<i>Oocystis sp.</i>	4.00	435.41	1,742	
* <i>Scenedesmus arcuatus/bijuga asmb/g</i>	1.00	368.43	368	8-cell colony
<i>Tetraedron sp.</i>	1.00	753.60	754	
colonial (sph) nannoplktn	64.00	381.51	24,417	
colonial (sph) nannoplktn	24.00	65.42	1,570	
unicell (sph) nannoplktn	6.00	1,238.21	7,429	
<b>Taxon Subtotal</b>	<b>115.00</b>		<b>38,221</b>	
<b>Chrysophyta</b>				
<i>Dinobryon sociale/sertularia asmb/g</i>	60.00	1,013.17	60,790	
<i>Dinobryon sociale/sertularia asmb/g</i>	220.00	680.33	149,673	
<i>Dinobryon bavaricum</i>	5.00	327.08	1,635	
<i>Dinobryon divergens</i>	10.00	669.87	6,699	
<i>Mallomonas sp.</i>	9.00	3,714.62	33,432	
<i>Mallomonas sp.</i>	12.00	2,260.80	27,130	
<i>Rhizochrysis sp.</i>	3.00	4,559.28	13,678	
Tribonematales	14.00	621.72	8,704	
chrysophyte (flagel-unicell)	3,630.00	124.34	451,369	ovoid cell
chrysophyte (flagel-unicell)	10.00	1,436.03	14,360	
chrysophyte (flagel-unicell)	2.00	2,411.52	4,823	
<b>Bacillariophyceae</b>				
<i>Asterionella formosa</i>	800.00	525.00	420,000	
<i>Cyclotella sp.</i>	8.00	5,306.60	42,453	
<i>Fragilaria crotonensis</i>	180.00	576.00	103,680	
<i>Fragilaria crotonensis</i>	140.00	900.00	126,000	
<i>Gomphonema sp.</i>	1.00	13,066.67	13,067	
<i>Melosira sp.</i>	50.00	1,077.02	53,851	
<i>Melosira sp.</i>	35.00	392.50	13,738	
<i>Melosira sp.</i>	2.00	4,000.36	8,001	
<i>Synedra sp.</i>	200.00	3,626.70	725,340	frustule slight bow
<i>Synedra sp.</i>	4.00	126.93	508	
<i>Synedra sp.</i>	10.00	352.60	3,526	
<i>Tabellaria fenestrata</i>	560.00	3,920.00	2,195,200	
undet pennate diatom	2.00	327.08	654	
undet pennate diatom	2.00	1,153.95	2,308	
<b>Taxon Subtotal</b>	<b>5969</b>		<b>4,480,617</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas spp.</i>	3.00	2,461.76	7,385	
small cryptomonad	3.00	459.23	1,378	
<b>Taxon Subtotal</b>	<b>6.00</b>		<b>8,763</b>	
<b>Euglenophyta</b>				
<i>Phacus sp.</i>	1.00	2,939.04	2,939	
<i>Trachelomonas volvocina</i>	3.00	2,571.14	7,713	smooth wall
<i>Trachelomonas sp.(sph)</i>	2.00	5,572.45	11,145	smooth wall
<b>Taxon Subtotal</b>	<b>6</b>		<b>21,797</b>	
<b>Pyrrhophyta</b>				
<b>Undetermined</b>				
undeter unicell	1.00	11,488.21	11,488	dense ovate cell
<b>Taxon Subtotal</b>	<b>1.00</b>		<b>11,488</b>	
			(um <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
<b>Total Number/ml</b>	<b>8098</b>	<b>Total Volume</b>	<b>4,597,601</b>	<b>4.598</b>
Percent Cyanophyta	24.71	Percent Cyanophyta	0.80	
Percent Chlorophyta	1.42	Percent Chlorophyta	0.83	
Percent Chrysophyta	73.71	Percent Chrysophyta	97.46	
Percent Cryptophyta	0.07	Percent Cryptophyta	0.19	
Percent Euglenophyta	0.07	Percent Euglenophyta	0.47	
Percent Pyrrhophyta	0.00	Percent Pyrrhophyta	0.00	
Percent Undetermined	0.01	Percent Undetermined	0.25	
*= colony	+=filament			



PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 6/17/2010		SAMPLE STATUS: Lugols preserved		
STATION: center-1m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<i>Anabaena</i> sp.	10.00	110.82	1,108	short crimped coils;ellip cells
<i>Anabaena circinalis/flos-aquae/spiroides</i> asmb/g	600.00	150.46	90,274	loose coils;sph cells;sausage-shp gonidia
<i>Anabaena</i> sp.	575.00	368.43	211,845	linear compres barrel cells
<i>Anabaena spiroides</i>	40.00	628.00	25,120	short spiral coils
<i>Anacystis (Aphanothece/Anathece spp.)</i>	1,200.00	3.39	4,069	
<i>Chroococcus</i> sp.	4.00	69.94	280	
<i>Coelosphaerium/Snowella</i> spp. asmb/g	2,720.00	22.44	61,031	cells @col mucous edge;fibrils?
<i>Gomphosphaeria</i> sp.	80.00	11.45	916	small col;thin stalks
<b>Taxon Subtotal</b>	<b>5229</b>		<b>394,643</b>	
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	1.00	128	128	
* <i>Botryococcus</i> sp.	1.00	8,205.87	8,206	col<30 um diam
<i>Cosmarium</i> sp.	2.00	5,744.11	11,488	
<i>Oocystis</i> sp.	1.00	1,591.98	1,592	
<i>Oocystis</i> sp.	3.00	468.91	1,407	
<i>Oocystis</i> sp.	1.00	5,861.33	5,861	large unicell
* <i>Scenedesmus</i> sp.	2.00	359.01	718	4-cell colony
<i>Schroederia (Ankyra)</i> sp.	1.00	211.95	212	
<i>Tetraedron</i> sp.	1.00	2,154.04	2,154	
colonial (sph) nannoplktn	40.00	65.42	2,617	
colonial (sph) nannoplktn	12.00	904.32	10,852	
unicell (sph) nannoplktn	10.00	1,238.21	12,382	
unicell (sph) nannoplktn	1.00	3,052.08	3,052	
<b>Taxon Subtotal</b>	<b>76.00</b>		<b>60,669</b>	
<b>Chrysophyta</b>				
<i>Dinobryon sociale/sertularia</i> asmb/g	2,500.00	732.67	1,831,667	
<i>Dinobryon bavaricum</i>	40.00	327.08	13,083	
<i>Dinobryon divergens</i>	200.00	669.87	133,973	
<i>Mallomonas</i> sp.	16.00	1,945.75	31,132	
<i>Mallomonas</i> sp.	20.00	2,653.30	53,066	
<i>Rhizochrysis</i> sp.	4.00	6,367.92	25,472	
Tribonematales	20.00	621.72	12,434	
chrysophyte (flagel-unicell)	55.00	904.32	49,738	
<b>Bacillariophyceae</b>				
<i>Asterionella formosa</i>	16.00	525.00	8,400	
<i>Cyclotella</i> sp.	2.00	883.13	1,766	small cells<15um diam
<i>Cyclotella</i> sp.	10.00	2,659.58	26,596	
<i>Cyclotella</i> sp.	36.00	5,306.60	191,038	
<i>Cyclotella</i> sp.	2.00	9,646.08	19,292	
<i>Melosira</i> sp.	242.00	1,780.38	430,852	
<i>Synedra</i> sp.	2.00	3,626.70	7,253	frustule slight bow
<i>Synedra</i> sp.	64.00	224.38	14,360	stellate colonies
<i>Synedra</i> sp.	2.00	352.60	705	
<i>Tabellaria fenestrata</i>	320.00	4,620.00	1,478,400	
<b>Taxon Subtotal</b>	<b>3551</b>		<b>4,329,228</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas</i> spp.	70.00	2,461.76	172,323	
<i>Cryptomonas</i> sp.	2.00	5,934.60	11,869	
<i>Cryptomonas</i> sp. (large)	2.00	12,123.54	24,247	
cryptomonad	50.00	777.15	38,858	
<i>Rhodomonas</i> sp.	33.00	175.21	5,782	
<b>Taxon Subtotal</b>	<b>157.00</b>		<b>253,079</b>	
<b>Euglenophyta</b>				
<i>Euglena</i> sp.	2.00	4,615.80	9,232	
<i>Trachelomonas volvocina</i>	8.00	2,571.14	20,569	smooth wall
<i>Trachelomonas</i> sp. (sph)	2.00	5,572.45	11,145	smooth wall
<b>Taxon Subtotal</b>	<b>12</b>		<b>40,946</b>	
<b>Pyrrhophyta</b>				
small dinoflagellate	4.00	1,582.56	6,330	
dinoflagellate	7.00	15,072.00	105,504	
<i>Ceratium hirundinella</i>	2.00	60,000.00	120,000	
<b>Taxon Subtotal</b>	<b>13.00</b>		<b>231,834</b>	
<b>Undetermined</b>				
			(um <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
<b>Total Number/ml</b>	<b>9038</b>	<b>Total Volume</b>	<b>5,310,399</b>	<b>5.310</b>
Percent Cyanophyta	57.86	Percent Cyanophyta	7.43	
Percent Chlorophyta	0.84	Percent Chlorophyta	1.14	
Percent Chrysophyta	39.29	Percent Chrysophyta	81.52	
Percent Cryptophyta	1.74	Percent Cryptophyta	4.77	
Percent Euglenophyta	0.13	Percent Euglenophyta	0.77	
Percent Pyrrhophyta	0.14	Percent Pyrrhophyta	4.37	
Percent Undetermined	0.00	Percent Undetermined	0.00	
*= colony	+=filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 7/15/2010		SAMPLE STATUS: Lugols preserved		
STATION: center-1m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<i>Anabaena sp.</i>	4,500.00	368.43	1,657,920	linear compres barrel cells
<i>Anabaena spiroides</i>	140.00	628.00	87,920	short spiral coils
<i>Aphanocapsa sp.</i>	800.00	4.19	3,349	sph cells<2um diam
<i>Anacystis (Aphanothece/Anathece spp.)</i>	2,400.00	3.39	8,139	
<i>Chroococcus sp.</i>	200.00	69.94	13,989	
<i>Coelosphaerium/Snowella spp. asmb/g</i>	4,000.00	22.44	89,752	cells @col mucous edge:fibrils?
<i>Gomphosphaeria sp.</i>	384.00	11.45	4,396	small col:thin stalks
* <i>Woronichinia spp. (incl Coelos. Naegel)</i>	1.00	314,000	314,000	disintegr colonies<100um diam
+ <i>Oscillatoriales</i>	1.00	3,956.40	3,956	fil<7um diam, no sheath evid
<b>Taxon Subtotal</b>	<b>12426</b>		<b>2,183,421</b>	
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	3.00	128	385	
* <i>Botryococcus sp.</i>	4.00	27,694.80	110,779	col<40 um diam
* <i>Botryococcus sp.</i>	1.00	72,211.63	72,212	col<60 um diam
<i>Oocystis sp.</i>	1.00	1,591.98	1,592	
<i>Oocystis sp.</i>	2.00	837.33	1,675	
<i>Quadrigula sp.</i>	8.00	251.20	2,010	
* <i>Scenedesmus sp.</i>	1.00	732.67	733	4-cell colony
* <i>Scenedesmus arcuatus/bijuga asmb/g</i>	2.00	575.67	1,151	8-cell colony
colonial (ell) nannoplktn	32.00	551.07	17,634	
colonial (sph) nannoplktn	128.00	65.42	8,373	
colonial (sph) nannoplktn	16.00	381.51	6,104	
unicell (sph) nannoplktn	4.00	2,143.57	8,574	
unicell (sph) nannoplktn	10.00	523.33	5,233	
<b>Taxon Subtotal</b>	<b>212.00</b>		<b>236,455</b>	
<b>Chrysophyta</b>				
<i>Dinobryon sociale/seritularia asmb/g</i>	160.00	732.67	117,227	
<i>Dinobryon divergens</i>	100.00	669.87	66,987	
<i>Gloeobotrys sp.</i>	640.00	124.34	79,580	cells disrupted
<i>Mallomonas sp.</i>	2.00	2,299.53	4,599	
<i>Rhizochrysis sp.</i>	1.00	6,367.92	6,368	
Tribonematales	45.00	621.72	27,977	
chrysophyte (flagel-unicell)	2.00	5,652.00	11,304	obovoid cell:long flagellum
chrysophyte (flagel-unicell)	22.00	904.32	19,895	
<b>Bacillariophyceae</b>				
<i>Asterionella formosa</i>	352.00	525.00	184,800	
<i>Asterionella formosa</i>	400.00	825.00	330,000	
<i>Cyclotella sp.</i>	2.00	883.13	1,766	small cells<15um diam
<i>Cyclotella sp.</i>	150.00	2,659.58	398,937	
<i>Cyclotella sp.</i>	42.00	5,306.60	222,877	
<i>Cyclotella sp.</i>	2.00	10,889.52	21,779	
<i>Fragilaria crotonensis</i>	120.00	604.80	72,576	
<i>Fragilaria crotonensis</i>	400.00	900.00	360,000	
<i>Melosira sp.</i>	330.00	1,077.02	355,417	
<i>Melosira sp.</i>	180.00	686.88	123,638	
<i>Melosira sp.</i>	90.00	3,165.12	284,861	
<i>Synedra sp.</i>	1.00	5,181.00	5,181	frustule slight bow
<i>Synedra ulna</i>	3.00	23,625.00	70,875	
<i>Synedra sp.</i>	48.00	320.54	15,386	stellate colonies
<i>Tabellaria fenestrata</i>	168.00	4,620.00	776,160	
<b>Taxon Subtotal</b>	<b>3260</b>		<b>3,558,189</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas spp.</i>	28.00	2,461.76	68,929	
<i>Cryptomonas sp.</i>	22.00	5,934.60	130,561	
<i>Cryptomonas sp. (large)</i>	2.00	12,572.56	25,145	
cryptomonad	40.00	777.15	31,086	
<i>Rhodomonas sp.</i>	22.00	175.21	3,855	
<b>Taxon Subtotal</b>	<b>114.00</b>		<b>259,576</b>	
<b>Euglenophyta</b>				
<i>Euglena sp.</i>	4.00	4,615.80	18,463	
<i>Trachelomonas volvocina</i>	6.00	2,571.14	15,427	smooth wall
<i>Trachelomonas sp. (sph)</i>	4.00	5,572.45	22,290	smooth wall
<b>Taxon Subtotal</b>	<b>14</b>		<b>56,180</b>	
<b>Pyrrhophyta</b>				
dinoflagellate	2.00	7,837.44	15,675	
dinoflagellate	2.00	21,298.62	42,597	
<b>Taxon Subtotal</b>	<b>4.00</b>		<b>58,272</b>	
<b>Undetermined</b>				
			(um <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
<b>Total Number/ml</b>	<b>16030</b>	<b>Total Volume</b>	<b>6,352,094</b>	<b>6.352</b>
Percent Cyanophyta	77.52	Percent Cyanophyta	34.37	
Percent Chlorophyta	1.32	Percent Chlorophyta	3.72	
Percent Chrysophyta	20.34	Percent Chrysophyta	56.02	
Percent Cryptophyta	0.71	Percent Cryptophyta	4.09	
Percent Euglenophyta	0.09	Percent Euglenophyta	0.88	
Percent Pyrrhophyta	0.02	Percent Pyrrhophyta	0.92	
Percent Undetermined	0.00	Percent Undetermined	0.00	
*= colony	+=filament			

LONG LAKE (Kitsap Co., WA)		SAMPLE STATUS: Lugols preserved		
DATE: 7/29/2010		NOTE:		
STATION: center-1m				
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<i>Anabaena sp.</i>	30.00	110.82	3,324	short crimped coils:ellip cells
<i>Anabaena sp.</i>	10.00	368.43	3,684	linear compres barrel cells
<i>Anabaena spiroides</i>	20.00	628.00	12,560	short spiral coils
<i>Anacystis (Aphanothece/Anathece spp.)</i>	6,000.00	3.39	20,347	
<i>Chroococcus sp.</i>	440.00	63.59	27,977	cubical cell packets
<i>Chroococcus sp.</i>	1,320.00	69.94	92,325	
<i>Gomphosphaeria sp.</i>	40.00	11.45	458	small col;thin stalks
* <i>Woronichinia spp.(incl Coelos. Naegel)</i>	1.00	128,217	128,217	disintegr colonies<100um diam
<b>Taxon Subtotal</b>	<b>7861</b>		<b>288,893</b>	
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	2.00	75	151	
* <i>Botryococcus sp.</i>	3.00	8,205.87	24,618	col<30 um diam
* <i>Botryococcus sp.</i>	1.00	27,694.80	27,695	col<40 um diam
* <i>Botryococcus sp.</i>	2.00	72,211.63	144,423	col<60 um diam
<i>Cosmarium sp.</i>	2.00	5,744.11	11,488	
<i>Oocystis sp.</i>	11.00	837.33	9,211	
* <i>Scenedesmus arcuatus/bijuga asmbly</i>	2.00	575.67	1,151	8-cell colony
colonial (sph) nannoplktn	64.00	65.42	4,187	
unicell (sph) nannoplktn	11.00	2,143.57	23,579	
unicell (sph) nannoplktn	3.00	523.33	1,570	
<b>Taxon Subtotal</b>	<b>101.00</b>		<b>248,073</b>	
<b>Chrysophyta</b>				
<i>Dinobryon sociale/sertularia asmbly</i>	180.00	732.67	131,880	
<i>Gloeobotrys sp.</i>	336.00	124.34	41,780	cells disrupted
<i>Mallomonas sp.</i>	2.00	1,945.75	3,892	
Tribonematales	4.00	621.72	2,487	
colonial chrysophyte	50.00	62.80	3,140	delicate vasselike lorica
chrysophyte (flagel-unicell)	22.00	904.32	19,895	
chrysophyte (flagel-unicell)	1.00	2,143.57	2,144	
chrysophyte (flagel-unicell)	1.00	4,186.67	4,187	
<b>Bacillariophyceae</b>				
<i>Asterionella formosa</i>	12.00	750.00	9,000	
<i>Cyclotella sp.</i>	2.00	883.13	1,766	small cells<15um diam
<i>Cyclotella sp.</i>	3.00	2,659.58	7,979	
<i>Cyclotella sp.</i>	1.00	5,306.60	5,307	
<i>Fragilaria crotonensis</i>	250.00	900.00	225,000	
<i>Melosira sp.</i>	462.00	1,780.38	822,536	
<i>Melosira sp.</i>	14.00	686.88	9,616	
<i>Melosira sp.</i>	28.00	4,308.08	120,626	
<i>Synedra sp.</i>	1.00	3,768.00	3,768	frustule slight bow
<i>Synedra sp.</i>	1.00	320.54	321	
<i>Tabellaria fenestrata</i>	4.00	4,900.00	19,600	
<b>Taxon Subtotal</b>	<b>1374</b>		<b>1,434,921</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas sp.</i>	6.00	1,857.31	11,144	
cryptomonad	9.00	777.15	6,994	
<i>Rhodomonas sp.</i>	44.00	175.21	7,709	
<b>Taxon Subtotal</b>	<b>59.00</b>		<b>25,848</b>	
<b>Euglenophyta</b>				
<i>Euglena sp.</i>	1.00	4,615.80	4,616	
<i>Trachelomonas volvocina</i>	4.00	2,571.14	10,285	smooth wall
<b>Taxon Subtotal</b>	<b>5</b>		<b>14,900</b>	
<b>Pyrrhophyta</b>				
dinoflagellate	4.00	7,837.44	31,350	
<b>Taxon Subtotal</b>	<b>4.00</b>		<b>31,350</b>	
<b>Undetermined</b>				
undeter colony	60.00	65.42	3,925	very deterior sph cells<6um
<b>Taxon Subtotal</b>	<b>60.00</b>		<b>3,925</b>	
			(um <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
<b>Total Number/ml</b>	<b>9464</b>	<b>Total Volume</b>	<b>2,047,910</b>	<b>2.048</b>
Percent Cyanophyta	83.06	Percent Cyanophyta	14.11	
Percent Chlorophyta	1.07	Percent Chlorophyta	12.11	
Percent Chrysophyta	14.52	Percent Chrysophyta	70.07	
Percent Cryptophyta	0.62	Percent Cryptophyta	1.26	
Percent Euglenophyta	0.05	Percent Euglenophyta	0.73	
Percent Pyrrhophyta	0.04	Percent Pyrrhophyta	1.53	
Percent Undetermined	0.63	Percent Undetermined	0.19	
*= colony	+=filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 8/24/2010		SAMPLE STATUS: Lugols preserved		
STATION: center-1m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<i>Anabaena sp.</i>	216.00	368.43	79,580	linear compres barrel cells
<i>Anabaena spiroides</i>	60.00	628.00	37,680	short spiral coils
<i>Aphanizomenon flos-aquae</i>	180.00	137.38	24,728	heterocysts absent
<i>Anacystis (Aphanothece/Anathece spp.)</i>	16,000.00	3.39	54,259	
<i>Chroococcus sp.</i>	16.00	205.17	3,283	
<i>Coelosphaerium/Snowella spp. asmblg</i>	80.00	22.44	1,795	cells @col mucous edge;fibrils?
* <i>Woronichinia spp.(incl Coelos. Naegel)</i>	1.00	128,217	128,217	disintegr colonies<100um diam
<b>Taxon Subtotal</b>	<b>16553</b>		<b>329,541</b>	
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	4.00	75	301	
<i>Ankistrodesmus falcatus</i>	7.00	128	898	
<i>Kirchneriella sp.</i>	32.00	42	1,340	
<i>Oocystis sp.</i>	4.00	143.92	576	
<i>Oocystis sp.</i>	3.00	1,846.32	5,539	
* <i>Scenedesmus arcuatus/bijuga asmblg</i>	1.00	466.29	466	8-cell colony
<i>Schroederia (Ankyra) sp.</i>	1.00	211.95	212	
<i>Schroederia (Ankyra) sp.</i>	1.00	366.33	366	
<i>Staurastrum sp.</i>	1.00	13,840.00	13,840	triangular semicell
<i>Staurastrum sp.</i>	1.00	21,625.00	21,625	triangular semicell
colonial (sph) nannoplktn	128.00	87.07	11,145	
unicell (sph) nannoplktn	10.00	2,143.57	21,436	
<b>Taxon Subtotal</b>	<b>193.00</b>		<b>77,744</b>	
<b>Chrysophyta</b>				
<i>Dinobryon sociale/sertularia asmblg</i>	80.00	502.40	40,192	
<i>Dinobryon divergens</i>	160.00	669.87	107,179	
Tribonematales	30.00	621.72	18,652	
chrysophyte (flagel-unicell)	55.00	904.32	49,738	
chrysophyte (flagel-unicell)	1.00	2,143.57	2,144	
Bacillariophyceae				
<i>Asterionella formosa</i>	24.00	450.00	10,800	
<i>Asterionella formosa</i>	64.00	750.00	48,000	
<i>Cyclotella sp.</i>	3.00	2,659.58	7,979	
<i>Cyclotella sp.</i>	1.00	5,306.60	5,307	
<i>Melosira sp.</i>	1,050.00	1,780.38	1,869,399	
<i>Melosira sp.</i>	20.00	686.88	13,738	
<i>Synedra sp.</i>	12.00	256.43	3,077	stellate colonies
<b>Taxon Subtotal</b>	<b>1500</b>		<b>2,176,202</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas sp.</i>	15.00	1,857.31	27,860	
cryptomonad	27.00	777.15	20,983	
<i>Rhodomonas sp.</i>	10.00	175.21	1,752	
<b>Taxon Subtotal</b>	<b>52.00</b>		<b>50,595</b>	
<b>Euglenophyta</b>				
euglenoid	1.00	16,485.00	16,485	
<i>Trachelomonas volvocina</i>	3.00	2,571.14	7,713	smooth wall
<i>Trachelomonas sp.(sph)</i>	1.00	5,572.45	5,572	smooth wall
<b>Taxon Subtotal</b>	<b>5</b>		<b>29,771</b>	
<b>Pyrrhophyta</b>				
<i>Ceratium hirundinella</i>	2.00	60,000.00	120,000	
<b>Taxon Subtotal</b>	<b>2.00</b>		<b>120,000</b>	
<b>Undetermined</b>				
			(um <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
<b>Total Number/ml</b>	<b>18305</b>	<b>Total Volume</b>	<b>2,783,853</b>	<b>2.784</b>
Percent Cyanophyta	90.43	Percent Cyanophyta	11.84	
Percent Chlorophyta	1.05	Percent Chlorophyta	2.79	
Percent Chrysophyta	8.19	Percent Chrysophyta	78.17	
Percent Cryptophyta	0.28	Percent Cryptophyta	1.82	
Percent Euglenophyta	0.03	Percent Euglenophyta	1.07	
Percent Pyrrhophyta	0.01	Percent Pyrrhophyta	4.31	
Percent Undetermined	0.00	Percent Undetermined	0.00	
*= colony	+=filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 9/30/2010		SAMPLE STATUS: Lugols preserved		
STATION: center-1m		NOTE:		
Taxon	Cells/ml	$\mu\text{m}^3/\text{cell}$	$\mu\text{m}^3/\text{ml}$	comments
<b>Cyanophyta</b>				
<i>Anabaena sp.</i>	30.00	110.82	3,324	short crimped coils;ellip cells
<i>Anabaena circinalis/flos-aquae/spiroides asmblg</i>	300.00	78.50	23,550	loose coils;sph cells;sausage-shp gonidia
<i>Anabaena sp.</i>	160.00	368.43	58,948	linear compres barrel cells;no akin/hetero
<i>Anabaena spiroides</i>	80.00	628.00	50,240	short spiral coils
<i>Aphanizomenon flos-aquae</i>	380.00	137.38	52,203	akinetes pres;heterocysts scarce
<i>Anacystis (Aphanothece/Anathece spp.)</i>	10,000.00	3.39	33,912	
<i>Chroococcus sp.</i>	8.00	69.94	560	
<b>Taxon Subtotal</b>	<b>10958</b>		<b>222,737</b>	
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	30.00	75	2,261	
<i>Ankistrodesmus falcatus</i>	6.00	128	769	
<i>Oocystis sp.</i>	14.00	837.33	11,723	
<i>Quadrigula sp.</i>	2.00	445.10	890	
<i>Schroederia (Ankyra) sp.</i>	5.00	211.95	1,060	
colonial (sph) nannoplktn	40.00	381.51	15,260	
unicell (sph) nannoplktn	10.00	1,436.03	14,360	
unicell (sph) nannoplktn	3.00	3,730.32	11,191	
<b>Taxon Subtotal</b>	<b>110.00</b>		<b>57,514</b>	
<b>Chrysophyta</b>				
<i>Dinobryon divergens</i>	35.00	669.87	23,445	
<i>Dinobryon sp.</i>	200.00	1,046.67	209,333	
<i>Gloeobotrys sp.</i>	48.00	124.34	5,969	cells disrupted
<i>Mallomonas sp.</i>	6.00	1,945.75	11,675	
Tribonematales	18.00	621.72	11,191	
chrysophyte (flagel-unicell)	4.00	4,710.00	18,840	obovoid cell;long flagellum
chrysophyte (flagel-unicell)	22.00	904.32	19,895	
chrysophyte (flagel-unicell)	33.00	196.25	6,476	
Bacillariophyceae				
<i>Asterionella formosa</i>	88.00	750.00	66,000	
<i>Melosira sp.</i>	8.00	831.12	6,649	
<b>Taxon Subtotal</b>	<b>462</b>		<b>379,473</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas spp.</i>	52.00	2,461.76	128,012	
<i>Cryptomonas sp.</i>	10.00	5,934.60	59,346	
<i>Cryptomonas sp. (large)</i>	2.00	12,572.56	25,145	
cryptomonad	64.00	777.15	49,738	
<i>Rhodomonas sp.</i>	44.00	175.21	7,709	
<b>Taxon Subtotal</b>	<b>172.00</b>		<b>269,950</b>	
<b>Euglenophyta</b>				
<i>Trachelomonas volvocina</i>	2.00	2,571.14	5,142	smooth wall
<b>Taxon Subtotal</b>	<b>2</b>		<b>5,142</b>	
<b>Pyrrhophyta</b>				
<i>Ceratium hirundinella</i>	3.00	60,000.00	180,000	
<b>Taxon Subtotal</b>	<b>3.00</b>		<b>180,000</b>	
<b>Undetermined</b>				
			( $\mu\text{m}^3/\text{ml}$ )	( $\text{mm}^3/\text{L}$ )
<b>Total Number/ml</b>	<b>11707</b>	<b>Total Volume</b>	<b>1,114,816</b>	<b>1.115</b>
Percent Cyanophyta	93.60	Percent Cyanophyta	19.98	
Percent Chlorophyta	0.94	Percent Chlorophyta	5.16	
Percent Chrysophyta	3.95	Percent Chrysophyta	34.04	
Percent Cryptophyta	1.47	Percent Cryptophyta	24.21	
Percent Euglenophyta	0.02	Percent Euglenophyta	0.46	
Percent Pyrrhophyta	0.03	Percent Pyrrhophyta	16.15	
Percent Undetermined	0.00	Percent Undetermined	0.00	
*= colony	+=filament			

PHYTOPLANKTON				
LONG LAKE (Kitsap Co., WA)				
DATE: 11/11/2010		SAMPLE STATUS: Lugols preserved		
STATION: center-1m		NOTE:		
Taxon	Cells/ml	µm <sup>3</sup> /cell	µm <sup>3</sup> /ml	comments
<b>Cyanophyta</b>				
<i>Anabaena sp.</i>	20.00	368.43	7,369	lin compres barrel cells;hetero pres;no akin
<i>Aphanizomenon flos-aquae</i>	15.00	3,014.40	45,216	akinetes only
<i>Gomphosphaeria sp.</i>	16.00	25.64	410	small col;thick stalks
+ <i>Oscillatoriales</i>	1.00	494.55	495	threadlike fil<3.5um wide;no sheath evid
<b>Taxon Subtotal</b>	<b>52</b>		<b>53,489</b>	
<b>Chlorophyta</b>				
<i>Ankistrodesmus falcatus</i>	10.00	75	754	deteriorated
* <i>Scenedesmus sp.</i>	1.00	401.92	402	4-cell colony
colonial (sph) nannoplktn	16.00	113.04	1,809	
unicell (sph) nannoplktn	4.00	1,436.03	5,744	deteriorated
<b>Taxon Subtotal</b>	<b>31.00</b>		<b>8,708</b>	
<b>Chrysophyta</b>				
<i>Mallomonas sp.</i>	1.00	1,945.75	1,946	deteriorated
Tribonematales	24.00	621.72	14,921	
chrysophyte (flagel-unicell)	22.00	904.32	19,895	
chrysophyte (flagel-unicell)	3.00	2,143.57	6,431	
chrysophyte (flagel-unicell)	2.00	9,198.11	18,396	
<b>Bacillariophyceae</b>				
<i>Asterionella formosa</i>	8.00	630.00	5,040	
<i>Cocconeis sp.</i>	1.00	1,130.40	1,130	
<i>Melosira sp.</i>	7.00	3,077.20	21,540	
<i>Melosira sp.</i>	140.00	989.10	138,474	
<i>Melosira sp.</i>	35.00	3,165.12	110,779	
<i>Synedra sp.</i>	1.00	2,072.40	2,072	frustule slight bow
<i>Synedra sp.</i>	1.00	126.93	127	
<i>Synedra sp.</i>	1.00	224.38	224	
<i>Synedra sp.</i>	1.00	357.18	357	
undet pennate diatom	1.00	183.17	183	
<b>Taxon Subtotal</b>	<b>248</b>		<b>341,517</b>	
<b>Cryptophyta</b>				
<i>Cryptomonas sp.</i>	6.00	1,857.31	11,144	
<i>Cryptomonas sp.</i>	2.00	5,934.60	11,869	
cryptomonad	8.00	777.15	6,217	
<i>Rhodomonas sp.</i>	10.00	175.21	1,752	
<b>Taxon Subtotal</b>	<b>26.00</b>		<b>30,982</b>	
<b>Euglenophyta</b>				
<b>Pyrrhophyta</b>				
small dinoflagellate	1.00	1,582.56	1,583	
<b>Taxon Subtotal</b>	<b>1.00</b>		<b>1,583</b>	
<b>Undetermined</b>				
			(um <sup>3</sup> /ml)	(mm <sup>3</sup> /L)
<b>Total Number/ml</b>	<b>358</b>	<b>Total Volume</b>	<b>436,280</b>	<b>0.436</b>
Percent Cyanophyta	14.53	Percent Cyanophyta	12.26	
Percent Chlorophyta	8.66	Percent Chlorophyta	2.00	
Percent Chrysophyta	69.27	Percent Chrysophyta	78.28	
Percent Cryptophyta	7.26	Percent Cryptophyta	7.10	
Percent Euglenophyta	0.00	Percent Euglenophyta	0.00	
Percent Pyrrhophyta	0.28	Percent Pyrrhophyta	0.36	
Percent Undetermined	0.00	Percent Undetermined	0.00	
*= colony	+=filament			

## **Appendix D – Phosphorus Budget**

**Table D-1. Monthly Phosphorus Budget for Long Lake, Kitsap County, 2006.**

Year	Month	Direct P Load (kg/month)	Salmonberry Creek TP Load (kg/month)	Ground Water Creek TP Load (kg/month)	Ungaged Surface TP Load (kg/month)	GW TP Load (kg/month)	Septic Tank Load (kg/month)	Curley Creek TP Output (kg/month)	Net TP Sedimentation or Net TP Internal Loading (kg/month)
2006	January	12	10	0.0	17	9	9	48	-16
	February	3	9	0.0	19	11	8	38	-9
	March	3	14	0.0	18	9	9	40	4
	April	2	16	0.0	12	3	9	24	-45
	May	1	18	0.0	2	2	9	17	-15
	June	1	25	0.0	2	1	9	10	-32
	July	0.1	15	0.0	9	1	9	18	61
	August	0.0	12	0.0	12	3	9	28	-40
	September	1	5	0.0	16	10	9	32	0.5
	October	1	3	0.0	29	19	9	37	-64
	November	15	12	0.0	51	33	9	94	-17
	December	8	9	0.0	60	41	9	116	-10
Annual Total		47	147	0.0	246	141	106	501	-182
June-September Total		2	57	0.0	38	15	35	87	-11

\*Flow measurements or phosphorus samples were not collected in 2006 for GW Creek, therefore it was left out of the water and phosphorus budgets

\*\*a (+) number reflects internal loading, a (-) number reflects net sedimentation

Note: More detailed information for both the water budget and phosphorus budget can be found in the excel spreadsheet retained by Tetra Tech, Kitsap County, and WA DOE. Lake levels were missing for 2006. Lake level logger data was estimated using relationship between lake stage (ken's dock) and Curley creek stage then a relationship between Curley Creek stage and 2007-2010 lake level logger data.



**Table D-2. Monthly Phosphorus Budget for Long Lake, Kitsap County, 2007.**

Year	Month	Direct P Load (kg/month)	Salmonberry Creek TP Load (kg/month)	Ground Water Creek TP Load (kg/month)	Ungaged Surface TP Load (kg/month)	GW TP Load (kg/month)	Septic Tank Load (kg/month)	Curley Creek TP Output (kg/month)	Net TP Sedimentation or <b>Net TP Internal Loading</b> (kg/month)
2007	January	5	9	0.0	45	30	9	82	-12
	February	3	10	0.0	43	29	8	88	3
	March	3	16	0.0	36	22	9	70	-11
	April	1	14	0.0	10	2	9	23	-33
	May	1	15	0.0	13	4	9	20	-43
	June	1	15	0.0	13	5	9	57	16
	July	2	15	0.0	3	2	9	7	-39
	August	1	13	0.0	3	2	9	14	-15
	September	1	11	0.0	1	1	9	6	-18
	October	4	11	0.0	14	5	9	14	-37
	November	4	10	0.0	14	5	9	19	-16
December	11	22	0.0	29	16	9	85	46	
Annual Total		37	161	0.0	225	123	106	484	-160
June-September Total		5	53	0.0	20	10	35	84	-56

\*Flow measurements or phosphorus samples were not collected in 2006 for GW Creek, therefore it was left out of the water and phosphorus budgets

\*\*a (+) number reflects internal loading, a (-) number reflects net sedimentation

Note: More detailed information for both the water budget and phosphorus budget can be found in the excel spreadsheet retained by Tetra Tech, Kitsap County, and WA DOE. Lake levels were missing for the beginning of 2007. Lake level logger data was estimated using relationship between lake stage (ken's dock) and Curley creek stage then a relationship between Curley Creek stage and 2007-2010 lake level logger data. Also September Curley Creek outflow was set to 400,000 cubic meters because field measurements were suspect for that month.

**Table D-3. Monthly Phosphorus Budget for Long Lake, Kitsap County, 2008.**

Year	Month	Direct P Load (kg/month)	Salmonberry Creek TP Load (kg/month)	Ground Water Creek TP Load (kg/month)	Ungaged Surface TP Load (kg/month)	GW TP Load (kg/month)	Septic Tank Load (kg/month)	Curley Creek TP Output (kg/month)	Net TP Sedimentation or Net TP Internal Loading (kg/month)
2008	January	5	13	0.4	33	19	9	69	-15
	February	2	12	0.3	30	18	8	58	-28
	March	3	21	0.4	19	7	9	32	-33
	April	2	14	0.3	14	3	9	28	-10
	May	0.3	17	0.2	14	5	9	12	-45
	June	1	16	0.3	14	6	9	11	-44
	July	0	11	0.2	10	3	9	9	41
	August	2	27	0.3	7	0.2	9	15	-57
	September	0.4	12	0.4	3	2	9	11	-24
	October	2	74	0.3	4	3	9	11	-107
	November	6	17	0.3	17	7	9	30	-32
December	2	22	0.3	11	3	9	22	15	
Annual Total		26	257	3.7	177	75	106	308	-337
June-September Total		4	66	1	35	10	35	46	-84

\*a (+) number reflects internal loading, a (-) number reflects net sedimentation

Note: More detailed information for both the water budget and phosphorus budget can be found in the excel spreadsheet retained by Tetra Tech, Kitsap County, and WA DOE.

**Table D- 4. Monthly Phosphorus Budget for Long Lake, Kitsap County, 2009.**

Year	Month	Direct P Load (kg/month)	Salmonberry Creek TP Load (kg/month)	Ground Water Creek TP Load (kg/month)	Ungaged Surface TP Load (kg/month)	GW TP Load (kg/month)	Septic Tank Load (kg/month)	Curley Creek TP Output (kg/month)	Net TP Sedimentation or <b>Net TP Internal Loading</b> (kg/month)
2009	January	3	14	0.2	18	8	9	41	-17
	February	1	31	1	18	8	8	34	-13
	March	3	16	0.4	18	8	9	48	-20
	April	3	15	0.3	16	6	9	21	-53
	May	4	40	1	17	7	9	30	-51
	June	0.4	16	0.3	1	1	9	12	-14
	July	0.1	15	0.3	12	3	9	12	-13
	August	1	13	0.2	2	2	9	11	-12
	September	1	10	0.3	2	1	9	9	-15
	October	5	20	0.3	8	0.3	9	20	-49
	November	10	15	0.5	38	23	9	70	<b>1</b>
December	3	19	1	40	25	9	86	-9	
Annual Total		35	222	5.5	192	92	106	395	-264
June-September Total		2	54	1	18	8	35	44	-53

\*a (+) number reflects internal loading, a (-) number reflects net sedimentation

Note: More detailed information for both the water budget and phosphorus budget can be found in the excel spreadsheet retained by Tetra Tech, Kitsap County, and WA DOE.

**Table D-5. Monthly Phosphorus Budget for Long Lake, Kitsap County, 2010.**

Year	Month	Direct P Load (kg/month)	Salmonberry Creek TP Load (kg/month)	Ground Water Creek TP Load (kg/month)	Ungaged Surface TP Load (kg/month)	GW TP Load (kg/month)	Septic Tank Load (kg/month)	Curley Creek TP Output (kg/month)	Change in Lake TP (kg/month)	Net TP Sedimentation or Net TP Internal Loading (kg/month)
2010	January	9	16	1	29	16	9	67	21	9
	February	5	16	0.3	21	10	8	45	-14	-28
	March	4	22	1	29	16	9	71	3	-5
	April	3	18	1	25	13	9	61	2	-6
	May	2	25	1	1	1	9	32	-23	-32
	June	1	35	1	2	2	9	32	18	1
	July	0.2	31	0.4	0.0	0.0	9	19	-17	-39
	August	0.3	10	0.3	7	1	9	13	-17	-33
	September	3	14	0.3	9	2	9	12	-8	-34
	October	4	13	0.3	21	10	9	27	2	-28
	November	4	33	0.3	29	11	9	54	19	-13
December	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Annual Total		35	233	5.9	173	83	97	432	-15	-209
June-September Total		5	91	2	18	5	35	75	-24	-105

\*a (+) number reflects internal loading, a (-) number reflects net sedimentation

Note: More detailed information for both the water budget and phosphorus budget can be found in the excel spreadsheet retained by Tetra Tech, Kitsap County, and WA DOE.

**Table D-6. Volume Weighted Whole Lake Phosphorus Concentrations Used in Phosphorus Budget.**

<b>2006</b>		<b>2007</b>		<b>2008</b>		<b>2009</b>		<b>2010</b>	
<b>Date</b>	<b>TP (ug/L)</b>	<b>Date</b>	<b>TP (ug/L)</b>	<b>Date</b>	<b>TP (ug/L)</b>	<b>Date</b>	<b>TP (ug/L)</b>	<b>Date</b>	<b>TP (ug/L)</b>
January	27	January	33	January	34	January	33	January	42
February	29	February	36	February	28	February	41	February	36
March	36	March	37	March	25	March	35	March	37
April	26	April	31	April	27	April	26	April	39
May	26	May	23	May	24	May	25	May	31
June	25	June	24	June	20	June	27	June	38
July	55	July	19	July	45	July	31	July	32
August	42	August	18	August	36	August	33	August	25
September	45	September	18	September	32	September	32	September	22
October	30	October	14	October	22	October	22	October	22
November	31	November	17	November	20	November	31	November	28
December	30	December	34	December	35	December	33	December	33

**Table D- 7. Salmonberry Creek Phosphorus Concentrations Used in Phosphorus Budget.**

<b>2006</b>		<b>2007</b>		<b>2008</b>		<b>2009</b>		<b>2010</b>	
<b>Date</b>	<b>TP (ug/L)</b>	<b>Date</b>	<b>TP (ug/L)</b>	<b>Date</b>	<b>TP (ug/L)</b>	<b>Date</b>	<b>TP (ug/L)</b>	<b>Date</b>	<b>TP (ug/L)</b>
January	34	January	28	January	33	January	32	January	37
February	35	February	37	February	31	February	80	February	40
March	40	March	38	March	39	March	37	March	51
April	35	April	36	April	28	April	35	April	43
May	37	May	38	May	41	May	94	May	59
June	56	June	39	June	43	June	39	June	45
July	37	July	37	July	30	July	38	July	39
August	29	August	33	August	70	August	32	August	37
September	30	September	29	September	30	September	27	September	42
October	20	October	28	October	178	October	47	October	32
November	32	November	26	November	41	November	36	November	42
December	26	December	52	December	52	December	43	December	43

\*For ungaged surface water inflows a phosphorus concentration of 37 ug/L was used, which is the median of the Salmonberry data.

**Table D-8. Groundwater Creek Phosphorus Concentrations Used in Phosphorus Budget.**

2006		2007		2008		2009		2010	
Date	TP (ug/L)	Date	TP (ug/L)	Date	TP (ug/L)	Date	TP (ug/L)	Date	TP (ug/L)
January	-	January	-	January	29	January	19	January	39
February	-	February	-	February	23	February	43	February	24
March	-	March	-	March	23	March	26	March	22
April	-	April	-	April	24	April	30	April	30
May	-	May	21	May	30	May	29	May	48
June	-	June	28	June	31	June	33	June	35
July	-	July	30	July	26	July	41	July	33
August	27	August	-	August	36	August	28	August	28
September	50	September	-	September	31	September	29	September	31
October	23	October	-	October	27	October	26	October	25
November	9	November	-	November	29	November	18	November	24
December	-	December	20	December	27	December	24	December	24

\*2006 and 2007 Groundwater Creek Phosphorus Concentrations were not used in the P budget because of the lack of flow data.

\*\*For unaged groundwater inflow a phosphorus concentration of 28 ug/L was applied, which is the median of the GW Creek phosphorus data.

## **Appendix E Alum Treatment Summary**



**Table E-1. Summary of Long Lake Phosphorus Inactivation Activities, 2006-2010.**

<b>Year</b>	<b>Dates of Application</b>	<b>Chemicals Used</b>	<b>Aluminum Dose</b>	<b>Acres Treated</b>
2006	August 1 <sup>st</sup> -4 <sup>th</sup> , 2006	Aluminum Sulfate	2.5 mg/L as Al <sup>3+</sup>	340
2007	April 11 <sup>th</sup> -14 <sup>th</sup> , 2007	Aluminum Sulfate and Sodium Aluminate	17.5 mg/L as Al <sup>3+</sup>	300

## **Appendix F Herbicide Treatments Summary**

**Table F-1. Summary of Long Lake Herbicide Applications, 2006-2010.**

<b>Year</b>	<b>Dates of Application</b>	<b>Chemical Applied</b>	<b>Amount of Chemical</b>	<b>Acres Treated</b>	<b>Plants Targeted</b>
2006	7/2/2006	Fluridone	180 lbs	25	<i>Egeria densa</i> , <i>Myriophyllum spicatum</i>
2006	8/2/2006	Fluridone	180 lbs	25	<i>Egeria densa</i> , <i>Myriophyllum spicatum</i>
2006	8/18/2006	Fluridone	81 lbs	25	<i>Egeria densa</i> , <i>Myriophyllum spicatum</i>
2007	7/2/2007, 7/30/2007, 8/8/2007, 8/17/2007	Fluridone	420 lbs	25	<i>Egeria densa</i> , <i>Myriophyllum spicatum</i>
2008	6/17/2008	Fluridone	98 lbs	45.5	<i>Egeria densa</i>
2008	7/16/2008	Diquat dibromide	45.5 gal	45.5	<i>Egeria densa</i>
2008	8/11/2008	Fluridone	90 lbs	45.5	<i>Egeria densa</i>
2008	8/11/2008	Glyphosate	0.75 gal	3	<i>Nymphaea odorata</i>
2009	6/23/2009	Diquat dibromide	45 gal	36	<i>Potamogeton spp.</i> , <i>Egeria densa</i> , <i>Utricularia inflata</i> , <i>Najas</i>
2009	8/13/2009	Fluridone	90 lbs	35	<i>Egeria densa</i> , <i>Najas</i> , <i>Potamogeton spp.</i> , <i>Utricularia spp.</i>
2009	9/1/2009	Fluridone	246 lbs	36	<i>Egeria densa</i> , <i>Najas</i> , <i>Potamogeton spp.</i> , <i>Utricularia spp.</i>
2010	8/23/2010	Diquat dibromide	21 lbs	10.5	<i>Egeria densa</i> , <i>Nymphaea odorata</i>
2010	9/10/2010	Fluridone	26.7 lbs	10.3	<i>Egeria densa</i> , <i>Myriophyllum spicatum</i>

# **Proposed Long Lake Integrated/ Adaptive Lake Management Plan**

**2014-2023**

**March 3, 2014**

**Prepared for:  
Kitsap County and CILL**

**Tetra Tech, Inc.  
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Seattle, WA 98101**



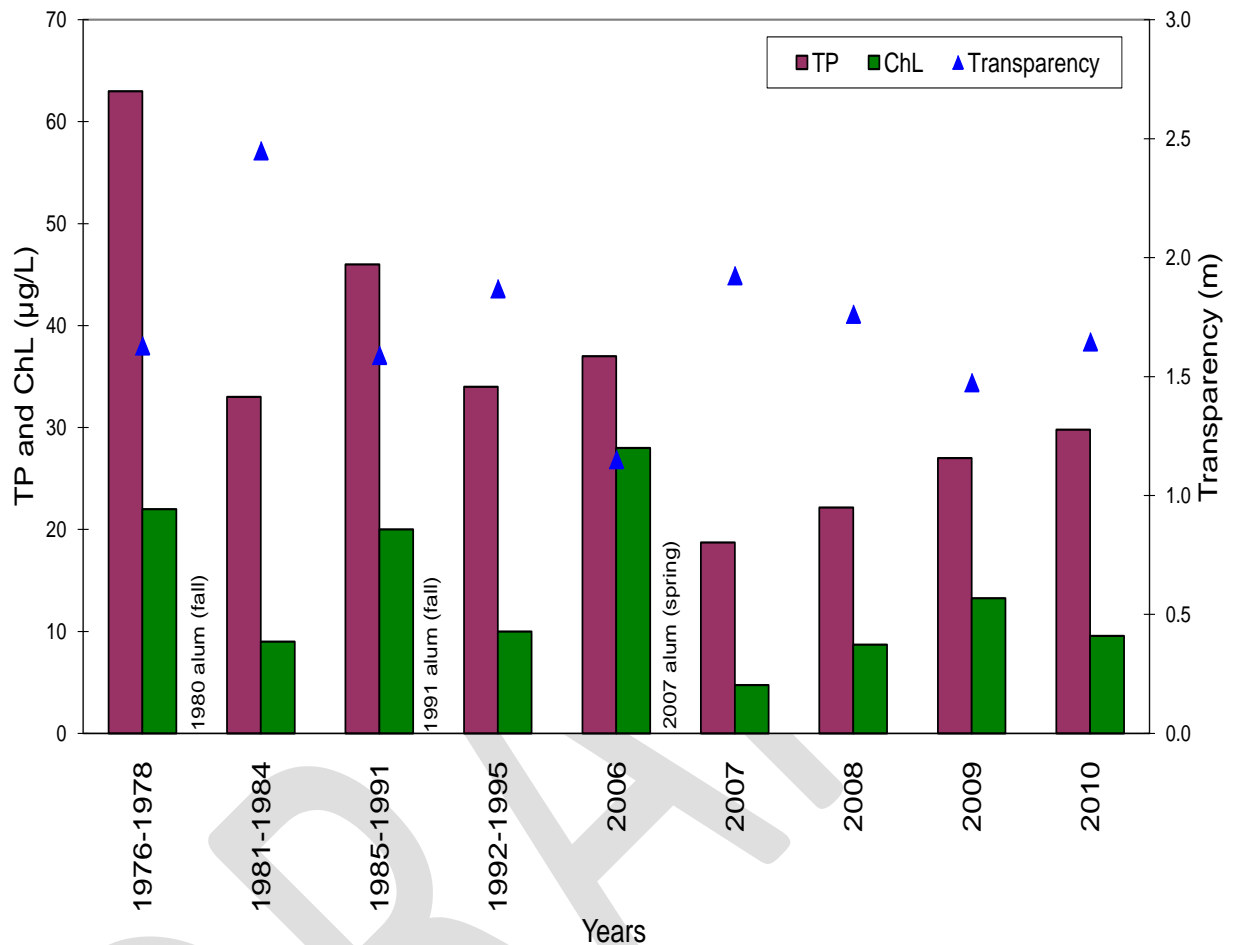
## Restoration History

Long Lake was studied by personnel from the University of Washington for 20 consecutive years from 1976 to 1995 to evaluate the effectiveness of several restoration techniques (Welch, 1996). The lake water level was drawn down about 6 feet (1.8 m) during the summer of 1979 to desiccate previously submersed rooted plants and to consolidate the flocculent sediment. While lake sediment substantially dried in laboratory experiments, they failed to consolidate over the 40% of lake sediments exposed, because seepage water prevented sediment drying. Although exposed plants desiccated and biomass was low the following year (1980), they began to recover by 1981 and were back to maximum biomass by 1984 (Jacoby et al., 1982). Also a small area in the north end was dredged during the 1979 drawdown to widen and deepen the outlet although this was too localized to affect internal phosphorus (P) loading throughout the lake.

The lake was treated to inactivate sediment P with alum in the fall of 1980 with a dose of 5.5 mg/L Al and again at the same time and concentration in 1991. In the meantime, rooted plants were mowed with a harvester during the summer of 1988, 1989 and 1990, removing 10, 43 and 69% of the peak plant biomass per year, respectively.

The first alum treatment was highly effective for the first four years and maintained modest water quality improvement on average for the next seven years, compared to pretreatment TP (Figure 1). The high summer mean TPs of 69 and 78  $\mu\text{g/L}$ , which occurred in 1977 and 1978, did not recur during that eleven-year period, although TP and chlorophyll (chl) were rather high (66 and 36  $\mu\text{g/L}$ , respectively) in 1985, due mostly to a rooted plant-die-off, and in 1990 (55 and 40  $\mu\text{g/L}$ ), prior to the second alum treatment (Figure 2). These were the highest chl concentrations during the twenty-year period. Note that transparency varied inversely with chl, with the highest transparency occurring with the lowest chl (Figure 2). Transparency also varied directly with macrophyte biomass (Jacoby et al., 2001).

The second alum treatment was applied in late summer 1991 at 5.5 mg/L Al. The following summer TP averaged only 20  $\mu\text{g/L}$ , the lowest summer mean ever. The summer mean for the four-year post treatment was slightly above 30  $\mu\text{g/L}$  and chl averaged less than 10  $\mu\text{g/L}$ , similar to the four-year mean following the 1980 treatment (Figure 1).



**Figure 1. Mean whole-lake summer (June-September) TP, chl and Secchi transparency for groups of study years before and after three alum treatments in Long Lake, Kitsap. Pre 2006 data from Welch (1996). Data for 2006 serves as a partial reference for post-alum years 2007-2010.**

Monitoring of the lake by UW ceased after 1995, but was resumed in 2006 as part of a long-term project by Kitsap County and CILL to improve the lake's quality. As part of the planned control measures, alum was again added to the lake at a low dose of 2.5 mg/L Al during August 1-4, 2006 to achieve short term control of TP and minimize late summer algal blooms. Alum was applied again during April 11-14, 2007 at a high dose of 17.5 mg/L Al, based on sediment P concentration, for long-term control.

Sampling of Long Lake for the previous long-term project by Kitsap County and CILL was continued through 2010. Historical data were compared with 2006-2010 data in the annual report on Long Lake Water Quality, February 2010. For that report, 2010 data were integrated with 2006-2009 data to show that summer TP gradually increased, but was still below the 2006 pretreatment level, while chl remained well below pretreatment

levels averaging less than 10 µg/L (Figure 1). Transparency averaged about 0.5 m greater during the last four years of monitoring than the pretreatment depth of visibility in 2006.

## **Scope of Work - Long Lake Integrated/Adaptive Management Plan**

The following scope of work describes the specific activities that will be performed in order to enable the Kitsap County's Long Lake Management District to meet the requirements of the Long Lake Integrated/Adaptive Lake Management Plan. Building upon the recent lake management efforts at the lake an integrated/adaptive lake management plan will be prepared and implemented. Specifically, implementation of in-lake activities that will lead to a balanced ecosystem that supports water contact recreation, sport fishery, salmon migration, ecological sustainability and aesthetic appeal. To meet these goals the lake management program will limit internal phosphorus loading to reduce excessive phytoplankton production, will control excess population of rooted aquatic plants, and eliminate, where possible, non-native plants such as Eurasian watermilfoil. The integrated management program for Long Lake includes six basic elements. Specific scope of work elements are outlined below:

### **Task 1 - Project Management**

- 1.1 Project Management (PM) responsibilities shall include maintenance of project records, progress reports, and submittal of required performance items.
- 1.2 Efforts shall include conducting, coordinating, and scheduling project activities and assuring quality control.

Deliverables:

1. Effective administration and management of this project.
2. Maintenance of all project records.
3. Submittal of all required performance items, progress reports, invoices, and maintenance of all project records.

Schedule of Activities:

- a) PM activities will be carried out throughout the project from authorization to proceed in 2014 through December 2023  
Budget \$80,000 (Tt \$40,000 and Kitsap County \$40,000)

Proposed Responsibility of Effort:

- a) Kitsap County would provide approximately 50% of the PM coordination and administration, through its signed PM and Department
- b) Tetra Tech, Inc. (Tt) would provide the other 50% of the PM by leading technical documentation, QA/QC, invoicing and progress reports

### **Task 2 – Planning and Permitting**

- 2.1 Development of a QAPP for adaptive effectiveness evaluation.
- 2.2 Development of a 10-year an integrated/adaptive management plan for the lake.

Deliverables:

1. Necessary permit(s) applications for in-lake activities.

The Kitsap County PM will lead the permit process and maintain the permits with Tt providing the necessary technical material and permit compliance activities

2. A 10-year integrated/adaptive lake management plan including the QAPP. Tt will draft plan and QAPP.

Schedule of Activities:

1. Permit activities will be carried out annually throughout the project from authorization to proceed in 2014 through December 2023
2. The integrated/adaptive management plan within 90 days of formation of LMD.

Budget \$50,000 (\$35,000 Tt and \$15,000 Kitsap County)

### **Task 3 – In-lake Activities Design and Implementation**

Tt will be responsible for all elements of Task 3

- 3.1 Design phosphorus management activities both maintenance treatments and sediment inactivation treatments.
- 3.2 Implementation of phosphorus management in-lake activities.
- 3.3 Update the IAVMP (Integrated Aquatic Vegetation Management Plan) and prepare treatment specifications for management control effort for EWM (Eurasian Watermilfoil) and Brazilian elodea as well as, for management control of specific boating lanes based.
- 3.4 Implement the annual aquatic plant management activities.

Deliverables:

1. Alum treatment design.
2. Update the IAVMP.
3. Implementation of in-lake phosphorus management activities.
4. Implementation of aquatic plant management activities.

Schedule of Activities:

1. Design elements will be initially conducted within the first 6 months of LMD formation with on-going review and annual modifications to activities carried out through December 2023.
2. The IAVMP updated within 180 days of formation of LMD with annual updates based upon data results and lake requirements.
3. Implementation of phosphorus management activities as needed.
4. Implementation of aquatic plant control activities as needed.

Budget \$460,000

### **Task 4 – Lake and Stream Monitoring**

Tt will be responsible for the following elements of Task 4.

Conduct an on-going monitoring program to track phosphorus, phytoplankton production and aquatic macrophytes (visual mapping conducted twice annually) in the lake. This information shall be used to assess management progress relative to the long-term integrated/adaptive management program and be used to adjust the plan's activities relative to the effectiveness of those activities.

Conduct water quality sampling of Long Lake at the previously established midlake station. Monthly samples will be taken at 0.5 m depth for TP, SRP,



chlorophyll and profiles for dissolved oxygen, conductivity, and pH will be measured. A phytoplankton sample will also be collected. Between mid-May and mid-October additional TP and SRP samples will be taken at 2.5 m depth. Lake and Salmonberry Creek will be sampled monthly for TP and SRP. Water samples will be sent to Aquatic Research, Inc. in Seattle, on the same day as collected for filtering and analysis.

Tt will obtain stream gage data from Kitsap County Public Works Stormwater Division or the Kitsap Public Utility District web accessible stream data for continuous gages at Curley and Salmonberry Creek. Tetra Tech in coordination with CILL will install and maintain a data logger to collect lake level data.

Deliverables:

1. Limnological data collection and data management
2. Aquatic plant data collection and data management
3. Inlet and outlet surface water flow and quality data.

Schedule of Activities:

1. Monitoring activities will be carried out throughout the project from authorization to proceed in 2014 through December 2023  
Budget \$180,000

**Task 5 – Reporting**

Tt will produce all technical reports for review and approval by the Kitsap County PM.

5.1 annual assessments of in-lake activities and monitoring data will be produced in a technical memorandum format. This memorandum will also recommend activities for the next year revising the adaptive plan as dictated by the data.

5.2 Final project completion report will record data, finding and activities over the ten year LMD.

Deliverables:

1. Annual Summary Memos
2. Draft and final LMD ten year report

Schedule of Activities:

1. Annual technical memorandum will be produced every December starting in 2014 through 2023.
2. In December 2023 a draft and final project report will be produced.  
Budget \$96,000 (\$80,000 Tt and \$16,000 Kitsap County)

**Task 6 – Public Education**

Kitsap County PM will coordinate Task 6 with Tt technical and presentation support.

- 6.1 One (1) public information meeting will be held each year. At these meetings, the management activities will be discussed as will water quality and aquatic plant data. A spokesperson from Tt will assist in the presentation. Public input will be taken relative to the perception of in-lake activities effectiveness and this information will be used in the updating of the annual adaptive plan.

6.2 A Public Involvement and Education Plan (PIEP) for developing and implementing the public education and outreach for the citizens of Long Lake and its watershed will be produced by Kitsap County. The plan will specify the goals and objectives of the outreach efforts to inform citizens about water quality and aquatic plant data results, and educate residents about actions they can take to reduce phosphorus entering the lake.

6.3 A High School Science Outreach Program will be developed to promote watershed and lake environmental awareness and stewardship. Kitsap County PM will coordinate with the local High School students and environmental educators at the appropriate agencies involved in the STEM field-based learning program to develop a field-based learning opportunity.

Deliverables:

1. At a minimum, one public informational meeting annually.
2. Completion and implementation of a Public Involvement and Education Plan.
3. High School Science Field-Based Learning Program

Budget \$90,000 (\$60,000 Kitsap County, \$10,000 Tt)

**Total Budget \$956,000 - Tt \$805,000; Kitsap County \$131,000; Reserve \$38,000**

Itemized Budget by Task

	<b>Tetra Tech</b>	<b>Kitsap County</b>	<b>Total Cost from LMD</b>	<b>Kitsap County In-Kind</b>
<b>Task 1 – Project Management</b>	\$40,000	\$40,000	\$80,000	
<b>Task 2 – Planning and Permitting</b>	\$35,000	\$15,000	\$50,000	
<b>Task 3 – In-Lake Activities</b>	\$460,000	\$0	\$460,000	
<b>Task 4 – Lake and Stream Monitoring</b>	\$162,000	\$0	\$180,000 including \$18,000 to Project Reserve	\$50,000 (stream gaging data)
<b>Task 5 - Reporting</b>	\$80,000	\$16,000	\$96,000	
<b>Task 6 – Public Education</b>	\$10,000	\$60,000	\$90,000 including \$20,000 to project reserve	\$50,000 (Existing STEM Program)
<b>Project Reserve</b>			\$38,000	
<b>Total</b>	\$805,000	\$131,000	<b>\$956,000</b>	(\$100,000)

