APPENDIX 3:

SUMMARY OF PHYTOPLANKTON BIOMASS IN THE ASSINIBOINE RIVER, JUNE-SEPTEMBER 2002

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1.0 INTRODUCTION

The Assiniboine River Monitoring Study, conducted by Earth Tech Canada Inc. (formerly Reid Crowther and Partners Ltd.) and North/South Consultants Inc., was initiated in 1998. The main objective of the study has been to assess the effects of effluent release from the wastewater treatment facility (WWTF) constructed for the Maple Leaf hog processing plant, which became operational in September 1999, on water quality in the Assiniboine River from Brandon downstream to Portage la Prairie, Manitoba (Toews 2002).

Spatial and temporal trends in phytoplankton biomass in the Assiniboine River were investigated in the years 1999 and 2000. As discussed Toews (2002) and the main text of this report, portions of the Study were postponed from 2000 until lower-flow conditions were observed in the study area in 2002. Phytoplankton data from 1999 and 2000 have been previously presented and interpreted in an appendix to Cooley et al. (2001b). This document discusses phytoplankton data collected under low flow conditions in 2002, and is a companion to Toews (2002), a data report describing methods and preliminary results of the water quality component of the 2002 study.

2.0 MATERIALS AND METHODS

Samples for the identification and enumeration of phytoplankton were collected as described in Toews (2002). Integrated water column samples were submitted to Algal Taxonomy and Ecology Ltd., Winnipeg MB, for identification and enumeration of algae. Raw data were provided by H. Kling, and were reported as an appendix to Toews (2002). The data have been sorted by sampling period and appended to this report. Detailed information is reported for each organism identified *via* microscopy: "length" and "width" (reported in microns); magnification "factor"; "count" (number viewed in the sample); "volume"; "cells/L"; and wet weight in "mg/m^3". Each organism was categorized into its respective taxonomic group: Cyanophyta (blue-green algae), Chlorophyta (green algae), Euglenophyta, Chrysophyceae, Diatomeae, Cryptophyceae, and Peridineae. Percent composition of each group was then calculated based on total algal biomass and numbers of cells per liter; this discussion refers mainly to total biomass (mg/m^3). In addition, chlorophyll *a* data from each sampling period is included for comparison to total biomass. These data were originally reported in Toews (2002).

2.1 INTENSIVE SAMPLING/MODEL CALIBRATION

Intensive sampling for the collection of model calibration data, described in detail in Toews (2002), took place during the following time periods: June 5-18, July 16-26, and August 21-September 5, 2002. Phytoplankton samples were collected from sites 3, 8, 13, and 14 (Figure 1) and are reported in Appendices I, II, and III; all physical and chemical data have been previously reported in Toews (2002). Site 3 is located upstream of the WWTF effluent outfall, site 8 is the downstream end of the mixing zone of effluents, site 13 is the upstream end of the Portage la Prairie reservoir, and site 14 is located within the reservoir. River travel times were followed to the extent possible to permit collection of samples from approximately the same parcel of river water as it moved downstream; samples were collected in a transect across the river (left [L], right[R], and/or center [C] channel) to address spatial variation in algal biomass. In addition to samples collected from the Assiniboine River, two point sources to the river were also sampled. Brandon's wastewater lagoon, cell 5, effluent (BSE5G) was sampled during the June and July sample periods. The Souris River was sampled during the July sample period only.

2.2 WEEKLY SAMPLING

Weekly samples were collected at sites 3C, 8C, and 13C between intensive sampling periods (23 July – 11 September). Physical and chemical data collected during weekly sampling is provided in Toews (2002).

3.0 RESULTS & DISCUSSION

3.1 INTENSIVE MONITORING

3.1.1 June

Phytoplankton biomass in river samples collected from all Assiniboine River sites (3, 8, 13, 14) ranged from approximately 1000 to 3000 mg/m^3 (Figure 2). Total biomass sampled June 5 from the wastewater lagoon effluent was high relative to river samples (7840 mg/m^3; Table 1). Total algal biomass averaged 1759 mg/m^3 at site 3, 1394 mg/m^3 at site 8, 3266 mg/m^3 at site 13 and 1876 mg/m^3 at site 14 (Table 2).

Diatoms and/or green algae dominated the phytoplankton community at river sites 3, 8, and 13 sampled in June (Figure 2; Table 3). Diatoms consisted primarily of planktonic centrics, such as *Cyclotella* and *Stephanodiscus* spp., and larger benthic pennate diatoms, such as *Nitzschia*, *Navicula*, *Gyrosigma*, *Rhopalodia*, and *Surirella* spp., particularly at site 8 (Appendix I). It is likely that the typically benthic diatoms were dislodged from benthic habitats, and therefore were not reproducing populations in the plankton (H. Kling, *pers. comm.*). Green algae consisted mainly of small and "pico" species that were too small to be identified with light microscopy, in addition to *Chlamydomonas*, *Scenedesmus*, *Oocystis*, *Chlorella*, and *Dictyosphaerium* spp. (Appendix I). Chlorophytes often comprised large proportions of total numbers, but because of their small size, made up a smaller percentage of total biomass (e.g., 47.9% of total numbers of algal cells, but 24.5% of total algal biomass in sample 3L; Appendix I). Cryptophytes (*Rhodomonas minuta*) and chrysophytes (ochromonads, *Chrysococcus* spp., and *Dinobryon* spp.) were present in smaller amounts than diatoms and greens, ranging from less than one percent each at site 13L to 9.5 and 22.8 percent, respectively, at site 3C (Table 3).

Diatoms at sites 13 and 14 consisted primarily of planktonic centric species whereas the large benthic diatoms were less abundant at site 14 than at upstream sites (Appendix I). It is likely that reduced velocity within the reservoir (site 14) resulted in this shift in species composition due to settling of large benthic diatoms; however, there is some indication that the centric species were increasing in numbers throughout the end of the study area (Appendix I). The phagotrophic *Collodictyon triciliatum*, a colour-less green alga similar to *Chlamydomonas*, was found at several sites along the river, particularly site 14, to be feeding on green algae and diatoms (H. Kling, *pers. comm.*). In addition, a large number of ciliate protozoans were presumably feeding on small planktonic algae at site 14. The extent to which predation may have influenced phytoplankton populations in the Assiniboine River is unknown and generally assumed to be minimal; however, there is evidence that zooplankton grazing may reduce total biomass during low-flow summer months in other river systems (e.g., Balbi 2000).

3.1.2 July

Similar to June monitoring, samples were collected in July at sites 3, 8, 13, and 14; additional samples were also obtained from the Brandon wastewater lagoon and from the Souris River. Phytoplankton biomass in samples collected from Assiniboine River sites 3, 8, 13, and 14 were somewhat more variable than observed in June, ranging in general from less than 500 to 4000 mg/m^3 (Figure 3). In addition, biomass measured at site 13R was extremely high relative to 13L and all other sites - 32,135 mg/m^3 (Figure 3). These data were excluded from calculations of average biomass by site (Table 2). Total biomass sampled July 15, 16, and 17 from the Brandon wastewater lagoon effluent was variable, ranging from 2,211 to 15,862 mg/m^3 (Table 1); the Souris River was characterized by relatively high biomass - 6730 and 24,953 mg/m^3 at the right and left channels, respectively (Table 1). Total algal biomass was low at sites 3 and 8 in the Assiniboine River, averaging 1754 mg/m^3 and 439 mg/m^3, respectively (Table 2).

Diatoms and green algae co-dominated the phytoplankton community at river sites 3 and 8 sampled in July (Figure 3, and Table 3). Similar to June, the diatom community consisted of both planktonic and benthic species (Appendix II). *Pleurosira laevissima* (formerly *Biddulphia* sp.), a large benthic diatom indicative of brackish conditions (H. Kling, *pers. comm.)*, was identified at site 8 (Appendix II) although previously not found in samples collected from the river in 2002. It is possible that low river discharge observed during the intensive sampling period in July (Toews 2002, Table 2) may have resulted in somewhat increased salinity, and therefore the appearance of *Pleurosira* in the diatom community.

Sites 13 and 14 were primarily composed of green algae and cyanophytes, with lesser amounts of diatoms than at upstream sites (Table 3). Cyanophytes identified at sites 13 and 14 included *Anabaena flos-aquae*, *Aphanizomenon flos-aquae*, *Merismopedia* spp., *Microcystis* spp., and *Aphanocapsa* spp (Appendix II). Diatom species identified at sites 13 and 14 generally were similar to those identified in the June samples, with the exception of primarily planktonic *Aulacoseira ambigua* and *Nitzschia closterium* (H. Kling, *pers. comm*.), which were not observed in June. Euglenids comprised between 0 and 23 percent of total algal biomass (Table 3); although these algae are generally indicative of an organic nitrogen source (H. Kling, *pers. comm*.), they did not appear exclusively in the wastewater lagoon samples, suggesting that organic nitrogen availability in the river may be high enough to support facultative heterotrophy in algae.

Green algae (*Closterium cf. strigosum*) comprised between 72 and 97 percent of total phytoplankton biomass in the wastewater lagoon effluent samples collected in July (BSE5G, Table 3). The Souris River was primarily characterized by green algae and cyanophytes (Table 3). Diatoms comprised less than 10 percent of total biomass (Table 3), but were present at

biomass levels approaching those of all groups at sites 3 and 8 (Souris River diatom biomass - average approximately 800 mg/m^3; Table 1).

3.1.3 August

Samples were collected in August at river sites 3, 8, 13, and 14; samples were not obtained from either the wastewater lagoon or the Souris River. Similar to the July sampling period, phytoplankton biomass ranged from 605 to 4484 mg/m^3 with the exception of site 13R, which was again characterized by extremely high biomass relative to 13L (Figure 4; Tables 1 - 2). Total algal biomass averaged 1069 mg/m^3 at site 3 and 1703 mg/m^3 at site 8, 8359 mg/m^3 at site 13 and 3715 mg/m^3 at site 14 (Table 2).

Diatoms, greens, and cyanophytes generally comprised equal proportions of the phytoplankton community at river sites 3, 8, and 13 sampled in August (Figure 4; Table 3). Notably, cyanophytes were observed in upstream samples (sites 3 and 8) in greater total abundance and relative proportions than in June or July sample periods. For example, total cyanophyte biomass at site 3R was 18.7, 0, and 298 mg/m^3 in June, July, and August, respectively (Table 1), representing 0.8, 0, and 49.2 percent of total algal biomass, respectively (Table 3). Abundant cyanophytes included *Anabaena flos-aquae*, *Merismopedia tenuissima*, and *Aphanocapsa* sp. at sites 3 and 8. Similar to July, the diatom community consisted of both planktonic and benthic species: *Anomoneis cf. sphaerophora* and *Bacillaria paradoxa*, indicative of brackish conditions (H. Kling, *pers. comm.),* were identified at sites 3 and 8 in August (Appendix III). Species of green algae were similar to previous sampling periods, although the phagotrophic *Collodictyon triciliatum* comprised a large proportion of the total biomass of green algae in several samples (e.g., 347 mg/m^3 of a total 816 mg/m^3 at 8R; Appendix III).

Site 14 was primarily composed of green algae, cyanophytes, and diatoms, similar to the July sample (Table 3; Appendix III). Small planktonic centric diatoms and small green algae were predominant (Appendix III); "colonial greens" were composed of clumped small green algae (H. Kling, *pers. comm*.). Euglenids and greens appeared in larger relative abundances at site 14 than at upstream sites (Table 3).

3.2 WEEKLY MONITORING

Site 3

Total phytoplankton biomass at site 3 was less than 2000 mg/m^3 throughout June, July, and early August (Table 4; Figure 5). By late August and early September, biomass had increased to a maximum of 16,227 mg/m^3. Seasonal succession of dominant groups was characterized by diatoms in early summer, greens in mid-summer, and cyanophytes in late summer (Table 5).

Anabaena spp., *Aphanizomenon flos-aquae*, *Planktothrix suspensus*, and *Microcystis* spp. populations dominated the phytoplankton assemblage at site 3 in late August and September (Appendix IV).

Site 8

Total phytoplankton biomass at site 8 generally was less than 1000 mg/m^3 throughout June, July, and early August (Table 4; Figure 6). Biomass increased slightly in late August to approximately 2000 mg/m^3, and exhibited a very large peak of cyanophytes (65,609 mg/m^3) on 11 September (Table 4). This "bloom" consisted primarily of the potentially toxin-producing *Aphanizomenon flos-aquae* (Appendix V). Seasonal succession was similar to that at Site 3, although diatoms maintained relatively large proportions of total biomass throughout the year (Table 5).

Site 13

Total phytoplankton biomass at site 13 ranged from 1461 to 4977 mg/m^3 during June, July, and August, and peaked at 37,439 mg/m^3 on 11 September (Table 4; Figure 7). Data from site 13R (intensive monitoring only – June 13, July 23, and August 30) were omitted from weekly analysis (see section 3.1.2). Species composition of samples collected from site 13 was similar to that observed at site 3 with diatoms in early summer, greens in mid-summer, and cyanophytes in late summer; however, cyanophytes periodically became abundant throughout the summer, ranging from less than one to 22.6 percent of total biomass in June, July, and early August (Table 5). *Aphanizomenon* spp., *Aphanocapsa* spp., *Anabaena* sp., *Merismopedia tenuissima*, and *Planktothrix suspensus* comprised cyanophyte populations throughout the summer (Appendix VI). The cyanophyte "bloom" on 11 September (34,726 mg/m^3) was due to a large population of *Aphanizomenon flos-aquae* (Appendix VI).

3.3 DISCUSSION

Seasonal succession of dominant algal groups in the Assiniboine River followed generalized patterns observed in many north temperate aquatic systems due to changing conditions of river discharge, light, temperature, and nutrient availability (*cf.* Reynolds 1984). Diatoms were abundant in June and August; green algae dominated in mid-summer, and cyanophytes increased toward the end of the summer. Small numbers of cryptophytes and chrysophytes were observed in June. Many of the cyanophytes recorded in the Assiniboine River in 2002 and earlier studies in 1999 and 2000 are capable of producing the algal toxin Microcystin, for example, *Microcystis* spp. and *Aphanizomenon flos-aquae* (H. Kling 2001 in Cooley et al. 2001b). Microcystin concentrations were measured during intensive monitoring only; therefore, it is not known if the "blooms" observed in late August and early September 2002 were toxin-producing. Heterocysts

of the nitrogen-fixing species *Anabaena* and *Aphanizomenon* were observed in large numbers in late summer (Appendices I – VI), suggesting that available N:P ratios had shifted in favour of nitrogen fixers. However, N:P ratios and dissolved inorganic nitrogen concentrations indicated that N-limitation occurred throughout the open-water season (Table 6), suggesting that other factors such as increased residence time and algal populations upstream of Brandon may influence the development of blue-green algal blooms in the Assiniboine River between Brandon and Portage la Prairie.

Total algal biomass (mg/m^3) was not strongly correlated with chlorophyll *a* (a measure of the amount of phytoplankton photosynthetic pigment in the water column) measured during intensive and weekly sampling at sites 3, 8, 13, and 14 throughout the open-water season of 2002 (Figure 8). Regression analysis indicated an R^2 of 0.3 (Figure 8); however, when several large outliers were included in the analysis (i.e., algal biomass > 20,000 mg/m^3), R^2 was less than 0.01.

4.0 LITERATURE CITED

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TABLES AND FIGURES

Table 1. Phytoplankton biomass (mg/m^3), chlorophyll *a*, and composition (by group) in the Assiniboine River (sites 3, 8, 13, and 14), the Brandon wastewater lagoon effluent (BSE5G), and the Souris River, 2002. Samples were collected during three intensive periods (June, July, and August) according to river travel times.

Site	Date 2002	Chlorophyll *a* (µg/L)	Total Biomass (mg/m^3)	Biomass By Group (mg/m^3)						
				Cyano-phyta	Chloro-phyta	Eugleno-phyta	Chryso-phyceae	Diatomeae	Crypto-phyceae	Peridineae
3L	5-Jun	19	1157	17	283	18	167	590	72	10
3C	5-Jun	18	1706	1	460	26	389	669	162	0
3R	5-Jun	19	2413	19	167	35	233	1654	306	0
BSE5G	5-Jun	120	7840	0	7781	56	0	2	0	0
8L	7-Jun	33	1565	26	529	36	324	605	46	0
8R	7-Jun	20	1223	0	641	2	148	380	52	0
13L	13-Jun	40	3312	96	1669	17	34	1468	28	0
13R	13-Jun	38	3220	24	596	0	264	2312	15	9
14L	18-Jun	22	2242	3	1085	29	159	888	78	0
14R	18-Jun	15	1510	9	839	35	90	521	17	0
3L	16-Jul	4	719	0	253	25	3	437	0	0
3C	16-Jul	4	468	0	186	1	0	282	0	0
3R	16-Jul	6	4075	0	1249	948	0	1879	0	0
BSE5G	15-Jul	17	2211	41	2048	70	19	33	0	0
BSE5G	16-Jul	17	6780	872	4892	886	0	129	0	0
BSE5G	17-Jul	36	15862	2	15348	75	0	437	0	0
8L	17-Jul	4	601	0	283	33	6	275	4	0
8R	17-Jul	2	278	0	128	0	8	138	4	0
Souris L	18-Jul	16	24953	9369	14037	566	0	956	26	0
Souris R	18-Jul	20	6730	1095	4903	22	49	595	0	67
13L	23-Jul	7	1887	359	1172	19	0	332	4	0
13R	23-Jul	9	32135	1101	25955	0	0	5079	0	0
14L	26-Jul	14	2499	1015	767	217	0	346	95	58
14R	26-Jul	11	3469	1086	1210	538	0	543	0	93
3L	21-Aug	18	957	140	367	6	0	436	9	0
3C	21-Aug	20	1646	423	546	60	3	606	9	0
3R	21-Aug	18	605	298	46	8	7	236	11	0
8L	23-Aug	16	1598	18	441	0	2	1135	2	0
8R	23-Aug	17	1808	481	816	0	0	509	2	0
13L	30-Aug	24	1461	36	835	6	0	575	10	0
13R	30-Aug	20	15258	4109	1613	1639	33	7797	66	0
14L	5-Sep	33	4484	314	3214	128	57	632	42	97
14R	5-Sep	29	2947	515	587	575	18	1160	62	30

Table 2. Average phytoplankton biomass (mg/m^3) in the Assiniboine River, 2002. Samples were collected along transects of the river at sites 3, 8, 13, and 14 during intensive monitoring periods in June, July, and August.

Site	n	Date 2002	Total Biomass mg/m^3	Biomass By Group (mg/m^3)						
				Cyano-phyta	Chloro-phyta	Eugleno-phyta	Chryso-phyceae	Diatomeae	Crypto-phyceae	Peridineae
3	3	5-Jun	1759	12	303	26	263	971	180	3
8	2	7-Jun	1394	13	585	19	236	493	49	0
13	2	13-Jun	3266	60	1133	8	149	1890	22	5
14	2	18-Jun	1876	6	962	32	124	704	48	0
3	3	16-Jul	1754	0	562	324	1	866	0	0
8	2	17-Jul	439	0	205	16	7	207	4	0
13	1	23-Jul	1887[a]	359	1172	19	0	332	4	0
14	2	26-Jul	2984	1051	988	377	0	445	48	76
3	3	21-Aug	1069	287	320	24	3	426	9	0
8	2	23-Aug	1703	249	629	0	1	822	2	0
13	1	30-Aug	1461[a]	36	835	6	0	575	10	0
14	2	5-Sep	3715	415	1901	351	38	896	52	64

[a]Results presented for site 13L only; data from site 13R were excluded from calculations as described in Section 3.1.

Table 3. Percent composition of phytoplankton biomass in the Assiniboine River (sites 3, 8, 13, and 14), the Brandon wastewater lagoon effluent (BSE5G), and the Souris River, 2002. Samples were collected during three intensive periods (June, July, and August) according to river travel times.

Site	Date 2002	Total Biomass mg/m^3	Percent of Total Biomass						
			Cyano-phyta	Chloro-phyta	Eugleno-phyta	Chryso-phyceae	Diatomeae	Crypto-phyceae	Peridineae
3L	5-Jun	1157	1	25	2	14	51	6	1
3C	5-Jun	1706	0	27	2	23	39	10	0
3R	5-Jun	2413	1	7	1	10	69	13	0
BSE5G	5-Jun	7840	0	99	1	0	0	0	0
8L	7-Jun	1565	2	34	2	21	39	3	0
8R	7-Jun	1223	0	52	0	12	31	4	0
13L	13-Jun	3312	3	50	1	1	44	1	0
13R	13-Jun	3220	1	19	0	8	72	1	0
14L	18-Jun	2242	0	48	1	7	40	4	0
14R	18-Jun	1510	1	56	2	6	35	1	0
3L	16-Jul	719	0	35	4	1	61	0	0
3C	16-Jul	468	0	40	0	0	60	0	0
3R	16-Jul	4075	0	31	23	0	46	0	0
BSE5G	15-Jul	2211	2	93	3	1	2	0	0
BSE5G	16-Jul	6780	13	72	13	0	2	0	0
BSE5G	17-Jul	15862	0	97	1	0	3	0	0
8L	17-Jul	601	0	47	5	1	46	1	0
8R	17-Jul	278	0	46	0	3	50	2	0
Souris L	18-Jul	24953	38	56	2	0	4	0	0
Souris R	18-Jul	6730	16	73	0	1	9	0	1
13L	23-Jul	1887	19	62	1	0	18	0	0
13R	23-Jul	32135	3	81	0	0	16	0	0
14L	26-Jul	2499	41	31	9	0	14	4	2
14R	26-Jul	3469	31	35	16	0	16	0	3
3L	21-Aug	957	15	38	1	0	46	1	0
3C	21-Aug	1646	26	33	4	0	37	1	0
3R	21-Aug	605	49	8	1	1	39	2	0
8L	23-Aug	1598	1	28	0	0	71	0	0
8R	23-Aug	1808	27	45	0	0	28	0	0
13L	30-Aug	1461	2	57	0	0	39	1	0
13R	30-Aug	15258	27	11	11	0	51	0	0
14L	5-Sep	4484	7	72	3	1	14	1	2
14R	5-Sep	2947	18	20	20	1	39	2	1

Table 4. Phytoplankton biomass (mg/m^3), chlorophyll a, and composition (by group) in the Assiniboine River (sites 3, 8, and 13), 2002. Samples were collected weekly from July 15 to September 11; additional data from intensive monitoring periods in June, July, and August is also presented.

Site	Date 2002	Chlorophyll *a* (µg/L)	Total Biomass (mg/m^3)	Biomass By Group (mg/m^3)						
				Cyano-phyta	Chloro-phyta	Eugleno-phyta	Chryso-phyceae	Diatomeae	Crypto-phyceae	Peridineae
3[a]	5-Jun	19	1759	12	303	26	263	971	180	3
8[a]	7-Jun	27	1394	13	585	19	236	493	49	0
13	13-Jun	39	3266	60	1133	8	149	1890	22	5
13C	15-Jul	24	5863	520	3428	25	2	1886	0	3
3[a]	16-Jul	5	1754	0	562	324	1	866	0	0
8[a]	17-Jul	3	439	0	205	16	7	207	4	0
13[b]	23-Jul	8	1887	359	1172	19	0	332	4	0
3C	23-Jul	8	633	6	225	21	2	366	12	0
8C	23-Jul	6	944	0	575	0	0	367	2	0
3C	29-Jul	8	651	1	510	31	0	17	93	0
8C	29-Jul	2	786	0	709	0	1	72	3	0
13C	29-Jul	7	1747	27	1513	17	0	190	0	0
3C	7-Aug	4	840	6	555	70	6	156	48	0
8C	7-Aug	12	1162	14	536	3	0	595	14	0
13C	7-Aug	7	2888	653	1893	12	0	226	104	0
3C	13-Aug	2	101	0	31	32	0	21	17	0
8C	13-Aug	4	657	7	264	0	11	365	10	0
13C	13-Aug	6	1546	81	858	198	0	359	50	0
13C	20-Aug	8	4977	31	4502	6	0	416	22	0
3[a]	21-Aug	8	1069	287	320	24	3	426	9	0
8[a]	23-Aug	6	1703	249	629	0	1	822	2	0
13[b]	30-Aug	10	1461	36	835	6	0	575	10	0
3C	27-Aug	20	14216	11873	1862	0	132	332	17	0
8C	27-Aug	16	2326	810	712	0	8	789	8	0
3C	3-Sep	34	5929	5579	157	9	4	174	0	6
8C	3-Sep	10	1658	190	840	12	1	605	11	0
13C	3-Sep	36	3792	1216	1415	4	0	1149	8	0
3C	11-Sep	12	16227	14682	757	182	45	374	78	110
8C	11-Sep	14	66962	65609	239	11	144	755	70	135
13R	11-Sep	17	37439	34726	1199	355	119	957	80	2

[a] Average biomass calculated from samples collected during intensive monitoring periods (see Table 2).
[b] Results presented for site 13L only; 13R was omitted as described in section 3.1.

Table 5. Percent composition of phytoplankton biomass in the Assiniboine River (sites 3, 8, and 13), 2002. Samples were collected weekly from July 15 to September 11; additional data from intensive monitoring periods in June, July, and August is also presented.

Site	Date 2002	Total Biomass mg/m^3	Percent of Total Biomass						
			Cyano-phyta	Chloro-phyta	Eugleno-phyta	Chryso-phyceae	Diatomeae	Crypto-phyceae	Peridineae
3[a]	5-Jun	1759	1	17	1	15	55	10	0
8[a]	7-Jun	1394	1	42	1	17	35	3	0
13	13-Jun	3266	2	35	0	5	58	1	0
13C	15-Jul	5863	9	59	0	0	32	0	0
3[a]	16-Jul	1754	0	32	18	0	49	0	0
8[a]	17-Jul	439	0	47	4	2	47	1	0
13[b]	23-Jul	1887	19	62	1	0	18	0	0
3C	23-Jul	633	1	36	3	0	58	2	0
8C	23-Jul	944	0	61	0	0	39	0	0
3C	29-Jul	651	0	78	5	0	3	14	0
8C	29-Jul	786	0	90	0	0	9	0	0
13C	29-Jul	1747	2	87	1	0	11	0	0
3C	7-Aug	840	1	66	8	1	19	6	0
8C	7-Aug	1162	1	46	0	0	51	1	0
13C	7-Aug	2888	23	66	0	0	8	4	0
3C	13-Aug	101	0	31	32	0	21	16	0
8C	13-Aug	657	1	40	0	2	56	2	0
13C	13-Aug	1546	5	56	13	0	23	3	0
13C	20-Aug	4977	1	91	0	0	8	0	0
3[a]	21-Aug	1069	27	30	2	0	40	1	0
8[a]	23-Aug	1703	15	37	0	0	48	0	0
13[b]	30-Aug	1461	2	57	0	0	39	1	0
3C	27-Aug	14216	84	13	0	1	2	0	0
8C	27-Aug	2326	35	31	0	0	34	0	0
3C	3-Sep	5929	94	3	0	0	3	0	0
8C	3-Sep	1658	11	51	1	0	37	1	0
13C	3-Sep	3792	32	37	0	0	30	0	0
3C	11-Sep	16227	91	5	1	0	2	1	1
8C	11-Sep	66962	98	0	0	0	1	0	0
13R	11-Sep	37439	93	3	1	0	3	0	0

[a] Average biomass calculated from samples collected during intensive monitoring periods (see Table 2).
[b] Results presented for site 13L only; 13R was omitted as described in section 3.1.

Table 6. Concentrations of total and soluble reactive phosphorus (SRP), total and dissolved inorganic nitrogen (DIN), ratios of total N: total P, DIN:SRP, and DIN: total P, and nutrient limitation in the Assiniboine River, July - September 2002a. SRP is estimated as dissolved orthophosphate.

		Phosphorus		Nitrogen		N:P Ratios			Nutrient
Site#	Date 2002	SRP mg/L P	Total mg/L P	Total mg/L	DIN mg/L	TN:TP	DIN:SRP	DIN:TP	Limitation[b]
3[a]	5-Jun	0.024	0.080	1.14	0.228	31.5	21.0	6.3	-
8[a]	7-Jun	0.039	0.130	1.11	0.190	19.0	10.8	3.2	-
13[a]	13-Jun	0.018	0.139	0.76	0.013	12.1	1.6	0.2	Nitrogen
13C	15-Jul	0.068	0.369	1.52	0.025	9.1	0.8	0.1	Nitrogen
3[a]	16-Jul	0.097	0.163	1.13	0.132	15.3	3.0	1.8	-
8[a]	17-Jul	0.230	0.278	1.53	0.615	12.2	5.9	4.9	-
13[a]	23-Jul	0.059	0.218	1.21	0.011	12.3	0.4	0.1	Nitrogen
3C	23-Jul	0.080	0.173	1.00	0.103	12.8	2.8	1.3	-
8C	23-Jul	0.161	0.207	0.85	0.054	9.1	0.7	0.6	Nitrogen
3C	29-Jul	0.099	0.185	1.04	0.153	12.4	3.4	1.8	-
8C	29-Jul	0.170	0.226	0.81	0.009	7.9	0.1	0.1	Nitrogen
13C	29-Jul	0.059	0.222	1.01	0.008	10.0	0.3	0.1	Nitrogen
3C	7-Aug	0.103	0.165	1.06	0.064	14.2	1.4	0.9	-
8C	7-Aug	0.142	0.194	1.08	0.083	12.3	1.3	0.9	-
13C	7-Aug	0.043	0.136	1.01	0.008	16.3	0.4	0.1	Nitrogen
3C	13-Aug	0.085	0.152	0.81	0.009	11.7	0.2	0.1	Nitrogen
8C	13-Aug	0.182	0.216	1.23	0.336	12.6	4.1	3.4	-
13C	13-Aug	0.041	0.151	1.01	0.012	14.7	0.6	0.2	Nitrogen
13C	20-Aug	0.042	0.165	1.01	0.009	13.5	0.5	0.1	Nitrogen
3[a]	21-Aug	0.033	0.105	1.09	0.109	23.2	7.5	2.3	-
8[a]	23-Aug	0.094	0.159	1.01	0.266	14.0	6.3	3.7	-
13[a]	30-Aug	0.041	0.159	0.81	0.015	11.5	0.8	0.2	Nitrogen
3C	27-Aug	0.051	0.156	2.06	0.274	29.2	11.9	3.9	-
8C	27-Aug	0.005	0.221	1.47	0.200	14.7	88.5	2.0	Phosphorus
3C	3-Sep	0.006	0.209	3.11	0.019	32.9	7.0	0.2	Nitrogen
8C	3-Sep	0.103	0.197	1.79	0.502	20.1	10.8	5.6	-
13C	3-Sep	0.005	0.147	1.61	0.012	24.1	5.3	0.2	Nitrogen/ Phosphorus
3C	11-Sep	0.034	0.148	1.37	0.074	20.5	4.8	1.1	-
8C	11-Sep	0.103	0.253	2.21	0.414	19.3	8.9	3.6	-
13C	11-Sep	0.016	0.312	2.61	0.008	18.5	1.1	0.1	Nitrogen

[a] Averages calculated from samples collected during intensive monitoring periods; n=3 for site 3, n=2 for sites 8 & 13

[b] Nutrient limitation was assumed to follow the following relationship: DIN:SRP < 10 = N limited; DIN:SRP > 20 = P limited; DIN:SRP 10 - 20 = N or P limited. Where [SRP] ≥ 0.005 mg/L, P is not limiting. Where [DIN] ≥ 0.055 mg/L, N is not limiting.

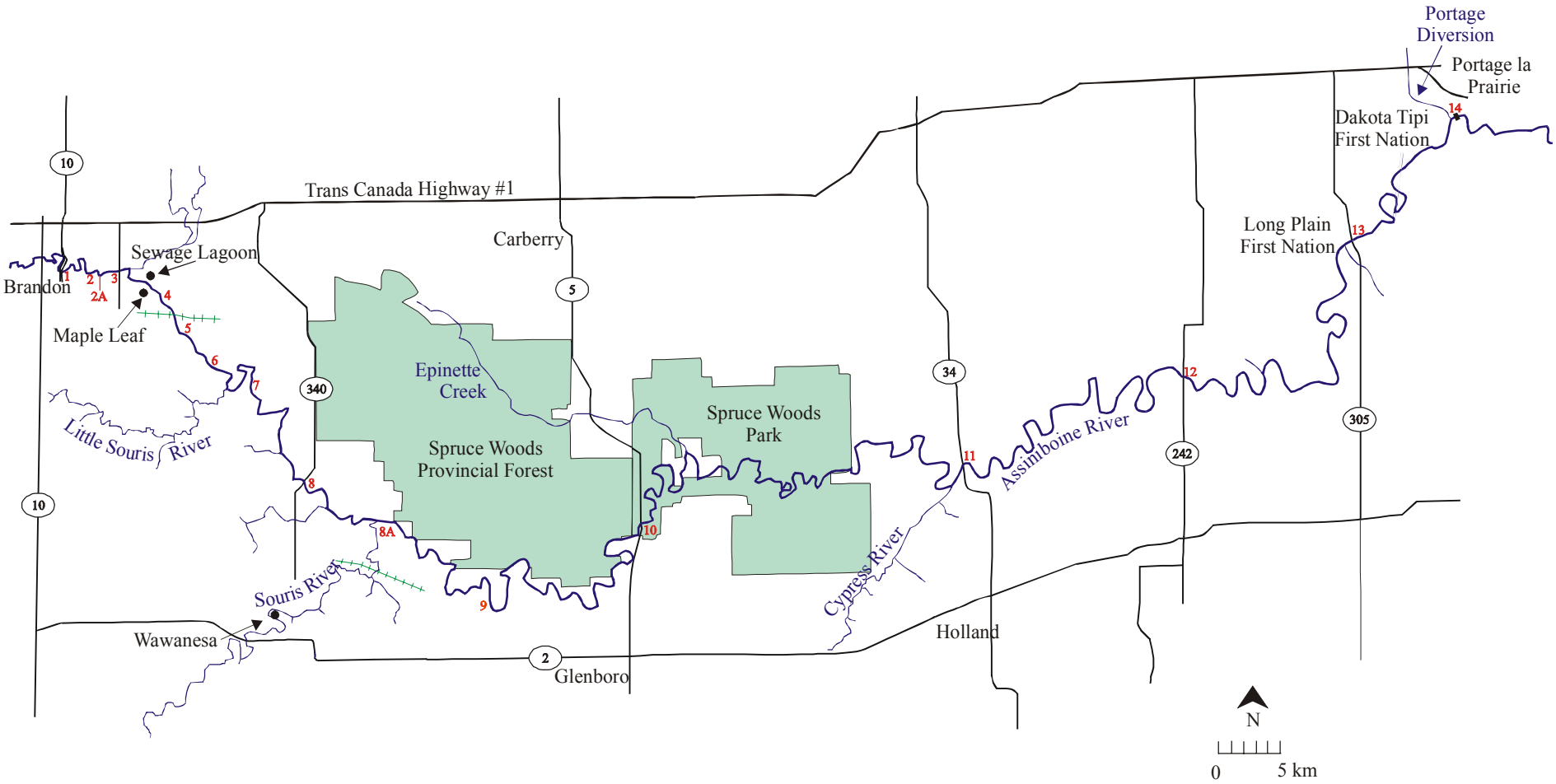

Figure 1. Study area of the Assiniboine River Monitoring Study (Brandon to Portage la Prairie), with sampling site locations.

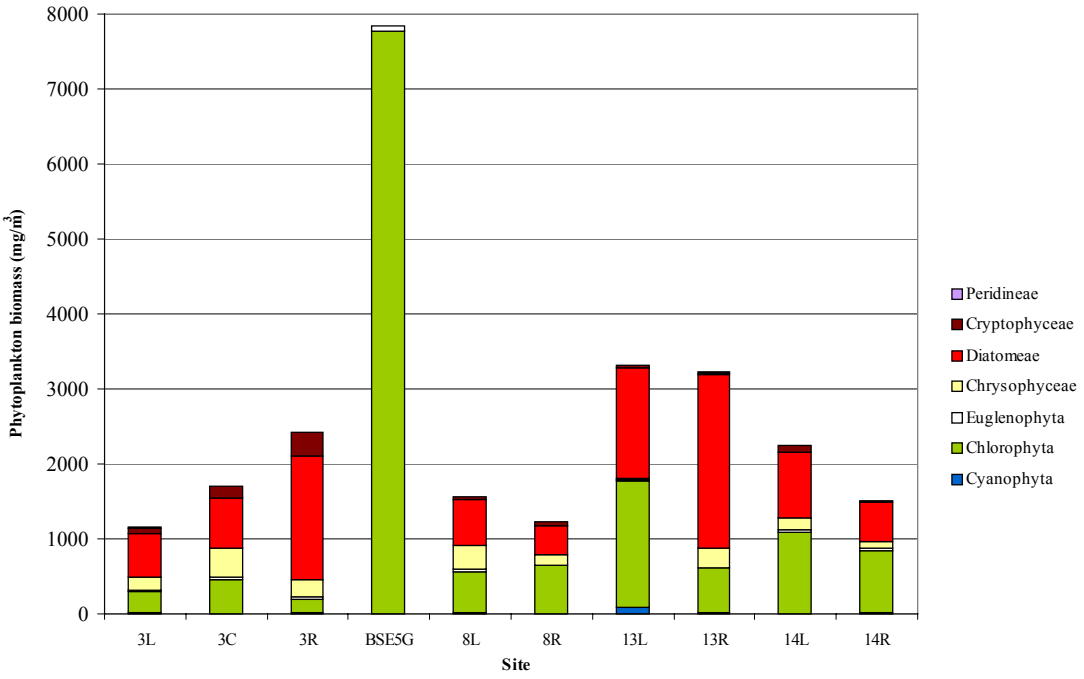

Figure 2. Phytoplankton biomass in the Assiniboine River (sites 3, 8, 13, 14) and Brandon's wastewater lagoon effluent (BSE5G) during the June 2002 intensive monitoring period (June 5-18).

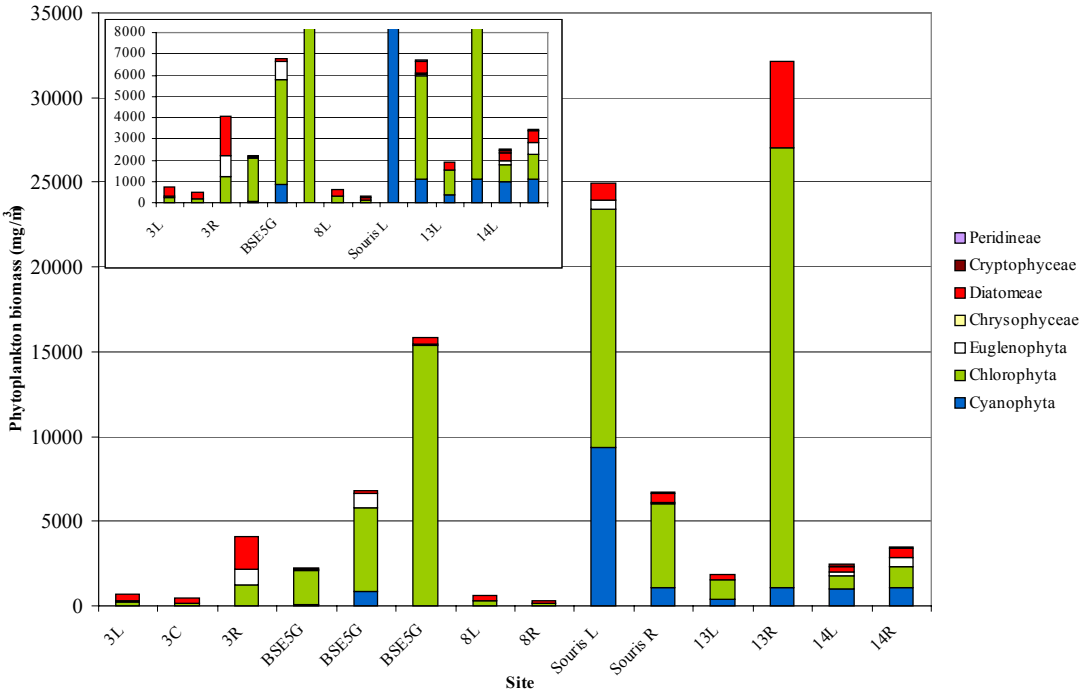

Figure 3. Phytoplankton biomass in the Assiniboine River (sites 3, 8, 13, 14) and its tributaries (BSE5G, Souris River) during the July 2002 intensive monitoring period (July 16-26).

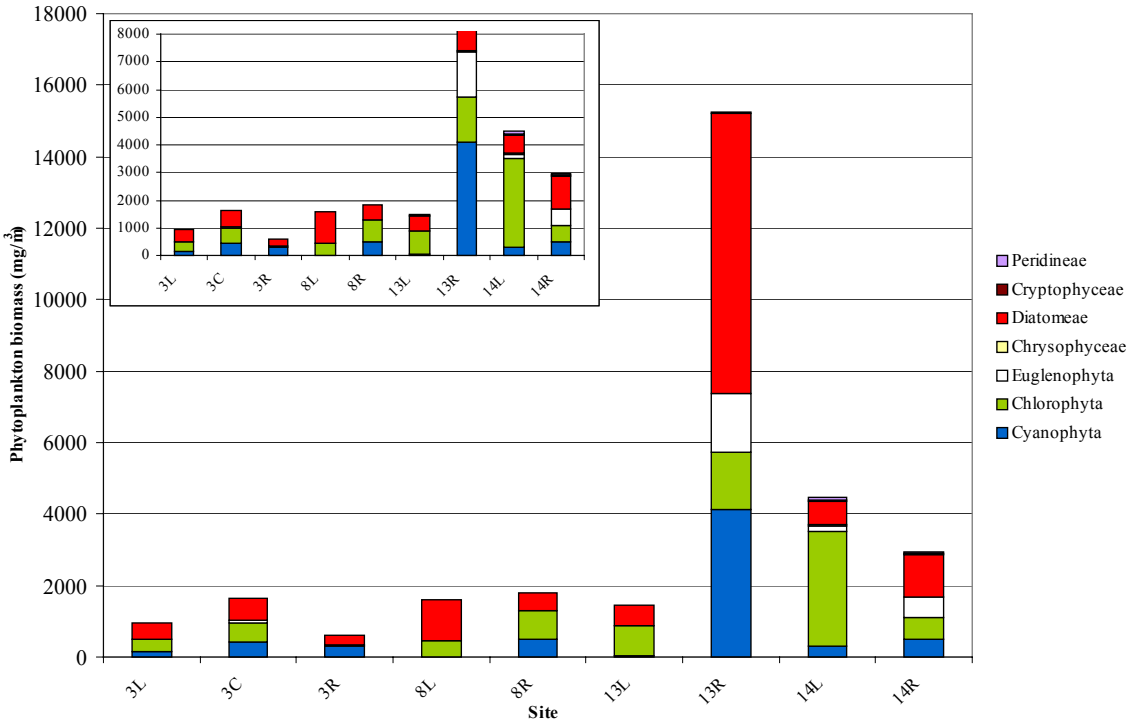

Figure 4. Phytoplankton biomass in the Assiniboine River (sites 3, 8, 13, 14) during the August 2002 intensive monitoring period (August 21 - September 5).

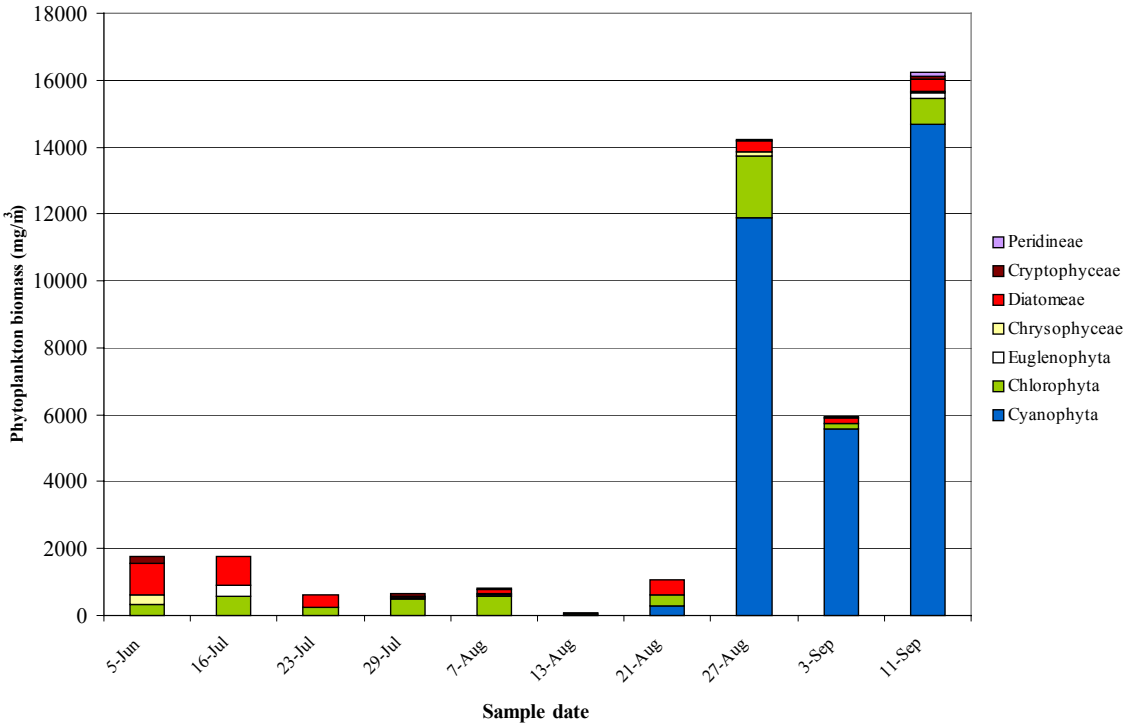

Figure 5. Phytoplankton biomass in the Assiniboine River at Site 3, June - September 2002. Results from 5 June, 16 July, and 21August are average values calculated from three samples collected at the left, centre, and right channel.

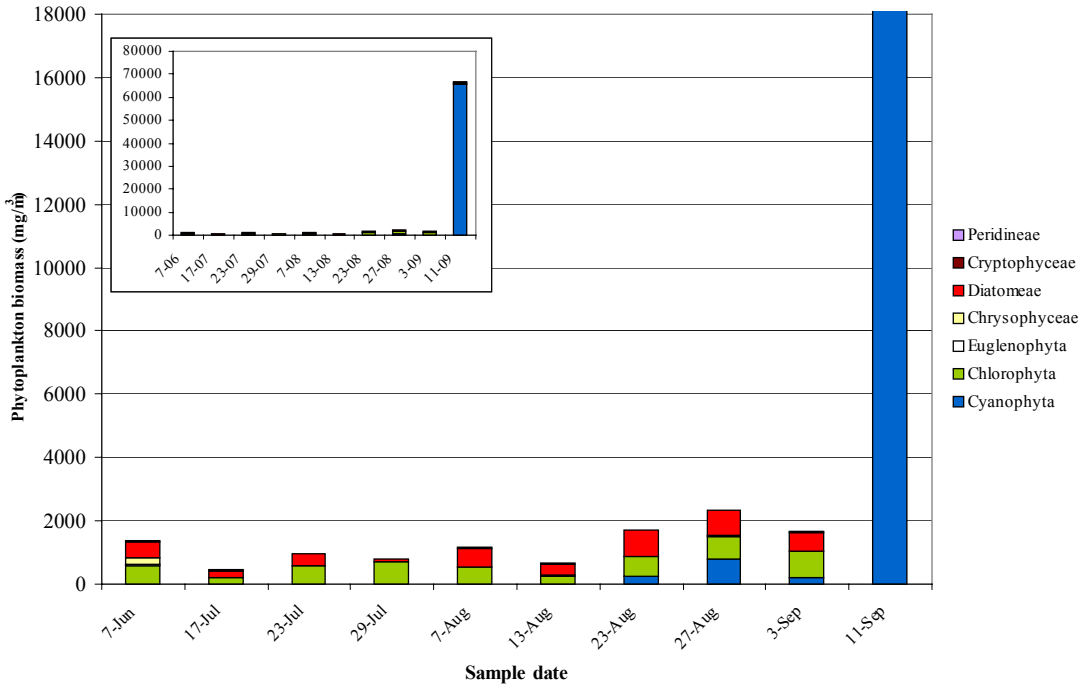

Figure 6. Phytoplankton biomass in the Assiniboine River at Site 8, June - September 2002. Results from 7 June, 17 July, and 23 August are average values calculated from two samples collected at the left and right channel.

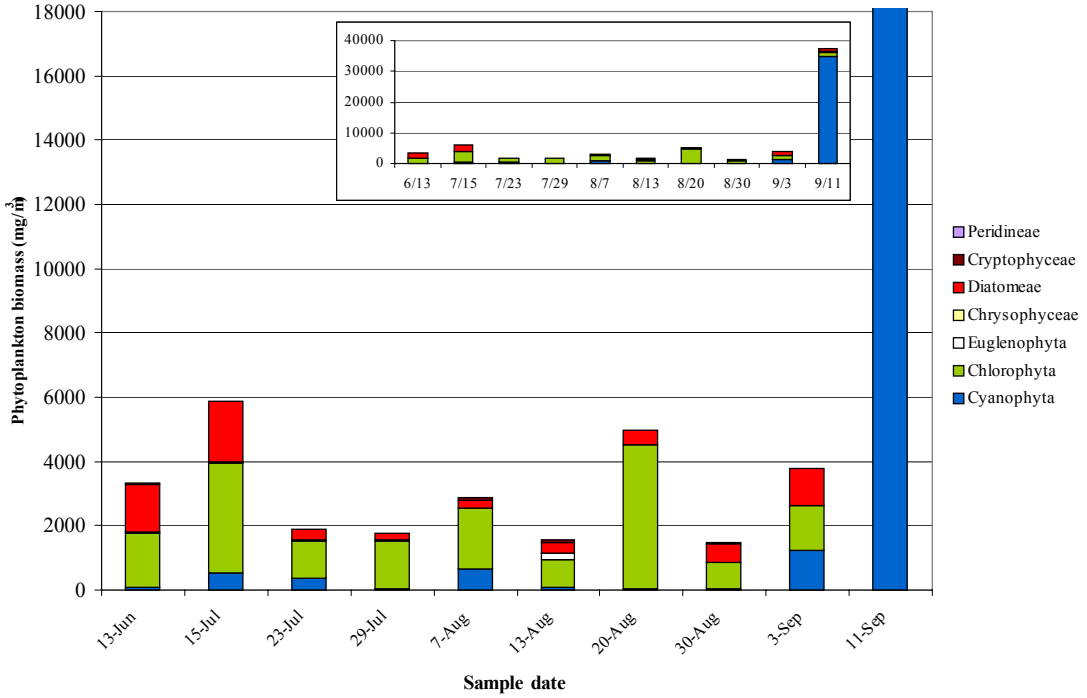

Figure 7. Phytoplankton biomass in the Assiniboine River at Site 13, June - September 2002. Results from 13 June, 23 July, and 30 August are from samples collected in the left channel only.

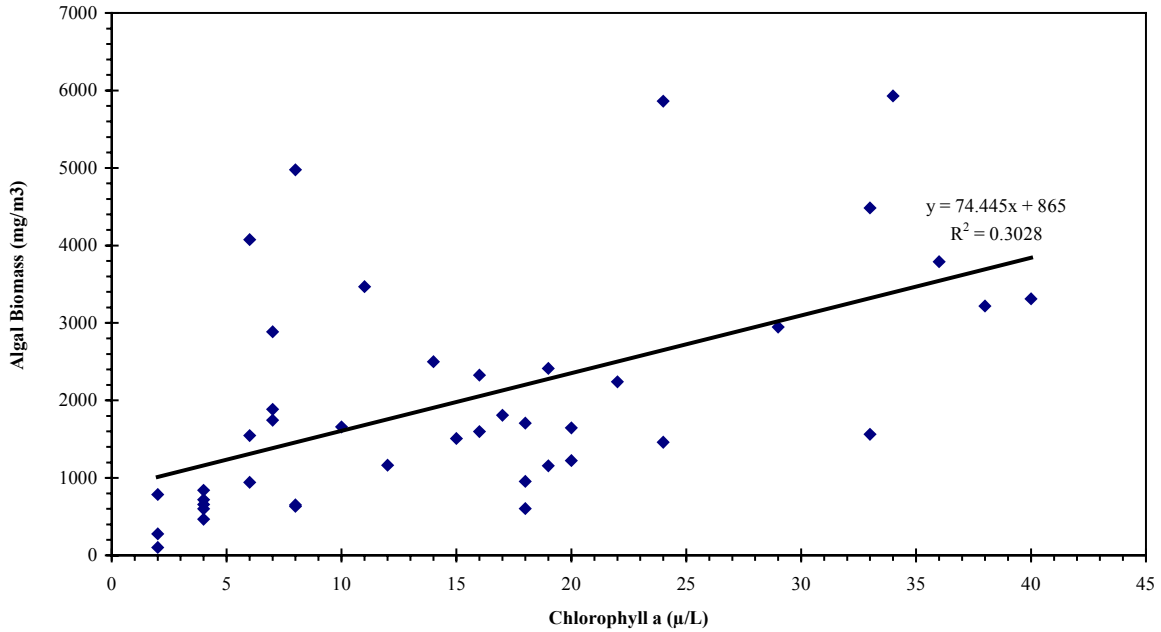

Figure 8. Relationship between measured algal biomass and chlorophyll a in the Assiniboine River (Sites 3, 8, 13, and 14) during the open-water season, 2002. Several outliers were removed from the analysis.

APPENDIX I

PHYTOPLANKTON BIOMASS IN THE ASSINIBOINE RIVER, JUNE 2002 INTENSIVE MONITORING

Assiniboine R	Station 3L			05-Jun-02	Volume 2 mL		
Taxon	Group	Length	Width Factor	Count	Volume	Cells/L	mg/m^3
Dictosphaerium pulcellum	CHLO	5.6	4.2 29838	85.00	51.7	2536230	131.2
Chlamydomonas sp	CHLO	5.6	5.6 29838	11.00	92.0	328218	30.2
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	5.6	5.6 29838	11.00	92.0	328218	30.2
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	2.8	2.0 29838	107.00	5.9	3192666	18.7
Siderocelis (several species or morphs)	CHLO	7.0	5.6 29838	5.00	114.9	149190	17.1
Oocystis sp	CHLO	8.4	5.6 29838	3.00	137.9	89514	12.3
Scenedesmus (several very small species/morphotypes)	CHLO	5.6	4.2 29838	8.00	34.5	238704	8.2
Koliella longissima	CHLO	70.0	2.0 29838	2.00	110.0	59676	6.6
Dictyosphaerium sp	CHLO	3.0	2.8 29838	16.00	12.3	477408	5.9
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	4.2	2.8 29838	11.00	17.2	328218	5.7
Scenedesmus quadricauda	CHLO	16.0	5.0 1000	40.00	139.6	40000	5.6
Eudorina elegans	CHLO	8.4	8.4 1000	16.00	310.3	16000	5.0
Scenedesmus (several very small species/morphotypes)	CHLO	5.6	2.0 29838	12.00	7.8	358056	2.8
Monoraphidium contortum	CHLO	22.5	1.4 29838	3.00	17.3	89514	1.6
Lagerheimia genevensis	CHLO	5.6	4.2 29838	1.00	51.7	29838	1.5
Monoraphidium arcuatum	CHLO	32.0	2.0 1000	10.00	50.3	10000	0.5
Ochromonads	CHRY	5.6	5.6 29838	46.00	92.0	1372548	126.2
Chrysococcus biporus	CHRY	5.6	4.2 29838	15.00	51.7	447570	23.1
small chrysophytes	CHRY	4.2	2.8 29838	23.00	17.2	686274	11.8
Dinobryon sociale	CHRY	11.2	8.4 1000	13.00	413.8	13000	5.4
Chrysochromulina parva (haptophyte included in chrysophytes)	CHRY	4.2	2.8 29838	1.00	11.5	29838	0.3
Rhodomonas minuta	CRYP	8.2	5.6 29838	27.00	89.8	805626	72.3
Cyanothece aeruginosa	CYAN	5.6	5.6 29838	4.00	92.0	119352	11.0
Raphidonema	CYAN	7.0	2.0 29838	11.00	11.0	328218	3.6
Aphanocapsa delicatissima	CYAN	1.0	1.0 1000	2000.00	0.5	2000000	1.0
Filamentous bluegreen	CYAN	50.0	4.2 1000	1.00	692.7	1000	0.7
Pseudanabaena sp	CYAN	100.0	1.4 1000	1.00	153.9	1000	0.2
Stephanodiscus agassizensis	DIAT	14.0	8.4 29838	15.00	646.5	447570	289.4
Stephanodiscus hantzschii	DIAT	9.6	5.6 29838	17.00	202.7	507246	102.8
Stephanodiscus agassizensis	DIAT	20.0	10.0 1000	54.00	1570.8	54000	84.8
Stephanodiscus sp	DIAT	4.2	2.8 29838	68.00	19.4	2028984	39.4
Nitzschia cf linearis	DIAT	125.0	8.4 1000	6.00	2309.1	6000	13.9
Nitzschia sp	DIAT	50.0	8.4 1000	9.00	923.6	9000	8.3
Gyrosigma acuminatum	DIAT	120.0	16.0 1000	1.00	8042.5	1000	8.0
Synedra ulna	DIAT	225.0	4.2 1000	7.00	1039.1	7000	7.3
Surirella cf brebissoni	DIAT	33.0	20.0 1000	2.00	3455.8	2000	6.9
Nitzschia acicularis	DIAT	70.0	2.0 29838	3.00	73.3	89514	6.6
Stephanodiscus niagarae	DIAT	30.0	15.0 1000	1.00	5301.4	1000	5.3
Aulacoseira subarctica	DIAT	28.0	5.4 1000	6.00	641.3	6000	3.8
Surirella spp	DIAT	50.0	16.0 1000	1.00	3351.0	1000	3.4
Gyrosigma prolongum	DIAT	100.0	11.2 1000	1.00	3284.0	1000	3.3
Synedra cf acus	DIAT	84.0	2.8 1000	14.00	172.4	14000	2.4
Navicula gregaria (also includes some N. cryptocephela)	DIAT	25.0	7.0 1000	5.00	320.7	5000	1.6
Asterionella formosa	DIAT	70.0	2.8 1000	10.00	143.7	10000	1.4
Navicula cf digioradiata (need SEM ID (N.tripunctata/N.margalathi))	DIAT	44.0	8.4 1000	1.00	812.8	1000	0.8
Rhicosphenia curvata	DIAT	20.0	8.4 1000	1.00	369.5	1000	0.4
Nitzschia tryboniella (types)	DIAT	28.0	5.6 1000	1.00	229.9	1000	0.2
Euglena sp	EUGL	38.0	14.0 1000	4.00	3899.8	4000	15.6
Trachelomonas sp	EUGL	20.0	20.0 1000	1.00	2792.5	1000	2.8
Glenodinium sp 1	PERI	28.0	25.0 1000	1.00	9163.0	1000	9.2
Gymnodinium sp 4	PERI	16.0	14.0 1000	1.00	1094.7	1000	1.1
Strobilidium sp	PROT	55.0	50.0 1000	1.00	71994.8	1000	72.0
Strobilidium sp	PROT	28.0	25.0 1000	2.00	9163.0	2000	18.3
Urotricha sp (common scuticociliate that feed on algae)	PROT	12.6	8.4 29838	1.00	465.5	29838	13.9
Strobilidium sp	PROT	22.0	20.0 1000	3.00	4607.7	3000	13.8
Scuticociliates	PROT	20.0	16.0 1000	4.00	2680.8	4000	10.7
Thecate amoeba	PROT	44.0	20.0 1000	1.00	9215.3	1000	9.2
Spermatozoa	ZOOP	7.0	1.2 29838	11.00	5.3	328218	1.7

Phyto Diversity:	Cell number:	0.902	Biomass:	0.892
	mg/m^3	%	Cells/L	%
Cyanophyta	16.5	1.4	2449570	14.2
Chlorophyta	283	24.5	8271450	47.9
Euglenophyta	18.4	1.6	5000	0.0
Chrysophyceae	166.9	14.4	2549230	14.8
Diatomeae	590	51.0	3193314	18.5
Cryptophyceae	72.3	6.2	805626	4.7
Peridineae	10.3	0.9	2000	0.0
TOTAL	1157.4		17276190	

Assiniboine R	Station 3C			05-Jun-02	Volume 2 mL		
Taxon	Group	Length	Width Factor	Count	Volume	Cells/L	mg/m^3
Pico greens	CHLO	1.4	1.2 29838	6210.00	1.1	185293980	195.6
Chlamydomonas sp	CHLO	5.6	5.6 29838	33.00	92.0	984654	90.5
Chlorella/free Dictyospaerium/free Coelastrum	CHLO	5.6	5.6 29838	33.00	92.0	984654	90.5
Chlamydomonas sp	CHLO	4.2	4.2 29838	45.00	38.8	1342710	52.1
Actinastrum hantzschii	CHLO	16.0	2.8 29838	4.00	49.3	119352	5.9
Pediastrum boryanum	CHLO	11.2	8.4 1000	32.00	183.9	32000	5.9
Collodictyon triciliatum (phagotroph eating greens and diatoms)	CHLO	16.0	16.0 1000	2.00	2144.7	2000	4.3
Scenesdesmus quadricauda	CHLO	16.0	5.6 1000	24.00	175.1	24000	4.2
Siderocelis (several species or morphs)	CHLO	8.4	5.6 29838	1.00	137.9	29838	4.1
Scenedesmus (several very small species/morphotypes)	CHLO	7.0	2.8 29838	4.00	19.2	119352	2.3
Scenesdesmus quadricauda	CHLO	5.6	3.0 29838	4.00	17.6	119352	2.1
Kolialla tatrae	CHLO	28.0	2.0 29838	1.00	29.3	29838	0.9
Monoraphidium minutum	CHLO	5.6	1.4 29838	3.00	5.7	89514	0.5
Scenedesmus acuminatus	CHLO	16.0	2.8 1000	8.00	43.8	8000	0.4
Monoraphidium arcuatum	CHLO	32.0	2.8 1000	3.00	98.5	3000	0.3
Scenedesmus quadricauda	CHLO	14.0	4.2 1000	4.00	86.2	4000	0.3
Gleotilia pelagica	CHLO	100.0	1.6 1000	1.00	201.1	1000	0.2
Closterium aciculare	CHLO	56.0	2.8 1000	1.00	114.9	1000	0.1
large chrysophytes (ochromonas spp)	CHRY	8.0	7.0 29838	33.00	205.3	984654	202.1
midsize chrysophytes (ochromonads)	CHRY	5.0	4.2 29838	96.00	46.2	2864448	132.3
small chrysophytes	CHRY	3.0	2.8 29838	101.00	12.3	3013638	37.1
Chrysococcus biporus	CHRY	5.6	4.2 29838	11.00	51.7	328218	17.0
Rhodomonas minuta	CRYP	8.4	5.6 29838	56.00	92.0	1670928	153.6
Katablepharis ovalis	CRYP	7.0	4.2 29838	6.00	43.1	179028	7.7
Cryptomonas reflexa	CRYP	20.0	7.0 1000	1.00	342.1	1000	0.3
Chroococcus turgida	CYAN	7.0	5.6 1000	4.00	114.9	4000	0.5
Stephanodiscus agassizensis	DIAT	14.0	8.4 29838	13.00	646.5	387894	250.8
Stephanodiscus agassizensis	DIAT	20.0	12.6 1000	85.00	1979.2	85000	168.2
Stephanodiscus hantzschii	DIAT	5.6	4.2 29838	56.00	51.7	1670928	86.4
Aulacoseira islandica	DIAT	33.0	8.4 1000	26.00	1828.8	26000	47.5
Nitschia sigma/sigmoidea (sigmoid complex)	DIAT	200.0	11.2 1000	5.00	6568.0	5000	32.8
Cycoltella meneghiniana	DIAT	7.0	4.2 29838	11.00	80.8	328218	26.5
Stephanodiscus niagarae	DIAT	50.0	22.0 1000	1.00	21598.4	1000	21.6
Gyrosigma prolongum	DIAT	175.0	11.2 1000	2.00	5747.0	2000	11.5
Nitzschia acicularis	DIAT	56.0	2.8 29838	2.00	114.9	59676	6.9
Synedra ulna	DIAT	200.0	5.0 1000	3.00	1309.0	3000	3.9
Surirella cf brebissoni	DIAT	38.0	11.2 1000	2.00	1247.9	2000	2.5
Nitzschia sp	DIAT	125.0	8.4 1000	1.00	2309.1	1000	2.3
Synedra cf acus	DIAT	84.0	2.8 1000	13.00	172.4	13000	2.2
Navicula cf digioradiata (need SEM ID (N. tripunctata/N. margalathi))	DIAT	44.0	8.4 1000	2.00	812.8	2000	1.6
Navicula gregaria (also includes some N. cryptocephela)	DIAT	28.0	8.4 1000	3.00	517.2	3000	1.6
Asterionella formosa	DIAT	84.0	5.6 1000	1.00	689.6	1000	0.7
Rhicosphenia curvata	DIAT	38.0	8.4 1000	1.00	702.0	1000	0.7
Nitzschia tryboniella (types)	DIAT	33.0	8.4 1000	1.00	609.6	1000	0.6
Asterionella formosa	DIAT	70.0	2.8 1000	3.00	143.7	3000	0.4
Navicula sp (small species requires SEM)	DIAT	20.0	7.0 1000	1.00	256.6	1000	0.3
Nitzschia closterium (possible syn N. longissima)	DIAT	28.0	4.2 1000	2.00	129.3	2000	0.3
Euglena sp	EUGL	56.0	16.0 1000	3.00	7506.3	3000	22.5
Strobomonas (fluviatile & morphs)	EUGL	16.0	14.0 1000	2.00	1094.7	2000	2.2
Trachelomonas sp	EUGL	16.0	14.0 1000	1.00	1094.7	1000	1.1
Strobolidium sp	PROT	44.0	38.0 1000	3.00	33267.4	3000	99.8
Scuticociliates	PROT	16.0	12.6 1000	9.00	1330.0	9000	12.0
Scuticociliates	PROT	18.0	16.0 1000	1.00	2412.7	1000	2.4
Spermatozoa	ZOOP	7.0	1.4 29838	14.00	7.2	417732	3.0

Phyto Diversity:	Cell number:	0.15	Biomass:	0.916
Taxon	mg/m^3	%	Cells/L	%
Cyanophyta	0.5	0.0	4000	0.0
Chlorophyta	460.2	27.0	189188244	94.2
Euglenophyta	25.8	1.5	6000	0.0
Chrysophyceae	388.5	22.8	7190958	3.6
Diatomeae	669.4	39.2	2598716	1.3
Cryptophyceae	161.7	9.5	1850956	0.9
Peridineae	0	0.0	0	0.0
TOTAL	1706.1		200838874	

		Ratio to phyto total
Protozoa	114.2	0.067

Assiniboine R	Station 3R			05-Jun-02	Volume 2 mL		
Taxon	Group	Length	Width Factor	Count	Volume	Cells/L	mg/m^3
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	2.0	1.4 29838	709.00	2.1	21155142	43.4
Chlamydomonas sp	CHLO	5.6	4.2 29838	26.00	51.7	775788	40.1
Scenedesmus opoliensis	CHLO	5.6	4.0 29838	22.00	31.3	656436	20.5
Chlamydomonas sp	CHLO	9.6	9.6 29838	1.00	463.2	29838	13.8
Chlamydomonas sp	CHLO	9.6	8.4 29838	1.00	354.7	29838	10.6
Scenedesmus (several very small species/morphotypes)	CHLO	4.2	2.8 29838	20.00	11.5	596760	6.9
Scenedesmus spinosa	CHLO	9.6	2.8 29838	8.00	26.3	238704	6.3
Botryococcus protruberans	CHLO	28.0	20.0 1000	1.00	3909.5	1000	3.9
Siderocelis (several species or morphs)	CHLO	5.6	4.2 29838	2.00	51.7	59676	3.1
Pediastrum duplex	CHLO	11.2	8.4 1000	16.00	183.9	16000	2.9
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	5.6	5.6 29838	1.00	92.0	29838	2.7
Koliella longissima	CHLO	28.0	2.0 29838	2.00	44.0	59676	2.6
Scenedesmus quadricauda	CHLO	7.0	2.8 29838	4.00	19.2	119352	2.3
Scenedesmus quadricauda	CHLO	19.6	5.6 1000	8.00	214.6	8000	1.7
Didymocystis spp	CHLO	9.6	2.8 29838	2.00	26.3	59676	1.6
Carteria sp	CHLO	14.0	14.0 1000	1.00	1436.8	1000	1.4
Tetrastrum staurogeniaforme	CHLO	2.8	2.8 29838	4.00	7.3	119352	0.9
Didymocystis spp	CHLO	5.6	2.8 29838	2.00	15.3	59676	0.9
Tetrastrum staurogeniaforme	CHLO	4.2	4.2 29838	1.00	24.7	29838	0.7
Actinastrum hantzschii	CHLO	16.0	2.0 1000	8.00	25.1	8000	0.2
Monoraphidium arcuatum	CHLO	32.0	2.0 1000	3.00	50.3	3000	0.2
Ugreens (tiny pico greens)	CHLO	4.0	1.0 29838	1.00	2.1	29838	0.1
Chrysococcus rufescens	CHRY	5.6	4.2 29838	78.00	51.7	2327364	120.4
small chrysophytes	CHRY	4.2	2.8 29838	214.00	17.2	6385332	110.1
Desmarella moniliformis	CHRY	5.6	5.6 1000	23.00	92.0	23000	2.1
Rhodomonas minuta	CRYP	8.0	5.0 29838	146.00	69.8	4356348	304.1
Cryptomonas reflexa	CRYP	28.0	12.6 1000	1.00	1551.7	1000	1.6
Chroococcus turgida	CYAN	7.0	5.6 29838	2.00	114.9	59676	6.9
Cyanothece aeruginosa	CYAN	7.0	5.6 29838	2.00	114.9	59676	6.9
Anabaena sp	CYAN	4.2	4.0 29838	4.00	35.2	119352	4.2
Pseudanabaena sp	CYAN	100.0	1.4 1000	5.00	153.9	5000	0.8
Stephanodiscus agassizensis	DIAT	16.0	8.4 29838	45.00	844.5	1342710	1133.9
Stephanodiscus hantzschii	DIAT	5.6	4.2 29838	169.00	51.7	5042622	260.8
Nitzschia acicularis	DIAT	56.0	2.0 29838	56.00	58.6	1670928	98.0
Nitzschia sp	DIAT	56.0	5.6 29838	3.00	459.8	89514	41.2
Stephanodiscus agassizensis	DIAT	22.0	12.6 1000	12.00	2394.8	12000	28.7
Gyrosigma attenuatum	DIAT	100.0	16.0 1000	3.00	6702.1	3000	20.1
Surirella cf brebissoni	DIAT	33.0	20.0 1000	4.00	3455.8	4000	13.8
Nitzschia sigma/sigmoidea (sigmoid complex)	DIAT	150.0	7.0 1000	7.00	1924.2	7000	13.5
Gyrosigma acuminatum	DIAT	100.0	18.0 1000	1.00	8482.3	1000	8.5
Synedra ulna	DIAT	216.0	4.2 1000	8.00	997.5	8000	8.0
Nitzschia sp	DIAT	100.0	8.4 1000	3.00	1847.3	3000	5.5
Synedra cf acus	DIAT	84.0	2.0 29838	2.00	88.0	59676	5.2
Fragilaria crotenensis	DIAT	98.0	4.2 1000	10.00	452.6	10000	4.5
Nitzschia sp	DIAT	28.0	2.0 29838	5.00	29.3	149190	4.4
Nitzschia tryboniella (types)	DIAT	42.0	9.6 1000	4.00	1013.4	4000	4.1
Navicula cf digioradiata (need SEM ID (N.tripunctata/N.margalathi))	DIAT	56.0	8.4 1000	2.00	1034.5	2000	2.1
Navicula gregaria (also includes some N. cryptocephela)	DIAT	20.0	5.6 1000	4.00	164.2	4000	0.7
Asterionella formosa	DIAT	70.0	2.0 1000	7.00	73.3	7000	0.5
Diatoma tenue v. elongatum	DIAT	66.0	5.6 1000	1.00	541.9	1000	0.5
Nitzschia closterium (possible syn N longissima)	DIAT	28.0	4.2 1000	1.00	129.3	1000	0.1
Strobomonas (fluviatile & morphs)	EUGL	28.0	20.0 1000	4.00	3909.5	4000	15.6
Trachelomonas hispida	EUGL	20.0	16.0 1000	4.00	2680.8	4000	10.7
Euglena acus	EUGL	125.0	11.2 1000	1.00	8210.0	1000	8.2
Scuticociliates	PROT	14.0	11.2 29838	3.00	919.5	89514	82.3
Strobilidium sp	PROT	35.0	20.0 1000	3.00	7330.4	3000	22.0
Spermatozoa	ZOOP	8.4	2.0 29838	5.00	17.6	149190	2.6

Phyto Diversity:	Cell number:	0.74	Biomass:	0.744
	mg/m^3	%	Cells/L	%
Cyanophyta	18.7	0.8	243704	0.5
Chlorophyta	166.9	6.9	24086428	52.5
Euglenophyta	34.6	1.4	9000	0.0
Chrysophyceae	232.6	9.6	8735696	19.1
Diatomeae	1654.1	68.6	8421640	18.4
Cryptophyceae	305.7	12.7	4357348	9.5
Peridineae	0.0	0.0	0	0.0
TOTAL	2412.5		45853816	

Ratio to phyto

Assiniboine R	Station BSE5G				05-Jun-02	Volume 2 ml		
Taxon	Group	Length	Width	Factor	Count	Volume	Cells/L	mg/m^3
Oocystis lacustris	CHLO	11.2	6.5	29838	529.00	247.8	15784302	3910.8
Oocystis lacustris	CHLO	16.0	12.6	29838	84.00	1330.0	2506392	3333.6
Scenedesmus quadricauda	CHLO	16.0	4.2	29838	120.00	98.5	3580560	352.8
Scenedesmus acuminatus	CHLO	20.0	5.6	29838	12.00	218.9	358056	78.4
Scenedesmus (several very small species/morphotypes)	CHLO	14.0	3.0	29838	24.00	44.0	716112	31.5
Pediastrum boryanum	CHLO	14.0	14.0	1000	60.00	478.9	60000	28.7
Scenedesmus quadricauda	CHLO	11.2	3.0	29838	20.00	35.2	596760	21.0
Pediastrum boryanum	CHLO	9.6	8.4	1000	96.00	135.1	96000	13.0
Ugreens (tiny pico greens)	CHLO	1.4	1.2	29838	348.00	1.1	10383624	11.0
Nitzschia acicularis	DIAT	70.0	2.0	29838	1.00	73.3	29838	2.2
Lepocinclis sp	EUG	55.0	44.0	1000	1.00	55752.8	1000	55.8
Ciliate	PROT	38.0	20.0	1000	40.00	7958.7	40000	318.3
Haltaria sp	PROT	25.0	20.0	1000	4.00	5236.0	4000	20.9
cladoceran	ZOOP	300.0	200.0	1000	3.00	4188792.3	3000	12566.4

Phyto Diversity:	Cell number:	0.676	Biomass:	0.568
	mg/m^3	%	Cells/L	%
Cyanophyta	0	0.0	0	0.0
Chlorophyta	7780.7	99.3	34081806	99.9
Euglenophyta	55.8	0.7	1000	0.0
Chrysophyceae	0	0.0	0	0.0
Diatomeae	2.2	0.0	29838	0.1
Cryptophyceae	0	0.0	0	0.0
Peridineae	0	0.0	0	0.0
TOTAL	7839.6		34112644	

		Ratio to phyto total
Protozoa	339.3	0.043
Zooplankton	12566.4	1.603

Assiniboine R	Station 8L				07-Jun-02	Volume 2 ml		
Taxon	Group	Length	Width	Factor	Count	Volume	Cells/L	mg/m^3
Chlamydomonas sp	CHLO	9.6	9.6	29838	10.00	463.2	298380	138.2
Ugreens (tiny pico greens)	CHLO	1.4	1.2	29838	3060.00	1.1	91304280	96.4
Oocystis sp	CHLO	8.4	5.6	29838	19.00	137.9	566922	78.2
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	3.0	2.8	29838	96.00	12.3	2864448	35.3
Oocystis sp	CHLO	16.0	11.2	29838	1.00	1050.9	29838	31.4
Collodictyon triciliatum (phagotroph eating greens & diatoms)	CHLO	9.6	9.6	29838	2.00	463.2	59676	27.6
Oocystis sp	CHLO	11.2	7.0	29838	3.00	287.4	89514	25.7
Scenedesmus opoliensis	CHLO	14.0	4.2	29838	8.00	86.2	238704	20.6
Scenedesmus (several very small species/morphotypes)	CHLO	14.0	5.6	29838	4.00	153.3	119352	18.3
Chlamydomonas sp	CHLO	5.6	5.6	29838	6.00	92.0	179028	16.5
Pediastrum boryanum	CHLO	16.0	12.6	1000	16.00	563.0	16000	9.0
Scenedesmus (several very small species/morphotypes)	CHLO	5.6	2.8	29838	16.00	15.3	477408	7.3
Chlorella / free Dictyospaerium/freeCoelastrum	CHLO	5.6	5.6	29838	2.00	92.0	59676	5.5
Scenedesmus quadricauda	CHLO	20.0	8.4	1000	8.00	492.6	8000	3.9
Siderocelis (several species or morphs)	CHLO	7.0	5.6	29838	1.00	114.9	29838	3.4
Crucigenia quadrata	CHLO	4.2	4.2	29838	4.00	24.7	119352	2.9
Scenedesmus opoliensis	CHLO	11.2	2.4	29838	4.00	22.5	119352	2.7
Oocystis lacustris	CHLO	4.2	2.8	29838	4.00	17.2	119352	2.1
Collodictyon triciliatum (phagotroph eating greens & diatoms)	CHLO	16.0	14.0	1000	1.00	1642.0	1000	1.6
Scenedesmus (several very small species/morphotypes)	CHLO	7.0	2.8	29838	1.00	19.2	29838	0.6
Monoraphidium arcuatum	CHLO	40.0	2.8	1000	5.00	123.2	5000	0.6
Kolialla tatrae	CHLO	16.0	1.0	29838	4.00	4.2	119352	0.5
Scenedesmus acuminatus	CHLO	14.0	2.0	1000	12.00	19.5	12000	0.2
small chrysophytes	CHRY	4.2	4.2	29838	146.00	38.8	4356348	169.0
Ochromonads	CHRY	5.6	5.6	29838	56.00	92.0	1670928	153.6
Desmarella moniliformis	CHRY	5.0	4.2	1000	20.00	46.2	20000	0.9
Rhodomonas minuta	CRYP	7.0	4.2	29838	23.00	43.1	686274	29.6
Cryptomonas marsonii	CRYP	21.0	8.4	29838	1.00	517.2	29838	15.4
Katablepharis ovalis	CRYP	5.6	4.2	29838	1.00	34.5	29838	1.0
Chroococcus sp	CYAN	4.2	4.2	29838	19.00	38.8	566922	22.0
Filamentous bluegreen	CYAN	100.0	2.0	1000	7.00	314.2	7000	2.2
Anabaena sp	CYAN	6.0	6.0	1000	7.00	113.1	7000	0.8
Pseudanabaena sp	CYAN	100.0	1.4	1000	4.00	153.9	4000	0.6
Navicula cf digioradiata (need SEM ID (N.tripunctata/N.margalathi))	DIAT	50.0	8.4	29838	9.00	923.6	268542	248.0
Navicula cf cryptocephela/cryptotenella/gregaria	DIAT	33.0	8.4	29838	6.00	609.6	179028	109.1
Navicula sp (small species requires SEM)	DIAT	28.0	7.0	29838	6.00	359.2	179028	64.3
Stephanodiscus & Cyclotella (impossible to split in LM)	DIAT	8.4	5.6	29838	11.00	155.2	328218	50.9
Melosira varians	DIAT	20.0	18.0	1000	4.00	5089.4	4000	20.4
Nitzschia dissipata	DIAT	84.0	11.2	1000	7.00	2758.6	7000	19.3
Nitzschia cf linearis	DIAT	125.0	8.4	1000	7.00	2309.1	7000	16.2
Surirella cf brebissoni	DIAT	28.0	14.0	1000	11.00	1436.8	11000	15.8
Nitzschia sp	DIAT	56.0	5.6	29838	1.00	459.8	29838	13.7
Nitzschia acicularis	DIAT	56.0	2.8	29838	3.00	114.9	89514	10.3
small centrics (Stephanodiscus, Cyclostephanos, Cyclotella species)	DIAT	4.2	2.8	29838	17.00	19.4	507246	9.8
Stephanodiscus agassizensis	DIAT	16.0	8.4	1000	11.00	844.5	11000	9.3
Gomphonema sp	DIAT	20.0	16.0	1000	4.00	1340.4	4000	5.4
Surirella sp	DIAT	66.0	16.0	1000	1.00	4423.4	1000	4.4
Nitzschia palae/palaceae	DIAT	28.0	2.8	29838	2.00	57.5	59676	3.4
Nitzschia tryboniella (types)	DIAT	50.0	16.0	1000	1.00	3351.0	1000	3.4
Nitzschia sp	DIAT	28.0	11.2	1000	1.00	919.5	1000	0.9
Asterionella formosa	DIAT	66.0	2.0	1000	4.00	69.1	4000	0.3
Euglena sp	EUGL	38.0	25.0	1000	1.00	12435.5	1000	12.4
Astasia sp	EUGL	18.0	5.6	29838	1.00	295.6	29838	8.8
Euglena sp	EUGL	38.0	11.2	1000	3.00	2495.8	3000	7.5
Trachelomonas hispida	EUGL	16.0	14.0	1000	3.00	1642.0	3000	4.9
Strobomonas (fluviatile & morphs)	EUGL	20.0	18.0	1000	1.00	2261.9	1000	2.3
Fungal hyphae	FUNG	100.0	5.6	1000	89.00	0.0	89000	0.0
Tintinnidium fluviatile	PROT	100.0	50.0	1000	1.00	130899.7	1000	130.9
Strobilidium sp	PROT	40.0	38.0	1000	2.00	30243.1	2000	60.5
Urotricha sp (common scuticociliate that feed on algae)	PROT	16.0	14.0	1000	1.00	1642.0	1000	1.6
Spermatozoa	ZOOP	8.4	2.0	29838	6.00	17.6	179028	3.1

Phyto Diversity:	Cell number:	0.26	Biomass:	0.929
	mg/m^3	%	Cells/L	%
Cyanophyta	25.6	1.6	584922	0.6
Chlorophyta	528.6	33.8	96866310	91.4
Euglenophyta	35.9	2.3	37838	0.0
Chrysophyceae	323.6	20.7	6047276	5.7
Diatomeae	604.9	38.7	1692090	1.6
Cryptophyceae	46	2.9	745950	0.7

Assiniboine R	Station 8R				07-Jun-02	Volume 2 ml		
Taxon	Group	Length	Width	Factor	Count	Volume	Cells/L	mg/m^3
Oocystis sp	CHLO	9.6	5.6	29838	40.00	157.6	1193520	188.1
Oocystis sp	CHLO	20.0	14.0	29838	2.00	2052.5	59676	122.5
Ugreens (tiny pico greens)	CHLO	1.4	1.2	29838	3150.00	1.1	93989700	99.2
Chlamydomonas sp	CHLO	9.0	8.0	29838	6.00	301.6	179028	54.0
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	5.6	5.6	29838	14.00	92.0	417732	38.4
Chlorella/free Dictyospaerium/free Coelastrum	CHLO	4.2	4.2	29838	26.00	38.8	775788	30.1
Collodictyon triciliatum (phagotroph eating greens & diatoms)	CHLO	9.6	9.6	29838	2.00	463.2	59676	27.6
Oocystis borgei	CHLO	14.0	9.6	29838	1.00	675.6	29838	20.2
Scenedesmus (several very small species/ morphotypes)	CHLO	14.0	4.2	29838	6.00	86.2	179028	15.4
Scenedesmus quadricauda	CHLO	5.6	3.0	29838	28.00	17.6	835464	14.7
Scenedesmus acuminatus	CHLO	14.0	4.2	29838	4.00	86.2	119352	10.3
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	5.6	5.6	29838	3.00	92.0	89514	8.2
Chlamydomonas sp	CHLO	16.0	16.0	1000	2.00	2144.7	2000	4.3
Crucigenia quadrata	CHLO	2.8	2.8	29838	16.00	7.3	477408	3.5
Didymocystis spp	CHLO	7.0	4.2	29838	2.00	43.1	59676	2.6
Didymocystis spp	CHLO	4.2	2.8	29838	2.00	11.5	59676	0.7
Nephrochlamy	CHLO	14.0	2.0	29838	1.00	14.7	29838	0.4
Scenedesmus quadricauda	CHLO	16.0	4.2	1000	4.00	98.5	4000	0.4
Oocystis sp	CHLO	5.6	2.0	29838	1.00	11.7	29838	0.3
Monoraphidium arcuatum	CHLO	32.0	2.0	1000	1.00	50.3	1000	0.1
small chrysophytes	CHRY	4.2	3.0	29838	214.00	19.8	6385332	126.4
Ochromonads	CHRY	9.6	8.4	29838	1.00	354.7	29838	10.6
Chrysococcus biporus	CHRY	5.6	4.2	29838	5.00	51.7	149190	7.7
Chrysoccus punctifera	CHRY	4.2	4.2	29838	2.00	38.8	59676	2.3
Kephyrion sp	CHRY	5.6	2.8	29838	2.00	23.0	59676	1.4
Rhodomonas minuta	CRYP	7.0	4.2	29838	32.00	43.1	954816	41.2
Rhodomonas lens	CRYP	11.2	8.4	29838	1.00	275.9	29838	8.2
Cryptomonas reflexa	CRYP	25.0	11.2	1000	1.00	1094.7	1000	1.1
Katablepharis ovalis	CRYP	5.6	4.2	29838	1.00	34.5	29838	1.0
Navicula cf digioradiata (need SEM ID (N.tripunctata/N.margalathi))	DIAT	56.0	8.4	29838	6.00	1034.5	179028	185.2
Navicula cf cryptocephela/cryptotenella/gregaria	DIAT	30.0	8.0	29838	5.00	502.7	149190	75.0
Stephanodiscus & Cyclotella (impossible to split in LM)	DIAT	9.6	5.6	29838	5.00	202.7	149190	30.2
Nitzschia palae/palaceae	DIAT	35.0	4.2	29838	5.00	161.6	149190	24.1
small centrics (Stephanodiscus, Cyclostephanos, Cyclotella species)	DIAT	5.6	4.2	29838	15.00	51.7	447570	23.1
Navicula gregaria (also includes some N. cryptocephela)	DIAT	28.0	7.0	29838	2.00	359.2	59676	21.4
Surirella cf brebissoni	DIAT	28.0	20.0	1000	3.00	2932.2	3000	8.8
Nitzschia acicularis	DIAT	70.0	2.8	1000	38.00	143.7	38000	5.5
Stephanodiscus & Cyclotella (impossible to split in LM)	DIAT	16.0	8.4	1000	4.00	844.5	4000	3.4
Nitzschia sp	DIAT	84.0	8.4	1000	1.00	1551.7	1000	1.6
Nitzschia cf linearis	DIAT	66.0	4.2	1000	4.00	304.8	4000	1.2
Rhicosphenia curvata	DIAT	42.0	8.4	1000	1.00	775.8	1000	0.8
Euglena sp	EUGL	16.0	16.0	1000	1.00	2144.7	1000	2.1
Fungal hyphae	FUNG	100.0	5.6	1000	75.00	0.0	75000	0.0
Tintinnidium fluviatile	PROT	70.0	25.0	1000	4.00	22907.4	4000	91.6
Colorless flagellate (mixotroph)	PROT	5.6	5.6	29838	45.00	61.3	1342710	82.3
Ciliate	PROT	40.0	40.0	1000	1.00	33510.3	1000	33.5
Haltaria sp	PROT	25.0	20.0	1000	3.00	5236.0	3000	15.7
Ciliate	PROT	20.0	20.0	1000	1.00	4188.8	1000	4.2
Urotricha sp (common scuticociliate that feed on algae)	PROT	16.0	14.0	1000	1.00	1642.0	1000	1.6
Rotifer eggs	ROTI	80.0	40.0	1000	1.00	67020.6	1000	67.0
Spermatozoa	ZOOP	7.0	1.4	29838	10.00	7.2	298380	2.1

Phyto Diversity: Ce	Cell number:	0.231	Biomass:	0.915
	mg/m^3	%	Cells/L	%
Cyanophyta	0	0.0	0	0.0
Chlorophyta	641.1	52.4	98591752	91.7
Euglenophyta	2.1	0.2	1000	0.0
Chrysophyceae	148.4	12.1	6683712	6.2
Diatomeae	380.3	31.1	1184844	1.1
Cryptophyceae	51.5	4.2	1015492	0.9
Peridineae	0	0.0	0	0.0
TOTAL	1223.4		107476800	

			Ratio to phyto total
Protozoa	229	1352710	0.187
Rotifers	67	1000	0.055
Zooplankton	2.1	298380	0.002
Fungus	0	75000	0.000

Assiniboine R | Station 13L | 13-Jun-02 | Volume 2 ml

Taxon	Group	Length	Width	Factor	Count	Volume	Cells/L	mg/m^3
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	2.8	2.8	29838	1668.00	11.5	49769784	572.1
Ugreens (tiny pico greens)	CHLO	1.4	1.2	29838	6660.00	1.1	198721080	209.8
Dictosphaerium tetrachotum	CHLO	4.2	4.2	29838	160.00	38.8	4774080	185.2
Chlamydomonas sp	CHLO	9.6	8.4	29838	15.00	354.7	447570	158.7
Actinastrum hantzschii	CHLO	14.0	2.0	29838	169.00	22.0	5042622	110.9
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	2.8	2.8	29838	270.00	11.5	8056260	92.6
Scenedesmus quadricauda	CHLO	14.0	5.6	29838	16.00	153.3	477408	73.2
Coenococcus cf fottei	CHLO	4.2	4.2	29838	48.00	38.8	1432224	55.6
Dictosphaerium tetrachotum	CHLO	3.0	3.0	29838	84.00	14.1	2506392	35.4
Oocystis parva	CHLO	7.0	4.2	29838	16.00	64.7	477408	30.9
Scenedesmus (several very small species/ morphotypes)	CHLO	5.6	4.2	29838	30.00	34.5	895140	30.9
Scenedesmus acuminatus	CHLO	20.0	3.0	29838	12.00	62.8	358056	22.5
Siderocelis sp	CHLO	7.0	5.6	29838	9.00	76.6	268542	20.6
Schroedaria setigera	CHLO	70.0	4.2	29838	1.00	484.9	29838	14.5
Phacotus lenticularis	CHLO	11.2	8.4	29838	1.00	275.9	29838	8.2
Monoraphidium contortum	CHLO	15.0	1.0	29838	45.00	5.9	1342710	7.9
Scenedesmus serratus	CHLO	5.2	2.0	29838	30.00	7.3	895140	6.5
Crucigenia apiculata	CHLO	2.8	2.8	29838	20.00	7.3	596760	4.4
Scenedesmus (several very small species/ morphotypes)	CHLO	8.4	2.0	29838	10.00	11.7	298380	3.5
Pediastrum duplex	CHLO	11.2	9.6	1000	16.00	210.2	16000	3.4
Raphidocelis (several species)	CHLO	4.2	2.0	29838	16.00	6.6	477408	3.1
Lagerheimia genevensis	CHLO	4.2	2.8	29838	6.00	17.2	179028	3.1
Monoraphidium arcuatum	CHLO	32.0	1.6	29838	3.00	32.2	89514	2.9
Scenedesmus spinosa	CHLO	8.4	2.0	29838	8.00	11.7	238704	2.8
Raphidocelis (several species)	CHLO	4.2	2.0	29838	10.00	6.6	298380	2.0
Didymocystis spp	CHLO	5.6	2.0	29838	8.00	7.8	238704	1.9
Koliella longissima	CHLO	70.0	1.4	29838	1.00	53.9	29838	1.6
Quadicoccus ellipsoidae	CHLO	5.6	4.0	29838	1.00	46.9	29838	1.4
Scenedesmus (several very small species/ morphotypes)	CHLO	7.0	4.2	29838	1.00	43.1	29838	1.3
Pediastrum duplex	CHLO	8.4	5.6	1000	16.00	69.0	16000	1.1
Monoraphidium contortum	CHLO	42.0	1.4	29838	1.00	32.3	29838	1.0
Chrysococcus biporus	CHRY	5.6	4.2	29838	20.00	51.7	596760	30.9
Large chrysophytes (ochromonas spp)	CHRY	5.6	5.6	29838	1.00	92.0	29838	2.7
Desmarella moniliformis	CHRY	5.6	5.6	1000	8.00	92.0	8000	0.7
Rhodomonas minuta	CRYP	6.0	4.2	29838	19.00	36.9	566922	20.9
Cryptomonas cf erosa	CRYP	14.0	7.0	29838	1.00	239.5	29838	7.1
Anabaena sp	CYAN	4.2	2.8	29838	140.00	17.2	4177320	72.0
Chroococcus dispursus	CYAN	3.0	2.8	29838	64.00	12.3	1909632	23.5
Small bluegreens (pico blue greens)	CYAN	4.2	2.8	1000	4.00	17.2	4000	0.1
small centrics (Stephanodiscus, Cyclostephanos, Cyclotella species)	DIAT	5.6	4.2	29838	259.00	51.7	7728042	399.7
Stephanodiscus hantzschii	DIAT	8.4	4.2	29838	90.00	116.4	2685420	312.5
Stephanodiscus agassizensis	DIAT	20.0	10.0	29838	5.00	1570.8	149190	234.3
Navicula cf digioradiata (need SEM ID (N.tripunctata/N.margalathi))	DIAT	50.0	8.4	29838	4.00	923.6	119352	110.2
Nitzschia acicularis	DIAT	70.0	2.8	29838	18.00	143.7	537084	77.2
Stephanodiscus agassizensis	DIAT	25.0	12.5	1000	19.00	3068.0	19000	58.3
Cyclotella meneghiniana	DIAT	9.6	5.6	29838	8.00	202.7	238704	48.4
Nitzschia cf linearis	DIAT	150.0	11.2	1000	7.00	4926.0	7000	34.5
Anomoneis cf sphaerophora	DIAT	60.0	20.0	1000	5.00	6283.2	5000	31.4
Synedra cf acus	DIAT	66.0	2.8	29838	7.00	135.5	208866	28.3
Nitzschia sigma/sigmoidea (sigmoid complex)	DIAT	125.0	11.2	1000	6.00	4105.0	6000	24.6
Gyrosigma acuminatum	DIAT	120.0	14.0	1000	3.00	6157.5	3000	18.5
Navicula gregaria (also includes some N. cryptocephela)	DIAT	35.0	8.4	1000	25.00	646.5	25000	16.2
Epithemia sorex	DIAT	20.0	16.0	1000	10.00	1340.4	10000	13.4
Gyrosigma attenuatum	DIAT	110.0	14.0	1000	2.00	5644.4	2000	11.3
Nitzschia palae/palaceae	DIAT	42.0	2.0	29838	8.00	44.0	238704	10.5
Cymatopleura solea	DIAT	100.0	20.0	1000	1.00	10472.0	1000	10.5
Rhodomonas minuta	DIAT	50.0	20.0	1000	2.00	5236.0	2000	10.5
Navicula cf cryptocephela/cryptotenella/gregaria	DIAT	30.0	8.4	1000	11.00	554.2	11000	6.1
Navicula radiosa	DIAT	84.0	8.4	1000	3.00	1551.7	3000	4.7
Surirella cf brebissoni	DIAT	28.0	16.0	1000	2.00	1876.6	2000	3.8
Nitzschia gracilis	DIAT	84.0	4.2	1000	3.00	387.9	3000	1.2
Nitzschia sp	DIAT	66.0	5.6	1000	2.00	541.9	2000	1.1
Synedra ulna	DIAT	200.0	4.2	1000	1.00	923.6	1000	0.9
Euglena sp	EUGL	33.0	14.0	1000	4.00	3386.6	4000	13.5
Trachelomonas hispida	EUGL	16.0	14.0	1000	2.00	1642.0	2000	3.3
Anabaena/Anabaenopsis heterocyst	HETE	2.8	2.8	29838	6.00	0.0	179028	0.0
large ciliates	PROT	55.0	50.0	1000	1.00	71994.8	1000	72.0
Strobilidium sp	PROT	25.0	20.0	1000	5.00	5236.0	5000	26.2
Haltaria sp	PROT	22.0	20.0	1000	5.00	4607.7	5000	23.0

Phyto Diversity: | Cell number: 0.52 | Biomass: 0.926

Assiniboine R | Station 13 R | 13-Jun-02 | Volume 2 ml

Taxon	Group	Length	Width	Factor	Count	Volume	Cells/L	mg/m^3
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	2.8	2.0	29838	1013.00	5.9	30225894	177.3
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	5.0	5.0	29838	73.00	65.4	2178174	142.6
Ugreens (tiny pico greens)	CHLO	1.4	1.2	29838	3510.00	1.1	104731380	110.6
Oocystis lacustris	CHLO	6.8	5.0	29838	23.00	89.0	686274	61.1
Actinastrum hantzschii	CHLO	15.0	2.0	29838	46.00	23.6	1372548	32.3
Scenedesmus quadricauda	CHLO	14.0	2.8	29838	12.00	38.3	358056	13.7
Gleotila contorta	CHLO	120.0	2.0	29838	1.00	377.0	29838	11.2
Monoraphidium contortum	CHLO	20.0	1.2	29838	23.00	11.3	686274	7.8
Scenedesmus (several very small species/morphotypes)	CHLO	7.0	4.2	29838	6.00	43.1	179028	7.7
Lagerheimia quatrata	CHLO	2.8	2.0	29838	34.00	5.9	1014492	5.9
Pediastrum duplex	CHLO	11.2	9.6	1000	24.00	210.2	24000	5.0
Siderocelis sp	CHLO	7.0	5.6	29838	2.00	76.6	59676	4.6
Scenedesmus serratus	CHLO	8.4	2.0	29838	11.00	11.7	328218	3.8
Scenedesmus spinosa	CHLO	5.6	2.0	29838	16.00	7.8	477408	3.7
Pediastrum boryanum	CHLO	11.2	8.4	1000	16.00	183.9	16000	2.9
Raphidocelis spp/Gloeoactinium limneticum (difficult to distinguish)	CHLO	4.2	1.4	29838	28.00	3.2	835464	2.7
Crucigenia quadrata	CHLO	3.0	3.0	29838	8.00	9.0	238704	2.1
Didymocystis spp	CHLO	7.0	2.8	29838	2.00	19.2	59676	1.1
Dinobryon sertularia	CHRY	11.2	9.6	29838	14.00	540.5	417732	225.8
Chrysococcus biporus	CHRY	5.6	4.2	29838	23.00	51.7	686274	35.5
Gloeactinium limneticum/ small cells with Raphidocelis	CHRY	5.6	1.4	29838	8.00	5.7	238704	1.4
Desmarella moniliformis	CHRY	5.6	5.6	1000	10.00	92.0	10000	0.9
Chrysoccus punctifera	CHRY	3.0	2.8	29838	1.00	12.3	29838	0.4
Cryptomonas cf erosa	CRYP	11.2	7.0	29838	2.00	191.6	59676	11.4
Rhodomonas minuta	CRYP	7.0	4.2	29838	3.00	43.1	89514	3.9
Small bluegreens (pico blue greens)	CYAN	5.6	4.2	29838	12.00	51.7	358056	18.5
Anabaena sp	CYAN	4.2	4.2	1000	100.00	38.8	100000	3.9
Coelosphaerium kuetzingianum	CYAN	2.8	2.8	1000	128.00	11.5	128000	1.5
small centrics (Stephanodiscus, Cyclostephanos, Cyclotella species)	DIAT	8.0	4.2	29838	214.00	105.6	6385332	674.0
Rhopalodia gibba	DIAT	33.0	20.0	29838	6.00	3455.8	179028	618.7
Navicula gregaria (also includes some N. cryptocephela)	DIAT	28.0	7.0	29838	23.00	359.2	686274	246.5
small centrics (Stephanodiscus, Cyclostephanos, Cyclotella species)	DIAT	9.6	5.6	29838	34.00	202.7	1014492	205.6
Surirella cf brebissoni	DIAT	30.0	20.0	29838	1.00	3141.6	29838	93.7
Navicula cf digioradiata (need SEM ID (N.tripunctata/N.margalathi))	DIAT	56.0	8.4	29838	3.00	1034.5	89514	92.6
Stephanodiscus agassizensis	DIAT	15.0	7.0	29838	4.00	618.5	119352	73.8
Cyclotella meneghiniana	DIAT	8.0	4.2	29838	23.00	105.6	686274	72.4
Epithemia sorex	DIAT	28.0	9.6	29838	2.00	675.6	59676	40.3
Navicula cf cryptocephela/cryptotenella/gregaria	DIAT	33.0	8.4	29838	2.00	609.6	59676	36.4
Nitzschia acicularis	DIAT	56.0	2.0	29838	20.00	58.6	596760	35.0
Nitzschia cf linearis	DIAT	120.0	8.4	1000	15.00	2216.7	15000	33.3
Stephanodiscus niagarae	DIAT	50.0	25.0	1000	1.00	24543.7	1000	24.5
Anomoneis cf sphaerophora	DIAT	66.0	16.0	1000	3.00	4423.4	3000	13.3
Stephanodiscus agassizensis	DIAT	20.0	10.0	1000	8.00	1570.8	8000	12.6
Navicula gregaria (also includes some N. cryptocephela)	DIAT	22.0	7.0	29838	1.00	282.2	29838	8.4
Rhopalodia gibba	DIAT	66.0	20.0	1000	1.00	6911.5	1000	6.9
Nitzschia sp	DIAT	42.0	4.2	29838	1.00	194.0	29838	5.8
Nitzschia sigma/sigmoidea (sigmoid complex)	DIAT	150.0	8.4	1000	2.00	2770.9	2000	5.5
Asterionella formosa	DIAT	42.0	2.8	29838	2.00	86.2	59676	5.1
Surirella angustata	DIAT	50.0	16.0	1000	1.00	3351.0	1000	3.4
Synedra ulna	DIAT	84.0	8.4	1000	1.00	1551.7	1000	1.6
Diatoma vulgarae	DIAT	44.0	11.2	1000	1.00	1445.0	1000	1.4
Nitzschia closterium (possible syn N longissima)	DIAT	70.0	4.2	1000	2.00	323.3	2000	0.6
Anabaena/Anabaenopsis heterocyst	HETE	4.2	4.2	1000	4.00	0.0	4000	0.0
Glenodinium sp2	PERI	28.0	25.0	1000	1.00	9163.0	1000	9.2
Strobilidium sp	PROT	55.0	50.0	1000	1.00	71994.8	1000	72.0
Strobilidium sp	PROT	28.0	20.0	1000	8.00	5864.3	8000	46.9

Phyto Diversity: Cell number: 0.51 Biomass: 0.895

	mg/m^3	%	Cells/L	%
Cyanophyta	23.9	0.7	586056	0.4
Chlorophyta	596.3	18.5	143501104	92.2
Euglenophyta	0	0.0	0	0.0
Chrysophyceae	263.9	8.2	1382548	0.9
Diatomeae	2311.5	71.8	10060568	6.5
Cryptophyceae	15.3	0.5	149190	0.1
Peridineae	9.2	0.3	1000	0.0
TOTAL	3220.1		155680466	

Ratio to phyto total

Assiniboine R | Station 14L | 18-Jun-02 | Volume 2 ml

Taxon	Group	Length	Width	Factor	Count	Volume	Cells/L	mg/m^3
Collodictyon triciliatum (phagotroph eating greens & diatoms)	CHLO	20.0	18.0	29838	5.00	3392.9	149190	506.2
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	4.2	4.2	29838	169.00	38.8	5042622	195.6
Ugreens (tiny pico greens)	CHLO	1.4	1.2	29838	4410.00	1.1	131585580	138.9
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	5.6	3.0	29838	68.00	26.4	2028984	53.5
Scenedesmus (several very small species/morphotypes)	CHLO	5.6	2.0	29838	146.00	7.8	4356348	34.1
Oocystis borgei	CHLO	16.0	11.2	29838	1.00	1050.9	29838	31.4
Actinastrum hantzschii	CHLO	14.0	1.4	29838	94.00	10.8	2804772	30.2
Treubaria triappendiculata	CHLO	4.2	4.2	29838	23.00	24.7	686274	16.9
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	2.4	2.4	29838	58.00	7.2	1730604	12.5
Pediastrum duplex	CHLO	11.2	8.4	1000	64.00	183.9	64000	11.8
Siderocelis sp	CHLO	7.0	4.2	29838	9.00	43.1	268542	11.6
Monoraphidium contortum	CHLO	14.0	1.0	29838	68.00	5.5	2028984	11.2
Coelastrum cf asteroide	CHLO	5.6	4.2	29838	4.00	51.7	119352	6.2
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	7.0	7.0	29838	1.00	179.6	29838	5.4
Scenedesmus quadricauda	CHLO	14.0	4.2	29838	2.00	86.2	59676	5.1
Monoraphidium arcuatum	CHLO	32.0	2.0	29838	3.00	50.3	89514	4.5
Pediastrum boryanum	CHLO	11.2	8.4	1000	16.00	183.9	16000	2.9
Koliella longissima	CHLO	42.0	1.0	29838	4.00	16.5	119352	2.0
Tetrastrum staurogeniaforme	CHLO	5.6	5.6	29838	1.00	58.5	29838	1.7
Scenedesmus acuminatus	CHLO	20.0	4.2	1000	12.00	123.2	12000	1.5
Monoraphidium komarkovae	CHLO	84.0	2.8	1000	5.00	258.6	5000	1.3
Didymocystis spp	CHLO	5.6	2.0	29838	2.00	7.8	59676	0.5
Chrysococcus biporus	CHRY	5.6	4.2	29838	45.00	51.7	1342710	69.4
Dinobryon sociale	CHRY	11.2	7.0	29838	8.00	287.4	238704	68.6
Chrysococcus sp	CHRY	8.4	8.4	29838	2.00	310.3	59676	18.5
small chrysophytes	CHRY	4.2	2.8	29838	4.00	17.2	119352	2.1
Rhodomonas minuta	CRYP	5.0	4.0	29838	84.00	27.9	2506392	70.0
Cryptomonas reflexa	CRYP	22.0	11.2	1000	6.00	963.3	6000	5.8
Katablepharis ovalis	CRYP	7.0	4.2	29838	2.00	43.1	59676	2.6
Coelosphaerium kuetzingianum	CYAN	2.8	2.8	1000	128.00	11.5	128000	1.5
Aphanizomenon flos aquae	CYAN	100.0	4.2	1000	1.00	1385.4	1000	1.4
Stephanodiscus hantzschii	DIAT	8.4	5.6	29838	56.00	155.2	1670928	259.3
Stephanodiscus agassizensis	DIAT	15.0	8.4	29838	9.00	742.2	268542	199.3
small centrics (Stephanodiscus, Cyclostephanos, Cyclotella species)	DIAT	5.0	4.2	29838	135.00	41.2	4028130	166.1
Stephanodiscus agassizensis	DIAT	22.0	11.2	1000	44.00	2128.7	44000	93.7
Cyclotella meneghiniana	DIAT	9.6	4.2	29838	11.00	152.0	328218	49.9
Surirella cf brebissoni	DIAT	28.0	14.0	29838	1.00	1436.8	29838	42.9
Cyclotella meneghiniana	DIAT	11.2	5.6	29838	4.00	275.9	119352	32.9
Stephanodiscus niagarae	DIAT	33.0	14.0	1000	3.00	5987.1	3000	18.0
Synedra cf acus	DIAT	70.0	2.0	29838	6.00	73.3	179028	13.1
Cyclotella meneghiniana	DIAT	4.2	2.8	29838	11.00	19.4	328218	6.4
Nitzschia acicularis	DIAT	70.0	2.8	29838	1.00	143.7	29838	4.3
Synedra cf acus	DIAT	300.0	4.2	1000	1.00	1385.4	1000	1.4
Synedra cf acus	DIAT	150.0	4.2	1000	1.00	692.7	1000	0.7
Nitzschia acicularis	DIAT	66.0	2.8	1000	1.00	135.5	1000	0.1
Euglena sp	EUGL	21.0	8.4	29838	1.00	775.8	29838	23.1
Strobomonas (fluviatile & morphs)	EUGL	28.0	20.0	1000	1.00	3909.5	1000	3.9
Euglena sp	EUGL	38.0	9.6	1000	1.00	1833.7	1000	1.8
Aphanizomenon heterocyst	HETE	5.6	4.2	1000	1.00	0.0	1000	0.0
large ciliates	PROT	55.0	38.0	1000	12.00	41584.2	12000	499.0
large ciliates	PROT	100.0	83.0	1000	1.00	360707.2	1000	360.7
Ciliate	PROT	70.0	66.0	1000	2.00	159655.7	2000	319.3
Strombidium sp	PROT	44.0	28.0	1000	3.00	18062.1	3000	54.2
Tintinnidium fluviatile	PROT	44.0	20.0	1000	4.00	9215.3	4000	36.9
Codonella sp	PROT	33.0	28.0	1000	2.00	13546.5	2000	27.1
Thecate amoeba	PROT	44.0	33.0	1000	1.00	25088.8	1000	25.1
Scuticociliates	PROT	16.0	9.6	29838	1.00	772.1	29838	23.0
Vorticella sp (commonly associated with Anabaena colonies)	PROT	44.0	28.0	1000	1.00	18062.1	1000	18.1
Strobilidium sp	PROT	28.0	20.0	1000	2.00	5864.3	2000	11.7
Colorless flagellate (mixotroph)	PROT	9.6	9.6	29838	1.00	308.8	29838	9.2
Heliozoan spp	PROT	15.0	15.0	1000	4.00	1767.1	4000	7.1
Strobilidium sp	PROT	16.0	14.0	1000	3.00	1642.0	3000	4.9
Askenasia sp	PROT	20.0	18.0	1000	1.00	3392.9	1000	3.4
Urotricha sp (common scuticociliate that feed on algae)	PROT	20.0	12.0	1000	1.00	1508.0	1000	1.5
Rotifer eggs	ROTI	55.0	44.0	1000	2.00	55752.8	2000	111.5
Rotifer (not ID)	ROTI	60.0	50.0	1000	1.00	52359.9	1000	52.4

Phyto Diversity:	Cell number:	0.34	Biomass:	0.904

	mg/m^3	%	Cells/L	%
Cyanophyta	2.9	0.1	129000	0.1

Assiniboine R | Station 14R | 18-Jun-02 | Volume 2 ml

Taxon	Group	Length	Width	Factor	Count	Volume	Cells/L	mg/m^3
Collodictyon triciliatum (phagotroph eating greens & diatoms)	CHLO	16.0	16.0	29838	3.00	2144.7	89514	192.0
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	2.8	2.0	29838	1001.00	5.9	29867838	175.2
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	5.6	4.2	29838	90.00	51.7	2685420	138.9
Siderocelis sp	CHLO	7.0	5.6	29838	45.00	76.6	1342710	102.9
Ugreens (tiny pico greens)	CHLO	1.4	1.2	29838	2250.00	1.1	67135500	70.9
Scenedesmus (several very small species/morphotypes)	CHLO	5.6	3.0	29838	113.00	17.6	3371694	59.3
Actinastrum hantzschii	CHLO	16.0	2.0	29838	37.00	25.1	1104006	27.7
Scenedesmus serratus	CHLO	16.0	2.8	29838	14.00	43.8	417732	18.3
Monoraphidium contortum	CHLO	21.0	1.4	29838	16.00	16.2	477408	7.7
Scenedesmus spinosa	CHLO	8.4	4.2	29838	4.00	51.7	119352	6.2
Tetaedron caudatum	CHLO	8.4	8.4	29838	1.00	197.6	29838	5.9
Golenkenia radiata	CHLO	7.0	7.0	29838	1.00	179.6	29838	5.4
Pediastrum duplex	CHLO	12.6	9.6	1000	16.00	266.0	16000	4.3
Scenedesmus (several very small species/morphotypes)	CHLO	7.0	4.2	29838	3.00	43.1	89514	3.9
Oocystis parva	CHLO	5.6	2.8	29838	5.00	23.0	149190	3.4
Koliella longissima	CHLO	70.0	1.4	29838	2.00	53.9	59676	3.2
Collodictyon triciliatum (phagotroph eating greens & diatoms)	CHLO	16.0	16.0	1000	1.00	2144.7	1000	2.1
Didymocystis spp	CHLO	5.6	4.2	29838	2.00	34.5	59676	2.1
Scenedesmus quadricauda	CHLO	20.0	4.2	1000	16.00	123.2	16000	2.0
Dictosphaerium pulcellum	CHLO	6.0	6.0	1000	12.00	113.1	12000	1.4
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	4.2	3.0	29838	2.00	19.8	59676	1.2
Closterium aciculare	CHLO	120.0	5.6	1000	1.00	985.2	1000	1.0
Closterium aciculare	CHLO	66.0	4.2	1000	3.00	304.8	3000	0.9
Dictosphaerium tetrachotum	CHLO	4.2	4.2	1000	24.00	38.8	24000	0.9
Scenedesmus acuminatus	CHLO	20.0	5.6	1000	4.00	218.9	4000	0.9
Monoraphidium arcuatum	CHLO	28.0	1.4	29838	1.00	21.6	29838	0.6
Monoraphidium minutum	CHLO	5.6	1.4	29838	3.00	5.7	89514	0.5
Planktosphaeria gelatinosa	CHLO	8.4	8.4	1000	1.00	310.3	1000	0.3
Lagerheimia genevensis	CHLO	4.2	2.0	29838	1.00	8.8	29838	0.3
Chrysococcus biporus	CHRY	5.6	4.2	29838	56.00	51.7	1670928	86.4
Ochromonads	CHRY	5.6	4.2	29838	2.00	51.7	59676	3.1
Rhodomonas minuta	CRYP	7.0	4.2	29838	13.00	43.1	387894	16.7
Aphanocapsa incerta	CYAN	1.0	1.0	29838	500.00	0.5	14919000	7.8
Anabaena sp	CYAN	4.2	4.2	1000	34.00	38.8	34000	1.3
Stephanodiscus sp	DIAT	15.0	8.4	29838	7.00	742.2	208866	155.0
small centrics (Stephanodiscus, Cyclostephanos, Cyclotella species)	DIAT	5.6	2.8	29838	135.00	34.5	4028130	138.9
small centrics (Stephanodiscus, Cyclostephanos, Cyclotella species)	DIAT	9.6	5.6	29838	21.00	202.7	626598	127.0
Stephanodiscus agassizensis	DIAT	20.0	10.0	1000	40.00	1570.8	40000	62.8
Surirella spp	DIAT	100.0	20.0	1000	1.00	10472.0	1000	10.5
Nitzschia cf linearis	DIAT	84.0	11.2	1000	3.00	2758.6	3000	8.3
Stephanodiscus niagarae	DIAT	33.0	15.0	1000	1.00	6414.7	1000	6.4
Cyclotella meneghiniana	DIAT	8.0	4.2	29838	1.00	105.6	29838	3.1
Surirella ovata/ovalis	DIAT	28.0	20.0	1000	1.00	2932.2	1000	2.9
Nitzschia sigma/sigmoidea (sigmoid complex)	DIAT	125.0	8.4	1000	1.00	2309.1	1000	2.3
Synedra ulna	DIAT	150.0	5.6	1000	1.00	1231.5	1000	1.2
Fragilaria crotenensis	DIAT	150.0	5.6	1000	1.00	1231.5	1000	1.2
Fragilaria crotenensis	DIAT	100.0	4.2	1000	2.00	461.8	2000	0.9
Euglena sp	EUGL	33.0	7.0	29838	1.00	846.7	29838	25.3
Trachelomonas hispida	EUGL	20.0	16.0	1000	2.00	2680.8	2000	5.4
Strobomonas (fluviatile & morphs)	EUGL	28.0	20.0	1000	1.00	3909.5	1000	3.9
Anabaena/Anabaenopsis heterocyst	HETE	4.2	4.2	1000	2.00	0.0	2000	0.0
Tintinnidium fluviatile	PROT	44.0	20.0	1000	4.00	9215.3	4000	36.9
Haltaria sp	PROT	25.0	20.0	1000	4.00	5236.0	4000	20.9
Holophyra (type ciliate)	PROT	33.0	20.0	1000	3.00	6911.5	3000	20.7
Strobilidium sp	PROT	28.0	20.0	1000	1.00	5864.3	1000	5.9
Urotricha sp (common scuticociliate that feed on algae)	PROT	28.0	20.0	1000	1.00	5864.3	1000	5.9
Strobilidium sp	PROT	20.0	16.0	1000	2.00	2680.8	2000	5.4
Vorticella sp (commonly associated with Anabaena colonies)	PROT	20.0	20.0	1000	1.00	4188.8	1000	4.2
Scuticociliates	PROT	20.0	11.2	1000	1.00	1313.6	1000	1.3
Rotifers (not ID)	ROTI	72.0	60.0	1000	2.00	90477.9	2000	181.0

Phyto Diversity:	Cell number:	0.66	Biomass:	0.922
	mg/m^3	%	Cells/L	%
Cyanophyta	9.1	0.6	14953000	11.6
Chlorophyta	839.2	55.6	107315772	83.0
Euglenophyta	34.5	2.3	32838	0.0
Chrysophyceae	89.5	5.9	1730604	1.3
Diatomeae	520.7	34.5	4944432	3.8
Cryptophyceae	16.7	1.1	387894	0.3
Peridineae	0	0.0	0	0.0

APPENDIX II

PHYTOPLANKTON BIOMASS IN THE ASSINIBOINE RIVER, JULY 2002 INTENSIVE MONITORING

Assiniboine R.	Station 3L				16-Jul-02	Volume 2 ml		
Taxon	Group	Length	Width	Factor	Count	Volume	Cells/L	mg/m^3
Ugreens (tiny pico greens)	CHLO	1.4	1.2	29838	1990.00	1.1	59377620	62.7
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	4.2	2.8	29838	94.00	17.2	2804772	48.4
Westella botrys	CHLO	5.6	5.6	29838	12.00	92.0	358056	32.9
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	5.6	5.6	29838	11.00	92.0	328218	30.2
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	8.4	8.4	29838	3.00	310.3	89514	27.8
Chlamydomonas sp	CHLO	9.7	8.4	29838	2.00	358.4	59676	21.4
Scenedesmus acuminatus	CHLO	14.0	4.2	29838	4.00	86.2	119352	10.3
Actinastrum hantzschii	CHLO	11.2	2.0	29838	16.00	17.6	477408	8.4
Coelastrum cf pseudmicroporum	CHLO	5.6	5.6	1000	32.00	92.0	32000	2.9
Scenedesmus opoliensis	CHLO	5.6	2.0	29838	12.00	7.8	358056	2.8
Lagerheimia quatrata	CHLO	7.0	4.2	29838	1.00	64.7	29838	1.9
Dictosphaerium tetrachotum	CHLO	5.6	5.6	1000	16.00	92.0	16000	1.5
Oocystis spp	CHLO	11.2	8.4	1000	3.00	413.8	3000	1.2
Monoraphidium contortum	CHLO	8.4	1.0	29838	3.00	3.3	89514	0.3
Ankyra judayi	CHLO	20.0	2.8	1000	1.00	61.6	1000	0.1
Koliella longissima	CHLO	40.0	1.2	1000	3.00	22.6	3000	0.1
Monoraphidium cf braunii (includes pseudobraunii)	CHLO	42.0	2.0	1000	1.00	66.0	1000	0.1
Desmarella moniliformis	CHRY	7.0	5.6	29838	1.00	114.9	29838	3.4
Filamentous bluegreen	CYAN	100.0	1.4	1000	1.00	153.9	1000	0.2
Cyclotella spp	DIAT	4.2	2.8	29838	383.00	19.4	11427954	221.7
Cyclotella spp	DIAT	6.8	4.2	29838	23.00	76.3	686274	52.3
Nitzschia spp	DIAT	40.0	5.0	29838	5.00	261.8	149190	39.1
Surirella cf brebissoni	DIAT	28.0	11.2	29838	1.00	919.5	29838	27.4
Nitzschia palae/palaceae	DIAT	28.0	4.2	29838	5.00	129.3	149190	19.3
small centrics (Stephanodiscus, Cyclostephanos, Cyclotella species)	DIAT	8.0	4.0	29838	6.00	100.5	179028	18.0
Nitzschia palae/palaceae	DIAT	70.0	3.0	29838	3.00	164.9	89514	14.8
Surirella ovata/ovalis	DIAT	38.0	28.0	1000	1.00	7799.5	1000	7.8
Nitzschia spp	DIAT	56.0	4.2	29838	1.00	258.6	29838	7.7
Nitzschia cf linearis	DIAT	66.0	8.4	1000	6.00	1219.2	6000	7.3
Nitzschia closterium (possible syn N longissima)	DIAT	28.0	3.0	29838	3.00	66.0	89514	5.9
Nitzschia dibilis	DIAT	14.0	7.0	29838	1.00	179.6	29838	5.4
Nitzschia palae/palaceae	DIAT	45.0	2.8	29838	1.00	92.4	29838	2.8
Amphiprora ornata	DIAT	20.0	11.2	1000	2.00	1313.6	2000	2.6
Navicula cf cryptocephela/cryptotenella/gregaria	DIAT	28.0	8.4	1000	3.00	517.2	3000	1.6
Stephanodiscus sp	DIAT	20.0	10.0	1000	1.00	1570.8	1000	1.6
Triboniella / Nitscshia complex	DIAT	33.0	11.2	1000	1.00	1083.7	1000	1.1
Nitzschia gracilis	DIAT	100.0	4.2	1000	1.00	461.8	1000	0.5
Navicula gregaria (also includes some N. cryptocephela)	DIAT	28.0	7.0	1000	1.00	359.2	1000	0.4
Nitzschia spp	DIAT	11.2	2.0	29838	1.00	11.7	29838	0.3
Strobomonas (fluviatile & morphs)	EUGL	28.0	20.0	1000	5.00	3909.5	5000	19.5
Strobomonas (fluviatile & morphs)	EUGL	20.0	16.0	1000	2.00	1787.2	2000	3.6
Phacus sp	EUGL	22.0	11.2	1000	2.00	963.3	2000	1.9
Strobilidium sp	PROT	33.0	28.0	1000	5.00	13546.5	5000	67.7
Urotricha sp (common scuticociliate that feed on algae)	PROT	14.0	11.2	29838	1.00	919.5	29838	27.4
Ciliate	PROT	33.0	33.0	1000	1.00	18816.6	1000	18.8

Phyto Diversity:	Cell number:	0.384	Biomass:	0.875
	mg/m^3	%	Cells/L	%
Cyanophyta	0.2	0.0	1000	0.0
Chlorophyta	252.9	35.2	64148024	83.2
Euglenophyta	25	3.5	9000	0.0
Chrysophyceae	3.4	0.5	29838	0.0
Diatomeae	437.4	60.8	12935854	16.8
Cryptophyceae	0	0.0	0	0.0
Peridineae	0	0.0	0	0.0
TOTAL	718.9		77123716	

		Ratio to phyto total
Protozoa	114	0.159

Assiniboine R	Station 3C			16-Jul-02	Volume 2 ml		
Taxon	Group	Length	Width Factor	Count	Volume	Cells/L	mg/m^3
Ugreens (tiny pico greens)	CHLO	1.4	1.2 29838	2160.00	1.1	64450080	68.0
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	2.8	2.0 29838	293.00	5.9	8742534	51.3
Oocystis borgei	CHLO	9.6	7.0 29838	3.00	246.3	89514	22.0
Chlamydomonas sp	CHLO	9.6	9.6 29838	1.00	463.2	29838	13.8
Dictyosphaerium sp	CHLO	2.8	2.8 29838	18.00	11.5	537084	6.2
Scenedesmus (several very small species/morphotypes)	CHLO	4.2	2.8 29838	15.00	11.5	447570	5.1
Westella botrys	CHLO	8.4	8.4 1000	13.00	310.3	13000	4.0
Colonial green	CHLO	1.4	1.2 29838	100.00	1.1	2983800	3.1
Monoraphidium contortum	CHLO	11.2	1.4 29838	11.00	8.6	328218	2.8
Collodictyon triciliatum (phagotroph eating greens & diatoms)	CHLO	20.0	16.0 1000	1.00	2680.8	1000	2.7
Lagerheimia quatrata	CHLO	7.0	4.2 29838	1.00	64.7	29838	1.9
Tetraedron minimum	CHLO	5.6	5.6 29838	1.00	58.5	29838	1.7
Ankyra judayi	CHLO	28.0	2.0 29838	1.00	44.0	29838	1.3
Dictyosphaerium sp	CHLO	4.2	4.2 1000	32.00	38.8	32000	1.2
Actinastrum hantzschii	CHLO	15.0	2.0 1000	12.00	23.6	12000	0.3
Coenococcus planktonicus	CHLO	2.8	2.8 1000	20.00	11.5	20000	0.2
Monoraphidium arcuatum	CHLO	32.0	2.8 1000	1.00	98.5	1000	0.1
small centrics (Stephanodiscus, Cyclostephanos, Cyclotella species)	DIAT	2.8	2.8 29838	690.00	8.6	20588220	177.5
Nitzschia dissipata	DIAT	33.0	5.0 29838	12.00	216.0	358056	77.3
Aulacoseira granulata	DIAT	28.0	8.4 1000	6.00	1551.7	6000	9.3
Nitzschia spp	DIAT	66.0	2.8 1000	21.00	135.5	21000	2.8
Nitzschia acicularis	DIAT	56.0	2.8 1000	22.00	114.9	22000	2.5
Navicula gregaria (also includes some N. cryptocephela)	DIAT	28.0	7.0 1000	7.00	359.2	7000	2.5
Nitzschia gracilis	DIAT	100.0	4.2 1000	5.00	461.8	5000	2.3
Nitzschia closterium (possibly syn N longissima)	DIAT	28.0	2.8 1000	34.00	57.5	34000	2.0
Surirella cf brebissoni	DIAT	18.0	11.2 1000	3.00	591.1	3000	1.8
Nitzschia spp	DIAT	14.0	2.0 29838	3.00	14.7	89514	1.3
Enyconema sp	DIAT	20.0	11.2 1000	1.00	656.8	1000	0.7
Navicula cf cryptocephela/cryptotenella/gregaria	DIAT	33.0	8.4 1000	1.00	609.6	1000	0.6
Tryboniella cf levidensis	DIAT	12.6	8.4 1000	2.00	232.8	2000	0.5
Skeletonema potomus	DIAT	5.6	2.8 29838	1.00	15.3	29838	0.5
Synedra cf acus	DIAT	100.0	2.8 1000	1.00	205.3	1000	0.2
Euglena sp	EUGL	28.0	5.6 1000	1.00	459.8	1000	0.5
Strobilidium sp	PROT	50.0	40.0 1000	3.00	41887.9	3000	125.7
Scuticociliates	PROT	12.0	11.2 29838	3.00	788.2	89514	70.6

Phyto Diversity:	Cell number:	0.52	Biomass:	0.793
	mg/m^3	%	Cells/L	%
Cyanophyta	0	0.0	0	0.0
Chlorophyta	186	39.7	77777152	78.6
Euglenophyta	0.5	0.1	1000	0.0
Chrysophyceae	0	0.0	0	0.0
Diatomeae	281.8	60.2	21168628	21.4
Cryptophyceae	0	0.0	0	0.0
Peridineae	0	0.0	0	0.0
TOTAL	468.2		98946780	

			Ratio to phyto total
Protozoa	196.2	92514	0.419

Assiniboine R	Station 3R				16-Jul-02	Volume 2 ml		
Taxon	Group	Length	Width	Factor	Count	Volume	Cells/L	mg/m^3
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	4.2	2.8	29838	1575.00	17.2	46994850	810.2
Westella botrys	CHLO	5.6	5.6	29838	32.00	92.0	954816	87.8
Chlamydomonas sp	CHLO	9.6	8.4	29838	7.00	354.7	208866	74.1
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	11.2	11.2	29838	3.00	735.6	89514	65.8
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	5.6	5.6	29838	24.00	92.0	716112	65.8
Dictosphaerium tetrachotum	CHLO	4.2	4.2	29838	38.00	38.8	1133844	44.0
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	8.4	8.4	29838	3.00	310.3	89514	27.8
Chlamydomonas sp	CHLO	9.6	9.6	29838	2.00	463.2	59676	27.6
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	5.6	5.6	29838	5.00	92.0	149190	13.7
Ugreens (tiny pico greens)	CHLO	1.4	1.2	29838	425.00	1.1	12681150	13.4
Monoraphidium cf braunii (includes pseudobraunii)	CHLO	42.0	2.0	29838	4.00	66.0	119352	7.9
Actinastrum hantzschii	CHLO	9.6	2.0	29838	8.00	15.1	238704	3.6
Collodictyon triciliatum (phagotroph eating greens & diatoms)	CHLO	14.0	11.2	1000	3.00	919.5	3000	2.8
Scenedesmus (several very small species/ morphotypes)	CHLO	5.6	2.8	29838	4.00	15.3	119352	1.8
Planktosphaeria gelatinosa	CHLO	14.0	14.0	1000	1.00	1436.8	1000	1.4
Scenedesmus quadricauda	CHLO	16.0	5.6	1000	4.00	175.1	4000	0.7
Cyclotella spp	DIAT	4.2	2.8	29838	2475.00	19.4	73849050	1432.4
Surirella spp	DIAT	100.0	66.0	1000	1.00	114039.8	1000	114.0
Fragilaria crotenensis	DIAT	98.0	4.2	29838	6.00	452.6	179028	81.0
Nitzschia spp	DIAT	66.0	4.2	29838	4.00	304.8	119352	36.4
Nitzschia tryboniella (types)	DIAT	28.0	7.0	29838	3.00	359.2	89514	32.2
Nitzschia acicularis	DIAT	70.0	4.2	29838	3.00	323.3	89514	28.9
Nitzschia palae/palaceae	DIAT	42.0	4.2	29838	5.00	194.0	149190	28.9
small centrics (Stephanodiscus, Cyclostephanos, Cyclotella species)	DIAT	8.4	5.6	29838	6.00	155.2	179028	27.8
Navicula cf cryptocephela/cryptotenella/gregaria	DIAT	35.0	8.4	29838	1.00	646.5	29838	19.3
Navicula cf digioradiata (need SEM ID (N.tripunctata/N.margalathi))	DIAT	28.0	8.4	29838	1.00	517.2	29838	15.4
Nitzschia tryboniella (types)	DIAT	66.0	8.4	1000	12.00	1219.2	12000	14.6
Nitzschia palae/palaceae	DIAT	35.0	3.8	29838	3.00	132.3	89514	11.8
Amphora sp	DIAT	28.0	20.0	1000	2.00	5864.3	2000	11.7
Navicula gregaria (also includes some N. cryptocephela)	DIAT	28.0	7.0	29838	1.00	359.2	29838	10.7
Rhopalodia gibba	DIAT	33.0	20.0	1000	1.00	3455.8	1000	3.5
Achnanthes sp	DIAT	12.0	5.6	29838	1.00	98.5	29838	2.9
Nitzschia sp	DIAT	14.0	2.8	29838	3.00	28.7	89514	2.6
Nitzschia gracilis	DIAT	112.0	4.2	1000	4.00	517.2	4000	2.1
Rhicosphenia curvata	DIAT	33.0	11.2	1000	1.00	1083.7	1000	1.1
Surirella spp	DIAT	28.0	11.2	1000	1.00	919.5	1000	0.9
Nitzschia sigma/sigmoidea (sigmoid complex)	DIAT	70.0	5.6	1000	1.00	574.7	1000	0.6
Strobomonas (fluviatile & morphs)	EUGL	28.0	20.0	29838	8.00	3909.5	238704	933.2
Euglena sp	EUGL	28.0	11.2	1000	5.00	1839.0	5000	9.2
Strobomonas (fluviatile & morphs)	EUGL	22.0	11.2	1000	4.00	963.3	4000	3.9
Euglena sp	EUGL	33.0	8.4	1000	1.00	1219.2	1000	1.2
Strobilidium sp	PROT	44.0	33.0	1000	4.00	25088.8	4000	100.4
Urotricha sp (common scuticociliate that feed on algae)	PROT	11.2	9.6	1000	5.00	540.5	5000	2.7

Phyto Diversity:	Cell number:	0.594	Biomass:	0.782
	mg/m^3	%	Cells/L	%
Cyanophyta	0	0.0	0	0.0
Chlorophyta	1248.5	30.6	63562940	45.8
Euglenophyta	947.5	23.3	248704	0.2
Chrysophyceae	0	0.0	0	0.0
Diatomeae	1878.9	46.1	74976056	54.0
Cryptophyceae	0	0.0	0	0.0
Peridineae	0	0.0	0	0.0
TOTAL	4074.9		138787700	

			Ratio to phyto total
Protozoa	103.1	9000	0.025

Assiniboine R Station BSE5G 15-Jul-02 Volume 2 ml

Taxon	Group	Length	Width	Factor	Count	Volume	Cells/L	mg/m^3
Closterium cf strigosum	CHLO	200.0	14.0	29838	4.00	10262.5	119352	1224.9
Planktosphaeria gelatinosa	CHLO	14.0	14.0	29838	8.00	1436.8	238704	343.0
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	8.4	8.4	29838	13.00	310.3	387894	120.4
Ankyra judayi	CHLO	21.0	5.6	29838	12.00	258.6	358056	92.6
Ugreens (tiny pico greens)	CHLO	3.0	2.0	29838	326.00	6.3	9727188	61.1
Chlorella / free Dictyospaerium/freeCoelastrum	CHLO	4.2	4.2	29838	49.00	38.8	1462062	56.7
Scenedesmus opoliensis	CHLO	14.0	5.6	29838	8.00	153.3	238704	36.6
Oocystis sp	CHLO	11.2	5.6	29838	5.00	183.9	149190	27.4
Scenedesmus acuminatus	CHLO	14.0	4.2	29838	8.00	86.2	238704	20.6
Oocystis sp	CHLO	14.0	9.6	29838	1.00	675.6	29838	20.2
Oocystis sp	CHLO	5.7	3.0	29838	16.00	26.9	477408	12.8
Ankyra judayi	CHLO	14.0	2.0	29838	18.00	22.0	537084	11.8
Scenedesmus cf dimorphus	CHLO	9.6	4.2	29838	4.00	59.1	119352	7.1
Coelastrum cf pseudmicroporum	CHLO	8.4	8.4	1000	16.00	310.3	16000	5.0
Scenedesmus (several very small species/morphotypes)	CHLO	9.6	2.8	29838	4.00	26.3	119352	3.1
Pediastrum boryanum	CHLO	8.4	5.6	1000	32.00	69.0	32000	2.2
Monoraphidium cf braunii (includes pseudobraunii)	CHLO	22.0	2.8	29838	1.00	67.7	29838	2.0
Chlamydomonas sp	CHLO	5.6	2.0	29838	1.00	11.7	29838	0.3
Ochromonads	CHRY	5.6	5.6	29838	7.00	92.0	208866	19.2
Microcystis viridis (morphotype)	CYAN	4.2	4.2	1000	900.00	38.8	900000	34.9
Microcystis viridis (morphotype)	CYAN	5.6	4.2	1000	75.00	51.7	75000	3.9
Chroococcus limneticus	CYAN	7.0	4.2	29838	1.00	64.7	29838	1.9
Synechococcus sp	CYAN	7.0	1.4	29838	2.00	7.2	59676	0.4
Cyclotella meneghiniana	DIAT	8.4	5.6	29838	7.00	155.2	208866	32.4
Nitzschia palae/palaceae	DIAT	50.0	2.8	1000	2.00	102.6	2000	0.2
Lepocinclis ovum	EUGL	44.0	38.0	1000	2.00	33267.4	2000	66.5
Lepocinclis ovum	EUGL	20.0	18.0	1000	1.00	3392.9	1000	3.4

Phyto Diversity: Cell number: 0.61 Biomass: 0.661

	mg/m^3	%	Cells/L	%
Cyanophyta	41.2	1.9	1064514	6.7
Chlorophyta	2047.7	92.6	14310564	90.6
Euglenophyta	69.9	3.2	3000	0.0
Chrysophyceae	19.2	0.9	208866	1.3
Diatomeae	32.6	1.5	210866	1.3
Cryptophyceae	0	0.0	0	0.0
Peridineae	0	0.0	0	0.0
TOTAL	2210.6		15797810	

Assiniboine R Station BSE5G 16-Jul-02 Volume 2ml

Taxon	Group	Length	Width	Factor	Count	Volume	Cells/L	mg/m^3
Closterium cf strigosum	CHLO	280.0	14.0	29838	5.00	14367.6	149190	2143.5
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	8.4	8.4	29838	157.00	310.3	4684566	1453.8
Ankyra judayi	CHLO	20.0	2.8	29838	495.00	61.6	14769810	909.5
Scenedesmus quadricauda	CHLO	11.2	2.8	29838	135.00	30.7	4028130	123.5
Pediastrum boryanum	CHLO	14.0	11.2	29838	10.00	383.1	298380	114.3
Coelastrum microporum	CHLO	4.2	4.2	29838	48.00	38.8	1432224	55.6
Choricystis sp	CHLO	2.0	1.4	29838	686.00	2.1	20468868	42.0
Oocystis sp	CHLO	7.0	2.8	29838	34.00	28.7	1014492	29.2
Scenedesmus cf dimorphus	CHLO	8.4	2.0	29838	45.00	11.7	1342710	15.7
Pediastrum boryanum	CHLO	8.4	7.0	1000	32.00	86.2	32000	2.8
Oocystis solitaria	CHLO	20.0	16.0	1000	1.00	2680.8	1000	2.7
Microcystis viridis (morphotype)	CYAN	4.2	3.0	1000	40000.00	19.8	40000000	791.7
Microcystis aeruginosa	CYAN	4.2	3.0	29838	136.00	19.8	4057968	80.3
Cyclotella meneghiniana	DIAT	11.2	5.6	29838	12.00	275.9	358056	98.8
Nitzschia palae/palaceae	DIAT	45.0	36.0	1000	2.00	15268.1	2000	30.5
Lepocinclis ovum	EUGL	44.0	33.0	29838	1.00	25088.8	29838	748.6
Lepocinclis ovum	EUGL	22.0	20.0	29838	1.00	4607.7	29838	137.5
Haltaria sp	PROT	33.0	28.0	1000	12.00	13546.5	12000	162.6

Phyto Diversity: Cell number: 0.733 Biomass: 0.809

	mg/m^3	%	Cells/L	%
Cyanophyta	872	12.9	44057968	47.5
Chlorophyta	4892.4	72.2	48221370	52.0
Euglenophyta	886.1	13.1	59676	0.1
Chrysophyceae	0	0.0	0	0.0
Diatomeae	129.3	1.9	360056	0.4
Cryptophyceae	0	0.0	0	0.0
Peridineae	0	0.0	0	0.0
TOTAL	6779.8		92699070	

			Ratio to phyto total
Protozoa	162.6	12000	0.024

Assiniboine R | Station BSE5G | 17-Jul-02 | Volume 2 mL

		Group	Length	Width	Factor	Count	Volume	Cells/L	mg/m^3
Coelastrum microporum	18	CHLO	11.2	11.2	29838	518.00	735.6	15456084	11369.8
Closterium cf strigosum		CHLO	280.0	14.0	29838	4.00	14367.6	119352	1714.8
Planktosphaeria gelatinosa		CHLO	15.0	15.0	29838	25.00	1767.1	745950	1318.2
Scenedesmus (several very small species/morphotypes)		CHLO	9.6	8.4	29838	45.00	236.4	1342710	317.5
Scenedesmus spinosa		CHLO	14.0	2.9	29838	225.00	41.1	6713550	275.9
Ankyra judayi		CHLO	14.0	2.0	29838	169.00	22.0	5042622	110.9
Scenedesmus acuminatus		CHLO	11.2	4.2	29838	45.00	69.0	1342710	92.6
small greens (Choricystis, Chlorella, Stichococcus)		CHLO	3.0	1.4	29838	506.00	3.1	15098028	46.5
Monoraphidium cf braunii (includes pseudobraunii)		CHLO	18.0	2.8	29838	16.00	55.4	477408	26.5
Oocystis sp		CHLO	9.8	8.4	29838	2.00	362.1	59676	21.6
Oocystis sp		CHLO	5.6	3.0	29838	23.00	26.4	686274	18.1
Pediastrum boryanum		CHLO	11.2	8.4	1000	64.00	183.9	64000	11.8
Schroederia setigera		CHLO	28.0	5.6	29838	1.00	344.8	29838	10.3
Actinastrum hantzschii		CHLO	14.0	2.0	29838	12.00	22.0	358056	7.9
Pediastrum duplex		CHLO	11.2	8.4	1000	32.00	183.9	32000	5.9
Microcystis viridis (morphotype)		CYAN	4.2	4.2	1000	50.00	38.8	50000	1.9
Cyclotella meneghiniana		DIAT	7.0	5.6	29838	135.00	107.8	4028130	434.1
Tryboniella/Nitscshia complex		DIAT	42.0	11.2	1000	2.00	1379.3	2000	2.8
Lepocinclis ovum		EUGL	44.0	33.0	1000	3.00	25088.8	3000	75.3
Haltaria sp		PROT	30.0	28.0	1000	6.00	12315.0	6000	73.9

Phyto Diversity: Cell number: 0.791 Biomass: 0.466

	mg/m^3	%	Cells/L	%
Cyanophyta	1.9	0.0	50000	0.1
Chlorophyta	15348.2	96.8	47568258	92.1
Euglenophyta	75.3	0.5	3000	0.0
Chrysophyceae	0	0.0	0	0.0
Diatomeae	436.8	2.8	4030130	7.8
Cryptophyceae	0	0.0	0	0.0
Peridineae	0	0.0	0	0.0
TOTAL	15862.2		51651388	

		Ratio to phyto total
Protozoa	73.9	6000	0.005

Assiniboine R B | Station 8L | 17-Jul-02 | Volume 2 ml

Taxon	Group	Length	Width	Factor	Count	Volume	Cells/L	mg/m^3
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	4.2	3.0	29838	180.00	19.8	5370840	106.3
Ugreens (tiny pico greens)	CHLO	1.4	1.2	29838	2610.00	1.1	77877180	82.2
Dictyosphaerium sp	CHLO	5.6	4.2	29838	24.00	51.7	716112	37.0
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	5.6	5.6	29838	8.00	92.0	238704	21.9
Oocystis solitaria	CHLO	11.2	8.4	29838	1.00	413.8	29838	12.3
Gleotila contorta	CHLO	5.6	2.0	29838	10.00	17.6	298380	5.2
Scenedesmus (several very small species/ morphotypes)	CHLO	14.0	2.8	29838	4.00	38.3	119352	4.6
Scenedesmus quadricauda	CHLO	15.0	5.0	1000	34.00	130.9	34000	4.5
Scenedesmus (several very small species/ morphotypes)	CHLO	4.2	2.4	29838	14.00	8.4	417732	3.5
Didymocystis spp	CHLO	5.6	2.8	29838	6.00	15.3	179028	2.7
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	8.4	8.4	1000	4.00	310.3	4000	1.2
Westella botrys	CHLO	5.6	5.6	1000	12.00	92.0	12000	1.1
Monoraphadium contortum	CHLO	14.0	2.0	29838	1.00	22.0	29838	0.7
Ochromonads	CHRY	5.0	4.2	29838	4.00	46.2	119352	5.5
Rhodomonas minuta	CRYP	7.0	4.2	29838	3.00	43.1	89514	3.9
Pleurosira laevissima (syn Biddulphia large benthic brackish species)	DIAT	58.0	52.0	1000	2.00	123175.6	2000	246.4
Benthic diatom	DIAT	20.0	8.4	29838	1.00	369.5	29838	11.0
Nitzschia/ Tryboniella apiculata (further work need on this group)	DIAT	55.0	8.4	1000	4.00	1016.0	4000	4.1
Cocconeis pediculus	DIAT	28.0	20.0	1000	1.00	2932.2	1000	2.9
Nitzschia tryboniella (types)	DIAT	38.0	11.2	1000	2.00	1247.9	2000	2.5
Nitzschia palae/palaceae	DIAT	33.0	4.2	1000	14.00	152.4	14000	2.1
Surirella spp	DIAT	28.0	16.0	1000	1.00	1876.6	1000	1.9
Navicula cf digioradiata (need SEM ID (N.tripunctata/N.margalathi))	DIAT	44.0	8.4	1000	1.00	812.8	1000	0.8
Cyclotella spp	DIAT	16.0	8.4	1000	1.00	844.5	1000	0.8
Nitzschia closterium (possible syn N longissima)	DIAT	28.0	2.8	1000	14.00	57.5	14000	0.8
Cyclotella spp	DIAT	4.2	2.8	29838	1.00	19.4	29838	0.6
Navicula cf digioradiata (need SEM ID (N.tripunctata/N.margalathi))	DIAT	28.0	8.4	1000	1.00	517.2	1000	0.5
Navicula descussis	DIAT	20.0	8.4	1000	1.00	369.5	1000	0.4
Rhicosphenia curvata	DIAT	16.0	7.0	1000	1.00	205.3	1000	0.2
Nitzschia acicularis	DIAT	56.0	2.8	1000	2.00	114.9	2000	0.2
Strobomonas (fluviatile & morphs)	EUGL	16.0	14.0	29838	1.00	1094.7	29838	32.7
Ciliate	PROT	33.0	14.0	1000	1.00	3386.6	1000	3.4
nematode	ZOOP	150.0	9.6	1000	1.00	4825.5	1000	4.8

Phyto Diversity: Cell number: 0.17 Biomass: 0.774

	mg/m^3	%	Cells/L	%
Cyanophyta	0	0.0	0	0.0
Chlorophyta	283.4	47.2	85327004	99.6
Euglenophyta	32.7	5.4	29838	0.0
Chrysophyceae	5.5	0.9	119352	0.1
Diatomeae	275.2	45.8	104676	0.1
Cryptophyceae	3.9	0.6	89514	0.1
Peridineae	0	0.0	0	0.0
TOTAL	600.7		85670384	

		Ratio to phyto total
Protozoa	3.4	1000	0.006
Zooplankton	4.8	1000	0.008

Assiniboine R	Station 8R			17-Jul-02	Volume 2 ml		
Taxon	Group	Length	Width Factor	Count	Volume	Cells/L	mg/m^3
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	4.0	2.8 29838	124.00	16.4	3699912	60.8
Chlorella / free Dictyospaerium/freeCoelastrum	CHLO	8.4	8.4 29838	4.00	310.3	119352	37.0
Scenedesmus (several very small species/morphotypes)	CHLO	4.2	2.8 29838	45.00	11.5	1342710	15.4
Coenococcus cf fottei	CHLO	2.8	2.8 29838	16.00	11.5	477408	5.5
Ugreens (tiny pico greens)	CHLO	1.4	1.2 29838	95.00	1.1	2834610	3.0
Scenedesmus (several very small species/ morphotypes)	CHLO	5.6	2.8 29838	4.00	15.3	119352	1.8
Oocystis solitaria	CHLO	16.0	11.2 1000	1.00	1050.9	1000	1.1
Didymocystis spp	CHLO	5.6	2.8 29838	2.00	15.3	59676	0.9
Scenedesmus quadricauda	CHLO	16.0	5.6 1000	4.00	175.1	4000	0.7
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	1.4	1.0 29838	25.00	0.7	745950	0.5
Chlamydomonas sp	CHLO	2.8	2.0 29838	2.00	5.9	59676	0.3
Spermatozoa exaltans	CHLO	5.6	1.2 29838	1.00	6.3	29838	0.2
Monoraphidium contortum	CHLO	8.4	1.4 29838	1.00	6.5	29838	0.2
Ochromonads	CHRY	4.2	4.2 29838	7.00	38.8	208866	8.1
Cyanomonas truncata	CRYP	2.8	2.0 29838	23.00	3.9	686274	2.7
Rhodomonas minuta	CRYP	8.4	4.2 29838	1.00	51.7	29838	1.5
Pleurosira laevissima (syn Biddulphia large benthic brackish species)	DIAT	55.0	50.0 1000	1.00	107992.2	1000	108.0
Melosira varians	DIAT	20.0	16.0 1000	3.00	4021.2	3000	12.1
Nitzschia spp	DIAT	25.0	4.2 29838	1.00	115.5	29838	3.4
Cocconeis pediculus	DIAT	28.0	20.0 1000	1.00	2932.2	1000	2.9
Surirella spp	DIAT	28.0	20.0 1000	1.00	2932.2	1000	2.9
Nitzschia spp	DIAT	16.0	2.4 29838	3.00	24.1	89514	2.2
Surirella cf brebissoni	DIAT	28.0	16.0 1000	1.00	1876.6	1000	1.9
Cocconeis pediculus	DIAT	20.0	16.0 1000	1.00	1340.4	1000	1.3
Nitzschia palae/palaceae	DIAT	38.0	4.2 1000	7.00	175.5	7000	1.2
Nitzschia/ Tryboniella apiculata (further work need on this group)	DIAT	55.0	8.4 1000	1.00	1016.0	1000	1.0
Navicula cf digioradiata (need SEM ID (N.tripunctata/N.margalathi))	DIAT	28.0	8.0 1000	1.00	469.1	1000	0.5
Nitzschia acicularis	DIAT	70.0	2.8 1000	3.00	143.7	3000	0.4
Nitzschia closterium (possible syn N longissima)	DIAT	28.0	2.8 1000	5.00	57.5	5000	0.3

Phyto Diversity:	Cell number:	0.778	Biomass:	0.779
	mg/m^3	%	Cells/L	%
Cyanophyta	0	0.0	0	0.0
Chlorophyta	127.5	45.9	9523322	89.9
Euglenophyta	0	0.0	0	0.0
Chrysophyceae	8.1	2.9	208866	2.0
Diatomeae	138.2	49.7	144352	1.4
Cryptophyceae	4.2	1.5	716112	6.8
Peridineae	0	0.0	0	0.0
TOTAL	278.0		10592652	

Souris R | Station 8 AL | 18-Jul-02 | Volume 2 ml

Taxon	Group	Length	Width	Factor	Count	Volume	Cells/L	mg/m^3
Dictyosphaerium sp	CHLO	5.6	4.2	29838	6075.00	51.7	181265850	9375.6
Raphidocelis spp/Gloeoactinium limneticum (difficult to distinguish)	CHLO	4.2	2.4	29838	9270.00	9.5	276598260	2627.7
Pediastrum duplex	CHLO	11.2	8.4	29838	104.00	183.9	3103152	570.7
Ugreens (tiny pico greens)	CHLO	1.4	1.2	29838	9180.00	1.1	273912840	289.1
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	2.8	2.0	29838	1518.00	5.9	45294084	265.6
Oocystis spp	CHLO	7.0	4.2	29838	123.00	64.7	3670074	237.3
Scenedesmus opoliensis	CHLO	11.2	2.8	29838	225.00	30.7	6713550	205.8
Scenedesmus (several very small species/morphotypes)	CHLO	5.0	2.8	29838	450.00	13.7	13427100	183.7
Collodictyon triciliatum (phagotroph eating greens & diatoms)	CHLO	14.0	14.0	29838	1.00	1436.8	29838	42.9
Kirchnerella lunaris	CHLO	14.0	2.0	29838	45.00	29.3	1342710	39.4
Tetrastrum staurogeniaforme	CHLO	2.8	2.8	29838	180.00	7.3	5370840	39.3
Oocystis spp	CHLO	11.2	8.4	29838	3.00	413.8	89514	37.0
Scenedesmus bijugatus	CHLO	14.0	4.2	29838	8.00	86.2	238704	20.6
Tetrastrum heterocanthum	CHLO	2.8	2.8	29838	90.00	7.3	2685420	19.7
Crucigenia apiculata	CHLO	5.6	2.8	29838	45.00	14.6	1342710	19.7
Scenedesmus spinosa	CHLO	5.6	2.0	29838	79.00	7.8	2357202	18.4
Scenedesmus quadricauda	CHLO	14.0	4.2	29838	6.00	86.2	179028	15.4
Tetaedron caudatum	CHLO	11.2	11.2	29838	1.00	468.3	29838	14.0
Colonial green	CHLO	1.2	1.2	29838	288.00	0.9	8593344	7.8
Ankyra judayi	CHLO	14.0	1.4	29838	11.00	10.8	328218	3.5
Didymocystis spp	CHLO	5.6	2.0	29838	10.00	7.8	298380	2.3
Actinastrum hantzschii	CHLO	14.0	1.4	29838	4.00	10.8	119352	1.3
Cryptomonas sp	CRYP	14.0	5.6	29838	3.00	153.3	89514	13.7
Sennia parvula	CRYP	4.2	2.8	29838	23.00	11.5	686274	7.9
Cryptaulax sp	CRYP	7.0	4.2	29838	3.00	43.1	89514	3.9
Small bluegreens (pico blue greens)	CYAN	4.2	4.2	29838	7920.00	38.8	236316960	9167.3
Aphanizomenon flos aquae	CYAN	5.0	4.2	29838	60.00	69.3	1790280	124.0
Aphanocapsa spp	CYAN	1.0	1.0	29838	3938.00	0.5	117502044	61.5
Pseudanabaena sp	CYAN	14.0	2.0	29838	6.00	44.0	179028	7.9
Microcystis aeruginosa	CYAN	4.2	4.2	29838	6.00	38.8	179028	6.9
Small bluegreens (pico blue greens)	CYAN	4.2	2.8	29838	2.00	17.2	59676	1.0
Fragilaria crotenensis	DIAT	70.0	4.2	29838	23.00	323.3	686274	221.9
Cyclotella spp	DIAT	5.0	4.2	29838	180.00	41.2	5370840	221.5
Nitzschia closterium (possible syn N longissima)	DIAT	28.0	2.8	29838	113.00	57.5	3371694	193.8
Cyclotella spp	DIAT	8.0	4.2	29838	45.00	105.6	1342710	141.7
Nitzschia palae/palaceae	DIAT	42.0	3.0	29838	34.00	99.0	1014492	100.4
Nitzschia spp	DIAT	28.0	2.8	29838	23.00	57.5	686274	39.4
Epithemia sorex	DIAT	16.0	14.0	29838	1.00	821.0	29838	24.5
Skeletonema potomus	DIAT	7.0	2.8	29838	23.00	19.2	686274	13.1
Euglena sp	EUGL	42.0	20.0	29838	2.00	8796.5	59676	524.9
Phacus sp	EUGL	20.0	14.0	29838	1.00	1368.3	29838	40.8
Aphanizomenon heterocyst	HETE	9.6	5.6	29838	6.00	0.0	179028	0.0
Ciliate	PROT	28.0	16.0	29838	3.00	3753.2	89514	336.0

Phyto Diversity:	Cell number:	0.82	Biomass:	0.711

	mg/m^3	%	Cells/L	%
Cyanophyta	9368.7	37.5	356027016	29.7
Chlorophyta	14036.8	56.3	826990008	69.1
Euglenophyta	565.8	2.3	89514	0.0
Chrysophyceae	0	0.0	0	0.0
Diatomeae	956.3	3.8	13188396	1.1
Cryptophyceae	25.5	0.1	865302	0.1
Peridineae	0	0.0	0	0.0
TOTAL	24953		1197160236	

			Ratio to phyto total
Protozoa	336	89514	0.013
Heterocysts	0	179028	0.000

Souris R | Station 8 AR | 17-Jul-02 | Volume 2 ml

Taxon	Group	Length	Width	Factor	Count	Volume	Cells/L	mg/m^3
Pediastrum duplex	CHLO	11.2	8.4	29838	288.00	183.9	8593344	1580.4
Oocystis spp	CHLO	8.4	7.0	29838	139.00	215.5	4147482	893.8
Rhaphidocelis spp/Gloeoactinium limneticum (difficult to distinguish)	CHLO	3.0	1.4	29838	11790.00	2.3	351790020	812.3
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	4.0	2.8	29838	900.00	16.4	26854200	440.9
Oocystis spp	CHLO	5.6	4.2	29838	169.00	51.7	5042622	260.8
Pediastrum duplex	CHLO	7.0	5.6	29838	168.00	47.9	5012784	240.1
Scenedesmus opoliensis	CHLO	9.6	4.2	29838	113.00	59.1	3371694	199.3
Coelastrum cf pseudmicroporum	CHLO	5.6	5.6	29838	32.00	92.0	954816	87.8
Scenedesmus quadricauda	CHLO	16.0	4.2	29838	28.00	98.5	835464	82.3
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	1.4	1.4	29838	1440.00	1.4	42966720	61.7
Scenedesmus (several very small species/ morphotypes)	CHLO	5.6	2.0	29838	203.00	7.8	6057114	47.4
Ugreens (tiny pico greens)	CHLO	1.4	1.2	29838	1350.00	1.1	40281300	42.5
Scenedesmus acuminatus	CHLO	20.0	3.0	29838	20.00	62.8	596760	37.5
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	8.4	8.4	29838	3.00	310.3	89514	27.8
Tetrastrum staurogeniaforme	CHLO	2.8	2.8	29838	107.00	7.3	3192666	23.4
Collodictyon triciliatum (phagotroph eating greens & diatoms)	CHLO	16.0	14.0	1000	6.00	1642.0	6000	9.9
Tetrastrum heterocanthum	CHLO	2.8	2.8	29838	45.00	7.3	1342710	9.8
Oocystis solitaria	CHLO	20.0	16.0	1000	3.00	2680.8	3000	8.0
Monoraphidium cf braunii (includes pseudobraunii)	CHLO	42.0	2.0	29838	4.00	66.0	119352	7.9
Treubaria triappendiculata	CHLO	5.6	5.6	29838	4.00	58.5	119352	7.0
Didymocystis spp	CHLO	4.4	2.0	29838	34.00	6.1	1014492	6.2
Tetaedron caudatum	CHLO	8.4	8.4	29838	1.00	197.6	29838	5.9
Crucigenia tetrapedia	CHLO	4.2	4.2	29838	6.00	24.7	179028	4.4
Sphaerocystis schroeteri	CHLO	8.4	8.4	1000	8.00	310.3	8000	2.5
Scenedesmus acuminatus	CHLO	11.2	2.0	29838	4.00	15.6	119352	1.9
Crucigenia apiculata	CHLO	4.2	2.0	29838	8.00	5.6	238704	1.3
Closterium aciculare	CHLO	140.0	2.8	1000	1.00	287.4	1000	0.3
Desmarella moniliformis	CHRY	7.0	7.0	29838	5.00	179.6	149190	26.8
Ochromonads	CHRY	11.2	11.2	29838	1.00	735.6	29838	21.9
Merismopedia tenuissima	CYAN	1.0	1.0	29838	36540.00	0.5	1090280520	570.9
Aphanizomenon flos aquae	CYAN	5.0	5.0	29838	165.00	98.2	4923270	483.3
Microcystis aeruginosa	CYAN	4.2	4.2	1000	900.00	38.8	900000	34.9
Microcystis aeruginosa	CYAN	2.8	2.8	29838	16.00	11.5	477408	5.5
Nitzschia closterium (possible syn N longissima)	DIAT	28.0	2.8	29838	119.00	57.5	3550722	204.1
Cyclotella meneghiniana	DIAT	8.4	4.2	29838	29.00	116.4	865302	100.7
Fragilaria crotenensis	DIAT	98.0	4.2	29838	7.00	452.6	208866	94.5
Nitzschia palae/palaceae	DIAT	24.0	4.2	29838	28.00	110.8	835464	92.6
Cyclotella spp	DIAT	5.0	2.5	29838	51.00	24.5	1521738	37.3
Nitzschia palae/palaceae	DIAT	45.0	5.0	29838	2.00	294.5	59676	17.6
Nitzschia acicularis	DIAT	50.0	11.2	1000	7.00	1642.0	7000	11.5
Rhopalodia gibba	DIAT	55.0	20.0	1000	2.00	5759.6	2000	11.5
Nitzschia acicularis	DIAT	70.0	2.8	29838	2.00	143.7	59676	8.6
Navicula exigua	DIAT	14.0	7.0	29838	1.00	179.6	29838	5.4
Nitzschia spp	DIAT	40.0	8.4	1000	6.00	738.9	6000	4.4
Epithemia sorex	DIAT	44.0	16.0	1000	1.00	2948.9	1000	2.9
Nitzschia cf linearis	DIAT	100.0	8.4	1000	1.00	1847.3	1000	1.8
Nitzschia dissipata	DIAT	50.0	9.6	1000	1.00	1206.4	1000	1.2
Navicula cf cryptocephela/cryptotenella/gregaria	DIAT	28.0	8.4	1000	1.00	517.2	1000	0.5
Navicula gregaria (also includes some N. cryptocephela)	DIAT	25.0	7.0	1000	1.00	320.7	1000	0.3
Phacus sp	EUGL	20.0	16.0	1000	4.00	1787.2	4000	7.1
Euglena cf tortus	EUGL	50.0	16.0	1000	1.00	6702.1	1000	6.7
Strobomonas (fluviatile & morphs)	EUGL	28.0	20.0	1000	1.00	3909.5	1000	3.9
Euglena sp	EUGL	84.0	8.4	1000	1.00	3103.4	1000	3.1
Euglena sp	EUGL	28.0	7.0	1000	1.00	718.4	1000	0.7
Aphanizomenon heterocyst	HETE	9.6	5.6	29838	1.00	0.0	29838	0.0
Gymnodinium sp3	PERI	16.0	14.0	29838	2.00	1094.7	59676	65.3
Amphidinium sp	PERI	20.0	16.0	1000	1.00	1787.2	1000	1.8
Scuticociliates	PROT	33.0	20.0	29838	2.00	6911.5	59676	412.5
Scuticociliates	PROT	20.0	14.0	1000	15.00	2052.5	15000	30.8
Strobilidium sp	PROT	28.0	25.0	1000	2.00	9163.0	2000	18.3
Mesodinium sp	PROT	8.4	7.0	29838	1.00	215.5	29838	6.4

Phyto Diversity:	Cell number:	0.49	Biomass:	0.890

	mg/m^3	%	Cells/L	%
Cyanophyta	1094.6	16.3	1096581198	68.2
Chlorophyta	4903.1	72.9	502967328	31.3
Euglenophyta	21.6	0.3	8000	0.0
Chrysophyceae	48.7	0.7	179028	0.0
Diatomeae	595	8.8	7151282	0.4
Cryptophyceae	0	0.0	0	0.0

Assiniboine R	Station 13L			23-Jul-02	Volume 2 ml 2x		
Taxon	Group	Length	Width Factor	Count	Volume	Cells/L	mg/m^3
Dictochlorella/Dictyosphaerium primarum	CHLO	5.0	5.0 29838	78.00	65.4	4654728	304.7
Ugreens (tiny pico greens)	CHLO	1.4	1.2 29838	4410.00	1.1	263171160	277.8
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	2.0	2.0 29838	968.00	4.2	57766368	242.0
Crucigenia quadrata	CHLO	4.2	4.2 29838	60.00	24.7	3580560	88.4
Scenedesmus quadricauda	CHLO	16.0	4.2 29838	8.00	98.5	477408	47.0
Oocystis sp	CHLO	7.0	4.2 29838	8.00	64.7	477408	30.9
Pediastrum duplex	CHLO	14.0	9.6 1000	41.00	328.4	82000	26.9
Oocystis sp	CHLO	8.4	7.0 29838	2.00	215.5	119352	25.7
Scenedesmus acuminatus	CHLO	16.0	3.0 29838	8.00	50.3	477408	24.0
Crucigenia apiculata	CHLO	5.6	2.8 29838	20.00	14.6	1193520	17.5
Treubaria triappendiculata	CHLO	8.4	8.4 29838	1.00	197.6	59676	11.8
Crucigenia tetrapedia	CHLO	5.6	5.6 29838	3.00	58.5	179028	10.5
Colonial green	CHLO	1.4	1.2 29838	128.00	1.1	7638528	8.1
Didymocystis spp	CHLO	4.2	2.0 29838	22.00	5.9	1312872	7.7
Didymocystis spp	CHLO	5.6	2.0 29838	16.00	7.8	954816	7.5
Tetaedron caudatum	CHLO	5.6	5.6 29838	2.00	58.5	119352	7.0
Monoraphidium minutum	CHLO	5.6	2.0 29838	10.00	11.7	596760	7.0
Actinastrum hantzschii	CHLO	16.0	2.0 29838	4.00	25.1	238704	6.0
Pediastrum duplex	CHLO	8.4	5.6 1000	32.00	69.0	64000	4.4
Monoraphidium griffithii	CHLO	28.0	1.4 29838	3.00	21.6	179028	3.9
Scenedesmus acuminatus	CHLO	11.2	2.8 29838	2.00	30.7	119352	3.7
Scenedesmus (several very small species/morphotypes)	CHLO	5.6	2.0 29838	8.00	7.8	477408	3.7
Tetrastrum staurogeniaforme	CHLO	2.8	2.8 29838	8.00	7.3	477408	3.5
Tetrastrum sp	CHLO	2.8	2.8 29838	4.00	7.3	238704	1.7
Closterium aciculare	CHLO	100.0	4.2 1000	1.00	461.8	2000	0.9
Rhodomonas minuta	CRYP	5.6	4.2 29838	2.00	34.5	119352	4.1
Anabaena flos aquae	CYAN	5.6	4.2 29838	62.00	51.7	3699912	191.4
Aphanizomenon flos aquae	CYAN	5.6	5.0 1000	380.00	110.0	760000	83.6
Merismopedia tenuissima	CYAN	1.0	1.0 29838	2464.00	0.5	147041664	77.0
Planktothrix suspensus	CYAN	150.0	4.2 1000	1.00	2078.2	2000	4.2
Chroococcus sp	CYAN	2.0	2.0 29838	8.00	4.2	477408	2.0
Chroococcus limneticus	CYAN	5.6	5.6 1000	4.00	92.0	8000	0.7
Stephanodiscus & Cyclotella (impossible to split in LM)	DIAT	5.0	4.2 29838	61.00	41.2	3640236	150.1
Nitzschia closterium (possible syn N longissima)	DIAT	28.0	4.0 29838	16.00	117.3	954816	112.0
Nitzschia sp	DIAT	42.0	2.8 29838	3.00	86.2	179028	15.4
Nitzschia acicularis	DIAT	56.0	2.0 29838	4.00	58.6	238704	14.0
Nitzschia sp	DIAT	28.0	2.8 29838	3.00	57.5	179028	10.3
Nitzschia sp	DIAT	11.2	2.0 29838	11.00	11.7	656436	7.7
Rhopalodia gibba	DIAT	28.0	20.0 1000	1.00	2932.2	2000	5.9
Nitzschia tryboniella (types)	DIAT	50.0	5.6 1000	7.00	410.5	14000	5.7
Nitzschia sp	DIAT	11.2	5.6 29838	1.00	92.0	59676	5.5
Cyclotella meneghiniana	DIAT	15.0	7.0 1000	4.00	618.5	8000	4.9
Nitzschia sp	DIAT	9.6	2.0 29838	1.00	10.1	59676	0.6
Strobomonas (fluviatile & morphs)	EUGL	28.0	20.0 1000	2.00	3909.5	4000	15.6
Strobomonas (fluviatile & morphs)	EUGL	20.0	16.0 1000	1.00	1787.2	2000	3.6
Aphanizomenon heterocyst	HETE	7.0	5.6 1000	3.00	0.0	6000	0.0

Phyto Diversity:	Cell number:	0.627	Biomass:	0.908
	mg/m^3	%	Cells/L	%
Cyanophyta	358.8	19.0	151988984	30.2
Chlorophyta	1172.2	62.1	344657548	68.6
Euglenophyta	19.2	1.0	6000	0.0
Chrysophyceae	0	0.0	0	0.0
Diatomeae	332.2	17.6	5991600	1.2
Cryptophyceae	4.1	0.2	119352	0.0
Peridineae	0	0.0	0	0.0
TOTAL	1886.5		502763484	

		Ratio to phyto total
Heterocysts	0	0.000

Assiniboine R | Station 13R | 23-Jul-02 | Volume 2 ml 8x

Taxon	Group	Length	Width	Factor	Count	Volume	Cells/L	mg/m^3
Pediastrum duplex	CHLO	11.2	8.4	1000	112.00	183.9	896000	164.8
Ugreens (tiny pico greens)	CHLO	1.4	1.2	29838	11780.00	1.1 2	811933120	2968.2
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	3.0	2.8	29838	5228.00	12.3 1	247944512	15368.5
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	4.2	3.0	29838	596.00	19.8	142267584	2815.8
Crucigenia quadrata	CHLO	5.6	5.6	29838	100.00	58.5	23870400	1397.3
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	5.6	5.6	29838	39.00	92.0	9309456	856.0
Oocystis sp	CHLO	14.0	8.4	29838	5.00	517.2	1193520	617.3
Scenedesmus acuminatus	CHLO	20.0	4.2	29838	12.00	123.2	2864448	352.8
Pediastrum duplex	CHLO	18.0	16.0	1000	25.00	904.8	200000	181.0
Scenedesmus quadricauda	CHLO	14.0	4.2	29838	8.00	86.2	1909632	164.6
Closterium cf strigosum	CHLO	400.0	11.2	1000	1.00	13136.0	8000	105.1
Monoraphidium circinale	CHLO	12.0	2.0	29838	23.00	18.8	5490192	103.5
Crucigenia apiculata	CHLO	3.0	3.0	29838	44.00	9.0	10502976	94.5
Actinastrum hantzschii	CHLO	12.6	2.0	29838	20.00	19.8	4774080	94.5
Oocystis sp	CHLO	5.6	3.0	29838	14.00	26.4	3341856	88.2
Pediastrum duplex	CHLO	5.6	4.2	29838	16.00	23.0	3819264	87.8
Scenedesmus opoliensis	CHLO	14.0	2.8	29838	8.00	38.3	1909632	73.2
Coelastrum cf pseudmicroporum	CHLO	9.6	9.6	1000	16.00	463.2	128000	59.3
Tetrastrum sp	CHLO	5.6	5.6	29838	4.00	58.5	954816	55.9
Scenedesmus (several very small species/morphotypes)	CHLO	8.4	2.0	29838	18.00	11.7	4296672	50.4
Tetraedron trigonum	CHLO	8.4	8.4	29838	1.00	197.6	238704	47.2
Monoraphidium komarkovae	CHLO	56.0	2.0	29838	2.00	88.0	477408	42.0
Didymocystis spp	CHLO	5.6	2.0	29838	16.00	7.8	3819264	29.9
Tetrastrum staurogeniaforme	CHLO	3.0	3.0	29838	12.00	9.0	2864448	25.8
Pediastrum boryanum	CHLO	8.4	7.0	1000	32.00	86.2	256000	22.1
Tetrastrum sp	CHLO	4.2	4.2	29838	3.00	24.7	716112	17.7
Colonial green	CHLO	1.0	1.0	29838	120.00	0.5	28644480	15.0
Tetraedron minimum	CHLO	5.6	5.6	29838	1.00	58.5	238704	14.0
Tetaedron caudatum	CHLO	5.6	5.6	29838	1.00	58.5	238704	14.0
Coelastrum cf pseudmicroporum	CHLO	5.6	5.6	1000	16.00	92.0	128000	11.8
Scenedesmus (several very small species/morphotypes)	CHLO	4.2	2.0	29838	6.00	5.9	1432224	8.4
Closterium sp	CHLO	100.0	5.6	1000	1.00	821.0	8000	6.6
Scenedesmus bijugatus	CHLO	11.2	2.0	1000	16.00	15.6	128000	2.0
Aphanizomenon flos aquae	CYAN	5.6	5.0	29838	25.00	110.0	5967600	656.2
Aphanizomenon flos aquae	CYAN	5.0	4.8	1000	400.00	90.5	3200000	289.5
Filamentous bluegreen	CYAN	550.0	5.6	1000	1.00	13546.5	8000	108.4
Merismopedia tenuissima	CYAN	1.0	1.0	29838	240.00	0.5	57288960	30.0
Aphanocapsa delicatissima	CYAN	1.0	1.0	29838	75.00	0.5	17902800	9.4
Chroococcus sp	CYAN	2.0	2.0	29838	8.00	4.2	1909632	8.0
small centrics (Stephanodiscus, Cyclostephanos, Cyclotella species)	DIAT	5.0	4.2	29838	203.00	41.2	48456912	1998.0
Aulacoseira ambigua	DIAT	28.0	11.2	29838	2.00	2758.6	477408	1317.0
Nitzschia closterium (possible syn N longissima)	DIAT	28.0	4.0	29838	31.00	117.3	7399824	867.9
Nitzschia palae/palaceae	DIAT	28.0	4.2	29838	12.00	129.3	2864448	370.4
Stephanodiscus & Cyclotella (impossible to split in LM)	DIAT	8.4	5.6	29838	6.00	155.2	1432224	222.2
Cyclotella meneghiniana	DIAT	14.0	7.0	29838	1.00	538.8	238704	128.6
Nitzschia sp	DIAT	16.0	2.0	29838	13.00	16.8	3103152	52.0
Navicula sp (small species requires SEM)	DIAT	16.0	7.0	29838	1.00	205.3	238704	49.0
Nitzschia acicularis	DIAT	56.0	2.0	29838	2.00	58.6	477408	28.0
Skeletonema potomus	DIAT	7.0	4.2	29838	2.00	43.1	477408	20.6
Skeletonema potomus	DIAT	5.6	2.8	29838	4.00	15.3	954816	14.6
Surirella cf brebissoni	DIAT	16.0	9.6	1000	2.00	386.0	16000	6.2
Navicula sp (small species requires SEM)	DIAT	44.0	5.6	1000	1.00	361.2	8000	2.9
Nitzschia gracilis	DIAT	100.0	2.8	1000	1.00	205.3	8000	1.6
Aphanizomenon heterocyst	HETE	9.6	5.0	1000	7.00	0.0	56000	0.0
Scuticociliates	PROT	14.0	9.6	29838	4.00	675.6	954816	645.0
Vorticella sp (commonly associated with Anabaena colonies)	PROT	25.0	25.0	1000	2.00	8181.2	16000	130.9
Strobilidium sp	PROT	20.0	16.0	1000	1.00	2680.8	8000	21.4

Phyto Diversity:	Cell number:	0.525	Biomass:	0.745
	mg/m^3	%	Cells/L	%
Cyanophyta	1101.4	3.4	86276992	1.9
Chlorophyta	25954.8	80.8	4316804208	96.6
Euglenophyta	0	0.0	0	0.0
Chrysophyceae	0	0.0	0	0.0
Diatomeae	5079.1	15.8	66153008	1.5
Cryptophyceae	0	0.0	0	0.0
Peridineae	0	0.0	0	0.0
TOTAL	32135.3		4469234208	

Ratio to phyto

Location Assiniboine R Station 14L 26-Jul-02 Volume 2 ml

Taxon	Group	Length	Width	Factor	Count	Volume	Cells/L	mg/m^3
Ugreens (tiny pico greens)	CHLO	1.4	1.2	29838	5670.00	1.1	169181460	178.6
Pediastrum duplex	CHLO	8.4	5.6	29838	32.00	69.0	954816	65.8
Coelastrum cf pseudmicroporum	CHLO	4.2	4.2	29838	48.00	38.8	1432224	55.6
Dictochlorella/Dictyosphaerium primarum	CHLO	8.4	8.4	29838	5.00	310.3	149190	46.3
Crucigenia quadrata	CHLO	4.2	4.2	29838	56.00	24.7	1670928	41.3
Eudorina elegans	CHLO	9.6	9.6	1000	84.00	463.2	84000	38.9
Dictosphaerium tetrachotum	CHLO	5.6	5.6	1000	384.00	92.0	384000	35.3
Pediastrum duplex	CHLO	7.0	4.2	29838	32.00	35.9	954816	34.3
Oocystis sp	CHLO	8.4	7.0	29838	5.00	215.5	149190	32.2
Oocystis sp	CHLO	14.0	11.2	29838	1.00	919.5	29838	27.4
Crucigenia quadrata	CHLO	5.6	5.6	29838	13.00	58.5	387894	22.7
Chlamydomonas sp	CHLO	8.4	8.4	29838	2.00	310.3	59676	18.5
Scenedesmus cf dimorphus	CHLO	14.0	5.6	29838	4.00	153.3	119352	18.3
Ugreens (tiny pico greens)	CHLO	1.2	1.2	29838	468.00	0.9	13964184	12.6
Scenedesmus (several very small species/morphotypes)	CHLO	9.6	2.8	29838	16.00	26.3	477408	12.5
Tetrastrum (granulated form)	CHLO	4.2	4.2	29838	16.00	24.7	477408	11.8
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	3.0	3.0	29838	26.00	14.1	775788	11.0
Francia sp	CHLO	14.0	7.0	29838	1.00	359.2	29838	10.7
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	8.4	8.4	29838	1.00	310.3	29838	9.3
Willea irregularis	CHLO	4.2	4.2	29838	12.00	24.7	358056	8.8
Scenedesmus quadricauda	CHLO	20.0	5.6	1000	36.00	218.9	36000	7.9
Scenedesmus (several very small species/morphotypes)	CHLO	7.0	2.0	29838	24.00	9.8	716112	7.0
Oocystis lacustris	CHLO	8.4	7.0	29838	1.00	215.5	29838	6.4
Actinastrum hantzschii	CHLO	20.0	2.8	1000	100.00	61.6	100000	6.2
Tetrastrum staurogeniaforme	CHLO	4.2	4.2	29838	8.00	24.7	238704	5.9
Tetrastrum staurogeniaforme	CHLO	2.8	2.8	29838	24.00	7.3	716112	5.2
Chlamydomonas sp	CHLO	16.0	16.0	1000	2.00	2144.7	2000	4.3
Collodictyon triciliatum (phagotroph eating greens & diatoms)	CHLO	20.0	20.0	1000	1.00	4188.8	1000	4.2
Didymocystis spp	CHLO	5.6	4.2	29838	4.00	34.5	119352	4.1
Treubaria triappendiculata	CHLO	5.6	5.6	29838	2.00	58.5	59676	3.5
Crucigenia apiculata	CHLO	4.2	2.8	29838	8.00	11.0	238704	2.6
Willea irregularis	CHLO	8.4	7.0	1000	16.00	137.2	16000	2.2
Cosmarium sp	CHLO	7.0	4.2	29838	2.00	35.9	59676	2.1
Quadicoccus ellipsoidae	CHLO	4.2	2.8	29838	4.00	17.2	119352	2.1
Scenedesmus spinosa	CHLO	5.6	2.0	29838	8.00	7.8	238704	1.9
Crucigenia tetrapedia	CHLO	5.6	5.6	29838	1.00	58.5	29838	1.7
Collodictyon triciliatum (phagotroph eating greens & diatoms)	CHLO	16.0	14.0	1000	1.00	1642.0	1000	1.6
Tetrastrum heterocanthum	CHLO	4.2	4.2	29838	2.00	24.7	59676	1.5
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	4.2	4.2	29838	1.00	38.8	29838	1.2
Tetrastrum sp	CHLO	2.8	2.8	29838	4.00	7.3	119352	0.9
Scenedesmus (several very small species/morphotypes)	CHLO	4.2	2.0	29838	5.00	5.9	149190	0.9
Spermatozoa exaltans	CHLO	5.6	2.0	29838	1.00	17.6	29838	0.5
Oocystis parva	CHLO	7.0	5.6	1000	4.00	114.9	4000	0.5
Closterium aciculare	CHLO	100.0	4.2	1000	1.00	461.8	1000	0.5
Cryptomonas reflexa	CRYP	22.0	11.2	29838	3.00	963.3	89514	86.2
Cryptomonas cf erosa	CRYP	20.0	12.6	1000	4.00	1108.4	4000	4.4
Katablepharis ovalis	CRYP	7.0	4.2	29838	2.00	43.1	59676	2.6
Rhodomonas minuta	CRYP	5.6	4.2	29838	2.00	34.5	59676	2.1
Aphanizomenon flos aquae	CYAN	5.6	5.0	29838	300.00	110.0	8951400	984.3
Merismopedia tenuissima	CYAN	1.0	1.0	29838	816.00	0.5	24347808	12.7
Aphanizomenon akinete	CYAN	77.0	7.0	1000	3.00	1975.5	3000	5.9
Raphidonema	CYAN	4.2	1.4	29838	48.00	3.2	1432224	4.6
Aphanocapsa incerta	CYAN	1.0	1.0	1000	7500.00	0.5	7500000	3.9
Planktothrix suspensus	CYAN	200.0	4.2	1000	1.00	2770.9	1000	2.8
Anabaena sp	CYAN	4.0	4.0	1000	32.00	33.5	32000	1.1
Cyclotella spp	DIAT	5.6	4.2	29838	113.00	51.7	3371694	174.4
Cyclotella meneghiniana	DIAT	9.6	5.6	29838	21.00	202.7	626598	127.0
Nitzschia palae/palaceae	DIAT	35.0	2.8	29838	8.00	71.8	238704	17.1
Surirella spp	DIAT	20.0	9.6	1000	17.00	482.5	17000	8.2
Cyclotella spp	DIAT	20.0	10.0	1000	4.00	1570.8	4000	6.3
Surirella ovata/ovalis	DIAT	28.0	20.0	1000	1.00	2932.2	1000	2.9
Nitzschia tryboniella (types)	DIAT	50.0	8.6	1000	3.00	968.1	3000	2.9
Skeletonema potomus	DIAT	5.6	2.8	29838	6.00	15.3	179028	2.7
Nitzschia closterium (possible syn N longissima)	DIAT	28.0	2.8	1000	22.00	57.5	22000	1.3
Nitzschia palae/palaceae	DIAT	44.0	2.8	1000	14.00	90.3	14000	1.3
Synedra ulna	DIAT	175.0	4.2	1000	1.00	808.2	1000	0.8
Nitzschia gracilis	DIAT	77.0	4.2	1000	2.00	355.6	2000	0.7
Fragilaria crotenensis	DIAT	70.0	4.2	1000	2.00	323.3	2000	0.6
Euglena sp	EUGL	20.0	8.4	29838	2.00	738.9	59676	44.1
Strobomonas (fluviatile & morphs)	EUGL	28.0	20.0	1000	11.00	3909.5	11000	43.0
Euglena sp	EUGL	75.0	16.0	1000	4.00	10053.1	4000	40.2

Assiniboine R | Station 14R | 26-Jul-02 | Volume 2 ml

Taxon	Group	Length	Width	Factor	Count	Volume	Cells/L	mg/m^3
Closterium cf strigosum	CHLO	240.0	16.0	29838	1.00	16085.0	29838	479.9
Ugreens (tiny pico greens)	CHLO	1.4	1.2	29838	4320.00	1.1	128900160	136.1
Collodictyon triciliatum (phagotroph eating greens & diatoms)	CHLO	16.0	14.0	29838	1.50	1642.0	44757	73.5
Pediastrum duplex	CHLO	7.0	5.6	29838	48.00	47.9	1432224	68.6
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	14.0	14.0	29838	1.50	1436.8	44757	64.3
Oocystis sp	CHLO	16.0	11.2	29838	2.00	1050.9	59676	62.7
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	2.8	2.8	29838	169.00	11.5	5042622	58.0
Actinastrum hantzschii	CHLO	14.0	2.8	29838	36.00	43.1	1074168	46.3
Coelastrum cf pseudmicroporum	CHLO	5.0	5.0	29838	16.00	65.4	477408	31.2
Tetrastrum staurogeniaforme	CHLO	3.0	3.0	29838	112.00	9.0	3341856	30.1
Coenococcus cf fottei	CHLO	4.2	4.2	29838	24.00	38.8	716112	27.8
Francia sp	CHLO	11.2	8.4	29838	2.00	413.8	59676	24.7
Chlamydomonas sp	CHLO	9.0	9.0	29838	2.00	381.7	59676	22.8
Didymocystis spp	CHLO	5.6	2.0	29838	56.00	7.8	1670928	13.1
Crucigenia tetrapedia	CHLO	2.8	2.8	29838	52.00	7.3	1551576	11.4
Pediastrum boryanum	CHLO	11.2	9.6	1000	40.00	210.2	40000	8.4
Pediastrum duplex	CHLO	9.6	8.4	1000	52.00	135.1	52000	7.0
Lagerheimia quatrata	CHLO	7.0	5.6	29838	2.00	114.9	59676	6.9
Oocystis sp	CHLO	20.0	18.0	1000	2.00	3392.9	2000	6.8
Tetrastrum heterocanthum	CHLO	4.2	4.2	29838	8.00	24.7	238704	5.9
Tetrastrum (granulated form)	CHLO	4.2	4.2	29838	8.00	24.7	238704	5.9
Crucigenia apiculata	CHLO	5.0	2.8	29838	12.00	13.1	358056	4.7
Pediastrum duplex	CHLO	16.0	11.2	1000	8.00	500.4	8000	4.0
Siderocelis (several species or morphs)	CHLO	7.0	5.6	29838	1.00	114.9	29838	3.4
Pediastrum tetras	CHLO	8.4	7.0	1000	40.00	86.2	40000	3.4
Closterium aciculare	CHLO	140.0	4.2	1000	2.00	646.5	2000	1.3
Scenedesmus bijugatus	CHLO	16.0	4.2	1000	8.00	98.5	8000	0.8
Oocystis sp	CHLO	11.2	11.2	1000	1.00	735.6	1000	0.7
Aphanizomenon flos aquae	CYAN	5.0	5.0	29838	340.00	98.2	10144920	996.0
Aphanizomenon akinete	CYAN	56.0	7.0	29838	1.00	1436.8	29838	42.9
Pseudanabaena sp	CYAN	100.0	1.8	29838	3.00	254.5	89514	22.8
Merismopedia tenuissima	CYAN	1.0	1.0	29838	1080.00	0.5	32225040	16.9
Microcystis flos aquae	CYAN	3.0	3.0	1000	400.00	14.1	400000	5.7
Aphanocapsa incerta	CYAN	1.0	1.0	1000	2500.00	0.5	2500000	1.3
Chroococcus limneticus	CYAN	5.6	5.6	1000	8.00	92.0	8000	0.7
small centrics (Stephanodiscus, Cyclostephanos, Cyclotella species)	DIAT	7.0	4.2	29838	90.00	80.8	2685420	217.0
Surirella spp	DIAT	28.0	16.0	29838	3.00	1876.6	89514	168.0
small centrics (Stephanodiscus, Cyclostephanos, Cyclotella species)	DIAT	4.0	2.8	29838	135.00	17.6	4028130	70.9
Cyclotella spp	DIAT	16.0	8.4	29838	2.00	844.5	59676	50.4
Nitzschia closterium (possible syn N longissima)	DIAT	28.0	4.2	29838	3.00	129.3	89514	11.6
Nitzschia palae/palaceae	DIAT	42.0	2.8	29838	4.00	86.2	119352	10.3
Nitzschia acicularis	DIAT	56.0	2.8	29838	2.00	114.9	59676	6.9
Cyclotella spp	DIAT	18.0	9.6	1000	5.00	1221.5	5000	6.1
Skeletonema potomus	DIAT	5.6	3.0	29838	3.00	17.6	89514	1.6
Strobomonas (fluviatile & morphs)	EUGL	28.0	20.0	29838	1.50	3909.5	44757	175.0
Euglena sp	EUGL	22.0	20.0	29838	1.00	4607.7	29838	137.5
Euglena sp	EUGL	33.0	8.4	29838	2.00	1219.2	59676	72.8
Phacus sp	EUGL	20.0	14.0	29838	1.50	1368.3	44757	61.2
Euglena sp	EUGL	84.0	16.0	1000	4.00	11259.5	4000	45.0
Strobomonas (fluviatile & morphs)	EUGL	16.0	14.0	29838	1.00	1094.7	29838	32.7
Euglena sp	EUGL	100.0	16.0	1000	1.00	13404.1	1000	13.4
Aphanizomenon heterocyst	HETE	9.6	6.0	29838	10.00	0.0	298380	0.0
Glenodinium sp2	PERI	28.0	24.0	1000	11.00	8444.6	11000	92.9
Strobilidium sp	PROT	33.0	22.0	29838	2.00	8362.9	59676	499.1
Urotricha sp (common scuticociliate that feed on algae)	PROT	12.6	11.2	29838	8.00	827.6	238704	197.5
Strobilidium sp	PROT	44.0	38.0	1000	1.00	33267.4	1000	33.3
Rotifer eggs	ROTI	80.0	66.0	1000	3.00	182463.7	3000	547.4
Rotifer (not ID)	ROTI	150.0	100.0	1000	1.00	523599.0	1000	523.6
Rotifer (not ID)	ROTI	100.0	50.0	1000	1.00	87266.5	1000	87.3

Phyto Diversity: Cell number: 0.547 Biomass: 0.882

	mg/m^3	%	Cells/L	%
Cyanophyta	1086.2	31.3	45397312	22.9
Chlorophyta	1209.6	34.9	145583412	73.4
Euglenophyta	537.6	15.5	213866	0.1
Chrysophyceae	0	0.0	0	0.0
Diatomeae	542.7	15.6	7225796	3.6
Cryptophyceae	0	0.0	0	0.0
Peridineae	92.9	2.7	11000	0.0

APPENDIX III

PHYTOPLANKTON BIOMASS IN THE ASSINIBOINE RIVER, AUGUST 2002 INTENSIVE MONITORING

Assiniboine R	Station 3L				21-Aug-02	Volume 2ml		
Taxon	Group	Length	Width	Factor	Count	Volume	Cells/L	mg/m^3
Ugreens (tiny pico greens)	CHLO	1.4	1.2	29838	4410.00	1.1	131585580	138.9
Oocystis sp	CHLO	5.6	2.8	29838	135.00	23.0	4028130	92.6
Dictochlorella/Dictyosphaerium primarum	CHLO	4.2	4.2	29838	69.00	38.8	2058822	79.9
Actinastrum hantzschii	CHLO	12.6	2.0	29838	32.00	19.8	954816	18.9
Coelastrum cf pseudmicroporum	CHLO	5.6	5.0	29838	8.00	73.3	238704	17.5
Dictosphaerium ehrenbergianum	CHLO	5.6	2.8	29838	12.00	23.0	358056	8.2
Monoraphidium contortum	CHLO	16.0	2.0	29838	5.00	25.1	149190	3.7
Tetrastrum staurogeniaforme	CHLO	4.2	4.2	29838	4.00	24.7	119352	2.9
Oocystis sp	CHLO	5.6	4.2	29838	1.00	51.7	29838	1.5
Didymocystis spp	CHLO	5.6	2.0	29838	4.00	7.8	119352	0.9
Scenedesmus quadricauda	CHLO	16.0	4.2	1000	8.00	98.5	8000	0.8
Scenedesmus (several very small species/morphotypes)	CHLO	4.2	2.0	29838	4.00	5.9	119352	0.7
Rhodomonas minuta	CRYP	4.2	2.8	29838	18.00	11.5	537084	6.2
Cryptomonas reflexa	CRYP	20.0	8.4	1000	6.00	492.6	6000	3.0
Anabaena flos aquae	CYAN	5.6	5.6	29838	44.00	92.0	1312872	120.7
Merismopedia tenuissima	CYAN	1.0	1.0	29838	530.00	0.5	15814140	8.3
Chroococcus sp	CYAN	3.0	3.0	29838	8.00	14.1	238704	3.4
Anabaena/Anabaenopsis akinete	CYAN	16.0	9.6	1000	4.00	772.1	4000	3.1
Aphanizomenon issatchenkoi	CYAN	200.0	2.8	1000	2.00	1231.5	2000	2.5
Aphanocapsa spp	CYAN	3.0	3.0	1000	100.00	14.1	100000	1.4
Aphanocapsa incerta	CYAN	1.0	1.0	29838	20.00	0.5	596760	0.3
Nitzschia sp	DIAT	12.6	2.0	29838	484.00	13.2	14441592	190.6
small centrics (Stephanodiscus, Cyclostephanos, Cyclotella species)	DIAT	2.8	2.0	29838	641.00	6.2	19126158	117.8
Stephanodiscus & Cyclotella (impossible to split in LM)	DIAT	7.0	4.2	29838	15.00	80.8	447570	36.2
Surirella cf brebissoni	DIAT	20.0	9.6	29838	2.00	482.5	59676	28.8
Nitzschia palae/palaceae	DIAT	35.0	5.6	29838	2.00	287.4	59676	17.1
Nitzschia closterium (possible syn N longissima)	DIAT	28.0	4.2	29838	4.00	129.3	119352	15.4
Bacillaria paradoxa	DIAT	88.0	5.6	1000	15.00	722.5	15000	10.8
Nitzschia palae/palaceae	DIAT	70.0	3.0	29838	2.00	164.9	59676	9.8
Nitzschia cf linearis	DIAT	84.0	9.6	1000	2.00	2026.7	2000	4.1
Cyclotella meneghiniana	DIAT	20.0	10.0	1000	2.00	1570.8	2000	3.1
Nitzschia acicularis	DIAT	70.0	2.0	29838	1.00	73.3	29838	2.2
Phacus sp	EUGL	18.0	15.0	1000	4.00	1413.7	4000	5.7
Anabaena/Anabaenopsis heterocyst	HETE	5.6	5.6	29838	2.00	0.0	59676	0.0
Ciliate	PROT	100.0	80.0	1000	1.00	335103.2	1000	335.1
Holophyra (type ciliate)	PROT	44.0	38.0	1000	1.00	33267.4	1000	33.3
Strobilidium sp	PROT	28.0	20.0	1000	1.00	5864.3	1000	5.9
Urotricha sp (common scuticociliate that feed on algae)	PROT	16.0	14.0	1000	2.00	1642.0	2000	3.3
Filinia sp	ROTI	66.0	33.0	1000	1.00	37633.1	1000	37.6

Phyto Diversity:	Cell number:	0.51	Biomass:	0.889
	mg/m^3	%	Cells/L	%
Cyanophyta	139.7	14.6	18068476	9.4
Chlorophyta	366.7	38.3	139769192	72.5
Euglenophyta	5.7	0.6	4000	0.0
Chrysophyceae	0	0.0	0	0.0
Diatomeae	435.9	45.6	34362538	17.8
Cryptophyceae	9.1	1.0	543084	0.3
Peridineae	0	0.0	0	0.0
TOTAL	957		192747290	

		Ratio to phyto total
Protozoa	377.5	0.394
Rotifers	37.6	0.039
Heterocysts	0	0.000

Assiniboine R	Station 3c				21-Aug-02	Volume 2 ml		
Taxon	Group	Length	Width	Factor	Count	Volume	Cells/L	mg/m^3
Collodictyon triciliatum (phagotroph eating greens & diatoms)	CHLO	14.0	14.0	29838	3.00	1436.8	89514	128.6
Collodictyon triciliatum (phagotroph eating greens & diatoms)	CHLO	20.0	16.0	29838	1.00	2680.8	29838	80.0
Oocystis sp	CHLO	5.6	3.0	29838	101.00	26.4	3013638	79.5
Dictochlorella/Dictyosphaerium primarum	CHLO	5.6	4.2	29838	49.00	51.7	1462062	75.6
Botryococcus braunii	CHLO	55.0	55.0	1000	1.00	58075.9	1000	58.1
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	11.2	11.2	29838	2.00	735.6	59676	43.9
Oocystis borgei	CHLO	16.0	11.2	29838	1.00	1050.9	29838	31.4
Actinastrum hantzschii	CHLO	20.0	2.0	29838	32.00	31.4	954816	30.0
Treubaria triappendiculata	CHLO	11.2	11.2	29838	1.00	468.3	29838	14.0
Scenedesmus acuminatus	CHLO	16.0	2.0	29838	4.00	22.3	119352	2.7
Scenedesmus quadricauda	CHLO	20.0	5.6	1000	8.00	218.9	8000	1.8
Monoraphidium contortum	CHLO	16.0	1.0	29838	1.00	6.3	29838	0.2
Scenedesmus (several very small species/morphotypes)	CHLO	8.4	2.8	1000	8.00	23.0	8000	0.2
Crucigenia apiculata	CHLO	5.6	2.8	1000	16.00	14.6	16000	0.2
Gloeactinium limneticum/small cells with Raphidocelis	CHRY	5.6	2.0	29838	8.00	11.7	238704	2.8
Rhodomonas minuta	CRYP	5.6	4.2	29838	7.00	34.5	208866	7.2
Cryptomonas reflexa	CRYP	22.0	7.0	1000	4.00	376.3	4000	1.5
Anabaena flos aquae	CYAN	5.6	5.6	29838	149.00	92.0	4445862	408.8
Merismopedia tenuissima	CYAN	1.0	1.0	29838	352.00	0.5	10502976	5.5
Aphanizomenon issatchenkoi	CYAN	200.0	2.8	1000	4.00	1231.5	4000	4.9
Anabaenopsis cf circularis	CYAN	7.0	5.6	1000	16.00	114.9	16000	1.8
Aphanocapsa spp	CYAN	2.8	2.8	1000	100.00	11.5	100000	1.1
Chroococcus dispursus	CYAN	2.0	2.0	29838	8.00	4.2	238704	1.0
Aphanizomenon akinete	CYAN	11.2	3.0	1000	3.00	52.8	3000	0.2
small centrics (Stephanodiscus, Cyclostephanos, Cyclotella species)	DIAT	5.0	2.8	29838	495.00	27.5	14769810	406.0
small centrics (Stephanodiscus, Cyclostephanos, Cyclotella species)	DIAT	7.0	4.2	29838	25.00	80.8	745950	60.3
Surirella cf brebissoni	DIAT	33.0	9.6	29838	2.00	796.2	59676	47.5
Nitzschia sp	DIAT	8.4	2.0	29838	135.00	8.8	4028130	35.4
Navicula gregaria (also includes some N. cryptocephela)	DIAT	28.0	8.4	29838	1.00	517.2	29838	15.4
Synedra cf acus	DIAT	70.0	2.8	29838	3.00	143.7	89514	12.9
Bacillaria paradoxa	DIAT	88.0	4.2	1000	14.00	406.4	14000	5.7
Synedra ulna	DIAT	200.0	4.2	1000	6.00	923.6	6000	5.5
Nitzschia cf linearis	DIAT	84.0	4.2	1000	13.00	387.9	13000	5.0
Nitzschia tryboniella (types)	DIAT	44.0	11.2	1000	3.00	1445.0	3000	4.3
Nitzschia palae/palaceae	DIAT	56.0	3.0	1000	17.00	131.9	17000	2.2
Benthic diatom	DIAT	33.0	16.0	1000	1.00	2211.7	1000	2.2
Nitzschia sigma/sigmoidea (sigmoid complex)	DIAT	66.0	5.6	1000	3.00	541.9	3000	1.6
Nitzschia closterium (possible syn N longissima)	DIAT	28.0	2.8	1000	12.00	57.5	12000	0.7
Nitzschia gracilis	DIAT	125.0	4.2	1000	1.00	577.3	1000	0.6
Phacus sp	EUGL	16.0	14.0	29838	1.00	1094.7	29838	32.7
Euglena sp	EUGL	50.0	16.0	1000	4.00	6702.1	4000	26.8
Euglena sp	EUGL	20.0	4.2	1000	1.00	184.7	1000	0.2
Anabaena/Anabaenopsis heterocyst	HETE	5.6	5.6	29838	17.00	0.0	507246	0.0
Anabaena/Anabaenopsis heterocyst	HETE	5.0	5.0	1000	4.00	0.0	4000	0.0
Ciliate	PROT	125.0	100.0	1000	5.00	654498.5	5000	3272.5
Strobilidium sp	PROT	24.0	18.0	1000	7.00	4071.5	7000	28.5
Haltaria sp	PROT	28.0	20.0	1000	1.00	5864.3	1000	5.9
Polyarthra	ROTI	66.0	50.0	1000	2.00	57595.9	2000	115.2
Filinia sp	ROTI	66.0	38.0	1000	1.00	49901.1	1000	49.9

Phyto Diversity:	Cell number:	0.78	Biomass:	0.859
	mg/m^3	%	Cells/L	%
Cyanophyta	423.4	25.7	15310542	36.9
Chlorophyta	546.1	33.2	5851410	14.1
Euglenophyta	59.7	3.6	34838	0.1
Chrysophyceae	2.8	0.2	238704	0.6
Diatomeae	605.5	36.8	19792918	47.8
Cryptophyceae	8.7	0.5	212866	0.5
Peridineae	0	0.0	0	0.0
TOTAL	1646.1		41441278	

		Ratio to phyto total
Protozoa	3306.9	2.009
Rotifers	165.1	0.100
Heterocysts	0	0.000

Assiniboine R	Station 3R			21-Aug-02	Volume 2 ml		
Taxon	Group	Length	Width Factor	Count	Volume	Cells/L	mg/m^3
Dictochlorella/Dictyosphaerium primarum	CHLO	4.2	4.2 29838	26.00	38.8	775788	30.1
Oocystis sp	CHLO	4.2	2.8 29838	21.00	17.2	626598	10.8
Actinastrum hantzschii	CHLO	14.0	2.0 29838	8.00	22.0	238704	5.2
Ochromonads	CHRY	5.6	4.2 29838	4.00	51.7	119352	6.2
Ochromonads	CHRY	3.0	2.8 29838	3.00	12.3	89514	1.1
Cryptomonas reflexa	CRYP	28.0	9.6 1000	6.00	900.8	6000	5.4
Rhodomonas minuta	CRYP	5.6	4.2 29838	5.00	34.5	149190	5.1
Anabaena flos aquae	CYAN	5.6	5.6 29838	96.00	92.0	2864448	263.4
Anabaena sp	CYAN	4.2	4.2 29838	14.00	38.8	417732	16.2
Aphanizomenon issatchenkoi	CYAN	100.0	2.8 1000	12.00	615.8	12000	7.4
Planktothrix suspensus	CYAN	300.0	4.2 1000	1.00	4156.3	1000	4.2
Microcystis sp (includes morphotypes of all others)	CYAN	3.0	3.0 1000	250.00	14.1	250000	3.5
Merismopedia tenuissima	CYAN	1.0	1.0 29838	128.00	0.5	3819264	2.0
Anabaenopsis cf circularis	CYAN	7.0	5.6 1000	8.00	114.9	8000	0.9
Nitzschia sp	DIAT	9.6	2.0 29838	146.00	10.1	4356348	43.8
Bacillaria paradoxa	DIAT	98.0	7.0 1000	32.00	1257.2	32000	40.2
small centrics (Stephanodiscus, Cyclostephanos, Cyclotella species)	DIAT	2.8	2.0 29838	191.00	6.2	5699058	35.1
Nitzschia palae/palaceae	DIAT	50.0	4.2 29838	4.00	230.9	119352	27.6
Stephanodiscus & Cyclotella (impossible to split in LM)	DIAT	5.6	4.2 29838	12.00	51.7	358056	18.5
Nitzschia closterium (possible syn N longissima)	DIAT	28.0	4.2 29838	4.00	129.3	119352	15.4
Surirella cf brebissoni	DIAT	20.0	9.6 29838	1.00	482.5	29838	14.4
Synedra ulna	DIAT	200.0	4.2 1000	11.00	923.6	11000	10.2
Gyrosigma acuminatum	DIAT	140.0	16.0 1000	1.00	9382.9	1000	9.4
Surirella sp	DIAT	33.0	28.0 1000	1.00	6773.3	1000	6.8
Nitzschia tryboniella (types)	DIAT	50.0	8.4 1000	6.00	923.6	6000	5.5
Nitzschia cf linearis	DIAT	100.0	7.0 1000	2.00	1282.8	2000	2.6
Navicula sp (small species requires SEM)	DIAT	14.0	4.2 29838	1.00	64.7	29838	1.9
Navicula cf cryptocephela/cryptotenella/gregaria	DIAT	28.0	7.0 1000	5.00	359.2	5000	1.8
Nitzschia sigma/sigmoidea (sigmoid complex)	DIAT	84.0	8.4 1000	1.00	1551.7	1000	1.6
Nitzschia gracilis	DIAT	100.0	4.0 1000	2.00	418.9	2000	0.8
Euglena sp	EUGL	84.0	11.2 1000	1.00	5517.1	1000	5.5
Phacus sp	EUGL	16.0	14.0 1000	2.00	1094.7	2000	2.2
Anabaena/Anabaenopsis heterocyst	HETE	7.0	5.6 29838	4.00	0.0	119352	0.0
Anabaena/Anabaenopsis heterocyst	HETE	5.0	5.0 1000	2.00	0.0	2000	0.0
Ciliate	PROT	30.0	30.0 1000	3.00	14137.2	3000	42.4
Vorticella sp (commonly associated with Anabaena colonies)	PROT	20.0	18.0 1000	10.00	3392.9	10000	33.9
Haltaria sp	PROT	20.0	20.0 1000	1.00	4188.8	1000	4.2
Strobilidium sp	PROT	20.0	16.0 1000	1.00	2680.8	1000	2.7
Urotricha sp (common scuticociliate that feed on algae)	PROT	12.0	8.6 1000	3.00	464.7	3000	1.4
rotifer (not ID)	ROTI	82.0	50.0 1000	1.00	71558.5	1000	71.6
Rotifer eggs	ROTI	50.0	30.0 1000	2.00	23561.9	2000	47.1

Phyto Diversity:	Cell number:	0.81	Biomass:	0.789
	mg/m^3	%	Cells/L	%
Cyanophyta	297.6	49.2	7372444	36.6
Chlorophyta	46.1	7.6	1641090	8.1
Euglenophyta	7.7	1.3	3000	0.0
Chrysophyceae	7.3	1.2	208866	1.0
Diatomeae	235.6	38.9	10772842	53.5
Cryptophyceae	10.5	1.7	155190	0.8
Peridineae	0	0.0	0	0.0
TOTAL	604.8		20153432	

		Ratio to phyto total
Protozoa	18000	0.140
Rotifers	3000	0.196
Heterocysts	121352	0.000

Assiniboine R | Station 8L | 23-Aug-02 | Volume 2 ml

Taxon	Group	Length	Width	Factor	Count	Volume	Cells/L	mg/m^3
Collodictyon triciliatum (phagotroph eating greens & diatoms)	CHLO	16.0	14.0	29838	3.00	1642.0	89514	147.0
Scenedesmus (several very small species/morphotypes)	CHLO	4.2	2.8	29838	338.00	11.5	10085244	115.9
Collodictyon triciliatum (phagotroph eating greens & diatoms)	CHLO	25.0	20.0	1000	12.00	5236.0	12000	62.8
Oocystis solitaria	CHLO	14.0	9.6	29838	2.00	675.6	59676	40.3
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	7.0	5.6	29838	9.00	114.9	268542	30.9
Scenedesmus (several very small species/morphotypes)	CHLO	5.6	2.8	29838	24.00	15.3	716112	11.0
Dictochlorella/Dictyosphaerium primarum	CHLO	2.8	2.8	29838	24.00	11.5	716112	8.2
Tetrastrum sp	CHLO	5.6	5.6	29838	4.00	58.5	119352	7.0
Scenedesmus (several very small species/morphotypes)	CHLO	4.2	2.8	29838	16.00	11.5	477408	5.5
Coelastrum cf pseudmicroporum	CHLO	5.6	5.6	1000	48.00	92.0	48000	4.4
Scenedesmus quadricauda	CHLO	16.0	4.2	1000	20.00	98.5	20000	2.0
Actinastrum hantzschii	CHLO	20.0	2.8	1000	24.00	61.6	24000	1.5
Monoraphidium contortum	CHLO	30.0	2.0	29838	1.00	47.1	29838	1.4
Crucigenia apiculata	CHLO	5.6	4.2	1000	36.00	32.9	36000	1.2
Didymocystis spp	CHLO	5.6	2.0	29838	4.00	7.8	119352	0.9
Dictosphaerium tetrachotum	CHLO	4.2	4.2	1000	24.00	38.8	24000	0.9
Monoraphidium circinale	CHLO	5.6	2.0	29838	2.00	8.8	59676	0.5
Mallomonas sp	CHRY	16.0	11.2	1000	1.00	1050.9	1000	1.1
small chrysophytes	CHRY	2.8	2.8	29838	2.00	11.5	59676	0.7
Cyanomonas truncata	CRYP	9.6	4.2	29838	1.00	59.1	29838	1.8
Aphanocapsa incerta	CYAN	1.0	1.0	29838	600.00	0.5	17902800	9.4
Anabaena flos aquae	CYAN	5.6	5.6	1000	38.00	92.0	38000	3.5
Aphanizomenon issatchenkoi	CYAN	150.0	2.8	1000	3.00	923.6	3000	2.8
Filamentous bluegreen	CYAN	150.0	2.8	1000	1.00	923.6	1000	0.9
Chroococcus sp	CYAN	2.0	2.0	29838	6.00	4.2	179028	0.7
Aphanizomenon akinete	CYAN	14.0	2.8	1000	6.00	57.5	6000	0.3
Merismopedia tenuissima	CYAN	1.0	1.0	1000	96.00	0.5	96000	0.1
small centrics (Stephanodiscus, Cyclostephanos, Cyclotella species)	DIAT	4.0	2.8	29838	551.00	17.6	16440738	289.2
Gyrosigma acuminatum	DIAT	120.0	16.0	29838	1.00	8042.5	29838	240.0
Gyrosigma acuminatum	DIAT	130.0	16.0	1000	14.00	8712.7	14000	122.0
Navicula cf cryptocephela/cryptotenella/gregaria	DIAT	35.0	8.4	29838	6.00	646.5	179028	115.7
Anomoneis cf sphaerophora	DIAT	44.0	16.0	29838	1.00	2948.9	29838	88.0
Cocconeis pediculus	DIAT	28.0	20.0	29838	1.00	2932.2	29838	87.5
Biddulphia (syn Pleurosira)	DIAT	30.0	20.0	1000	5.00	9424.8	5000	47.1
Nitzschia sp	DIAT	8.4	2.0	29838	113.00	8.8	3371694	29.7
Nitzschia palae/palaceae	DIAT	28.0	4.2	29838	6.00	129.3	179028	23.1
Stephanodiscus & Cyclotella (impossible to split in LM)	DIAT	7.0	5.6	29838	6.00	107.8	179028	19.3
Gyrosigma attenuatum	DIAT	166.0	20.0	1000	1.00	17383.5	1000	17.4
Stephanodiscus agassizensis	DIAT	14.0	7.0	29838	1.00	538.8	29838	16.1
Nitzschia sp	DIAT	28.0	5.6	29838	1.00	229.9	29838	6.9
Navicula sp (small species requires SEM)	DIAT	28.0	5.6	29838	1.00	229.9	29838	6.9
Stephanodiscus & Cyclotella (impossible to split in LM)	DIAT	16.0	8.4	1000	8.00	844.5	8000	6.8
Synedra ulna	DIAT	200.0	5.6	1000	2.00	1642.0	2000	3.3
Surirella sp	DIAT	28.0	20.0	1000	1.00	2932.2	1000	2.9
Skeletonema potomus	DIAT	5.6	2.8	29838	6.00	15.3	179028	2.7
Tryboniella cf levidensis	DIAT	12.6	9.6	1000	9.00	304.0	9000	2.7
Nitzschia acicularis	DIAT	42.0	2.8	29838	1.00	86.2	29838	2.6
Cocconeis pediculus	DIAT	22.0	16.0	1000	1.00	1474.5	1000	1.5
Nitzschia closterium (possible syn N longissima)	DIAT	28.0	4.2	1000	11.00	129.3	11000	1.4
Rhicosphenia curvata	DIAT	20.0	9.6	1000	3.00	482.5	3000	1.4
Nitzschia sp	DIAT	56.0	5.6	1000	1.00	459.8	1000	0.5
Nitzschia tryboniella (types)	DIAT	44.0	5.6	1000	1.00	361.2	1000	0.4
Nitzschia acicularis	DIAT	100.0	2.8	1000	1.00	205.3	1000	0.2
Anabaena/Anabaenopsis heterocyst	HETE	5.6	5.6	1000	5.00	0.0	5000	0.0
Aphanizomenon heterocyst	HETE	5.6	2.8	1000	2.00	0.0	2000	0.0
Scuticociliates	PROT	22.0	16.0	29838	2.00	2948.9	59676	176.0
Haltaria sp	PROT	28.0	20.0	1000	4.00	5864.3	4000	23.5
Urotricha sp (common scuticociliate that feed on algae)	PROT	20.0	18.0	1000	1.00	3392.9	1000	3.4
Keratella	ROTI	66.0	44.0	1000	1.00	44602.3	1000	44.6

Phyto Diversity:	Cell number:	0.739	Biomass:	0.910
	mg/m^3	%	Cells/L	%
Cyanophyta	17.7	1.1	18225828	35.0
Chlorophyta	441.4	27.6	12904826	24.8
Euglenophyta	0	0.0	0	0.0
Chrysophyceae	1.7	0.1	60676	0.1
Diatomeae	1135.2	71.0	20795410	40.0
Cryptophyceae	1.8	0.1	29838	0.1
Peridineae	0	0.0	0	0.0

Assiniboine R	Station 8R			23-Aug-02	Volume 2 ml		
Taxon	Group	Length	Width Factor	Count	Volume	Cells/L	mg/m^3
Collodictyon triciliatum (phagotroph eating greens & diatoms)	CHLO	14.0	12.6 29838	10.00	1163.8	298380	347.2
Oocystis sp	CHLO	5.6	2.8 29838	360.00	23.0	10741680	246.9
Ugreens (tiny pico greens)	CHLO	1.4	1.4 29838	2250.00	1.4	67135500	96.5
Coelastrum cf pseudmicroporum	CHLO	5.6	5.6 29838	16.00	92.0	477408	43.9
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	5.6	5.6 29838	7.00	92.0	208866	19.2
Coelastrum microporum	CHLO	4.2	4.2 29838	16.00	38.8	477408	18.5
Oocystis apiculata	CHLO	14.0	8.4 29838	1.00	517.2	29838	15.4
Actinastrum hantzschii	CHLO	15.0	2.0 29838	16.00	23.6	477408	11.2
Monoraphidium contortum	CHLO	16.0	2.0 29838	8.00	25.1	238704	6.0
Oocystis borgei	CHLO	11.2	8.4 1000	8.00	413.8	8000	3.3
Coelastrum cf pseudmicroporum	CHLO	11.2	8.4 1000	8.00	413.8	8000	3.3
Scenedesmus (several very small species/morphotypes)	CHLO	4.2	2.0 29838	14.00	5.9	417732	2.4
Raphidocelis spp/Gloeoactinium limneticum (difficult to distinguish)	CHLO	4.0	2.0 29838	10.00	6.3	298380	1.9
Didymocystis spp	CHLO	5.0	2.0 29838	2.00	7.0	59676	0.4
Rhodomonas minuta	CRYP	5.6	4.2 29838	1.00	34.5	29838	1.0
Cryptomonas reflexa	CRYP	22.0	8.4 1000	1.00	541.9	1000	0.5
Anabaena flos aquae	CYAN	5.6	5.6 29838	140.00	92.0	4177320	384.1
Aphanocapsa spp	CYAN	3.0	3.0 29838	200.00	14.1	5967600	84.4
Merismopedia tenuissima	CYAN	1.0	1.0 29838	448.00	0.5	13367424	7.0
Aphanocapsa incerta	CYAN	1.0	1.0 29838	200.00	0.5	5967600	3.1
Chroococcus sp	CYAN	2.8	2.8 29838	4.00	11.5	119352	1.4
Microcystis sp (includes morphotypes of all others)	CYAN	3.0	3.0 29838	2.00	14.1	59676	0.8
small centrics (Stephanodiscus, Cyclostephanos, Cyclotella species)	DIAT	3.0	2.0 29838	754.00	7.1	22497852	159.0
Navicula cf cryptocephela/cryptotenella/gregaria	DIAT	35.0	7.0 29838	7.00	449.0	208866	93.8
Nitzschia sp	DIAT	11.2	2.8 29838	113.00	23.0	3371694	77.5
Gyrosigma acuminatum	DIAT	125.0	16.0 1000	5.00	8377.6	5000	41.9
Navicula sp (small species requires SEM)	DIAT	35.0	8.4 29838	2.00	646.5	59676	38.6
Biddulphia (syn Pleurosira)	DIAT	30.0	20.0 1000	4.00	9424.8	4000	37.7
Nitzschia tryboniella (types)	DIAT	30.0	8.4 29838	1.00	554.2	29838	16.5
Cyclotella spp	DIAT	5.6	4.2 29838	8.00	51.7	238704	12.3
Cyclotella meneghiniana	DIAT	9.6	5.6 29838	2.00	202.7	59676	12.1
Surirella sp	DIAT	33.0	28.0 1000	1.00	6773.3	1000	6.8
Synedra ulna	DIAT	200.0	4.2 1000	5.00	923.6	5000	4.6
Stephanodiscus & Cyclotella (impossible to split in LM)	DIAT	16.0	8.4 1000	4.00	844.5	4000	3.4
Cocconeis pediculus	DIAT	20.0	16.0 1000	2.00	1340.4	2000	2.7
Nitzschia closterium (possible syn N longissima)	DIAT	28.0	4.2 1000	8.00	129.3	8000	1.0
Nitzschia palae/palaceae	DIAT	30.0	4.0 1000	6.00	125.7	6000	0.8
Nitzschia tryboniella (types)	DIAT	35.0	4.2 1000	2.00	161.6	2000	0.3
Anabaena/Anabaenopsis heterocyst	HETE	5.6	5.6 29838	6.00	0.0	179028	0.0
Strobilidium sp	PROT	20.0	20.0 1000	6.00	4188.8	6000	25.1
Holophyra (type ciliate)	PROT	28.0	20.0 1000	1.00	5864.3	1000	5.9

Phyto Diversity:	Cell number:	0.71	Biomass:	0.880
	mg/m^3	%	Cells/L	%
Cyanophyta	480.8	26.6	29658972	21.6
Chlorophyta	816.3	45.2	80876980	59.0
Euglenophyta	0	0.0	0	0.0
Chrysophyceae	0	0.0	0	0.0
Diatomeae	509	28.2	26503306	19.3
Cryptophyceae	1.6	0.1	30838	0.0
Peridineae	0	0.0	0	0.0
TOTAL	1807.7		137070096	

				Ratio to phyto total
Protozoa	31		7000	0	0.017
Heterocysts	0		179028	0	0.000

Assiniboine R	Station 13L		Date	30-Aug-02	Volume 2 ml		
Taxon	Group	Length	Width Factor	Count	Volume	Cells/L	mg/m^3
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	3.0	2.8 29838	709.00	12.3	21155142	260.5
Ugreens (tiny pico greens)	CHLO	1.4	1.2 29838	7560.00	1.1	225575280	238.1
Dictochlorella/Dictyosphaerium primarum	CHLO	4.2	4.2 29838	101.00	38.8	3013638	116.9
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	8.4	8.4 29838	5.00	310.3	149190	46.3
Oocystis sp	CHLO	7.0	5.6 29838	11.00	114.9	328218	37.7
Raphidocelis spp/Gloeoactinium limneticum (difficult to distinguish)	CHLO	2.8	1.4 29838	428.00	2.2	12770664	27.5
Crucigenia apiculata	CHLO	5.6	2.8 29838	48.00	14.6	1432224	21.0
Tetrastrum sp	CHLO	4.2	4.2 29838	20.00	24.7	596760	14.7
Oocystis sp	CHLO	11.2	8.4 29838	1.00	413.8	29838	12.3
Treubaria triappendiculata	CHLO	8.4	8.4 29838	2.00	197.6	59676	11.8
Scenedesmus opoliensis	CHLO	8.4	2.8 29838	12.00	23.0	358056	8.2
Tetraedron caudatum	CHLO	8.4	8.4 29838	1.00	197.6	29838	5.9
Scenedesmus quadricauda	CHLO	16.0	4.2 1000	60.00	98.5	60000	5.9
Scenedesmus (several very small species/morphotypes)	CHLO	7.0	3.0 29838	8.00	22.0	238704	5.2
Pediastrum duplex	CHLO	11.2	9.6 1000	23.00	210.2	23000	4.8
Scenedesmus (several very small species/morphotypes)	CHLO	5.6	2.0 29838	20.00	7.8	596760	4.7
Tetrastrum staurogeniaforme	CHLO	2.8	2.8 29838	20.00	7.3	596760	4.4
Monoraphidium circinale	CHLO	8.4	2.0 29838	10.00	13.2	298380	3.9
Scenedesmus (several very small species/morphotypes)	CHLO	4.2	1.4 29838	26.00	2.9	775788	2.2
Pediastrum duplex	CHLO	7.0	5.6 1000	32.00	47.9	32000	1.5
Crucigenia quadrata	CHLO	2.8	2.8 29838	4.00	7.3	119352	0.9
Rhodomonas minuta	CRYP	7.0	4.2 29838	8.00	43.1	238704	10.3
Chroococcus sp	CYAN	2.0	2.0 29838	113.00	4.2	3371694	14.1
Merismopedia tenuissima	CYAN	1.0	1.0 29838	672.00	0.5	20051136	10.5
Anabaena flos aquae	CYAN	5.6	4.2 1000	132.00	51.7	132000	6.8
Aphanizomenon issatchenkoi	CYAN	100.0	2.8 1000	4.00	615.8	4000	2.5
Planktothrix suspensus	CYAN	100.0	2.8 1000	2.00	615.8	2000	1.2
Anabaena lemmermanni	CYAN	7.0	5.6 1000	3.00	114.9	3000	0.3
Cyclotella meneghiniana	DIAT	11.2	5.6 29838	18.00	275.9	537084	148.2
Surirella ovata/ovalis	DIAT	100.0	66.0 1000	1.00	114039.8	1000	114.0
small centrics (Stephanodiscus, Cyclostephanos, Cyclotella species)	DIAT	5.6	4.2 29838	68.00	51.7	2028984	104.9
Nitzschia closterium (possible syn N longissima)	DIAT	28.0	3.0 29838	16.00	66.0	477408	31.5
Cyclotella meneghiniana	DIAT	5.6	4.2 29838	18.00	51.7	537084	27.8
Cyclotella meneghiniana	DIAT	16.0	8.4 1000	31.00	844.5	31000	26.2
Nitzschia palae/palaceae	DIAT	35.0	3.0 29838	10.00	82.5	298380	24.6
Navicula cf cryptocephela/cryptotenella/gregaria	DIAT	24.0	7.0 1000	56.00	307.9	56000	17.2
Nitzschia sp	DIAT	44.0	6.8 1000	32.00	532.6	32000	17.0
Synedra ulna	DIAT	200.0	4.6 1000	11.00	1107.9	11000	12.2
Tryboniella apiculata (Nitzschia/Tryboniella complex needs work)	DIAT	44.0	16.0 1000	3.00	2948.9	3000	8.8
Nitzschia sigma/sigmoidea (sigmoid complex)	DIAT	150.0	8.4 1000	3.00	2770.9	3000	8.3
Nitzschia sp	DIAT	14.0	2.0 29838	18.00	14.7	537084	7.9
Surirella ovata/ovalis	DIAT	33.0	28.0 1000	1.00	6773.3	1000	6.8
Nitzschia sp	DIAT	42.0	4.2 29838	1.00	194.0	29838	5.8
Nitzschia sp	DIAT	14.0	5.6 29838	1.00	114.9	29838	3.4
Epithemia sorex	DIAT	20.0	11.2 1000	5.00	656.8	5000	3.3
Skeletonema potomus	DIAT	5.6	2.8 29838	5.00	15.3	149190	2.3
Epithemia adanata	DIAT	33.0	11.2 1000	2.00	1083.7	2000	2.2
Nitzschia gracilis	DIAT	120.0	2.8 1000	7.00	246.3	7000	1.7
Nitzschia acicularis	DIAT	70.0	2.8 1000	2.00	143.7	2000	0.3
Euglena sp	EUGL	44.0	11.2 1000	1.00	2889.9	1000	2.9
Strobomonas (fluviatile & morphs)	EUGL	20.0	16.0 1000	1.00	1787.2	1000	1.8
Trachelomonas sp	EUGL	16.0	15.0 1000	1.00	1256.6	1000	1.3
Euglena sp	EUGL	10.0	5.6 1000	2.00	164.2	2000	0.3
Anabaena/Anabaenopsis heterocyst	HETE	5.6	5.6 1000	7.00	0.0	7000	0.0
Anabaena/Anabaenopsis heterocyst	HETE	5.6	5.6 1000	1.00	0.0	1000	0.0
Strobilidium sp	PROT	28.0	24.0 1000	5.00	8444.6	5000	42.2

Phyto Diversity:	Cell number:	0.41	Biomass:	0.910
	mg/m^3	%	Cells/L	%
Cyanophyta	35.5	2.4	23563830	7.9
Chlorophyta	834.7	57.1	268239268	90.4
Euglenophyta	6.3	0.4	5000	0.0
Chrysophyceae	0	0.0	0	0.0
Diatomeae	574.5	39.3	4778890	1.6
Cryptophyceae	10.3	0.7	238704	0.1
Peridineae	0	0.0	0	0.0
TOTAL	1461.1		296825692	

Ratio to phyto total

Assiniboine R	Station 13R			30-Aug-02	Volume 2ml 2x		
Taxon	Group	Length	Width Factor	Count	Volume	Cells/L	mg/m^3
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	3.0	2.8 29838	563.00	12.3	33597588	413.8
Scenedesmus quadricauda	CHLO	16.0	4.2 29838	36.00	98.5	2148336	211.7
Pediastrum duplex	CHLO	8.4	5.6 29838	48.00	69.0	2864448	197.5
Collodictyon triciliatum (phagotroph eating greens & diatoms)	CHLO	20.0	16.0 29838	1.00	2680.8	59676	160.0
Ugreens (tiny pico greens)	CHLO	1.4	1.2 29838	2160.00	1.1	128900160	136.1
Oocystis sp	CHLO	8.4	5.6 29838	12.00	137.9	716112	98.8
Scenedesmus bijugatus	CHLO	11.2	4.2 29838	16.00	69.0	954816	65.8
Collodictyon triciliatum (phagotroph eating greens & diatoms)	CHLO	16.0	11.2 29838	1.00	1050.9	59676	62.7
Scenedesmus acuminatus	CHLO	20.0	4.2 29838	8.00	123.2	477408	58.8
Oocystis borgei	CHLO	8.4	7.0 29838	4.00	215.5	238704	51.4
Crucigenia apiculata	CHLO	5.6	4.2 29838	23.00	32.9	1372548	45.2
Raphidocelis spp/Gloeoactinium limneticum (difficult to distinguish)	CHLO	4.2	1.4 29838	113.00	3.2	6743388	21.8
Scenedesmus opoliensis	CHLO	9.6	4.2 29838	4.00	59.1	238704	14.1
Crucigenia tetrapedia	CHLO	5.6	5.6 29838	4.00	58.5	238704	14.0
Oocystis sp	CHLO	5.6	4.2 29838	4.00	51.7	238704	12.3
Scenedesmus (several very small species/morphotypes)	CHLO	4.2	2.8 29838	14.00	11.5	835464	9.6
Scenedesmus spinosa	CHLO	7.0	2.8 29838	8.00	19.2	477408	9.1
Siderocelis (several species or morphs)	CHLO	7.0	5.6 29838	1.00	114.9	59676	6.9
Tetraedron trigonum	CHLO	7.0	7.0 29838	1.00	114.3	59676	6.8
Tetrastrum heterocanthum	CHLO	2.8	2.8 29838	14.00	7.3	835464	6.1
Scenedesmus bijugatus	CHLO	8.4	2.0 29838	8.00	11.7	477408	5.6
Oocystis sp	CHLO	5.6	4.2 29838	1.00	51.7	59676	3.1
Monoraphidium circinale	CHLO	8.4	2.0 29838	2.00	13.2	119352	1.6
Monoraphidium contortum	CHLO	8.4	1.0 29838	1.00	3.3	59676	0.2
Ochromonads	CHRY	5.6	5.6 29838	6.00	92.0	358056	32.9
Cryptomonas reflexa	CRYP	20.0	12.0 29838	1.00	1005.3	59676	60.0
Rhodomonas minuta	CRYP	5.6	4.2 29838	3.00	34.5	179028	6.2
Planktothrix suspensus	CYAN	400.0	4.2 29838	12.00	5541.8	716112	3968.5
Anabaena flos aquae	CYAN	5.6	5.6 29838	16.00	92.0	954816	87.8
Merismopedia tenuissima	CYAN	1.0	1.0 29838	1440.00	0.5	85933440	45.0
Chroococcus sp	CYAN	2.0	2.0 29838	32.00	4.2	1909632	8.0
Cyclotella meneghiniana	DIAT	20.0	10.0 29838	26.00	1570.8	1551576	2437.2
Navicula cf cryptocephela/cryptotenella/gregaria	DIAT	30.0	8.4 29838	35.00	554.2	2088660	1157.5
Nitzschia tryboniella (types)	DIAT	70.0	7.0 29838	19.00	898.0	1133844	1018.2
Cyclotella spp	DIAT	15.0	11.2 29838	10.00	989.6	596760	590.6
Gyrosigma acuminatum	DIAT	138.0	16.0 29838	1.00	9248.8	59676	551.9
Navicula sp (small species requires SEM)	DIAT	50.0	16.0 29838	2.00	3351.0	119352	400.0
Surirella cf brebissoni	DIAT	38.0	16.0 29838	2.00	2546.8	119352	304.0
Synedra ulna	DIAT	200.0	4.2 29838	5.00	923.6	298380	275.6
Nitzschia gracilis	DIAT	120.0	4.2 29838	6.00	554.2	358056	198.4
Stephanodiscus agassizensis	DIAT	20.0	10.0 29838	2.00	1570.8	119352	187.5
Navicula sp (small species requires SEM)	DIAT	25.0	12.6 29838	3.00	1039.1	179028	186.0
Cyclotella meneghiniana	DIAT	8.4	5.6 29838	9.00	155.2	537084	83.3
Nitzschia gracilis	DIAT	100.0	4.2 29838	3.00	461.8	179028	82.7
Nitzschia tryboniella (types)	DIAT	46.0	9.6 29838	1.00	1109.9	59676	66.2
Tryboniella cf levidensis	DIAT	16.0	11.2 29838	2.00	525.4	119352	62.7
Nitzschia cf linearis	DIAT	50.0	4.2 29838	4.00	230.9	238704	55.1
Nitzschia closterium (possible syn N longissima)	DIAT	28.0	4.2 29838	6.00	129.3	358056	46.3
Nitzschia acicularis	DIAT	70.0	2.8 29838	3.00	143.7	179028	25.7
Nitzschia sp	DIAT	16.0	2.8 29838	11.00	32.8	656436	21.6
Cyclotella spp	DIAT	5.6	4.2 29838	7.00	51.7	417732	21.6
Navicula cf cryptocephela/cryptotenella/gregaria	DIAT	20.0	5.6 29838	1.00	164.2	59676	9.8
Nitzschia sp	DIAT	20.0	3.0 29838	3.00	47.1	179028	8.4
Nitzschia palae/palaceae	DIAT	35.0	2.8 29838	1.00	71.8	59676	4.3
Skeletonema potomus	DIAT	8.4	2.8 29838	2.00	23.0	119352	2.7
Euglena sp	EUGL	66.0	16.0 29838	3.00	8846.7	179028	1583.8
Euglena sp	EUGL	25.0	8.4 29838	1.00	923.6	59676	55.1
Anabaena/Anabaenopsis heterocyst	HETE	7.0	5.6 29838	1.00	0.0	59676	0.0
Strobilidium sp	PROT	28.0	20.0 29838	5.00	5864.3	298380	1749.8
Scuticociliates	PROT	20.0	16.0 29838	3.00	2680.8	179028	479.9

Phyto Diversity:	Cell number:	0.68	Biomass:	0.880
	mg/m^3	%	Cells/L	%
Cyanophyta	4109.3	26.9	89514000	31.7
Chlorophyta	1613	10.6	181832772	64.5
Euglenophyta	1638.9	10.7	238704	0.1
Chrysophyceae	32.9	0.2	358056	0.1
Diatomeae	7797.3	51.1	9786864	3.5
Cryptophyceae	66.2	0.4	238704	0.1
Peridineae	0	0.0	0	0.0

Assiniboine R | Station 14L | 05-Sep-02 | Volume 2 ml

Taxon	Group	Length	Width	Factor	Count	Volume	Cells/L	mg/m^3
Colonial green	CHLO	14.0	11.2	29838	96.00	919.5	2864448	2633.9
Ugreens (tiny pico greens)	CHLO	1.4	1.2	29838	4680.00	1.1	139641840	147.4
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	5.6	5.6	29838	40.00	92.0	1193520	109.7
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	2.8	1.4	29838	619.00	2.9	18469722	53.1
Oocystis sp	CHLO	7.0	4.0	29838	29.00	58.6	865302	50.7
Collodictyon triciliatum (phagotroph eating greens & diatoms)	CHLO	20.0	16.0	1000	11.00	2680.8	11000	29.5
Actinastrum hantzschii	CHLO	10.0	2.4	29838	42.00	22.6	1253196	28.3
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	9.6	9.6	29838	2.00	463.2	59676	27.6
Pediastrum duplex	CHLO	7.0	5.6	29838	16.00	47.9	477408	22.9
Crucigenia quadrata	CHLO	5.6	4.2	29838	20.00	32.9	596760	19.7
Treubaria triappendiculata	CHLO	5.6	5.6	29838	8.00	58.5	238704	14.0
Coelastrum cf pseudmicroporum	CHLO	7.0	5.6	29838	4.00	114.9	119352	13.7
Scenedesmus opoliensis	CHLO	14.0	2.8	29838	8.00	38.3	238704	9.1
Tetrastrum staurogeniaforme	CHLO	4.2	4.2	29838	12.00	24.7	358056	8.8
Scenedesmus spinosa	CHLO	5.6	2.0	29838	34.00	7.8	1014492	7.9
Monoraphidium contortum	CHLO	28.0	2.0	29838	6.00	44.0	179028	7.9
Scenedesmus (several very small species/morphotypes)	CHLO	7.0	2.8	29838	12.00	19.2	358056	6.9
Schroedaria setigera	CHLO	28.0	4.2	29838	1.00	194.0	29838	5.8
Closterium cf strigosum	CHLO	220.0	9.6	1000	1.00	5308.0	1000	5.3
Tetrastrum sp	CHLO	4.2	4.2	29838	4.00	24.7	119352	2.9
Scourfeldia cordiformis	CHLO	5.6	5.6	29838	1.00	92.0	29838	2.7
Lagerheimia wratislaviense	CHLO	4.2	2.8	29838	6.00	11.5	179028	2.1
Monoraphidium griffithii	CHLO	28.0	1.4	29838	3.00	21.6	89514	1.9
Tetraedron trigonum	CHLO	5.6	5.6	29838	1.00	58.5	29838	1.7
Didymocystis spp	CHLO	5.6	2.0	29838	2.00	7.8	59676	0.5
Mallomonas sp	CHRY	16.0	11.2	29838	1.00	1050.9	29838	31.4
Ochromonads	CHRY	5.6	4.2	29838	10.00	51.7	298380	15.4
Synura sp	CHRY	9.6	8.4	29838	1.00	354.7	29838	10.6
Cryptomonas reflexa	CRYP	22.0	9.6	29838	2.00	707.7	59676	42.2
Anabaena flos aquae	CYAN	5.6	4.2	29838	113.00	51.7	3371694	174.4
Microcystis sp (includes morphotypes of all others)	CYAN	4.2	4.2	29838	68.00	38.8	2028984	78.7
Aphanizomenon issatchenkoi	CYAN	200.0	2.8	1000	20.00	1231.5	20000	24.6
Aphanocapsa incerta	CYAN	1.0	1.0	29838	600.00	0.5	17902800	9.4
Anabaenopsis cf circularis	CYAN	7.0	5.6	1000	80.00	114.9	80000	9.2
Coelosphaerium kuetzingianum	CYAN	2.0	2.0	29838	64.00	4.2	1909632	8.0
Merismopedia tenuissima	CYAN	1.0	1.0	29838	272.00	0.5	8115936	4.2
Chroococcus sp	CYAN	2.0	2.0	29838	24.00	4.2	716112	3.0
Catenata sp	CYAN	2.8	2.0	29838	12.00	3.9	358056	1.4
Aphanizomenon issatchenkoi	CYAN	100.0	2.8	1000	1.00	615.8	1000	0.6
Synedra ulna	DIAT	200.0	4.2	29838	12.00	923.6	358056	330.7
small centrics (Stephanodiscus, Cyclostephanos, Cyclotella species	DIAT	5.6	4.2	29838	113.00	51.7	3371694	174.4
Cyclotella meneghiniana	DIAT	8.4	8.4	29838	7.00	232.8	208866	48.6
Synedra cf acus	DIAT	70.0	2.8	29838	5.00	143.7	149190	21.4
Amphiprora ornata	DIAT	84.0	28.0	1000	1.00	17241.1	1000	17.2
Gyrosigma attenuatum	DIAT	125.0	16.0	1000	2.00	8377.6	2000	16.8
Nitzschia closterium (possible syn N longissima)	DIAT	28.0	2.8	29838	7.00	57.5	208866	12.0
Skeletonema potomus	DIAT	5.6	2.8	29838	22.00	15.3	656436	10.1
Nitzschia sp	DIAT	20.0	2.0	29838	1.00	20.9	29838	0.6
Euglena cf tortus	EUGL	48.0	16.0	1000	10.00	6434.0	10000	64.3
Euglena sp	EUGL	84.0	16.0	1000	3.00	11259.5	3000	33.8
Strobomonas (fluviatile & morphs)	EUGL	28.0	20.0	1000	7.00	3909.5	7000	27.4
Euglena sp	EUGL	16.0	16.0	1000	1.00	2144.7	1000	2.1
Anabaena/Anabaenopsis heterocyst	HETE	7.0	5.6	29838	13.00	0.0	387894	0.0
Anabaena/Anabaenopsis heterocyst	HETE	5.0	5.0	1000	14.00	0.0	14000	0.0
Glenodinium sp2	PERI	28.0	22.0	1000	10.00	7095.8	10000	71.0
Glenodinium sp2	PERI	20.0	18.0	1000	5.00	3392.9	5000	17.0
Amphidinium sp	PERI	33.0	28.0	1000	1.00	9031.0	1000	9.0
Holophyra (type ciliate)	PROT	50.0	33.0	1000	6.00	28510.0	6000	171.1
Tintinnidium fluviatile	PROT	50.0	28.0	1000	3.00	20525.1	3000	61.6
Strombidium sp	PROT	50.0	33.0	1000	2.00	28510.0	2000	57.0
Vorticella sp (commonly associated with Anabaena colonies)	PROT	20.0	20.0	1000	5.00	4188.8	5000	20.9
Urotricha sp (common scuticociliate that feed on algae)	PROT	11.2	5.6	29838	3.00	183.9	89514	16.5
Haltaria sp	PROT	20.0	16.0	1000	5.00	2680.8	5000	13.4
Ciliate	PROT	33.0	20.0	1000	1.00	6911.5	1000	6.9
Urotricha sp (common scuticociliate that feed on algae)	PROT	14.0	12.0	1000	2.00	1055.6	2000	2.1
Polyarthra	ROTI	100.0	66.0	1000	2.00	152053.2	2000	304.1
Rotifer eggs	ROTI	66.0	44.0	1000	3.00	66903.4	3000	200.7
Trichocerca sp	ROTI	66.0	28.0	1000	5.00	18062.1	5000	90.3
Rotifer eggs	ROTI	44.0	39.0	1000	2.00	35041.3	2000	70.1
Brachionus	ZOOP	66.0	50.0	1000	1.00	57595.9	1000	57.6

Assiniboine R Station 14R 05-Sep-02 Volume 2 ml

Taxon	Group	Length	Width	Factor	Count	Volume	Cells/L	mg/m^3
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	7.0	7.0	29838	21.00	179.6	626598	112.5
Collodictyon triciliatum (phagotroph eating greens & diatoms)	CHLO	16.0	14.0	29838	2.00	1642.0	59676	98.0
Oocystis sp	CHLO	9.6	8.0	29838	7.00	321.7	208866	67.2
Ugreens (tiny pico greens)	CHLO	1.4	1.2	29838	1800.00	1.1	53708400	56.7
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	2.0	2.0	29838	371.00	4.2	11069898	46.4
Raphidocelis spp/Gloeoactinium limneticum (difficult to distinguish)	CHLO	3.0	1.4	29838	429.00	2.3	12800502	29.6
Treubaria triappendiculata	CHLO	11.2	11.2	29838	2.00	468.3	59676	27.9
Coelastrum cf pseudmicroporum	CHLO	5.6	4.2	29838	16.00	51.7	477408	24.7
Oocystis sp	CHLO	7.0	5.6	29838	7.00	114.9	208866	24.0
Actinastrum hantzschii	CHLO	8.4	1.4	29838	80.00	6.5	2387040	15.4
Tetrastrum staurogeniaforme	CHLO	4.2	4.2	29838	20.00	24.7	596760	14.7
Tetaedron caudatum	CHLO	11.2	11.2	29838	1.00	468.3	29838	14.0
Tetaedron caudatum	CHLO	7.0	7.0	29838	3.00	114.3	89514	10.2
Treubaria triappendiculata	CHLO	7.0	7.0	29838	3.00	114.3	89514	10.2
Pediastrum duplex	CHLO	8.4	8.4	1000	87.00	103.4	87000	9.0
Scenedesmus spinosa	CHLO	5.6	2.0	29838	26.00	7.8	775788	6.1
Dictochlorella/Dictyosphaerium primarum	CHLO	3.0	3.0	29838	12.00	14.1	358056	5.1
Tetraedron minimum	CHLO	5.6	5.6	29838	2.00	58.5	59676	3.5
Tetrastrum staurogeniaforme	CHLO	2.8	2.8	29838	12.00	7.3	358056	2.6
Actinastrum hantzschii	CHLO	12.6	1.4	29838	8.00	9.7	238704	2.3
Scenedesmus (several very small species/morphotypes)	CHLO	5.0	2.0	29838	8.00	7.0	238704	1.7
Crucigenia tetrapedia	CHLO	4.2	4.2	29838	2.00	24.7	59676	1.5
Scenedesmus opoliensis	CHLO	11.2	2.8	29838	1.00	30.7	29838	0.9
Didymocystis spp	CHLO	4.2	2.0	29838	4.00	5.9	119352	0.7
Siderocelis (several species or morphs)	CHLO	4.2	3.0	29838	1.00	19.8	29838	0.6
Monoraphidium contortum	CHLO	14.0	1.0	29838	3.00	5.5	89514	0.5
Nephrochlamy	CHLO	8.4	2.8	29838	1.00	17.2	29838	0.5
Didymocystis spp	CHLO	5.6	2.0	29838	2.00	7.8	59676	0.5
Mallomonas sp	CHRY	11.2	8.4	29838	1.00	413.8	29838	12.3
Ochromonads	CHRY	5.6	5.6	29838	2.00	92.0	59676	5.5
Chrysochromulina parva (haptophyte included in chrysophytes)	CHRY	4.2	2.8	29838	1.00	11.5	29838	0.3
Rhodomonas minuta	CRYP	5.6	4.2	29838	56.00	34.5	1670928	57.6
Cryptomonas reflexa	CRYP	24.0	11.0	1000	4.00	1013.7	4000	4.1
Anabaena flos aquae	CYAN	5.6	4.2	29838	248.00	51.7	7399824	382.7
Aphanizomenon issatchenkoi	CYAN	100.0	2.8	29838	3.00	615.8	89514	55.1
Aphanizomenon akinete	CYAN	20.0	8.4	29838	1.00	738.9	29838	22.0
Aphanizomenon issatchenkoi	CYAN	100.0	2.8	29838	1.00	615.8	29838	18.4
Anabaenopsis cf circularis	CYAN	7.0	5.6	1000	104.00	114.9	104000	12.0
Aphanizomenon akinete	CYAN	9.0	4.2	29838	4.00	83.1	119352	9.9
Anabaenopsis cf circularis	CYAN	6.0	5.0	29838	3.00	78.5	89514	7.0
Microcystis cf panniformis morphotype	CYAN	3.0	2.8	1000	400.00	12.3	400000	4.9
Aphanocapsa incerta	CYAN	1.0	1.0	29838	200.00	0.5	5967600	3.1
Merismopedia tenuissima	CYAN	1.0	1.0	29838	8.00	0.5	238704	0.1
Anomoneis cf sphaerophora	DIAT	70.0	28.0	29838	1.00	14367.6	29838	428.7
small centrics (Stephanodiscus, Cyclostephanos, Cyclotella species)	DIAT	5.6	4.2	29838	236.00	51.7	7041768	364.2
Synedra ulna	DIAT	200.0	4.2	29838	9.00	923.6	268542	248.0
Surirella cf brebissoni	DIAT	21.0	9.6	29838	2.00	506.7	59676	30.2
Cyclotella meneghiniana	DIAT	16.0	8.4	29838	1.00	844.5	29838	25.2
Synedra cf acus	DIAT	70.0	2.8	29838	5.00	143.7	149190	21.4
Surirella ovata/ovalis	DIAT	28.0	20.0	1000	5.00	2932.2	5000	14.7
Nitzschia closterium (possible syn N longissima)	DIAT	28.0	4.2	29838	2.00	129.3	59676	7.7
Cymatopleura solea	DIAT	84.0	18.0	1000	1.00	7125.1	1000	7.1
Cyclotella meneghiniana	DIAT	8.4	5.6	29838	1.00	155.2	29838	4.6
Gyrosigma acuminatum	DIAT	25.0	16.0	1000	2.00	1675.5	2000	3.4
Tryboniella cf levidensis	DIAT	28.0	16.0	1000	1.00	1876.6	1000	1.9
Bacillaria paradoxa	DIAT	84.0	5.6	1000	2.00	689.6	2000	1.4
Skeletonema potomus	DIAT	5.6	2.8	29838	2.00	15.3	59676	0.9
Euglena sp	EUGL	50.0	50.0	1000	8.41	65449.8	8410	550.4
Euglena sp	EUGL	84.0	16.0	1000	1.00	11259.5	1000	11.3
Euglena sp	EUGL	50.0	11.2	1000	3.00	3284.0	3000	9.9
Phacus sp	EUGL	20.0	16.0	1000	2.00	1787.2	2000	3.6
Anabaena/Anabaenopsis heterocyst	HETE	7.0	5.6	29838	7.00	0.0	208866	0.0
Anabaena/Anabaenopsis heterocyst	HETE	7.0	5.6	1000	17.00	0.0	17000	0.0
Gymnodinium sp 4	PERI	14.0	11.2	29838	1.00	613.0	29838	18.3
Glenodinium sp2	PERI	28.0	20.0	1000	2.00	5864.3	2000	11.7
Ciliate	PROT	44.0	44.0	1000	1.00	44602.2	1000	44.6
Strobilidium sp	PROT	28.0	20.0	1000	4.00	5864.3	4000	23.5
Haltaria sp	PROT	20.0	20.0	1000	4.00	4188.8	4000	16.8
Vorticella sp (commonly associated with Anabaena colonies)	PROT	28.0	20.0	1000	2.00	5864.3	2000	11.7
Trichocerca sp	ROTI	72.0	50.0	1000	4.00	62831.9	4000	251.3
Polyarthra	ROTI	66.0	50.0	1000	1.00	57595.9	1000	57.6

APPENDIX IV

PHYTOPLANKTON BIOMASS IN THE ASSINIBOINE RIVER (SITE 3) WEEKLY MONITORING

Assiniboine R	Station 3C			23-Jul-02	Volume 2 ml 2x		
Taxon	Group	Length	Width Factor	Count	Volume	Cells/L	mg/m^3
Ugreens (tiny pico greens)	CHLO	1.4	1.2 29838	2610.00	1.1	155754360	164.4
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	5.0	5.0 29838	5.00	65.4	298380	19.5
Oocystis sp	CHLO	8.4	7.0 29838	1.00	215.5	59676	12.9
Scenedesmus (several very small species/morphotypes)	CHLO	4.2	2.8 29838	14.00	11.5	835464	9.6
Crucigenia tetrapedia	CHLO	7.0	7.0 29838	1.00	114.3	59676	6.8
Monoraphidium circinale	CHLO	7.0	2.8 29838	3.00	21.6	179028	3.9
Treubaria triappendiculata	CHLO	5.6	5.6 29838	1.00	58.5	59676	3.5
Scenedesmus acuminatus	CHLO	16.0	4.2 1000	8.00	98.5	16000	1.6
Dictochlorella/Dictyosphaerium primarum	CHLO	2.8	2.8 1000	64.00	11.5	128000	1.5
Spermatozoa exaltans	CHLO	7.0	1.4 29838	2.00	10.8	119352	1.3
Mallomonas sp	CHRY	16.0	11.2 1000	1.00	1050.9	2000	2.1
Rhodomonas minuta	CRYP	5.6	4.2 29838	6.00	34.5	358056	12.3
Aphanocapsa incerta	CYAN	1.0	1.0 29838	200.00	0.5	11935200	6.2
Nitzschia sp	DIAT	30.0	4.2 29838	25.00	138.5	1491900	206.7
Nitzschia acicularis	DIAT	70.0	2.8 29838	4.00	143.7	238704	34.3
Nitzschia cf linearis	DIAT	130.0	5.6 1000	16.00	1067.3	32000	34.2
Nitzschia sp	DIAT	14.0	2.8 29838	14.00	28.7	835464	24.0
Nitzschia closterium (possible syn N longissima)	DIAT	28.0	3.2 29838	4.00	75.1	238704	17.9
Surirella cf peisonis	DIAT	33.0	28.0 1000	1.00	6773.3	2000	13.5
Navicula sp (small species requires SEM)	DIAT	14.0	5.6 29838	1.00	114.9	59676	6.9
Stephanodiscus & Cyclotella (impossible to split in LM)	DIAT	16.0	8.4 1000	4.00	844.5	8000	6.8
small centrics (Stephanodiscus, Cyclostephanos, Cyclotella species)	DIAT	5.6	4.2 29838	2.00	51.7	119352	6.2
Navicula sp (small species requires SEM)	DIAT	14.0	4.2 29838	1.00	64.7	59676	3.9
Navicula cf cryptocephela/cryptotenella/gregaria	DIAT	28.0	8.4 1000	3.00	517.2	6000	3.1
Nitzschia cf linearis	DIAT	100.0	7.0 1000	1.00	1282.8	2000	2.6
Nitzschia acicularis	DIAT	35.0	2.0 29838	1.00	36.7	59676	2.2
Navicula cf digioradiata (need SEM ID (N.tripunctata/N.margalathi))	DIAT	56.0	7.0 1000	1.00	718.4	2000	1.4
Surirella cf brebissoni	DIAT	20.0	11.2 1000	1.00	656.8	2000	1.3
Tryboniella cf levidensis	DIAT	14.0	8.4 1000	2.00	258.6	4000	1.0
Euglena sp	EUGL	20.0	5.6 29838	1.00	328.4	59676	19.6
Phacus sp	EUGL	20.0	11.2 1000	1.00	875.7	2000	1.8
Strobilidium sp	PROT	33.0	28.0 29838	1.00	13546.5	59676	808.4
Strobilidium sp	PROT	30.0	20.0 1000	6.00	6283.2	12000	75.4

Phyto Diversity:	Cell number:	0.19	Biomass:	0.815
	mg/m^3	%	Cells/L	%
Cyanophyta	6.2	1.0	11935200	6.9
Chlorophyta	224.9	35.5	157509612	91.0
Euglenophyta	21.3	3.4	61676	0.0
Chrysophyceae	2.1	0.3	2000	0.0
Diatomeae	365.9	57.8	3161152	1.8
Cryptophyceae	12.3	2.0	358056	0.2
Peridineae	0	0.0	0	0.0
TOTAL	632.9		173027696	

		Ratio to phyto total
Protozoa	883.8	71676	1.397

Assiniboine R	Station 3C				29-Jul-02	Volume 2 ml		
Taxon	Group	Length	Width	Factor	Count	Volume	Cells/L	mg/m^3
Siderocelis (several species or morphs)	CHLO	7.0	5.6	29838	62.00	114.9	1849956	212.6
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	4.2	2.8	29838	383.00	17.2	11427954	197.0
Ugreens (tiny pico greens)	CHLO	1.4	1.2	29838	1260.00	1.1	37595880	39.7
Siderocelis (several species or morphs)	CHLO	14.0	8.4	29838	1.00	517.2	29838	15.4
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	5.6	5.0	29838	5.00	73.3	149190	10.9
Scenedesmus quadricauda	CHLO	14.0	4.2	29838	4.00	86.2	119352	10.3
Oocystis spp	CHLO	16.0	14.0	1000	4.00	1642.0	4000	6.6
Tetaedron caudatum	CHLO	8.4	8.4	29838	1.00	197.6	29838	5.9
Scenedesmus (several very small species/morphotypes)	CHLO	4.2	2.8	29838	8.00	11.5	238704	2.7
Scenedesmus acuminatus	CHLO	28.0	5.6	1000	8.00	306.5	8000	2.5
Pediastrum duplex	CHLO	8.4	5.6	1000	24.00	69.0	24000	1.7
Collodictyon triciliatum (phagotroph eating greens & diatoms)	CHLO	16.0	14.0	1000	1.00	1642.0	1000	1.6
Crucigenia apiculata	CHLO	5.6	2.8	1000	104.00	14.6	104000	1.5
Raphidocelis spp/Gloeoactinium limneticum (difficult to distinguish)	CHLO	5.6	1.4	29838	8.00	4.3	238704	1.0
Rhodomonas minuta	CRYP	7.0	4.2	29838	68.00	43.1	2028984	87.5
Katablepharis ovalis	CRYP	5.6	4.0	29838	2.00	31.3	59676	1.9
Cryptomonas reflexa	CRYP	25.0	10.0	1000	2.00	872.7	2000	1.7
Cryptomonas marsonii	CRYP	16.0	7.0	1000	6.00	273.7	6000	1.6
Anabaena sp	CYAN	4.2	4.2	1000	22.00	38.8	22000	0.9
Aphanocapsa incerta	CYAN	1.0	1.0	1000	500.00	0.5	500000	0.3
Surirella cf brebissoni	DIAT	18.0	11.2	1000	6.00	591.1	6000	3.5
Navicula gregaria (also includes some N. cryptocephela)	DIAT	24.0	8.0	1000	8.00	402.1	8000	3.2
Nitzschia palae/palaceae	DIAT	50.0	5.6	1000	7.00	410.5	7000	2.9
Nitzschia sp	DIAT	70.0	4.2	1000	6.00	323.3	6000	1.9
Cocconeis pediculus	DIAT	20.0	18.0	1000	1.00	1696.5	1000	1.7
Cyclotella spp	DIAT	10.0	5.6	1000	4.00	219.9	4000	0.9
Nitzschia closterium	DIAT	28.0	3.0	1000	12.00	66.0	12000	0.8
Cyclotella spp	DIAT	14.0	7.0	1000	1.00	538.8	1000	0.5
Nitzschia gracilis	DIAT	100.0	4.2	1000	1.00	461.8	1000	0.5
Nitzschia sp	DIAT	140.0	2.8	1000	1.00	287.4	1000	0.3
Nitzschia palae/palaceae	DIAT	28.0	2.8	1000	4.00	57.5	4000	0.2
Nitzschia acicularis	DIAT	44.0	2.8	1000	2.00	90.3	2000	0.2
Navicula sp (small species requires SEM)	DIAT	11.2	5.6	1000	1.00	92.0	1000	0.1
Nitzschia closterium	DIAT	16.0	2.0	1000	2.00	16.8	2000	0.0
Strobomonas (fluviatile & morphs)	EUGL	20.0	16.0	1000	8.00	1787.2	8000	14.3
Euglena cf tortus	EUGL	44.0	16.0	1000	1.00	5897.8	1000	5.9
Euglena sp	EUGL	28.0	14.0	1000	2.00	2873.5	2000	5.7
Euglena sp	EUGL	33.0	8.4	1000	2.00	1219.2	2000	2.4
Trachelomonas hispida	EUGL	16.0	12.6	1000	1.00	1330.0	1000	1.3
Phacus sp	EUGL	16.0	14.0	1000	1.00	1094.7	1000	1.1
Strobilidium sp	PROT	20.0	20.0	1000	6.00	4188.8	6000	25.1
Ciliate	PROT	44.0	33.0	1000	1.00	25088.8	1000	25.1
Urotricha sp (common Scuticociliate that feed on algae)	PROT	16.0	14.0	1000	3.00	1642.0	3000	4.9
Strobilidium sp	PROT	38.0	2.8	1000	10.00	156.0	10000	1.6
Sponge spicule	SPON	200.0	11.2	1000	1.00	8757.4	1000	8.8

Phyto Diversity:	Cell number:	0.48	Biomass:	0.779
	mg/m^3	%	Cells/L	%
Cyanophyta	1.1	0.2	522000	1.0
Chlorophyta	509.5	78.3	51820416	95.1
Euglenophyta	30.8	4.7	15000	0.0
Chrysophyceae	0	0.0	0	0.0
Diatomeae	16.8	2.6	56000	0.1
Cryptophyceae	92.7	14.2	2096660	3.8
Peridineae	0	0.0	0	0.0
TOTAL	650.9		54510076	

		Ratio to phyto total
Protozoa	56.7	0.087
Sponge Spicule	8.8	0.013

Assiniboine R	Station 3C			07-Aug-02	Volume 2 ml		
Taxon	Group	Length	Width Factor	Count	Volume	Cells/L	mg/m^3
Ugreens (tiny pico greens)	CHLO	1.4	1.2 29838	7650.00	1.1	228260700	240.9
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	2.8	2.8 29838	439.00	11.5	13098882	150.6
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	7.0	7.0 29838	6.00	179.6	179028	32.2
Siderocelis (several species or morphs)	CHLO	4.2	2.8 29838	56.00	17.2	1670928	28.8
Scenedesmus (several very small species/morphotypes)	CHLO	5.6	4.2 29838	22.00	34.5	656436	22.6
Coelastrum cf pseudmicroporum	CHLO	5.6	5.6 29838	8.00	92.0	238704	21.9
Oocystis sp	CHLO	8.4	7.0 29838	3.00	215.5	89514	19.3
Raphidocelis spp/Gloeoactinium limneticum (difficult to distinguish)	CHLO	3.0	2.0 29838	101.00	4.7	3013638	14.2
Scenedesmus (several very small species/morphotypes)	CHLO	4.2	2.8 29838	34.00	11.5	1014492	11.7
Oocystis sp	CHLO	16.0	14.0 1000	3.00	1642.0	3000	4.9
Oocystis sp	CHLO	9.6	7.0 1000	12.00	246.3	12000	3.0
Didymocystis spp	CHLO	7.0	2.8 29838	2.00	19.2	59676	1.1
Pediastrum duplex	CHLO	11.2	8.4 1000	6.00	183.9	6000	1.1
Scenedesmus acuminatus	CHLO	16.0	4.2 1000	8.00	98.5	8000	0.8
Siderocelis (several species or morphs)	CHLO	5.6	2.8 29838	1.00	23.0	29838	0.7
Siderocelis (several species or morphs)	CHLO	11.2	8.4 1000	1.00	413.8	1000	0.4
Scenedesmus quadricauda	CHLO	16.0	4.2 1000	4.00	98.5	4000	0.4
small chrysophytes	CHRY	4.2	2.8 29838	11.00	17.2	328218	5.7
Rhodomonas minuta	CRYP	7.0	4.2 29838	31.00	43.1	924978	39.9
Cryptomonas reflexa	CRYP	28.0	16.0 1000	3.00	2502.1	3000	7.5
Cryptomonas sp	CRYP	16.0	11.2 1000	1.00	700.6	1000	0.7
Chroococcus dispursus	CYAN	2.8	2.8 29838	8.00	11.5	238704	2.7
Anabaena sp	CYAN	4.2	4.2 1000	48.00	38.8	48000	1.9
Merismopedia tenuissima	CYAN	1.0	1.0 29838	64.00	0.5	1909632	1.0
Anabaena sp	CYAN	4.2	4.2 1000	10.00	38.8	10000	0.4
Nitzschia sp	DIAT	45.0	4.2 29838	7.00	207.8	208866	43.4
Cyclotella meneghiniana	DIAT	9.0	5.6 29838	7.00	178.1	208866	37.2
Aulacoseira granulata	DIAT	18.0	11.2 1000	12.00	1773.4	12000	21.3
Surirella ovata/ovalis	DIAT	32.0	22.0 1000	4.00	4054.7	4000	16.2
Navicula sp (small species requires SEM)	DIAT	11.2	5.6 29838	3.00	92.0	89514	8.2
Nitzschia sp	DIAT	16.0	2.0 29838	13.00	16.8	387894	6.5
small centrics (Stephanodiscus, Cyclostephanos, Cyclotella species)	DIAT	5.0	2.8 29838	5.00	27.5	149190	4.1
Nitschia sp	DIAT	28.0	2.8 29838	2.00	57.5	59676	3.4
Nitzschia sigma/sigmoidea (sigmoid complex)	DIAT	84.0	8.4 1000	2.00	1551.7	2000	3.1
Nitzschia closterium (possible syn N longissima)	DIAT	28.0	4.2 1000	23.00	129.3	23000	3.0
Cymatopleura solea	DIAT	44.0	16.0 1000	1.00	2948.9	1000	2.9
Cyclotella meneghiniana	DIAT	16.0	8.4 1000	3.00	844.5	3000	2.5
Nitzschia tryboniella (types)	DIAT	30.0	8.4 1000	4.00	554.2	4000	2.2
Surirella cf brebissoni	DIAT	20.0	14.0 1000	1.00	1026.3	1000	1.0
Nitzschia acicularis	DIAT	56.0	2.8 1000	5.00	114.9	5000	0.6
Navicula gregaria (also includes some N. cryptocephela)	DIAT	28.0	8.4 1000	1.00	517.2	1000	0.5
Euglena sp	EUGL	33.0	20.0 1000	5.00	6911.5	5000	34.6
Euglena sp	EUGL	14.0	9.6 29838	1.00	675.6	29838	20.2
Strobomonas (fluviatile & morphs)	EUGL	28.0	16.0 1000	6.00	2502.1	6000	15.0
Anabaena/Anabaenopsis heterocyst	HETE	5.6	5.6 1000	1.00	0.0	1000	0.0
Anabaena/Anabaenopsis heterocyst	HETE	5.6	5.6 1000	2.00	0.0	2000	0.0
Strobilidium sp	PROT	33.0	20.0 1000	1.00	6911.5	1000	6.9

Phyto Diversity:	Cell number:	0.18	Biomass:	0.871
	mg/m^3	%	Cells/L	%
Cyanophyta	6	0.7	2206336	0.9
Chlorophyta	554.6	66.0	248345836	98.2
Euglenophyta	69.7	8.3	40838	0.0
Chrysophyceae	5.7	0.7	328218	0.1
Diatomeae	156.3	18.6	1160006	0.5
Cryptophyceae	48.1	5.7	928978	0.4
Peridineae	0	0.0	0	0.0
TOTAL	840.3		253010212	

		Ratio to phyto total
Protozoa	6.9	0.008
Heterocysts	0	0.000

Assiniboine R	Station 3C			13-Aug-02	Volume 2 ml		
Taxon	Group	Length	Width Factor	Count	Volume	Cells/L	mg/m^3
Siderocelis sp (several species or morphs)	CHLO	5.6	4.2 29838	20.00	51.7	596760	30.9
Rhodomonas minuta	CRYP	5.6	4.2 29838	16.00	34.5	477408	16.5
Nitzschia closterium (possibly syn N longissima)	DIAT	28.0	4.2 29838	3.00	129.3	89514	11.6
Cyclotella spp	DIAT	5.6	4.2 29838	3.00	51.7	89514	4.6
Nitzschia tryboniella (types)	DIAT	44.0	9.6 1000	2.00	1061.6	2000	2.1
Nitzschia sp	DIAT	84.0	5.6 1000	2.00	689.6	2000	1.4
Surirella ovata/ovalis	DIAT	50.0	10.0 1000	1.00	1309.0	1000	1.3
Nitzschia palae/palaceae	DIAT	42.0	4.2 1000	2.00	194.0	2000	0.4
Euglena sp	EUGL	48.0	18.0 1000	3.00	8143.0	3000	24.4
Strobomonas (fluviatilte & morphs)	EUGL	28.0	20.0 1000	1.00	3909.5	1000	3.9
Phacus sp	EUGL	28.0	20.0 1000	1.00	3909.5	1000	3.9
Strobilidium sp	PROT	28.0	20.0 1000	9.00	5864.3	9000	52.8
Askenasia sp	PROT	30.0	30.0 1000	2.00	14137.2	2000	28.3
Haltaria sp	PROT	22.0	20.0 1000	4.00	4607.7	4000	18.4
Phyto Diversity:	Cell number:	0.63	Biomass:	0.810			
	mg/m^3	%	Cells/L	%			
Cyanophyta	0	0.0	0	0.0			
Chlorophyta	30.9	30.6	596760	47.2			
Euglenophyta	32.2	31.9	5000	0.4			
Chrysophyceae	0	0.0	0	0.0			
Diatomeae	21.4	21.2	186028	14.7			
Cryptophyceae	16.5	16.3	477408	37.7			
Peridineae	0	0.0	0	0.0			
TOTAL	101		1265196				
					Ratio to phyto total		
Protozoa	99.5		15000		0.985		

Assiniboine R	Station 3C			27-Aug-02	Volume 2 ml		
Taxon	Group	Length	Width Factor	Count	Volume	Cells/L	mg/m^3
Oocystis sp	CHLO	12.6	8.4 29838	56.00	465.5	1670928	777.8
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	8.4	8.4 29838	79.00	310.3	2357202	731.5
Ulothrix sp	CHLO	14.0	4.0 29838	32.00	175.9	954816	168.0
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	3.0	2.8 29838	180.00	12.3	5370840	66.1
Collodictyon triciliatum (phagotroph eating greens & diatoms)	CHLO	11.2	11.2 29838	2.00	735.6	59676	43.9
Monoraphidium contortum	CHLO	16.0	2.0 29838	34.00	25.1	1014492	25.5
Tetrastrum staurogeniaforme	CHLO	2.8	2.8 29838	92.00	7.3	2745096	20.1
Ugreens (tiny pico greens)	CHLO	1.4	1.2 29838	380.00	1.1	11338440	12.0
Actinastrum hantzschii	CHLO	15.0	2.0 29838	14.00	23.6	417732	9.8
Monoraphidium minutum	CHLO	8.4	2.0 29838	11.00	17.6	328218	5.8
Didymocystis spp	CHLO	5.6	2.8 29838	4.00	15.3	119352	1.8
small chrysophytes	CHRY	4.0	2.8 29838	270.00	16.4	8056260	132.3
Rhodomonas minuta	CRYP	7.0	4.2 29838	11.00	43.1	328218	14.1
Cryptomonas reflexa	CRYP	28.0	12.0 1000	2.00	1407.4	2000	2.8
Anabaena cf compacta	CYAN	7.0	5.6 29838	1914.00	114.9	57109932	6564.2
Aphanizomenon flos aquae	CYAN	5.0	4.2 29838	2020.00	69.3	60272760	4175.2
Microcystis flos aquae	CYAN	50.0	50.0 1000	6.00	65449.8	6000	392.7
Microcystis flos aquae	CYAN	100.0	84.0 1000	1.00	369451.3	1000	369.5
Anabaena/Anabaenopsis akinete	CYAN	16.0	9.6 29838	9.00	772.1	268542	207.3
Planktothrix suspensus	CYAN	100.0	4.2 29838	2.00	1385.4	59676	82.7
Coelosphaerium kuetzingianum	CYAN	2.8	2.8 29838	128.00	11.5	3819264	43.9
Anabaena mendotae	CYAN	5.6	4.0 29838	12.00	46.9	358056	16.8
Microcystis viridis (morphotype)	CYAN	3.0	3.0 1000	800.00	14.1	800000	11.3
Pseudanabaena sp	CYAN	100.0	1.4 29838	1.00	153.9	29838	4.6
Aphanizomenon issatchenkoi	CYAN	600.0	3.0 1000	1.00	4241.2	1000	4.2
Nitzschia palae/palaceae	DIAT	50.0	7.0 29838	6.00	641.4	179028	114.8
Nitzschia sp	DIAT	8.4	2.0 29838	248.00	8.8	7399824	65.1
Nitzschia closterium (possible syn N longissima)	DIAT	56.0	4.2 29838	7.00	258.6	208866	54.0
Synedra ulna	DIAT	220.0	4.2 1000	42.00	1016.0	42000	42.7
Surirella cf brebissoni	DIAT	22.0	8.4 29838	3.00	406.4	89514	36.4
Nitzschia sp	DIAT	500.0	8.4 1000	1.00	9236.3	1000	9.2
Nitzschia acicularis	DIAT	60.0	2.0 29838	2.00	62.8	59676	3.7
Navicula sp (small species requires SEM)	DIAT	11.2	5.6 29838	1.00	92.0	29838	2.7
Nitzschia acicularis	DIAT	56.0	2.0 29838	1.00	58.6	29838	1.7
Asterionella formosa	DIAT	56.0	4.2 1000	5.00	258.6	5000	1.3
Anabaena/Anabaenopsis heterocyst	HETE	8.4	8.4 29838	102.00	0.0	3043476	0.0
Aphanizomenon heterocyst	HETE	7.0	4.2 29838	4.00	0.0	119352	0.0
Ciliate	PROT	125.0	125.0 1000	5.00	1022653.9	5000	5113.3
Vorticella sp (commonly associated with Anabaena colonies)	PROT	32.0	28.0 1000	14.00	13136.0	14000	183.9
Heliozoan spp	PROT	20.0	20.0 29838	1.00	4188.8	29838	125.0
Holophyra (type ciliate)	PROT	38.0	33.0 1000	3.00	21667.6	3000	65.0
Scuticociliates	PROT	23.0	16.0 1000	4.00	3082.9	4000	12.3
large ciliates	PROT	100.0	8.4 1000	1.00	3694.5	1000	3.7
Rotifer (not ID)	ROTI	200.0	100.0 1000	3.00	698132.0	3000	2094.4
Polyarthra	ROTI	84.0	50.0 1000	6.00	73303.9	6000	439.8
Rotifer eggs	ROTI	60.0	40.0 1000	7.00	50265.5	7000	351.9
Rotifer (not ID)	ROTI	100.0	84.0 1000	1.00	246301.0	1000	246.3
Filinia sp	ROTI	100.0	38.0 1000	1.00	75607.7	1000	75.6
Rotifer (not ID)	ROTI	66.0	38.0 1000	1.00	33267.4	1000	33.3

Phyto Diversity:	Cell number:	0.737	Biomass:	0.693
	mg/m^3	%	Cells/L	%
Cyanophyta	11872.5	83.5	122726068	74.1
Chlorophyta	1862.4	13.1	26376792	15.9
Euglenophyta	0	0.0	0	0.0
Chrysophyceae	132.3	0.9	8056260	4.9
Diatomeae	331.8	2.3	8044584	4.9
Cryptophyceae	17	0.1	330218	0.2
Peridineae	0	0.0	0	0.0
TOTAL	14215.9		165533922	

		Ratio to phyto total
Protozoa	5503.2	56838	0.387
Rotifers	3241.3	19000	0.228
Heterocysts	0	3162828	0.000

Assiniboine R	Station 3C				03-Sep-02	Volume 2 ml		
Taxon	Group	Length	Width	Factor	Count	Volume	Cells/L	mg/m^3
Oocystis sp	CHLO	8.4	7.0	29838	11.00	215.5	328218	70.7
Pediastrum duplex	CHLO	7.0	5.6	29838	24.00	47.9	716112	34.3
Ugreens (tiny pico greens)	CHLO	1.4	1.2	29838	1080.00	1.1	32225040	34.0
Oocystis sp	CHLO	5.6	2.8	29838	14.00	23.0	417732	9.6
Treubaria triappendiculata	CHLO	5.6	5.6	29838	1.00	58.5	29838	1.7
Tetraedron minimum	CHLO	5.6	5.6	29838	1.00	58.5	29838	1.7
Monoraphidium contortum	CHLO	14.0	1.0	29838	9.00	5.5	268542	1.5
Scenedesmus (several very small species/morphotypes)	CHLO	7.0	2.0	29838	4.00	9.8	119352	1.2
Planktonema lauterbornii	CHLO	8.4	2.8	1000	16.00	51.7	16000	0.8
Scenedesmus (several very small species/morphotypes)	CHLO	4.2	2.8	29838	2.00	11.5	59676	0.7
Nephrochlamy	CHLO	8.4	2.8	29838	1.00	17.2	29838	0.5
Raphidocelis spp/Gloeoactinium limneticum (difficult to distinguish)	CHLO	4.2	1.4	29838	4.00	3.2	119352	0.4
small chrysophytes	CHRY	4.2	4.2	29838	2.00	38.8	59676	2.3
Ochromonads	CHRY	4.2	2.8	29838	3.00	17.2	89514	1.5
Aphanizomenon flos aquae	CYAN	5.6	5.0	29838	1553.00	110.0	46338414	5095.2
Anabaena flos aquae	CYAN	5.0	5.0	29838	186.00	65.4	5549868	363.2
Planktothrix suspensus	CYAN	100.0	4.2	1000	41.00	1385.4	41000	56.8
Aphanizomenon akinete	CYAN	60.0	7.0	29838	1.00	1539.4	29838	45.9
Microcystis sp (includes morphotypes of all others)	CYAN	4.2	2.8	1000	800.00	17.2	800000	13.8
Small bluegreens (pico blue greens)	CYAN	1.0	1.0	29838	280.00	0.5	8354640	4.4
Aulacoseira granulata	DIAT	33.0	11.2	1000	16.00	3251.2	16000	52.0
small centrics (Stephanodiscus, Cyclostephanos, Cyclotella species)	DIAT	5.6	4.2	29838	25.00	51.7	745950	38.6
Nitzschia closterium (possible syn N longissima)	DIAT	28.0	4.2	29838	5.00	129.3	149190	19.3
Stephanodiscus & Cyclotella (impossible to split in LM)	DIAT	9.6	5.0	29838	3.00	181.0	89514	16.2
Bacillaria paradoxa	DIAT	82.0	4.2	1000	29.00	378.7	29000	11.0
Gyrosigma acuminatum	DIAT	125.0	16.0	1000	1.00	8377.6	1000	8.4
Surirella spp	DIAT	33.0	28.0	1000	1.00	6773.3	1000	6.8
Navicula sp (small species requires SEM)	DIAT	14.0	7.0	29838	1.00	179.6	29838	5.4
Stephanodiscus & Cyclotella (impossible to split in LM)	DIAT	20.0	10.0	1000	3.00	1570.8	3000	4.7
Nitzschia acicularis	DIAT	70.0	2.8	29838	1.00	143.7	29838	4.3
Surirella ovata/ovalis	DIAT	28.0	20.0	1000	1.00	2932.2	1000	2.9
Achnanthes sp	DIAT	9.6	5.6	29838	1.00	78.8	29838	2.4
Nitzschia cf linearis	DIAT	66.0	8.4	1000	2.00	1219.2	2000	2.4
Trachelomonas sp	EUGL	9.6	8.4	29838	1.00	236.4	29838	7.1
Phacus sp	EUGL	20.0	16.0	1000	1.00	1787.2	1000	1.8
Aphanizomenon heterocyst	HETE	9.6	5.6	29838	45.00	0.0	1342710	0.0
Anabaena/Anabaenopsis heterocyst	HETE	7.0	7.0	29838	3.00	0.0	89514	0.0
Glenodinium sp2	PERI	28.0	20.0	1000	1.00	5864.3	1000	5.9
Holophyra (type ciliate)	PROT	33.0	33.0	1000	203.00	18816.6	203000	3819.8
Strobilidium sp	PROT	55.0	50.0	1000	9.00	71994.8	9000	648.0
Amoeba	PROT	18.0	16.0	29838	3.00	2412.7	89514	216.0
Amoeba	PROT	20.0	20.0	29838	1.00	4188.8	29838	125.0
Vorticella sp (commonly associated with Anabaena colonies)	PROT	30.0	30.0	1000	8.00	14137.2	8000	113.1
Ciliate	PROT	16.0	16.0	29838	1.00	2144.7	29838	64.0
Amoeba	PROT	7.0	5.6	29838	3.00	114.9	89514	10.3
Trichocerca sp	ROTI	100.0	40.0	1000	4.00	55850.6	4000	223.4
Polyarthra	ROTI	84.0	50.0	1000	3.00	73303.9	3000	219.9
Rotifer eggs	ROTI	55.0	33.0	1000	6.00	31360.9	6000	188.2
Keratella	ROTI	84.0	33.0	1000	3.00	31931.2	3000	95.8
Rotifer (not ID)	ROTI	50.0	30.0	1000	3.00	15708.0	3000	47.1

Phyto Diversity:	Cell number:	0.65	Biomass:	0.257
	mg/m^3	%	Cells/L	%
Cyanophyta	5579.3	94.1	61113760	63.1
Chlorophyta	157.2	2.7	34359538	35.5
Euglenophyta	8.8	0.1	30838	0.0
Chrysophyceae	3.9	0.1	149190	0.2
Diatomeae	174.3	2.9	1127168	1.2
Cryptophyceae	0	0.0	0	0.0
Peridineae	5.9	0.1	1000	0.0
TOTAL	5929.4		96781494	

			Ratio to phyto total
Protozoa	4996.1	458704	0.843
Rotifers	774.4	19000	0.131
Heterocysts	0	1432224	0.000

Assiniboine R | Station 3C | 11-Sep-02 | Volume 2 ml

Taxon	Group	Length	Width	Factor	Count	Volume	Cells/L	mg/m^3
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	3.0	2.8	29838	754.00	12.3	22497852	277.1
Ugreens (tiny pico greens)	CHLO	1.4	1.2	29838	3420.00	1.1	102045960	107.7
Siderocelis (several species or morphs)	CHLO	8.6	8.4	29838	9.00	317.7	268542	85.3
Treubaria triappendiculata	CHLO	11.2	11.2	29838	4.00	468.3	119352	55.9
Tetrastrum staurogeniaforme	CHLO	7.0	7.0	29838	13.00	114.3	387894	44.3
Scenedesmus (several very small species/morphotypes)	CHLO	5.6	4.2	29838	33.00	34.5	984654	34.0
botryococcus protruberans	CHLO	44.0	44.0	1000	1.00	29734.8	1000	29.7
Raphidocelis spp/Gloeoactinium limneticum (difficult to distinguish)	CHLO	4.0	2.0	29838	158.00	6.3	4714404	29.6
Collodictyon triciliatum (phagotroph eating greens & diatoms)	CHLO	20.0	20.0	1000	7.00	4188.8	7000	29.3
Oocystis sp	CHLO	7.0	4.2	29838	11.00	64.7	328218	21.2
Oocystis sp	CHLO	18.0	14.0	1000	8.00	1847.3	8000	14.8
Scenedesmus (several very small species/morphotypes)	CHLO	4.2	2.8	29838	18.00	11.5	537084	6.2
Planktonema lauterbornii	CHLO	200.0	4.2	1000	2.00	2770.9	2000	5.5
Tetrastrum staurogeniaforme	CHLO	2.8	2.8	29838	20.00	7.3	596760	4.4
Chlorogonium maximus	CHLO	66.0	8.4	1000	1.00	3657.6	1000	3.7
Pediastrum boryanum	CHLO	16.0	11.2	1000	4.00	500.4	4000	2.0
Scenedesmus acuminatus	CHLO	20.0	5.6	1000	8.00	218.9	8000	1.8
Scenedesmus acuminatus	CHLO	16.0	4.0	1000	16.00	89.4	16000	1.4
Monoraphidium contortum	CHLO	28.0	1.4	29838	2.00	21.6	59676	1.3
Didymocystis spp	CHLO	4.2	2.0	29838	4.00	5.9	119352	0.7
Schroedaria setigera	CHLO	50.0	4.2	1000	2.00	346.4	2000	0.7
Actinastrum hantzschii	CHLO	20.0	2.8	1000	8.00	61.6	8000	0.5
Ochromonads	CHRY	5.6	5.6	29838	16.00	92.0	477408	43.9
small chrysophytes	CHRY	5.6	4.2	1000	16.00	51.7	16000	0.8
Katablepharis ovalis	CRYP	8.4	5.6	29838	20.00	92.0	596760	54.9
Cryptomonas marsonii	CRYP	18.0	9.6	1000	21.00	579.1	21000	12.2
Rhodomonas minuta	CRYP	5.6	4.2	29838	11.00	34.5	328218	11.3
Aphanizomenon flos aquae	CYAN	5.6	5.0	29838	4050.00	110.0	120843900	13287.5
Planktothrix suspensus	CYAN	200.0	4.2	29838	6.00	2770.9	179028	496.1
Microcystis sp (includes morphotypes of all others)	CYAN	5.0	4.2	29838	203.00	46.2	6057114	279.7
Microcystis sp (includes morphotypes of all others)	CYAN	5.6	4.2	29838	169.00	51.7	5042622	260.8
Microcystis aeruginosa	CYAN	5.6	4.2	1000	4300.00	51.7	4300000	222.4
Aphanizomenon akinete	CYAN	28.0	5.6	29838	6.00	459.8	179028	82.3
Anabaena flos aquae	CYAN	5.6	5.6	1000	240.00	92.0	240000	22.1
Microcystis sp (includes morphotypes of all others)	CYAN	4.2	4.2	1000	350.00	38.8	350000	13.6
Woronichinia naeglianum	CYAN	5.6	4.2	1000	128.00	51.7	128000	6.6
Chroococcus sp	CYAN	5.6	5.6	29838	2.00	92.0	59676	5.5
Anabaena/Anabaenopsis akinete	CYAN	20.0	11.2	1000	2.00	1313.6	2000	2.6
Merismopedia tenuissima	CYAN	1.0	1.0	29838	144.00	0.5	4296672	2.2
Pseudanabaena sp	CYAN	50.0	2.0	1000	2.00	157.1	2000	0.3
small centrics (Stephanodiscus, Cyclostephanos, Cyclotella species)	DIAT	5.0	4.2	29838	79.00	41.2	2357202	97.2
Aulacoseira granulata	DIAT	28.0	14.0	1000	16.00	4310.3	16000	69.0
Cyclotella meneghiniana	DIAT	8.4	5.6	29838	13.00	155.2	387894	60.2
Cyclotella spp	DIAT	20.0	10.0	1000	28.00	1570.8	28000	44.0
Surirella ovata/ovalis	DIAT	33.0	28.0	1000	4.00	6773.3	4000	27.1
Nitzschia closterium (possible syn N longissima)	DIAT	28.0	2.8	29838	11.00	57.5	328218	18.9
Stephanodiscus & Cyclotella (impossible to split in LM)	DIAT	25.0	12.6	1000	6.00	3092.5	6000	18.6
Surirella sp	DIAT	44.0	28.0	1000	2.00	9031.0	2000	18.1
Nitzschia sp	DIAT	14.0	2.0	29838	23.00	14.7	686274	10.1
Stephanodiscus niagarae	DIAT	22.0	11.0	1000	2.00	2090.7	2000	4.2
Nitzschia sp	DIAT	11.2	2.0	29838	7.00	11.7	208866	2.4
Nitzschia cf linearis	DIAT	98.0	5.6	1000	3.00	804.6	3000	2.4
Synedra ulna	DIAT	200.0	5.6	1000	1.00	1642.0	1000	1.6
Euglena sp	EUGL	28.0	14.0	29838	1.00	2873.5	29838	85.7
Euglena cf tortus	EUGL	84.0	16.0	1000	7.00	11259.5	7000	78.8
Strobomonas (fluviatile & morphs)	EUGL	28.0	20.0	1000	4.00	3909.5	4000	15.6
Phacus sp	EUGL	16.0	12.6	1000	2.00	886.7	2000	1.8
Aphanizomenon heterocyst	HETE	11.2	4.2	29838	6.00	0.0	179028	0.0
Anabaena/Anabaenopsis heterocyst	HETE	5.6	5.6	1000	4.00	0.0	4000	0.0
Glenodinium sp2	PERI	28.0	24.0	1000	13.00	8444.6	13000	109.8
Vorticella sp (commonly associated with Anabaena colonies)	PROT	40.0	40.0	1000	3.00	33510.3	3000	100.5
Strobilidium sp	PROT	32.0	28.0	1000	5.00	13136.0	5000	65.7
Vorticella sp (commonly associated with Anabaena colonies)	PROT	28.0	20.0	1000	8.00	5864.3	8000	46.9
Ciliate	PROT	20.0	16.0	1000	4.00	2680.8	4000	10.7
Askenasia sp	PROT	20.0	16.0	1000	3.00	2680.8	3000	8.0
Scuticociliates	PROT	16.0	12.6	1000	4.00	1330.0	4000	5.3
Tintinnidium fluviatile	PROT	20.0	16.0	1000	1.00	2680.8	1000	2.7
Rotifer (not ID)	ROTI	150.0	100.0	1000	1.00	523599.0	1000	523.6

Phyto Diversity: | Cell number: 0.673 | Biomass: 0.327

APPENDIX V

PHYTOPLANKTON BIOMASS IN THE ASSINIBOINE RIVER (SITE 8) WEEKLY MONITORING

Assiniboine R	Station 8C			23-Jul-02	Volume 2 ml		
Taxon	Group	Length	Width Factor	Count	Volume	Cells/L	mg/m^3
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	4.0	3.0 29838	405.00	18.8	12084390	227.8
Scenedesmus (several very small species/morphotypes)	CHLO	5.0	3.0 29838	319.00	15.7	9518322	149.5
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	5.6	4.2 29838	70.00	51.7	2088660	108.0
Ugreens (tiny pico greens)	CHLO	1.4	1.2 29838	1620.00	1.1	48337560	51.0
Crucigenia apiculata	CHLO	5.6	4.2 29838	12.00	32.9	358056	11.8
Colonial green	CHLO	2.8	2.0 29838	64.00	5.9	1909632	11.2
Scenedesmus (several very small species/morphotypes)	CHLO	4.2	2.0 29838	46.00	5.9	1372548	8.0
Oocystis sp	CHLO	9.6	5.6 29838	1.00	157.6	29838	4.7
Treubaria triappendiculata	CHLO	5.6	5.6 29838	1.00	58.5	29838	1.7
Monoraphidium circinale	CHLO	4.2	2.0 29838	2.00	6.6	59676	0.4
Scenedesmus quadricauda	CHLO	14.0	4.2 1000	4.00	86.2	4000	0.3
Rhodomonas minuta	CRYP	5.6	4.2 29838	2.00	34.5	59676	2.1
Biddulphia (syn Pleurosira)	DIAT	84.0	66.0 1000	1.00 2	87380.3	1000	287.4
Nitzschia palae/palaceae	DIAT	30.0	2.8 29838	12.00	61.6	358056	22.0
Navicula sp (small species requires SEM)	DIAT	20.0	5.6 29838	3.00	164.2	89514	14.7
Cocconeis pediculus	DIAT	28.0	20.0 1000	5.00	2932.2	5000	14.7
Nitzschia closterium (possible syn N longissima)	DIAT	28.0	4.2 29838	3.00	129.3	89514	11.6
Nitzschia sp	DIAT	42.0	2.8 29838	3.00	86.2	89514	7.7
small centrics (Stephanodiscus, Cyclostephanos, Cyclotella species)	DIAT	5.6	4.2 29838	5.00	51.7	149190	7.7
Navicula cf digioradiata (need SEM ID (N.tripunctata/N.margalathi))	DIAT	33.0	8.4 1000	2.00	609.6	2000	1.2

Phyto Diversity:	Cell number:	0.56	Biomass:	0.807
	mg/m^3	%	Cells/L	%
Cyanophyta	0	0.0	0	0.0
Chlorophyta	574.6	60.9	75792520	98.9
Euglenophyta	0	0.0	0	0.0
Chrysophyceae	0	0.0	0	0.0
Diatomeae	367	38.9	783788	1.0
Cryptophyceae	2.1	0.2	59676	0.1
Peridineae	0	0.0	0	0.0
TOTAL	943.7		76635984	

Assiniboine R	Station 8C				29-Jul-02	Volume 2ml		
Taxon	Group	Length	Width	Factor	Count	Volume	Cells/L	mg/m^3
Oocystis parva	CHLO	8.4	7.0	29838	60.00	215.5	1790280	385.8
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	5.6	4.2	29838	46.00	51.7	1372548	71.0
Ugreens (tiny pico greens)	CHLO	1.4	1.2	29838	1680.00	1.1	50127840	52.9
Crucigenia apiculata	CHLO	5.6	4.2	29838	36.00	32.9	1074168	35.4
Siderocelis (several species or morphs)	CHLO	8.4	7.0	29838	5.00	215.5	149190	32.2
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	2.8	1.4	29838	360.00	2.9	10741680	30.9
Coelastrum microporum	CHLO	5.6	5.6	29838	8.00	92.0	238704	21.9
Siderocelis (several species or morphs)	CHLO	5.6	4.2	29838	14.00	51.7	417732	21.6
Raphidocelis spp/Gloeoactinium limneticum (difficult to distinguish)	CHLO	5.0	2.0	29838	80.00	7.9	2387040	18.7
Chlamydomonas sp	CHLO	11.2	9.6	29838	1.00	540.5	29838	16.1
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	8.4	8.4	29838	1.00	310.3	29838	9.3
Tetraedron trigonum	CHLO	9.6	9.6	29838	1.00	294.9	29838	8.8
Oocystis sp	CHLO	14.0	2.8	29838	2.00	57.5	59676	3.4
Scenedesmus (several very small species/morphotypes)	CHLO	4.2	2.0	29838	8.00	5.9	238704	1.4
Ochromonads	CHRY	2.8	2.8	29838	2.00	11.5	59676	0.7
Rhodomonas minuta	CRYP	5.6	4.2	29838	3.00	34.5	89514	3.1
Cocconeis pediculus	DIAT	20.0	16.0	1000	23.00	1340.4	23000	30.8
Cyclotella meneghiniana	DIAT	9.6	5.6	29838	2.00	202.7	59676	12.1
Nitzschia sp	DIAT	20.0	2.8	29838	6.00	41.1	179028	7.3
Gyrosigma acuminatum	DIAT	140.0	14.0	1000	1.00	7183.8	1000	7.2
Nitzschia sp	DIAT	42.0	4.2	29838	1.00	194.0	29838	5.8
Navicula cf digioradiata (need SEM ID (N.tripunctata/N.margalathi))	DIAT	42.0	8.4	1000	3.00	775.8	3000	2.3
Nitzschia palae/palaceae	DIAT	40.0	4.0	1000	12.00	167.6	12000	2.0
Tryboniella cf levidensis	DIAT	28.0	11.2	1000	2.00	919.5	2000	1.8
Navicula cf cryptocephela/cryptotenella/gregaria	DIAT	33.0	8.4	1000	2.00	609.6	2000	1.2
Navicula gregaria (also includes some N. cryptocephela)	DIAT	28.0	7.0	1000	2.00	359.2	2000	0.7
Enyconema sp	DIAT	20.0	11.2	1000	1.00	656.8	1000	0.7
Nitzschia tryboniella (types)	DIAT	28.0	7.0	1000	1.00	359.2	1000	0.4

Phyto Diversity:	Cell number:	0.45	Biomass:	0.737
	mg/m^3	%	Cells/L	%
Cyanophyta	0	0.0	0	0.0
Chlorophyta	709.4	90.3	68687076	99.3
Euglenophyta	0	0.0	0	0.0
Chrysophyceae	0.7	0.1	59676	0.1
Diatomeae	72.4	9.2	315542	0.5
Cryptophyceae	3.1	0.4	89514	0.1
Peridineae	0	0.0	0	0.0
TOTAL	785.6		69151808	

Assiniboine R	Station 8C			07-Aug-02	Volume 2 ml		
Taxon	Group	Length	Width Factor	Count	Volume	Cells/L	mg/m^3
Siderocelis (several species or morphs)	CHLO	5.6	4.2 29838	146.00	51.7	4356348	225.3
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	1.4	1.2 29838	2880.00	1.1	85933440	90.7
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	9.6	9.6 29838	3.00	463.2	89514	41.5
Scenedesmus (several very small species/morphotypes)	CHLO	4.2	2.8 29838	113.00	11.5	3371694	38.8
Crucigenia apiculata	CHLO	7.0	4.2 29838	28.00	41.2	835464	34.4
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	5.6	5.6 29838	12.00	92.0	358056	32.9
Tetraedron trigonum	CHLO	9.6	9.6 29838	2.00	294.9	59676	17.6
Oocystis sp	CHLO	9.6	5.6 29838	3.00	157.6	89514	14.1
Siderocelis (several species or morphs)	CHLO	11.2	7.0 29838	1.00	287.4	29838	8.6
Oocystis sp	CHLO	11.2	7.0 29838	1.00	287.4	29838	8.6
Scenedesmus quadricauda	CHLO	8.4	4.2 29838	4.00	51.7	119352	6.2
Raphidocelis spp/Gloeoactinium limneticum (difficult to distinguish)	CHLO	2.8	2.0 29838	32.00	4.4	954816	4.2
Coelastrum cf pseudmicroporum	CHLO	5.6	5.6 1000	40.00	92.0	40000	3.7
Coelastrum cf pseudmicroporum	CHLO	9.6	9.6 1000	8.00	463.2	8000	3.7
Monoraphidium contortum	CHLO	21.0	2.0 29838	2.00	33.0	59676	2.0
Scenedesmus quadricauda	CHLO	11.2	4.2 1000	28.00	69.0	28000	1.9
Dictochlorella/ Dictyosphaerium primarum	CHLO	2.8	2.8 29838	4.00	11.5	119352	1.4
Oocystis sp	CHLO	9.6	5.6 1000	4.00	157.6	4000	0.6
Rhodomonas minuta	CRYP	7.0	4.2 29838	11.00	43.1	328218	14.1
Aphanocapsa spp	CYAN	1.4	1.4 29838	200.00	1.4	5967600	8.6
Anabaena/Anabaenopsis akinete	CYAN	21.0	4.2 29838	1.00	194.0	29838	5.8
Cyclotella meneghiniana	DIAT	14.0	7.0 29838	11.00	538.8	328218	176.8
Cyclotella meneghiniana	DIAT	9.0	5.6 29838	30.00	178.1	895140	159.4
Cyclotella meneghiniana	DIAT	16.0	8.4 29838	4.00	844.5	119352	100.8
Biddulphia (syn Pleurosira)	DIAT	50.0	50.0 1000	1.00	98174.8	1000	98.2
Cocconeis pediculus	DIAT	24.0	18.0 1000	18.00	2035.8	18000	36.6
Cyclotella meneghiniana	DIAT	20.0	10.0 1000	4.00	1570.8	4000	6.3
Nitzschia sp	DIAT	50.0	8.4 1000	5.00	923.6	5000	4.6
Surirella ovata/ovalis	DIAT	28.0	20.0 1000	1.00	2932.2	1000	2.9
Navicula cf cryptocephela/cryptotenella/gregaria	DIAT	32.0	7.0 1000	6.00	410.5	6000	2.5
Nitzschia cf linearis	DIAT	44.0	8.4 1000	3.00	812.8	3000	2.4
Rhicosphenia curvata	DIAT	24.0	8.4 1000	5.00	443.3	5000	2.2
Navicula cf digioradiata (need SEM ID (N.tripunctata/N.margalathi))	DIAT	28.0	8.4 1000	2.00	517.2	2000	1.0
Nitzschia acicularis	DIAT	45.0	2.8 1000	9.00	92.4	9000	0.8
Nitzschia closterium (possible syn N longissima)	DIAT	28.0	2.8 1000	2.00	57.5	2000	0.1
Euglena sp	EUGL	28.0	14.0 1000	1.00	2873.5	1000	2.9
Ciliate	PROT	20.0	20.0 1000	1.00	4188.8	1000	4.2

Phyto Diversity:	Cell number:	0.31	Biomass:	0.895
	mg/m^3	%	Cells/L	%
Cyanophyta	14.4	1.2	5997438	5.8
Chlorophyta	536.1	46.1	96486578	92.6
Euglenophyta	2.9	0.2	1000	0.0
Chrysophyceae	0	0.0	0	0.0
Diatomeae	594.8	51.2	1398710	1.3
Cryptophyceae	14.1	1.2	328218	0.3
Peridineae	0	0.0	0	0.0
TOTAL	1162.3		104211944	

		Ratio to phyto total
Protozoa	4.2	1000	0.004

Assiniboine R | Station 8c | 13-Aug-02 | Volume 2 ml

Taxon	Group	Length	Width	Factor	Count	Volume	Cells/L	mg/m^3
Ugreens (tiny pico greens)	CHLO	1.4	1.2	29838	3600.00	1.1	107416800	113.4
Siderocelis (several species or morphs)	CHLO	5.6	4.2	29838	37.00	51.7	1104006	57.1
Scenedesmus (several very small species/morphotypes)	CHLO	5.6	3.0	29838	70.00	17.6	2088660	36.7
Colonial green	CHLO	7.0	7.0	29838	3.00	179.6	89514	16.1
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	3.0	3.0	29838	31.00	14.1	924978	13.1
Closterium dianne	CHLO	140.0	16.0	1000	1.00	9382.9	1000	9.4
Raphidocelis spp/Gloeoactinium limneticum (difficult to distinguish)	CHLO	4.2	2.0	29838	36.00	6.6	1074168	7.1
Crucigenia apiculata	CHLO	5.6	4.2	1000	112.00	32.9	112000	3.7
Oocystis sp	CHLO	8.4	7.0	1000	12.00	215.5	12000	2.6
Scenedesmus quadricauda	CHLO	11.2	4.2	1000	36.00	69.0	36000	2.5
Filamentous green	CHLO	14.0	2.0	29838	1.00	44.0	29838	1.3
Crucigenia tetrapedia	CHLO	5.6	4.2	29838	1.00	32.9	29838	1.0
Monoraphidium contortum	CHLO	14.0	1.0	29838	1.00	5.5	29838	0.2
small chrysophytes	CHRY	4.2	4.2	29838	7.00	38.8	208866	8.1
Large chrysophytes (ochromonas spp)	CHRY	5.6	4.2	29838	2.00	51.7	59676	3.1
Rhodomonas minuta	CRYP	6.0	4.2	29838	9.00	36.9	268542	9.9
Cryptomonas sp	CRYP	11.2	5.6	1000	1.00	122.6	1000	0.1
Synechocystis sp	CYAN	4.2	4.2	29838	4.00	38.8	119352	4.6
Small bluegreens (pico blue greens)	CYAN	2.0	2.0	29838	16.00	4.2	477408	2.0
Gyrosigma attenuatum	DIAT	150.0	16.0	1000	15.00	10053.1	15000	150.8
small centrics (Stephanodiscus, Cyclostephanos, Cyclotella species)	DIAT	8.4	5.6	29838	13.00	155.2	387894	60.2
Cocconeis pediculus	DIAT	28.0	20.0	1000	13.00	2932.2	13000	38.1
Rhicosphenia curvata	DIAT	21.0	9.6	29838	2.00	506.7	59676	30.2
Cyclotella meneghiniana	DIAT	16.0	8.4	29838	1.00	844.5	29838	25.2
Nitzschia sp	DIAT	16.0	2.8	29838	24.00	32.8	716112	23.5
Navicula cf cryptocephela/cryptotenella/gregaria	DIAT	28.0	7.0	1000	33.00	359.2	33000	11.9
Nitzschia sp	DIAT	84.0	11.2	1000	2.00	2758.6	2000	5.5
Cyclotella meneghiniana	DIAT	20.0	10.0	1000	3.00	1570.8	3000	4.7
Cyclotella meneghiniana	DIAT	20.0	10.0	1000	3.00	1570.8	3000	4.7
Surirella ovata/ovalis	DIAT	28.0	22.0	1000	1.00	3547.9	1000	3.5
Navicula sp(small species requires SEM)	DIAT	33.0	8.4	1000	3.00	609.6	3000	1.8
Nitzschia closterium (possible syn N longissima)	DIAT	28.0	4.2	1000	12.00	129.3	12000	1.6
Nitzschia closterium (possible syn N longissima)	DIAT	28.0	4.2	1000	12.00	129.3	12000	1.6
Nitzschia sp	DIAT	70.0	5.6	1000	2.00	574.7	2000	1.1
Achnanthes sp	DIAT	8.4	2.0	29838	2.00	8.8	59676	0.5
Nitzschia sp	DIAT	35.0	4.2	1000	2.00	161.6	2000	0.3
Nitzschia acicularis	DIAT	50.0	2.0	1000	1.00	52.4	1000	0.1
Ciliate	PROT	33.0	20.0	1000	1.00	6911.5	1000	6.9
Scuticociliates	PROT	16.0	12.0	1000	1.00	1206.4	1000	1.2

Phyto Diversity:	Cell number:	0.134	Biomass:	0.889
	mg/m^3	%	Cells/L	%
Cyanophyta	6.6	1.0	596760	0.5
Chlorophyta	264.1	40.2	112948640	97.8
Euglenophyta	0	0.0	0	0.0
Chrysophyceae	11.2	1.7	268542	0.2
Diatomeae	365.4	55.6	1355196	1.2
Cryptophyceae	10	1.5	269542	0.2
Peridineae	0	0.0	0	0.0
TOTAL	657.3		115438680	

			Ratio to phyto total
Protozoa	8.1	2000	0.012

Assiniboine R	Station 8C			27-Aug-02	Volume 2 ml		
Taxon	Group	Length	Width Factor	Count	Volume	Cells/L	mg/m^3
Oocystis solitaria	CHLO	16.0	14.0 29838	4.00	1642.0	119352	196.0
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	8.4	8.4 29838	12.00	310.3	358056	111.1
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	3.0	2.8 29838	259.00	12.3	7728042	95.2
Scenedesmus quadricauda	CHLO	20.0	5.6 29838	12.00	218.9	358056	78.4
Ugreens (tiny pico greens)	CHLO	1.4	1.2 29838	1530.00	1.1	45652140	48.2
Oocystis sp	CHLO	8.4	7.0 29838	6.00	215.5	179028	38.6
Oocystis sp	CHLO	5.6	2.8 29838	52.00	23.0	1551576	35.7
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	5.0	5.0 29838	18.00	65.4	537084	35.2
Oocystis sp	CHLO	11.2	9.6 29838	1.00	540.5	29838	16.1
Tetraedron minimum	CHLO	5.6	5.6 29838	9.00	58.5	268542	15.7
Scenedesmus (several very small species/morphotypes)	CHLO	5.6	2.0 29838	32.00	7.8	954816	7.5
Treubaria triappendiculata	CHLO	8.4	8.4 29838	1.00	197.6	29838	5.9
Monoraphidium griffithii	CHLO	28.0	2.0 29838	4.00	44.0	119352	5.2
Pediastrum duplex	CHLO	8.4	7.0 1000	48.00	86.2	48000	4.1
Francia sp	CHLO	7.0	4.2 29838	2.00	64.7	59676	3.9
Didymocystis spp	CHLO	5.6	2.0 29838	16.00	7.8	477408	3.7
Nephrochlamy	CHLO	11.2	4.2 29838	2.00	51.7	59676	3.1
Tetrastrum sp	CHLO	4.2	4.2 29838	4.00	24.7	119352	2.9
Closterium kuetzinginanum	CHLO	400.0	4.2 1000	1.00	1847.3	1000	1.8
Scenedesmus spinosa	CHLO	7.0	2.8 29838	2.00	19.2	59676	1.1
Tetrastrum staurogeniaforme	CHLO	2.8	2.8 29838	4.00	7.3	119352	0.9
Monoraphidium contortum	CHLO	11.2	1.0 29838	4.00	4.4	119352	0.5
Actinastrum hantzschii	CHLO	20.0	2.8 1000	6.00	61.6	6000	0.4
Lagerheimia wratislaviense	CHLO	5.6	2.0 29838	1.00	7.8	29838	0.2
Ochromonads	CHRY	5.6	5.6 29838	3.00	92.0	89514	8.2
Rhodomonas minuta	CRYP	7.0	4.2 29838	6.00	43.1	179028	7.7
Anabaena flos aquae	CYAN	5.6	4.2 29838	466.00	51.7	13904508	719.2
Planktothrix suspensus	CYAN	100.0	4.2 1000	32.00	1385.4	32000	44.3
Aphanizomenon issatchenkoi	CYAN	100.0	2.8 29838	1.00	615.8	29838	18.4
Microcystis sp (includes morphotypes of all others)	CYAN	3.0	3.0 1000	1000.00	14.1	1000000	14.1
Anabaena crassa	CYAN	11.2	6.8 1000	40.00	271.2	40000	10.8
Pseudanabaena sp	CYAN	100.0	1.4 1000	20.00	153.9	20000	3.1
Synedra ulna	DIAT	200.0	4.2 29838	16.00	923.6	477408	440.9
Nitzschia sp	DIAT	11.2	2.0 29838	473.00	11.7	14113374	165.5
Biddulphia (syn Pleurosira)	DIAT	30.0	20.0 1000	10.00	9424.8	10000	94.2
small centrics (Stephanodiscus, Cyclostephanos, Cyclotella species)	DIAT	5.0	2.8 29838	30.00	27.5	895140	24.6
Nitzschia acicularis	DIAT	70.0	2.8 29838	5.00	143.7	149190	21.4
small centrics (Stephanodiscus, Cyclostephanos, Cyclotella species)	DIAT	2.8	2.8 29838	79.00	8.6	2357202	20.3
Nitzschia palae/palaceae	DIAT	28.0	2.8 29838	4.00	57.5	119352	6.9
Synedra cf acus	DIAT	98.0	3.0 29838	1.00	230.9	29838	6.9
Surirella spirale	DIAT	44.0	20.0 1000	1.00	4607.7	1000	4.6
Navicula sp (small species requires SEM)	DIAT	11.2	5.6 29838	1.00	92.0	29838	2.7
Surirella cf brebissoni	DIAT	20.0	9.6 1000	1.00	482.5	1000	0.5
Navicula sp (small species requires SEM)	DIAT	28.0	7.0 1000	1.00	359.2	1000	0.4
Anabaena/Anabaenopsis heterocyst	HETE	7.0	5.6 29838	16.00	0.0	477408	0.0
Heliozoan spp	PROT	20.0	20.0 1000	2.00	4188.8	2000	8.4
Holophyra (type ciliate)	PROT	28.0	20.0 1000	1.00	5864.3	1000	5.9

Phyto Diversity:	Cell number:	0.70	Biomass:	0.848
	mg/m^3	%	Cells/L	%
Cyanophyta	810	34.8	15026346	16.3
Chlorophyta	711.5	30.6	58985050	63.8
Euglenophyta	0	0.0	0	0.0
Chrysophyceae	8.2	0.4	89514	0.1
Diatomeae	789	33.9	18184342	19.7
Cryptophyceae	7.7	0.3	179028	0.2
Peridineae	0	0.0	0	0.0
TOTAL	2326.4		92464280	

			Ratio to phyto total
Protozoa	14.2	3000	0	0.006
Heterocysts	0	477408	0	0.000

Assiniboine R	Station 8C			03-Sep-02	Volume 2 ml		
Taxon	Group	Length	Width Factor	Count	Volume	Cells/L	mg/m^3
Botryococcus braunii	CHLO	100.0	80.0 1000	1.00	223402.3	1000	223.4
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	8.4	8.4 29838	24.00	310.3	716112	222.2
Siderocelis (several species or morphs)	CHLO	5.6	2.8 29838	225.00	23.0	6713550	154.3
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	2.8	2.0 29838	428.00	5.9	12770664	74.9
Raphidocelis spp/Gloeoactinium limneticum (difficult to distinguish)	CHLO	2.8	1.4 29838	519.00	2.2	15485922	33.4
Oocystis cp	CHLO	9.6	5.6 29838	4.00	157.6	119352	18.8
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	2.0	2.0 29838	113.00	4.2	3371694	14.1
Coelastrum cf pseudmicroporum	CHLO	5.6	4.2 29838	8.00	51.7	238704	12.3
Treubaria triappendiculata	CHLO	8.4	8.4 29838	2.00	197.6	59676	11.8
Actinastrum hantzschii	CHLO	16.0	2.8 29838	8.00	49.3	238704	11.8
Actinastrum hantzschii	CHLO	16.0	2.8 29838	8.00	49.3	238704	11.8
Coelastrum microporum	CHLO	4.2	4.2 29838	8.00	38.8	238704	9.3
Scenedesmus opoliensis	CHLO	12.6	4.0 29838	4.00	70.4	119352	8.4
Planktonema lauterbornii	CHLO	14.0	3.0 29838	2.00	99.0	59676	5.9
Pediastrum duplex	CHLO	16.0	14.0 1000	8.00	625.5	8000	5.0
Monoraphidium contortum	CHLO	14.0	2.0 29838	7.00	22.0	208866	4.6
Scenedesmus (several very small species/morphotypes)	CHLO	5.6	2.8 29838	9.00	15.3	268542	4.1
Planktonema lauterbornii	CHLO	7.0	2.8 1000	88.00	43.1	88000	3.8
Nephrochlamy	CHLO	11.2	2.8 29838	5.00	23.0	149190	3.4
Scenedesmus (several very small species/morphotypes)	CHLO	4.2	2.0 29838	8.00	5.9	238704	1.4
Scenedesmus quadricauda	CHLO	16.0	5.6 1000	8.00	175.1	8000	1.4
Didymocystis spp	CHLO	5.6	2.0 29838	5.00	7.8	149190	1.2
Raphidocelis spp/Gloeoactinium limneticum (difficult to distinguish)	CHLO	5.6	2.0 29838	4.00	8.8	119352	1.0
Monoraphidium minutum	CHLO	5.6	2.0 29838	2.00	11.7	59676	0.7
Lagerheimia wratislaviense	CHLO	5.6	2.8 29838	1.00	15.3	29838	0.5
Ochromonads	CHRY	5.0	4.2 29838	1.00	46.2	29838	1.4
Rhodomonas minuta	CRYP	7.0	5.0 29838	6.00	61.1	179028	10.9
Anabaena flos aquae	CYAN	5.6	5.6 1000	690.00	92.0	690000	63.4
Aphanocapsa incerta	CYAN	1.0	1.0 29838	2100.00	0.5	62659800	32.8
Anabaena cf compacta	CYAN	7.0	5.6 29838	8.00	114.9	238704	27.4
Planktothrix suspensus	CYAN	100.0	4.2 1000	15.00	1385.4	15000	20.8
Chroococcus sp	CYAN	2.8	2.0 29838	90.00	5.9	2685420	15.7
Aphanocapsa spp	CYAN	3.0	3.0 29838	25.00	14.1	745950	10.5
Lemmermaniella pallida	CYAN	1.0	1.0 29838	400.00	0.5	11935200	6.2
Microcystis sp (includes morphotypes of all others)	CYAN	2.0	2.0 29838	45.00	4.2	1342710	5.6
Merismopedia tenuissima	CYAN	1.0	1.0 29838	272.00	0.5	8115936	4.2
Anabaenopsis cf circularis	CYAN	7.0	5.6 1000	16.00	114.9	16000	1.8
Microcystis flos aquae	CYAN	4.0	3.0 1000	50.00	18.8	50000	0.9
Nitzschia sp	DIAT	11.2	2.8 29838	304.00	23.0	9070752	208.5
Surirella spp	DIAT	100.0	50.0 1000	2.00	65449.8	2000	130.9
small centrics (Stephanodiscus, Cyclostephanos, Cyclotella species)	DIAT	4.2	2.8 29838	157.00	19.4	4684566	90.9
Synedra ulna	DIAT	200.0	4.2 29838	2.00	923.6	59676	55.1
Nitzschia tryboniella (types)	DIAT	18.0	7.0 29838	4.00	230.9	119352	27.6
Bacillaria paradoxa	DIAT	70.0	8.4 1000	19.00	1293.1	19000	24.6
Cyclotella spp	DIAT	8.4	5.6 29838	4.00	155.2	119352	18.5
Surirella cf brebissoni	DIAT	20.0	9.6 29838	1.00	482.5	29838	14.4
Nitzschia palae/palaceae	DIAT	30.0	4.0 29838	3.00	125.7	89514	11.2
Navicula sp (small species requires SEM)	DIAT	14.0	7.0 29838	2.00	179.6	59676	10.7
Achnanthes sp	DIAT	9.6	8.4 29838	1.00	177.3	29838	5.3
Cyclotella meneghiniana	DIAT	20.0	10.0 1000	2.00	1570.8	2000	3.1
Surirella ovata/ovalis	DIAT	28.0	20.0 1000	1.00	2932.2	1000	2.9
Navicula gregaria (also includes some N. cryptocephela)	DIAT	22.0	7.0 1000	4.00	282.2	4000	1.1
Nitzschia closterium (possible syn N longissima)	DIAT	28.0	4.2 1000	2.00	129.3	2000	0.3
Rhizosolenia longiseta (syn Urosolenia longiseta eutrophic species)	DIAT	28.0	4.2 1000	1.00	258.6	1000	0.3
Euglena sp	EUGL	28.0	28.0 1000	1.00	11494.0	1000	11.5
Anabaena/Anabaenopsis heterocyst	HETE	7.0	7.0 29838	1.00	0.0	29838	0.0
Anabaena/Anabaenopsis heterocyst	HETE	7.0	7.0 1000	10.00	0.0	10000	0.0
Anabaena/Anabaenopsis heterocyst	HETE	5.0	4.2 1000	4.00	0.0	4000	0.0
Strobilidium sp	PROT	28.0	20.0 1000	2.00	5864.3	2000	11.7
Urotricha sp (common scuticociliate that feed on algae)	PROT	16.0	14.0 1000	1.00	1642.0	1000	1.6

Phyto Diversity:	Cell number:	0.775	Biomass:	0.923
	mg/m^3	%	Cells/L	%
Cyanophyta	189.7	11.4	88494720	61.2
Chlorophyta	839.5	50.6	41699172	28.8
Euglenophyta	11.5	0.7	1000	0.0
Chrysophyceae	1.4	0.1	29838	0.0
Diatomeae	605.4	36.5	14293564	9.9
Cryptophyceae	10.9	0.7	179028	0.1
Peridineae	0	0.0	0	0.0

Assiniboine R	Station 8C			11-Sep-02	Volume 2 ml		
Taxon	Group	Length	Width Factor	Count	Volume	Cells/L	mg/m^3
Closterium cf strigosum	CHLO	200.0	16.0 1000	10.00	13404.1	10000	134.0
Actinastrum hantzschii	CHLO	16.0	2.8 29838	16.00	49.3	477408	23.5
Pediastrum duplex	CHLO	11.2	9.6 1000	96.00	210.2	96000	20.2
Raphidocelis spp/Gloeoactinium limneticum (difficult to distinguish)	CHLO	3.0	1.4 29838	270.00	2.3	8056260	18.6
Dictosphaerium tetrachotum	CHLO	8.4	8.4 1000	48.00	310.3	48000	14.9
Phacotus lenticularis	CHLO	9.6	9.6 29838	1.00	308.8	29838	9.2
Scenedesmus (several very small species/morphotypes)	CHLO	8.4	2.8 29838	8.00	23.0	238704	5.5
Actinastrum hantzschii	CHLO	14.0	1.4 29838	16.00	10.8	477408	5.1
Scenedesmus (several very small species/morphotypes)	CHLO	5.6	4.2 29838	4.00	34.5	119352	4.1
Tetrastrum sp	CHLO	4.2	4.2 29838	4.00	24.7	119352	2.9
Monoraphidium contortum	CHLO	21.0	1.4 29838	1.00	16.2	29838	0.5
small chrysophytes	CHRY	3.0	2.8 29838	349.00	12.3	10413462	128.2
Synura sp	CHRY	14.0	8.4 29838	1.00	517.2	29838	15.4
Katablepharis ovalis	CRYP	5.6	4.2 29838	68.00	34.5	2028984	70.0
Aphanizomenon flos aquae	CYAN	5.6	5.0 29838	18450.00	110.0	550511100	60531.9
Planktothrix suspensus	CYAN	100.0	4.2 29838	68.00	1385.4	2028984	2811.0
Microcystis sp (includes morphotypes of all others)	CYAN	5.0	4.2 29838	1350.00	46.2	40281300	1860.2
Anabaena flos aquae	CYAN	5.6	5.6 29838	56.00	92.0	1670928	153.6
Microcystis aeruginosa	CYAN	5.0	4.2 1000	2500.00	46.2	2500000	115.5
Microcystis sp (includes morphotypes of all others)	CYAN	5.0	4.0 1000	2100.00	41.9	2100000	88.0
Anabaena/Anabaenopsis akinete	CYAN	18.0	11.2 29838	1.00	1182.2	29838	35.3
Pseudanabaena limnetica	CYAN	200.0	1.4 29838	1.00	307.9	29838	9.2
Phormidium sp	CYAN	200.0	4.2 1000	1.00	2770.9	1000	2.8
Anabaenopsis cf circularis	CYAN	7.0	5.6 1000	10.00	114.9	10000	1.1
Stephanodiscus & Cyclotella (impossible to split in LM)	DIAT	7.0	4.2 29838	124.00	80.8	3699912	299.0
Stephanodiscus & Cyclotella (impossible to split in LM)	DIAT	14.0	7.0 29838	13.00	538.8	387894	209.0
Aulacoseira granulata	DIAT	28.0	4.2 29838	10.00	387.9	298380	115.7
small centrics (Stephanodiscus, Cyclostephanos, Cyclotella species)	DIAT	4.2	3.0 29838	79.00	20.8	2357202	49.0
Biddulphia (syn Pleurosira)	DIAT	30.0	20.0 1000	2.00	9424.8	2000	18.8
Nitzschia tryboniella (types)	DIAT	33.0	8.4 29838	1.00	609.6	29838	18.2
Nitzschia acicularis	DIAT	84.0	2.8 29838	3.00	172.4	89514	15.4
Nitzschia sp	DIAT	8.4	2.8 29838	23.00	17.2	686274	11.8
Aulacoseira granulata	DIAT	28.0	7.0 1000	8.00	1077.6	8000	8.6
Nitzschia palae/palaceae	DIAT	35.0	4.2 29838	1.00	161.6	29838	4.8
Nitzschia cf linearis	DIAT	70.0	2.8 29838	1.00	143.7	29838	4.3
Euglena cf tortus	EUGL	84.0	16.0 1000	1.00	11259.5	1000	11.3
Aphanizomenon heterocyst	HETE	9.6	5.6 29838	68.00	0.0	2028984	0.0
Anabaena/Anabaenopsis heterocyst	HETE	5.0	5.0 1000	2.00	0.0	2000	0.0
Glenodinium sp2	PERI	28.0	20.0 1000	23.00	5864.3	23000	134.9
Strobilidium sp	PROT	33.0	28.0 1000	9.00	13546.5	9000	121.9
Scuticociliates	PROT	28.0	16.0 29838	1.00	3753.2	29838	112.0
Scuticociliates	PROT	16.0	14.0 29838	1.00	1642.0	29838	49.0

Phyto Diversity:	Cell number:	0.23	Biomass:	0.180
	mg/m^3	%	Cells/L	%
Cyanophyta	65608.6	98.0	599162988	95.3
Chlorophyta	238.6	0.4	9702160	1.5
Euglenophyta	11.3	0.0	1000	0.0
Chrysophyceae	143.7	0.2	10443300	1.7
Diatomeae	754.8	1.1	7618690	1.2
Cryptophyceae	70	0.1	2028984	0.3
Peridineae	134.9	0.2	23000	0.0
TOTAL	66961.8		628980122	

		Ratio to phyto total
Protozoa	282.9	68676	0.004
Heterocysts	0	2030984	0.000

APPENDIX VI

PHYTOPLANKTON BIOMASS IN THE ASSINIBOINE RIVER (SITE 13) WEEKLY MONITORING

Assiniboine R | Station 13C | 15-Jul-02 | Volume 2 ml 2x

Taxon	Group	Length	Width	Factor	Count	Volume	Cells/L	mg/m^3
Pediastrum duplex	CHLO	16.0	8.4	29838	32.00	375.3	1909632	716.7
Ugreens (tiny pico greens)	CHLO	1.4	1.2	29838	8460.00	1.1	504858960	532.9
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	2.8	2.8	29838	720.00	11.5	42966720	493.9
Oocystis sp	CHLO	11.2	5.6	29838	34.00	183.9	2028984	373.1
Pediastrum duplex	CHLO	8.4	5.6	29838	80.00	69.0	4774080	329.2
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	2.0	2.0	29838	1240.00	4.2	73998240	310.0
Coelastrum cf pseudmicroporum	CHLO	5.6	5.6	29838	32.00	92.0	1909632	175.6
Crucigenia tetrapedia	CHLO	4.2	4.2	29838	79.00	24.7	4714404	116.4
Tetrastrum (granulated form)	CHLO	4.2	4.2	29838	45.00	24.7	2685420	66.3
Siderocelis (several species or morphs)	CHLO	5.0	3.0	29838	45.00	23.6	2685420	63.3
Scenedesmus quadricauda	CHLO	20.0	5.6	29838	4.00	218.9	238704	52.3
Actinastrum hantzschii	CHLO	18.0	2.0	29838	20.00	28.3	1193520	33.7
Scenedesmus bijugatus	CHLO	8.4	2.8	29838	16.00	23.0	954816	21.9
Phacotus lenticularis	CHLO	11.2	9.6	29838	1.00	360.3	59676	21.5
Tetrastrum (granulated form)	CHLO	2.8	2.8	29838	45.00	7.3	2685420	19.7
Tetrastrum staurogeniaforme	CHLO	5.6	5.6	29838	4.00	58.5	238704	14.0
Didymocystis spp	CHLO	4.2	2.0	29838	34.00	5.9	2028984	11.9
Scenedesmus bijugatus	CHLO	8.4	2.8	29838	8.00	23.0	477408	11.0
Tetrastrum heterocanthum	CHLO	2.8	2.8	29838	22.00	7.3	1312872	9.6
Crucigenia apiculata	CHLO	5.6	2.8	29838	11.00	14.6	656436	9.6
Scenedesmus acuminatus	CHLO	14.0	2.0	29838	8.00	19.5	477408	9.3
Scenedesmus opoliensis	CHLO	14.0	2.8	29838	4.00	38.3	238704	9.1
Monoraphidium contortum	CHLO	8.4	1.0	29838	34.00	3.3	2028984	6.7
Scenedesmus (several very small species/ morphotypes)	CHLO	5.0	2.0	29838	16.00	7.0	954816	6.7
Pediastrum boryanum	CHLO	11.2	9.6	1000	16.00	210.2	32000	6.7
Tetrastrum staurogeniaforme	CHLO	2.0	2.0	29838	34.00	2.7	2028984	5.4
Lagerheimia quatrata	CHLO	4.2	2.8	29838	1.00	17.2	59676	1.0
Monoraphidium cf braunii (includes pseudobraunii)	CHLO	42.0	2.0	1000	4.00	66.0	8000	0.5
Gloeactinium limneticum/small cells with Raphidocelis	CHRY	3.0	1.4	29838	11.00	3.1	656436	2.0
Aphanizomenon flos aquae	CYAN	100.0	4.2	29838	3.00	1385.4	179028	248.0
Aphanocapsa spp	CYAN	4.2	4.2	1000	1800.00	38.8	3600000	139.7
Merismopedia tenuissima	CYAN	1.0	1.0	29838	3960.00	0.5	236316960	123.7
Small bluegreens (pico blue greens)	CYAN	2.0	1.2	29838	90.00	1.5	5370840	8.1
Melosira varians	DIAT	20.0	16.0	29838	3.00	4021.2	179028	719.9
Nitzschia palae/palaceae	DIAT	35.0	4.2	29838	18.00	161.6	1074168	173.6
Cyclotella spp	DIAT	6.0	3.0	29838	68.00	42.4	4057968	172.1
Fragilaria crotenensis	DIAT	70.0	4.2	29838	6.00	323.3	358056	115.7
Surirella spp	DIAT	20.0	9.6	29838	4.00	482.5	238704	115.2
Nitzschia acicularis	DIAT	84.0	2.8	29838	8.00	172.4	477408	82.3
Nitzschia tryboniella (types)	DIAT	35.0	8.4	29838	2.00	646.5	119352	77.2
Cyclotella spp	DIAT	9.6	5.6	29838	6.00	202.7	358056	72.6
Auxospore	DIAT	40.0	40.0	1000	1.00	33510.3	2000	67.0
Cyclotella spp	DIAT	16.0	8.4	29838	1.00	844.5	59676	50.4
Nitzschia closterium (possible syn N longissima)	DIAT	28.0	2.8	29838	13.00	57.5	775788	44.6
Nitzschia gracilis	DIAT	70.0	3.0	29838	4.00	164.9	238704	39.4
Nitzschia sp	DIAT	75.0	11.2	1000	8.00	2463.0	16000	39.4
Navicula cf cryptocephela/cryptotenella/gregaria	DIAT	28.0	8.4	29838	1.00	517.2	59676	30.9
Surirella ovata/ovalis	DIAT	28.0	25.0	1000	3.00	4581.5	6000	27.5
Achnanthes sp	DIAT	14.0	5.6	29838	2.00	114.9	119352	13.7
Surirella spp	DIAT	33.0	28.0	1000	1.00	6773.3	2000	13.5
Tryboniella cf levidensis	DIAT	11.2	8.4	29838	1.00	206.9	59676	12.3
Navicula gregaria (also includes some N. cryptocephela)	DIAT	22.0	5.6	29838	1.00	180.6	59676	10.8
Benthic diatom	DIAT	38.0	12.0	1000	1.00	1432.6	2000	2.9
Navicula cf cryptocephela/cryptotenella/gregaria	DIAT	25.0	8.0	1000	2.00	418.9	4000	1.7
Navicula cf digioradiata (need SEM ID (N.tripunctata/N.margalathi))	DIAT	38.0	8.4	1000	1.00	702.0	2000	1.4
Nitzschia gracilis	DIAT	100.0	4.2	1000	1.00	461.8	2000	0.9
Achnanthes sp	DIAT	11.2	2.0	29838	1.00	11.7	59676	0.7
Euglena sp	EUGL	44.0	16.0	1000	1.00	5897.8	2000	11.8
Euglena sp	EUGL	50.0	11.2	1000	1.00	3284.0	2000	6.6
Strobomonas (fluviatile & morphs)	EUGL	20.0	18.0	1000	1.00	2261.9	2000	4.5
Strobomonas (fluviatile & morphs)	EUGL	16.0	12.0	1000	1.00	804.2	2000	1.6
Aphanizomenon heterocyst	HETE	9.6	5.0	1000	7.00	0.0	14000	0.0
Gymnodinium sp3	PERI	16.0	16.0	1000	1.00	1429.8	2000	2.9
Tintinnidium fluviatile	PROT	28.0	20.0	29838	1.00	5864.3	59676	350.0
Vorticella sp (commonly associated with Anabaena colonies)	PROT	25.0	25.0	1000	7.00	8181.2	14000	114.5

Phyto Diversity:	Cell number:	0.618	Biomass:	0.937

	mg/m^3	%	Cells/L	%
Cyanophyta	519.5	8.9	245466828	26.9
Chlorophyta	3428.1	58.5	658206604	72.1

Assiniboine R	Station 13C				29-Jul-02	Volume 2 ml		
Taxon	Group	Length	Width	Factor	Count	Volume	Cells/L	mg/m^3
Ugreens (tiny pico greens)	CHLO	1.4	1.2	29838	11025.00	1.1	328963950	347.2
Dictosphaerium tetrachotum	CHLO	5.6	4.2	29838	293.00	51.7	8742534	452.2
Coelastrum cf pseudmicroporum	CHLO	11.2	11.2	29838	8.00	735.6	238704	175.6
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	5.0	4.2	29838	113.00	46.2	3371694	155.7
Raphidocelis spp/Gloeoactinium limneticum (difficult to distinguish)	CHLO	4.2	1.4	29838	1181.00	3.2	35238678	113.9
Crucigenia quadrata	CHLO	4.2	4.2	29838	96.00	24.7	2864448	70.7
Siderocelis (several species or morphs)	CHLO	7.0	5.6	29838	13.00	114.9	387894	44.6
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	5.6	5.6	29838	5.00	92.0	149190	13.7
Siderocelis (several species or morphs)	CHLO	4.2	2.8	29838	23.00	17.2	686274	11.8
Tetrastrum (granulated form)	CHLO	4.2	4.2	29838	16.00	24.7	477408	11.8
Tetrastrum sp	CHLO	4.2	4.2	29838	16.00	24.7	477408	11.8
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	4.2	4.2	29838	10.00	38.8	298380	11.6
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	8.4	8.4	29838	1.00	310.3	29838	9.3
Scenedesmus (several very small species/morphotypes)	CHLO	5.0	2.8	29838	22.00	13.7	656436	9.0
Pediastrum duplex	CHLO	11.2	8.4	1000	48.00	183.9	48000	8.8
Oocystis borgei	CHLO	11.2	7.0	29838	1.00	287.4	29838	8.6
Crucigenia apiculata	CHLO	5.6	4.2	29838	8.00	32.9	238704	7.9
Pediastrum duplex	CHLO	8.4	5.6	1000	112.00	69.0	112000	7.7
Didymocystis spp	CHLO	8.4	2.8	29838	8.00	23.0	238704	5.5
Colonial green	CHLO	1.4	1.2	29838	160.00	1.1	4774080	5.0
Colonial green	CHLO	1.4	1.2	29838	160.00	1.1	4774080	5.0
Scenedesmus quadricauda	CHLO	18.0	4.2	1000	40.00	110.8	40000	4.4
Oocystis spp	CHLO	8.4	5.6	29838	1.00	137.9	29838	4.1
Oocystis spp	CHLO	15.0	2.0	29838	4.00	31.4	119352	3.7
Oocystis submarina	CHLO	5.6	4.2	29838	2.00	51.7	59676	3.1
Pediastrum duplex	CHLO	7.0	5.6	1000	58.00	47.9	58000	2.8
Didymocystis spp	CHLO	4.2	2.0	29838	14.00	5.9	417732	2.4
Scenedesmus (several very small species/morphotypes)	CHLO	8.4	2.8	29838	2.00	23.0	59676	1.4
Scenedesmus bijugatus	CHLO	9.6	4.2	1000	16.00	59.1	16000	0.9
Scenedesmus acuminatus	CHLO	20.0	5.6	1000	4.00	218.9	4000	0.9
Monoraphidium contortum	CHLO	12.6	1.4	29838	3.00	9.7	89514	0.9
lagerheimia quatrata	CHLO	2.8	2.0	29838	1.00	5.9	29838	0.2
Spermatozoa exaltans	CHLO	2.8	1.4	29838	1.00	4.3	29838	0.1
Merismopedia tenuissima	CYAN	1.0	1.0	29838	990.00	0.5	29539620	15.5
Merismopedia glauca	CYAN	2.0	2.0	29838	90.00	4.2	2685420	11.2
Skeletonema potomus	DIAT	7.0	3.0	29838	101.00	22.0	3013638	66.3
Cyclotella meneghiniana	DIAT	5.6	5.0	29838	15.00	61.6	447570	27.6
Nitzschia palae/palaceae	DIAT	40.0	4.2	29838	5.00	184.7	149190	27.6
Nitzschia closterium (possible syn N longissima)	DIAT	28.0	3.0	29838	9.00	66.0	268542	17.7
Nitzschia sp	DIAT	16.0	2.0	29838	29.00	16.8	865302	14.5
Nitzschia palae/palaceae	DIAT	24.0	2.8	29838	6.00	49.3	179028	8.8
Melosira varians	DIAT	33.0	12.6	1000	2.00	4114.8	2000	8.2
Nitzschia spp	DIAT	14.0	2.0	29838	16.00	14.7	477408	7.0
Nitzschia tryboniella (types)	DIAT	30.0	8.4	1000	5.00	554.2	5000	2.8
Navicula gregaria (also includes some N. cryptocephela)	DIAT	25.0	7.0	1000	8.00	320.7	8000	2.6
Nitzschia cf linearis	DIAT	70.0	8.4	1000	2.00	1293.1	2000	2.6
Cyclotella meneghiniana	DIAT	16.0	8.4	1000	3.00	844.5	3000	2.5
Nitzschia spp	DIAT	50.0	11.2	1000	1.00	1642.0	1000	1.6
Nitzschia spp	DIAT	70.0	2.8	1000	2.00	143.7	2000	0.3
Strobomonas (fluviatile & morphs)	EUGL	28.0	20.0	1000	4.00	3909.5	4000	15.6
Strobomonas (fluviatile & morphs)	EUGL	20.0	16.0	1000	1.00	1787.2	1000	1.8
Strobilidium sp	PROT	28.0	20.0	1000	5.00	5864.3	5000	29.3
Rotifer (not ID)	ROTI	74.0	44.0	1000	1.00	50008.6	1000	50.0

Phyto Diversity:	Cell number:	0.41	Biomass:	0.867
	mg/m^3	%	Cells/L	%
Cyanophyta	26.7	1.5	32225040	7.5
Chlorophyta	1512.5	86.6	393751706	91.3
Euglenophyta	17.4	1.0	5000	0.0
Chrysophyceae	0	0.0	0	0.0
Diatomeae	190	10.9	5423678	1.3
Cryptophyceae	0	0.0	0	0.0
Peridineae	0	0.0	0	0.0
TOTAL	1746.6		431405424	

		Ratio to phyto total
Protozoa	29.3	5000	0.017
Rotifers	50	1000	0.029

Assiniboine R | Station 13C | 07-Aug-02 | Volume 2 ml

Taxon	Group	Length	Width	Factor	Count	Volume	Cells/L	mg/m^3
Ugreens (tiny pico greens)	CHLO	1.4	1.2	29838	12870.00	1.1	384015060	405.4
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	3.0	3.0	29838	894.00	14.1	26675172	377.1
Siderocelis (several species or morphs)	CHLO	5.6	4.0	29838	225.00	46.9	6713550	315.0
Tetrastrum staurogeniaforme	CHLO	4.2	4.2	29838	225.00	24.7	6713550	165.8
Crucigenia apiculata	CHLO	5.6	4.2	29838	135.00	32.9	4028130	132.6
Collodictyon triciliatum (phagotroph eating greens & diatoms)	CHLO	14.0	14.0	29838	2.00	1436.8	59676	85.7
Didymocystis spp	CHLO	8.4	4.2	29838	45.00	51.7	1342710	69.4
Oocystis sp	CHLO	9.0	5.6	29838	14.00	147.8	417732	61.7
Raphidocelis spp/Gloeoactinium limneticum (difficult to distinguish)	CHLO	4.0	1.4	29838	574.00	3.1	17127012	52.7
Scenedesmus (several very small species/morphotypes)	CHLO	56.0	2.8	29838	9.00	153.3	268542	41.2
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	8.4	8.4	29838	4.00	310.3	119352	37.0
Scenedesmus (several very small species/morphotypes)	CHLO	5.6	4.2	29838	33.00	34.5	984654	34.0
Crucigenia quadrata	CHLO	5.0	5.0	29838	16.00	41.7	477408	19.9
Scenedesmus quadricauda	CHLO	12.0	4.2	29838	8.00	73.9	238704	17.6
Coelastrum cf pseudmicroporum	CHLO	8.4	8.4	1000	48.00	310.3	48000	14.9
Tetaedron caudatum	CHLO	8.4	8.4	29838	2.00	197.6	59676	11.8
Oocystis sp	CHLO	5.6	2.8	29838	12.00	23.0	358056	8.2
Monoraphidium contortum	CHLO	16.0	1.4	29838	17.00	12.3	507246	6.2
Didymocystis spp	CHLO	5.6	2.8	29838	12.00	15.3	358056	5.5
Koliella longissima	CHLO	78.0	1.0	29838	6.00	30.6	179028	5.5
Pediastrum duplex	CHLO	8.4	7.0	1000	64.00	86.2	64000	5.5
Scenedesmus quadricauda	CHLO	16.0	5.6	1000	20.00	175.1	20000	3.5
Kirchnerella lunaris	CHLO	8.0	2.0	29838	6.00	16.8	179028	3.0
Pediastrum duplex	CHLO	11.2	8.4	1000	16.00	183.9	16000	2.9
Scenedesmus (several very small species/morphotypes)	CHLO	8.4	2.0	29838	8.00	11.7	238704	2.8
Actinastrum hantzschii	CHLO	14.0	2.0	29838	4.00	22.0	119352	2.6
Filamentous green	CHLO	42.0	1.4	29838	1.00	64.7	29838	1.9
Tetraedron minimum	CHLO	5.6	5.6	29838	1.00	58.5	29838	1.7
Scenedesmus bijugatus	CHLO	8.4	2.8	1000	40.00	23.0	40000	0.9
Scenedesmus spinosa	CHLO	5.6	2.0	29838	2.00	7.8	59676	0.5
Lagerheimia genevensis	CHLO	4.2	2.0	29838	1.00	8.8	29838	0.3
Colonial green	CHLO	1.4	1.2	29838	4.00	1.1	119352	0.1
Rhodomonas minuta	CRYP	5.0	4.2	29838	113.00	30.8	3371694	103.8
Anabaena sp	CYAN	5.6	4.2	29838	380.00	51.7	11338440	586.5
Merismopedia tenuissima	CYAN	1.0	1.0	29838	2880.00	0.5	85933440	45.0
Aphanizomenon gracile	CYAN	50.0	5.6	1000	13.00	1231.5	13000	16.0
Aphanocapsa incerta	CYAN	1.0	1.0	29838	200.00	0.5	5967600	3.1
Aphanizomenon akinete	CYAN	60.0	8.4	1000	1.00	2216.7	1000	2.2
Cyclotella meneghiniana	DIAT	12.0	7.0	29838	8.00	395.8	238704	94.5
Surirella cf brebissoni	DIAT	22.0	9.6	29838	2.00	530.8	59676	31.7
Cyclotella meneghiniana	DIAT	7.0	5.6	29838	6.00	107.8	179028	19.3
Nitzschia closterium (possible syn N longissima)	DIAT	28.0	3.0	29838	9.00	66.0	268542	17.7
Nitzschia tryboniella (types)	DIAT	70.0	9.6	1000	10.00	1688.9	10000	16.9
Surirella ovata/ovalis	DIAT	33.0	20.0	1000	3.00	3455.8	3000	10.4
Nitzschia palae/palaceae	DIAT	56.0	4.2	29838	1.00	258.6	29838	7.7
Anomoneis cf sphaerophora	DIAT	71.0	20.0	1000	1.00	7435.1	1000	7.4
Skeletonema potomus	DIAT	5.6	2.8	29838	14.00	15.3	417732	6.4
Nitzschia palae/palaceae	DIAT	28.0	2.8	29838	3.00	57.5	89514	5.1
Nitzschia sp	DIAT	14.0	2.0	29838	11.00	14.7	328218	4.8
Cymatopleura solea	DIAT	44.0	16.0	1000	1.00	2948.9	1000	2.9
Tryboniella cf levidensis	DIAT	20.0	12.6	1000	1.00	831.3	1000	0.8
Strobomonas (fluviatile & morphs)	EUGL	44.0	20.0	1000	2.00	6143.6	2000	12.3
Aphanizomenon heterocyst	HETE	5.6	5.6	1000	9.00	0.0	9000	0.0
Strobilidium sp	PROT	33.0	20.0	1000	22.00	6911.5	22000	152.1
Askenasia sp	PROT	20.0	20.0	1000	2.00	4188.8	2000	8.4

Phyto Diversity: Cell number: 0.50 Biomass: 0.899

	mg/m^3	%	Cells/L	%
Cyanophyta	652.8	22.6	103253480	18.4
Chlorophyta	1893.2	65.6	451636940	80.7
Euglenophyta	12.3	0.4	2000	0.0
Chrysophyceae	0	0.0	0	0.0
Diatomeae	225.7	7.8	1627252	0.3
Cryptophyceae	103.8	3.6	3371694	0.6
Peridineae	0	0.0	0	0.0
TOTAL	2887.8		559891366	

		Ratio to phyto total
Protozoa	160.4	0.056

Assiniboine R	Station 13c			13-Aug-02	Volume 2ml		
Taxon	Group	Length	Width Factor	Count	Volume	Cells/L	mg/m^3
Pediastrum duplex	CHLO	14.0	9.6 29838	16.00	328.4	477408	156.8
Siderocelis (several species or morphs)	CHLO	4.2	2.8 29838	258.00	17.2	7698204	132.7
Raphidocelis spp/Gloeoactinium limneticum (difficult to distinguish)	CHLO	4.2	2.0 29838	506.00	6.6	15098028	99.6
Crucigenia apiculata	CHLO	5.6	4.2 29838	90.00	32.9	2685420	88.4
Dictyosphaerium sp	CHLO	4.2	2.8 29838	135.00	17.2	4028130	69.4
Scenedesmus (several very small species/morphotypes)	CHLO	8.4	4.2 29838	45.00	51.7	1342710	69.4
Ugreens (tiny pico greens)	CHLO	1.4	1.2 29838	1800.00	1.1	53708400	56.7
Scenedesmus (several very small species/morphotypes)	CHLO	13.0	4.2 29838	20.00	80.0	596760	47.8
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	2.8	2.8 29838	101.00	11.5	3013638	34.6
Tetrastrum sp	CHLO	4.2	4.2 29838	45.00	24.7	1342710	33.2
Pediastrum duplex	CHLO	8.4	5.6 29838	16.00	69.0	477408	32.9
Oocystis sp	CHLO	12.6	8.4 29838	2.00	465.5	59676	27.8
Scenedesmus (several very small species/morphotypes)	CHLO	5.6	2.0 29838	23.00	7.8	686274	5.4
Lagerheimia quatrata	CHLO	4.2	2.0 29838	11.00	8.8	328218	2.9
Rhodomonas minuta	CRYP	5.6	4.2 29838	34.00	34.5	1014492	35.0
Cryptomonas sp	CRYP	21.0	8.4 29838	1.00	517.2	29838	15.4
Merismopedia tenuissima	CYAN	1.0	1.0 29838	4680.00	0.5	139641840	73.1
Chroococcus minutus	CYAN	2.8	2.8 29838	24.00	11.5	716112	8.2
Cyclotella meneghiniana	DIAT	11.2	5.6 29838	14.00	275.9	417732	115.2
Nitzschia tryboniella (types)	DIAT	56.0	8.4 29838	2.00	1034.5	59676	61.7
Cyclotella meneghiniana	DIAT	7.0	4.2 29838	23.00	80.8	686274	55.5
Navicula gregaria (also includes some N. cryptocephela)	DIAT	28.0	8.4 29838	3.00	517.2	89514	46.3
Cyclotella meneghiniana	DIAT	4.2	2.8 29838	68.00	19.4	2028984	39.4
Cyclotella meneghiniana	DIAT	14.0	7.0 29838	1.00	538.8	29838	16.1
Skeletonema potomus	DIAT	7.0	2.8 29838	22.00	19.2	656436	12.6
Nitzschia gracilis	DIAT	100.0	2.8 29838	1.00	205.3	29838	6.1
Nitzschia sp	DIAT	20.0	4.0 29838	2.00	83.8	59676	5.0
Nitzschia closterium (possible syn N longissima)	DIAT	28.0	2.8 1000	12.00	57.5	12000	0.7
Strobomonas (fluviatile & morphs)	EUGL	33.0	24.0 29838	1.00	6635.0	29838	198.0
Strobilidium sp	PROT	33.0	28.0 29838	3.00	13546.5	89514	1212.6

Phyto Diversity:	Cell number:	0.596	Biomass:	0.938
	mg/m^3	%	Cells/L	%
Cyanophyta	81.3	5.3	140357952	59.2
Chlorophyta	857.7	55.5	91542984	38.6
Euglenophyta	198	12.8	29838	0.0
Chrysophyceae	0	0.0	0	0.0
Diatomeae	358.5	23.2	4069968	1.7
Cryptophyceae	50.4	3.3	1044330	0.4
Peridineae	0	0.0	0	0.0
TOTAL	1545.9		237045072	

		Ratio to phyto total
Protozoa	1212.6	0.784

Assiniboine R	Station 13C			20-Aug-02	Volume 2 ml		
Taxon	Group	Length	Width Factor	Count	Volume	Cells/L	mg/m^3
Chlorella/free Dictyosphaerium/free Coelastrum	CHLO	84	8.4 29838	20	3103.4	596760	1852
Dictosphaerium tetrachotum	CHLO	4.2	4.2 29838	788	38.8	23512344	912.1
small greens (Choricystis, Chlorella, Stichococcus)	CHLO	2.8	2.0 29838	3510	5.9	104731380	614.2
ugreens (tiny pico greens)	CHLO	1.4	1.2 29838	9090	1.1	271227420	286.3
Scenedesmus (several very small species/morphotypes)	CHLO	8.4	4.2 29838	72	51.7	2148336	111.1
Oocystis solitaria	CHLO	18	14.0 29838	2	1847.3	59676	110.2
Raphidocelis spp/Gloeoactinium limneticum (difficult to distinguish)	CHLO	4	1.4 29838	1069	3.1	31896822	98.2
Oocystis sp	CHLO	6	4.0 29838	58	50.3	1730604	87
Crucigenia apiculata	CHLO	5	3.0 29838	180	15	5370840	80.6
Tetrastrum sp	CHLO	3	3.0 29838	248	9	7399824	66.6
Oocystis sp	CHLO	4.2	2.8 29838	124	17.2	3699912	63.8
Oocystis sp	CHLO	8.4	5.0 29838	18	110	537084	59.1
Scenedesmus quadricauda	CHLO	14	4.2 29838	12	86.2	358056	30.9
Crucigenia quadrata	CHLO	2.8	2.8 29838	116	7.3	3461208	25.3
Pediastrum duplex	CHLO	16	11.2 1000	44	500.4	44000	22
Tetraedron caudatum	CHLO	8	8.0 29838	3	170.7	89514	15.3
Treubaria triappendiculata	CHLO	7	7.0 29838	4	114.3	119352	13.6
Crucigenia quadrata	CHLO	8.4	8.4 29838	2	197.6	59676	11.8
Monoraphidium circinale	CHLO	7	2.8 29838	16	21.6	477408	10.3
Crucigenia quadrata	CHLO	5.6	5.6 29838	5	58.5	149190	8.7
Scenedesmus (several very small species/morphotypes)	CHLO	4.2	2.8 29838	20	11.5	596760	6.9
Scenedesmus quadricauda	CHLO	20	5.6 1000	20	218.9	20000	4.4
Didymocystis sp	CHLO	5.6	2.8 29838	6	15.3	179028	2.7
Scenedesmus spinosa	CHLO	5.6	2.4 29838	8	11.3	238704	2.7
Cosmarium sp	CHLO	28	20.0 1000	1	2736.7	1000	2.7
Colonial green	CHLO	1.4	1.2 29838	60	1.1	1790280	1.9
Pediastrum duplex	CHLO	5.6	4.2 1000	80	23	80000	1.8
Rhodomonas minuta	CRYP	6	4.2 29838	20	36.9	596760	22
Chroococcus sp	CYAN	2	2.0 29838	158	4.2	4714404	19.7
Merismopedia tenuissima	CYAN	1	1.0 29838	640	0.5	19096320	10
Chroococcus sp	CYAN	5.6	5.6 1000	8	92	8000	0.7
Navicula cf cryptocephala/cryptotenella/gregaria	DIAT	28	8.4 29838	6	517.2	179028	92.6
Cyclotella meneghiniana	DIAT	9.6	4.2 29838	19	152	566922	86.2
Anomoneis cf sphaerophora	DIAT	42	16.0 29838	1	2814.9	29838	84
Cyclotella meneghiniana	DIAT	20	10.0 1000	19	1570.8	19000	29.8
Nitzschia closterium (possible syn N longissima)	DIAT	28	3.0 29838	10	66	298380	19.7
Navicula sp (small species requires SEM)	DIAT	21	7.0 29838	2	269.4	59676	16.1
small centrics (Stephanodiscus, Cyclostephanos, Cyclotella sp)	DIAT	5.6	4.2 29838	10	51.7	298380	15.4
Nitzschia sp	DIAT	8.4	2.0 29838	56	8.8	1670928	14.7
Epithemia sorex	DIAT	22	20.0 1000	6	2303.8	6000	13.8
Cymatopleura solea	DIAT	44	16.0 1000	3	2948.9	3000	8.8
Gyrosigma attenuatum	DIAT	84	20.0 1000	1	8796.5	1000	8.8
Nitzschia sp	DIAT	150	11.2 1000	1	4926	1000	4.9
Nitzschia palae/palaceae	DIAT	56	4.2 1000	14	258.6	14000	3.6
Surirella ovata/ovalis	DIAT	28	20.0 1000	1	2932.2	1000	2.9
Skeletonema potomus	DIAT	5.6	3.0 29838	5	17.6	149190	2.6
Nitzschia tryboniella (types)	DIAT	20	11.2 1000	4	656.8	4000	2.6
Nitzschia sp	DIAT	20	2.0 29838	4	20.9	119352	2.5
Nitzschia acicularis	DIAT	40	2.8 29838	1	82.1	29838	2.4
Nitzschia sp	DIAT	66	11.2 1000	1	2167.4	1000	2.2
Tryboniella cf levidensis	DIAT	20	16.0 1000	1	1340.4	1000	1.3
Nitzschia cf linearis	DIAT	50	8.4 1000	1	923.6	1000	0.9
Strobomonas (fluviatile & morphs)	EUGL	28	20.0 1000	1	3909.5	1000	3.9
Euglena ap	EUGL	50	8.4 1000	1	1847.3	1000	1.8
Strobilidium sp	PROT	33	28.0 1000	3	13546.5	3000	40.6
Urotricha sp (common Scuticociliate that feed on algae)	PROT	14	7.0 29838	2	359.2	59676	21.4

Phyto Diversity:	Cell number:	0.64	Biomass:	0.806
	mg/m^3	%	Cells/L	%
Cyanophyta	30.5	0.6	23818724	4.9
Chlorophyta	4502.2	90.5	460575178	94.3
Euglenophyta	5.8	0.1	2000	0
Chrysophyceae	0	0	0	0
Diatomeae	416.1	8.4	3453532	0.7
Cryptophyceae	22	0.4	596760	0.1
Peridineae	0	0	0	0
TOTAL	4976.6		488446194	

Ratio to phyto total

Assiniboine R | Station 13C | 03-Sep-02 | Volume 2 ml

Taxon	Group	Length	Width	Factor	Count	Volume	Cells/L	mg/m^3
Ugreens (tiny pico greens)	CHLO	1.4	1.2	29838	10530.00	1.1	314194140	331.7
Dictosphaerium tetrachotum	CHLO	5.0	4.2	29838	248.00	46.2	7399824	341.7
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	3.0	2.8	29838	574.00	12.3	17127012	210.9
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	8.0	8.0	29838	9.00	268.1	268542	72.0
Oocystis borgei	CHLO	11.2	8.4	29838	5.00	413.8	149190	61.7
Scenedesmus acuminatus	CHLO	100.0	2.8	29838	6.00	273.7	179028	49.0
Collodictyon triciliatum (phagotroph eating greens & diatoms)	CHLO	16.0	14.0	29838	1.00	1642.0	29838	49.0
Scenedesmus quadricauda	CHLO	16.0	5.6	29838	8.00	175.1	238704	41.8
Actinastrum hantzschii	CHLO	11.2	2.0	29838	74.00	17.6	2208012	38.8
Tetaedron caudatum	CHLO	14.0	14.0	29838	1.00	914.7	29838	27.3
Pediastrum duplex	CHLO	11.2	9.6	1000	128.00	210.2	128000	26.9
Scenedesmus (several very small species/morphotypes)	CHLO	9.6	2.8	29838	28.00	26.3	835464	21.9
Coelastrum microporum	CHLO	5.6	5.6	29838	8.00	92.0	238704	21.9
Raphidocelis spp/Gloeoactinium limneticum (difficult to distinguish)	CHLO	2.8	1.0	29838	585.00	1.1	17455230	19.2
Dictyosphaerium sp	CHLO	5.6	2.8	29838	28.00	23.0	835464	19.2
Francia sp	CHLO	11.2	8.4	29838	1.00	413.8	29838	12.3
Pediastrum duplex	CHLO	16.0	11.2	1000	24.00	500.4	24000	12.0
Tetrastrum sp	CHLO	8.4	8.4	29838	2.00	197.6	59676	11.8
Siderocelis (several species or morphs)	CHLO	8.0	5.6	29838	2.00	131.4	59676	7.8
Scenedesmus acuminatus	CHLO	20.0	4.2	29838	2.00	123.2	59676	7.3
Schroedaria setigera	CHLO	28.0	4.2	29838	1.00	194.0	29838	5.8
Treubaria triappendiculata	CHLO	5.6	5.6	29838	2.00	58.5	59676	3.5
Quadicoccus ellipsoidae	CHLO	7.0	2.8	29838	4.00	28.7	119352	3.4
Monoraphidium komarkovae	CHLO	35.0	2.0	29838	2.00	55.0	59676	3.3
Scenedesmus spinosa	CHLO	5.6	2.0	29838	12.00	7.8	358056	2.8
Oocystis sp	CHLO	9.6	4.2	29838	1.00	88.7	29838	2.6
Pediastrum boryanum	CHLO	9.6	8.4	1000	16.00	135.1	16000	2.2
Oocystis borgei	CHLO	11.2	8.4	1000	4.00	413.8	4000	1.7
Scenedesmus (several very small species/morphotypes)	CHLO	4.2	2.0	29838	8.00	5.9	238704	1.4
Scenedesmus spinosa	CHLO	8.4	2.0	29838	4.00	11.7	119352	1.4
Siderocelis (several species or morphs)	CHLO	5.0	2.8	29838	2.00	20.5	59676	1.2
Didymocystis spp	CHLO	5.6	2.8	29838	2.00	15.3	59676	0.9
Monoraphidium contortum	CHLO	8.4	1.0	29838	4.00	3.3	119352	0.4
Cryptomonas marsonii	CRYP	14.0	5.6	29838	1.00	153.3	29838	4.6
Rhodomonas minuta	CRYP	5.6	4.0	29838	4.00	31.3	119352	3.7
Planktothrix suspensus	CYAN	100.0	4.2	29838	19.00	1385.4	566922	785.4
Anabaena flos aquae	CYAN	5.0	4.2	29838	145.00	46.2	4326510	199.8
Aphanizomenon issatchenkoi	CYAN	100.0	2.0	29838	14.00	314.2	417732	131.2
Aphanocapsa incerta	CYAN	1.0	1.0	29838	1650.00	0.5	49232700	25.8
Chroococcus dispursus	CYAN	2.0	2.0	29838	180.00	4.2	5370840	22.5
Anabaena crassa	CYAN	9.6	7.0	1000	80.00	246.3	80000	19.7
Synechocystis sp	CYAN	5.6	5.6	29838	3.00	92.0	89514	8.2
Anabaenopsis cf circularis	CYAN	7.0	5.6	1000	56.00	114.9	56000	6.4
Anabaena mendotae	CYAN	5.6	4.2	1000	120.00	51.7	120000	6.2
Chroococcus dispursus	CYAN	1.0	1.0	29838	338.00	0.5	10085244	5.3
Anabaena sp	CYAN	4.2	4.2	1000	80.00	38.8	80000	3.1
Merismopedia tenuissima	CYAN	1.0	1.0	29838	158.00	0.5	4714404	2.5
Aphanocapsa spp	CYAN	2.8	2.8	1000	16.00	11.5	16000	0.2
Cyclotella meneghiniana	DIAT	14.0	7.0	29838	28.00	538.8	835464	450.1
Synedra ulna	DIAT	200.0	4.2	29838	7.00	923.6	208866	192.9
Nitzschia closterium (possible syn N longissima)	DIAT	66.0	4.2	29838	20.00	304.8	596760	181.9
small centrics (Stephanodiscus, Cyclostephanos, Cyclotella species)	DIAT	5.6	4.2	29838	84.00	51.7	2506392	129.6
Nitzschia acicularis	DIAT	84.0	2.8	29838	23.00	172.4	686274	118.3
Navicula sp (small species requires SEM)	DIAT	20.0	5.6	29838	2.00	164.2	59676	9.8
Gyrosigma attenuatum	DIAT	84.0	20.0	1000	1.00	8796.5	1000	8.8
Gyrosigma acuminatum	DIAT	125.0	16.0	1000	1.00	8377.6	1000	8.4
Amphora ovalis	DIAT	20.0	16.0	1000	3.00	2680.8	3000	8.0
Nitzschia tryboniella (types)	DIAT	55.0	7.0	1000	11.00	705.5	11000	7.8
Nitzschia palae/palaceae	DIAT	33.0	3.0	29838	3.00	77.8	89514	7.0
Cymatopleura solea	DIAT	66.0	20.0	1000	1.00	6911.5	1000	6.9
Anomoneis cf sphaerophora	DIAT	55.0	20.0	1000	1.00	5759.6	1000	5.8
Nitzschia sigma/sigmoidea (sigmoid complex)	DIAT	150.0	11.2	1000	1.00	4926.0	1000	4.9
Skeletonema potomus	DIAT	5.6	3.0	29838	8.00	17.6	238704	4.2
Surirella ovata/ovalis	DIAT	28.0	20.0	1000	1.00	2932.2	1000	2.9
Surirella cf brebissoni	DIAT	20.0	9.6	1000	1.00	482.5	1000	0.5
Nitzschia gracilis	DIAT	100.0	4.2	1000	1.00	461.8	1000	0.5
Nitzschia sp	DIAT	8.4	2.0	29838	1.00	8.8	29838	0.3
Euglena sp	EUGL	20.0	8.4	1000	4.00	738.9	4000	3.0
Phacus sp	EUGL	16.0	14.0	1000	1.00	1094.7	1000	1.1
Anabaena/Anabaenopsis heterocyst	HETE	7.0	7.0	29838	79.00	0.0	2357202	0.0
Anabaena/Anabaenopsis heterocyst	HETE	5.0	5.0	1000	12.00	0.0	12000	0.0

Assiniboine R	Station 13c			11-Sep-02	Volume 2 ml 2x		
Taxon	Group	Length	Width Factor	Count	Volume	Cells/L	mg/m^3
Ugreens (tiny pico greens)	CHLO	1.4	1.2 29838	3150.00	1.1	187979400	198.4
Collodictyon triciliatum (phagotroph eating greens & diatoms)	CHLO	14.0	12.0 29838	8.00	1055.6	477408	503.9
Pediastrum duplex	CHLO	11.2	8.4 29838	8.00	183.9	477408	87.8
Small greens (Choricystis, Chlorella, Stichococcus)	CHLO	3.0	2.8 29838	90.00	12.3	5370840	66.1
Dictosphaerium tetrachotum	CHLO	4.2	4.2 29838	28.00	38.8	1670928	64.8
Chlorella/free Dictyospaerium/freeCoelastrum	CHLO	7.0	7.0 29838	5.00	179.6	298380	53.6
Pediastrum duplex	CHLO	7.0	5.6 29838	16.00	47.9	954816	45.7
Ulothrix sp	CHLO	200.0	4.2 1000	5.00	2770.9	10000	27.7
Monoraphidium griffithii	CHLO	32.0	2.8 29838	4.00	98.5	238704	23.5
Oocystis sp	CHLO	7.0	5.6 29838	3.00	114.9	179028	20.6
Coelastrum cf pseudmicroporum	CHLO	5.6	4.2 29838	6.00	51.7	358056	18.5
Closterium cf strigosum	CHLO	220.0	12.6 1000	1.00	9143.9	2000	18.3
Siderocelis (several species or morphs)	CHLO	5.6	4.2 29838	5.00	51.7	298380	15.4
Scenedesmus quadricauda	CHLO	16.0	5.6 1000	31.00	175.1	62000	10.9
Phacotus lenticularis	CHLO	7.0	7.0 29838	1.00	119.7	59676	7.1
Oocystis sp	CHLO	11.2	8.4 1000	8.00	413.8	16000	6.6
Oocystis borgei	CHLO	11.2	8.4 1000	8.00	413.8	16000	6.6
Raphidocelis spp/Gloeoactinium limneticum (difficult to distinguish)	CHLO	2.8	1.4 29838	48.00	2.2	2864448	6.2
Scenedesmus (several very small species/morphotypes)	CHLO	4.2	2.8 29838	8.00	11.5	477408	5.5
Scenedesmus (several very small species/morphotypes)	CHLO	5.6	2.0 29838	8.00	7.8	477408	3.7
Crucigenia tetrapedia	CHLO	5.6	5.6 29838	1.00	58.5	59676	3.5
Scenedesmus acuminatus	CHLO	16.0	5.0 1000	8.00	139.6	16000	2.2
Monoraphidium contortum	CHLO	15.0	1.0 29838	4.00	5.9	238704	1.4
Lagerheimia wratislaviense	CHLO	4.2	2.8 29838	1.00	11.5	59676	0.7
small chrysophytes	CHRY	2.8	2.8 29838	101.00	11.5	6027276	69.3
Ochromonads	CHRY	5.6	5.6 29838	9.00	92.0	537084	49.4
Katablepharis ovalis	CRYP	5.6	4.2 29838	34.00	34.5	2028984	70.0
Rhodomonas minuta	CRYP	7.0	4.2 29838	4.00	43.1	238704	10.3
Aphanizomenon flos aquae	CYAN	5.0	4.2 29838	8100.00	69.3	483375600	33484.5
Anabaena sp	CYAN	4.2	4.2 29838	200.00	38.8	11935200	463.0
Anabaena flos aquae	CYAN	5.6	4.2 29838	128.00	51.7	7638528	395.1
Microcystis sp (includes morphotypes of all others)	CYAN	3.0	3.0 29838	256.00	14.1	15277056	216.0
Microcystis sp (includes morphotypes of all others)	CYAN	4.2	4.2 29838	28.00	38.8	1670928	64.8
Microcystis sp (includes morphotypes of all others)	CYAN	4.0	3.0 1000	1400.00	18.8	2800000	52.8
Woronichinia sp	CYAN	2.8	2.0 1000	1536.00	5.9	3072000	18.0
Anabaena cf compacta	CYAN	5.6	4.2 1000	144.00	51.7	288000	14.9
Pseudanabaena sp	CYAN	100.0	1.4 29838	1.00	153.9	59676	9.2
Merismopedia tenuissima	CYAN	1.0	1.0 29838	192.00	0.5	11457792	6.0
Anabaenopsis cf circularis	CYAN	7.0	5.6 1000	8.00	114.9	16000	1.8
Stephanodiscus & Cyclotella (impossible to split in LM)	DIAT	8.4	4.2 29838	45.00	116.4	2685420	312.5
Nitzschia tryboniella (types)	DIAT	42.0	6.0 29838	6.00	395.8	358056	141.7
small centrics (Stephanodiscus, Cyclostephanos, Cyclotella species)	DIAT	5.6	4.2 29838	34.00	51.7	2028984	104.9
Nitzschia closterium (possible syn N longissima)	DIAT	28.0	4.2 29838	12.00	129.3	716112	92.6
Nitzschia palae/palaceae	DIAT	35.0	5.6 29838	5.00	287.4	298380	85.7
Skeletonema potomus	DIAT	5.6	2.8 29838	79.00	15.3	4714404	72.3
Navicula cf digioradiata (need SEM ID (N.tripunctata/N.margalathi))	DIAT	42.0	8.4 29838	1.00	775.8	59676	46.3
Surirella ovata/ovalis	DIAT	28.0	20.0 1000	5.00	2932.2	10000	29.3
Gyrosigma acuminatum	DIAT	125.0	16.0 1000	1.00	8377.6	2000	16.8
Nitzschia acicularis	DIAT	56.0	2.8 29838	2.00	114.9	119352	13.7
Cymatopleura solea	DIAT	50.0	16.0 1000	2.00	3351.0	4000	13.4
Nitzschia sp	DIAT	14.0	2.0 29838	11.00	14.7	656436	9.6
Synedra ulna	DIAT	200.0	4.2 1000	4.00	923.6	8000	7.4
Navicula cf cryptocephela/cryptotenella/gregaria	DIAT	28.0	8.4 1000	7.00	517.2	14000	7.2
Nitzschia gracilis	DIAT	100.0	4.2 1000	4.00	461.8	8000	3.7
Euglena sp	EUGL	28.0	20.0 29838	1.00	5864.3	59676	350.0
Euglena sp	EUGL	20.0	11.2 1000	2.00	1313.6	4000	5.3
Aphanizomenon heterocyst	HETE	9.6	5.6 29838	85.00	0.0	5072460	0.0
Anabaena/Anabaenopsis heterocyst	HETE	5.6	5.6 29838	2.00	0.0	119352	0.0
Anabaena/Anabaenopsis heterocyst	HETE	5.6	4.2 29838	2.00	0.0	119352	0.0
Anabaena/Anabaenopsis heterocyst	HETE	4.2	0.0 1000	2.00	0.0	4000	0.0
Anabaena/Anabaenopsis heterocyst	HETE	5.6	5.6 1000	19.00	0.0	38000	0.0
Gymnodinium sp4	PERI	16.0	14.0 1000	1.00	1094.7	2000	2.2
Vorticella sp (commonly associated with Anabaena colonies)	PROT	28.0	28.0 1000	16.00	11494.0	32000	367.8
Vorticella sp (commonly associated with Anabaena colonies)	PROT	44.0	40.0 1000	2.00	36861.4	4000	147.4
Haltaria sp	PROT	20.0	16.0 1000	17.00	2680.8	34000	91.1
Ciliate	PROT	66.0	20.0 1000	1.00	13823.0	2000	27.6
Amoeba	PROT	8.4	8.4 29838	1.00	310.3	59676	18.5
Strombidium sp	PROT	28.0	20.0 1000	1.00	5864.3	2000	11.7
Scuticociliates	PROT	20.0	16.0 1000	1.00	2680.8	2000	5.4
Phyto Diversity:	Cell number:	0.53	Biomass:	0.199			