THE UNIVERSITY OF BRITISH COLUMBIA

# A REPORT ON THE OKANAGAN WATER INVESTIGATION 1968-69

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# A B S T R A C T

The study in 1968 was limited to two Okanagan lakes namely Skaha and Osoyoos. The monitoring program of 1967 indicated the need for a more detailed study of these two lakes.

Two transects were established on each lake and a bi-weekly sampling program instituted. In addition to the lake transects several miscellaneous sampling points were located to gain information on the chemical characteristics of inflow waters to the lakes. The chemical analyses were performed in the laboratory in Vancouver and the biological algae identification and counting analyses carried out at Oliver, B.C.

This report shows high algal counts of bloom populations during two periods in the summer. The conditions in north Osoyoos Lake appear to be more serious than expected from the 1967 investigation. There is a marked difference in the results, chemical and biological, between the north and south sections of the lake. This feature is reported in a graduate student thesis by D.M. Booth, University of British Columbia.

A discussion of the chemical and biological factors of both lakes together with the influence of inflow from the miscellaneous sampling points is presented with a complete set of field and laboratory data.

# OKANAGAN WATER INVESTIGATIONS 1968-69.

## Introduction.

During the summer of 1967, at the request of the British Columbia Department of Lands, Forests and Water Resources, Water Resources Service, Water Investigations Branch, the authors surveyed the water quality of three lakes of the Okanagan chain. Also one sampling point at the south end of Shuswap Lake, near Sicamous, was included.

The primary object was to determine the algae in the lakes together with some chemical and physical factors influencing their growth. That survey terminated in late August 1967 and was reported to the Water Investigations Branch (Coulthard and Stein 1968). Later in the season arrangements were made to sample some of the areas through the winter months for information on the lakes during the full 12 months period. Subsequently samples were taken on a monthly basis beginning in late October 1967 from the following locations:

1) Central Okanagan Lake, directly across from Kelowna.
2) South end of Okanagan Lake, near Kickinee Point.
3) South end of Skaha Lake, near Dolly Varden resort.
4) South end of Osoyoos Lake, near pumping plant intake.

Some of the data on the chemical analyses and algae present from these winter samples are included in the present report.

From information obtained during 1967 on the Okanagan Valley lakes, it was decided a more detailed and intensive program in certain lakes should be continued. This was due to the high algal populations in Skaha Lake, and the distinct signs of similar potential in Osoyoos Lake. Conclusions from the 1967 data showed that a more comprehensive sampling and analytical program should be undertaken on these two lakes. The problem is one of many overtones and affecting many areas of the economy and social welfare of the Okanagan Valley. This includes the recreational value of the area that is disturbed by the algal blooms during the summer, as well as economic considerations. In the south Osoyoos Lake area, water is pumped for domestic use and during mid-summer there was a definite taste and odor to the waters from approximately the 20 and 40 ft depths.

In the summer of 1968 two students, located in the Okanagan Valley, carried out the physical sampling and those analyses that must be done at the sampling locations. Chemical analyses were performed in the laboratory at the University of British Columbia. Sampling from May through August 1968 was scheduled on a fortnightly basis, whereas sampling from September through April 1969 was monthly. The summer sampling was conducted by Mr. D. Michael Booth and Mr. Guy Lautard; the former a graduate student studying water quality in the Department of Agricultural Engineering. The students were under the supervision of Professor T. L. Coulthard (Agricultural Engineering, U.B.C.) and Dr. J. R. Stein (Botany, U.B.C.). Headquarters for the survey team during the summer, as in the previous year, was the B.C. Water Investigations Branch Office in Oliver. As the students were not available after August, sampling was continued by the B.C. Fish and Wildlife Branch at Penticton under the direction of Mr. David Hurn. The laboratory analyses were performed by Mr. Gordon Davis, assisted by Miss A. Myers. Mr. Booth undertook the microscopic analyses and was assisted during the winter by Mr. Lorne Kastrukoff.

Financial assistance for the study was provided by the B.C. Water Resources Service for which grateful acknowledgment is hereby given. We offer sincere thanks to Mr. S. B. Mould, Hydraulic Engineer, Water Investigations Branch, Oliver, for assistance in the sampling program. Also, Mr. Jack Bone, Technical Wildlife Assistant, Fish and Wildlife Branch, Penticton, is gratefully acknowledged for his invaluable assistance in securing the winter samples.

## MATERIALS AND METHODS.

### Sampling Area:

Skaha and Osoyoos Lakes are at the south end of the Okanagan Valley system. Skaha Lake (Fig. 1) is south of Penticton and at the north end receives water through the Okanagan River from Okanagan Lake, a distance of 4 miles. Fig. 2b, and 2c shows the levels of Okanagan Lake at Penticton and the discharge for March through September 1968. The Okanagan River between Okanagan and Skaha Lakes receives effluent from the Penticton sewage treatment plant (secondary treatment) and untreated cannery waste (Aylmer cannery), as well as inflow from several creeks (i.e. Shingle and Ellis Creeks). The level of Skaha Lake at the south end (Okanagan Falls) and the discharge are shown in Fig. 2d, and 2e.

Osoyoos Lake (Fig. 3) receives water from Skaha Lake, a distance of 23 miles including Vaseux Lake, through the Okanagan River. This reach of the channel has 17 drop structures, each 3 ft high. The town of Oliver contributes secondarily treated sewage effluent into the river at an outfall located in the town approximately 3 miles upstream from Osoyoos Lake. The level of Osoyoos Lake at its southern end is shown in Fig. 2f which gives the data from Oroville, Washington (U.S.A.).

### Sampling Methods:

To obtain more detailed information on the two lakes, transects were established at the north and south end of each. The points, shown in Fig. 1 and 3, on each transect are equidistant in their location.

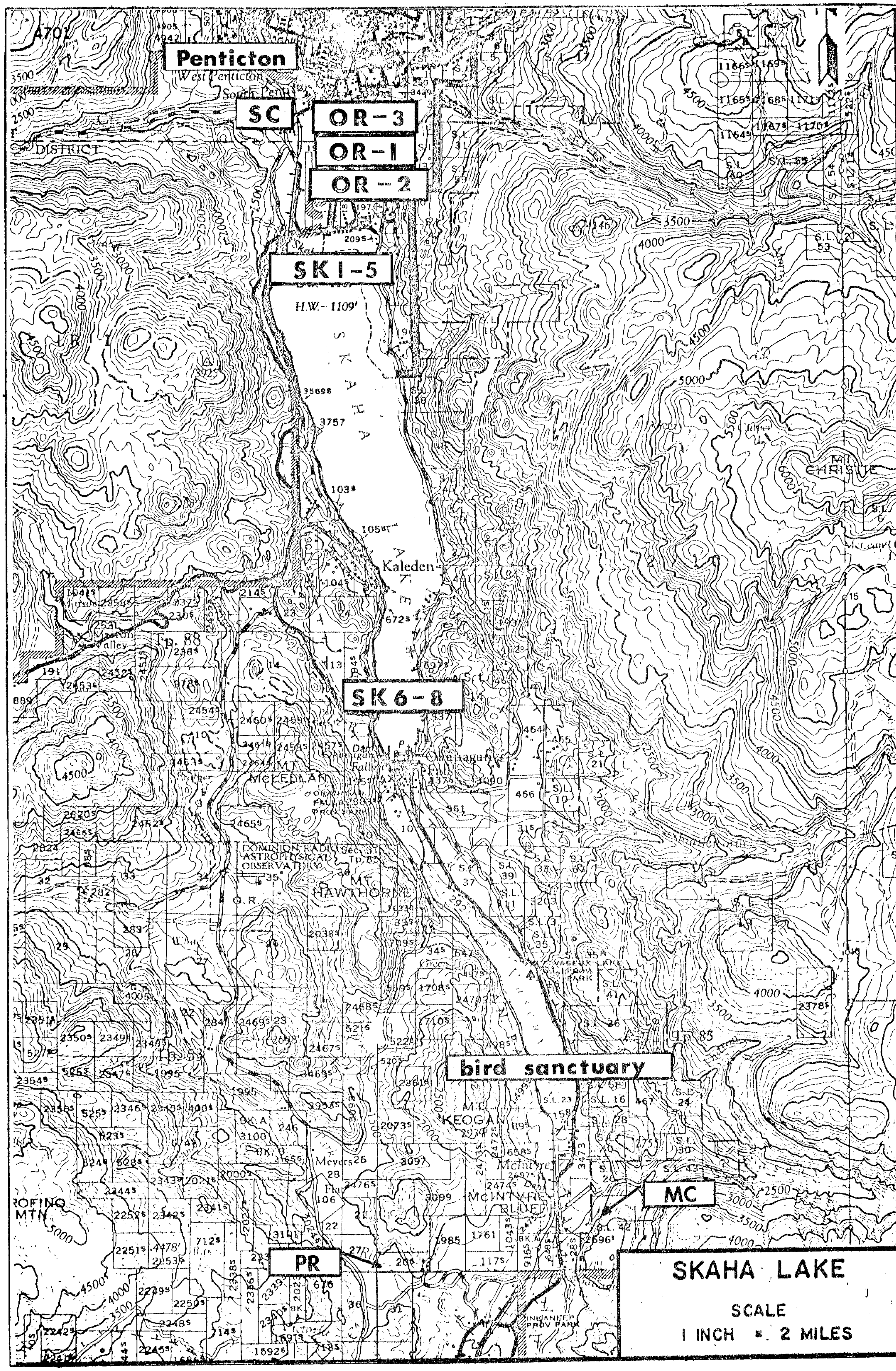
Table 1 shows the dates sampled and the code for each. The location was pinpointed similarly to the 1967 method, employing a sextant and sighting at two predetermined points on the shore. Samples were taken by a Nansen sampling bottle and placed in 1 qt plastic bottles for chemical analyses and 8 oz

FIG. 1:

Map of Skaha Lake showing the location of the north (SK-1 to SK-5) and south (SK-6 to SK-8) transects.

Miscellaneous sampling sites (OR-1, OR-2, OR-3, SC, MC, PR, are also shown.

(See Table 1 for explanation of symbols)



Penticton
SC
OR-3
OR-1
OR-2
SK1-5
SK6-8
bird sanctuary
MC
PR
SKAHA LAKE
SCALE
1 INCH = 2 MILES

FIG. 2:

(a - f) Hydrological data for Okanagan, Skaha and Osoyoos Lakes for March to September 1968.

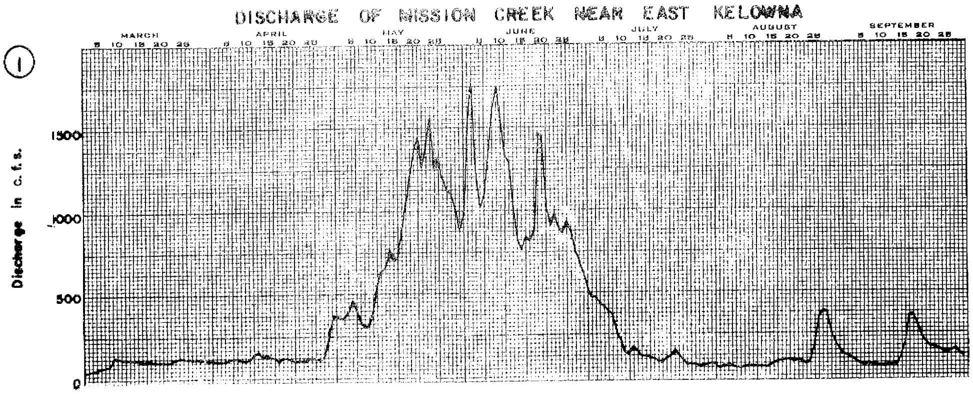
The figure shows the following items:

- a Discharge of Mission Creek near east Kelowna (central Okanagan Lake).
- b Okanagan Lake levels at Penticton.
- c Okanagan Lake discharge at Penticton (north end of Okanagan River).
- d Skaha Lake levels at Okanagan Falls (south end of lake).
- e Skaha Lake discharge at Okanagan Falls.
- f Osoyoos Lake levels near Oroville, Washington, (near south end of lake).

1968

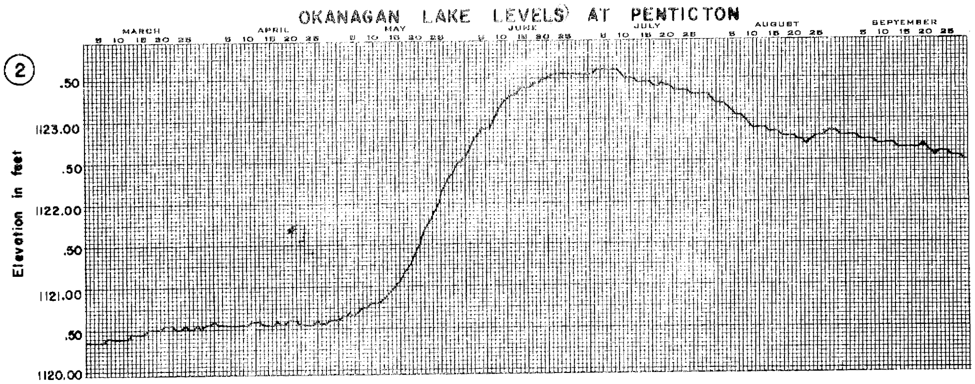
DISCHARGE OF MISSION CREEK NEAR EAST KELOWNA

(1)



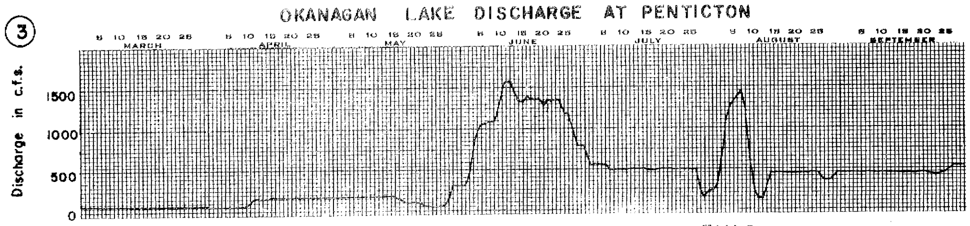

OKANAGAN LAKE LEVELS AT PENTICTON

(2)



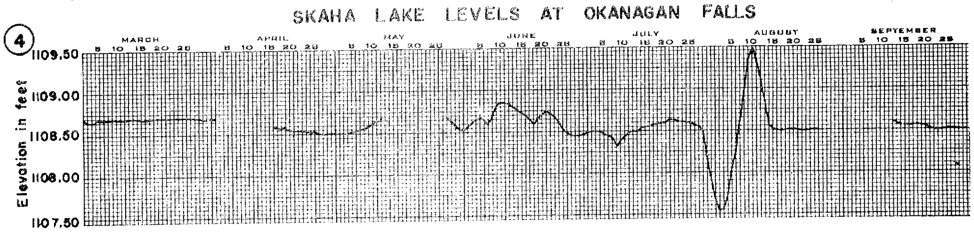

OKANAGAN LAKE DISCHARGE AT PENTICTON

(3)



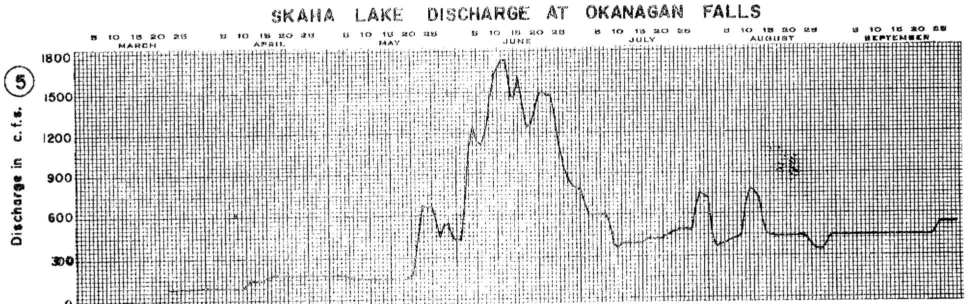

SKAHA LAKE LEVELS AT OKANAGAN FALLS

(4)




SKAHA LAKE DISCHARGE AT OKANAGAN FALLS

(5)




(6)

OSOYOOS LAKE LEVELS NEAR OROVILLE

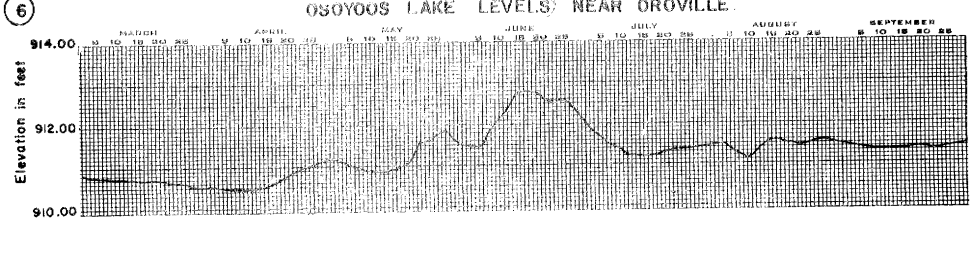


FIG. 3:

Map of Osoyoos Lake showing the location of the north (OY-1 to OY-4) and south (OY-5 to OY-8) transects, and U.S. transect OY-9 to OY-12.

Miscellaneous sampling sites TL, OY-DD, OY-PL, OY-SS are also shown.

(See Table 1 for explanation of symbols)

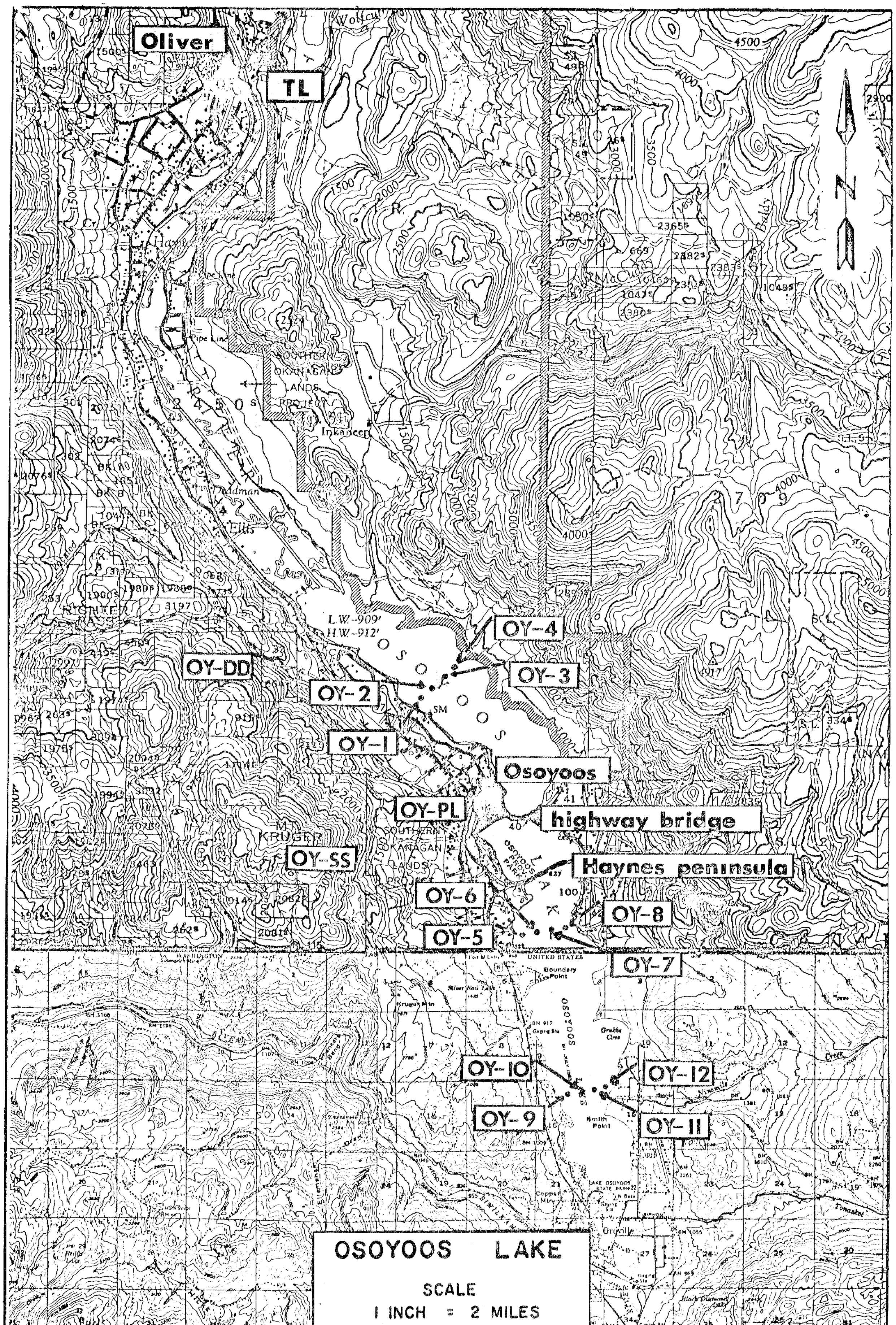

Oliver
TL
Inkaneep
LW-909'
HW-912'
OY-4
OY-3
OY-DD
OY-2
OY-1
Osoyoos
OY-PL
highway bridge
OY-SS
Haynes peninsula
OY-6
OY-8
OY-5
OY-7
OY-10
OY-12
OY-9
OY-11
Smith Point
Oroville
OSOYOOS LAKE
SCALE
1 INCH = 2 MILES

TABLE 1. SAMPLING SITES, DATES, AND CODE DESIGNATIONS FOR SKAHA AND OSOYOOS LAKES, MAY 1968 TO APRIL 1969

| Lake Location Code | DATE** | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | J | K | L | M | N | O |
| Skaha Lake, North Tran. SK-1 to Sk-5 | 5/24 | 6/10 | 6/26 | 7/11-7/12 | 7/31 | 8/13 | 8/26 | 9/5 | NT | 11/13 | 12/13 | 2/5 | 3/18 | NT |
| Skaha Lake, South Tran. SK-6 to SK-8 | 5/27 | 6/14 | 7/2 | 7/15 | 8/1 | 8/14 | 8/27 | 9/10 | NT | 11/20 | 12/13 | 2/5 | 3/18 | 4/17 |
| Osoyoos Lake North Tran. OY-1 to OY-4 | 5/28 | 6/17 | 7/4 | 7/16 | 8/2 | 8/15 | 8/28 | 9/12 | 10/13 | 11/22 | 12/12 | 2/5 | 3/17 | 4/17 |
| Osoyoos Lake, South Tran. OY-5 to OY-8 | 5/30 | 6/18-6/20 | 7/10 | 7/25 | 8/9 | 8/19 | 8/29 | 9/12 | 10/14 | 11/22 | 12/12 | 2/5 | 3/17 | 4/17 |
| Osoyoos Lake, U.S.A. Trans. OY-9 to OY-12 | NT | NT | NT | NT | NT | 8/23 | 8/30 | 10/14 | NT | NT | NT | NT | NT | NT |

** Date is month/day

NT = No sample taken

Samples J through O taken only from one point on each transect: SK-3 in north; SK-7 in south; OY-3 in north; OY-7 in south.

glass jars for algal analyses (Coulthard and Stein 1968).

These samples were taken from five depths: 0, 10, 20, 40, and 60 ft levels. Several sediment samples were taken when possible at each transect point during the summer. The samples for chemical analyses were placed in a cool, insulated box and frozen at -20°C as soon as possible (Strickland and Parsons 1965). To the algal samples was added enough Lugol's IKI preservative to give a final concentration of 1-4% (Coulthard and Stein 1968).

Five points of the transect at north Skaha Lake were taken as indicated by SK-1 to SK-5 and in south Skaha Lake as SK-6 to SK-8 (Fig. 1, Table 1). The transects established in Osoyoos Lake are indicated as OY-1 to OY-4 at the north end, and OY-5 to OY-8 at the south end (Fig. 3, Table 1). A transect on the most southerly part of Osoyoos Lake (OY-9 to OY-12 below the 49th parallel in Washington (Fig. 3) was added to the program in mid-summer. Locations of these samples are also shown in Table 1. Data taken from Osoyoos Lake is the basis of a M.Sc.(Agric.) thesis, in the process of submission, by Mr. Booth.

After the 1967 sampling, it was considered that other sources could be contributing nutrients to the lake waters, in addition to that from the Okanagan River. Thus, sampling of selected water sources, to obtain information regarding inflow and drainage conditions into the two lakes, was undertaken. The miscellaneous sampling locations should be representative of the inflow to the lakes from a variety of sources. These are listed with date and a sample code in Table 2. The miscellaneous samples are divided into three groups as follows:

1) North of Skaha Lake: (a) Okanagan River above the Penticton treatment plant; (b) Okanagan River below the Penticton treatment plant; (c) at the Aylmer cannery outflow; (d) Shingle Creek which flows into the Okanagan River south and west of the Penticton treatment plant (Fig. 1).

2) Between Skaha and Osoyoos Lakes: (a) McIntyre Creek (Fig. 1); (b) Park Rill (Fig. 1), near Oliver; (c) Tugulnuit Lake (Fig. 3), near Oliver.

3) Adjacent to Osoyoos Lake: (a) Agricultural drainage ditch; (b) Peanut Lake; (c) "Kissinger Spring" seepage from Osoyoos town sewage lagoon (Fig. 3).

In addition, sampling along a transect across the south end of Okanagan Lake was started in June 1968. However, due to staff limitations and adverse weather, this was discontinued after the initial sampling.

At each sampling time, the water was checked for pH, electrical conductivity, and dissolved oxygen (started in August). The frozen samples, for chemical analyses, were shipped in insulated boxes to the laboratory in Vancouver. Only rarely did any water arrive unfrozen, thus the chemical analyses are considered an accurate evaluation of field conditions.

In addition to the sampling, the temperature of the water was recorded at each sampling depth. Secchi disk readings were obtained in the lakes at each location in order to determine the extent of turbidity as represented by light penetration.

At the end of July 1968, the Water Investigations Branch, B.C. Water Resources Service, undertook an experimental flushing process on Skaha Lake. This consisted of dropping the level 1 ft in elevation over a period of four days and then raising the level 2 ft over a period of approximately eight days and then back to the original level during the next five days. (The details are shown in Appendix 1, and Fig. 2b-e). Sampling was carried out at approximately the same time as the flushing process.

TABLE 2. SAMPLING SITES AND DATES, AND CODE DESIGNATIONS FOR MISCELLANEOUS SAMPLES IN SOUTH OKANAGAN VALLEY.

| | | D A T E ** | | | | | |
|---|---|---|---|---|---|---|---|
| Code | | A | B | C | D | E | F |
| OR-1 | Okanagan River, above Penticton treatment plant | 6/6 | 6/19 | 7/5 | 7/24 | 8/5 | 8/20 |
| OR-2 | Okanagan River, below Penticton treatment plant | 6/6 | 6/19 | 7/5 | 7/24 | 8/5 | 8/20 |
| OR-3 | Okanagan River, Aylmer Cannery outfall | 6/6 | 6/19 | 7/5 | 7/24 | 8/5 | 8/20 |
| SC | Shingle Creek, west of Penticton | 6/6 | 6/19 | 7/5 | 7/24 | 8/5 | 8/20 |
| MC | McIntyre Creek, below Vaseux Lake | 6/6 | 6/19 | 7/5 | 7/24 | 8/5 | 8/20 |
| PR | Park Rill, north of Oliver | 6/6 | 6/19 | 7/5 | NT* | NT* | NT* |
| TL | Tugulnuit Lake, east of Oliver | 6/6 | 6/19 | 7/5 | 7/24 | 8/6 | 8/20 |
| OY-DD | Drainage ditch into Osoyoos Lake, north | 6/5 | 6/19 | 7/5 | 7/24 | 8/6 | 8/20 |
| OY-SS | Sewage seepage from the lagoon above Osoyoos "Kissinger Spring" | 6/5 | 6/19 | 7/5 | 7/24 | 8/6 | 8/20 |
| OY-PL | Peanut Lake, west of Osoyoos Lake, north | 6/5 | 6/19 | 7/5 | 7/24 | 8/6 | 8/20 |

* Park Rill - no samples taken

** Date is month/day

LABORATORY ANALYSES.

Chemical Analyses:

As mentioned previously, the water samples were received frozen and stored as such until analyzed. The chemical analyses were carried out according to standard methods utilized for examination of water quality. The actual tests used are indicated by the reference given in parentheses. Modifications made for some of these tests are shown in more detail in Appendix II. The colorimetric tests were performed on a Perkin-Elmer 139 Spectrophotometer.

The total residue test (APHA 1965, p. 244) was a simple evaporation method used to determine an increase or decrease in concentration of total salts, both soluble and insoluble, plus organic matter in the water. The chemical oxygen demand (C.O.D.) was determined by a modified titrimetric method (APHA 1965, p. 510) to indicate the chemically oxidizable material present. The calcium test (APHA 1965, p. 74) and the chloride test (Domask and Kobe 1952) both involve titrimetric techniques. The magnesium was calculated by atomic absorbance, and the silicate test by colorimetric techniques (APHA 1965, p. 261). The total inorganic nitrogen concentration is the addition of the individual results from the nitrate test (APHA 1965, p. 195), nitrite test (Strickland and Parsons 1965, p. 79) and ammonia test (Strickland and Parsons 1965, p. 83). The nitrite-nitrogen is oxidized to nitrate-nitrogen on standing. The total phosphate test (Gales, et al. 1966) includes both organic and inorganic phosphate. The inorganic ortho-phosphate test (APHA 1965, p. 234) is modified slightly by adding potassium persulfate to release any phosphate incorporated in bacterial cell walls.

The sediment samples were analyzed for calcium, nitrate, and phosphate. The calcium was measured using the same method as for the water samples (APHA 1965, p. 74). The nitrate test (Black 1965, p. 1036) and the phosphate test

(Black 1965, p. 1216) were used to indicate possible nutrient accumulation at the lake bottom.

Algal Analyses:

The preserved samples were counted using a Sedgwick Rafter Counting Chamber and 100X magnification with a compound microscope (Coulthard and Stein, 1968). Generally the entire chamber was counted (1 ml). When high algal populations were encountered, an estimate was made of the number of cells and filaments present. This estimation was probably accurate within 100-200 cells (less than 10% error). As in 1967 (Coulthard and Stein, 1968), two counts of each sample were made and averaged. Again, more counts would be preferable but were not practical at that time.

For several algae (colonial or filamentous ones) counting each cell was not feasible. Thus the following scale for the algae present was used:

| | |
|---|---|
| Bacillariophyceae (diatoms) | |
| Asterionella formosa Hass | 8 cells = 1 unit |
| Cyclotella glomerata Bachm. | 1 cell = 1 " |
| Cymbella sp. | 1 cell = 1 " |
| Melosira spp. | 1 cell = 1 " |
| Navicula sp. | 1 cell = 1 " |
| Pinnularia sp. | 1 cell = 1 " |
| Stephanodiscus sp. | 1 cell = 1 " |
| Tabellaria sp. | 1 cell = 1 " |
| Chlorophyceae | |
| Mougeotia sp. | 12-15 cells = 1 unit |
| Chrysophyceae (chrysophtes) | |
| Dinobryon sp. | 1 cell = 1 unit |
| Cryptophyceae (cryptomonads) | |
| Cryptomonas ovata Ehrbg. | 1 cell = 1 " |
| Cyanophyceae (blue-green algae) | |
| Anabaena flos-aquae (Lyngb.) Breb. | 12-15 cells = 1 unit |
| Nostoc sp. | 12-15 cells = 1 " |
| Oscillatoria acutissima Kuff | 12-15 cells = 1 " |

Dinophyceae (dinoflagellates)
Certaium hirundinella
(O.F. Mull.) Duj. 1 cell = 1 unit

Only the dominant genera are considered and included in the results.

RESULTS AND DISCUSSION.

Due to the large amount of data collected from November 1967 through April 1969, only a brief summary of each parameter is considered. The main discussion is based on data from May 1968. The appendices contain the actual figures for further reference (Appendices II-VI). The data from the transects taken during May to September 1968 are considered in general only from one station at the north and south of each lake (SK-3 and SK-7 in Fig. 1, Table 1; OY-3 and OY-7 in Fig. 3, Table 1). Although there is variation across a transect as well as within each point on the transect, the differences appear minor for a general interpretation of the data.

Each lake is treated separately and the south end of Osoyoos Lake also will be considered separately. This is due to the presence of two peninsulas in Osoyoos Lake -- one from the east of the town of Osoyoos and one from the west, ca. 1 ml south (see Fig. 3). These peninsulas essentially cut off the main body of water in the north from that in the south. The data from 1967 to 1969 are compared with that taken in 1936 from Okanagan Lake to the north of the lakes (Clemens, et al. 1939).

Air temperatures, hours of sunlight and radiation intensity for the general area of the Okanagan Valley are given in Figs. 4, 5, and 6, respectively, as well as in Appendix III. The data are from the Canada Department of Agricultural Research Station in Summerland and give an indication of the conditions in the area.

Comparisons are not generally feasible between chemical data from May 1967 to early May 1968, and those from May 1968 through April 1969 because different techniques were used. Starting in mid-May 1968 more defined chemical analyses were performed in the laboratory whereas previously "Hach Chemical Kit" analyses had been used under modified field conditions (Coulthard and Stein 1968).

MEAN AIR TEMPERATURES
recorded at Summerland, B.C.

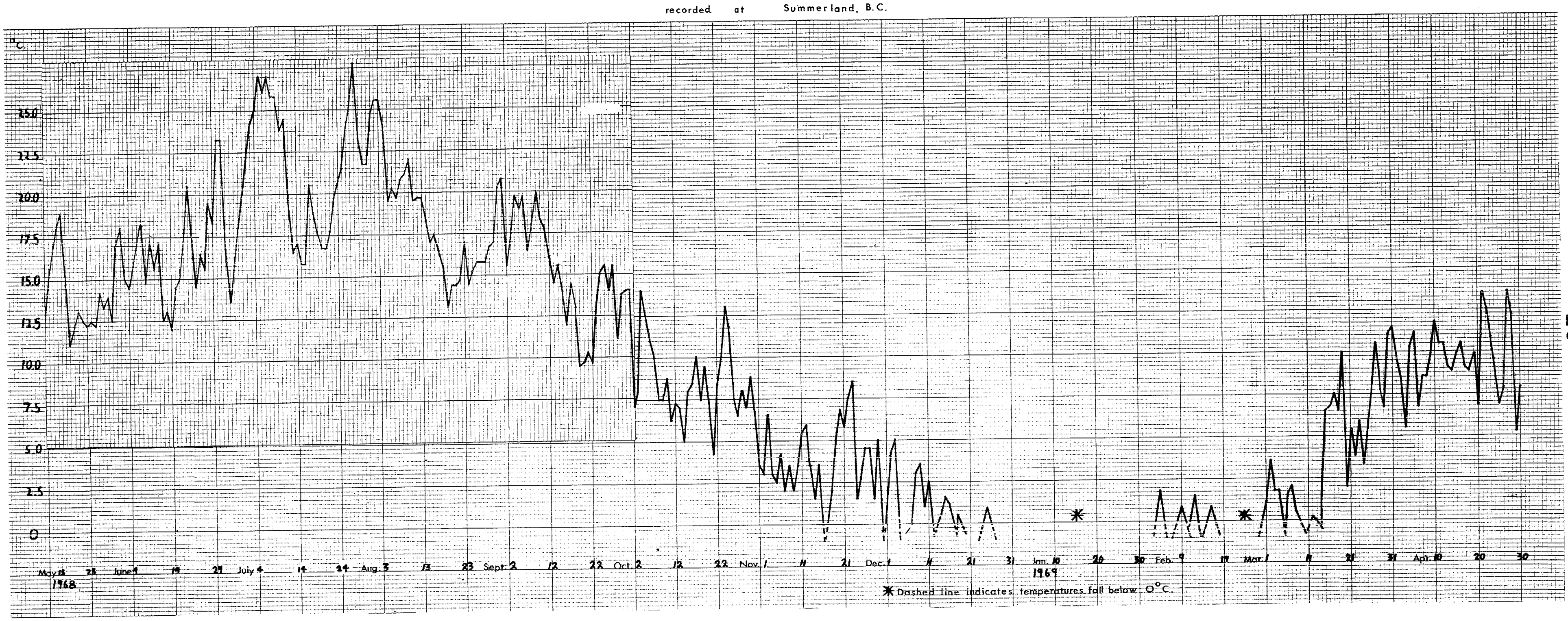



FIG. 4

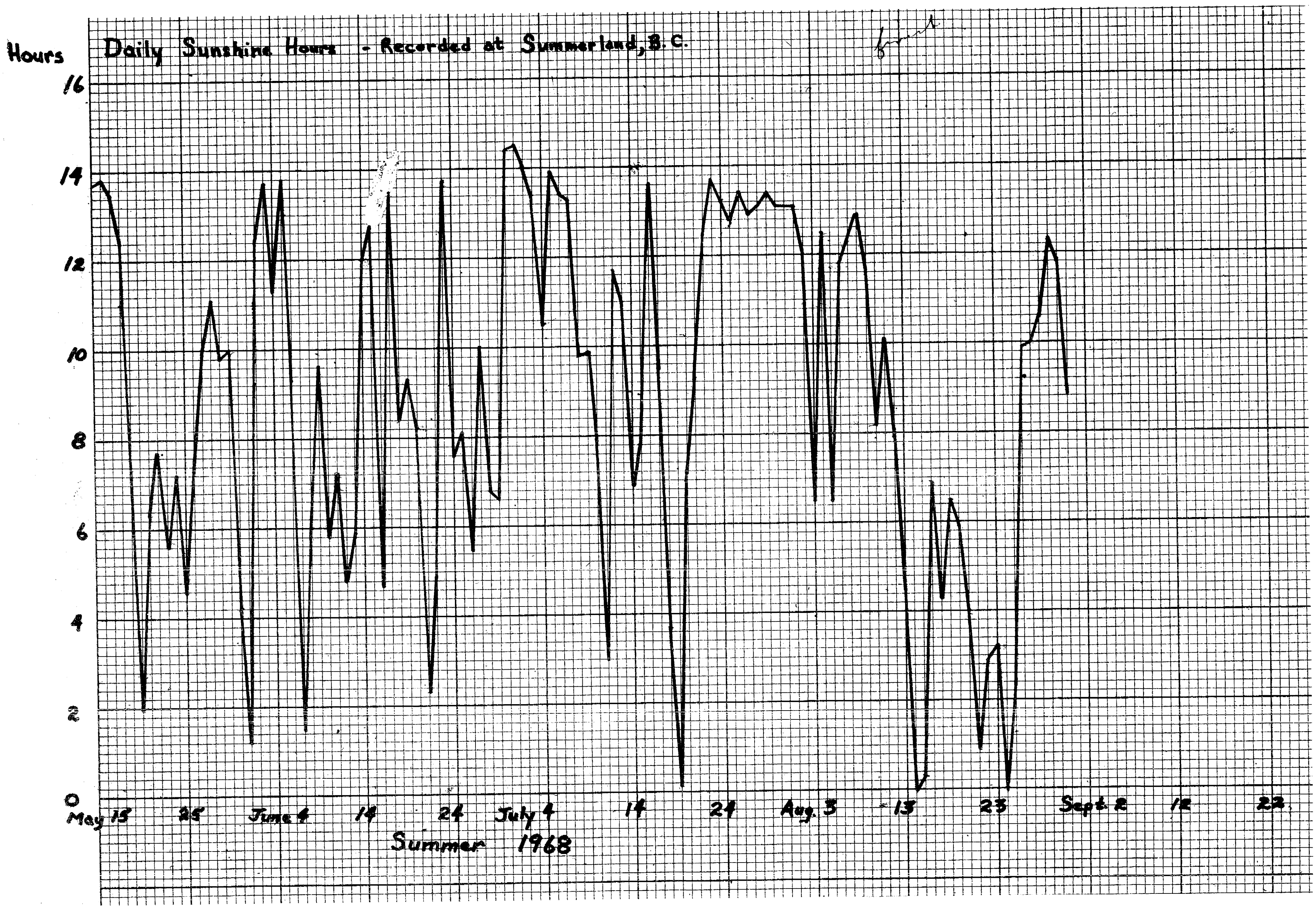

Hours
Daily Sunshine Hours - Recorded at Summerland, B.C.
16
14
12
10
8
6
4
2
0
May 15
25
June 4
14
24
July 4
14
24
Aug. 3
13
23
Sept. 2
12
22
Summer 1968

FIG. 5

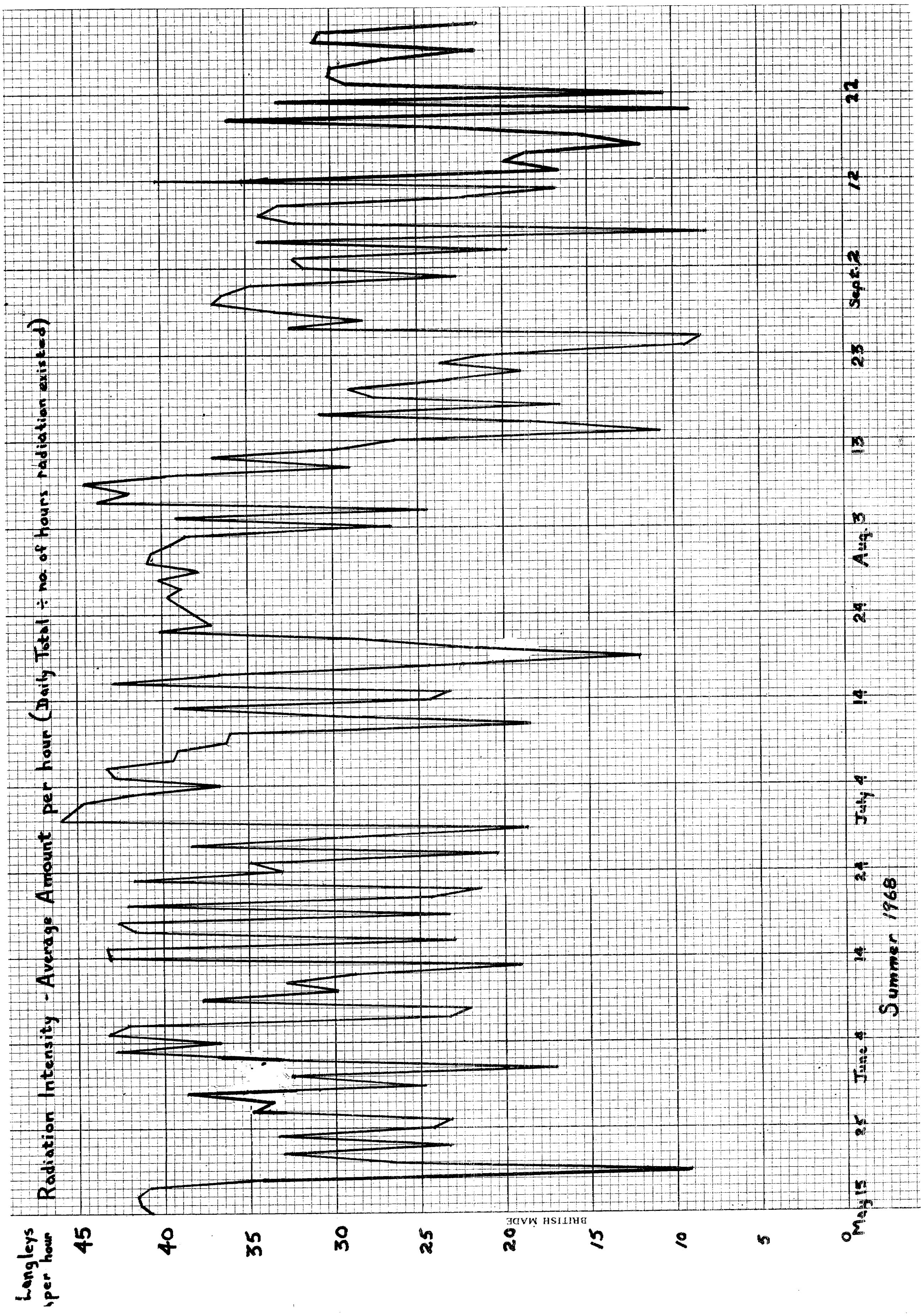

Radiation Intensity - Average Amount per hour (Daily Total ÷ no. of hours radiation existed)
Langleys per hour
45
40
35
30
25
20
15
10
5
0
May 15
25
June 4
14
24
July 4
14
24
Aug. 3
13
23
Sept. 2
12
22
Summer 1968
BRITISH MADE

FIG. 6

SKAHA LAKE.

Figure 7A gives a general indication of the water temperature from May 1967 through April 1969. More detail for the two transects is shown in Figure 8. Detailed water temperatures are given in Appendix IV-1. The highest temperatures recorded were in the summer of 1967. Lower water temperatures occurred in 1968, and the water did not stay warm for as long a period. The coolest temperatures were recorded in January and February for both years. In 1969 ice formed on the lake and lasted for several weeks. For both years the lake was fairly uniform in temperature from November through March. Thermal stratification was noticeable by May.

An indication of the amount of light penetrating the lake is given by the Secchi disk readings (Appendix IV-2). The disk could be seen at a depth from 3-9 ft during the summer months; whereas, the average was near 12 ft in winter -- except for December 1968 when the disk was visible for 27 ft. At the south end of the lake the readings were not as deep. This may be due to the narrowing of the lake just north of the sampling area, thus causing a concentration of suspended materials in a more shallow area.

Dissolved oxygen measurements were not started until late in the summer of 1968 (Appendix IV-3). In August the surface waters were around 10 ppm with a gradual drop by a third with depth and temperature. Dissolved oxygen values in September were at a low of less than 2 ppm at some depths. This was followed by a gradual rise until in November a uniform concentration around 9.5 ppm was reached and even higher in the winter.

At the temperatures experienced in August the surface waters at 10 ppm would be approximately 100% of saturation value, whereas in September at 2 ppm it would only approximate 20-25% of the dissolved oxygen saturation.

Total residue measurements performed on unfiltered samples gives some indication of the amount of nutrients and algae present (Appendix IV-4). In the spring of 1968 the total residue started to rise until mid-summer when a gradual drop was experienced with a low reached in September. This low was maintained through the winter with a gradual rise again in late March. The total residue measured in 1968-69 is in the same range as that determined for Okanagan Lake in 1936 (Clemens, et al, 1939).

Another general measure of materials in the lake is the chemical oxygen demand (COD) (Appendix IV-5). The amount varied from 5-10 ppm in June and remained low at the surface. There was a slight increase during the summer with a peak in late July. Following this (and possibly correlated with the lake-flushing), there was a drop and a maintenance of these lower figures until March and April when there again was an increase. As this test is not considered accurate below 50 ppm, the data cannot be classified as significant (APHA 1965).

The data for electrical conductivity given in Appendix IV-6 shows an increase from spring through summer with a drop in the winter. The difference between the north and the south ends of the lake for the sampling of August 13-14 may be explained by the flushing of the lake at that time. These were the lowest values although not as low as those recorded for the August period in 1967. The electrical conductivity measurement is only an indication of the total salts in solution; the nature of the salts is not shown by this test. However, measurements in the laboratory of two cations, calcium and magnesium, indicate that neither were present in large amounts. Calcium (Appendix IV-7) ranges around 30 ppm in the north and 20 ppm in the south. These figures are similar to those recorded in 1936 from Okanagan Lake (Clemens, et al. 1939).

The 1968-69 figures are also lower than those given by Hutchinson (1957) for waters from igneous or sedimentary rocks. The drop in calcium between the north and south may be explained by formation of a phosphate or carbonate precipitate (see further discussion with pH and phosphorus results). The magnesium levels range between 6.0 to 8.2 ppm (Appendix IV-8) with a low level in March 1969 around 2.5 ppm. Interestingly, in February 1969 the magnesium level at 0 ft was 6.0 ppm but only 1.3 ppm was measured in the ice. In 1936 magnesium was not detected in Okanagan Lake (Clemens et al.1939). This discrepancy is not explainable at this time although the principle is true for some cations.

Chloride measurements from November 1967 through April 1969 vary from ca. 1.2-4.0 ppm (Appendix IV-9). The highest concentrations were in the spring of 1968 with a gradual drop during the year to the low point around 1.0 ppm. This measurement may give some indication of the amount of chlorine added to the inflow. In 1936 no chloride (measured as chlorine) was detectable in Okanagan Lake (Clemens, et al. 1939).

Silicate remained fairly constant from June 1968 through April 1969 at ca. 3-4 ppm (Appendix IV-10). However, in September 1968 the concentration almost doubled at the 10 ft level in the south transect. Whether this is significant is not known, but Hutchinson (1957) reports increases in silicate under anaerobic conditions. It is doubtful if anaerobic conditions occurred anywhere in the water column as the dissolved oxygen was almost 10 ppm. The only correlation of silicate with algal population at this time was the presence of the diatom Cyclotella in large numbers and the low numbers of any blue-green algae.

pH serves as a general measure of availability of nutrients (Appendix IV-11). It also gives an indication of the available form of carbon dioxide in the waters (Hutchinson

1957). In the winter (November to March) the pH is ca. 7.5-8.2 indicating carbon dioxide is present. From May the pH rises until it reaches 9.0 in September. At a pH over 8.4 carbon dioxide and bicarbonate concentrations are equal but the dominant carbon is carbonate (Hutchinson 1957). It is possible that calcium and magnesium are precipitated as carbonates. An analysis of the sediments shows this is possible as calcium was present in amounts ten times that in solution (Appendix IV-12).

The general pattern of nitrogen-containing compounds (Appendix IV-13) shows a steady increase throughout the summer and a slight drop in the winter which varies from November through February. The decrease is mainly attributable to ammonia (Appendix IV-13A). There seems to be a trend toward a decreasing amount in the north and this drop occurs earlier in the autumn. The samples taken in March 1969 show a gradual increase in all nitrogen compounds (except nitrate in the south). In the August 13-14 period, which was near the end of the lake flushing, there was a drop in nitrogen compounds. The amount of any one nitrogenous compound varied during the summer with depth. The south end of the lake was generally higher in all -- especially ammonia and nitrate (Appendix IV-13A, C). Nitrite was negligible at most samplings (Appendix IV-13B). Interestingly the ice sampled in March was the highest in ammonia, whereas there was less nitrate in the ice than throughout the water column. This may indicate decay of organic matter trapped in the ice. The amount of ammonia in Skaha Lake is definitely higher at most times than that reported from Okanagan Lake in 1936 (Clemens et al. 1939). This nitrogenous compound is generally not present for a long time and its presence serves as an indicator of organic matter decay (Hutchinson, 1957). Okanagan Lake had no measurable nitrate or nitrite in 1936 (Clemens et al. 1939).

The phosphate pattern (Appendix IV-14) of orthophosphate (inorganic) and total phosphate (organic and inorganic) is similar to the nitrogen pattern. Both are low (less than 0.1 ppm) in early summer and gradually increase with some fluctuations until September where they are steady throughout the winter or with a slight drop. (Inorganic phosphate may actually double from June to September). There does not seem to be an increase in phosphate at the south of the lake as there is with nitrogen compounds, except in one period in mid-August. The general lack of increase may be due to precipitation of calcium or magnesium phosphate compounds in the main body of the lake. In the south transect there was a marked increase in phosphate in the collections from August 14 during the lake flushing. Possibly with the increase in water movement through the lake, less precipitation occurred in the flow from the north to south. The large amount of phosphate in the sediments (Appendix IV-12) indicates precipitation, especially as the figures are higher at the north. It is also possible that the higher amounts of phosphate in the waters at the north are a direct result of the inflow waters from the Okanagan River (see discussion of the miscellaneous samples, especially OR-2 and OR-3).

Figure 9 shows the distribution of algae from May 1968 to April 1969. In early June *Anabaena flos-aquae* (Fig. 10A, B) appeared in large numbers in the upper layers. The numbers diminished somewhat in early July but a second build-up occurred in August. In September the *Anabaena* was replaced by the unicellular *Cryptomonas ovata* (Fig. 10C), and in November great numbers of the filamentous blue-green alga *Oscillatoria acutissima* (Fig. 10A, B) were present. This alga had not been previously noted elsewhere enough times for any conclusions on its growth requirements to be available. Although Fig. 9 indicates some algae appeared during only one or two collecting periods, many were present in earlier samples but in very small numbers.

Detailed study of the algae during the summer of 1968 across the two transects (Fig. 11A, B) showed less numbers at the easternmost (SK-5) and westernmost (SK-1) points and in the middle (SK-3, SK-7). At the north end of the lake the largest populations were on either side of the center, shown on Fig. 11A as SK-2 and SK-4. The reduction in algal numbers may be a result of the flow through the center of the lake from the Okanagan River and the steep banks on the east and west sides creating circulatory currents. This leaves an area where algal populations may develop more readily.

The ratio of nitrogen:phosphorus (N:P) reflects changes in both (Appendix IV-15). An indication of a yearly increase in total nitrogen and phosphate compounds is indicated with the highest point being reached in September and a second high in December (Fig. 12). During the winter (February) there seems to be a slight drop and a levelling off before further increases start in the spring. In some winter samples there was a sharp decline in nitrogen and phosphorus before the spring rise. The nature of this decline, or factors to explain it, are lacking at this time. The late summer N:P ratio was often high at 60 ft depth (e.g. SK-3 on August 13 was 18, and SK-7 in September was 37). The N:P ratio was low in June 1968 but gradually increased. There is less fluctuation through the summer at 20 ft than at either 0 or 10 ft as shown in Fig. 12. Generally the ratio is less at the south. In the winter the ratios are much lower (1-3) although there was an increase in December. There was a large drop in February during a period of extremely cold weather (see Fig. 4) but ca. a four-fold increase in March and April. In the south the high was at 0 ft with more moderate levels at depths.

Simple statistical correlations between algal numbers (*Anabaena flos-aquae*) and nitrate, nitrite, ammonia and total phosphate are presented in Table 3. The correlation comprises all samplings on both lakes for the May-August sampling period.

High positive correlations exist between algal numbers and nitrite and ammonia. This correlation probably indicates that the alga is capable of nitrogen-fixation as reported for other strains of <u>Anabaena flos-aquae</u> (Fogg 1965).

TABLE 3. SIMPLE CORRELATIONS BETWEEN ALGAL COUNTS (ANABAENA *flos-aquae*) AND CHEMICAL NUTRIENTS ($n = 324$)

| | |
|---|---|
| Nitrate | -0.095 |
| Nitrite | 0.159 ** |
| Ammonia | 0.447 ** |
| Total Phosphate | 0.032 |

** Significant at $P \leq 0.01$

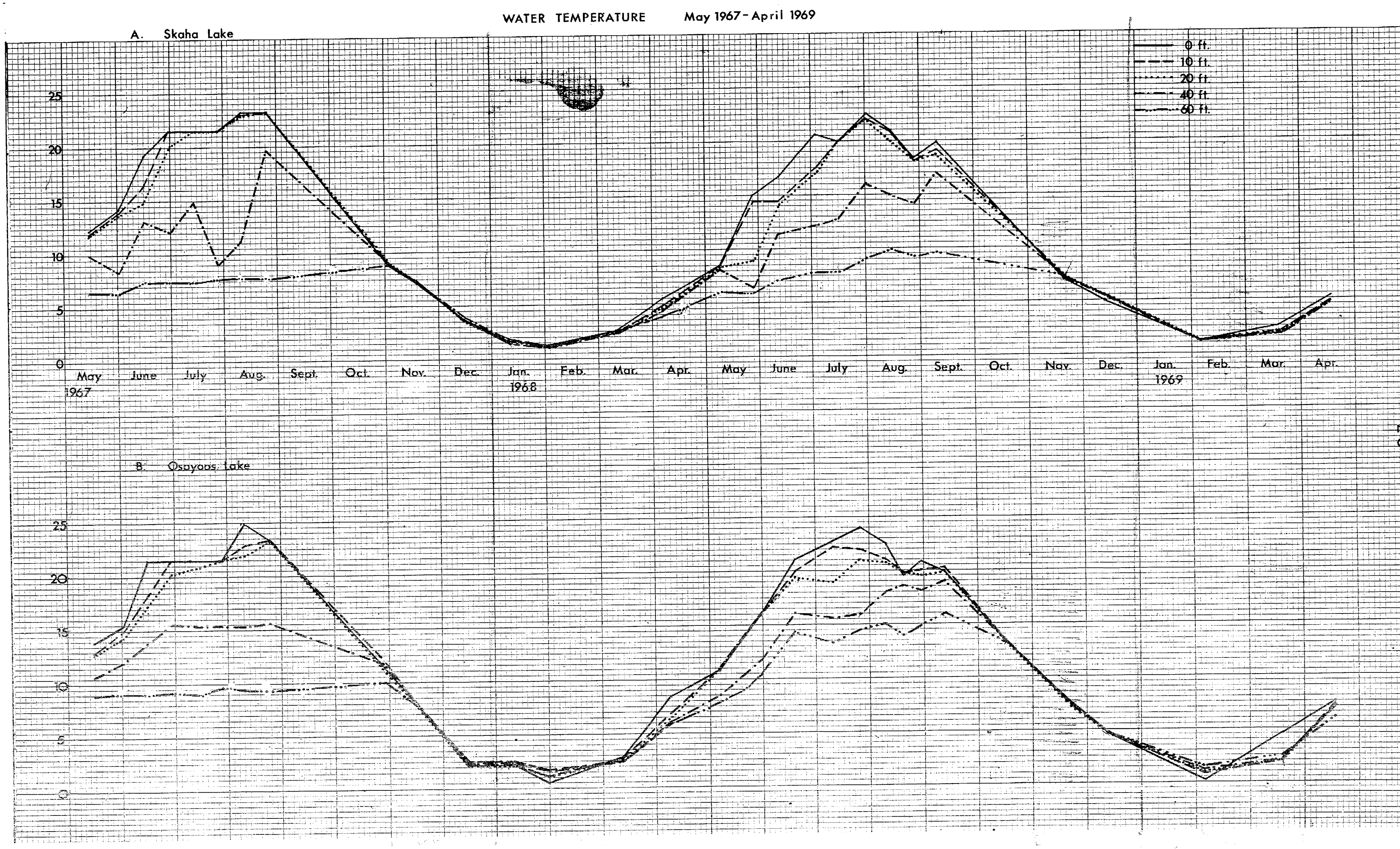
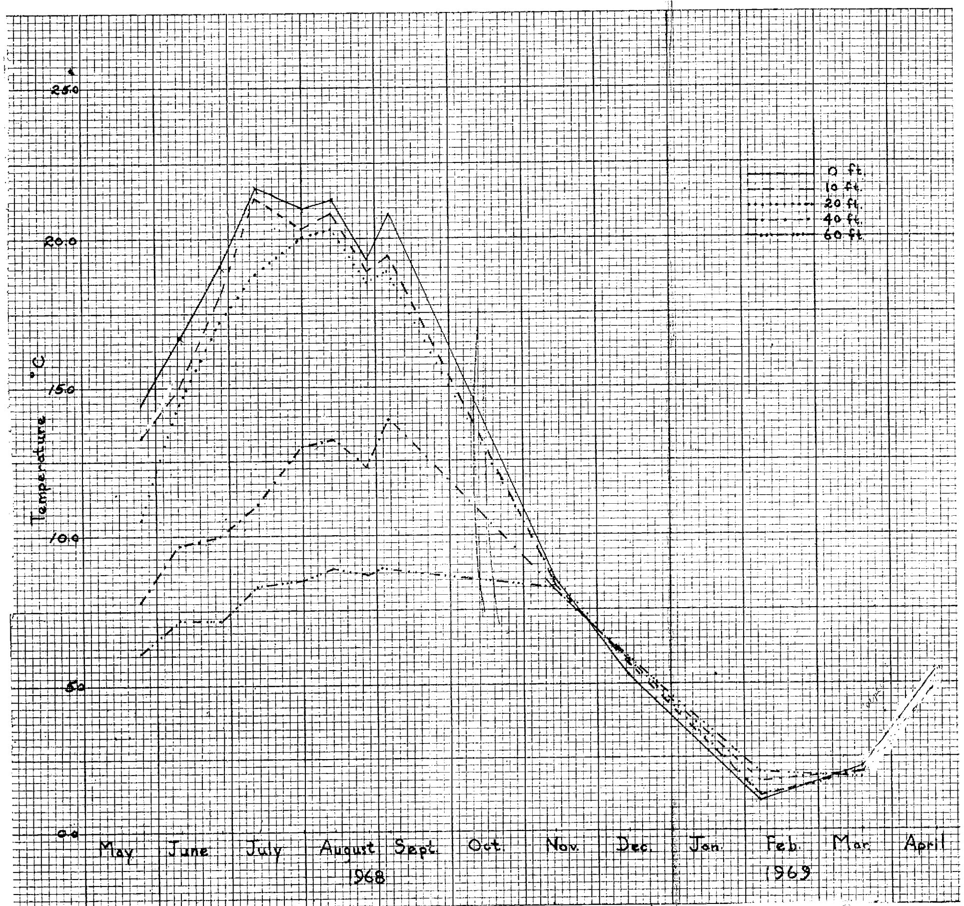

WATER TEMPERATURE May 1967 - April 1969
A. Skaha Lake
B. Osoyoos Lake
0 ft.
10 ft.
20 ft.
40 ft.
60 ft.
25
20
15
10
5
0
May 1967
June
July
Aug.
Sept.
Oct.
Nov.
Dec.
Jan. 1968
Feb.
Mar.
Apr.
May
June
July
Aug.
Sept.
Oct.
Nov.
Dec.
Jan. 1969
Feb.
Mar.
Apr.

FIG. 7

A. Skaha Lake North Transect, Horizontal Temperature Distribution




B. Skaha Lake South Transect, Horizontal Temperature Distribution

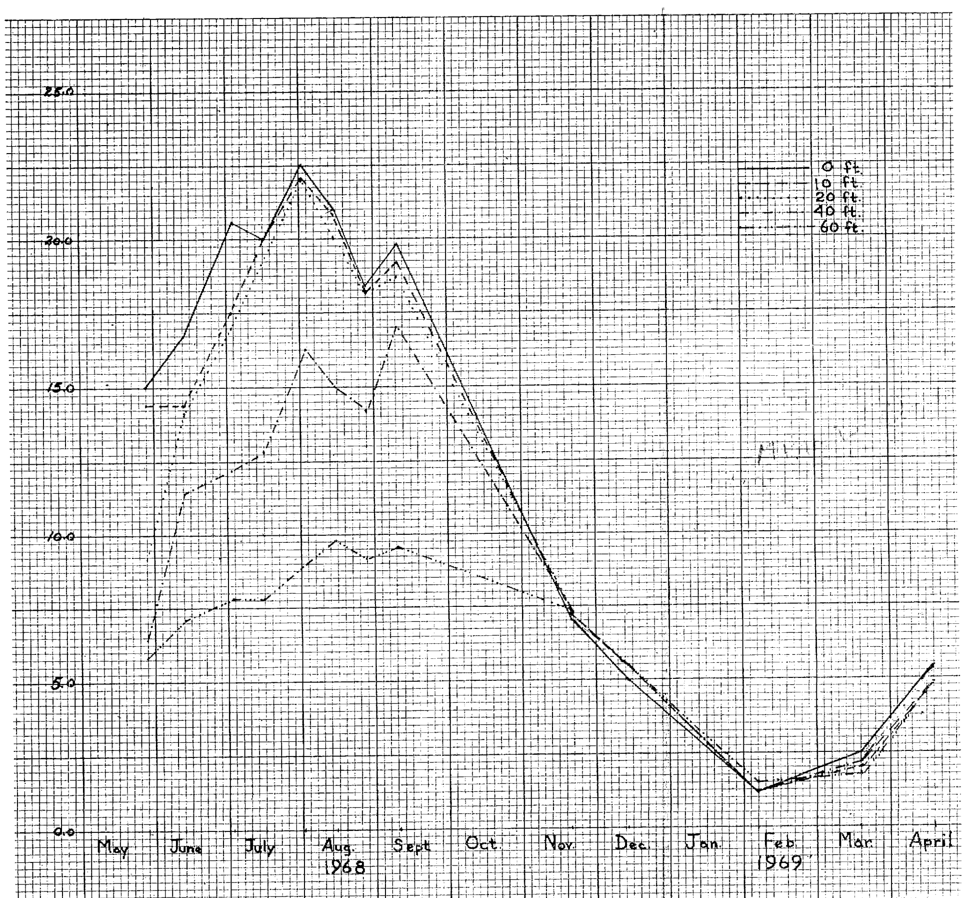



FIG. 8

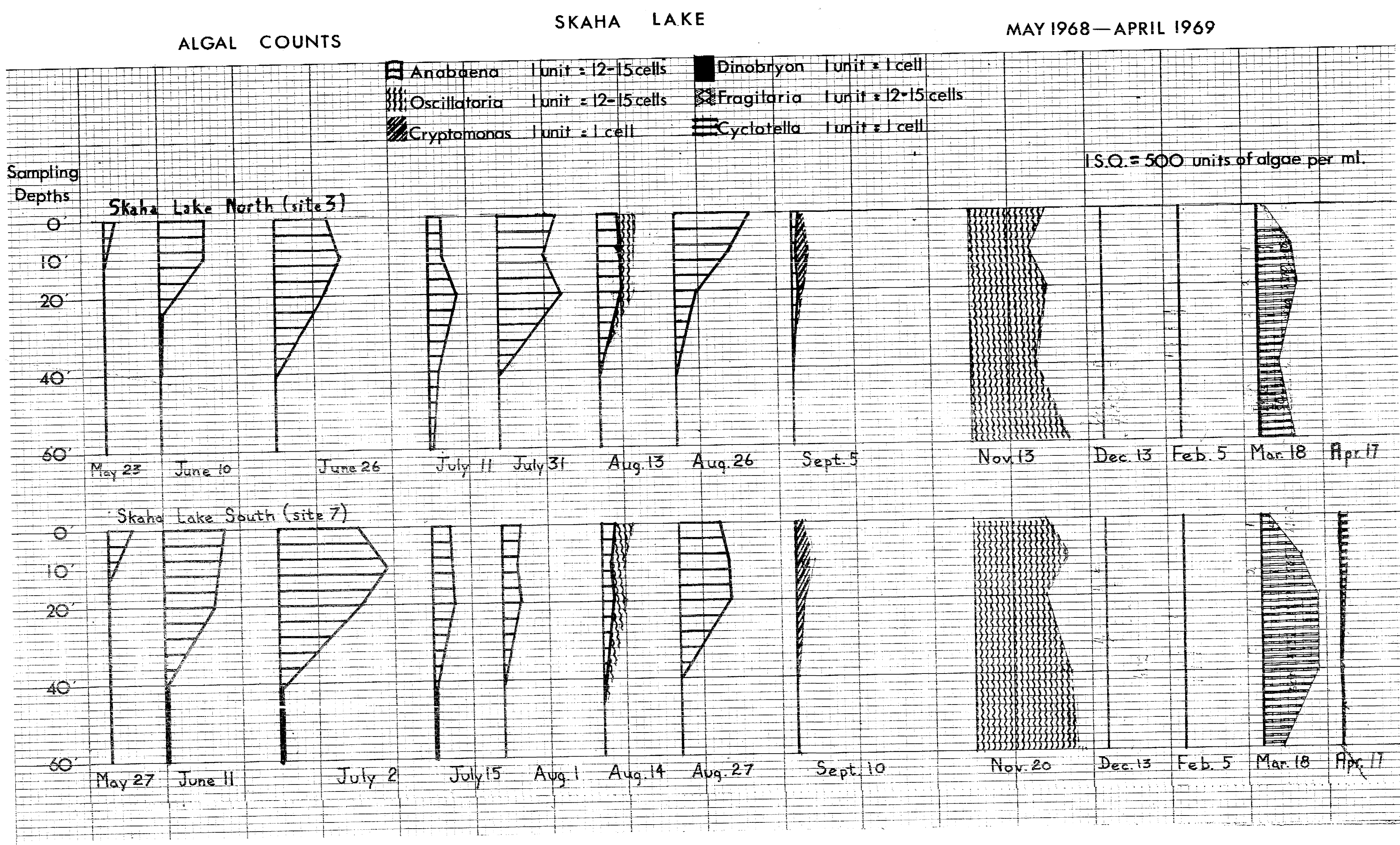

ALGAL COUNTS
SKAHA LAKE
MAY 1968—APRIL 1969
Anabaena 1 unit = 12-15 cells
Oscillatoria 1 unit = 12-15 cells
Cryptomonas 1 unit = 1 cell
Dinobryon 1 unit = 1 cell
Fragilaria 1 unit = 12-15 cells
Cyclotella 1 unit = 1 cell
I.S.Q. = 500 units of algae per ml.
Sampling Depths
Skaha Lake North (site 3)
0'
10'
20'
40'
60'
May 23
June 10
June 26
July 11
July 31
Aug. 13
Aug. 26
Sept. 5
Nov. 13
Dec. 13
Feb. 5
Mar. 18
Apr. 17
Skaha Lake South (site 7)
0'
10'
20'
40'
60'
May 27
June 11
July 2
July 15
Aug. 1
Aug. 14
Aug. 27
Sept. 10
Nov. 20
Dec. 13
Feb. 5
Mar. 18
Apr. 17

FIG. 9

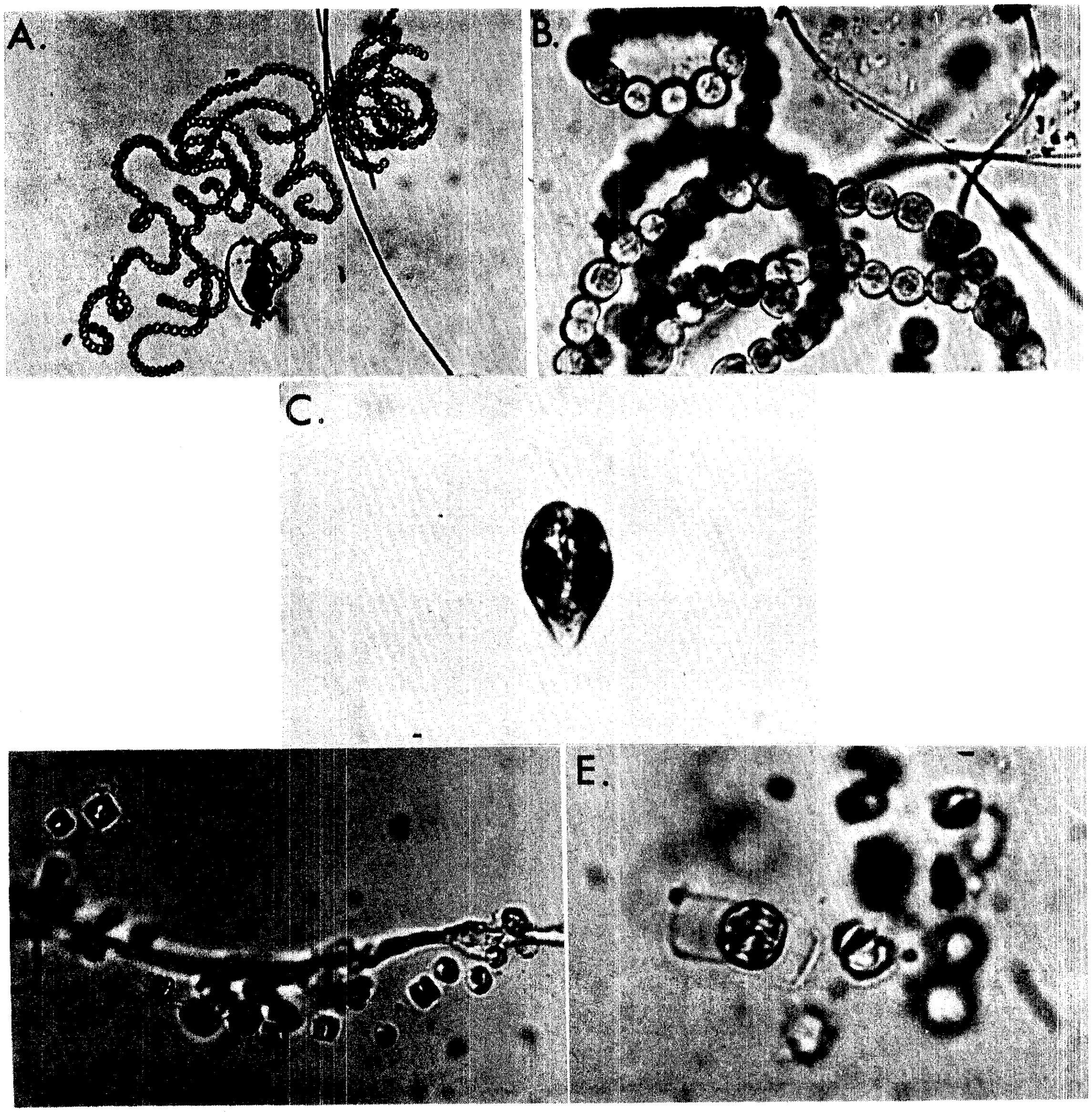



FIG. 10 Representative Algae from Skaha and Osoyoos Lakes

A.,B. Anabaena flos-aquae (larger cells, curled filament) and Oscillatoria acutissima (smaller cells, straight filament)

C. Cryptomonas ovata

D.,E. Cyclotella glomerate

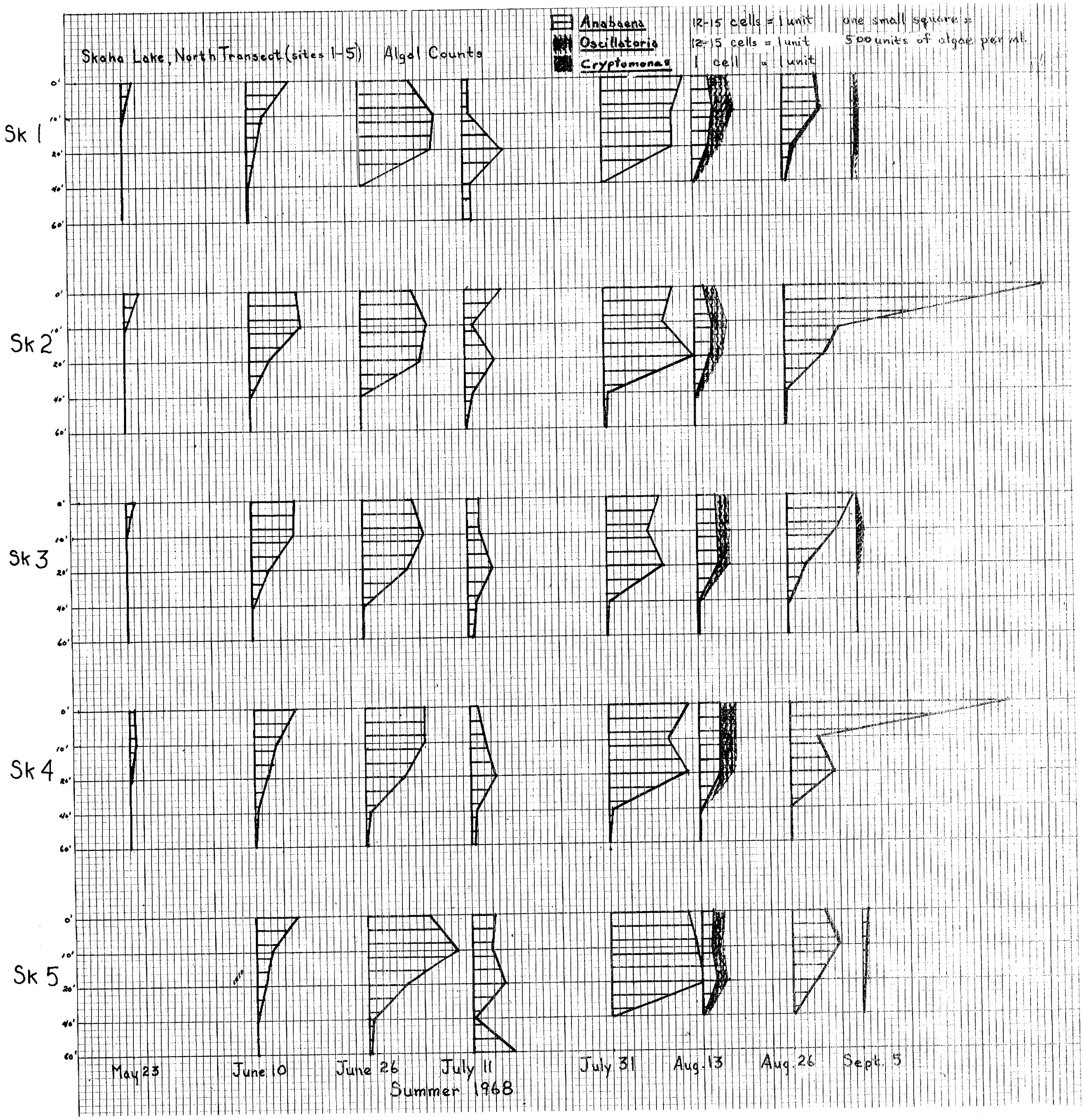



FIG. 11 Algal Distribution Across Skaha Lake Transects. May to September 1968.

A. North Transect (SK-1 to SK-5)

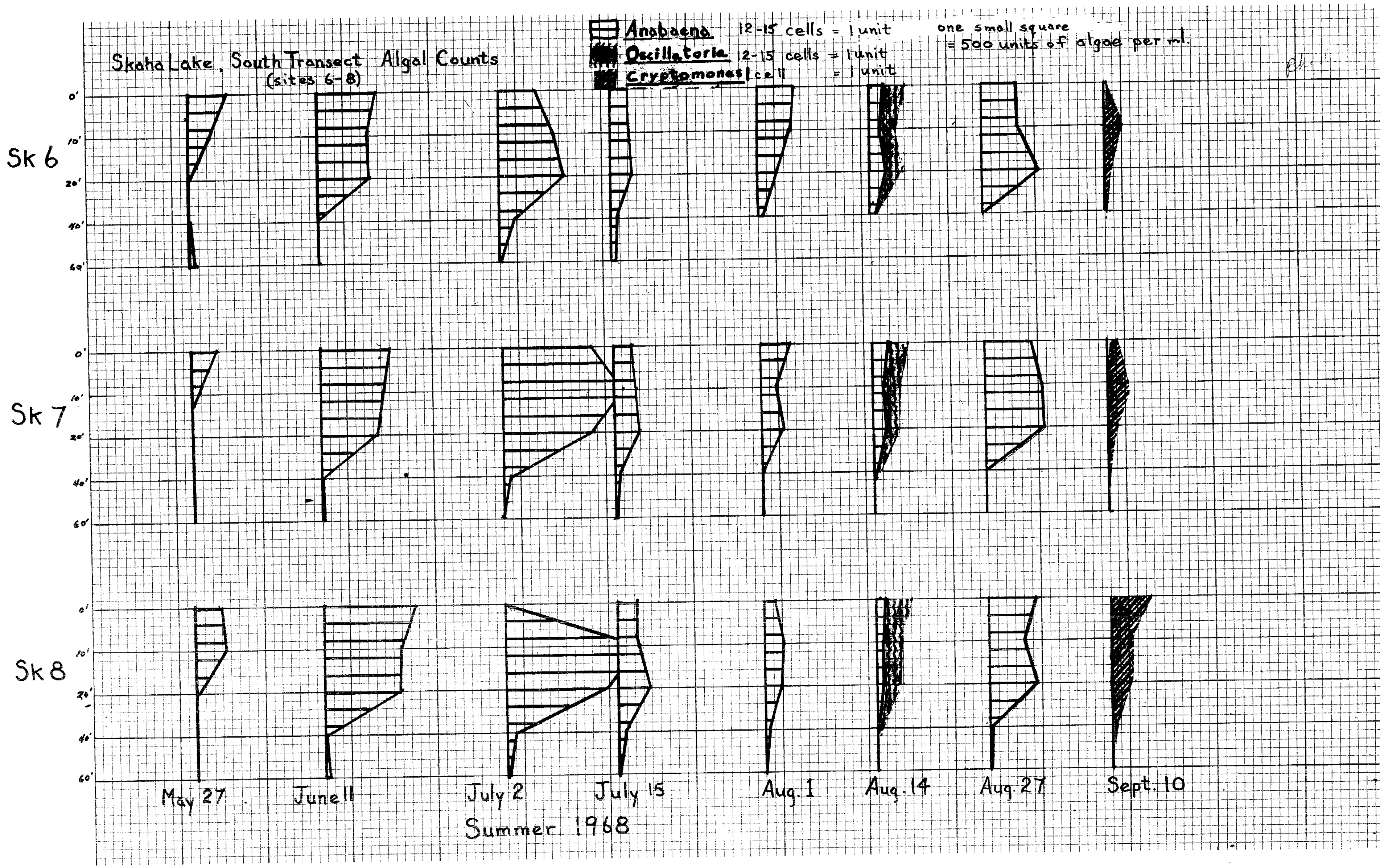



FIG. 11 Algal Distribution Across Skaha Lake Transects. May to September 1968.

B. South Transect (SK-6 to SK-8)

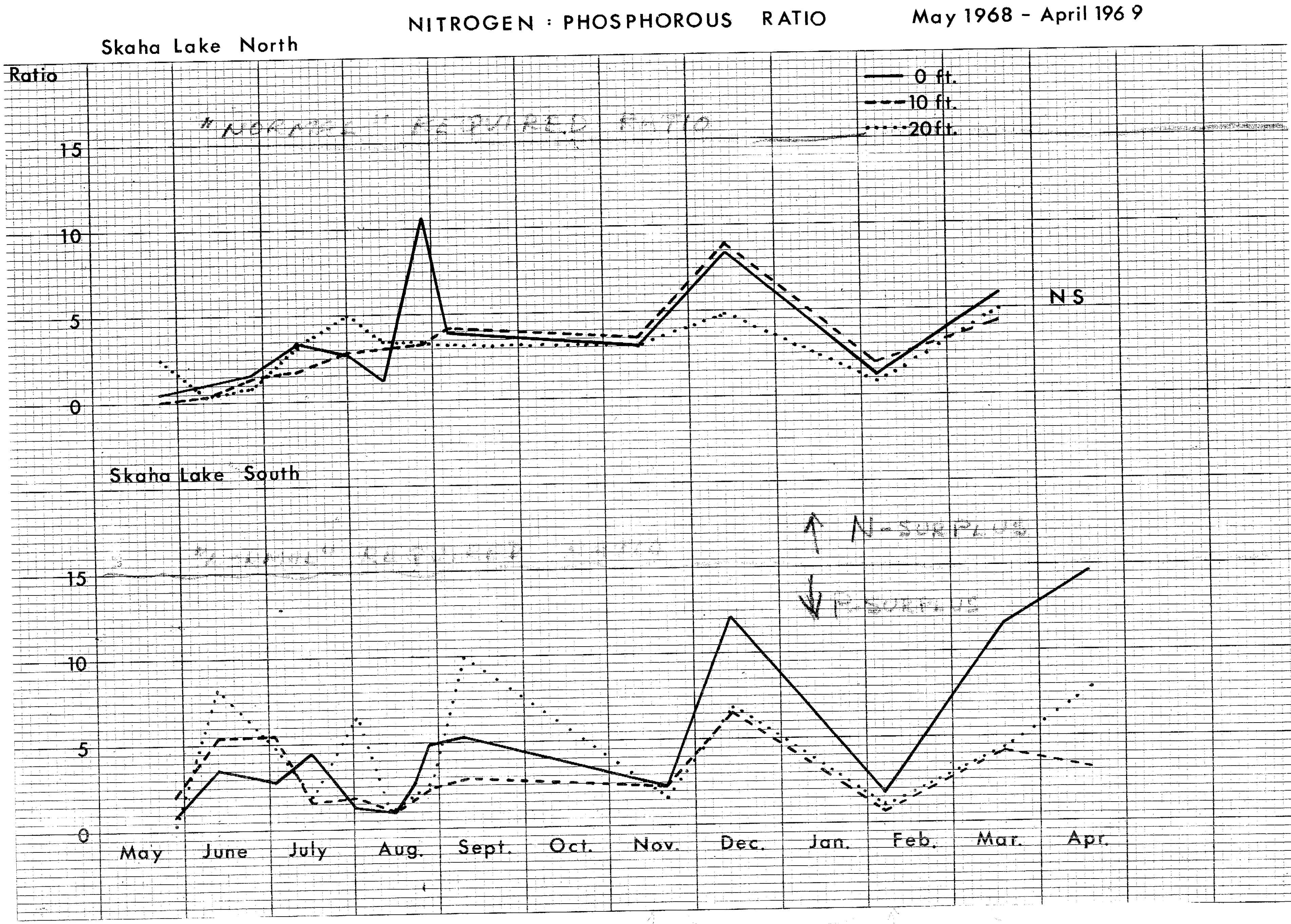

NITROGEN : PHOSPHOROUS RATIO
May 1968 - April 1969
Skaha Lake North
Ratio
15
10
5
0
0 ft.
10 ft.
20ft.
NS
Skaha Lake South
15
10
5
0
May
June
July
Aug.
Sept.
Oct.
Nov.
Dec.
Jan.
Feb.
Mar.
Apr.

FIG. 12

OSOYOOS LAKE - NORTH:

The general temperature pattern (Appendix V-1) in Osoyoos Lake is similar to that in Skaha Lake (Fig. 7B). In 1967 the lake was warmer and remained so for a longer period with the upper layers (to 20 ft) more uniform. In 1967 temperature stratification was more marked than in 1968. The water temperature was fairly uniform from November through April in the north (Fig. 13A). However, there was little, if any, stratification in the south (Fig. 13B).

The Secchi disk readings (Appendix V-2) were 9 ft in May with a reduction to 3.5 ft in July and an increase to 8-10 ft from September through the winter. March readings were incomplete due to slush ice; however, in April light penetrated to a depth of at least 13 ft.

Dissolved oxygen readings (Appendix V-3) were not possible until August 2 at which time there was a definite stratification between the upper 10 ft (6-8 ppm) and the lower depths (less than 3 ppm at 40 ft). This continued through September. In October a reading of 9 ppm occurred throughout the water column and continued through the winter with 11-12 ppm in March and April. In comparison these figures are higher than those of Okanagan Lake in 1936 (Clemens, et al. 1939). Such a difference may result from the techniques used.

Chemical oxygen demand (Appendix V-4) was high in May but dropped suddenly in the June 20 sampling (0.6 ppm at 0 ft). The summer was characterized by a general fluctuation, and winter with large differences in a thermally uniform lake (e.g. 2.7 ppm at 40 ft and 32 ppm at 20 ft in February). Again, though, as the measurements are below 50 ppm, the accuracy and significance of the data is questionable.

The total residue (Appendix V-5) ranged ca. 130-200 ppm with the higher values in the 60 ft layer (the anomaly on June 20 of 2734 ppm at 60 ft probably includes sediment in the sample.) During the winter, values were generally lower (ca. 100 ppm) although values of 150 were recorded in February.

The electrical conductivity (Appendix V-6) was high in the summer from 170-220 micromhos with a gradual drop in the autumn (140 in October) through to a low of 50 micromhos in March. However, a two-fold increase occurred between March and April sampling periods. Again, the nature of the salts is unknown. The calcium concentration (Appendix V-7) was ca. 27-29 ppm with the reading in the top 20 ft lower in mid-July. By late August the 40 and 60 ft samples were markedly higher with 48 ppm reported at 60 ft. The winter averages were higher than those during the summer (74 ppm present at 40 ft). A sudden drop occurred in March and April with 20-30 ppm recorded. The reason for the increase in calcium from late summer through February may result, in part, from the autumn mixing of water and the uniform temperature keeping the calcium in solution; although, calcium salts are less soluble in cold waters (also see results of miscellaneous samples). The sudden drop between February and March could be the result of ice formation and precipitation; but there is not a corresponding decrease in pH (source of carbonate) or phosphate. The sediments (Appendix V-8) have calcium values similar to those in the north of Skaha Lake. The magnesium levels (Appendix V-9) were similar to those in Skaha Lake (8-10 ppm). Often the 60 ft samples contained ca. 1 ppm more than that at other depths. Yet, in the winter when magnesium was 9-10 ppm, it was less at the 60 ft level.

Chloride (Appendix V-10) was less variable in north Osoyoos Lake than in Skaha Lake (1-2.7 ppm). The high of 2.7 ppm was recorded in June but this dropped to ca. 1.55 ppm by October.

Silicate levels (Appendix V-11) were in the general range of those in Skaha Lake (3-5 ppm). In September, after a bloom of the diatom Fragilaria there was a decrease of 2 ppm. The winter levels were similar to those of the summer, but again after development of a diatom population of Cyclotella the silicate dropped to 1.3 ppm. Whether silicate is a factor limiting diatom populations and thus affecting the development of blue-green algae growths is unknown at this time, but seems unlikely.

pH (Appendix V-12) also was similar to that in Skaha Lake with winter and early spring values around 7.5-8.0. In late spring and throughout the summer there is an increase to 9.0. The increase in calcium in the deeper water in late summer may indicate precipitation of calcium carbonate. Again, the sediments (Appendix V-8) were high in calcium -- as high as those in north Skaha Lake.

The nitrogen pattern showed a gradual increase from May through the summer followed by a decrease in winter (Appendix V-13). Nitrite was uniform and negligible (Appendix V-13B). However, ammonia (Appendix V-13A) and nitrate (Appendix V-13C) underwent the largest fluctuations. Ammonia steadily increased from May to late July followed by a gradual decrease. The high during the summer is, no doubt, related to the very large blue-green algal populations. Nitrate also increased steadily but reached the higher concentrations in late August. In November, December and March there were highs (ca. 0.5-0.8 ppm) with lower readings in October, February and April (0.1 ppm). At this time there does not seem to be any correlation of the winter fluctuations with algal populations or physical parameters. Probably several factors are involved, including the extremely cold weather and the inflow waters.

The phosphate pattern (Appendix V-14) showed a drop in May and June followed by an increase in July and August. The ortho-phosphate (inorganic) levels (Appendix V-14A) were slightly lower than those in Skaha Lake. These values increased from 0.03 ppm on May 28 to a high of 0.2 ppm on August 2.

During the autumn and winter months, the inorganic phosphate dropped to a low of 0.03 ppm in April. Total phosphate (Appendix V-14B) followed a similar pattern dropping to a low of ca. 0.007 ppm in April. An analysis of the sediments (Appendix V-8) indicated phosphate concentrations in a range similar to that in south Skaha Lake.

Blue-green algae were the dominant forms from May 28 through August 2, reaching a peak from mid-June to mid-July (Fig. 14, 16A). In mid-August the chrysophyte Dinobryon sp. and the diatom Fragilaria crotonensis (Fig. 15A) appeared in large numbers. These followed the period of flushing Skaha Lake and their growth may have been influenced by this action. F. crotonensis generally is considered not to flourish above 16°C, although there are reports of its presence in waters of higher temperature (20-30°C). It is evidently a species that has temperature tolerances varying from lake to lake (Hutchinson 1957). In late August Anabaena flos-aquae (Fig. 10A, B) and F. crotonensis were dominant, but the Anabaena did not reach as great numbers. In November and December Oscillatoria acutissima (Fig. 10A, B) were present in moderate numbers. The spring algal flora was almost entirely Cyclotella glomerata (Fig. 1D, E). It appears that both O. acutissima and C. glomerata are indicators of cooler waters and possibly lower nutrient (nitrogen, phosphate, etc.) concentrations in these two Okanagan Valley lakes. The distribution of algae throughout the transect (Fig. 16A) shows very little change from one station to the other.

The N:P ratio shows more fluctuation at the 0 ft level than at either 10 or 20 ft (Fig. 17, Appendix V-15). In comparison to Skaha Lake, the N:P ratio from May 1968 through April 1969 shows more variation, with two peaks in summer 1968, one in winter and one in spring 1969. This reflects the fluctuations in nitrogenous compounds (ammonia and nitrate) rather than phosphate compounds, as the latter showed increase only in July and August with a definite drop in the fall and winter. The nitrogen compounds have three main sources during the year. The first is the Okanagan River from Skaha Lake and the second is other inflow water (see miscellaneous sample results). The third could be nitrogen-fixation by blue-green algae. Although N-fixation has not been shown for the algae of these interior lakes, it is a strong possibility (see Fogg 1965, Hutchinson 1967).

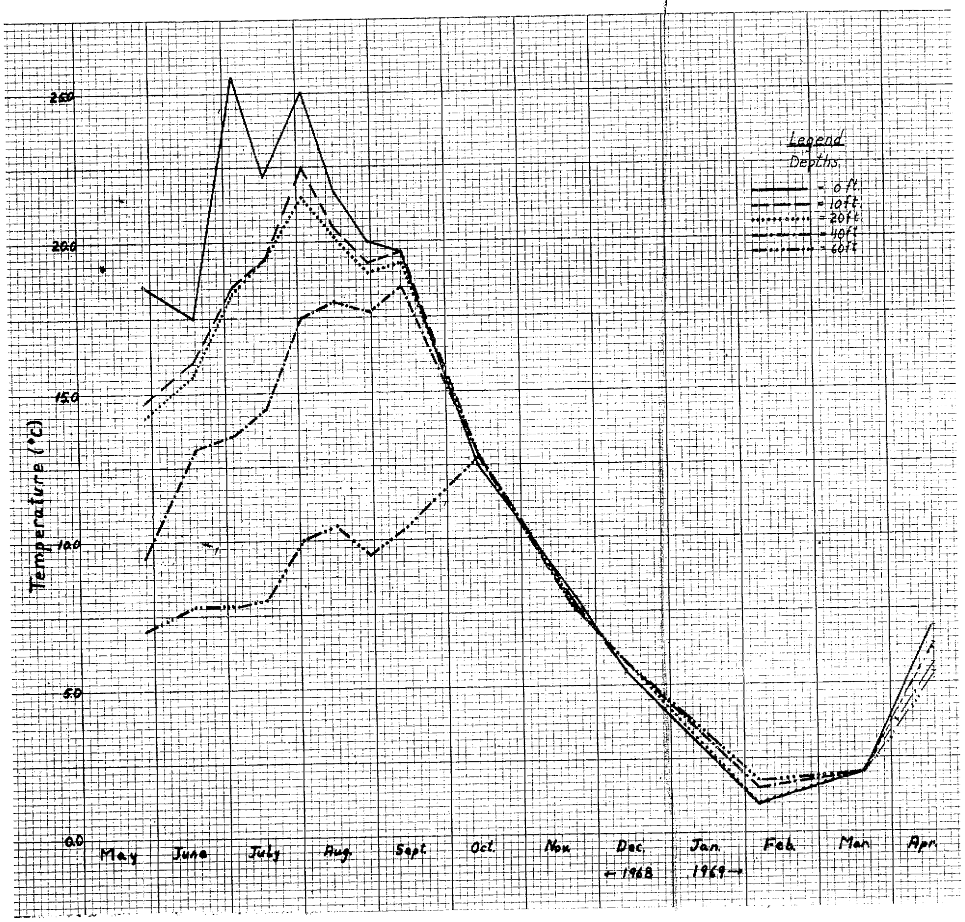
OSOYOOS LAKE - SOUTH:

Fig. 7B gives the general temperature pattern for the entire lake. As noted previously there was little, if any, temperature stratification in the south end of the lake (Fig. 13B). This may be explained by the more shallow nature of the basin in this area, where the steep sides are lacking and the deepest point is less than 100 ft (compared with the north transect where the lake is over 200 ft deep).

The southern end is similar to the northern and to Skaha Lake in many ways, but the differences in several parameters (e.g. pH, algal population, light penetration, N:P ratio, dissolved oxygen) are worth noting. The pH (Appendix V-12) was continually lower -- *ca.* 0.2 units -- and never reached the high of 9.5 recorded in the north. Thus, more carbon dioxide and bicarbonate were in solution, and less carbonate present (Hutchinson 1957), during the summer months, when the blue-green algae usually develop. This lower pH may be important in permitting other algae (other than blue-green algae) to develop. The algal populations (Fig. 16) were less in south Osoyoos Lake and the light penetration was deeper. Thus, the algae were spread further throughout the water column, although the total numbers of algae were not as high as in the north. This may indicate an inhibitory substance in the water, a lack of essential chemical (e.g. trace element), or even the unavailability of certain compounds. In the winter there appears to be more diversity of algae as several genera are represented in small numbers. This includes *Stephanodiscus* sp. (Fig. 15G, H), *Melosira* spp. (Fig. 15I), *Cryptomonas ovata* (Fig. 10C), and *Asterionella formosa* (Fig. 15J).

The N:P ratio (Fig. 17) Appendix V-15) in south Osoyoos Lake is the most variable of the three water masses. This is primarily a reflection of the variation in nitrogen. Also, there are several peaks occurring in the water column as shown by the ratio at the 20 ft level. In the south end of the lake there is more ammonia in deeper water with ammonia-nitrogen ca. 10 times higher than that in the north (Appendix V-13A). The total nitrogen in July is double that in the north and stays at the higher level through September (Appendix V-13D). However, the winter low values are similar. Correlated with the higher nitrogen values are the dissolved oxygen (Appendix V-3) values which are lower. This low dissolved oxygen in the lower water column probably indicates large amounts of moribund material. It is not surprising though to note that the dissolved oxygen values in the south transect often reflect the values in the north transect for the previous period, especially in the upper layers.

A. Osoyoos Lake - North Transect Horizontal Temperature Distribution




B. Osoyoos Lake South Transect Horizontal Temperature Distribution

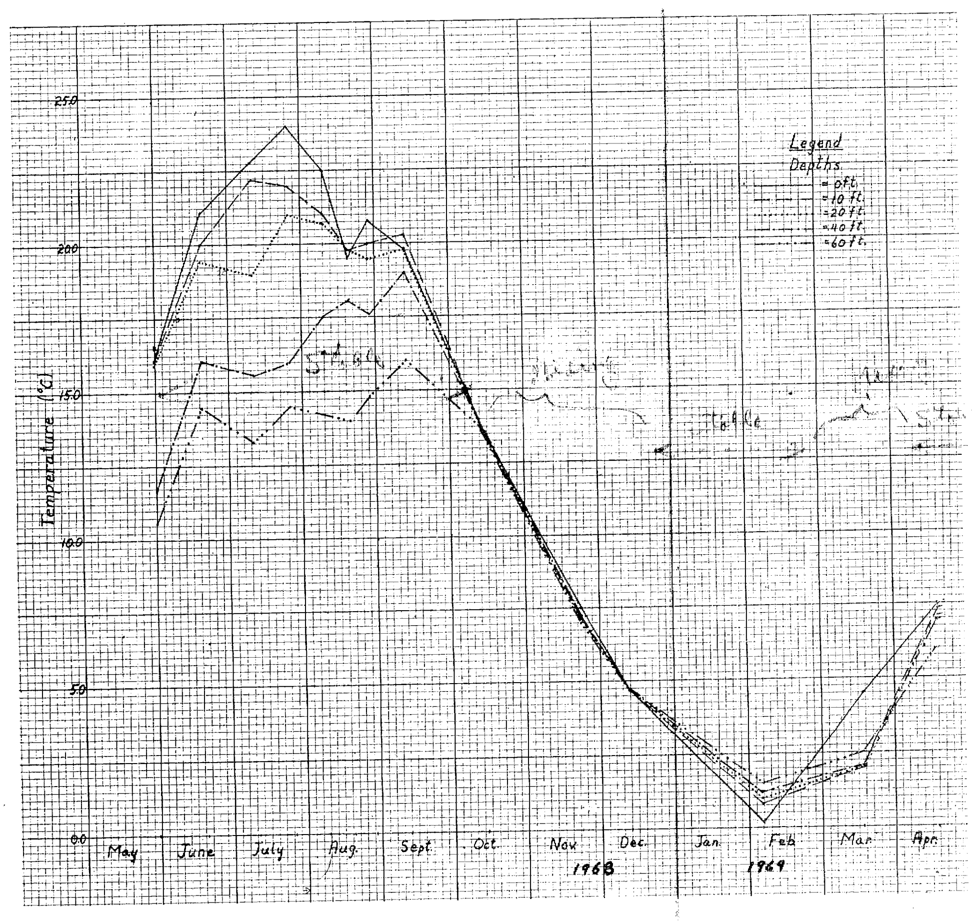



FIG. 13

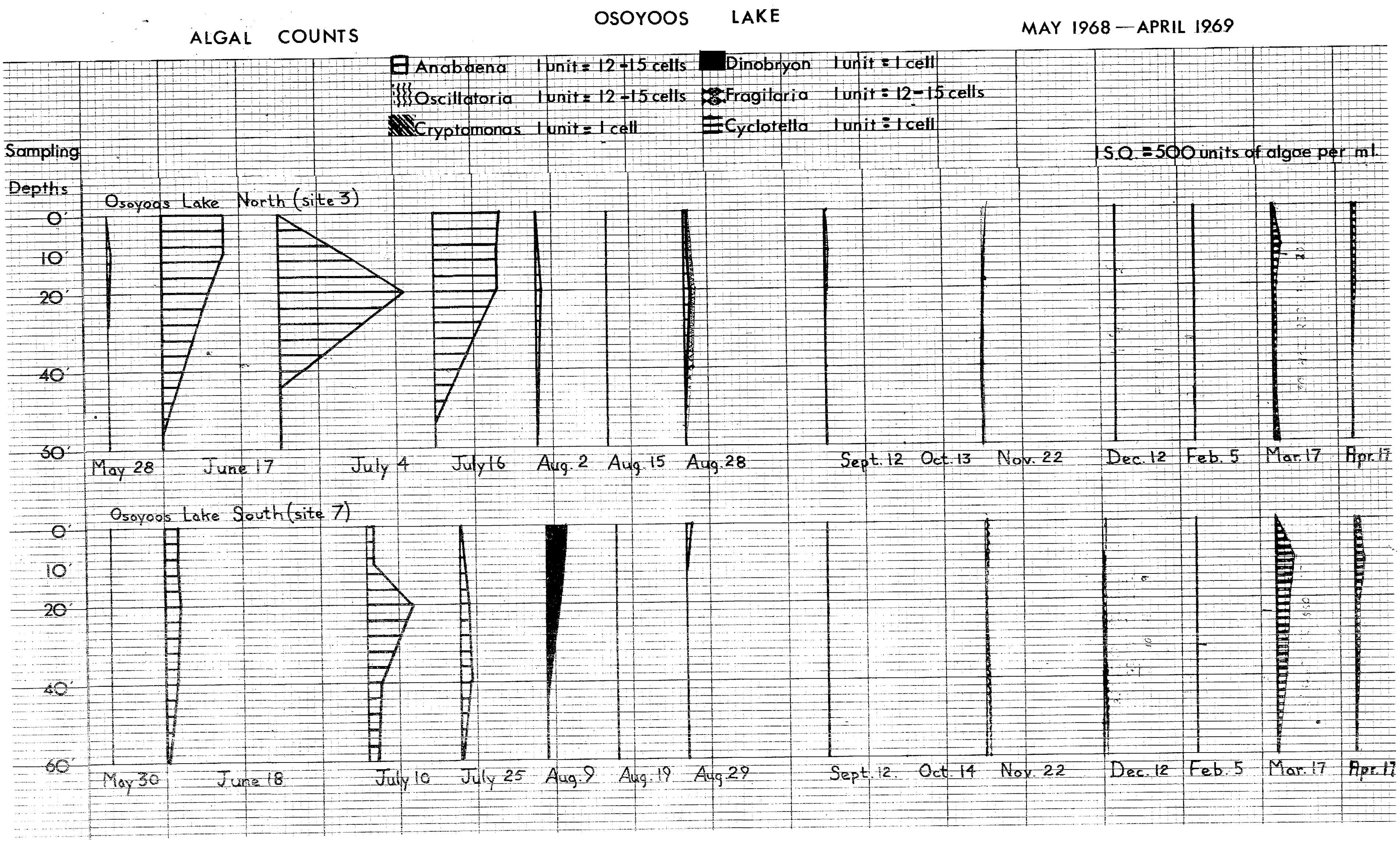

ALGAL COUNTS
OSOYOOS LAKE
MAY 1968 — APRIL 1969
Anabaena 1 unit = 12-15 cells
Oscillatoria 1 unit = 12-15 cells
Cryptomonas 1 unit = 1 cell
Dinobryon 1 unit = 1 cell
Fragilaria 1 unit = 12-15 cells
Cyclotella 1 unit = 1 cell
1 S.Q. = 500 units of algae per ml.
Sampling
Depths
Osoyoos Lake North (site 3)
0'
10'
20'
40'
60'
May 28
June 17
July 4
July 16
Aug. 2
Aug. 15
Aug. 28
Sept. 12
Oct. 13
Nov. 22
Dec. 12
Feb. 5
Mar. 17
Apr. 17
Osoyoos Lake South (site 7)
0'
10'
20'
40'
60'
May 30
June 18
July 10
July 25
Aug. 9
Aug. 19
Aug. 29
Sept. 12
Oct. 14
Nov. 22
Dec. 12
Feb. 5
Mar. 17
Apr. 17

FIG. 14

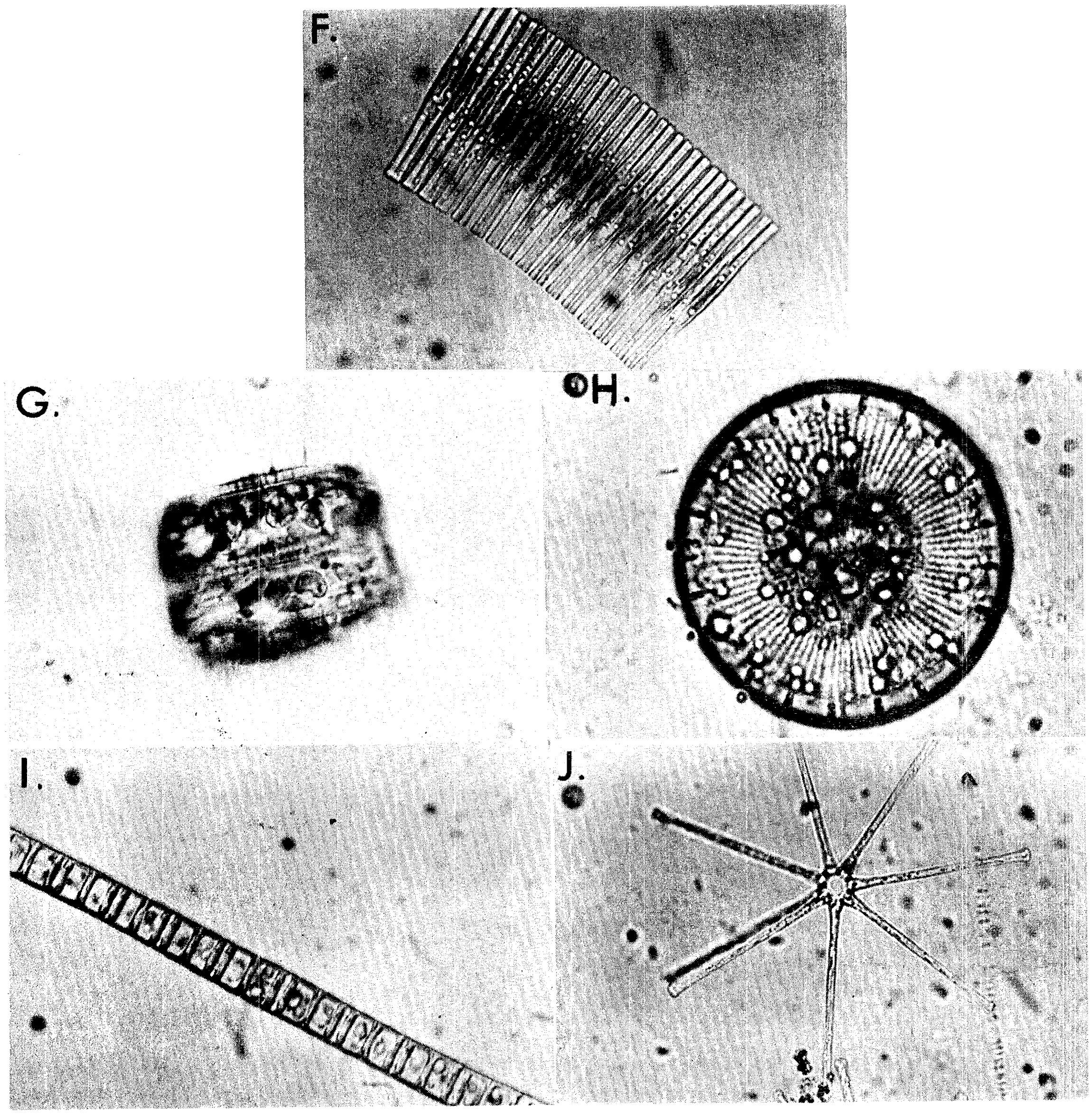



FIG. 15 Representative Algae from Skaha and Osoyoos Lakes

F. Fragilaria crotonensis

G.,H. Stephanodiscus sp.

I. Melosira sp.

J. Asterionella formosa

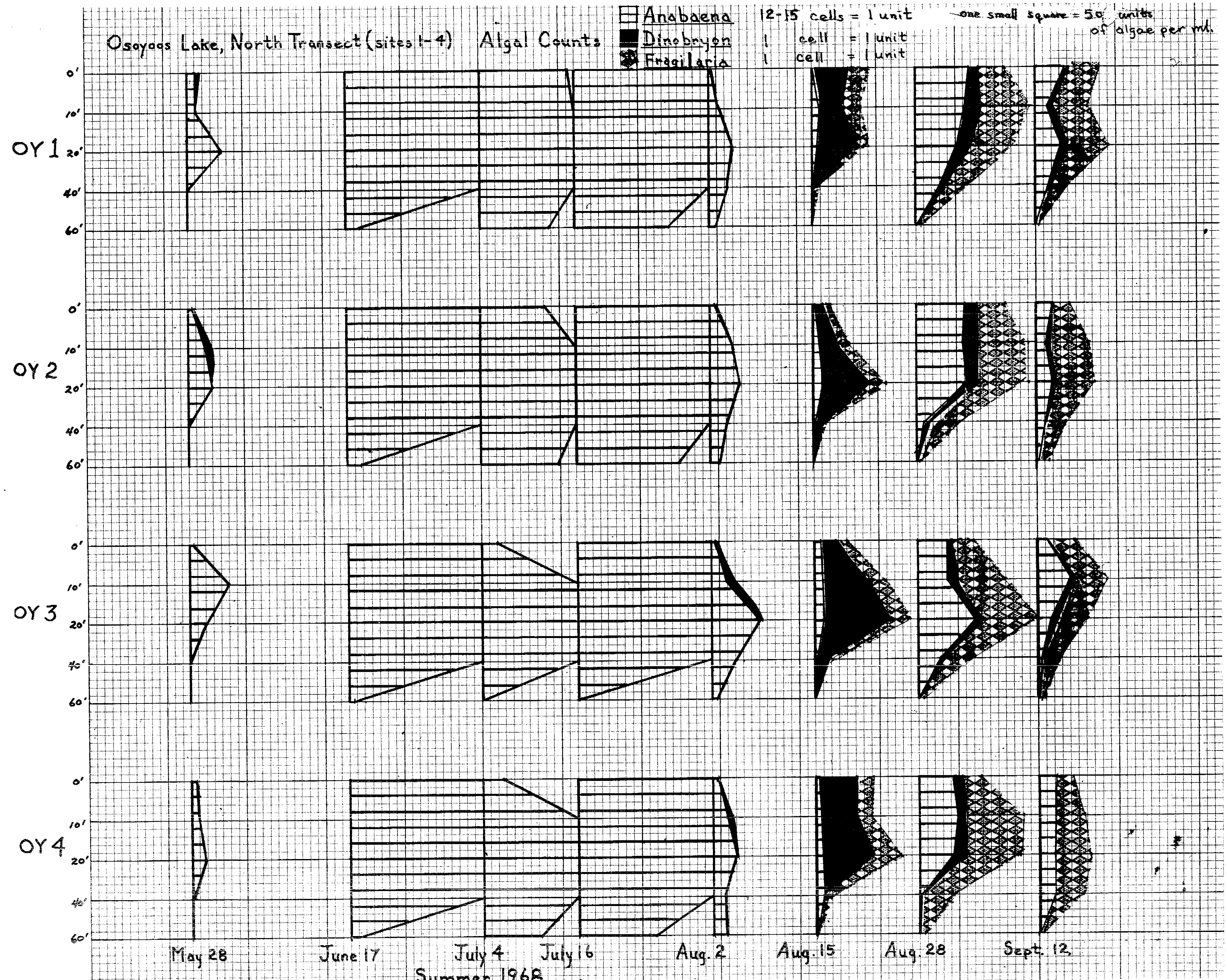



FIG. 16 Algal Distribution Across Osoyoos Lake Transects, May to September, 1968. A. North Transect (OY-1 to OY-4)

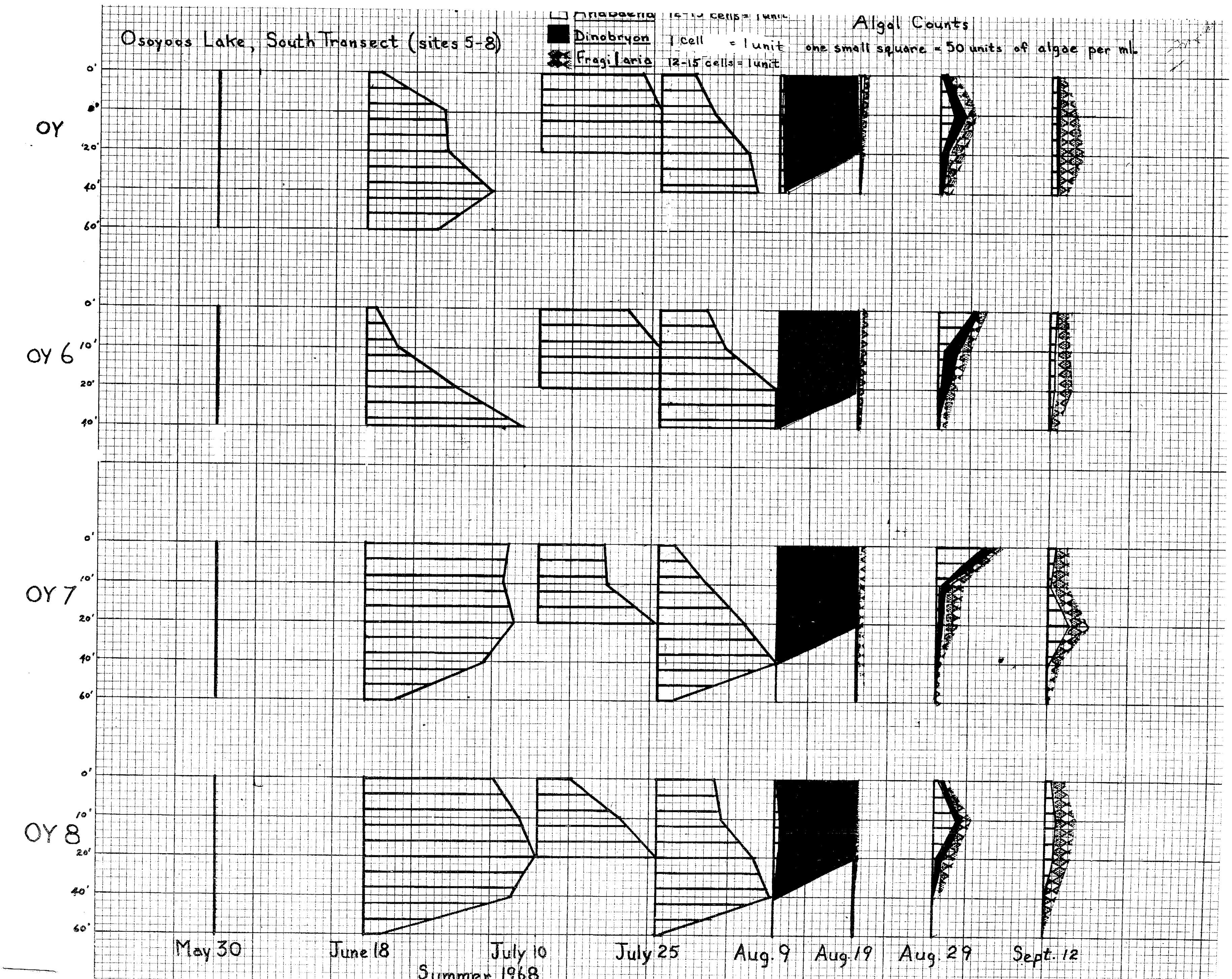



FIG. 16 Algal Distribution Across Osoyoos Lake Transects, May to September, 1968. B. South Transect (OY-5 to OY-8)

NITROGEN : PHOSPHOROUS RATIO MAY 1968 APRIL 1969

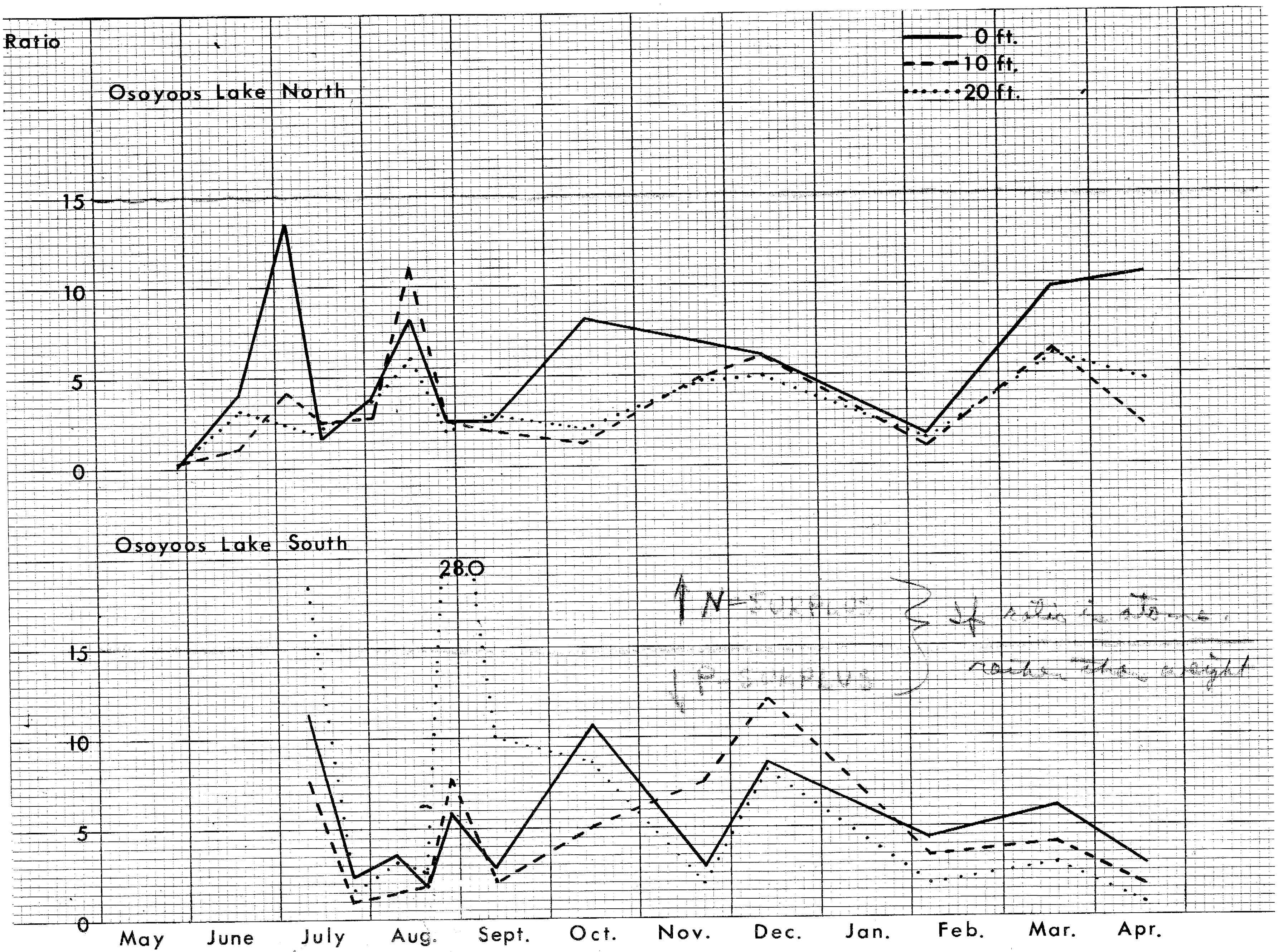



FIG. 17

MISCELLANEOUS SAMPLES:

The miscellaneous samples (Fig. 1, 3) can be divided into three groups: those flowing into the Okanagan River north of Skaha Lake; those flowing into the Okanagan River south of Skaha Lake; and those flowing or seeping into Osoyoos River.

The inflow into Skaha Lake includes the three Okanagan River samples (OR-1, OR-2, OR-3) and Shingle Creek (SC), shown in Fig. 1. Appendix VI-1 gives an indication of the chemical nature of these waters. Data from OR-1 can be considered indicative of the waters of Okanagan Lake. Shingle Creek, to the west of the Okanagan River and below OR-1 to OR-3, is indicative of the general inflow waters to the river from the surrounding land. It can be seen that at OR-2 (near the outfall of the Penticton secondary treatment plant) and OR-3 (near Aylmer cannery outfall) there is an increase in nitrogen (ammonia, nitrate, nitrite) and phosphate compounds. At OR-2 ammonia (0.17-0.47) and phosphate (ca. 0.3 ppm) are the important additions whereas at OR-3 nitrate (Ca. 0.07 ppm) and phosphate are important additions. The total residue (500-1100 ppm) and the chemical oxygen demand (90-200 ppm) at OR-3 are markedly increased from July through August (the period of sampling) as a result of the seasonal operation of the cannery. Interestingly, there is a seasonal increase in chloride (as high as 6.0 ppm in late June) indicating some other additive to the cannery discharge. Calcium,magnesium and silicate values remained fairly uniform in all four samples.

It is possible to calculate the general magnitude of phosphate and nitrogen entering the Okanagan River from the Penticton treatment plant. The difference in amounts of phosphate and nitrogen from site OR-1 (above the treatment plant outfall) and OR-2 (just below) can be determined. The average annual outflow from the Okanagan Lake was 700 c.f.s.

The outflow from the treatment plant is estimated at 1 M.G.D. during the winter months and 1.5 M.G.D. during the summer tourist season (J. N. Hamilton personal communication). The volume of water discharged by the treatment plant is small in comparison to the lake discharge. The values of outflow from the Okanagan Lake into the Okanagan River are listed in Tables 4 and 5 for those days when the river samples were obtained.

The average river flow was 883 c.f.s. for the six days sampled. On this basis it appears in Table 4 and 5 that an average of 906 lbs of phosphate, and 595 lbs of nitrogen was added per day during that period. Further calculations may be carried out adjusting for the lower annual flow (700 c.f.s.) to show that an annual input of these nutrients would be in the region of 130 tons of phosphate and 100 tons of nitrogen. More complete and detailed sampling would be required for verification of the above estimate.

The N:P ratio is 2:3. Such data are only a general indication of the nitrogen and phosphorus entering from the treatment plant and are based on data from the summer when the outflow of both are probably higher due to an increase in population. Discharge data from the cannery below the treatment plant is shown in Table 6.

The samples flowing into the Okanagan River south of Skaha Lake are (in north to south orientation): McIntyre Creek (MC) (Fig. 1); Park Rill (PR), (Fig. 1); and Tugulnuit Lake (TL) (Fig. 3). The data in Appendix VI-2 show nitrogen and phosphorus present in quantities similar to those of OR-1 and SC. One exception is at McIntyre Creek in June and July when the nitrate measurements were approximately 10 times higher than those for Tugulnuit Lake or Park Rill (TL was *ca*. 0.06 ppm). Also, in late August the nitrate level was higher in both MC (0.16 ppm) and TL (0.92 ppm). The total residue from TL is moderately high (over 200 ppm) and may indicate some artificial enrichment of this lake. The C.O.D. is still below the measurably accurate level of 50 ppm. Calcium and magnesium

TABLE 4. PHOSPHATE ADDITION TO THE OKANAGAN RIVER

| Date | Location & Analyses OR-2 ppm | OR-1 ppm | Net Input ppm | River Discharge c.f.s. | $PO_4$ lbs/day |
|---|---|---|---|---|---|
| June 5 | 0.320 | Nil | 0.320 | 1050 | 1812 |
| " 19 | 0.070 | 0.70 | Nil | 1350 | Nil |
| July 5 | 0.240 | Nil | 0.240 | 550 | 712 |
| " 24 | 0.288 | Nil | 0.288 | 500 | 776 |
| Aug. 6 | 0.241 | Nil | 0.241 | 1400 | 1819 |
| " 20 | 0.190 | 0.058 | 0.132 | 450 | 320 |

Average: 906 lbs of Phosphate per day

TABLE 5. NITROGEN ADDITION TO THE OKANAGAN RIVER

| Date | Location & Analyses OR-2 ppm | OR-1 ppm | Net Input ppm | River Discharge c.f.s. | N. lbs/day |
|---|---|---|---|---|---|
| June 5 | 0.014 | 0.009 | 0.005 | 1050 | 28 |
| " 19 | 0.011 | 0.014 | Nil | 1350 | Nil |
| July 5 | 0.370 | 0.034 | 0.336 | 550 | 996 |
| " 24 | 0.286 | 0.008 | 0.278 | 500 | 749 |
| Aug. 6 | 0.158 | 0.030 | 0.128 | 1400 | 966 |
| " 20 | 0.419 | 0.077 | 0.342 | 450 | 830 |

Average: 595 lbs of Nitrogen per day

TABLE 6. CHARACTERISTICS OF THE PROCESS WASTE FROM AYLMER CANNERY (EXCLUDING COOLING).

| Dates 1968 | Products | Avg.daily* volume | Peak daily volume | Peak hourly volume |
|---|---|---|---|---|
| Mar. 15 - Apr. 15 | B.B. Beans | 90,000 | 270,000 | 15,000 |
| May 1 - July 15 | Asparagus<br>Strawberries<br>Raspberries | 22,000 | 90,000 | 5,000 |
| July 15 - Aug. 1 | Cherries | 100,000 | 210,000 | 11,500 |
| Aug. 1 - Aug. 15 | Blueberries<br>Apricots | 125,000 | 270,000 | 15,000 |
| Aug. 15 - Sep. 30 | Peaches<br>Fruit Salad | 125,000 | 225,000 | 12,600 |
| Oct. 1 - Nov. 30 | Pears<br>Tomatoes<br>Plums | 100,000 | 300,000 | 16,800 |

* including all=days

Total volume of water per year about 30 million i.g. (processing and cooling). About 75% of this total requires treatment.

1) Average Total Phosphate -- $<$2.3 mg./l

2) Average Nitrate -- 2.7 mg./l

3) Average Kjeldahl Nitrogen-- 5.6 mg./l

are higher in TL than in the Okanagan River or in MC. Park Rill, which dries up or seeps underground in the summer was very high in calcium and magnesium (both over 30 ppm) and in total residue (500 ppm in July). Calcium, magnesium and silicate, present in moderately high amounts (higher than OR-1) in both TL and MC, give an indication of the general nature of the valley soils in the area.

The last three miscellaneous samples are indicative of waters entering Osoyoos Lake (Appendix VI-3). This includes an agricultural drainage ditch near the north end of the lake (OY-DD); Peanut Lake, a "kettle" on the west side of the north end of the lake (OY-PL); and the stream ("Kissinger Spring") probably fed by seepage from the sewage lagoon above the town of Osoyoos (OY-SS). In all samples ammonia and nitrite are negligible but excess amount of nitrate are present (usually over 5 ppm), especially in OY-DD and OY-SS. The amounts may be of a seasonal nature (e.g. OY-DD in early July with 21 ppm). The phosphate level is only high in the sewage seepage (OY-SS), which also has the highest level residue of any waters sampled (generally 10 times those of OR-2 or OR-3 near sewage and cannery outfalls). The total residue from the drainage ditch is higher than that of most inflow waters (over 500 ppm), often in the range of the cannery effluent (OR-3). Calcium, chloride, magnesium and silicate are all quite high for the sewage seepage and may account for the high total residue. Silicate (over 20 ppm) is at the same level in the drainage ditch and could indicate the type of fertilizers used. The amount of calcium, magnesium and silicate present in the drainage ditch and Peanut Lake, as in Tugulnuit Lake and McIntyre Creek, indicate the general nature of the soils in this area of the Okanagan Valley (see Fig. 1, 3).

The town of Oliver discharges effluent into the Okanagan River from a secondary treatment plant. In addition the river receives further effluent directly from one of the packing houses south of Oliver and other minor seepages from septic tank type of disposal systems.

CONCLUSIONS:

The general picture of Skaha Lake still shows signs of increasing enrichment. Each winter (February) the nutrient level is lower than in the previous spring (April-May); but, each successive low appears higher than that of the previous year. The increase of temperature and light, along with the nutrients during the early spring and summer creates a most satisfactory environment for large algal populations, especially blue-green algae. The situation in August and September is such that the dissolved oxygen may be low and the N:P ratio high. This could indicate a large amount of decay in the water column. As yet there is no sign of anaerobic conditions in the water or in the sediments. It is conceivable though that such may occur within 5-10 years, if the increase in nitrogen and phosphorus nutrients continues at the present rate. The lake appears to be actively cycling nutrients at present. Yet, it is probable that a gradual build-up is occurring in the sediments. In the future this may cause enrichment to occur at a more accelerated pace. The flushing process undertaken in early August indicates that the increase in summer temperature and nutrients can be slowed and possibly diminished. However, this flushing created only a temporary hiatus for the lake. Thus, it would probably be necessary to undertake flushing of the lake on a monthly basis from May through September. At the same time it will be necessary to lower the amount of wastes that enter the lake through the Okanagan River; both treated (from Penticton secondary treatment plant) and untreated (cannery plant).

The north end of Osoyoos Lake is very similar to Skaha Lake and reflects the condition of the northern lake. In 1967 the study included south Osoyoos Lake only, where the algal populations were smaller. Thus, the large algal growth occurring in the north in 1968 was surprising as it was assumed that Osoyoos Lake was not as enriched as Skaha Lake. This northern part of the lake is not the prime area for recreational usage and thus algal blooms may not be as objectionable, if noted at all. Changes in Skaha Lake generally affect this part of Osoyoos Lake almost equally. One important fact arising from the 1968-69 study is that the calcium and phosphate concentrations in the sediments are equal to those in the north of Skaha Lake (which is higher than that in the south of Skaha Lake). This indicates the addition of these compounds by waters coming into Okanagan River south of Okanagan Falls (see Fig. 1, 3) including the effluent from the secondary treatment plant at Oliver and the untreated packing plant wastes. Interpretation of data from Skaha Lake can then be applied to north Osoyoos and thus any treatment for the former will probably benefit the latter.

The south end of Osoyoos Lake differs from its north end, and from Skaha Lake as already noted in the results. There is little if any stratification in this section of the lake. This possibly helps establish an oxygen-deficient lower layer quite separate from the upper layers. Under anaerobic conditions nutrient salts readily return to solution and become available once there is uniform mixing of the water (Hutchinson 1957). The diverse algal population during the winter and spring may be one result of such mixing. If the sewage seepage water (OY-SS) does enter south Osoyoos Lake, it brings large quantities of calcium, phosphate and nitrate. The first two easily form an insoluble precipitate that settles in the sediments. The excess nitrate may be important as a source of nitrogen for growth of other algae. Thus, the nitrogen-fixing blue-green algae (<u>Anabaena</u>) that are able to grow readily when nitrogen is limited do not get started so easily. Possibly the slightly lower pH in south Osoyoos Lake may allow carbon to be more available as carbon dioxide and bicarbonate, both of which are more soluble than carbonate. (It has been suggested earlier that some factor may be in limited quantities in the waters of south Osoyoos Lake, and this also may be important.) At present any explanation for the smaller algal population in south Osoyoos Lake is purely speculative. The important item about this part of the lake is the lack of any thermal stratification during the summer and the development of a definite oxygen-deficient lower zone.

The miscellaneous samples give only an indication of the inflow waters into the Skaha-Osoyoos Lake system. These inflow waters are very important as sources of nitrate and phosphate as well as certain inorganic elements as calcium, magnesium and silicates. The lack of ammonia in these waters indicates little decay. However, the presence of ammonia, at certain times, in the lake waters indicates decay of organic matter in these bodies of water. The continued addition of excessive nutrients by the inflow waters over a period of time will change the nature of the lakes, causing accelerated enrichment and noxious algal blooms that can be detrimental to economic and aesthetic aspects in the area.

The affects of primary and secondary effluent, cannery and packing house wastes, together with the runoff and allied fertilizer components from agricultural lands should be considered and assessed as enrichment factors in the overall recommendations. Such a study was not possible during the term covered by this current report.

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APPENDIX I. SKAHA LAKE FLUSHING, UNDERTAKEN BY B.C. WATER RESOURCES SERVICE, WATER INVESTIGATIONS BRANCH. (LAKE AREA = 4,700 ACRES)

| | | | Skaha Lake Elevation feet beginning of day | Penticton Dam Discharge | | Okanagan Falls Discharge | | Net Change | | | Skaha Lake Elevation feet (end of 24-hour day.) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | c.f.s. | ac.ft. | c.f.s. | ac.ft. | c.f.s. | ac.ft. | feet | |
| Jul | 28 | 0 | 1108.50 | 400 | 800 | 400 | 800 | 0 | 0 | 0 | 1108.50 |
| " | 29 | 1 | 1108.50 | 100 | 200 | 700 | 1400 | | -1200 | -0.25 | 1108.25 |
| " | 30 | 2 | 1108.50 | 100 | 200 | 700 | 1400 | | -1200 | -0.25 | 1108.00 |
| " | 31 | 3 | 1108.00 | 100 | 200 | 700 | 1400 | | -1200 | -0.25 | 1107.75 |
| Aug | 1 | 4 | 1107.75 | 100 | 200 | 700 | 1400 | | -1200 | -0.25 | 1107.50 |
| " | 2 | 5 | 1107.50 | 350 | 700 | 350 | 700 | | 0 | 0 | 1107.50 |
| " | 3 | 6 | 1107.50 | 700 | 1400 | 350 | 700 | | + 700 | +0.15 | 1107.65 |
| " | 4 | 7 | 1107.65 | 1000 | 2000 | 350 | 700 | | +1300 | +0.27 | 1107.92 |
| " | 5 | 8 | 1107.92 | 1200 | 2400 | 350 | 700 | | +1700 | +0.36 | 1108.28 |
| " | 6 | 9 | 1108.28 | 1200 | 2400 | 350 | 700 | | +1700 | +0.36 | 1108.64 |
| " | 7 | 10 | 1108.64 | 1200 | 2400 | 350 | 700 | | +1700 | +0.36 | 1109.00 |
| " | 8 | 11 | 1109.00 | 1200 | 2400 | 350 | 700 | | +1700 | +0.36 | 1109.36 |
| " | 9 | 12 | 1109.36 | 800 | 1600 | 350 | 700 | | + 900 | +0.19 | 1109.55 |
| " | 10 | 13 | 1109.55 | 400 | 800 | 700 | 1400 | | - 600 | -0.13 | 1109.42 |
| " | 11 | 14 | 1109.42 | 100 | 200 | 700 | 1400 | | -1200 | -0.25 | 1109.17 |
| " | 12 | 15 | 1109.17 | 100 | 200 | 700 | 1400 | | -1200 | -0.25 | 1108.92 |
| " | 13 | 16 | 1108.92 | 100 | 200 | 700 | 1400 | | -1200 | -0.25 | 1108.67 |
| " | 14 | 17 | 1108.67 | 100 | 200 | 400 | 800 | | - 600 | -0.13 | 1108.54 |
| " | 15 | 18 | 1108.54 | 300 | 600 | 400 | 800 | | - 200 | -0.04 | 1108.50 |
| " | 16 | 19 | 1108.50 | 400 | 800 | 400 | 800 | | 0 | 0 | 1108.50 |

# APPENDIX II. MODIFICATION TO ANALYTICAL CHEMICAL METHODS (WATER SAMPLES)

Ammonia: (Strickland and Parsons 1965, p. 83)

Calcium: (APHA 1965, p. 74)
Used Eriochrome Blue Black R (Calcon) Indicator

Chemical Oxygen Demand: (APHA 1965, p. 510)
Omitted mercuric sulfate and silver sulfate. (Accurate only above 50 ppm)

Chloride: (Domask and Kobe 1952, p. 989)

Nitrate: (APHA 1965, p. 195)
Omitted step 4.2; measurements made at 410 mu.

Nitrite: (Strickland and Parsons 1965, p. 79)

Phosphate, total: (Gales, et al. 1966, p. 1363)

Phosphate, ortho-: (APHA 1965, p. 234)
Modified by adding potassium persulfate to release possible phosphate incorporated in bacterial cell walls.

Silicate: (APHA 1965, p. 261)
Omitted step 4.1

Total residue: (APHA 1965, p. 244)

# APPENDIX III. DAILY TEMPERATURE, HOURS OF SUNLIGHT, AND RADIATION INTENSITY FROM SUMMERLAND, B.C.

SUMMERLAND CDA BC 49 34 N 119 39 W MAY 1968

TOTAL RADIATION FOR EACH HOUR ENDING AT (LOCAL APPARENT TIME)

| DAY | RF | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | DAILY TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 1 | | | | | + | 7 | 21 | 37 | 50 | 37 | 39 | 30 | 26 | 18 | 33 | 27 | 28 | 22 | 7 | + | | | | | 382 |
| 02 | 1 | | | | | + | 7 | 21 | 36 | 47 | 59 | 66 | 71 | 71 | 49 | 59 | 45 | 15 | 14 | 3 | + | | | | | 565 |
| 03 | 1 | | | | | + | 6 | 20 | 35 | 44 | 58 | 65 | 62 | 63 | 57 | 62 | 50 | 21 | 9 | 4 | + | | | | | 557 |
| 04 | 1 | | | | | + | 5 | 19 | 38 | 47 | 51 | 43 | 7 | 7 | 25 | 38 | 9 | 7 | 5 | 2 | + | | | | | 302 |
| 05 | 1 | | | | | 0 | 1 | 3 | 11 | 34 | 27 | 31 | 34 | 48 | 51 | 51 | 19 | 12 | 6 | 1 | + | | | | | 330 |
| 06 | 1 | | | | | + | 1 | 3 | 7 | 10 | 9 | 12 | 15 | 20 | 22 | 8 | 10 | 11 | 4 | 2 | + | | | | | 133 |
| 07 | 1 | | | | | + | 4 | 14 | 29 | 51 | 54 | 69 | 76 | 42 | 24 | 30 | 29 | 12 | 8 | 3 | + | | | | | 446 |
| 08 | 1 | | | | | + | 3 | 22 | 37 | 51 | 62 | 71 | 39 | 27 | 68 | 62 | 36 | 27 | 12 | 4 | + | | | | | 520 |
| 09 | 1 | | | | | 1 | 9 | 22 | 37 | 50 | 61 | 68 | 73 | 73 | 69 | 60 | 48 | 36 | 23 | 8 | 1 | | | | | 638 |
| 10 | 1 | | | | | 1 | 9 | 24 | 38 | 51 | 62 | 70 | 73 | 73 | 69 | 61 | 49 | 37 | 23 | 9 | 1 | | | | | 650 |
| 11 | 1 | | | | | 1 | 9 | 24 | 38 | 51 | 62 | 69 | 73 | 71 | 54 | 67 | 51 | 37 | 24 | 9 | 1 | | | | | 641 |
| 12 | 1 | | | | | 1 | 10 | 24 | 31 | 36 | 60 | 67 | 73 | 74 | 59 | 38 | 44 | 24 | 21 | 9 | 1 | | | | | 569 |
| 13 | 1 | | | | | 1 | 9 | 23 | 38 | 51 | 63 | 49 | 49 | 46 | 40 | 31 | 26 | 23 | 10 | 11 | 1 | | | | | 469 |
| 14 | 1 | | | | | 0 | 2 | 6 | 4 | 16 | 15 | 52 | 46 | 60 | 32 | 40 | 16 | 25 | 8 | 4 | 1 | | | | | 326 |
| 15 | 1 | | | | | 1 | 11 | 25 | 39 | 53 | 65 | 72 | 75 | 76 | 72 | 55 | 46 | 31 | 22 | 10 | 1 | | | | | 652 |
| 16 | 1 | | | | | 1 | 11 | 25 | 39 | 52 | 63 | 70 | 74 | 74 | 70 | 61 | 50 | 37 | 24 | 11 | 1 | | | | | 663 |
| 17 | 1 | | | | | 1 | 11 | 25 | 39 | 52 | 63 | 70 | 74 | 75 | 71 | 62 | 50 | 37 | 24 | 9 | 1 | | | | | 664 |
| 18 | 1 | | | | | 1 | 11 | 24 | 38 | 51 | 62 | 69 | 73 | 74 | 70 | 62 | 55 | 41 | 14 | 5 | 1 | | | | | 653 |
| 19 | 1 | | | | | 1 | 11 | 26 | 39 | 52 | 62 | 69 | 68 | 52 | 37 | 47 | 45 | 21 | 10 | 6 | 1 | | | | | 546 |
| 20 | 1 | | | | | + | 1 | 5 | 8 | 3 | 7 | 13 | 16 | 19 | 21 | 15 | 12 | 7 | 2 | 2 | + | | | | | 130 |
| 21 | 1 | | | | | 2 | 14 | 23 | 27 | 44 | 45 | 68 | 68 | 67 | 31 | 20 | 5 | 3 | 7 | 4 | 1 | | | | | 429 |
| 22 | 1 | | | | | 1 | 8 | 20 | 31 | 42 | 63 | 67 | 67 | 55 | 51 | 42 | 40 | 20 | 15 | 6 | 1 | | | | | 529 |
| 23 | 1 | | | | | + | 2 | 4 | 9 | 24 | 35 | 43 | 48 | 34 | 38 | 41 | 18 | 24 | 5 | 2 | + | | | | | 327 |
| 24 | 1 | | | | | 2 | 15 | 27 | 46 | 42 | 46 | 33 | 69 | 72 | 76 | 38 | 49 | 9 | 2 | 8 | 2 | | | | | 534 |
| 25 | 1 | | | | | 1 | 8 | 15 | 14 | 20 | 24 | 55 | 60 | 70 | 59 | 16 | 1 | 8 | 18 | 16 | 2 | | | | | 388 |
| 26 | 1 | | | | | 1 | 3 | 5 | 9 | 11 | 16 | 29 | 47 | 69 | 65 | 44 | 40 | 14 | 11 | 7 | 2 | | | | | 372 |
| 27 | 1 | | | | 0 | 3 | 13 | 27 | 37 | 56 | 67 | 72 | 65 | 55 | 49 | 27 | 19 | 30 | 24 | 8 | 2 | 0 | | | | 554 |
| 28 | 1 | | | | 0 | 2 | 7 | 18 | 42 | 58 | 58 | 64 | 67 | 40 | 53 | 51 | 25 | 14 | 15 | 15 | 2 | 0 | | | | 531 |
| 29 | 1 | | | | 0 | 3 | 15 | 23 | 39 | 53 | 67 | 75 | 70 | 75 | 70 | 28 | 40 | 34 | 20 | 6 | 1 | 0 | | | | 619 |
| 30 | 1 | | | | 0 | + | 4 | 7 | 17 | 13 | 14 | 66 | 67 | 27 | 30 | 60 | 16 | 13 | 22 | 14 | 3 | + | | | | 372 |
| 31 | 1 | | | | + | 3 | 13 | 26 | 42 | 53 | 60 | 71 | 62 | 45 | 50 | 38 | 27 | 19 | 6 | 3 | 2 | 0 | | | | 520 |
| MEAN | | | | | 0 | 1 | 8 | 19 | 30 | 41 | 48 | 57 | 58 | 54 | 50 | 43 | 32 | 22 | 14 | 7 | 1 | 0 | | | | 484 |

SUMMERLAND CDA BC 49 34 N 119 39 W JUN 1968

TOTAL RADIATION FOR EACH HOUR ENDING AT (LOCAL APPARENT TIME)

| DAY | RF | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | DAILY TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 1 | | | | 0 | 1 | 3 | 10 | 14 | 27 | 49 | 49 | 21 | 20 | 17 | 18 | 16 | 15 | 8 | 6 | 1 | 0 | | | | 273 |
| 02 | 1 | | | | 0 | + | 3 | 9 | 20 | 27 | 14 | 56 | 64 | 67 | 55 | 64 | 58 | 42 | 25 | 17 | 4 | + | | | | 525 |
| 03 | 1 | | | | + | 4 | 15 | 28 | 41 | 54 | 62 | 76 | 78 | 55 | 66 | 65 | 56 | 41 | 27 | 15 | 3 | + | | | | 685 |
| 04 | 1 | | | | + | 3 | 15 | 27 | 41 | 54 | 65 | 74 | 78 | 49 | 51 | 26 | 41 | 35 | 14 | 12 | 2 | + | | | | 588 |
| 05 | 1 | | | | + | 3 | 14 | 27 | 41 | 54 | 64 | 71 | 75 | 76 | 73 | 65 | 53 | 37 | 25 | 12 | 2 | + | | | | 692 |
| 06 | 1 | | | | + | 3 | 14 | 28 | 41 | 54 | 66 | 72 | 78 | 78 | 58 | 52 | 46 | 49 | 24 | 9 | 3 | + | | | | 674 |
| 07 | 1 | | | | 0 | 1 | 7 | 13 | 22 | 41 | 45 | 48 | 44 | 38 | 28 | 27 | 20 | 8 | 5 | 2 | + | 0 | | | | 349 |
| 08 | 1 | | | | 0 | + | 2 | 4 | 12 | 17 | 15 | 20 | 26 | 27 | 51 | 52 | 26 | 29 | 28 | 17 | 4 | + | | | | 331 |
| 09 | 1 | | | | + | 3 | 15 | 28 | 41 | 54 | 65 | 72 | 76 | 77 | 75 | 50 | 23 | 12 | 11 | 2 | 1 | + | | | | 604 |
| 10 | 1 | | | | + | 3 | 16 | 22 | 31 | 47 | 51 | 61 | 63 | 49 | 39 | 25 | 24 | 18 | 19 | 8 | 2 | + | | | | 477 |
| 11 | 1 | | | | + | 2 | 8 | 21 | 30 | 50 | 58 | 69 | 78 | 49 | 29 | 21 | 12 | 24 | 9 | + | + | 0 | | | | 459 |
| 12 | 1 | | | | + | 2 | 16 | 29 | 45 | 58 | 70 | 41 | 34 | 35 | 36 | 25 | 28 | 18 | 17 | 7 | 2 | + | | | | 462 |
| 13 | 1 | | | | 0 | 1 | 3 | 6 | 9 | 9 | 16 | 39 | 72 | 57 | 11 | 17 | 14 | 21 | 18 | 11 | 3 | + | | | | 305 |
| 14 | 1 | | | | + | 4 | 15 | 28 | 43 | 56 | 67 | 74 | 79 | 82 | 63 | 66 | 59 | 28 | 21 | 7 | 1 | 0 | | | | 691 |
| 15 | 1 | | | | + | 3 | 15 | 29 | 43 | 56 | 66 | 73 | 79 | 67 | 69 | 63 | 43 | 41 | 30 | 14 | 4 | + | | | | 694 |
| 16 | 1 | | | | + | 2 | 9 | 22 | 40 | 46 | 52 | 28 | 35 | 43 | 34 | 22 | 16 | 10 | 5 | 3 | 2 | + | | | | 368 |
| 17 | 1 | | | | + | 4 | 15 | 28 | 40 | 45 | 46 | 51 | 75 | 79 | 73 | 67 | 55 | 41 | 28 | 15 | 4 | + | | | | 666 |
| 18 | 1 | | | | + | 3 | 13 | 29 | 43 | 54 | 62 | 71 | 75 | 78 | 74 | 67 | 37 | 21 | 10 | 3 | + | 0 | | | | 639 |
| 19 | 1 | | | | 0 | + | 1 | 2 | 3 | 6 | 7 | 11 | 19 | 37 | 63 | 66 | 49 | 37 | 29 | 16 | 4 | + | | | | 350 |
| 20 | 1 | | | | + | 4 | 15 | 29 | 43 | 58 | 66 | 73 | 75 | 77 | 75 | 67 | 46 | 24 | 13 | 5 | 1 | + | | | | 673 |
| 21 | 1 | | | | + | 2 | 7 | 11 | 19 | 18 | 31 | 51 | 43 | 48 | 42 | 49 | 35 | 18 | 9 | 4 | 2 | + | | | | 389 |
| 22 | 1 | | | | 0 | 1 | 3 | 8 | 13 | 20 | 25 | 28 | 53 | 32 | 33 | 24 | 48 | 20 | 12 | 6 | 2 | + | | | | 327 |
| 23 | 1 | | | | + | 4 | 15 | 28 | 42 | 55 | 68 | 74 | 80 | 74 | 54 | 49 | 44 | 38 | 28 | 13 | 3 | + | | | | 667 |
| 24 | 1 | | | | + | 4 | 12 | 21 | 43 | 55 | 61 | 65 | 61 | 61 | 42 | 37 | 24 | 17 | 15 | 8 | 3 | + | | | | 528 |
| 25 | 1 | | | | + | 4 | 15 | 21 | 27 | 47 | 62 | 72 | 74 | 56 | 67 | 48 | 36 | 16 | 7 | 5 | 2 | + | | | | 559 |
| 26 | 1 | | | | 0 | 1 | 10 | 20 | 15 | 25 | 26 | 16 | 16 | 27 | 61 | 33 | 34 | 16 | 20 | 6 | 2 | + | | | | 327 |
| 27 | 1 | | | | 0 | 1 | 4 | 18 | 21 | 40 | 69 | 74 | 67 | 50 | 65 | 71 | 62 | 24 | 34 | 14 | 2 | + | | | | 614 |
| 28 | 1 | | | | 0 | 1 | 5 | 14 | 16 | 46 | 64 | 60 | 40 | 64 | 54 | 44 | 12 | 16 | 19 | 16 | 4 | + | | | | 474 |
| 29 | 1 | | | | 0 | 1 | 4 | 6 | 19 | 17 | 20 | 22 | 34 | 45 | 41 | 32 | 19 | 25 | 6 | 8 | 1 | + | | | | 299 |
| 30 | 1 | | | | 0 | 4 | 15 | 29 | 42 | 55 | 66 | 73 | 79 | 79 | 76 | 70 | 57 | 43 | 29 | 16 | 4 | + | | | | 735 |
| MEAN | | | | | + | 2 | 10 | 20 | 30 | 41 | 50 | 56 | 59 | 56 | 52 | 46 | 36 | 26 | 18 | 9 | 2 | + | | | | 514 |

APPENDIX III - CONTINUED

SUMMERLAND CDA BC 49 34 N 119 39 W JUL 1968

| DAY | RF | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | DAILY TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TOTAL RADIATION FOR EACH HOUR ENDING AT (LOCAL APPARENT TIME) | | | | | | | | | | | | | | | | | | | | | | | | |
| 01 | 1 | | | | + | 4 | 15 | 29 | 43 | 55 | 66 | 73 | 76 | 77 | 75 | 67 | 55 | 42 | 29 | 16 | 4 | + | | | | 725 |
| 02 | 1 | | | | + | 3 | 15 | 29 | 43 | 55 | 66 | 72 | 76 | 77 | 75 | 66 | 54 | 38 | 28 | 15 | 4 | + | | | | 714 |
| 03 | 1 | | | | + | 3 | 7 | 26 | 42 | 54 | 65 | 71 | 75 | 76 | 73 | 65 | 51 | 32 | 14 | 12 | 4 | + | | | | 668 |
| 04 | 1 | | | | + | 3 | 14 | 27 | 41 | 53 | 64 | 71 | 75 | 76 | 43 | 49 | 38 | 14 | 6 | 10 | 5 | + | | | | 587 |
| 05 | 1 | | | | + | 1 | 10 | 26 | 35 | 52 | 63 | 70 | 75 | 76 | 71 | 66 | 54 | 41 | 28 | 15 | 4 | + | | | | 686 |
| 06 | 1 | | | | + | 3 | 14 | 27 | 41 | 54 | 65 | 72 | 75 | 68 | 73 | 64 | 52 | 40 | 27 | 15 | 2 | + | | | | 693 |
| 07 | 1 | | | | + | 2 | 11 | 23 | 33 | 46 | 64 | 60 | 56 | 76 | 73 | 64 | 35 | 40 | 28 | 15 | 3 | + | | | | 629 |
| 08 | 1 | | | | + | 3 | 14 | 27 | 41 | 53 | 64 | 70 | 75 | 76 | 69 | 64 | 44 | 9 | 6 | 6 | 3 | + | | | | 625 |
| 09 | 1 | | | | 0 | 1 | 13 | 16 | 26 | 36 | 52 | 44 | 40 | 69 | 74 | 66 | 54 | 44 | 28 | 14 | 3 | + | | | | 580 |
| 10 | 1 | | | | + | 2 | 6 | 20 | 31 | 53 | 65 | 72 | 67 | 70 | 65 | 62 | 23 | 24 | 10 | 5 | 1 | + | | | | 576 |
| 11 | 1 | | | | 0 | 1 | 4 | 19 | 28 | 49 | 45 | 65 | 33 | 11 | 16 | 13 | 6 | 4 | 1 | 2 | 1 | 0 | | | | 297 |
| 12 | 1 | | | | 0 | 1 | 6 | 12 | 27 | 39 | 31 | 34 | 60 | 58 | 34 | 27. | 53 | 42 | 29 | 15 | 3 | + | | | | 470 |
| 13 | 1 | | | | + | 2 | 14 | 27 | 41 | 50 | 65 | 73 | 76 | 77 | 74 | 54 | 30 | 20 | 12 | 11 | 2 | + | | | | 628 |
| 14 | 1 | | | | 0 | 1 | 7 | 25 | 34 | 38 | 49 | 24 | 27 | 42 | 39 | 33 | 27 | 21 | 14 | 6 | 4 | + | | | | 389 |
| 15 | 1 | | | | 0 | 1 | 9 | 12 | 34 | 42 | 42 | 44 | 22 | 46 | 31 | 23 | 36 | 9 | 11 | 4 | 2 | + | | | | 369 |
| 16 | 1 | | | | 0 | 3 | 14 | 27 | 42 | 53 | 64 | 71 | 76 | 77 | 74 | 64 | 52 | 34 | 22 | 11 | 2 | 0 | | | | 685 |
| 17 | 1 | | | | | 2 | 13 | 27 | 41 | 54 | 66 | 78 | 74 | 73 | 55 | 27 | 32 | 16 | 17 | 11 | 1 | | | | | 586 |
| 18 | 1 | | | | | 1 | 8 | 18 | 28 | 33 | 31 | 46 | 53 | 40 | 41 | 47 | 23 | 11 | 6 | 4 | 1 | | | | | 391 |
| 19 | 1 | | | | | 1 | 4 | 8 | 14 | 25 | 23 | 17 | 20 | 14 | 20 | 6 | 16 | 12 | 9 | 2 | 2 | | | | | 192 |
| 20 | 1 | | | | | + | 1 | 7 | 12 | 25 | 19 | 29 | 41 | 36 | 21 | 52 | 26 | 40 | 23 | 11 | 2 | | | | | 345 |
| 21 | 1 | | | | | 1 | 11 | 19 | 41 | 54 | 58 | 37 | 46 | 60 | 24 | 43 | 27 | 10 | 9 | 7 | 2 | | | | | 450 |
| 22 | 1 | | | | | 2 | 14 | 27 | 39 | 52 | 66 | 74 | 55 | 75 | 70 | 59 | 46 | 29 | 24 | 11 | 2 | | | | | 642 |
| 23 | 1 | | | | | 1 | 8 | 19 | 32 | 45 | 55 | 64 | 68 | 70 | 65 | 57 | 45 | 33 | 21 | 10 | 2 | | | | | 595 |
| 24 | 1 | | | | | 2 | 9 | 20 | 33 | 47 | 59 | 61 | 72 | 73 | 68 | 59 | 47 | 33 | 21 | 8 | 1 | | | | | 611 |
| 25 | 1 | | | | | 1 | 9 | 23 | 38 | 51 | 62 | 66 | 72 | 73 | 69 | 59 | 45 | 28 | 16 | 10 | 1 | | | | | 622 |
| 26 | 1 | | | | | 1 | 10 | 23 | 37 | 50 | 60 | 68 | 71 | 72 | 67 | 58 | 48 | 36 | 23 | 10 | 1 | | | | | 635 |
| 27 | 1 | | | | | 1 | 10 | 23 | 36 | 49 | 60 | 67 | 71 | 71 | 67 | 59 | 47 | 35 | 19 | 5 | 1 | | | | | 621 |
| 28 | 1 | | | | | 1 | 10 | 23 | 37 | 50 | 60 | 68 | 72 | 72 | 68 | 60 | 49 | 37 | 24 | 11 | 1 | | | | | 643 |
| 29 | 1 | | | | | 1 | 10 | 19 | 31 | 39 | 52 | 59 | 73 | 72 | 68 | 57 | 50 | 38 | 25 | 11 | 1 | | | | | 605 |
| 30 | 1 | | | | | 1 | 10 | 24 | 38 | 51 | 61 | 70 | 73 | 73 | 70 | 61 | 51 | 38 | 24 | 10 | 1 | | | | | 654 |
| 31 | 1 | | | | | 1 | 10 | 24 | 38 | 51 | 62 | 70 | 73 | 73 | 70 | 61 | 49 | 36 | 23 | 10 | 1 | | | | | 650 |
| MEAN | | | | | 0 | 2 | 10 | 22 | 35 | 47 | 56 | 60 | 62 | 65 | 58 | 52 | 41 | 29 | 19 | 10 | 2 | + | | | | 567 |

SUMMERLAND CDA BC 49 34 N 119 39 W AUG 1968

| DAY | RF | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | DAILY TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TOTAL RADIATION FOR EACH HOUR ENDING AT (LOCAL APPARENT TIME) | | | | | | | | | | | | | | | | | | | | | | | | |
| 01 | 1 | | | | | 1 | 9 | 23 | 37 | 50 | 61 | 68 | 71 | 72 | 68 | 59 | 47 | 35 | 23 | 9 | 1 | | | | | 632 |
| 02 | 1 | | | | | 1 | 9 | 22 | 36 | 49 | 59 | 66 | 70 | 70 | 66 | 59 | 48 | 35 | 22 | 9 | 1 | | | | | 619 |
| 03 | 1 | | | | | + | 5 | 16 | 7 | 9 | 46 | 57 | 67 | 51 | 34 | 53 | 17 | 15 | 13 | 7 | 1 | | | | | 399 |
| 04 | 1 | | | | | 1 | 9 | 21 | 37 | 50 | 61 | 64 | 68 | 70 | 54 | 49 | 32 | 43 | 22 | 7 | + | | | | | 586 |
| 05 | 1 | | | | | 1 | 8 | 22 | 23 | 34 | 48 | 35 | 30 | 25 | 23 | 30 | 31 | 31 | 25 | 3 | + | | | | | 367 |
| 06 | 1 | | | | | + | 6 | 20 | 37 | 50 | 61 | 68 | 71 | 72 | 68 | 59 | 55 | 31 | 10 | 5 | + | | | | | 612 |
| 07 | 1 | | | | | + | 8 | 21 | 35 | 48 | 60 | 67 | 70 | 70 | 66 | 54 | 46 | 26 | 11 | 4 | + | | | | | 586 |
| 08 | 1 | | | | | + | 8 | 22 | 39 | 50 | 60 | 67 | 71 | 72 | 67 | 59 | 46 | 35 | 21 | 6 | + | | | | | 623 |
| 09 | 1 | | | | | + | 8 | 25 | 28 | 46 | 52 | 71 | 68 | 67 | 58 | 43 | 37 | 29 | 19 | 6 | + | | | | | 556 |
| 10 | 1 | | | | | + | 4 | 17 | 28 | 38 | 41 | 41 | 51 | 64 | 48 | 4 | 29 | 32 | 7 | 1 | + | | | | | 406 |
| 11 | 1 | | | | | + | 8 | 14 | 17 | 41 | 32 | 66 | 52 | 64 | 71 | 59 | 39 | 35 | 19 | 4 | + | | | | | 518 |
| 12 | 1 | | | | | + | 4 | 15 | 27 | 43 | 55 | 62 | 52 | 29 | 26 | 44 | 35 | 16 | 6 | 2 | + | | | | | 415 |
| 13 | 1 | | | | | + | 6 | 12 | 29 | 45 | 39 | 38 | 54 | 44 | 31 | 24 | 25 | 13 | 8 | 2 | + | | | | | 369 |
| 14 | 1 | | | | | + | 4 | 11 | 16 | 19 | 13 | 10 | 17 | 22 | 18 | 13 | 4 | 3 | 2 | 1 | 0 | | | | | 152 |
| 15 | 1 | | | | | 0 | 1 | 3 | 8 | 18 | 34 | 39 | 27 | 20 | 29 | 31 | 22 | 12 | 11 | 4 | + | | | | | 258 |
| 16 | 1 | | | | | + | 1 | 4 | 9 | 13 | 49 | 44 | 45 | 67 | 65 | 56 | 44 | 25 | 8 | 2 | + | | | | | 430 |
| 17 | 1 | | | | | 0 | 1 | 4 | 5 | 4 | 18 | 28 | 19 | 24 | 27 | 36 | 34 | 21 | 9 | 4 | + | | | | | 233 |
| 18 | 1 | | | | | + | 4 | 15 | 30 | 36 | 54 | 56 | 58 | 49 | 17 | 19 | 12 | 5 | 2 | + | 0 | | | | | 358 |
| 19 | 1 | | | | | + | 3 | 19 | 32 | 43 | 53 | 59 | 28 | 31 | 54 | 27 | 27 | 21 | 5 | 3 | + | | | | | 405 |
| 20 | 1 | | | | | + | 1 | 4 | 19 | 43 | 49 | 65 | 42 | 24 | 19 | 13 | 24 | 8 | 11 | 1 | + | | | | | 323 |
| 21 | 1 | | | | | 0 | 1 | 7 | 17 | 24 | 22 | 24 | 31 | 32 | 33 | 23 | 18 | 8 | 4 | 2 | + | | | | | 246 |
| 22 | 1 | | | | | + | 2 | 6 | 11 | 23 | 51 | 50 | 51 | 32 | 24 | 23 | 20 | 12 | 2 | + | 0 | | | | | 308 |
| 23 | 1 | | | | | + | 1 | 6 | 22 | 34 | 43 | 54 | 51 | 46 | 21 | 7 | 5 | 4 | 2 | 1 | 0 | | | | | 296 |
| 24 | 1 | | | | | 0 | 1 | 5 | 7 | 10 | 9 | 21 | 17 | 14 | 12 | 9 | 4 | 10 | 2 | + | 0 | | | | | 121 |
| 25 | 1 | | | | | 0 | 1 | 2 | 3 | 10 | 8 | 10 | 9 | 10 | 13 | 11 | 23 | 13 | 5 | 1 | 0 | | | | | 118 |
| 26 | 1 | | | | | 0 | 3 | 13 | 25 | 39 | 52 | 53 | 56 | 49 | 57 | 48 | 32 | 16 | 11 | 2 | 0 | | | | | 454 |
| 27 | 1 | | | | | | 1 | 13 | 18 | 38 | 37 | 51 | 56 | 24 | 42 | 40 | 32 | 23 | 17 | 3 | | | | | | 394 |
| 28 | 1 | | | | | | 2 | 15 | 28 | 41 | 53 | 61 | 65 | 65 | 61 | 24 | 29 | 9 | 13 | 2 | | | | | | 467 |
| 29 | 1 | | | | | | 2 | 14 | 28 | 41 | 53 | 60 | 63 | 63 | 58 | 50 | 40 | 28 | 13 | 2 | | | | | | 516 |
| 30 | 1 | | | | | | 2 | 14 | 28 | 41 | 52 | 59 | 63 | 63 | 58 | 50 | 40 | 27 | 13 | 2 | | | | | | 509 |
| 31 | 1 | | | | | | 2 | 14 | 28 | 41 | 53 | 60 | 64 | 63 | 55 | 34 | 24 | 10 | 4 | + | | | | | | 451 |
| MEAN | | | | | | + | 4 | 13 | 23 | 35 | 44 | 51 | 50 | 47 | 43 | 36 | 30 | 20 | 11 | 3 | + | | | | | 411 |

APPENDIX III - CONTINUED

SUMMERLAND CDA BC 49 34 N 119 39 W SEP 1968

| DAY | RF | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | DAILY TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TOTAL RADIATION FOR EACH HOUR ENDING AT (LOCAL APPARENT TIME) | | | | | | | | | | | | | | | | | | | | | | | | |
| 01 | 1 | | | | | | + | 6 | 19 | 19 | 20 | 51 | 46 | 25 | 46 | 25 | 10 | 3 | 2 | + | | | | | | 273 |
| 02 | 1 | | | | | | 1 | 16 | 22 | 40 | 53 | 60 | 65 | 67 | 45 | 25 | 15 | 21 | 12 | 1 | | | | | | 443 |
| 03 | 1 | | | | | | 1 | 7 | 19 | 34 | 43 | 59 | 60 | 59 | 53 | 42 | 10 | 25 | 6 | + | | | | | | 419 |
| 04 | 1 | | | | | | 1 | 5 | 9 | 16 | 20 | 19 | 22 | 21 | 43 | 48 | 37 | 26 | 8 | 1 | | | | | | 276 |
| 05 | 1 | | | | | | 1 | 11 | 25 | 38 | 49 | 57 | 60 | 60 | 56 | 46 | 22 | 19 | 4 | + | | | | | | 447 |
| 06 | 1 | | | | | | + | 2 | 4 | 5 | 6 | 10 | 9 | 13 | 8 | 11 | 8 | 19 | 11 | 1 | | | | | | 104 |
| 07 | 1 | | | | | | + | 6 | 22 | 34 | 48 | 50 | 55 | 57 | 44 | 24 | 25 | 13 | 7 | + | | | | | | 386 |
| 08 | 1 | | | | | | 1 | 10 | 24 | 37 | 47 | 52 | 57 | 55 | 50 | 47 | 36 | 23 | 8 | + | | | | | | 445 |
| 09 | 1 | | | | | | 1 | 9 | 23 | 37 | 48 | 55 | 60 | 47 | 44 | 46 | 35 | 22 | 6 | + | | | | | | 431 |
| 10 | 1 | | | | | | 1 | 4 | 9 | 22 | 29 | 41 | 39 | 47 | 44 | 33 | 16 | 8 | 4 | + | | | | | | 294 |
| 11 | 1 | | | | | | + | 5 | 15 | 18 | 25 | 36 | 45 | 31 | 21 | 2 | 1 | 2 | 1 | + | | | | | | 202 |
| 12 | 1 | | | | | | + | 9 | 23 | 37 | 47 | 56 | 58 | 53 | 46 | 36 | 35 | 18 | 5 | + | | | | | | 423 |
| 13 | 1 | | | | | | + | 2 | 7 | 24 | 16 | 37 | 46 | 22 | 18 | 14 | 10 | 2 | 1 | + | | | | | | 200 |
| 14 | 1 | | | | | | + | 4 | 15 | 32 | 32 | 14 | 56 | 23 | 33 | 26 | 19 | 2 | 2 | 1 | | | | | | 259 |
| 15 | 1 | | | | | | + | 3 | 5 | 11 | 19 | 46 | 18 | 14 | 21 | 27 | 34 | 21 | 5 | + | | | | | | 222 |
| 16 | 1 | | | | | | + | 4 | 21 | 22 | 14 | 18 | 22 | 13 | 6 | 6 | 4 | 1 | + | + | | | | | | 132 |
| 17 | 1 | | | | | | + | 2 | 8 | 11 | 12 | 12 | 17 | 20 | 35 | 33 | 23 | 10 | 2 | + | | | | | | 184 |
| 18 | 1 | | | | | | 0 | + | 8 | 15 | 31 | 20 | 35 | 35 | 53 | 27 | 15 | 23 | 6 | + | | | | | | 266 |
| 19 | 1 | | | | | | + | 6 | 20 | 34 | 46 | 54 | 58 | 58 | 53 | 45 | 34 | 20 | 6 | + | | | | | | 432 |
| 20 | 1 | | | | | | + | + | 4 | 10 | 14 | 11 | 10 | 15 | 12 | 11 | 8 | 5 | 1 | + | | | | | | 99 |
| 21 | 1 | | | | | | + | 4 | 15 | 31 | 44 | 52 | 56 | 51 | 48 | 44 | 30 | 17 | 5 | + | | | | | | 398 |
| 22 | 1 | | | | | | + | 6 | 17 | 15 | 8 | 20 | 21 | 9 | 7 | 11 | 8 | 4 | 3 | + | | | | | | 128 |
| 23 | 1 | | | | | | + | 4 | 18 | 28 | 40 | 30 | 43 | 43 | 50 | 41 | 30 | 18 | 4 | + | | | | | | 350 |
| 24 | 1 | | | | | | + | 3 | 9 | 26 | 35 | 48 | 54 | 50 | 51 | 40 | 27 | 15 | 4 | + | | | | | | 362 |
| 25 | 1 | | | | | | + | 3 | 20 | 31 | 42 | 48 | 54 | 53 | 48 | 39 | 13 | 7 | 2 | + | | | | | | 360 |
| 26 | 1 | | | | | | + | 5 | 12 | 30 | 33 | 42 | 47 | 35 | 37 | 36 | 29 | 15 | 3 | + | | | | | | 323 |
| 27 | 1 | | | | | | 0 | 2 | 5 | 6 | 17 | 20 | 47 | 38 | 50 | 32 | 27 | 17 | 2 | + | | | | | | 262 |
| 28 | 1 | | | | | | + | 3 | 15 | 29 | 40 | 48 | 51 | 51 | 47 | 39 | 29 | 16 | 4 | + | | | | | | 372 |
| 29 | 1 | | | | | | | 3 | 16 | 29 | 41 | 48 | 52 | 51 | 46 | 37 | 27 | 15 | 2 | | | | | | | 368 |
| 30 | 1 | | | | | | | 4 | 11 | 18 | 33 | 21 | 32 | 43 | 39 | 29 | 21 | 7 | 1 | | | | | | | 258 |
| MEAN | | | | | | | + | 5 | 15 | 25 | 32 | 38 | 43 | 39 | 38 | 31 | 21 | 14 | 4 | + | | | | | | 304 |

APPENDIX IV SKAHA LAKE TRANSECTS

-1A WATER TEMPERATURE (°CENTIGRADE)

| LOCATION | DEPTH | MAY23 | JUN10 | JUN26 | JUL11 | JUL31 | AUG13 | AUG26 | SEP5 | OCT13 | NOV13 | DEC13 | FEB5 | MAR18 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 15.6 | 17.2 | 20.0 | 23.3 | 21.5 | 22.0 | 19.8 | 22.5 | | | | | | |
| 1 | 10 | 11.1 | 14.4 | 18.9 | 22.2 | 20.8 | 21.3 | 18.8 | 19.4 | | | | | | |
| 1 | 20 | 10.6 | 13.9 | 17.5 | 20.0 | 20.4 | 20.2 | 18.6 | 18.8 | | | | | | |
| 1 | 40 | 7.8 | 9.1 | 9.1 | 8.3 | 10.0 | 13.4 | 15.0 | 16.4 | | | | | | |
| 1 | 60 | 6.1 | 7.2 | NS | 7.8 | NS | NS | NS | NS | | | | | | |
| 2 | 0 | 15.6 | 17.2 | 20.0 | 23.3 | 21.0 | 21.3 | 19.3 | 20.4 | | | | | | |
| 2 | 10 | 12.2 | 15.6 | 18.0 | 22.2 | 20.4 | 21.0 | 18.9 | 19.0 | | | | | | |
| 2 | 20 | 10.0 | 14.4 | 17.5 | 20.9 | 20.0 | 20.5 | 18.6 | 18.5 | | | | | | |
| 2 | 40 | 7.5 | 9.4 | 9.7 | 12.5 | 12.0 | 13.8 | 11.9 | 14.8 | | | | | | |
| 2 | 60 | 6.1 | 7.2 | 7.2 | 7.8 | 8.5 | 9.0 | 8.5 | 8.9 | | | | | | |
| 3 | 0 | 14.4 | 16.7 | 19.1 | 21.7 | 21.0 | 21.3 | 19.3 | 20.8 | NS | 8.5 | 5.3 | 1.0 | 2.2 | NS |
| 3 | 10 | 13.3 | 15.0 | 18.0 | 21.4 | 20.3 | 20.8 | 18.9 | 19.4 | NS | 8.3 | 5.7 | 1.2 | 2.0 | NS |
| 3 | 20 | 10.6 | 14.4 | 17.2 | 18.9 | 20.0 | 20.3 | 18.5 | 18.9 | NS | 8.2 | 5.8 | 1.2 | 2.0 | NS |
| 3 | 40 | 7.8 | 9.7 | 10.0 | 11.1 | 13.0 | 13.2 | 12.3 | 13.9 | NS | 8.2 | 5.8 | 1.7 | 2.0 | NS |
| 3 | 60 | 6.1 | 7.2 | 7.2 | 8.3 | 8.5 | 8.9 | 8.7 | 8.9 | NS | 8.2 | 5.8 | 2.0 | 1.8 | NS |
| 4 | 0 | 14.4 | 16.7 | 18.9 | 22.0 | 21.0 | 20.8 | 19.2 | 20.0 | | | | | | |
| 4 | 10 | 13.6 | 13.9 | 17.8 | 21.4 | 20.2 | 20.6 | 18.7 | 19.2 | | | | | | |
| 4 | 20 | 10.6 | 13.3 | 16.7 | 18.9 | 20.0 | 20.4 | 18.4 | 18.9 | | | | | | |
| 4 | 40 | 7.8 | 10.0 | 10.6 | 11.4 | 12.5 | 13.4 | 12.2 | 13.8 | | | | | | |
| 4 | 60 | 5.8 | 6.7 | 7.8 | 8.1 | 8.5 | 8.8 | 9.0 | 9.1 | | | | | | |
| LOCATION | DEPTH | MAY27 | JUN12 | JUL2 | JUL15 | AUG1 | AUG14 | AUG27 | SEP10 | OCT14 | NOV20 | DEC13 | FEB5 | MAR18 | APR17 |
| 5 | 0 | 14.7 | 16.4 | 19.1 | 21.7 | 21.8 | 21.2 | 20.0 | 20.0 | | | | | | |
| 5 | 10 | 12.8 | 13.9 | 17.2 | 20.6 | 21.0 | 20.8 | 18.9 | 19.1 | | | | | | |
| 5 | 20 | 12.2 | 12.5 | 16.4 | 19.4 | 20.2 | 20.3 | 18.5 | 18.8 | | | | | | |
| 5 | 40 | 8.9 | 9.4 | 9.2 | 12.2 | 12.0 | 13.1 | 12.8 | 13.9 | | | | | | |
| 5 | 60 | 6.7 | 7.8 | 8.9 | 11.7 | 10.5 | NS | 10.9 | NS | | | | | | |
| 6 | 0 | 15.0 | 17.0 | 20.6 | 20.0 | 22.5 | 21.0 | 18.5 | 19.8 | | | | | | |
| 6 | 10 | 13.9 | 16.7 | 17.2 | 20.0 | 22.2 | 20.7 | 18.3 | 18.9 | | | | | | |
| 6 | 20 | 8.9 | 14.2 | 16.7 | 20.0 | 22.2 | 20.1 | 18.3 | 18.7 | | | | | | |
| 6 | 40 | 6.7 | 12.0 | 11.7 | 10.0 | 13.8 | 15.3 | 13.5 | 16.7 | | | | | | |
| 6 | 60 | 5.8 | 7.5 | 7.8 | 7.2 | NS | NS | NS | NS | | | | | | |
| 7 | 0 | 15.0 | 16.7 | 20.6 | 20.0 | 22.5 | 21.0 | 18.4 | 19.8 | NS | 7.0 | 5.0 | 1.2 | 2.5 | 5.3 |
| 7 | 10 | 14.4 | 14.4 | 17.5 | 20.0 | 22.1 | 20.8 | 18.2 | 19.2 | NS | 7.2 | 5.5 | 1.2 | 2.0 | 4.8 |
| 7 | 20 | 9.2 | 14.1 | 17.0 | 20.0 | 22.0 | 20.0 | 18.2 | 18.7 | NS | 7.3 | 5.5 | 1.2 | 2.0 | 4.8 |
| 7 | 40 | 6.4 | 11.4 | 12.2 | 12.8 | 16.0 | 15.0 | 14.2 | 17.0 | NS | 7.3 | 5.5 | 1.2 | 1.8 | 4.8 |
| 7 | 60 | 5.8 | 7.1 | 7.8 | 7.8 | 9.0 | 9.8 | 9.2 | 9.6 | NS | 7.3 | 5.5 | 1.5 | 1.8 | 4.8 |
| 8 | 0 | 15.3 | 16.7 | 19.1 | 20.0 | 22.8 | 21.2 | 18.3 | 20.3 | | | | | | |
| 8 | 10 | 14.4 | 16.1 | 17.5 | 20.0 | 22.2 | 21.0 | 18.1 | 18.8 | | | | | | |
| 8 | 20 | 8.0 | 15.8 | 17.2 | 20.0 | 22.1 | 19.0 | 18.1 | 18.5 | | | | | | |
| 8 | 40 | 6.4 | 12.2 | 13.3 | 13.3 | 15.4 | 13.2 | 13.7 | 15.7 | | | | | | |
| 8 | 60 | 6.1 | 6.7 | 8.3 | 7.2 | 9.5 | 8.9 | 8.8 | 10.0 | | | | | | |

-1B AVERAGE TEMPERATURE FOR TRANSECTS (°CENTIGRADE)

| LOCATION | DEPTH | MAY23 | JUN10 | JUN26 | JUL11 | JUL31 | AUG13 | AUG26 | SEP5 |
|---|---|---|---|---|---|---|---|---|---|
| N | 0 | 14.9 | 16.8 | 19.4 | 22.4 | 21.3 | 21.3 | 19.5 | 20.8 |
| N | 10 | 12.6 | 14.6 | 18.0 | 21.8 | 20.5 | 20.9 | 18.8 | 19.2 |
| N | 20 | 10.8 | 13.7 | 17.5 | 19.6 | 20.1 | 20.3 | 18.5 | 18.8 |
| N | 40 | 7.4 | 9.5 | 9.7 | 11.1 | 11.9 | 13.4 | 12.8 | 14.6 |
| N | 60 | 6.1 | 7.2 | 7.8 | 8.7 | 9.0 | 8.9 | 9.3 | 9.0 |
| LOCATION | DEPTH | MAY27 | JUN12 | JUL2 | JUL15 | AUG1 | AUG14 | AUG27 | SEP10 |
| S | 0 | 15.1 | 16.8 | 20.1 | 20.0 | 22.6 | 21.1 | 18.4 | 20.0 |
| S | 10 | 14.2 | 15.7 | 17.4 | 20.0 | 22.2 | 20.8 | 18.2 | 19.0 |
| S | 20 | 8.7 | 14.7 | 17.0 | 20.0 | 22.1 | 19.7 | 18.2 | 18.6 |
| S | 40 | 6.5 | 11.9 | 12.4 | 12.0 | 15.1 | 14.5 | 13.8 | 16.5 |
| S | 60 | 5.9 | 7.1 | 8.0 | 7.4 | 9.3 | 9.3 | 9.0 | 9.8 |

-2 SECCHI DISK READINGS (FEET)

| LOCATION | DEPTH | MAY23 | JUN10 | JUN26 | JUL11 | JUL31 | AUG13 | AUG26 | SEP5 | OCT13 | NOV13 | DEC13 | FEB5 | MAR18 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | | 5.0 | 5.0 | 4.0 | 9.0 | 6.0 | 3.5 | 3.5 | 8.5 | | 12.3 | 27.0 | 23.9 | 12.0 | |
| LOCATION | DEPTH | MAY27 | JUN12 | JUL2 | JUL15 | AUG1 | AUG14 | AUG27 | SEP10 | OCT14 | NOV20 | DEC13, | FEB5 | MAR18 | APR17 |
| 7 | | 4.5 | 4.5 | 4.25 | 9.0 | 8.0 | 5.0 | 4.0 | 7.0 | | 9.8 | 22.3 | 16.6 | 11.0 | 9.2 |

-3 DISSOLVED OXYGEN (PPM)

| LOCATION | DEPTH | MAY23 | JUN10 | JUN26 | JUL11 | JUL31 | AUG13 | AUG26 | SEP5 | OCT13 | NOV13 | DEC13 | FEB5 | MAR18 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | NS | NS | NS | NS | 12.0 | 11.3 | 10.0 | 8.3 | | | | | | |
| 1 | 10 | NS | NS | NS | NS | 10.2 | 9.6 | 10.0 | 8.3 | | | | | | |
| 1 | 20 | NS | NS | NS | NS | 7.8 | 6.8 | 9.2 | 7.4 | | | | | | |
| 1 | 40 | NS | NS | NS | NS | 3.4 | 2.8 | 2.5 | 3.8 | | | | | | |
| 1 | 60 | NS | NS | NS | NS | NS | 3.8 | 1.8 | NS | | | | | | |
| 2 | 0 | NS | NS | NS | NS | 10.7 | 11.2 | 9.4 | 8.0 | | | | | | |
| 2 | 10 | NS | NS | NS | NS | 8.6 | 10.8 | 9.2 | 8.0 | | | | | | |
| 2 | 20 | NS | NS | NS | NS | 7.4 | 8.7 | 8.8 | 7.4 | | | | | | |
| 2 | 40 | NS | NS | NS | NS | 3.4 | 2.1 | 1.6 | 2.9 | | | | | | |
| 2 | 60 | NS | NS | NS | NS | 3.4 | 6.4 | 4.7 | 4.2 | | | | | | |
| 3 | 0 | NS | NS | NS | NS | 10.2 | 10.9 | 9.2 | 7.3 | NS | 9.6 | 11.4 | 12.7 | 11.9 | NS |
| 3 | 10 | NS | NS | NS | NS | 8.4 | 10.3 | 9.0 | 7.4 | NS | 9.2 | 11.2 | 11.8 | 13.7 | NS |
| 3 | 20 | NS | NS | NS | NS | 7.8 | 8.7 | 8.8 | 7.1 | NS | 9.15 | 11.1 | 11.4 | 13.5 | NS |
| 3 | 40 | NS | NS | NS | NS | 3.5 | 2.6 | 0.0 | 2.1 | NS | 9.4 | 11.1 | 11.7 | 13.6 | NS |
| 3 | 60 | NS | NS | NS | NS | 5.1 | 6.7 | 5.1 | 4.2 | NS | 9.3 | 11.1 | 11.2 | 13.2 | NS |
| 4 | 0 | NS | NS | NS | NS | 9.6 | 10.4 | 10.0 | 8.4 | | | | | | |
| 4 | 10 | NS | NS | NS | NS | 7.8 | 10.2 | 9.9 | 8.2 | | | | | | |
| 4 | 20 | NS | NS | NS | NS | 8.0 | 8.8 | 9.5 | 7.7 | | | | | | |
| 4 | 40 | NS | NS | NS | NS | 3.2 | 2.8 | 2.3 | 2.3 | | | | | | |
| 4 | 60 | NS | NS | NS | NS | 4.2 | 6.2 | 4.0 | 2.7 | | | | | | |
| LOCATION | DEPTH | MAY27 | JUN12 | JUL2 | JUL15 | AUG1 | AUG14 | AUG27 | SEP10 | OCT14 | NOV20 | DEC13 | FEB5 | MAR18 | APR17 |
| 5 | 0 | NS | NS | NS | NS | 10.4 | 7.4 | 7.7 | 8.0 | | | | | | |
| 5 | 10 | NS | NS | NS | NS | 7.9 | 7.5 | 7.4 | 7.7 | | | | | | |
| 5 | 20 | NS | NS | NS | NS | 7.4 | 7.6 | 7.3 | 7.6 | | | | | | |
| 5 | 40 | NS | NS | NS | NS | 2.3 | 2.7 | 2.3 | 1.9 | | | | | | |
| 5 | 60 | NS | NS | NS | NS | NS | 2.4 | 1.7 | NS | | | | | | |
| 6 | 0 | NS | NS | NS | NS | 8.8 | 9.4 | 8.9 | NS | | | | | | |
| 6 | 10 | NS | NS | NS | NS | 7.0 | 9.5 | 8.8 | NS | | | | | | |
| 6 | 20 | NS | NS | NS | NS | 4.2 | 8.4 | 8.5 | NS | | | | | | |
| 6 | 40 | NS | NS | NS | NS | 2.1 | 4.4 | 3.3 | NS | | | | | | |
| 6 | 60 | NS | NS | NS | NS | NS | NS | NS | NS | | | | | | |
| 7 | 0 | NS | NS | NS | NS | 9.7 | 10.2 | 9.6 | NS | NS | 10.0 | 10.9 | 12.0 | 12.1 | 13.0 |
| 7 | 10 | NS | NS | NS | NS | 8.0 | 10.5 | 9.5 | NS | NS | 8.5 | 10.6 | 12.0 | 14.3 | 13.5 |
| 7 | 20 | NS | NS | NS | NS | 3.4 | 9.2 | 9.1 | NS | NS | 8.25 | 10.6 | 11.8 | 13.8 | 13.6 |
| 7 | 40 | NS | NS | NS | NS | 1.5 | 4.5 | 3.8 | NS | NS | 8.25 | 10.8 | 11.5 | 13.6 | 13.6 |
| 7 | 60 | NS | NS | NS | NS | 1.3 | 4.5 | 3.5 | NS | NS | 8.15 | 10.6 | 11.1 | 14.0 | 13.4 |
| 8 | 0 | NS | NS | NS | NS | 8.9 | 10.5 | 9.9 | NS | | | | | | |
| 8 | 10 | NS | NS | NS | NS | 8.6 | 10.9 | 9.5 | NS | | | | | | |
| 8 | 20 | NS | NS | NS | NS | 8.0 | 7.7 | 9.2 | NS | | | | | | |
| 8 | 40 | NS | NS | NS | NS | 4.1 | 3.8 | 3.8 | NS | | | | | | |
| 8 | 60 | NS | NS | NS | NS | 3.6 | 4.5 | 3.2 | NS | | | | | | |

-4 TOTAL RESIDUE (PPM)

| LOCATION | DEPTH | MAY23 | JUN10 | JUN26 | JUL11 | JUL31 | AUG13 | AUG26 | SEP5 | OCT13 | NOV13 | DEC13 | FEB5 | MAR18 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 179 | 125 | 234 | 149 | 114 | 151 | 66 | 127 | | | | | | |
| 1 | 10 | 201 | 198 | 234 | 119 | 103 | 177 | 124 | 121 | | | | | | |
| 1 | 20 | 183 | 146 | 244 | 128 | 166 | 146 | 149 | 128 | | | | | | |
| 1 | 40 | 182 | 188 | 230 | 146 | 175 | 183 | 143 | 115 | | | | | | |
| 1 | 60 | 169 | 126 | NS | 458 | NS | NS | NS | NS | | | | | | |
| 2 | 0 | 156 | 155 | 287 | 162 | 133 | 175 | 193 | 130 | | | | | | |
| 2 | 10 | 140 | 201 | 284 | 166 | 171 | 172 | 144 | 124 | | | | | | |
| 2 | 20 | 199 | 141 | 209 | 146 | 177 | 182 | 120 | 127 | | | | | | |
| 2 | 40 | 165 | 188 | 246 | 171 | 115 | 182 | 117 | 139 | | | | | | |
| 2 | 60 | 180 | 185 | 240 | 123 | 194 | 191 | 125 | 146 | | | | | | |
| 3 | 0 | 177 | 193 | 222 | 137 | 172 | 187 | 129 | 139 | NS | 123 | 140 | 146 | 32 | NS |
| 3 | 10 | 158 | 186 | 244 | 125 | NS | 201 | 92 | 135 | NS | 127 | 132 | 153 | 85 | NS |
| 3 | 20 | 174 | 97 | 200 | 128 | 161 | 191 | 89 | 141 | NS | 125 | 142 | 146 | 98 | NS |
| 3 | 40 | 115 | 204 | 219 | 145 | 153 | 194 | 124 | 150 | NS | 125 | NS | 128 | 101 | NS |
| 3 | 60 | 181 | 227 | 215 | 149 | 189 | 211 | 149 | 146 | NS | 125 | 135 | 139 | 129 | NS |
| 3 | 0 | | | | | | | | | | | | ICE | 18 | |
| 4 | 0 | 160 | 191 | 237 | 140 | 160 | 159 | 127 | 133 | | | | | | |
| 4 | 10 | 172 | 231 | 243 | 262 | 147 | 175 | 92 | 138 | | | | | | |
| 4 | 20 | 171 | 202 | 141 | 175 | 169 | 165 | 96 | 141 | | | | | | |
| 4 | 40 | 116 | 214 | 172 | 179 | 189 | 178 | 38 | 151 | | | | | | |
| 4 | 60 | 160 | 243 | 92 | 177 | 139 | 175 | 128 | 151 | | | | | | |

| LOCATION | DEPTH | MAY27 | JUN12 | JUL2 | JUL15 | AUG1 | AUG14 | AUG27 | SEP10 | OCT14 | NOV20 | DEC13 | FEB5 | MAR18 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 0 | 147 | 209 | 121 | 164 | 111 | 147 | 130 | 112 | | | | | | |
| 5 | 10 | 189 | 183 | 167 | 163 | 112 | 126 | 76 | 129 | | | | | | |
| 5 | 20 | 162 | 174 | 163 | 190 | 83 | 123 | 119 | 137 | | | | | | |
| 5 | 40 | 167 | 185 | 212 | 174 | 112 | 143 | 140 | 158 | | | | | | |
| 5 | 60 | 159 | 180 | 224 | 1370 | NS | NS | NS | NS | | | | | | |
| 6 | 0 | 179 | 256 | 114 | 157 | 109 | 123 | 141 | 129 | | | | | | |
| 6 | 10 | 87 | 167 | 148 | 140 | 120 | 110 | 140 | 139 | | | | | | |
| 6 | 20 | 72 | 169 | 158 | 167 | 122 | 127 | 131 | 135 | | | | | | |
| 6 | 40 | 106 | 233 | 151 | 156 | 161 | 143 | 116 | 150 | | | | | | |
| 6 | 60 | 93 | 181 | 167 | 379 | NS | NS | NS | NS | | | | | | |
| 7 | 0 | 118 | 197 | 151 | 149 | 108 | 108 | 132 | 119 | NS | 128 | 139 | 144 | 98 | 145 |
| 7 | 10 | 143 | 232 | 78 | 168 | 139 | 100 | 88 | 125 | NS | 127 | 145 | 149 | 130 | 153 |
| 7 | 20 | 198 | 96 | 91 | 171 | 138 | 105 | 28 | 127 | NS | 122 | 148 | 140 | 124 | 157 |
| 7 | 40 | 240 | 203 | 144 | 156 | 157 | 138 | 143 | 142 | NS | 125 | 140 | 131 | 130 | 154 |
| 7 | 60 | 264 | 278 | 140 | 154 | 155 | 148 | 94 | 164 | NS | 127 | 147 | 133 | 137 | 151 |
| 7 | 0 | | | | | | | | | | | | ICE | 18 | |
| 8 | 0 | 210 | 238 | 257 | 137 | 162 | 129 | 122 | 108 | | | | | | |
| 8 | 10 | 169 | 198 | 232 | 140 | 166 | 127 | 132 | 125 | | | | | | |
| 8 | 20 | 195 | 253 | 238 | 137 | 165 | 127 | 131 | 129 | | | | | | |
| 8 | 40 | 98 | 250 | 172 | 143 | 160 | 132 | 108 | 118 | | | | | | |
| 8 | 60 | 157 | 140 | 221 | 147 | 169 | 136 | 140 | 144 | | | | | | |

-5 CHEMICAL OXYGEN DEMAND (PPM)

| LOCATION | DEPTH | MAY23 | JUN10 | JUN26 | JUL11 | JUL31 | AUG13 | AUG26 | SEP5 | OCT13 | NOV13 | DEC13 | FEB5 | MAR18 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | NS | NS | 6.9 | 9.2 | 12.4 | 7.4 | 12.1 | 8.3 | | | | | | |
| 1 | 10 | NS | NS | 7.4 | 14.0 | 13.9 | 3.7 | 14.1 | 5.2 | | | | | | |
| 1 | 20 | NS | NS | 9.0 | 12.4 | 11.4 | 0.0 | 5.2 | 7.8 | | | | | | |
| 1 | 40 | NS | NS | 9.8 | 7.6 | 6.0 | 1.1 | 7.7 | 5.7 | | | | | | |
| 1 | 60 | NS | NS | NS | 20.0 | NS | NS | NS | NS | | | | | | |
| 2 | 0 | NS | NS | NS | 22.2 | 13.4 | 6.8 | 25.0 | 30.0 | | | | | | |
| 2 | 10 | NS | NS | 10.6 | 8.1 | 14.9 | 3.7 | 11.3 | 6.7 | | | | | | |
| 2 | 20 | NS | NS | 7.7 | 8.1 | 10.4 | 2.6 | 8.9 | 4.7 | | | | | | |
| 2 | 40 | NS | NS | NS | 16.8 | 7.5 | 3.2 | 7.7 | 6.7 | | | | | | |
| 2 | 60 | NS | NS | 3.7 | 36.2 | 7.5 | 2.6 | 12.5 | 10.4 | | | | | | |
| 3 | 0 | NS | 4.2 | 8.5 | 10.8 | 14.9 | 6.8 | 12.1 | 4.1 | NS | 5.9 | 2.7 | 3.4 | NS | NS |
| 3 | 10 | NS | 6.3 | 11.1 | 7.0 | 10.4 | 4.7 | 9.7 | 4.1 | NS | 6.8 | 10.0 | 19.2 | NS | NS |
| 3 | 20 | NS | 6.8 | 10.1 | 8.1 | 7.0 | 5.3 | 7.7 | 6.7 | NS | 3.6 | 17.2 | 23.3 | NS | NS |
| 3 | 40 | NS | 3.2 | 4.2 | 5.9 | 7.0 | 0.0 | 8.1 | 4.7 | NS | 6.8 | 3.6 | 21.3 | NS | NS |
| 3 | 60 | NS | 0.0 | 2.1 | 6.5 | 7.0 | 0.0 | 2.8 | 1.6 | NS | 6.4 | 4.1 | 2.0 | NS | NS |
| 4 | 0 | 3.4 | 4.7 | 10.1 | 3.2 | 11.4 | 1.6 | 9.3 | 3.6 | | | | | | |
| 4 | 10 | 1.1 | 3.2 | 10.1 | 17.3 | 8.5 | 5.8 | 11.7 | 5.2 | | | | | | |
| 4 | 20 | 5.0 | 0.5 | 11.7 | 21.1 | 8.0 | 10.0 | 9.3 | 9.3 | | | | | | |
| 4 | 40 | 2.6 | 0.5 | 6.4 | 9.7 | 8.5 | 0.0 | 5.6 | 6.7 | | | | | | |
| 4 | 60 | 64.0 | 0.5 | 4.2 | 9.2 | 13.4 | 0.0 | 6.1 | 7.8 | | | | | | |

| LOCATION | DEPTH | MAY27 | JUN12 | JUL2 | JUL15 | AUG1 | AUG14 | AUG27 | SEP10 | OCT14 | NOV20 | DEC13 | FEB5 | MAR18 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 0 | NS | 0.5 | 6.9 | 23.2 | 10.0 | 19.0 | 7.7 | 9.9 | | | | | | |
| 5 | 10 | NS | 9.0 | 14.7 | 6.5 | 10.4 | 31.6 | 11.7 | 8.3 | | | | | | |
| 5 | 20 | NS | 12.1 | 5.8 | 7.6 | 9.5 | 4.2 | 8.1 | 7.0 | | | | | | |
| 5 | 40 | NS | 3.7 | 8.9 | 12.4 | 9.5 | 0.0 | 3.6 | 7.4 | | | | | | |
| 5 | 60 | NS | 0.0 | 7.9 | 24.3 | NS | NS | NS | NS | | | | | | |
| 6 | 0 | 7.4 | 6.1 | 6.4 | 1.6 | 8.0 | 17.9 | 5.2 | 10.8 | | | | | | |
| 6 | 10 | 19.7 | 9.7 | 11.7 | 5.4 | 14.4 | 16.8 | 6.5 | 8.3 | | | | | | |
| 6 | 20 | 0.0 | 6.3 | 6.4 | 6.5 | 6.5 | 3.7 | 5.2 | 8.3 | | | | | | |
| 6 | 40 | 59.2 | 1.3 | 4.3 | 6.5 | 4.5 | 0.0 | 2.4 | 9.5 | | | | | | |
| 6 | 60 | 74.8 | 1.9 | 6.4 | 10.3 | NS | NS | NS | NS | | | | | | |
| 7 | 0 | 16.3 | 3.6 | 0.0 | 9.7 | 8.0 | 5.3 | 9.6 | 7.4 | NS | 5.0 | 10.4 | 8.9 | NS | NS |
| 7 | 10 | 13.8 | 5.3 | 14.9 | 5.9 | 10.0 | 10.0 | 6.5 | 8.3 | NS | 4.5 | 20.4 | 20.5 | NS | NS |
| 7 | 20 | 44.4 | 8.8 | 9.0 | 10.3 | 9.5 | 10.0 | 9.7 | 4.1 | NS | 2.7 | 5.4 | 8.2 | NS | NS |
| 7 | 40 | 60.4 | 0.4 | 10.6 | 9.2 | 10.0 | 4.2 | 2.0 | 1.7 | NS | 6.8 | 11.8 | 4.8 | NS | NS |
| 7 | 60 | 0.0 | 4.4 | 14.4 | 7.6 | 5.0 | 3.7 | 4.0 | 6.6 | NS | 5.0 | 4.5 | 17.8 | NS | NS |
| 8 | 0 | 13.8 | 4.2 | 11.7 | 7.0 | 8.5 | 2.6 | 7.3 | 15.7 | | | | | | |
| 8 | 10 | 17.3 | 6.1 | 13.8 | 10.8 | 10.0 | 2.6 | 8.9 | 4.6 | | | | | | |
| 8 | 20 | 0.0 | 4.4 | 13.3 | 17.3 | 8.5 | 4.2 | 8.9 | 8.3 | | | | | | |
| 8 | 40 | 0.0 | 2.3 | 2.7 | 2.7 | 10.9 | 2.6 | 2.8 | 4.1 | | | | | | |
| 8 | 60 | 2.5 | 0.0 | 0.0 | 3.2 | 11.9 | 0.0 | 3.2 | 2.1 | | | | | | |

-6 ELECTRICAL CONDUCTIVITY (MICROMHOS)

| LOCATION | DEPTH | MAY23 | JUN10 | JUN26 | JUL11 | JUL31 | AUG13 | AUG26 | SEP5 | OCT13 | NOV13 | DEC13 | FEB5 | MAR18 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | | 189. | 189. | 173. | 160. | 145. | 134. | 153. | | | | | | |
| 1 | 10 | | 184. | 195. | 175. | 165. | 149. | 139. | 164. | | | | | | |
| 1 | 20 | | 185. | 201. | 180. | 166. | 155. | 152. | 166. | | | | | | |
| 1 | 40 | | 214. | 247. | 255. | 231. | 198. | 200. | 180. | | | | | | |
| 1 | 60 | | 222. | | 256. | | | | | | | | | | |
| 2 | 0 | | 189. | 196. | 170. | 157. | 146. | 138. | 157. | | | | | | |
| 2 | 10 | | 184. | 201. | 176. | 165. | 148. | 138. | 162. | | | | | | |
| 2 | 20 | | 185. | 205. | 180. | 167. | 151. | 140. | 163. | | | | | | |
| 2 | 40 | | 220. | 241. | 228. | 216. | 199. | 178. | 185. | | | | | | |
| 2 | 60 | | 229. | 266. | 268. | 237. | 219. | 190. | 228. | | | | | | |
| 3 | 0 | | 191. | 187. | | 153. | 147. | 136. | 151. | | 134. | 161. | 139. | 50. | |
| 3 | 10 | | 185. | 194. | | 160. | 150. | 138. | 157. | | 224. | 159. | 138. | 150. | |
| 3 | 20 | | 193. | 197. | | 160. | 154. | 139. | 160. | | 188. | 158. | 138. | 133. | |
| 3 | 40 | | 215. | 235. | | 203. | 202. | 178. | 186. | | 208. | 158. | 135. | 167. | |
| 3 | 60 | | 227. | 260. | | 227. | 219. | 193. | 217. | | 216. | 158. | 133. | 168. | |
| 4 | 0 | | 189. | 193. | | 148. | 151. | 136. | 161. | | | | | | |
| 4 | 10 | | 199. | 194. | | 153. | 150. | 141. | 160. | | | | | | |
| 4 | 20 | | 196. | 201. | | 156. | 152. | 141. | 156. | | | | | | |
| 4 | 40 | | 216. | 236. | | 206. | 200. | 179. | 183. | | | | | | |
| 4 | 60 | | 234. | 251. | | 226. | 226. | 191. | 223. | | | | | | |

| LOCATION | DEPTH | MAY27 | JUN12 | JUL2 | JUL15 | AUG1 | AUG14 | AUG27 | SEP10 | OCT14 | NOV20 | DEC13 | FEB5 | MAR18 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 0 | | 190. | 189. | | 159. | 146. | 130. | 144. | | | | | | |
| 5 | 10 | | 197. | 195. | | 163. | 148. | 134. | 154. | | | | | | |
| 5 | 20 | | 205. | 198. | | 170. | 149. | 136. | 156. | | | | | | |
| 5 | 40 | | 219. | 228. | | 225. | 196. | 174. | 185. | | | | | | |
| 5 | 60 | | 226. | 237. | | | | | | | | | | | |
| 6 | 0 | 231. | 188. | 186. | 166. | 148. | 59. | 143. | 146. | | | | | | |
| 6 | 10 | 223. | 187. | 206. | 168. | 152. | 58. | 145. | 163. | | | | | | |
| 6 | 20 | 237. | 194. | 207. | 165. | 153. | 58. | 146. | 155. | | | | | | |
| 6 | 40 | 249. | 200. | 240. | 219. | 200. | 70. | 177. | 166. | | | | | | |
| 6 | 60 | 262. | 233. | 258. | 236. | | | | | | | | | | |
| 7 | 0 | 213. | 181. | 190. | 163. | 153. | 58. | 146. | 149. | | 234. | 163. | 172. | 114. | 161. |
| 7 | 10 | 209. | 190. | 205. | 168. | 154. | 59. | 149. | 154. | | 164. | 160. | 172. | 167. | 164. |
| 7 | 20 | 231. | 189. | 202. | 165. | 156. | 59. | 152. | 155. | | 177. | 160. | 172. | 167. | 164. |
| 7 | 40 | 254. | 205. | 235. | 201. | 188. | 72. | 176. | 165. | | 177. | 160. | 172. | 163. | 164. |
| 7 | 60 | 255. | 231. | 263. | 258. | 228. | 84. | 203. | 199. | | 177. | 160. | 170. | 168. | 164. |
| 8 | 0 | 212. | 191. | 195. | 170. | 153. | 61. | 149. | 148. | | | | | | |
| 8 | 10 | 211. | 188. | 199. | 170. | 157. | 60. | 151. | 157. | | | | | | |
| 8 | 20 | 240. | 189. | 202. | 170. | 156. | 67. | 154. | 155. | | | | | | |
| 8 | 40 | 246. | 202. | 228. | 203. | 196. | 82. | 184. | 170. | | | | | | |
| 8 | 60 | 246. | 236. | 261. | 241. | 232. | 92. | 218. | 197. | | | | | | |

-7 CALCIUM (PPM)

| LOCATION | DEPTH | MAY23 | JUN10 | JUN26 | JUL11 | JUL31 | AUG13 | AUG26 | SEP5 | OCT13 | NOV13 | DEC13 | FEB5 | MAR18 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 27.3 | 32.1 | 16.9 | 12.0 | 21.6 | 13.6 | 16.0 | 22.4 | | | | | | |
| 1 | 10 | 22.9 | 28.8 | 15.4 | 12.0 | 20.8 | 18.4 | 16.0 | 21.6 | | | | | | |
| 1 | 20 | 24.1 | 29.6 | 17.7 | 12.0 | 24.4 | 18.4 | 27.2 | 21.6 | | | | | | |
| 1 | 40 | 26.5 | 29.6 | 20.8 | 20.0 | 34.4 | 27.2 | 24.0 | 21.6 | | | | | | |
| 1 | 60 | 26.5 | 29.6 | NS | 22.4 | NS | NS | NS | NS | | | | | | |
| 2 | 0 | 29.7 | 30.9 | 18.5 | 11.4 | 29.6 | 12.8 | 17.6 | 21.6 | | | | | | |
| 2 | 10 | 28.9 | 32.9 | 16.1 | 12.0 | 30.4 | 12.0 | 16.0 | 22.4 | | | | | | |
| 2 | 20 | 26.5 | 33.3 | 15.4 | 12.0 | 20.8 | 16.0 | 16.0 | 22.4 | | | | | | |
| 2 | 40 | 30.9 | 32.1 | 20.0 | 18.4 | 35.2 | 19.2 | 25.6 | 29.6 | | | | | | |
| 2 | 60 | 27.3 | 28.8 | 22.3 | 16.0 | 32.0 | 21.6 | 20.8 | 26.4 | | | | | | |
| 3 | 0 | 33.7 | 18.9 | 15.4 | 12.8 | 24.0 | 21.6 | 14.4 | 28.0 | NS | 40.8 | 49.6 | 55.4 | 12.8 | NS |
| 3 | 10 | 28.1 | 22.4 | 16.1 | 14.4 | 21.6 | 13.6 | 12.8 | 28.0 | NS | 38.5 | 49.6 | 54.6 | 31.2 | NS |
| 3 | 20 | 30.9 | 20.4 | 18.5 | 12.8 | 21.6 | 15.2 | 13.6 | 31.2 | NS | 40.0 | 65.6 | 43.2 | 33.6 | NS |
| 3 | 40 | 24.9 | 21.8 | 19.2 | 16.8 | 31.2 | 20.8 | 24.8 | 34.4 | NS | 38.5 | 55.2 | 44.8 | 36.8 | NS |
| 3 | 60 | 30.1 | 23.9 | 20.8 | 20.8 | 39.2 | 24.8 | 24.0 | 29.6 | NS | 38.5 | 49.6 | 53.8 | 32.8 | NS |
| 3 | 0 | | | | | | | | | | | ICE | 8.0 | | |
| 4 | 0 | 22.0 | 23.2 | 16.9 | 12.8 | 20.0 | 15.2 | 12.0 | 40.8 | | | | | | |
| 4 | 10 | 24.0 | 21.8 | 15.4 | 11.4 | 20.0 | 15.2 | 12.8 | 39.2 | | | | | | |
| 4 | 20 | 22.6 | 24.6 | 18.5 | 15.2 | 20.0 | 15.2 | 13.6 | 26.4 | | | | | | |
| 4 | 40 | 22.0 | 21.0 | 19.2 | 20.8 | 24.0 | 24.0 | 19.2 | 32.8 | | | | | | |
| 4 | 60 | 24.8 | 22.4 | 19.2 | 22.3 | 26.4 | 27.2 | 20.0 | 34.4 | | | | | | |
| LOCATION | DEPTH | MAY27 | JUN12 | JUL2 | JUL15 | AUG1 | AUG14 | AUG27 | SEP10 | OCT14 | NOV20 | DEC13 | FEB5 | MAR18 | APR17 |
| 5 | 0 | 24.9 | 19.6 | 22.3 | 12.8 | 22.4 | 15.2 | 20.0 | 23.2 | | | | | | |
| 5 | 10 | 26.5 | 21.0 | 16.9 | 11.4 | 20.8 | 16.0 | 16.0 | 33.6 | | | | | | |
| 5 | 20 | 22.5 | 18.9 | 19.2 | 14.4 | 20.8 | 12.0 | 19.2 | 27.2 | | | | | | |
| 5 | 40 | 28.9 | NS | 18.5 | 22.3 | 26.4 | 25.6 | 22.4 | 30.4 | | | | | | |
| 5 | 60 | 28.1 | 17.6 | 19.2 | 24.0 | NS | NS | NS | NS | | | | | | |
| 6 | 0 | 23.4 | 23.2 | 10.8 | 13.6 | 20.8 | 13.6 | 20.0 | 22.4 | | | | | | |
| 6 | 10 | 23.4 | 18.2 | 14.6 | 14.4 | 20.8 | 16.0 | 21.6 | 26.4 | | | | | | |
| 6 | 20 | 19.8 | 21.0 | 17.7 | 13.6 | 24.0 | 12.8 | 19.2 | 24.8 | | | | | | |
| 6 | 40 | 23.4 | 22.4 | 22.3 | 20.0 | 24.4 | 24.8 | 20.0 | 33.6 | | | | | | |
| 6 | 60 | 24.0 | 23.9 | 22.3 | 22.4 | NS | NS | NS | NS | | | | | | |
| 7 | 0 | 20.5 | 18.9 | 16.9 | 13.6 | 20.0 | 14.4 | 20.0 | 26.4 | NS | 38.5 | 77.4 | 53.8 | 36.0 | 28.0 |
| 7 | 10 | 19.8 | 21.8 | 15.4 | 14.4 | 24.8 | 13.6 | 15.2 | 27.2 | NS | 40.8 | 48.0 | 74.4 | 32.8 | 19.2 |
| 7 | 20 | 19.8 | 20.4 | 18.5 | 15.2 | 20.8 | 15.2 | 15.2 | 32.0 | NS | 37.7 | 44.8 | 41.6 | 37.6 | 28.0 |
| 7 | 40 | 22.6 | 23.9 | 20.0 | 17.6 | 23.2 | 22.4 | 22.4 | 35.2 | NS | 36.9 | 50.4 | 55.4 | 28.8 | 32.8 |
| 7 | 60 | 19.8 | 22.4 | 22.3 | 24.0 | 22.4 | 24.0 | 30.4 | 39.2 | NS | 42.3 | 48.8 | 55.4 | 32.8 | 36.0 |
| 7 | 0 | | | | | | | | | | | ICE | 8.0 | | |
| 8 | 0 | 23.4 | 21.0 | 10.8 | 13.6 | 12.8 | 13.6 | 13.6 | 31.2 | | | | | | |
| 8 | 10 | 23.4 | 19.6 | 14.6 | 11.2 | 12.8 | 12.0 | 15.2 | 38.4 | | | | | | |
| 8 | 20 | 26.7 | 21.0 | 17.7 | 15.2 | 16.0 | 16.8 | 12.0 | 34.4 | | | | | | |
| 8 | 40 | 25.6 | 22.4 | 18.5 | 20.0 | 24.0 | 24.0 | 16.0 | 29.6 | | | | | | |
| 8 | 60 | 22.0 | 20.4 | 17.7 | 23.2 | 27.2 | 27.2 | 25.6 | 41.6 | | | | | | |

-8 MAGNESIUM (PPM)

| LOCATION | DEPTH | MAY23 | JUN10 | JUN26 | JUL11 | JUL31 | AUG13 | AUG26 | SEP5 | OCT13 | NOV13 | DEC13 | FEB5 | MAR18 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 9.0 | 8.8 | 8.1 | 8.6 | 9.8 | 9.2 | 8.1 | 4.3 | | | | | | |
| 1 | 10 | 7.8 | 7.0 | 8.0 | 7.1 | 9.0 | 8.5 | 8.1 | 8.3 | | | | | | |
| 1 | 20 | 11.5 | 7.7 | 8.0 | 8.8 | 9.0 | 8.0 | 8.1 | 8.4 | | | | | | |
| 1 | 40 | 9.9 | 6.9 | 9.5 | 8.5 | 8.7 | 8.5 | 8.0 | 8.6 | | | | | | |
| 1 | 60 | 9.7 | 8.8 | NS | 9.3 | NS | NS | NS | NS | | | | | | |
| 2 | 0 | 9.0 | 8.6 | 8.2 | 8.4 | 10.0 | 8.4 | 8.5 | 7.9 | | | | | | |
| 2 | 10 | 8.1 | 7.3 | 8.1 | 7.1 | 8.5 | 8.4 | 8.8 | 8.5 | | | | | | |
| 2 | 20 | 9.4 | 7.5 | 8.3 | 8.0 | 9.0 | 8.8 | 8.4 | 8.3 | | | | | | |
| 2 | 40 | 9.0 | 8.4 | 8.1 | 5.3 | 9.8 | 8.8 | 8.4 | 8.3 | | | | | | |
| 2 | 60 | 9.4 | 6.6 | 9.4 | 9.4 | 9.5 | 8.6 | 8.7 | 8.8 | | | | | | |
| 3 | 0 | 8.2 | 8.5 | 7.9 | 7.8 | 9.5 | 8.6 | 8.5 | 8.7 | NS | 8.7 | 8.1 | 9.1 | 2.5 | NS |
| 3 | 10 | 8.2 | 8.6 | 7.6 | 9.0 | 10.3 | 8.2 | 8.3 | 8.4 | NS | 8.7 | 8.5 | 9.2 | 9.0 | NS |
| 3 | 20 | 8.3 | 8.3 | 8.2 | 8.9 | 9.2 | 9.0 | 8.4 | 8.4 | NS | 8.8 | 8.5 | 9.2 | 9.5 | NS |
| 3 | 40 | 8.2 | 8.6 | 8.4 | 4.9 | 9.8 | 9.2 | 8.4 | 8.9 | NS | 8.5 | 8.3 | 9.0 | 9.3 | NS |
| 3 | 60 | 9.4 | 9.0 | 8.5 | 8.8 | 9.5 | 8.9 | 7.9 | 8.7 | NS | 8.8 | 8.3 | 9.1 | 9.1 | NS |
| 3 | 0 | | | | | | | | | | | ICE | 1.3 | | |
| 4 | 0 | 10.1 | 8.3 | 7.8 | 4.4 | 8.8 | 9.2 | 7.9 | 6.7 | | | | | | |
| 4 | 10 | 10.3 | 8.3 | 8.0 | 7.6 | 10.7 | 9.0 | 8.3 | 8.1 | | | | | | |
| 4 | 20 | 9.0 | 8.3 | 8.3 | 8.5 | 8.8 | 8.2 | 8.3 | 8.0 | | | | | | |
| 4 | 40 | 9.4 | 8.9 | 8.2 | 9.0 | 8.9 | 8.0 | 8.7 | 8.0 | | | | | | |
| 4 | 60 | 8.6 | 9.1 | 8.4 | 9.8 | 9.5 | 11.0 | 8.3 | 8.5 | | | | | | |
| LOCATION | DEPTH | MAY27 | JUN12 | JUL2 | JUL15 | AUG1 | AUG14 | AUG27 | SEP10 | OCT14 | NOV20 | DEC13 | FEB5 | MAR18 | APR17 |
| 5 | 0 | 8.8 | 10.0 | 8.0 | 8.3 | 9.0 | 7.8 | 8.0 | 8.1 | | | | | | |
| 5 | 10 | 9.7 | 8.8 | 8.0 | 8.1 | 9.0 | 8.0 | 8.3 | 7.9 | | | | | | |
| 5 | 20 | 9.4 | 8.0 | 8.0 | 8.3 | 9.0 | 8.0 | 8.5 | 8.5 | | | | | | |
| 5 | 40 | 9.1 | 8.8 | 8.3 | 8.6 | 9.0 | 8.0 | 8.6 | 8.5 | | | | | | |
| 5 | 60 | 9.0 | 8.6 | 8.6 | 8.6 | NS | NS | NS | NS | | | | | | |
| 6 | 0 | 5.0 | 8.4 | 7.9 | 7.9 | 13.1 | 7.7 | 8.5 | 7.9 | | | | | | |
| 6 | 10 | 9.4 | 8.2 | 7.8 | 8.2 | 9.8 | 7.7 | 8.8 | 8.1 | | | | | | |
| 6 | 20 | 10.2 | 8.9 | 7.9 | 8.4 | 9.2 | 8.0 | 8.6 | 8.4 | | | | | | |
| 6 | 40 | 9.8 | 8.5 | 8.4 | 8.4 | 10.4 | 8.0 | 8.9 | 8.0 | | | | | | |
| 6 | 60 | 9.1 | 8.6 | 9.8 | 8.9 | NS | NS | NS | NS | | | | | | |
| 7 | 0 | 8.6 | 8.5 | 8.5 | 8.5 | 8.4 | 7.6 | 8.1 | 8.2 | NS | 8.7 | 8.3 | 9.5 | 6.0 | 8.8 |
| 7 | 10 | 8.6 | 8.6 | 8.5 | 8.3 | 9.3 | 7.8 | 8.2 | 8.7 | NS | 8.8 | 8.5 | 9.25 | 8.9 | 9.0 |
| 7 | 20 | 8.6 | 8.4 | 8.4 | 8.1 | 9.5 | 8.2 | 7.9 | 7.9 | NS | 9.5 | 8.2 | 9.1 | 9.2 | 8.5 |
| 7 | 40 | 9.4 | 8.7 | 8.3 | 8.3 | 10.4 | 8.7 | 9.0 | 9.6 | NS | 8.7 | 8.2 | 9.1 | 8.6 | 8.8 |
| 7 | 60 | 9.5 | 8.7 | 8.7 | 8.6 | 10.4 | 8.1 | 9.0 | 9.6 | NS | 8.7 | 8.2 | 8.9 | 9.5 | 8.9 |
| 7 | 0 | | | | | | | | | | | ICE | 1.3 | | |
| 8 | 0 | 7.8 | 10.0 | 8.3 | 7.9 | 7.7 | 6.5 | 8.0 | 6.0 | | | | | | |
| 8 | 10 | 7.8 | 8.5 | 8.5 | 7.9 | 7.7 | 8.8 | 8.6 | 8.2 | | | | | | |
| 8 | 20 | 8.8 | 8.6 | 7.8 | 7.9 | 7.7 | 8.5 | 8.5 | 8.5 | | | | | | |
| 8 | 40 | 8.6 | 8.6 | 8.5 | 8.1 | 7.7 | 8.5 | 9.0 | 7.4 | | | | | | |
| 8 | 60 | 9.1 | 9.5 | 8.6 | 8.9 | 8.8 | 8.5 | 9.2 | 8.5 | | | | | | |

-9 CHLORIDE (PPM)

| LOCATION | DEPTH | MAY23 | JUN10 | JUN26 | JUL11 | JUL31 | AUG13 | AUG26 | SEP5 | OCT13 | NOV13 | DEC13 | FEB5 | MAR18 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 2.8 | 3.5 | 1.6 | 1.4 | NS | 1.2 | 1.1 | 1.2 | | | | | | |
| 1 | 10 | 3.0 | 3.5 | 1.7 | 1.4 | NS | 1.2 | 1.1 | 1.2 | | | | | | |
| 1 | 20 | 2.5 | 4.0 | 1.6 | 1.4 | NS | 1.3 | 1.1 | 1.2 | | | | | | |
| 1 | 40 | 2.7 | 3.0 | 1.8 | 1.4 | NS | 1.3 | 1.3 | 1.2 | | | | | | |
| 1 | 60 | 3.0 | 3.5 | NS | 1.8 | NS | NS | NS | NS | | | | | | |
| 2 | 0 | 3.1 | 3.0 | 1.7 | 1.6 | NS | 1.0 | 1.3 | 1.4 | | | | | | |
| 2 | 10 | 3.0 | 3.5 | 1.7 | 1.7 | NS | 1.3 | 0.9 | 1.2 | | | | | | |
| 2 | 20 | 3.0 | 3.0 | 1.7 | 1.4 | NS | 1.0 | 1.0 | 1.3 | | | | | | |
| 2 | 40 | 3.0 | 3.0 | 1.8 | 1.7 | NS | 1.2 | 0.9 | 1.2 | | | | | | |
| 2 | 60 | 3.0 | 3.0 | 1.7 | 1.5 | NS | 1.0 | 1.1 | 1.1 | | | | | | |
| 3 | 0 | 3.0 | 1.5 | 1.6 | 1.6 | NS | 1.2 | 1.1 | 1.4 | NS | 1.4 | 1.4 | 1.2 | 1.6 | NS |
| 3 | 10 | 3.0 | 2.0 | 1.8 | 1.6 | NS | 1.3 | 1.1 | 1.3 | NS | 1.5 | 1.0 | 1.3 | 1.0 | NS |
| 3 | 20 | 3.0 | 1.6 | 1.8 | 1.5 | NS | 1.2 | 1.3 | 1.2 | NS | 1.1 | 1.1 | 1.3 | 1.3 | NS |
| 3 | 40 | 3.0 | 1.7 | 1.7 | 1.4 | NS | 1.3 | 1.1 | 1.2 | NS | 1.2 | 1.1 | 1.4 | 1.2 | NS |
| 3 | 60 | 3.0 | 2.1 | 1.8 | 1.6 | NS | 1.3 | 1.1 | 1.2 | NS | 1.1 | 0.9 | 1.3 | 1.2 | NS |
| 3 | 0 | | | | | | | | | | | ICE | 1.1 | | |
| 4 | 0 | 2.5 | 2.0 | 1.7 | 1.6 | NS | 1.1 | 0.9 | 1.2 | | | | | | |
| 4 | 10 | 2.5 | 2.0 | 1.6 | 1.3 | NS | 1.3 | 1.3 | 1.3 | | | | | | |
| 4 | 20 | 2.8 | 2.2 | 1.8 | 1.3 | NS | 1.1 | 1.2 | 1.2 | | | | | | |
| 4 | 40 | 2.5 | 2.2 | 1.7 | 1.2 | NS | 1.1 | 1.1 | 1.4 | | | | | | |
| 4 | 60 | 2.4 | 2.3 | 1.7 | 1.6 | NS | 1.3 | 1.3 | 1.3 | | | | | | |
| LOCATION | DEPTH | MAY27 | JUN12 | JUL2 | JUL15 | AUG1 | AUG14 | AUG27 | SEP10 | OCT14 | NOV20 | DEC13 | FEB5 | MAR18 | APR17 |
| 5 | 0 | 3.0 | 1.7 | 1.5 | 1.4 | NS | 1.2 | 1.3 | 1.5 | | | | | | |
| 5 | 10 | 3.0 | 2.4 | 1.6 | 1.4 | NS | 1.2 | 1.2 | 1.4 | | | | | | |
| 5 | 20 | 2.8 | 2.4 | 1.5 | 1.4 | NS | 1.3 | 1.2 | 1.3 | | | | | | |
| 5 | 40 | 3.1 | 2.0 | 1.5 | 1.4 | NS | 1.4 | 1.0 | 1.3 | | | | | | |
| 5 | 60 | 3.0 | 1.9 | 1.4 | 1.6 | NS | NS | NS | NS | | | | | | |
| 6 | 0 | 2.7 | 2.1 | 1.4 | 1.2 | NS | 1.2 | 1.2 | 2.5 | | | | | | |
| 6 | 10 | 2.5 | 2.1 | 1.4 | 1.1 | NS | 1.3 | 1.2 | 1.3 | | | | | | |
| 6 | 20 | 2.5 | 2.3 | 1.4 | 1.1 | NS | 1.3 | 1.1 | 1.5 | | | | | | |
| 6 | 40 | 2.6 | 2.2 | 1.4 | 1.1 | NS | 1.3 | 1.4 | 1.3 | | | | | | |
| 6 | 60 | 2.6 | 1.9 | 1.4 | 1.2 | NS | NS | NS | NS | | | | | | |
| 7 | 0 | 3.0 | 2.1 | 1.3 | 1.1 | NS | 1.3 | 1.2 | 1.1 | NS | 1.0 | 1.1 | 1.4 | 1.0 | 1.2 |
| 7 | 10 | 2.5 | 1.8 | 1.3 | 1.4 | NS | 1.4 | 1.3 | 1.3 | NS | 1.4 | 1.2 | 1.3 | 1.1 | 1.0 |
| 7 | 20 | 2.5 | 2.0 | 1.5 | 1.0 | NS | 1.3 | 1.5 | 1.2 | NS | 1.2 | 1.1 | 1.3 | 1.1 | 1.1 |
| 7 | 40 | 2.6 | 2.2 | 1.4 | 1.0 | NS | 1.2 | 1.4 | 1.5 | NS | 1.3 | 1.1 | 1.5 | 1.1 | 1.2 |
| 7 | 60 | 2.4 | 2.2 | 1.4 | 1.0 | NS | 1.3 | 1.4 | 0.9 | NS | 1.2 | 1.2 | 1.2 | 1.1 | 1.1 |
| 7 | 0 | | | | | | | | | | | ICE | 1.1 | | |
| 8 | 0 | 2.8 | 1.9 | 1.3 | 0.8 | NS | 1.4 | 1.2 | 1.0 | | | | | | |
| 8 | 10 | 2.5 | 2.3 | 1.4 | 0.9 | NS | 1.3 | 1.2 | 1.2 | | | | | | |
| 8 | 20 | 2.5 | 2.0 | 1.4 | 1.1 | NS | 1.3 | 1.2 | 1.5 | | | | | | |
| 8 | 40 | 2.3 | 2.3 | 1.4 | 1.0 | NS | 1.0 | 1.2 | 0.9 | | | | | | |
| 8 | 60 | 2.7 | 2.2 | 1.5 | 1.3 | NS | 1.3 | 1.3 | 1.4 | | | | | | |

-10 SILICATE (PPM)

| LOCATION | DEPTH | MAY23 | JUN10 | JUN26 | JUL11 | JUL31 | AUG13 | AUG26 | SEP5 | OCT13 | NOV13 | DEC13 | FEB5 | MAR18 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | NS | NS | NS | 4.7 | 4.0 | 5.2 | 5.1 | 4.4 | | | | | | |
| 1 | 10 | NS | NS | NS | 4.8 | 4.2 | 4.2 | 5.5 | 4.4 | | | | | | |
| 1 | 20 | NS | NS | NS | 4.7 | 4.4 | 4.0 | 3.8 | 4.2 | | | | | | |
| 2 | 0 | NS | NS | NS | 4.6 | 4.0 | 4.9 | 3.6 | 4.6 | | | | | | |
| 2 | 10 | NS | NS | NS | 4.4 | 3.8 | 4.0 | 3.7 | 4.9 | | | | | | |
| 2 | 20 | NS | NS | NS | 4.6 | 7.0 | 4.1 | 3.8 | 4.0 | | | | | | |
| 3 | 0 | NS | NS | NS | 4.4 | 3.7 | 5.0 | 3.4 | 4.4 | NS | 2.3 | 2.35 | 3.05 | 0.85 | NS |
| 3 | 10 | NS | NS | NS | 4.5 | 3.5 | 4.2 | 3.8 | 4.2 | NS | 2.3 | 2.30 | 2.98 | 3.5 | NS |
| 3 | 20 | NS | NS | NS | 4.6 | 4.4 | 4.2 | 3.3 | 4.2 | NS | 2.3 | 2.35 | 2.83 | 3.6 | NS |
| 3 | 40 | NS | NS | NS | NS | NS | NS | NS | NS | NS | 2.3 | 2.2 | 2.61 | 3.65 | NS |
| 3 | 60 | NS | NS | NS | NS | NS | NS | NS | NS | NS | 1.7 | 2.2 | 2.53 | 3.35 | NS |
| 3 | 0 | | | | | | | | | | | ICE | .40 | | |
| 4 | 0 | NS | NS | NS | 4.4 | 3.7 | 5.4 | 4.5 | 5.0 | | | | | | |
| 4 | 10 | NS | NS | NS | 4.6 | 3.5 | 4.1 | 3.3 | 4.6 | | | | | | |
| 4 | 20 | NS | NS | NS | 4.3 | 4.4 | 4.0 | 4.3 | 4.6 | | | | | | |
| LOCATION | DEPTH | MAY27 | JUN12 | JUL2 | JUL15 | AUG1 | AUG14 | AUG27 | SEP10 | OCT14 | NOV20 | DEC13 | FEB5 | MAR18 | APR17 |
| 5 | 0 | NS | NS | NS | 4.1 | 3.5 | 3.6 | 3.8 | 4.5 | | | | | | |
| 5 | 10 | NS | NS | NS | 4.1 | 3.8 | 3.4 | 4.4 | 3.8 | | | | | | |
| 5 | 20 | NS | NS | NS | 3.9 | 4.2 | 2.9 | 3.8 | 4.8 | | | | | | |
| 6 | 0 | NS | NS | NS | 4.0 | 3.4 | 3.2 | 3.9 | 4.8 | | | | | | |
| 6 | 10 | NS | NS | NS | 3.9 | 3.2 | 3.2 | 3.8 | 4.8 | | | | | | |
| 6 | 20 | NS | NS | NS | 3.6 | 3.6 | 2.8 | 4.2 | 3.9 | | | | | | |
| 7 | 0 | NS | NS | NS | 4.0 | 4.7 | 3.4 | 3.6 | 4.3 | NS | 2.4 | 2.3 | 2.78 | 2.15 | 1.54 |
| 7 | 10 | NS | NS | NS | 3.9 | 3.8 | 3.3 | 3.6 | 7.0 | NS | 2.4 | 2.2 | 2.86 | 2.90 | 1.47 |
| 7 | 20 | NS | NS | NS | 4.0 | 3.6 | 2.8 | 4.5 | 4.5 | NS | 2.5 | 2.2 | 2.83 | 3.05 | 1.47 |
| 7 | 40 | NS | NS | NS | NS | NS | NS | NS | NS | NS | 2.4 | 2.3 | 2.78 | 2.95 | 1.50 |
| 7 | 60 | NS | NS | NS | NS | NS | NS | NS | NS | NS | 2.5 | 2.3 | 2.98 | 2.90 | 1.25 |
| 8 | 0 | NS | NS | NS | 4.0 | 3.8 | 3.4 | 4.0 | 5.0 | | | | | | |
| 8 | 10 | NS | NS | NS | 3.9 | 3.4 | 3.2 | 3.8 | 5.0 | | | | | | |
| 8 | 20 | NS | NS | NS | 4.2 | 3.8 | 2.7 | 4.2 | 4.2 | | | | | | |

-11 pH

| LOCATION | DEPTH | MAY23 | JUN10 | JUN26 | JUL11 | JUL31 | AUG13 | AUG26 | SEP5 | OCT13 | NOV13 | DEC13 | FEB5 | MAR18 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 9.16 | 9.35 | 9.70 | 9.40 | 9.40 | 9.66 | 9.40 | 9.21 | | | | | | |
| 1 | 10 | 8.95 | 9.22 | 9.64 | 9.38 | 9.40 | 9.58 | 9.36 | 9.00 | | | | | | |
| 1 | 20 | 8.95 | 8.83 | 9.38 | 9.40 | 9.38 | 9.20 | 8.11 | 8.89 | | | | | | |
| 1 | 40 | 8.85 | 8.51 | 8.63 | 8.49 | 8.00 | 7.90 | 8.18 | 8.40 | | | | | | |
| 1 | 60 | 8.29 | 9.45 | NS | 8.12 | NS | NS | NS | NS | | | | | | |
| 2 | 0 | 8.75 | 9.32 | 9.58 | 9.43 | 9.48 | 9.49 | 9.41 | 9.21 | | | | | | |
| 2 | 10 | 8.79 | 9.19 | 9.49 | 9.47 | 9.42 | 9.45 | 9.33 | 8.95 | | | | | | |
| 2 | 20 | 8.87 | 9.00 | 9.37 | 9.50 | 9.36 | 9.35 | 9.32 | 9.03 | | | | | | |
| 2 | 40 | 8.72 | 9.57 | 8.62 | 8.54 | 8.20 | 8.01 | 8.62 | 8.10 | | | | | | |
| 2 | 60 | 9.63 | 8.48 | 8.42 | 8.28 | 8.01 | 7.80 | 7.75 | 7.75 | | | | | | |
| 3 | 0 | 8.75 | 9.30 | 9.70 | 9.42 | 9.45 | 9.60 | 9.41 | 9.21 | NS | 8.40 | 8.7 | 8.4 | 9.2 | NS |
| 3 | 10 | 8.85 | 9.08 | 9.61 | 9.42 | 9.42 | 9.48 | 9.36 | 9.08 | NS | 8.05 | 8.2 | 8.2 | 8.6 | NS |
| 3 | 20 | 8.82 | 8.95 | 9.41 | 9.32 | 9.31 | 9.31 | 9.36 | 9.00 | NS | 7.90 | 8.15 | 8.1 | 8.4 | NS |
| 3 | 40 | 8.70 | 8.58 | 8.49 | 8.28 | 8.21 | 8.01 | 8.68 | 8.18 | NS | 7.90 | 8.1 | 8.1 | 8.4 | NS |
| 3 | 60 | 8.65 | 8.45 | 8.33 | 8.08 | 8.00 | 7.90 | 7.80 | 7.79 | NS | 7.83 | 8.0 | 8.1 | 8.4 | NS |
| 4 | 0 | 8.73 | 9.35 | 9.49 | 9.43 | 9.40 | 9.40 | 9.30 | 8.95 | | | | | | |
| 4 | 10 | 8.88 | 9.18 | 9.51 | 9.46 | 9.40 | 9.40 | 9.30 | 9.00 | | | | | | |
| 4 | 20 | 8.80 | 8.80 | 9.35 | 9.32 | 9.38 | 9.38 | 9.31 | 8.95 | | | | | | |
| 4 | 40 | 8.78 | 8.69 | 8.80 | 8.32 | 8.20 | 8.01 | 8.52 | 8.40 | | | | | | |
| 4 | 60 | 8.69 | 8.58 | 8.42 | 8.10 | 7.98 | 7.82 | 7.72 | 7.78 | | | | | | |
| LOCATION | DEPTH | MAY27 | JUN12 | JUL2 | JUL15 | AUG1 | AUG14 | AUG27 | SEP10 | OCT14 | NOV20 | DEC13 | FEB5 | MAR18 | APR17 |
| 5 | 0 | 8.00 | 9.35 | 9.49 | 9.40 | 9.48 | 9.32 | 9.38 | 8.95 | | | | | | |
| 5 | 10 | 7.89 | 9.15 | 9.31 | 9.40 | 9.48 | 9.32 | 9.30 | 8.95 | | | | | | |
| 5 | 20 | 8.13 | 8.85 | 9.18 | 9.16 | 9.35 | 9.32 | 9.30 | 8.96 | | | | | | |
| 5 | 40 | 9.02 | 8.70 | 8.55 | 8.40 | 8.01 | 8.30 | 8.09 | 8.07 | | | | | | |
| 5 | 60 | 7.85 | 8.62 | 8.60 | 7.92 | NS | NS | NS | NS | | | | | | |
| 6 | 0 | 9.03 | 9.22 | 9.58 | 9.40 | 9.41 | 9.49 | 9.33 | 9.03 | | | | | | |
| 6 | 10 | 8.80 | 9.18 | 9.46 | 9.40 | 9.38 | 9.46 | 9.27 | 9.02 | | | | | | |
| 6 | 20 | 8.59 | 9.00 | 9.22 | 9.35 | 9.35 | 9.30 | 9.25 | 9.02 | | | | | | |
| 6 | 40 | 8.49 | 8.71 | 8.59 | 8.80 | 8.25 | 8.10 | 8.33 | 8.45 | | | | | | |
| 6 | 60 | 8.59 | 8.43 | 8.20 | 8.02 | NS | NS | NS | NS | | | | | | |
| 7 | 0 | 8.90 | 9.29 | 9.52 | 9.42 | 9.40 | 9.49 | 9.41 | 9.08 | NS | 7.93 | 8.1 | 8.0 | 8.5 | 8.5 |
| 7 | 10 | 8.92 | 9.19 | 9.58 | 9.40 | 9.39 | 9.43 | 9.35 | 9.13 | NS | 7.95 | 7.95 | 8.0 | 8.3 | 8.6 |
| 7 | 20 | 8.60 | 9.10 | 9.45 | 9.33 | 9.37 | 9.35 | 9.34 | 8.95 | NS | 7.97 | 7.95 | 8.1 | 8.4 | 8.6 |
| 7 | 40 | 8.44 | 8.78 | 8.79 | 8.89 | 8.50 | 9.08 | 8.70 | 8.14 | NS | 8.00 | 7.90 | 8.1 | 8.4 | 8.6 |
| 7 | 60 | 8.42 | 8.42 | 8.30 | 8.05 | 7.81 | 7.70 | 7.71 | 7.65 | NS | 8.00 | 7.90 | 7.9 | 8.3 | 8.6 |
| 8 | 0 | 8.80 | 9.32 | 9.42 | 9.43 | 9.35 | 9.47 | 9.31 | 9.10 | | | | | | |
| 8 | 10 | 8.98 | 9.26 | 9.32 | 9.40 | 9.40 | 9.41 | 9.30 | 9.02 | | | | | | |
| 8 | 20 | 8.53 | 9.23 | 9.21 | 9.32 | 9.38 | 9.31 | 9.28 | 8.14 | | | | | | |
| 8 | 40 | 8.43 | 8.68 | 8.73 | 8.88 | 8.28 | 7.93 | 8.51 | 8.07 | | | | | | |
| 8 | 60 | 8.41 | 8.44 | 8.39 | 8.06 | 7.84 | 7.78 | 7.63 | 7.63 | | | | | | |

-12 SEDIMENT VALUES (LAKE BOTTOM SAMPLES)

-12A CALCIUM (PPM)

| LOCATION | JUN10 | JUL11 | JUL31 | AUG13 | AUG26 | SEP 5 |
|---|---|---|---|---|---|---|
| 1 | 475.0 | 560.0 | NS | 645.0 | NS | 512.0 |
| 2 | 489.0 | 528.0 | NS | 616.0 | NS | 248.0 |
| 3 | 440.0 | 440.0 | NS | 432.0 | NS | 184.0 |
| 4 | 475.0 | 656.0 | NS | 600.0 | NS | 504.0 |
| LOCATION | JUN11 | JUL15 | AUG 1 | AUG14 | AUG27 | SEP10 |
| 5 | 220.0 | 432.0 | NS | NS | NS | 424.0 |
| 6 | 197.0 | 334.0 | NS | 560.0 | NS | 360.0 |
| 7 | 333.0 | 656.0 | NS | 856.0 | NS | 424.0 |
| 8 | NS | 671.0 | NS | 623.0 | NS | 448.0 |

Note: $CaCO_3$ constitutes about 80% of the sediments of Lake Mendota, Wis. [See A. Delfino, op. cit., Vanderbilt Univ. Tech. Rept. [illegible] 1967]. See also Olson et al. (1967) Limnol. Oceanography 12: 392–404.

-12B NITRATE (PPM)

| LOCATION | JUN10 | JUL11 | JUL31 | AUG13 | AUG26 | SEP 5 |
|---|---|---|---|---|---|---|
| 1 | 3.55 | 4.89 | NS | 10.62 | NS | 7.3 |
| 2 | 6.21 | 5.76 | NS | 1.42 | NS | 15.7 |
| 3 | 7.09 | 5.76 | NS | 12.40 | NS | 15.3 |
| 4 | 3 | 5.32 | NS | 5.57 | NS | 12.1 |
| LOCATION | JUN11 | JUL15 | AUG 1 | AUG14 | AUG27 | SEP10 |
| 5 | 3.55 | 3.98 | NS | NS | NS | 7.6 |
| 6 | 2.66 | 3.81 | NS | | NS | 6.3 |
| 7 | 3.55 | 5.76 | NS | 1.15 | NS | 3.1 |
| 8 | NS | 3.81 | NS | 2.04 | NS | 9.4 |

-12C PHOSPHATE (PPM)

| LOCATION | JUN10 | JUL11 | JUL31 | AUG13 | AUG26 | SEP 5 |
|---|---|---|---|---|---|---|
| 1 | 5000.0 | 2130.0 | NS | 4165.0 | NS | 1788.0 |
| 2 | 3850.0 | 1655.0 | NS | 3750.0 | NS | 2630.0 |
| 3 | 4040.0 | 1000.0 | NS | 2426.0 | NS | 1912.0 |
| 4 | 4040.0 | 1250.0 | NS | 3662.0 | NS | 3040.0 |
| LOCATION | JUN11 | JUL15 | AUG 1 | AUG14 | AUG27 | SEP10 |
| 5 | 1750.0 | 1250.0 | NS | NS | NS | 1475.0 |
| 6 | 1814.0 | 1750.0 | NS | 2426.0 | NS | 1462.0 |
| 7 | 2540.0 | 1438.0 | NS | 2564.0 | NS | 1350.0 |
| 8 | NS | 1645.0 | NS | 2125.0 | NS | 1438.0 |

-13 NITROGEN

-13A AMMONIA NITROGEN (PPM)

| LOCATION | DEPTH | MAY23 | JUN10 | JUN26 | JUL11 | JUL31 | AUG13 | AUG26 | SEP5 | OCT13 | NOV13 | DEC13 | FEB5 | MAR18 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | NS | NS | .004 | .145 | .024 | .008 | .000 | .061 | | | | | | |
| 1 | 10 | NS | NS | .009 | .031 | .002 | .038 | .023 | .063 | | | | | | |
| 1 | 20 | NS | NS | .007 | .026 | .023 | .036 | .032 | .106 | | | | | | |
| 1 | 40 | NS | NS | .003 | .019 | .035 | .053 | .000 | .098 | | | | | | |
| 1 | 60 | NS | NS | NS | .026 | NS | NS | NS | NS | | | | | | |
| 2 | 0 | NS | NS | .006 | .000 | .025 | .000 | 1.923 | .087 | | | | | | |
| 2 | 10 | NS | NS | .012 | .014 | .024 | .000 | .054 | .082 | | | | | | |
| 2 | 20 | NS | NS | .007 | .040 | .027 | .011 | .067 | .097 | | | | | | |
| 2 | 40 | NS | NS | .002 | .033 | .036 | .000 | .073 | .106 | | | | | | |
| 2 | 60 | NS | NS | .000 | .016 | .031 | .016 | .077 | .002 | | | | | | |
| 3 | 0 | NS | .000 | .010 | .028 | .046 | .002 | .063 | .064 | NS | 0.000 | 0.028 | 0.000 | 0.000 | NS |
| 3 | 10 | NS | .013 | .010 | .013 | .045 | .007 | .097 | .073 | NS | 0.014 | 0.026 | 0.011 | 0.000 | NS |
| 3 | 20 | NS | .000 | .007 | .032 | .032 | .000 | .050 | .080 | NS | 0.004 | 0.017 | 0.005 | 0.000 | NS |
| 3 | 40 | NS | .000 | .000 | .036 | .054 | .012 | .013 | .110 | NS | 0.008 | 0.028 | 0.003 | 0.000 | NS |
| 3 | 60 | NS | .000 | .000 | .017 | .013 | .035 | .014 | .013 | NS | 0.000 | 0.027 | 0.000 | 0.000 | NS |
| 3 | 0 | | | | | | | | | | | ICE | .153 | | |
| 4 | 0 | .000 | .000 | .008 | .031 | .029 | .005 | .075 | .077 | | | | | | |
| 4 | 10 | .000 | .000 | .014 | .020 | .031 | .049 | .073 | .078 | | | | | | |
| 4 | 20 | .000 | .000 | .012 | .023 | .031 | .034 | .082 | .103 | | | | | | |
| 4 | 40 | .000 | .000 | .004 | .024 | .086 | .050 | .020 | .140 | | | | | | |
| 4 | 60 | .000 | .000 | .002 | .029 | .063 | .074 | .000 | .026 | | | | | | |
| LOCATION | DEPTH | MAY27 | JUN12 | JUL2 | JUL15 | AUG1 | AUG14 | AUG27 | SEP10 | OCT14 | NOV20 | DEC13 | FEB5 | MAR18 | APR17 |
| 5 | 0 | NS | .031 | .029 | .027 | .033 | .020 | .054 | .090 | | | | | | |
| 5 | 10 | NS | .000 | .029 | .038 | .049 | .037 | .033 | .126 | | | | | | |
| 5 | 20 | NS | .026 | .024 | .041 | .060 | .050 | .046 | .123 | | | | | | |
| 5 | 40 | NS | .000 | .009 | .026 | .094 | .012 | .026 | .187 | | | | | | |
| 5 | 60 | NS | .005 | .000 | .133 | NS | NS | NS | NS | | | | | | |
| 6 | 0 | .000 | .006 | .016 | .008 | .033 | .040 | .049 | .110 | | | | | | |
| 6 | 10 | .000 | .000 | .025 | .008 | .013 | .036 | .030 | .074 | | | | | | |
| 6 | 20 | .000 | .080 | .022 | .045 | .000 | .023 | .042 | .075 | | | | | | |
| 6 | 40 | .000 | .000 | .000 | .050 | .013 | .018 | .028 | .190 | | | | | | |
| 6 | 60 | .000 | .000 | .000 | .000 | NS | NS | NS | NS | | | | | | |
| 7 | 0 | .000 | .052 | .023 | .042 | .000 | .027 | .034 | .105 | NS | 0.017 | 0.079 | 0.011 | 0.071 | 0.104 |
| 7 | 10 | .000 | .028 | .025 | .039 | .043 | .045 | .042 | .054 | NS | 0.006 | 0.029 | 0.005 | 0.014 | 0.006 |
| 7 | 20 | .000 | .054 | .035 | .029 | .037 | .037 | .037 | .075 | NS | 0.007 | 0.030 | 0.001 | 0.008 | 0.042 |
| 7 | 40 | .000 | .038 | .013 | .043 | .023 | .009 | .026 | .020 | NS | 0.000 | 0.026 | 0.007 | 0.009 | 0.024 |
| 7 | 60 | .000 | .033 | .007 | .026 | .068 | .013 | .017 | .033 | NS | 0.001 | 0.034 | 0.007 | 0.015 | 0.052 |
| 7 | 0 | | | | | | | | | | | ICE | .148 | | |
| 8 | 0 | .000 | .044 | .026 | .045 | .008 | .036 | .036 | .045 | | | | | | |
| 8 | 10 | .000 | .107 | .043 | .043 | .002 | .033 | .041 | .080 | | | | | | |
| 8 | 20 | .000 | .107 | .040 | .048 | .041 | .016 | .045 | .161 | | | | | | |
| 8 | 40 | .000 | .029 | .014 | .040 | .013 | .026 | .025 | .096 | | | | | | |
| 8 | 60 | .000 | .059 | .004 | .026 | .040 | .043 | .006 | .034 | | | | | | |

-13B NITRITE NITROGEN (PPM)

| LOCATION | DEPTH | | | | | | | OCT13 | NOV13 | DEC13 | FEB5 | MAR18 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 0 | | | | | | | NS | 0.002 | 0.005 | 0.002 | 0.002 | NS |
| 3 | 10 | | | | | | | NS | 0.002 | 0.004 | 0.002 | 0.002 | NS |
| 3 | 20 | | | | | | | NS | 0.001 | 0.005 | 0.001 | 0.001 | NS |
| 3 | 40 | | | | | | | NS | 0.001 | 0.005 | 0.001 | 0.002 | NS |
| 3 | 60 | | | | | | | NS | 0.001 | 0.005 | 0.001 | 0.002 | NS |
| LOCATION | DEPTH | | | | | | | OCT14 | NOV20 | DEC13 | FEB5 | MAR18 | APR17 |
| 7 | 0 | | | | | | | NS | 0.002 | 0.005 | 0.001 | 0.001 | 0.001 |
| 7 | 10 | | | | | | | NS | 0.002 | 0.005 | 0.001 | 0.001 | 0.002 |
| 7 | 20 | | | | | | | NS | 0.001 | 0.005 | 0.002 | 0.001 | 0.001 |
| 7 | 40 | NS | 0.002 | 0.005 | 0.001 | 0.002 | 0.001 | NS | 0.002 | 0.006 | 0.002 | 0.001 | 0.001 |
| 7 | 60 | | | | | | | | | ICE | | .002 | |
| 7 | | | | | | | | | | | | | |

-13C NITRATE NITROGEN (PPM)

| LOCATION | DEPTH | OCT13 | NOV13 | DEC13 | FEB5 | MAR18 | APR17 |
|---|---|---|---|---|---|---|---|
| 3 | 0 | NS | 0.099 | 0.175 | 0.033 | 0.116 | NS |
| 3 | 10 | NS | 0.118 | 0.176 | 0.036 | 0.114 | NS |
| 3 | 20 | NS | 0.109 | 0.245 | 0.026 | 0.124 | NS |
| 3 | 40 | NS | 0.122 | 0.168 | 0.023 | 0.126 | NS |
| 3 | 60 | NS | 0.107 | 0.183 | 0.029 | 0.128 | NS |
| LOCATION | DEPTH | OCT14 | NOV20 | DEC13 | FEB5 | MAR18 | APR17 |
| 7 | 0 | NS | 0.152 | 0.180 | 0.042 | 0.109 | 0.012 |
| 7 | 10 | NS | 0.135 | 0.166 | 0.020 | 0.117 | 0.011 |
| 7 | 20 | NS | 0.095 | 0.175 | 0.036 | 0.117 | 0.012 |
| 7 | 40 | NS | 0.133 | 0.173 | 0.031 | 0.114 | 0.004 |
| 7 | 60 | NS | 0.149 | 0.169 | 0.030 | 0.107 | 0.015 |
| 7 | | | | ICE | | .008 | |

-13D TOTAL NITROGEN (PPM)

| LOCATION | DEPTH | MAY23 | JUN10 | JUN26 | JUL11 | JUL31 | AUG13 | AUG26 | SEP5 | OCT13 | NOV13 | DEC13 | FEB5 | MAR18 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | NS | NS | .004 | .145 | .052 | .030 | .018 | .063 | | | | | | |
| 1 | 10 | NS | NS | .009 | .036 | .030 | .056 | .043 | .084 | | | | | | |
| 1 | 20 | NS | NS | .007 | .026 | .042 | .066 | .078 | .110 | | | | | | |
| 1 | 40 | NS | NS | .003 | .046 | .108 | .074 | .020 | .127 | | | | | | |
| 1 | 60 | NS | NS | .000 | .047 | .000 | NS | NS | NS | | | | | | |
| 2 | 0 | N9 | .011 | .006 | .000 | .061 | .013 | 1.949 | .117 | | | | | | |
| 2 | 10 | NS | .007 | .018 | .018 | .043 | .023 | .100 | .086 | | | | | | |
| 2 | 20 | NS | .000 | .008 | .063 | .055 | .039 | .087 | .098 | | | | | | |
| 2 | 40 | NS | .005 | .022 | .063 | .053 | .013 | .111 | .147 | | | | | | |
| 2 | 60 | NS | .000 | .028 | .032 | .031 | .133 | .107 | .124 | | | | | | |
| 3 | 0 | NS | .009 | .010 | .048 | .075 | .022 | .074 | .065 | NS | 0.101 | 0.208 | 0.035 | 0.118 | NS |
| 3 | 10 | NS | .013 | .023 | .034 | .063 | .017 | .110 | .082 | NS | 0.134 | 0.206 | 0.049 | 0.116 | NS |
| 3 | 20 | NS | .001 | .017 | .054 | .067 | .025 | .067 | .108 | NS | 0.114 | 0.267 | 0.032 | 0.125 | NS |
| 3 | 40 | NS | .001 | .000 | .054 | .070 | .021 | .033 | .188 | NS | 0.131 | 0.201 | 0.027 | 0.128 | NS |
| 3 | 60 | NS | .000 | .025 | .045 | .055 | .093 | .144 | .252 | NS | 0.108 | 0.215 | 0.030 | 0.130 | NS |
| 3 | 0 | | | | | | | | | | | ICE | .153 | | |
| 4 | 0 | .008 | .001 | .027 | .031 | .057 | .023 | .092 | .084 | | | | | | |
| 4 | 10 | .001 | .000 | .019 | .020 | .042 | .061 | .099 | .089 | | | | | | |
| 4 | 20 | .015 | .001 | .018 | .058 | .088 | .074 | .128 | .105 | | | | | | |
| 4 | 40 | .000 | .002 | .019 | .049 | .159 | .121 | .031 | .172 | | | | | | |
| 4 | 60 | .021 | .020 | .002 | .053 | .148 | .112 | .009 | .289 | | | | | | |
| LOCATION | DEPTH | MAY27 | JUN12 | JUL2 | JUL15 | AUG1 | AUG14 | AUG27 | SEP10 | OCT14 | NOV20 | DEC13 | FEB5 | MAR18 | APR17 |
| 5 | 0 | .000 | .033 | .040 | .037 | .104 | .043 | .063 | .091 | | | | | | |
| 5 | 10 | .000 | .000 | .030 | .071 | .090 | .054 | .048 | .140 | | | | | | |
| 5 | 20 | .000 | .045 | .025 | .041 | .088 | .065 | .068 | .132 | | | | | | |
| 5 | 40 | .000 | .001 | .009 | .066 | .103 | .030 | .044 | .217 | | | | | | |
| 5 | 60 | .000 | .011 | .000 | .134 | NS | NS | NS | NS | | | | | | |
| 6 | 0 | .009 | .021 | .016 | .044 | .050 | .055 | .073 | .129 | | | | | | |
| 6 | 10 | .004 | .011 | .031 | .009 | .026 | .048 | .058 | .083 | | | | | | |
| 6 | 20 | .000 | .115 | .023 | .085 | .011 | .040 | .049 | .078 | | | | | | |
| 6 | 40 | .007 | .006 | .002 | .051 | .026 | .037 | .077 | .219 | | | | | | |
| 6 | 60 | .013 | .001 | .008 | .0 4 | NS | NS | NS | NS | | | | | | |
| 7 | 0 | .014 | .053 | .027 | .059 | .024 | .051 | .056 | .116 | NS | 0.171 | 0.264 | 0.054 | 0.181 | 0.117 |
| 7 | 10 | .009 | .048 | .058 | .039 | .061 | .060 | .070 | .058 | NS | 0.143 | 0.200 | 0.026 | 0.132 | 0.019 |
| 7 | 20 | .000 | .060 | .074 | .044 | .047 | .057 | .038 | .089 | NS | 0.103 | 0.210 | 0.039 | 0.126 | 0.055 |
| 7 | 40 | .003 | .075 | .013 | .079 | .057 | .027 | .037 | .042 | NS | 0.135 | 0.204 | 0.039 | 0.125 | 0.029 |
| 7 | 60 | .000 | .061 | .026 | .027 | .125 | .067 | .017 | .374 | NS | 0.151 | 0.209 | 0.039 | 0.123 | 0.068 |
| 7 | 0 | | | | | | | | | | | ICE | .158 | | |
| 8 | 0 | .000 | .065 | .048 | .086 | .032 | .059 | .051 | .069 | | | | | | |
| 8 | 10 | .023 | .136 | .058 | .078 | .005 | .043 | .067 | .084 | | | | | | |
| 8 | 20 | .006 | .110 | .040 | .049 | .054 | .036 | .051 | .193 | | | | | | |
| 8 | 40 | .000 | .030 | .015 | .041 | .041 | .044 | .032 | .134 | | | | | | |
| 8 | 60 | .068 | .061 | .004 | .026 | .120 | .095 | .021 | .430 | | | | | | |

-13E AMMONIA (PPM)

| LOCATION | DEPTH | MAY23 | JUN10 | JUN26 | JUL11 | JUL31 | AUG13 | AUG26 | SEP5 | OCT13 | NOV13 | DEC13 | FEB5 | MAR18 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | NS | NS | .005 | .176 | .029 | .010 | .000 | .074 | | | | | | |
| 1 | 10 | NS | NS | .011 | .037 | .002 | .047 | .028 | .077 | | | | | | |
| 1 | 20 | NS | NS | .009 | .032 | .028 | .044 | .039 | .129 | | | | | | |
| 1 | 40 | NS | NS | .004 | .023 | .043 | .064 | .000 | .119 | | | | | | |
| 1 | 60 | NS | NS | NS | .032 | NS | NS | NS | NS | | | | | | |
| 2 | 0 | NS | NS | .007 | .000 | .030 | .000 | 2.324 | .106 | | | | | | |
| 2 | 10 | NS | NS | .015 | .017 | .029 | .000 | .078 | .099 | | | | | | |
| 2 | 20 | NS | NS | .009 | .048 | .033 | .013 | .081 | .118 | | | | | | |
| 2 | 40 | NS | NS | .003 | .040 | .044 | .000 | .089 | .129 | | | | | | |
| 2 | 60 | NS | NS | .000 | .019 | .038 | .020 | .093 | .002 | | | | | | |
| 3 | 0 | NS | .000 | .012 | .034 | .056 | .003 | .077 | .078 | NS | 0.000 | 0.034 | 0.000 | 0.000 | NS |
| 3 | 10 | NS | .016 | .012 | .016 | .054 | .009 | .118 | .088 | NS | 0.017 | 0.031 | 0.014 | 0.000 | NS |
| 3 | 20 | NS | .000 | .008 | .039 | .039 | .000 | .060 | .097 | NS | 0.005 | 0.021 | 0.006 | 0.0 | NS |
| 3 | 40 | NS | .000 | .001 | .044 | .066 | .015 | .016 | .134 | NS | 0.010 | 0.034 | 0.004 | 0.0 | NS |
| 3 | 60 | NS | .000 | .000 | .021 | .016 | .043 | .017 | .016 | NS | 0.000 | 0.033 | 0.000 | 0.0 | NS |
| 3 | 0 | | | | | | | | | | | ICE | .148 | | |
| 4 | 0 | NS | .000 | .010 | .037 | .035 | .006 | .091 | .093 | | | | | | |
| 4 | 10 | NS | .000 | .017 | .024 | .037 | .060 | .089 | .095 | | | | | | |
| 4 | 20 | NS | .000 | .014 | .028 | .038 | .041 | .100 | .125 | | | | | | |
| 4 | 40 | NS | .000 | .005 | .029 | .104 | .061 | .024 | .170 | | | | | | |
| 4 | 60 | NS | .000 | .002 | .035 | .076 | .091 | .000 | .031 | | | | | | |
| LOCATION | DEPTH | MAY27 | JUN12 | JUL2 | JUL 15 | AUG1 | AUG14 | AUG27 | SEP10 | OCT14 | NOV20 | DEC13 | FEB5 | MAR18 | APR17 |
| 5 | 0 | NS | .038 | .035 | .033 | .040 | .024 | .065 | .109 | | | | | | |
| 5 | 10 | NS | .000 | .035 | .046 | .060 | .045 | .040 | .153 | | | | | | |
| 5 | 20 | NS | .032 | .029 | .050 | .073 | .061 | .053 | .149 | | | | | | |
| 5 | 40 | NS | .000 | .011 | .032 | .114 | .014 | .031 | .227 | | | | | | |
| 5 | 60 | NS | .006 | .001 | .161 | NS | NS | NS | NS | | | | | | |
| 6 | 0 | NS | .007 | .019 | .010 | .040 | .048 | .059 | .133 | | | | | | |
| 6 | 10 | NS | .000 | .031 | .010 | .016 | .044 | .036 | .090 | | | | | | |
| 6 | 20 | NS | .097 | .027 | .054 | .000 | .028 | .051 | .091 | | | | | | |
| 6 | 40 | NS | .000 | .000 | .061 | .016 | .022 | .034 | .230 | | | | | | |
| 6 | 60 | NS | .000 | .000 | .104 | NS | NS | NS | NS | | | | | | |
| 7 | 0 | NS | .063 | .028 | .051 | .000 | .033 | .041 | .127 | NS | 0.021 | 0.102 | 0.013 | 0.086 | 0.127 |
| 7 | 10 | NS | .034 | .030 | .047 | .053 | .054 | .051 | .066 | NS | 0.007 | 0.035 | 0.006 | 0.017 | 0.007 |
| 7 | 20 | NS | .066 | .043 | .035 | .045 | .045 | .045 | .091 | NS | 0.009 | 0.036 | 0.001 | 0.009 | 0.051 |
| 7 | 40 | NS | .046 | .016 | .052 | .028 | .011 | .032 | .240 | NS | 0.000 | 0.032 | 0.009 | 0.010 | 0.028 |
| 7 | 60 | NS | .040 | .009 | .032 | .082 | .016 | .021 | .040 | NS | 0.001 | 0.041 | 0.008 | 0.018 | 0.063 |
| 7 | 0 | | | | | | | | | | | ICE | .180 | | |
| 8 | 0 | NS | .053 | .032 | .054 | .010 | .044 | .044 | .054 | | | | | | |
| 8 | 10 | NS | .130 | .052 | .052 | .002 | .040 | .050 | .097 | | | | | | |
| 8 | 20 | NS | .130 | .049 | .058 | .050 | .019 | .055 | .196 | | | | | | |
| 8 | 40 | NS | .035 | .017 | .049 | .016 | .032 | .030 | .116 | | | | | | |
| 8 | 60 | NS | .072 | .005 | .031 | .049 | .052 | .007 | .041 | | | | | | |

-13F NITRITE (PPM)

| LOCATION | DEPTH | MAY23 | JUN10 | JUN26 | JUL11 | JUL31 | AUG13 | AUG26 | SEP5 | OCT13 | NOV13 | DEC13 | FEB5 | MAR18 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | .000 | .000 | .000 | .000 | NS | .000 | .014 | .005 | | | | | | |
| 1 | 10 | .000 | .000 | .000 | .000 | NS | .014 | .008 | .006 | | | | | | |
| 1 | 20 | .000 | .000 | .000 | .001 | NS | .000 | .004 | .009 | | | | | | |
| 1 | 40 | .000 | .000 | .000 | .001 | NS | .024 | .015 | .009 | | | | | | |
| 1 | 60 | .000 | .000 | .000 | .014 | NS | NS | NS | NS | | | | | | |
| 2 | 0 | .000 | .000 | .000 | .000 | NS | .000 | .005 | .005 | | | | | | |
| 2 | 10 | .000 | .000 | .000 | .000 | NS | .006 | .003 | .008 | | | | | | |
| 2 | 20 | .000 | .000 | .003 | .000 | NS | .014 | .004 | .005 | | | | | | |
| 2 | 40 | .000 | .000 | .003 | .000 | NS | .007 | .011 | .009 | | | | | | |
| 2 | 60 | .000 | .000 | .000 | .000 | NS | .005 | .004 | .015 | | | | | | |
| 3 | 0 | .000 | .001 | .000 | .000 | NS | .015 | .008 | .005 | NS | 0.007 | 0.017 | 0.007 | 0.008 | NS |
| 3 | 10 | .000 | .000 | .000 | .000 | NS | .000 | .005 | .001 | NS | 0.006 | 0.013 | 0.005 | 0.008 | NS |
| 3 | 20 | .000 | .002 | .000 | .000 | NS | .010 | .010 | .002 | NS | 0.004 | 0.015 | 0.004 | 0.004 | NS |
| 3 | 40 | .000 | .004 | .000 | .000 | NS | .024 | .003 | .009 | NS | 0.004 | 0.016 | 0.003 | 0.005 | NS |
| 3 | 60 | .000 | .000 | .000 | .000 | NS | .000 | .003 | .003 | NS | 0.004 | 0.016 | 0.003 | 0.005 | NS |
| 3 | 0 | | | | | | | | | | | ICE | .006 | | |
| 4 | 0 | .000 | .005 | .000 | .000 | NS | .000 | .013 | .002 | | | | | | |
| 4 | 10 | .004 | .000 | .000 | .000 | NS | .002 | .009 | .004 | | | | | | |
| 4 | 20 | .000 | .003 | .000 | .000 | NS | .001 | .004 | .001 | | | | | | |
| 4 | 40 | .000 | .006 | .000 | .000 | NS | .005 | .013 | .009 | | | | | | |
| 4 | 60 | .002 | .005 | .000 | .002 | NS | .011 | .003 | .005 | | | | | | |
| LOCATION | DEPTH | MAY27 | JUN12 | JUL2 | JUL15 | AUG1 | AUG14 | AUG27 | SEP10 | OCT14 | NOV20 | DEC13 | FEB5 | MAR18 | APR17 |
| 5 | 0 | .000 | .006 | .003 | .000 | NS | .000 | .002 | .005 | | | | | | |
| 5 | 10 | .000 | .000 | .003 | .000 | NS | .000 | .006 | .007 | | | | | | |
| 5 | 20 | .000 | .005 | .002 | .000 | NS | .000 | .011 | .006 | | | | | | |
| 5 | 40 | .000 | .003 | .000 | .002 | NS | .000 | .000 | .015 | | | | | | |
| 5 | 60 | .000 | .005 | .000 | .004 | NS | NS | NS | NS | | | | | | |
| 6 | 0 | .002 | .005 | .001 | .000 | NS | .000 | .006 | .010 | | | | | | |
| 6 | 10 | .000 | .005 | .004 | .002 | NS | .000 | .012 | .008 | | | | | | |
| 6 | 20 | .000 | .002 | .003 | .001 | NS | .000 | .004 | .009 | | | | | | |
| 6 | 40 | .000 | .004 | .000 | .003 | NS | .000 | .006 | .017 | | | | | | |
| 6 | 60 | .000 | .004 | .002 | .014 | NS | NS | NS | NS | | | | | | |
| 7 | 0 | .000 | .003 | .000 | .003 | .000 | .000 | .011 | .012 | NS | 0.007 | 0.017 | 0.003 | 0.003 | 0.005 |
| 7 | 10 | .000 | .007 | .003 | .001 | .000 | .000 | .002 | .008 | NS | 0.006 | 0.017 | 0.002 | 0.003 | 0.007 |
| 7 | 20 | .000 | .005 | .005 | .000 | .000 | .000 | .004 | .007 | NS | 0.004 | 0.016 | 0.005 | 0.005 | 0.005 |
| 7 | 40 | .000 | .003 | .000 | .002 | .018 | .000 | .009 | .016 | NS | 0.007 | 0.015 | 0.003 | 0.005 | 0.002 |
| 7 | 60 | .003 | .004 | .020 | .002 | .024 | .000 | .001 | .008 | NS | 0.007 | 0.020 | 0.005 | 0.003 | 0.004 |
| 7 | 0 | | | | | | | | | | | ICE | .006 | | |
| 8 | 0 | .000 | .008 | .005 | .003 | .014 | .000 | .006 | .007 | | | | | | |
| 8 | 10 | .000 | .005 | .004 | .000 | .011 | .000 | .013 | .007 | | | | | | |
| 8 | 20 | .000 | .009 | .000 | .003 | .000 | .000 | .001 | .013 | | | | | | |
| 8 | 40 | .000 | .005 | .003 | .002 | .012 | .000 | .008 | .008 | | | | | | |
| 8 | 60 | .000 | .007 | .000 | .000 | .022 | .000 | .009 | .006 | | | | | | |

-13G NITRATE (PPM)

| LOCATION | DEPTH | MAY23 | JUN10 | JUN26 | JUL11 | JUL31 | AUG13 | AUG26 | SEP5 | OCT13 | NOV13 | DEC13 | FEB5 | MAR18 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | NS | NS | NS | .000 | .124 | .089 | .062 | .000 | | | | | | |
| 1 | 10 | NS | NS | .000 | .022 | .124 | .062 | .080 | .075 | | | | | | |
| 1 | 20 | NS | NS | .000 | .000 | .084 | .133 | .199 | .004 | | | | | | |
| 1 | 40 | NS | NS | .000 | .120 | .324 | .066 | .067 | .115 | | | | | | |
| 1 | 60 | NS | NS | NS | .075 | NS | NS | NS | NS | | | | | | |
| 2 | 0 | NS | .050 | .000 | .000 | .159 | .058 | .111 | .013 | | | | | | |
| 2 | 10 | NS | .030 | .027 | .018 | .084 | .093 | .155 | .009 | | | | | | |
| 2 | 20 | NS | .000 | .000 | .102 | .124 | .106 | .084 | .000 | | | | | | |
| 2 | 40 | NS | .020 | .084 | .133 | .075 | .049 | .155 | .168 | | | | | | |
| 2 | 60 | NS | .000 | .124 | .071 | .000 | .518 | .128 | .520 | | | | | | |
| 3 | 0 | NS | .000 | .000 | .089 | .128 | .071 | .035 | .000 | NS | 0.438 | 0.776 | 0.146 | 0.515 | NS |
| 3 | 10 | NS | .000 | .058 | .093 | .080 | .044 | .053 | .040 | NS | 0.523 | 0.780 | 0.160 | 0.505 | NS |
| 3 | 20 | NS | .000 | .044 | .097 | .155 | .089 | .062 | .119 | NS | 0.483 | 1.085 | 0.115 | 0.550 | NS |
| 3 | 40 | NS | .000 | .000 | .080 | .071 | .009 | .084 | .330 | NS | 0.541 | 0.744 | 0.102 | 0.558 | NS |
| 3 | 60 | NS | .000 | .110 | .124 | .186 | .257 | .572 | 1.055 | NS | 0.474 | 0.811 | 0.129 | 0.568 | NS |
| 3 | 0 | | | | | | | | | | | ICE | .035 | | |
| 4 | 0 | .033 | .000 | .084 | .000 | .124 | .080 | .058 | .027 | | | | | | |
| 4 | 10 | .000 | .000 | .022 | .000 | .049 | .049 | .102 | .044 | | | | | | |
| 4 | 20 | .067 | .000 | .027 | .155 | .262 | .177 | .199 | .000 | | | | | | |
| 4 | 40 | .000 | .000 | .066 | .111 | .323 | .306 | .031 | .129 | | | | | | |
| 4 | 60 | .089 | .083 | .000 | .101 | .333 | .155 | .036 | 1.165 | | | | | | |
| LOCATION | DEPTH | MAY27 | JUN12 | JUL2 | JUL15 | AUG1 | AUG14 | AUG27 | SEP10 | OCT14 | NOV20 | DEC13 | FEB5 | MAR18 | APR17 |
| 5 | 0 | NS | .000 | .044 | .044 | .314 | .102 | .040 | .000 | | | | | | |
| 5 | 10 | NS | .000 | NS | .146 | .182 | .075 | .058 | .053 | | | | | | |
| 5 | 20 | NS | .080 | NS | .000 | .124 | .066 | .093 | .031 | | | | | | |
| 5 | 40 | NS | .000 | NS | .173 | .040 | .080 | .080 | .111 | | | | | | |
| 5 | 60 | NS | .020 | NS | .000 | .000 | NS | NS | NS | | | | | | |
| 6 | 0 | .038 | .063 | .000 | .160 | .075 | .066 | .089 | .071 | | | | | | |
| 6 | 10 | .018 | .045 | .022 | .000 | .057 | .053 | .009 | .027 | | | | | | |
| 6 | 20 | .000 | .150 | .000 | .177 | .048 | .075 | .027 | .000 | | | | | | |
| 6 | 40 | .031 | .020 | .009 | .000 | .057 | .084 | .208 | .106 | | | | | | |
| 6 | 60 | .058 | .000 | .031 | .000 | .000 | NS | NS | NS | | | | | | |
| 7 | 0 | .062 | .000 | .018 | .071 | .106 | .106 | .084 | .031 | NS | 0.674 | 0.798 | 0.186 | 0.483 | 0.053 |
| 7 | 10 | .040 | .080 | .142 | .000 | .040 | .066 | .120 | .004 | NS | 0.599 | 0.736 | 0.089 | 0.519 | 0.049 |
| 7 | 20 | .000 | .020 | .164 | .035 | .044 | .089 | .000 | .053 | NS | 0.421 | 0.776 | 0.160 | 0.519 | 0.053 |
| 7 | 40 | .013 | .158 | .000 | .155 | .124 | .080 | .035 | .075 | NS | 0.589 | 0.767 | 0.138 | 0.505 | 0.018 |
| 7 | 60 | .000 | .115 | .058 | .000 | .214 | .239 | .000 | 1.490 | NS | 0.656 | 0.749 | 0.133 | 0.475 | 0.067 |
| 7 | 0 | | | | | | | | | | | ICE | .035 | | |
| 8 | 0 | .000 | .080 | .089 | .177 | .088 | .102 | .058 | .098 | | | | | | |
| 8 | 10 | .102 | .123 | .062 | .150 | .000 | .044 | .089 | .000 | | | | | | |
| 8 | 20 | .027 | .000 | .000 | .000 | .057 | .089 | .022 | .124 | | | | | | |
| 8 | 40 | .000 | .000 | .000 | .000 | .092 | .080 | .022 | .155 | | | | | | |
| 8 | 60 | .300 | .000 | 9.999 | .000 | .323 | .230 | .053 | 1.740 | | | | | | |

-14 PHOSPHATE

-14A TOTAL PHOSPHATE (PPM)

| LOCATION | DEPTH | MAY23 | JUN10 | JUN26 | JUL11 | JUL31 | AUG13 | AUG26 | SEP5 | OCT13 | NOV13 | DEC13 | FEB5 | MAR18 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | .110 | .010 | .000 | .045 | .060 | .000 | .068 | .075 | | | | | | |
| 1 | 10 | .050 | .030 | .033 | .058 | .053 | .045 | .143 | .156 | | | | | | |
| 1 | 20 | .070 | .000 | .000 | .051 | .118 | .055 | .068 | .084 | | | | | | |
| 1 | 40 | .050 | .050 | .000 | .034 | .077 | .033 | .093 | .090 | | | | | | |
| 1 | 60 | .040 | .040 | NS | .075 | NS | NS | NS | NS | | | | | | |
| 2 | 0 | .080 | .020 | .125 | .018 | .127 | .023 | .137 | .093 | | | | | | |
| 2 | 10 | .020 | .040 | .068 | .051 | .067 | .020 | .112 | .093 | | | | | | |
| 2 | 20 | .080 | .030 | .073 | .025 | .170 | .053 | .068 | .142 | | | | | | |
| 2 | 40 | .040 | .030 | .040 | .061 | .053 | .040 | .103 | .109 | | | | | | |
| 2 | 60 | .020 | .090 | .018 | .038 | .062 | .000 | .063 | .131 | | | | | | |
| 3 | 0 | .300 | .033 | .060 | .055 | .038 | .066 | .099 | .129 | NS | 0.10 | 0.077 | 0.088 | 0.060 | NS |
| 3 | 10 | .050 | .045 | .085 | .091 | .032 | .045 | .147 | .102 | NS | 0.117 | 0.071 | 0.076 | 0.083 | NS |
| 3 | 20 | .020 | .045 | .050 | .065 | .310 | .023 | .085 | .150 | NS | 0.115 | 0.170 | 0.105 | 0.075 | NS |
| 3 | 40 | .040 | .060 | .033 | .055 | .308 | .094 | .025 | .050 | NS | 0.10 | 0.093 | 0.098 | 0.113 | NS |
| 3 | 60 | .030 | .056 | .018 | .075 | .241 | .015 | .147 | .043 | NS | 0.275 | 0.074 | 0.088 | 0.090 | NS |
| 3 | 0 | | | | | | | | | | | ICE | .120 | | |
| 4 | 0 | .025 | .038 | .060 | .068 | .098 | .040 | .099 | .043 | | | | | | |
| 4 | 10 | .037 | .025 | .060 | .058 | .249 | .032 | .037 | .043 | | | | | | |
| 4 | 20 | .018 | .020 | .045 | .055 | .024 | .033 | .130 | .066 | | | | | | |
| 4 | 40 | .045 | .041 | .025 | .055 | .124 | .010 | .125 | .093 | | | | | | |
| 4 | 60 | .033 | .093 | .010 | .041 | .183 | .033 | .018 | .111 | | | | | | |

| LOCATION | DEPTH | MAY27 | JUN12 | JUL2 | JUL15 | AUG1 | AUG14 | AUG27 | SEP10 | OCT14 | NOV20 | DEC13 | FEB5 | MAR18 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 0 | .030 | .050 | .027 | .034 | .257 | .205 | .065 | .075 | | | | | | |
| 5 | 10 | .050 | .056 | .024 | .065 | .076 | .140 | .047 | .053 | | | | | | |
| 5 | 20 | .000 | .125 | .025 | .041 | .000 | .215 | .165 | .125 | | | | | | |
| 5 | 40 | .010 | .038 | .020 | .048 | .065 | .065 | .030 | .020 | | | | | | |
| 5 | 60 | .020 | .033 | .024 | .300 | NS | NS | NS | NS | | | | | | |
| 6 | 0 | .080 | .033 | .015 | .049 | .168 | .148 | .038 | .067 | | | | | | |
| 6 | 10 | .045 | .062 | .025 | .089 | .062 | .243 | .085 | .095 | | | | | | |
| 6 | 20 | .022 | .030 | .028 | .099 | .006 | .117 | .078 | .070 | | | | | | |
| 6 | 40 | .033 | .030 | .022 | .057 | .035 | .160 | .098 | .110 | | | | | | |
| 6 | 60 | .070 | .060 | .027 | .350 | NS | NS | NS | NS | | | | | | |
| 7 | 0 | .033 | .038 | .028 | .091 | .045 | .213 | .048 | .073 | NS | 0.233 | 0.067 | 0.095 | 0.045 | 0.023 |
| 7 | 10 | .025 | .052 | .025 | .091 | .045 | .110 | .058 | .073 | NS | 0.190 | 0.096 | 0.116 | 0.098 | 0.017 |
| 7 | 20 | .037 | .033 | .030 | .073 | .152 | .155 | .085 | .112 | NS | 0.202 | 0.096 | 0.102 | 0.09 | 0.020 |
| 7 | 40 | .037 | .038 | .025 | .076 | .048 | .155 | .080 | .048 | NS | 0.285 | 0.048 | 0.095 | 0.083 | 0.010 |
| 7 | 60 | .025 | .025 | .024 | .057 | .070 | .130 | .083 | .030 | NS | 0.145 | 0.090 | 0.088 | 0.113 | 0.017 |
| 8 | 0 | .037 | .049 | .028 | .031 | .085 | .156 | .034 | .042 | | | | | | |
| 8 | 10 | .015 | .033 | .028 | .057 | .169 | .200 | .170 | .075 | | | | | | |
| 8 | 20 | .028 | .045 | .027 | .123 | .038 | .164 | .038 | .023 | | | | | | |
| 8 | 40 | .037 | .025 | .025 | .175 | .018 | .095 | .080 | .025 | | | | | | |
| 8 | 60 | .028 | .056 | .025 | .084 | .068 | .092 | .100 | .062 | | | | | | |

-14B PHOSPHATE PHOSPHORUS (PPM) Most likely!

| LOCATION | DEPTH | MAY23 | JUN10 | JUN26 | JUL11 | JUL31 | AUG13 | AUG26 | SEP5 | OCT13 | NOV13 | DEC13 | FEB5 | MAR18 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | .036 | .003 | .000 | .015 | .020 | .000 | .022 | .024 | | | | | | |
| 1 | 10 | .016 | .010 | .011 | .019 | .017 | .015 | .047 | .051 | | | | | | |
| 1 | 20 | .023 | .000 | .000 | .017 | .038 | .018 | .022 | .027 | | | | | | |
| 1 | 40 | .016 | .016 | .000 | .010 | .025 | .011 | .030 | .029 | | | | | | |
| 1 | 60 | .013 | .013 | NS | .024 | NS | NS | NS | NS | | | | | | |
| 2 | 0 | .026 | .006 | .041 | .006 | .041 | .008 | .045 | .030 | | | | | | |
| 2 | 10 | .006 | .013 | .022 | .017 | .022 | .006 | .036 | .030 | | | | | | |
| 2 | 20 | .026 | .010 | .024 | .008 | .055 | .017 | .022 | .046 | | | | | | |
| 2 | 40 | .013 | .010 | .013 | .020 | .017 | .013 | .033 | .036 | | | | | | |
| 2 | 60 | .006 | .030 | .006 | .012 | .020 | .000 | .021 | .043 | | | | | | |
| 3 | 0 | .010 | .011 | .020 | .018 | .012 | .022 | .032 | .042 | NS | 0.033 | 0.025 | 0.029 | 0.020 | NS |
| 3 | 10 | .016 | .015 | .028 | .030 | .010 | .015 | .048 | .033 | NS | 0.038 | 0.023 | 0.025 | 0.027 | NS |
| 3 | 20 | .006 | .015 | .016 | .021 | .010 | .008 | .028 | .049 | NS | 0.038 | 0.055 | 0.034 | 0.025 | NS |
| 3 | 40 | .013 | .020 | .011 | .018 | .010 | .031 | .008 | .016 | NS | 0.033 | 0.030 | 0.032 | 0.037 | NS |
| 3 | 60 | .010 | .018 | .006 | .025 | .079 | .005 | .048 | .014 | NS | 0.073 | 0.024 | 0.029 | 0.029 | NS |
| 4 | 0 | .008 | .012 | .020 | .022 | .032 | .013 | .032 | .014 | | | | | | |
| 4 | 10 | .012 | .008 | .020 | .019 | .081 | .010 | .012 | .014 | | | | | | |
| 4 | 20 | .006 | .006 | .015 | .018 | .008 | .011 | .042 | .022 | | | | | | |
| 4 | 40 | .015 | .013 | .008 | .018 | .040 | .003 | .041 | .030 | | | | | | |
| 4 | 60 | .011 | .030 | .003 | .013 | .060 | .011 | .006 | .036 | | | | | | |

| LOCATION | DEPTH | MAY27 | JUN12 | JUL2 | JUL15 | AUG1 | AUG14 | AUG27 | SEP10 | OCT14 | NOV20 | DEC13 | FEB5 | MAR18 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 0 | .010 | .016 | .009 | .011 | .084 | .063 | .021 | .024 | | | | | | |
| 5 | 10 | .016 | .018 | .008 | .021 | .025 | .045 | .015 | .017 | | | | | | |
| 5 | 20 | .000 | .041 | .008 | .013 | .000 | .070 | .054 | .041 | | | | | | |
| 5 | 40 | .003 | .012 | .006 | .015 | .021 | .021 | .010 | .007 | | | | | | |
| 5 | 60 | .006 | .011 | .008 | .082 | NS | NS | NS | NS | | | | | | |
| 6 | 0 | .026 | .011 | .005 | .016 | .055 | .048 | .012 | .022 | | | | | | |
| 6 | 10 | .015 | .020 | .008 | .029 | .020 | .079 | .028 | .031 | | | | | | |
| 6 | 20 | .007 | .010 | .009 | .032 | .002 | .038 | .025 | .023 | | | | | | |
| 6 | 40 | .011 | .010 | .007 | .019 | .111 | .095 | .032 | .036 | | | | | | |
| 6 | 60 | .023 | .020 | .009 | .011 | NS | NS | NS | NS | | | | | | |
| 7 | 0 | .011 | .012 | .009 | .030 | .015 | .069 | .015 | .024 | NS | 0.076 | 0.022 | 0.031 | 0.015 | 0.008 |
| 7 | 10 | .008 | .017 | .008 | .030 | .015 | .036 | .019 | .024 | NS | 0.062 | 0.031 | 0.036 | 0.032 | 0.006 |
| 7 | 20 | .012 | .011 | .010 | .024 | .005 | .050 | .028 | .037 | NS | 0.066 | 0.031 | 0.033 | 0.029 | 0.007 |
| 7 | 40 | .012 | .012 | .008 | .025 | .016 | .050 | .026 | .016 | NS | 0.093 | 0.016 | 0.031 | 0.027 | 0.033 |
| 7 | 60 | .008 | .008 | .008 | .019 | .023 | .042 | .027 | .010 | NS | 0.047 | 0.029 | 0.029 | 0.037 | 0.006 |
| 8 | 0 | .012 | .016 | .009 | .010 | .028 | .051 | .011 | .014 | | | | | | |
| 8 | 10 | .005 | .011 | .009 | .019 | .055 | .065 | .055 | .024 | | | | | | |
| 8 | 20 | .009 | .015 | .009 | .040 | .012 | .053 | .012 | .008 | | | | | | |
| 8 | 40 | .012 | .008 | .008 | .057 | .006 | .031 | .026 | .008 | | | | | | |
| 8 | 60 | .009 | .018 | .008 | .027 | .022 | .030 | .033 | .020 | | | | | | |

-15 N/P RATIO

| Location | Depth | May 23 | Jun 10 | Jun 26 | Jul 11 | Jul 31 | Aug 13 | Aug 26 | Sep 5 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | NS | NS | NS | 9.667 | 2.600 | NS | 0.818 | 2.625 |
| 1 | 10 | NS | NS | 0.818 | 1.895 | 1.765 | 3.733 | 0.915 | 1.647 |
| 1 | 20 | NS | NS | NS | 1.529 | 1.105 | 3.667 | 3.545 | 4.074 |
| 1 | 40 | NS | NS | NS | 4.600 | 4.320 | 6.727 | 0.667 | 4.379 |
| 1 | 60 | NS | NS | NS | 1.958 | NS | NS | NS | NS |
| 2 | 0 | NS | 1.833 | 0.146 | 0.000 | 1.488 | 1.625 | 43.311 x o | 3.900 |
| 2 | 10 | NS | 0.538 | 0.818 | 1.059 | 1.955 | 3.833 | 2.778 | 2.867 |
| 2 | 20 | NS | 0.000 | 0.333 | 7.875 | 1.000 | 2.294 | 3.955 | 2.130 |
| 2 | 40 | NS | 0.500 | 1.692 | 3.150 | 3.118 | 1.000 | 3.364 | 4.083 |
| 2 | 60 | NS | 0.000 | 4.667 | 2.667 | 1.550 | NS | 5.095 | 2.884 |
| 3 | 0 | NS | 0.000 | 0.500 | 2.667 | 6.250 | 1.000 | 2.312 | 1.548 |
| 3 | 10 | NS | 0.867 | 0.821 | 1.133 | 6.300 | 1.133 | 2.292 | 2.485 |
| 3 | 20 | NS | 0.067 | 1.062 | 2.571 | 6.700 | 3.125 | 2.393 | 2.204 |
| 3 | 40 | NS | 0.050 | 0.000 | 3.000 | 7.000 | 0.677 | 4.125 | 11.750 |
| 3 | 60 | NS | 0.000 | 4.167 | 1.800 | 0.696 | 18.600 | ✓ 3.000 | 18.000 + |
| 4 | 0 | 1.000 | 0.083 | 1.350 | 1.409 | 1.781 | 1.769 | 2.875 | 6.000 |
| 4 | 10 | 0.083 | 0.000 | 0.350 | 1.053 | 0.519 | 6.100 | 8.250 | 6.357 |
| 4 | 20 | 2.500 | 0.167 | 1.200 | 3.222 | 11.000 | 6.727 | 3.048 | 4.773 |
| 4 | 40 | 0.000 | 0.154 | 2.375 | 2.722 | 3.975 | 40.333 ✓ | 0.756 | 5.733 |
| 4 | 60 | 1.909 | 0.667 | 0.667 | 4.077 | 2.467 | 10.182 | 1.500 | 8.028 |

| Location | Depth | May 27 | Jun 12 | Jul 2 | Jul 15 | Aug 1 | Aug 14 | Aug 27 | Sep 10 |
|---|---|---|---|---|---|---|---|---|---|
| 5 | 0 | 0.000 | 2.062 | 4.444 | 3.364 | 1.238 | 0.683 | 3.000 | 3.792 |
| 5 | 10 | 0.000 | 0.000 | 3.750 | 3.381 | 3.600 | 1.200 | 3.200 | 8.235 |
| 5 | 20 | NS | 1.098 | 3.125 | 3.154 | NS | 0.929 | 1.259 | 3.220 |
| 5 | 40 | 0.000 | 0.083 | 1.500 | 4.400 | 4.905 | 1.429 | 4.400 | 31.000 o |
| 5 | 60 | 0.000 | 1.000 | 0.000 | 1.634 | NS | NS | NS | NS |
| 6 | 0 | 0.346 | 1.909 | 3.200 | 2.750 | 0.909 | 1.146 | 6.083 | 5.864 |
| 6 | 10 | 0.267 | 0.550 | 3.875 | 0.310 | 1.300 | 0.608 | 2.071 | 2.677 |
| 6 | 20 | 0.000 | 11.500 | 2.556 | 2.656 | 5.500 | 1.053 | 1.960 | 3.391 |
| 6 | 40 | 0.636 | 0.600 | 0.286 | 2.684 | 0.234 | 7.400 | 2.406 | 6.083 |
| 6 | 60 | 0.565 | 0.050 | 0.889 | 0.364 | NS | NS | NS | NS |
| 7 | 0 | 1.273 | 4.417 | 3.000 | 1.967 | 1.600 | 0.739 | 3.733 | 4.833 |
| 7 | 10 | 1.125 | 2.824 | 7.250 | 1.300 | 4.067 | 1.667 | 3.684 | 2.417 |
| 7 | 20 | 0.000 | 5.455 | 7.400 | 1.833 | 9.400 | 1.140 | 1.357 | 2.405 |
| 7 | 40 | 0.250 | 6.250 | 1.625 | 3.160 | 3.562 | 0.540 | 1.423 | 2.625 |
| 7 | 60 | 0.000 | 7.625 | 3.250 | 1.421 | 5.435 | 1.595 | 0.630 | 37.400 x o + |
| 8 | 0 | 0.000 | 4.063 | 5.333 | 8.600 | 1.143 | 1.157 | 4.636 | 4.929 |
| 8 | 10 | 4.600 | 12.364 | 6.444 | 4.105 | 0.091 | 0.662 | 1.218 | 3.500 |
| 8 | 20 | 0.667 | 7.333 | 4.444 | 1.225 | 4.500 | 0.679 | 4.250 | 24.125 ✓ o |
| 8 | 40 | 0.000 | 3.750 | 1.875 | 0.719 | 6.833 | 1.419 | 1.231 | 16.750 ✓ |
| 8 | 60 | 7.556 | 3.389 | 0.500 | 0.963 | 5.455 | 3.167 | 0.636 | 21.500 x + |

✓ = Very low PO4 P
x = Very high Total P

APPENDIX V OSOYOOS LAKE TRANSECTS

-1A WATER TEMPERATURE (°CENTIGRADE)

| LOCATION | DEPTH | MAY28 | JUN17 | JUL4 | JUL16 | AUG2 | AUG15 | AUG28 | SEP12 | OCT13 | NOV22 | DEC12 | FEB5 | MAR17 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 16.1 | 15.7 | 24.4 | 21.1 | 23.7 | 21.0 | 19.8 | 21.8 | | | | | | |
| 1 | 10 | 15.3 | 16.1 | 18.3 | 20.0 | 22.0 | 20.6 | 19.2 | 19.8 | | | | | | |
| 1 | 20 | 14.4 | 16.1 | 17.8 | 20.0 | 21.5 | 20.2 | 19.1 | 19.6 | | | | | | |
| 1 | 40 | 8.6 | 13.3 | 13.9 | 15.0 | 17.5 | 17.9 | 18.3 | 17.2 | | | | | | |
| 1 | 60 | 7.2 | 8.3 | 7.8 | 8.0 | 10.0 | 9.0 | 9.2 | 11.5 | | | | | | |
| 2 | 0 | 17.2 | 15.7 | 24.7 | 21.1 | 24.0 | 21.2 | 19.8 | 21.0 | | | | | | |
| 2 | 10 | 14.4 | 16.1 | 18.9 | 20.0 | 22.0 | 20.6 | 19.2 | 20.0 | | | | | | |
| 2 | 20 | 13.9 | 15.6 | 17.8 | 19.4 | 21.2 | 20.2 | 19.0 | 19.4 | | | | | | |
| 2 | 40 | 8.9 | 13.9 | 15.0 | 13.9 | 17.5 | 17.9 | 18.2 | 18.2 | | | | | | |
| 2 | 60 | 7.6 | 7.8 | 8.0 | 8.3 | 10.0 | 9.1 | 9.2 | 10.2 | | | | | | |
| 3 | 0 | 18.6 | 17.5 | 25.6 | 22.2 | 25.0 | 21.7 | 20.0 | 19.7 | 12.5 | 8.0 | 5.5 | 1.0 | 2.0 | 6.8 |
| 3 | 10 | 14.7 | 16.1 | 18.6 | 19.4 | 22.5 | 20.5 | 19.3 | 19.7 | 12.8 | 7.8 | 5.5 | 1.0 | 2.0 | 6.3 |
| 3 | 20 | 14.2 | 15.6 | 17.8 | 19.4 | 21.5 | 20.2 | 19.0 | 19.3 | 12.8 | 7.7 | 5.8 | 1.0 | 2.0 | 6.2 |
| 3 | 40 | 9.4 | 13.3 | 13.6 | 14.4 | 17.5 | 18.0 | 17.7 | 18.5 | 12.8 | 7.7 | 5.8 | 1.5 | 2.0 | 5.8 |
| 3 | 60 | 7.0 | 7.8 | 7.8 | 8.0 | 10.0 | 10.5 | 9.5 | 10.3 | 12.8 | 7.7 | 5.8 | 1.8 | 2.0 | 5.3 |
| 4 | 0 | 20.0 | 18.9 | 26.1 | 22.8 | 25.2 | 21.5 | 20.5 | 21.5 | | | | | | |
| 4 | 10 | 15.3 | 17.0 | 18.3 | 19.4 | 23.2 | 20.5 | 19.5 | 19.7 | | | | | | |
| 4 | 20 | 13.6 | 16.1 | 17.8 | 19.4 | 21.5 | 20.2 | 19.0 | 19.5 | | | | | | |
| 4 | 40 | 9.4 | 14.4 | 14.4 | 13.9 | 16.0 | 18.1 | 17.9 | 18.7 | | | | | | |
| 4 | 60 | 7.2 | 7.8 | 8.3 | 8.0 | 9.0 | 9.5 | 10.0 | 10.7 | | | | | | |
| LOCATION | DEPTH | MAY30 | JUN19 | JUL10 | JUL25 | AUG9 | AUG19 | AUG29 | SEP12 | OCT14 | NOV22 | DEC12 | FEB5 | MAR17 | APR17 |
| 5 | 0 | 16.1 | 19.4 | 22.2 | 22.0 | 21.2 | 20.5 | 20.8 | 21.5 | | | | | | |
| 5 | 10 | 15.6 | 17.8 | 20.0 | 21.2 | 21.0 | 20.5 | 20.1 | 20.4 | | | | | | |
| 5 | 20 | 15.6 | 17.0 | 18.9 | 20.8 | 20.7 | 20.3 | 19.9 | 19.6 | | | | | | |
| 5 | 40 | 12.5 | 12.8 | 15.9 | 15.5 | 19.9 | 18.1 | 17.8 | 19.0 | | | | | | |
| 5 | 60 | 12.2 | 12.0 | 13.9 | 14.5 | 16.9 | 15.7 | 15.9 | NS | | | | | | |
| 6 | 0 | 16.4 | 20.0 | 22.2 | 22.0 | 21.9 | 20.0 | 20.8 | 21.3 | | | | | | |
| 6 | 10 | 16.1 | 17.8 | 21.4 | 21.0 | 21.0 | 20.2 | 20.1 | 20.5 | | | | | | |
| 6 | 20 | 15.6 | 17.0 | 18.9 | 20.5 | 20.5 | 20.2 | 19.8 | 20.0 | | | | | | |
| 6 | 40 | 12.2 | 13.0 | 15.9 | 16.0 | 18.5 | 18.0 | 17.5 | 19.3 | | | | | | |
| 7 | 0 | 16.1 | 21.1 | 22.8 | 24.0 | 22.5 | 19.5 | 20.8 | 19.8 | 13.5 | 7.5 | 4.7 | 0.2 | 4.5 | 7.5 |
| 7 | 10 | 16.1 | 20.0 | 22.2 | 22.0 | 21.1 | 19.8 | 20.0 | 20.3 | 13.5 | 7.2 | 4.7 | 0.8 | 2.0 | 7.3 |
| 7 | 20 | 15.9 | 19.4 | 18.9 | 21.0 | 20.7 | 19.8 | 19.5 | 19.8 | 13.5 | 7.2 | 4.7 | 1.0 | 2.0 | 7.2 |
| 7 | 40 | 11.7 | 16.1 | 15.6 | 16.0 | 17.5 | 18.1 | 17.6 | 19.0 | 13.5 | 7.2 | 4.7 | 1.2 | 2.1 | 7.0 |
| 7 | 60 | 10.6 | 14.4 | 13.3 | 14.5 | 15.0 | 14.0 | 14.8 | 16.0 | 13.4 | 7.2 | 4.7 | 1.5 | 2.5 | 6.0 |
| 8 | 0 | 16.7 | 21.1 | 23.2 | 24.0 | 23.0 | 19.1 | 21.5 | 20.5 | | | | | | |
| 8 | 10 | 16.1 | 19.4 | 22.8 | 21.5 | 21.5 | 19.0 | 20.0 | 20.0 | | | | | | |
| 8 | 20 | 15.9 | 18.9 | 20.3 | 20.5 | 20.8 | 19.2 | 19.7 | 19.8 | | | | | | |
| 8 | 40 | 11.7 | 15.6 | 14.4 | 16.5 | 17.8 | 17.2 | 17.9 | 19.0 | | | | | | |
| 8 | 60 | 10.3 | 13.9 | 13.3 | 14.5 | 15.0 | 13.2 | 15.0 | 15.5 | | | | | | |

-1B AVERAGE TEMPERATURE FOR TRANSECTS (°CENTIGRADE)

| LOCATION | DEPTH | MAY28 | JUN17 | JUL4 | JUL16 | AUG2 | AUG15 | AUG28 | SEP12 |
|---|---|---|---|---|---|---|---|---|---|
| N | 0 | 18.0 | 17.4 | 25.2 | 21.8 | 24.2 | 21.4 | 20.0 | 21.0 |
| N | 10 | 14.9 | 16.3 | 18.5 | 19.7 | 22.4 | 20.6 | 19.3 | 19.8 |
| N | 20 | 14.0 | 15.9 | 17.8 | 19.5 | 21.5 | 20.2 | 19.0 | 19.5 |
| N | 40 | 9.1 | 13.7 | 14.2 | 14.4 | 17.1 | 18.0 | 18.0 | 18.5 |
| N | 60 | 7.1 | 7.9 | 8.0 | 8.1 | 9.8 | 9.5 | 9.5 | 10.7 |
| LOCATION | DEPTH | MAY30 | JUN19 | JUL10 | JUL25 | AUG9 | AUG19 | AUG29 | SEP12 |
| S | 0 | 16.3 | 20.4 | 22.6 | 23.0 | 22.1 | 19.7 | 21.0 | 20.8 |
| S | 10 | 16.0 | 18.9 | 21.6 | 21.5 | 21.2 | 19.8 | 20.1 | 20.3 |
| S | 20 | 15.8 | 18.1 | 19.2 | 20.7 | 20.7 | 19.9 | 19.7 | 19.8 |
| S | 40 | 12.0 | 14.5 | 15.5 | 16.0 | 18.4 | 17.9 | 17.7 | 19.1 |
| S | 60 | 11.0 | 13.4 | 13.5 | 14.5 | 15.6 | 14.3 | 15.2 | 15.8 |

-2 SECCHI DISK READINGS (FEET)

| LOCATION | DEPTH | MAY28 | JUN17 | JUL4 | JUL16 | AUG2 | AUG15 | AUG28 | SEP12 | OCT13 | NOV22 | DEC12 | FEB5 | MAR17 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | | 9.0 | 4.0 | 8.0 | 3.5 | 10.0 | 7.0 | 8.5 | 8.3 | 11.0 | 8.6 | 10.8 | 13.9 | NS | 13.4 |
| LOCATION | DEPTH | MAY30 | JUN19 | JUL10 | JUL25 | AUG9 | AUG19 | AUG29 | SEP12 | OCT14 | NOV22 | DEC12 | FEB5 | MAR17 | APR17 |
| 7 | | 17.0 | 12.0 | 8.0 | 8.0 | 9.0 | 9.5 | 8.5 | 9.5 | 8.5 | 9.5 | 15.3 | 14.1 | NS | 10.6 |

-3 DISSOLVED OXYGEN (PPM)

| LOCATION | DEPTH | MAY28 | JUN17 | JUL4 | JUL16 | AUG2 | AUG15 | AUG28 | SEP12 | OCT13 | NOV22 | DEC12 | FEB5 | MAR17 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | NS | NS | NS | NS | 8.3 | 7.6 | 8.2 | 7.6 | | | | | | |
| 1 | 10 | NS | NS | NS | NS | 8.0 | 7.5 | 8.2 | 6.8 | | | | | | |
| 1 | 20 | NS | NS | NS | NS | 7.2 | 7.4 | 8.0 | 6.65 | | | | | | |
| 1 | 40 | NS | NS | NS | NS | 3.4 | 3.2 | 6.8 | 3.6 | | | | | | |
| 1 | 60 | NS | NS | NS | NS | 4.4 | 5.3 | 4.8 | 2.5 | | | | | | |
| 2 | 0 | NS | NS | NS | NS | 6.9 | 8.3 | 8.6 | 8.36 | | | | | | |
| 2 | 10 | NS | NS | NS | NS | 5.6 | 8.3 | 8.6 | 7.53 | | | | | | |
| 2 | 20 | NS | NS | NS | NS | 4.5 | 8.2 | 8.4 | 7.05 | | | | | | |
| 2 | 40 | NS | NS | NS | NS | 2.1 | 3.2 | 7.1 | 4.15 | | | | | | |
| 2 | 60 | NS | NS | NS | NS | 2.6 | 5.3 | 4.9 | 3.15 | | | | | | |
| 3 | 0 | NS | NS | NS | NS | 6.9 | 8.1 | 7.7 | 8.3 | 9.9 | 9.25 | 11.1 | 12.7 | 11.3 | 11.4 |
| 3 | 10 | NS | NS | NS | NS | 5.7 | 7.9 | 7.8 | 7.2 | 9.9 | 8.8 | 10.9 | 12.6 | 12.1 | 11.7 |
| 3 | 20 | NS | NS | NS | NS | 4.0 | 7.8 | 7.7 | 7.0 | 9.8 | 8.6 | 10.9 | 12.3 | 12.3 | 11.7 |
| 3 | 40 | NS | NS | NS | NS | 1.9 | 3.3 | 4.4 | 4.75 | 9.8 | 8.5 | 10.9 | 11.4 | 12.4 | 11.6 |
| 3 | 60 | NS | NS | NS | NS | 2.2 | NS | NS | 3.0 | 9.8 | 8.3 | 10.9 | 10.9 | 12.6 | 11.6 |
| 4 | 0 | NS | NS | NS | NS | 7.5 | 8.6 | 7.7 | 7.7 | | | | | | |
| 4 | 10 | NS | NS | NS | NS | 5.8 | 8.5 | 7.8 | 7.25 | | | | | | |
| 4 | 20 | NS | NS | NS | NS | 4.0 | 8.4 | 7.7 | 6.82 | | | | | | |
| 4 | 40 | NS | NS | NS | NS | 1.6 | 3.6 | 3.2 | 6.3 | | | | | | |
| 4 | 60 | NS | NS | NS | NS | 2.1 | 5.1 | 3.9 | 3.25 | | | | | | |
| LOCATION | DEPTH | MAY30 | JUN19 | JUL10 | JUL25 | AUG9 | AUG19 | AUG29 | SEP12 | OCT14 | NOV22 | DEC12 | FEB5 | MAR17 | APR17 |
| 5 | 0 | NS | NS | NS | 8.1 | 8.0 | 8.1 | 7.5 | 8.0 | | | | | | |
| 5 | 10 | NS | NS | NS | 8.3 | 8.0 | 8.6 | 7.4 | 6.95 | | | | | | |
| 5 | 20 | NS | NS | NS | 7.2 | 7.2 | 8.6 | 7.2 | 5.75 | | | | | | |
| 5 | 40 | NS | NS | NS | 0.8 | 0.6 | 0.8 | 0.8 | 4.05 | | | | | | |
| 5 | 60 | NS | NS | NS | NS | NS | 0.4 | NS | NS | | | | | | |
| 6 | 0 | NS | NS | NS | 8.0 | 6.8 | 8.4 | 8.6 | 8.05 | | | | | | |
| 6 | 10 | NS | NS | NS | 6.7 | 6.1 | 8.2 | 8.6 | 7.25 | | | | | | |
| 6 | 20 | NS | NS | NS | 6.4 | 5.8 | 8.0 | 8.3 | 6.75 | | | | | | |
| 6 | 40 | NS | NS | NS | 0.7 | 0.7 | 0.3 | 0.6 | 3.0 | | | | | | |
| 7 | 0 | NS | NS | NS | 6.9 | 6.7 | 8.4 | 8.5 | 8.9 | 9.4 | 10.5 | 11.3 | 12.8 | 12.8 | 13.2 |
| 7 | 10 | NS | NS | NS | 6.0 | 5.8 | 8.2 | 8.2 | 7.6 | 9.4 | 9.5 | 10.9 | 11.8 | 14.2 | 13.1 |
| 7 | 20 | NS | NS | NS | 5.4 | 5.6 | 7.8 | 8.1 | 7.5 | 9.3 | 9.9 | 10.6 | 11.0 | 14.6 | 13.0 |
| 7 | 40 | NS | NS | NS | 0.7 | 0.6 | 0.7 | 0.6 | 3.25 | 9.2 | 9.6 | 10.7 | 9.9 | 14.6 | 13.0 |
| 7 | 60 | NS | NS | NS | 0.5 | 0.3 | 0.4 | 0.3 | 1.1 | 9.2 | 9.6 | 10.6 | 9.8 | 8.6 | 12.8 |
| 8 | 0 | NS | NS | NS | 7.8 | 6.9 | 8.5 | 7.7 | 9.5 | | | | | | |
| 8 | 10 | NS | NS | NS | 6.2 | 6.2 | 8.4 | 7.5 | 7.95 | | | | | | |
| 8 | 20 | NS | NS | NS | 5.8 | 5.8 | 8.0 | 7.3 | 7.6 | | | | | | |
| 8 | 40 | NS | NS | NS | 0.7 | 0.4 | 0.7 | 0.5 | 3.95 | | | | | | |
| 8 | 60 | NS | NS | NS | 0.4 | 0.1 | 0.2 | 0.3 | 1.3 | | | | | | |

-4 TOTAL RESIDUE (PPM)

| LOCATION | DEPTH | MAY28 | JUN17 | JUL4 | JUL16 | AUG2 | AUG15 | AUG28 | SEP12 | OCT13 | NOV22 | DEC12 | FEB5 | MAR17 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 248 | 183 | 169 | 155 | 104 | 122 | 138 | 146 | | | | | | |
| 1 | 10 | 173 | 188 | 198 | 158 | 102 | 118 | 139 | 133 | | | | | | |
| 1 | 20 | 233 | 136 | 169 | 145 | 110 | 133 | 138 | 155 | | | | | | |
| 1 | 40 | 156 | 144 | 165 | 202 | 98 | 127 | 156 | 144 | | | | | | |
| 1 | 60 | 216 | 168 | 211 | 199 | 131 | 146 | 143 | 166 | | | | | | |
| 2 | 0 | 196 | 157 | 164 | 189 | 118 | 104 | 126 | 148 | | | | | | |
| 2 | 10 | 149 | 156 | 176 | 182 | 98 | 126 | 134 | 144 | | | | | | |
| 2 | 20 | 153 | 203 | 158 | 182 | 86 | 129 | 130 | 111 | | | | | | |
| 2 | 40 | 176 | 183 | 178 | 182 | 81 | 136 | 147 | 138 | | | | | | |
| 2 | 60 | 180 | 151 | 199 | 211 | 109 | 160 | 172 | 134 | | | | | | |
| 3 | 0 | 159 | 160 | 223 | 175 | 133 | 84 | 145 | 112 | 117 | 118 | 162 | 155 | 86 | 164 |
| 3 | 10 | 162 | 123 | 185 | 180 | 140 | 105 | 139 | 125 | 112 | 121 | 143 | 155 | 147 | 157 |
| 3 | 20 | 255 | 179 | 179 | 185 | 140 | 124 | 160 | 137 | 117 | 120 | 145 | 147 | 128 | 160 |
| 3 | 40 | 131 | 117 | 214 | 176 | 131 | 72 | 144 | 91 | 117 | 116 | 135 | 120 | 150 | 172 |
| 3 | 60 | 255 | 2734 | 266 | 270 | 103 | 134 | 166 | 135 | 116 | 121 | 137 | 147 | 127 | 161 |
| 4 | 0 | 219 | 184 | 185 | 160 | 107 | 114 | 137 | 136 | | | | | | |
| 4 | 10 | 183 | 199 | 161 | 173 | 88 | 121 | 71 | 131 | | | | | | |
| 4 | 20 | 202 | 228 | 175 | 162 | 123 | 127 | 132 | 75 | | | | | | |
| 4 | 40 | 243 | 144 | 170 | 179 | 141 | 121 | 156 | 129 | | | | | | |
| 4 | 60 | 201 | 148 | 216 | 194 | 147 | 144 | 173 | 176 | | | | | | |

| LOCATION | DEPTH | MAY30 | JUN19 | JUL10 | JUL25 | AUG9 | AUG19 | AUG29 | SEP12 | OCT14 | NOV22 | DEC12 | FEB5 | MAR17 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 0 | 162 | 214 | 164 | 178 | 122 | 164 | 157 | 159 | | | | | | |
| 5 | 10 | 212 | 179 | 158 | 167 | 96 | 166 | 140 | 161 | | | | | | |
| 5 | 20 | 195 | 244 | 180 | 167 | 121 | 166 | 146 | 163 | | | | | | |
| 5 | 40 | 215 | 242 | 195 | 186 | 121 | 180 | 164 | 159 | | | | | | |
| 5 | 60 | 172 | 392 | 228 | NS | 118 | 297 | 304 | NS | | | | | | |
| 6 | 0 | 155 | 196 | 175 | 170 | 134 | 165 | 140 | 147 | | | | | | |
| 6 | 10 | 234 | 168 | 180 | 168 | 123 | 169 | 153 | 158 | | | | | | |
| 6 | 20 | 163 | 156 | 204 | 173 | 132 | 153 | 148 | 151 | | | | | | |
| 6 | 40 | 144 | 231 | 248 | 206 | 138 | 164 | 166 | 164 | | | | | | |
| 7 | 0 | 163 | 218 | 204 | 177 | 86 | 143 | 149 | 117 | 118 | 126 | 133 | 151 | 115 | 161 |
| 7 | 10 | 189 | 208 | 190 | 172 | 81 | 164 | 112 | 133 | 116 | 124 | 139 | 151 | 139 | 141 |
| 7 | 20 | 166 | 168 | 198 | 150 | 96 | 89 | 140 | 138 | 120 | 123 | 131 | 153 | 150 | 169 |
| 7 | 40 | 186 | 183 | 177 | 168 | 94 | 159 | 147 | 83 | 121 | 121 | 129 | 135 | 156 | 167 |
| 7 | 60 | 159 | 190 | 192 | 171 | 138 | 121 | 180 | 141 | 116 | 132 | 126 | NS | 189 | 148 |
| 8 | 0 | 180 | 195 | 105 | 144 | 76 | 159 | 149 | 86 | | | | | | |
| 8 | 10 | 156 | 259 | 116 | 149 | 141 | 116 | 144 | 109 | | | | | | |
| 8 | 20 | 193 | 201 | 141 | 147 | 112 | 142 | 153 | 146 | | | | | | |
| 8 | 40 | 172 | 182 | 161 | 152 | 142 | 142 | 149 | 136 | | | | | | |
| 8 | 60 | 186 | 145 | 136 | 151 | NS | 143 | 157 | 145 | | | | | | |

-5 CHEMICAL OXYGEN DEMAND (PPM)

| LOCATION | DEPTH | MAY28 | JUN17 | JUL4 | JUL16 | AUG2 | AUG15 | AUG28 | SEP12 | OCT13 | NOV22 | DEC12 | FEB5 | MAR17 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 4.2 | 1.1 | 5.3 | 27.0 | 10.9 | 11.2 | 5.9 | 3.6 | | | | | | |
| 1 | 10 | 4.2 | 10.5 | 13.3 | 19.6 | 0.0 | 12.3 | 2.7 | 5.4 | | | | | | |
| 1 | 20 | 4.8 | 8.4 | 13.8 | 14.3 | 8.8 | 10.7 | 5.9 | 5.0 | | | | | | |
| 1 | 40 | 2.7 | 0.0 | 6.4 | 4.2 | 3.6 | 6.8 | 4.8 | 3.2 | | | | | | |
| 1 | 60 | 1.6 | 0.0 | 3.2 | 8.5 | 0.0 | 11.5 | 4.3 | 1.8 | | | | | | |
| 2 | 0 | 0.0 | 11.0 | 2.7 | 28.6 | 5.2 | 14.8 | 5.3 | 8.9 | | | | | | |
| 2 | 10 | 3.7 | 5.3 | 12.7 | 16.9 | 4.7 | 9.3 | 4.3 | 7.6 | | | | | | |
| 2 | 20 | 4.2 | 5.3 | 18.6 | 7.9 | 0.0 | 6.9 | 4.3 | 7.6 | | | | | | |
| 2 | 40 | NS | 1.1 | 9.6 | 11.1 | 0.0 | 10.0 | 4.3 | 5.4 | | | | | | |
| 2 | 60 | 0.0 | 0.0 | 2.7 | 13.2 | 0.0 | 17.0 | 5.3 | 4.6 | | | | | | |
| 3 | 0 | 6.4 | 0.6 | 4.3 | 6.9 | 0.0 | 11.5 | 4.8 | 6.8 | 4.7 | 1.8 | 5.0 | 12.3 | NS | NS |
| 3 | 10 | 10.6 | 3.7 | 12.7 | 6.9 | 5.2 | 8.4 | 3.2 | 6.8 | 4.1 | 5.9 | 7.3 | 8.2 | NS | NS |
| 3 | 20 | 13.2 | 7.9 | 19.1 | 8.5 | 1.0 | 12.3 | 4.3 | 5.4 | 8.3 | 9.1 | 0.0 | 32.2 | NS | NS |
| 3 | 40 | 0.0 | 7.4 | 9.6 | 8.5 | 3.6 | 9.5 | 4.3 | 4.1 | 5.3 | 5.0 | 0.5 | 2.7 | NS | NS |
| 3 | 60 | 4.8 | 2.2 | 2.2 | 6.9 | 2.1 | 5.6 | 1.6 | 5.9 | 4.7 | 3.2 | 0.0 | 3.8 | NS | NS |
| 4 | 0 | 6.4 | 3.3 | 2.2 | 11.1 | 0.0 | 13.0 | 2.1 | 6.4 | | | | | | |
| 4 | 10 | 9.5 | 4.9 | 8.0 | 1.6 | 6.2 | ·7.6 | 2.7 | 4.1 | | | | | | |
| 4 | 20 | 7.9 | 4.4 | 16.5 | 1.6 | 1.0 | 13.2 | 3.8 | 6.8 | | | | | | |
| 4 | 40 | 2.7 | 1.1 | 6.4 | 13.2 | 3.6 | 22.0 | 1.1 | 6.8 | | | | | | |
| 4 | 60 | 0.0 | 0.0 | 0.0 | 11.6 | 2.6 | 9.0 | 0.0 | 3.6 | | | | | | |

| LOCATION | DEPTH | MAY30 | JUN19 | JUL10 | JUL25 | AUG9 | AUG19 | AUG29 | SEP12 | OCT14 | NOV22 | DEC12 | FEB5 | MAR17 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 0 | 0.0 | 0.0 | 4.8 | 13.2 | 21.0 | 14.3 | 2.7 | 6.4 | | | | | | |
| 5 | 10 | 2.9 | 2.7 | 4.8 | 9.5 | 8.8 | 23.6 | 3.2 | 7.3 | | | | | | |
| 5 | 20 | 4.9 | 6.5 | 7.4 | 6.4 | 5.0 | 9.0 | 0.0 | 1.4 | | | | | | |
| 5 | 40 | NS | 3.3 | 5.9 | 4.2 | 6.6 | 5.6 | 3.8 | 5.4 | | | | | | |
| 5 | 60 | 0.0 | 9.3 | 3.7 | NS | 12.2 | 14.0 | 0.0 | NS | | | | | | |
| 6 | 0 | NS | 0.0 | 3.7 | 9.5 | 6.6 | 14.8 | 1.6 | 4.6 | | | | | | |
| 6 | 10 | NS | 0.0 | 36.5 | 9.5 | 2.2 | 6.0 | 4.8 | 2.3 | | | | | | |
| 6 | 20 | NS | 20.5 | 91.6 | 18.5 | 8.8 | 9.0 | 4.3 | 5.9 | | | | | | |
| 6 | 40 | NS | 4.9 | 5.3 | 11.1 | 13.8 | 7.6 | 0.0 | 6.8 | | | | | | |
| 7 | 0 | NS | 8.8 | 19.6 | 8.8 | 8.8 | 6.0 | 4.3 | 2.7 | 3.5 | 2.7 | 0.5 | 11.6 | NS | NS |
| 7 | 10 | NS | 1.6 | 39.2 | 6.2 | 0.0 | 8.0 | 16.0 | 3.6 | 6.5 | 5.9 | 9.1 | 13.7 | NS | NS |
| 7 | 20 | NS | 6.0 | 6.4 | 6.7 | 0.0 | 7.0 | 0.5 | 0.9 | 11.2 | 5.4 | 6.8 | 7.5 | NS | NS |
| 7 | 40 | NS | 6.0 | 6.4 | 11.4 | 0.0 | 6.0 | 0.0 | 52.3 | 5.3 | 5.4 | 4.5 | 6.9 | NS | NS |
| 7 | 60 | NS | 0.0 | 10.6 | 19.2 | 0.0 | 13.5 | 2.1 | 46.8 | 5.9 | 20.8 | 3.2 | NS | NS | NS |
| 8 | 0 | 0.0 | 1.9 | 13.2 | 6.2 | 0.0 | 7.6 | 3.8 | 39.6 | | | | | | |
| 8 | 10 | NS | 5.4 | 14.8 | 3.1 | 0.0 | 16.8 | 3.2 | 10.5 | | | | | | |
| 8 | 20 | NS | 3.8 | 6.4 | 1.4 | 0.0 | 76.2 | 3.8 | 13.2 | | | | | | |
| 8 | 40 | NS | 1.6 | 13.2 | 5.7 | 0.0 | 10.8 | 0.0 | 21.8 | | | | | | |
| 8 | 60 | NS | 0.0 | 35.7 | 13.5 | 0.0 | 26.0 | 2.1 | 47.3 | | | | | | |

-6 ELECTRICAL CONDUCTIVITY (MICROMHOS)

| LOCATION | DEPTH | MAY28 | JUN17 | JUL4 | JUL16 | AUG2 | AUG15 | AUG28 | SEP12 | OCT13 | NOV22 | DEC12 | FEB5 | MAR17 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 222. | 187. | 178. | 170. | 167. | 157. | 158. | 156. | | | | | | |
| 1 | 10 | 211. | 184. | 204. | 184. | 179. | 159. | 162. | 171. | | | | | | |
| 1 | 20 | 209. | 184. | 201. | 179. | 183. | 161. | 164. | 168. | | | | | | |
| 1 | 40 | 264. | 203. | 225. | 203. | 201. | 172. | 173. | 181. | | | | | | |
| 1 | 60 | 273. | 239. | 290. | 251. | 262. | 221. | 226. | 207. | | | | | | |
| 2 | 0 | 216. | 188. | 180. | 173. | 176. | 163. | 167. | 174. | | | | | | |
| 2 | 10 | 221. | 186. | 207. | 176. | 185. | 167. | 173. | 178. | | | | | | |
| 2 | 20 | 211. | 188. | 212. | 184. | 184. | 171. | 177. | 178. | | | | | | |
| 2 | 40 | 265. | 202. | 225. | 219. | 206. | 177. | 179. | 178. | | | | | | |
| 2 | 60 | 265. | 252. | 287. | 263. | 254. | 233. | 233. | 212. | | | | | | |
| 3 | 0 | 222. | 184. | 179. | 175. | 174. | 160. | 171. | 177. | 159. | 160. | 145. | 209. | 83. | 153. |
| 3 | 10 | 201. | 187. | 205. | 186. | 188. | 167. | 175. | 176. | 157. | 161. | 145. | 209. | 133. | 155. |
| 3 | 20 | 215. | 190. | 211. | 187. | 201. | 171. | 175. | 175. | 159. | 162. | 144. | 209. | 150. | 156. |
| 3 | 40 | 251. | 208. | 238. | 221. | 208. | 179. | 179. | 177. | 159. | 175. | 144. | 204. | 150. | 158. |
| 3 | 60 | 288. | 258. | 297. | 271. | 266. | 218. | 254. | 215. | 160. | 175. | 144. | 202. | 133. | 161. |
| 4 | 0 | 212. | 192. | 185. | 182. | 176. | 159. | 171. | 169. | | | | | | |
| 4 | 10 | 213. | 193. | 204. | 186. | 188. | 163. | 175. | 173. | | | | | | |
| 4 | 20 | 212. | 197. | 207. | 194. | 188. | 165. | 177. | 170. | | | | | | |
| 4 | 40 | 254. | 211. | 234. | 228. | 217. | 172. | 187. | 172. | | | | | | |
| 4 | 60 | 263. | 266. | 289. | 284. | 276. | 221. | 232. | 209. | | | | | | |

| LOCATION | DEPTH | MAY30 | JUN19 | JUL10 | JUL25 | AUG9 | AUG19 | AUG29 | SEP12 | OCT14 | NOV22 | DEC12 | FEB5 | MAR17 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 0 | 233. | 208. | 175. | 181. | 188. | 160. | 165. | 173. | | | | | | |
| 5 | 10 | 235. | 207. | 187. | 187. | 194. | 161. | 173. | 175. | | | | | | |
| 5 | 20 | 232. | 208. | 195. | 190. | 193. | 165. | 176. | 176. | | | | | | |
| 5 | 40 | 250. | 243. | 227. | 241. | 208. | 186. | 204. | 179. | | | | | | |
| 5 | 60 | 248. | | 247. | | 232. | 201. | 210. | | | | | | | |
| 6 | 0 | 235. | 205. | 184. | 194. | 190. | 170. | 172. | 172. | | | | | | |
| 6 | 10 | 232. | 216. | 189. | 192. | 198. | 169. | 177. | 176. | | | | | | |
| 6 | 20 | 234. | 216. | 199. | 193. | 199. | 168. | 179. | 173. | | | | | | |
| 6 | 40 | 250. | 248. | 236. | 241. | 218. | 187. | 204. | 177. | | | | | | |
| 7 | 0 | 231. | 198. | 184. | 189. | 188. | 171. | 179. | 177. | 169. | 163. | 165. | 216. | 106. | 108. |
| 7 | 10 | 229. | 199. | 188. | 198. | 198. | 167. | 178. | 174. | 171. | 164. | 165. | 211. | 167. | 137. |
| 7 | 20 | 227. | 200. | 203. | 200. | 202. | 168. | 182. | 174. | 170. | 164. | 165. | 209. | 183. | 152. |
| 7 | 40 | 249. | 222. | 245. | 247. | 231. | 188. | 202. | 178. | 170. | 164. | 165. | 207. | 183. | 153. |
| 7 | 60 | 255. | 234. | 270. | 252. | 253. | 212. | 228. | 200. | 171. | 164. | 165. | | 196. | 159. |
| 8 | 0 | 235. | 199. | 187. | 184. | 190. | 170. | 173. | 175. | | | | | | |
| 8 | 10 | 232. | 208. | 190. | 200. | 199. | 167. | 177. | 174. | | | | | | |
| 8 | 20 | 230. | 209. | 200. | 200. | 204. | 170. | 182. | 174. | | | | | | |
| 8 | 40 | 253. | 240. | 247. | 237. | 228. | 188. | 197. | 178. | | | | | | |
| 8 | 60 | 259. | 246. | 269. | 250. | 263. | 212. | 228. | 202. | | | | | | |

-7 CALCIUM (PPM)

| LOCATION | DEPTH | MAY28 | JUN17 | JUL4 | JUL16 | AUG2 | AUG15 | AUG28 | SEP12 | OCT13 | NOV22 | DEC12 | FEB5 | MAR17 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 25.0 | 27.6 | 17.7 | 16.0 | 24.0 | 32.0 | 25.6 | 52.0 | | | | | | |
| 1 | 10 | 29.9 | 26.9 | 13.1 | 12.8 | 22.4 | 27.2 | 27.2 | 54.4 | | | | | | |
| 1 | 20 | 29.2 | 26.9 | 19.3 | 18.4 | 23.2 | 34.4 | 26.4 | 40.0 | | | | | | |
| 1 | 40 | 27.1 | 30.5 | 19.3 | 21.6 | 23.2 | 38.4 | 28.0 | 42.4 | | | | | | |
| 1 | 60 | 26.6 | 31.1 | 23.1 | 19.2 | 22.4 | NS | 32.8 | 47.2 | | | | | | |
| 2 | 0 | 18.8 | 28.3 | 16.9 | 16.8 | 22.4 | 28.8 | 26.4 | 41.6 | | | | | | |
| 2 | 10 | 21.6 | 28.3 | 14.6 | 14.4 | 23.2 | 31.2 | 28.0 | 38.4 | | | | | | |
| 2 | 20 | 21.6 | 28.3 | 17.7 | 14.4 | 24.0 | 30.4 | 28.0 | 43.2 | | | | | | |
| 2 | 40 | 25.7 | 29.7 | 22.3 | 23.1 | 21.6 | 31.2 | 26.4 | 44.8 | | | | | | |
| 2 | 60 | 26.6 | 29.7 | 23.1 | 24.0 | 24.0 | 37.6 | 29.6 | 45.6 | | | | | | |
| 3 | 0 | 23.7 | 25.5 | 20.8 | 16.0 | 27.2 | 21.6 | 24.0 | 27.2 | 33.6 | 44.7 | 52.8 | 60.0 | 20.8 | 25.6 |
| 3 | 10 | 29.2 | 29.7 | 17.7 | 12.0 | 26.4 | 28.8 | 24.0 | 33.6 | 40.0 | 44.7 | 50.4 | 66.4 | 40.0 | 24.8 |
| 3 | 20 | 27.8 | 29.4 | 20.0 | 15.2 | 30.8 | 24.0 | 24.0 | 38.4 | 31.2 | 43.1 | 50.4 | 51.2 | 33.6 | 25.6 |
| 3 | 40 | 29.9 | 29.7 | 20.8 | 24.8 | 24.8 | 34.4 | 30.4 | 21.6 | 33.6 | 46.2 | 53.6 | 74.4 | 36.0 | 29.6 |
| 3 | 60 | 23.7 | 29.4 | 24.6 | 21.6 | 25.6 | 35.2 | 32.0 | 48.8 | 48.0 | 39.2 | 64.8 | 47.2 | 32.8 | 25.6 |
| 4 | 0 | 24.3 | 25.5 | 16.9 | 13.5 | 20.0 | 24.0 | 24.0 | 32.0 | | | | | | |
| 4 | 10 | 30.6 | 24.8 | 16.2 | 13.5 | 20.8 | 28.0 | 25.6 | 30.4 | | | | | | |
| 4 | 20 | 31.3 | 27.6 | 20.0 | 11.2 | 20.0 | 28.8 | 23.2 | 37.6 | | | | | | |
| 4 | 40 | 25.7 | 32.6 | 21.5 | 20.0 | 24.8 | 27.2 | 21.6 | 44.0 | | | | | | |
| 4 | 60 | 20.9 | 30.5 | 21.5 | 24.8 | 25.6 | 34.4 | 30.4 | 34.4 | | | | | | |
| LOCATION | DEPTH | MAY30 | JUN19 | JUL10 | JUL25 | AUG9 | AUG19 | AUG29 | SEP12 | OCT14 | NOV22 | DEC12 | FEB5 | MAR17 | APR17 |
| 5 | 0 | 29.6 | 25.5 | 19.2 | 17.6 | 21.6 | 25.8 | 28.8 | 20.0 | | | | | | |
| 5 | 10 | 33.6 | 26.9 | 17.6 | 19.2 | 28.8 | 22.4 | 37.6 | 38.4 | | | | | | |
| 5 | 20 | 27.2 | 28.3 | 23.2 | 17.6 | 20.8 | 21.6 | 38.4 | 35.2 | | | | | | |
| 5 | 40 | 32.9 | 27.6 | 23.2 | 19.2 | 24.8 | 25.8 | 35.2 | 35.2 | | | | | | |
| 5 | 60 | 32.9 | 32.9 | 25.6 | NS | 27.4 | 30.4 | 37.6 | NS | | | | | | |
| 6 | 0 | 27.2 | 27.6 | 22.4 | 20.0 | 24.0 | 20.0 | 44.0 | 22.4 | | | | | | |
| 6 | 10 | 32.1 | 27.6 | 19.2 | 20.0 | 20.8 | 22.4 | 35.2 | 38.4 | | | | | | |
| 6 | 20 | 28.9 | 28.3 | 21.6 | 18.4 | 23.2 | 27.4 | 37.6 | 43.2 | | | | | | |
| 6 | 40 | 31.3 | 32.9 | 23.2 | 21.6 | 24.0 | 20.8 | 38.4 | 40.8 | | | | | | |
| 7 | 0 | 28.0 | 21.8 | 20.0 | 20.8 | 25.6 | 19.2 | 41.6 | 37.6 | 31.2 | 40.0 | 52.8 | 41.6 | 30.4 | 24.8 |
| 7 | 10 | 32.1 | 28.3 | 20.0 | 18.4 | 25.6 | 20.8 | 37.6 | 37.6 | 47.2 | 40.8 | 60.0 | 69.6 | 31.2 | 23.2 |
| 7 | 20 | 32.1 | 28.3 | 22.4 | 16.8 | 24.0 | 20.0 | 32.8 | 40.0 | 37.6 | 44.7 | 53.6 | 62.4 | 40.0 | 25.6 |
| 7 | 40 | 24.0 | 33.3 | 24.0 | 23.2 | 25.6 | 21.6 | 42.4 | 36.0 | 36.0 | 45.4 | 68.8 | 54.6 | 35.2 | 25.6 |
| 7 | 60 | 32.1 | 32.6 | 26.4 | 24.0 | 24.8 | 20.8 | 44.8 | 40.0 | 36.8 | 38.5 | 48.0 | NS | 40.8 | 26.4 |
| 8 | 0 | 26.4 | 26.7 | 21.6 | 16.8 | 20.8 | 17.6 | 33.6 | 32.8 | | | | | | |
| 8 | 10 | 27.2 | 25.5 | 19.2 | 17.6 | 24.8 | 17.6 | 30.4 | 33.6 | | | | | | |
| 8 | 20 | 28.0 | 28.3 | 19.2 | 19.2 | 21.6 | 17.6 | 32.0 | 28.8 | | | | | | |
| 8 | 40 | 32.1 | 29.0 | 23.2 | 18.4 | 28.0 | 22.4 | 29.6 | 33.6 | | | | | | |
| 8 | 60 | 30.5 | 30.4 | 24.0 | 20.8 | 25.6 | 22.4 | 37.6 | 32.0 | | | | | | |

-8 MAGNESIUM (PPM)

| LOCATION | DEPTH | MAY28 | JUN17 | JUL4 | JUL16 | AUG2 | AUG15 | AUG28 | SEP12 | OCT13 | NOV22 | DEC12 | FEB5 | MAR17 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 10.5 | 8.0 | 9.1 | 8.5 | 9.9 | 8.6 | 8.9 | 9.2 | | | | | | |
| 1 | 10 | 10.4 | 9.0 | 8.8 | 8.3 | 10.5 | 8.7 | 9.4 | 6.4 | | | | | | |
| 1 | 20 | 9.5 | 8.1 | 8.3 | 8.3 | 10.3 | 9.0 | 9.0 | 9.2 | | | | | | |
| 1 | 40 | 9.0 | 8.5 | 8.7 | 8.8 | 10.5 | 8.8 | 9.0 | 9.0 | | | | | | |
| 1 | 60 | 9.5 | 9.8 | 10.4 | 9.5 | 11.8 | 9.6 | 9.9 | 8.4 | | | | | | |
| 2 | 0 | 10.0 | 8.1 | 8.9 | 8.5 | 10.5 | 8.4 | 8.8 | 8.0 | | | | | | |
| 2 | 10 | 9.5 | 8.4 | 8.9 | 8.4 | 10.0 | 8.6 | 8.9 | 9.0 | | | | | | |
| 2 | 20 | 9.4 | 9.1 | 8.7 | 8.6 | 10.0 | 8.6 | 8.9 | 8.3 | | | | | | |
| 2 | 40 | 10.4 | 9.3 | 8.8 | 8.3 | 13.4 | 8.8 | 9.0 | 9.2 | | | | | | |
| 2 | 60 | 10.8 | 10.0 | 9.9 | 10.0 | 13.1 | 9.9 | 9.8 | 8.5 | | | | | | |
| 3 | 0 | 9.9 | 8.4 | 8.3 | 8.3 | 11.3 | 8.5 | 8.6 | 7.7 | 9.5 | 9.4 | 9.3 | 10.2 | 5.3 | 9.4 |
| 3 | 10 | 9.0 | 8.3 | 8.8 | 8.3 | 10.5 | 8.7 | 9.0 | 8.7 | 9.4 | 9.4 | 9.1 | 10.2 | 9.0 | 9.4 |
| 3 | 20 | 9.6 | 8.3 | 8.4 | 8.8 | 10.1 | 7.4 | 9.0 | 8.8 | 9.3 | 9.2 | 9.6 | 10.1 | 9.7 | 9.[illegible] |
| 3 | 40 | 10.3 | 9.0 | 8.5 | 8.6 | 10.0 | 8.9 | 9.4 | 6.2 | 9.8 | 9.7 | 7.8 | 10.0 | 9.5 | 9.2 |
| 3 | 60 | 10.8 | 10.3 | 9.9 | 9.6 | 11.0 | 9.3 | 9.9 | 9.7 | 9.8 | 9.5 | 9.6 | 10.0 | 9.5 | 9.4 |
| 4 | 0 | 9.5 | 8.5 | 8.4 | 8.6 | 10.4 | 8.7 | 9.0 | 8.3 | | | | | | |
| 4 | 10 | 9.6 | 8.3 | 8.4 | 8.3 | 10.9 | 8.7 | 9.2 | 9.4 | | | | | | |
| 4 | 20 | 9.7 | 8.3 | 8.4 | 8.3 | 9.8 | 8.8 | 9.2 | 9.9 | | | | | | |
| 4 | 40 | 10.3 | 9.6 | 8.6 | 8.8 | 10.6 | 8.8 | 9.0 | 9.6 | | | | | | |
| 4 | 60 | 11.0 | 10.0 | 9.4 | 10.3 | 12.3 | 9.7 | 10.0 | 10.3 | | | | | | |
| LOCATION | DEPTH | MAY30 | JUN19 | JUL10 | JUL25 | AUG9 | AUG19 | AUG29 | SEP12 | OCT14 | NOV22 | DEC12 | FEB5 | MAR17 | APR17 |
| 5 | 0 | 7.1 | 9.4 | 8.9 | 9.5 | 10.5 | 8.8 | 9.4 | 10.4 | | | | | | |
| 5 | 10 | 8.3 | 9.3 | 9.1 | 9.5 | 11.8 | 8.9 | 9.7 | 9.4 | | | | | | |
| 5 | 20 | 7.0 | 9.3 | 8.7 | 9.6 | 11.5 | 9.7 | 9.5 | 9.5 | | | | | | |
| 5 | 40 | 6.4 | 9.7 | 9.5 | 9.3 | 11.0 | 10.1 | 9.4 | 10.0 | | | | | | |
| 5 | 60 | 8.1 | 10.5 | 10.4 | NS | 13.0 | 11.3 | 10.9 | NS | | | | | | |
| 6 | 0 | 6.9 | 9.8 | 9.4 | 9.3 | 11.0 | 8.8 | 9.7 | 9.1 | | | | | | |
| 6 | 10 | 9.4 | 9.4 | 9.9 | 9.0 | 12.0 | 9.8 | 9.4 | 9.5 | | | | | | |
| 6 | 20 | 7.8 | 9.8 | 9.4 | 9.0 | 12.5 | 9.3 | 9.8 | 9.5 | | | | | | |
| 6 | 40 | 6.1 | 10.4 | 10.0 | 9.6 | 10.5 | 9.1 | 10.2 | 9.5 | | | | | | |
| 7 | 0 | 7.6 | 9.3 | 9.4 | 9.1 | 11.3 | 8.9 | 9.7 | 9.0 | 9.8 | 10.1 | 9.6 | 10.5 | 5.8 | 9.5 |
| 7 | 10 | 7.2 | 9.6 | 9.4 | 9.0 | 10.0 | 9.0 | 9.7 | 9.4 | 9.7 | 9.6 | 9.4 | 10.6 | 9.1 | 9.0 |
| 7 | 20 | 6.6 | 9.6 | 10.0 | 9.0 | 10.5 | 9.0 | 9.9 | 9.5 | 9.7 | 9.4 | 9.5 | 10.1 | 8.7 | 9.2 |
| 7 | 40 | 7.4 | 10.1 | 9.5 | 9.5 | 11.5 | 9.3 | 9.9 | 9.4 | 9.2 | 9.7 | 9.7 | 10.1 | 9.7 | 9.3 |
| 7 | 60 | 6.8 | 10.7 | 10.9 | 9.9 | 10.2 | 9.8 | 10.1 | 10.5 | 9.4 | 9.7 | 10.0 | NS | 10.3 | 9.5 |
| 8 | 0 | 7.4 | 9.1 | 9.6 | 8.8 | 12.0 | 9.4 | 9.2 | 8.6 | | | | | | |
| 8 | 10 | 7.5 | 9.1 | 8.7 | 17.2 | 15.8 | 9.4 | 9.4 | 9.5 | | | | | | |
| 8 | 20 | 6.4 | 9.1 | 9.0 | 9.2 | 13.5 | 9.3 | 17.3 | 10.0 | | | | | | |
| 8 | 40 | 9.9 | 9.5 | 9.8 | 9.2 | 11.0 | 9.5 | 9.7 | 8.8 | | | | | | |
| 8 | 60 | 6.6 | 10.5 | 9.8 | 9.6 | 13.7 | 11.0 | 10.2 | 9.9 | | | | | | |

-9 CHLORIDE (PPM)

| LOCATION | DEPTH | MAY28 | JUN17 | JUL4 | JUL16 | AUG2 | AUG15 | AUG28 | SEP12 | OCT13 | NOV22 | DEC12 | FEB5 | MAR17 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 1.7 | 2.4 | 3.9 | 1.9 | 1.6 | 1.4 | 1.3 | 2.3 | | | | | | |
| 1 | 10 | 1.9 | 2.8 | 1.7 | 1.6 | 1.2 | 1.4 | 1.3 | 1.1 | | | | | | |
| 1 | 20 | 1.8 | 3.0 | 1.6 | 1.2 | 1.3 | 1.3 | 1.3 | 1.3 | | | | | | |
| 1 | 40 | 2.0 | 2.8 | 1.6 | 1.2 | 1.5 | 1.3 | 1.3 | 1.3 | | | | | | |
| 1 | 60 | 1.9 | 3.0 | 1.7 | 2.0 | 1.5 | 1.5 | 1.4 | 1.0 | | | | | | |
| 2 | 0 | 1.9 | 2.5 | 1.7 | 0.7 | 1.4 | 1.4 | 1.4 | 1.1 | | | | | | |
| 2 | 10 | 1.9 | 2.8 | 1.9 | 1.3 | 1.4 | 1.4 | 1.3 | 1.4 | | | | | | |
| 2 | 20 | 2.1 | 2.7 | 1.8 | 1.2 | 1.6 | 1.4 | 1.4 | 1.3 | | | | | | |
| 2 | 40 | 2.8 | 5.0 | 1.7 | 1.4 | 1.5 | 1.3 | 1.4 | 1.2 | | | | | | |
| 2 | 60 | 2.0 | 2.5 | 1.7 | 1.5 | 1.5 | 1.5 | 1.4 | 1.3 | | | | | | |
| 3 | 0 | 1.9 | 2.5 | 1.6 | 1.7 | 1.4 | 1.5 | 1.4 | 1.2 | 1.1 | 1.6 | 2.1 | 1.6 | 0.8 | 0.9 |
| 3 | 10 | 1.8 | 2.5 | 1.5 | 1.3 | 1.4 | 1.2 | 1.4 | 1.3 | 0.9 | 1.3 | 1.3 | 1.6 | 1.2 | 1.2 |
| 3 | 20 | 1.8 | 2.5 | 1.6 | 1.2 | 1.2 | 1.1 | 1.3 | 1.4 | 1.3 | 1.4 | 1.2 | 1.3 | 1.4 | 1.1 |
| 3 | 40 | 1.9 | 2.7 | 1.5 | 1.4 | 1.2 | 1.4 | 1.2 | 1.0 | 1.1 | 1.6 | 0.9 | 1.5 | 1.2 | 1.1 |
| 3 | 60 | 2.0 | 2.5 | 1.6 | 1.4 | 1.4 | 1.4 | 1.3 | 1.4 | 1.0 | 1.1 | 1.1 | 1.4 | 1.4 | 1.1 |
| 4 | 0 | 1.8 | 3.0 | 1.5 | 1.6 | 1.4 | 1.5 | 1.4 | 1.3 | | | | | | |
| 4 | 10 | 2.0 | 2.5 | 1.6 | 1.5 | 1.6 | 1.4 | 1.2 | 1.4 | | | | | | |
| 4 | 20 | 2.0 | 2.2 | 1.6 | 1.5 | 1.3 | 1.5 | 1.4 | 1.3 | | | | | | |
| 4 | 40 | 1.9 | 3.0 | 1.6 | 1.6 | 1.4 | 1.5 | 1.3 | 1.4 | | | | | | |
| 4 | 60 | 2.1 | 2.5 | 1.9 | 1.5 | 1.5 | 1.7 | 1.5 | 1.3 | | | | | | |
| LOCATION | DEPTH | MAY30 | JUN19 | JUL10 | JUL25 | AUG9 | AUG19 | AUG29 | SEP12 | OCT14 | NOV22 | DEC12 | FEB5 | MAR17 | APR17 |
| 5 | 0 | 2.8 | 2.6 | 1.6 | 1.7 | 1.4 | 1.4 | 1.4 | 1.2 | | | | | | |
| 5 | 10 | 3.2 | 2.7 | 1.7 | 1.4 | 1.4 | 1.4 | 1.4 | 1.2 | | | | | | |
| 5 | 20 | 3.2 | 2.5 | 1.7 | 1.3 | 1.4 | 1.6 | 1.4 | 1.6 | | | | | | |
| 5 | 40 | 3.2 | 2.8 | 1.7 | 1.5 | 1.5 | 1.6 | 1.3 | 1.4 | | | | | | |
| 5 | 60 | 3.5 | 2.5 | 1.7 | NS | 1.4 | 2.2 | 1.7 | NS | | | | | | |
| 6 | 0 | 3.7 | 2.8 | 1.7 | 1.2 | 1.5 | 1.5 | 1.5 | 1.5 | | | | | | |
| 6 | 10 | 3.5 | 2.5 | 1.7 | 1.3 | 1.4 | 1.7 | 1.2 | 1.2 | | | | | | |
| 6 | 20 | 3.5 | 2.4 | 1.7 | 1.4 | 1.5 | 1.5 | 1.4 | 1.2 | | | | | | |
| 6 | 40 | 3.0 | 2.3 | 1.7 | 1.4 | 1.4 | 1.6 | 1.5 | 1.4 | | | | | | |
| 7 | 0 | 3.2 | 1.9 | 1.6 | 1.5 | 1.5 | 1.5 | 1.4 | 1.5 | 1.2 | 1.5 | 1.0 | 1.7 | 1.9 | 1.0 |
| 7 | 10 | 3.2 | 2.7 | 1.7 | 1.6 | 1.4 | 1.4 | 1.5 | 1.4 | 1.2 | 1.3 | 1.4 | 1.45 | 1.3 | 0.9 |
| 7 | 20 | 3.0 | 2.5 | 1.7 | 1.8 | 1.4 | 1.4 | 1.3 | 1.4 | 1.2 | 1.6 | 1.3 | 1.4 | 1.3 | 1.2 |
| 7 | 40 | 3.5 | 2.4 | 1.6 | 1.8 | 1.6 | 1.6 | 1.6 | 1.4 | 1.0 | 1.1 | 1.4 | 1.45 | 1.3 | 1.2 |
| 7 | 60 | 3.3 | 2.4 | 1.7 | 1.8 | 1.5 | 1.6 | 1.4 | 1.4 | 0.9 | 1.4 | 1.3 | NS | 1.7 | 1.2 |
| 8 | 0 | 3.5 | 3.0 | 1.7 | 1.7 | 1.5 | 1.7 | 1.4 | 1.3 | | | | | | |
| 8 | 10 | 3.5 | 2.7 | 1.6 | 1.3 | 1.6 | 1.4 | 1.5 | 1.4 | | | | | | |
| 8 | 20 | 3.5 | 3.0 | 1.7 | 1.3 | 1.3 | 1.4 | 1.5 | 1.4 | | | | | | |
| 8 | 40 | 3.7 | 2.4 | 1.6 | 1.0 | 1.8 | 1.6 | 1.5 | 1.2 | | | | | | |
| 8 | 60 | 3.5 | 3.0 | 1.7 | 1.5 | 0.9 | 1.6 | 1.4 | 1.3 | | | | | | |

-10 SILICATE (PPM)

| LOCATION | DEPTH | MAY28 | JUN17 | JUL4 | JUL16 | AUG2 | AUG15 | AUG28 | SEP12 | OCT13 | NOV22 | DEC12 | FEB5 | MAR17 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | NS | NS | NS | 5.2 | 4.6 | 3.7 | 3.3 | 2.7 | | | | | | |
| 1 | 10 | NS | NS | NS | 5.1 | 4.6 | 3.6 | 3.0 | 2.2 | | | | | | |
| 1 | 20 | NS | NS | NS | 5.2 | 4.6 | 3.7 | 3.3 | 2.2 | | | | | | |
| 2 | 0 | NS | NS | NS | 4.9 | 4.6 | 3.4 | 2.8 | 2.2 | | | | | | |
| 2 | 10 | NS | NS | NS | 4.9 | 4.6 | 3.3 | 4.8 | 2.3 | | | | | | |
| 2 | 20 | NS | NS | NS | 5.2 | 4.6 | 3.3 | 3.1 | 2.6 | | | | | | |
| 3 | 0 | NS | NS | NS | 4.9 | 4.6 | 3.1 | 3.0 | 2.5 | 3.6 | 7.1 | 4.7 | 4.6 | 2.25 | 1.33 |
| 3 | 10 | NS | NS | NS | 4.9 | 4.7 | 3.3 | 3.4 | 2.2 | 3.6 | 7.1 | 4.75 | 4.52 | 4.15 | 1.80 |
| 3 | 20 | NS | NS | NS | 5.1 | 4.5 | 3.0 | 2.8 | 2.3 | 3.6 | 4.9 | 4.85 | 4.25 | 4.50 | 1.17 |
| 3 | 40 | NS | NS | NS | NS | NS | NS | NS | NS | NS | 5.3 | 4.65 | 4.35 | 4.30 | 1.08 |
| 3 | 60 | NS | NS | NS | NS | NS | NS | NS | NS | NS | 6.7 | 4.7 | 4.47 | 4.45 | 1.89 |
| 4 | 0 | NS | NS | NS | 5.2 | 4.5 | 3.1 | 3.1 | 2.2 | | | | | | |
| 4 | 10 | NS | NS | NS | 5.1 | 4.5 | 3.4 | 2.8 | 2.2 | | | | | | |
| 4 | 20 | NS | NS | NS | 5.2 | 4.6 | 4.2 | 3.3 | 2.2 | | | | | | |
| LOCATION | DEPTH | MAY30 | JUN19 | JUL10 | JUL25 | AUG9 | AUG19 | AUG29 | SEP12 | OCT14 | NOV22 | DEC12 | FEB5 | MAR17 | APR17 |
| 5 | 0 | NS | NS | NS | 4.4 | 4.3 | 3.3 | 3.8 | 3.2 | | | | | | |
| 5 | 10 | NS | NS | NS | 4.2 | 5.0 | 4.9 | 4.2 | 3.2 | | | | | | |
| 5 | 20 | NS | NS | NS | 3.0 | 4.6 | 4.6 | 3.8 | 3.4 | | | | | | |
| 6 | 0 | NS | NS | NS | 4.4 | 4.1 | 4.5 | 4.0 | 3.1 | | | | | | |
| 6 | 10 | NS | NS | NS | 4.2 | 4.4 | 3.5 | 6.2 | 3.1 | | | | | | |
| 6 | 20 | NS | NS | NS | 4.0 | 4.5 | 2.4 | 3.8 | 3.0 | | | | | | |
| 7 | 0 | NS | NS | NS | 4.4 | 5.2 | 3.1 | 3.8 | 3.1 | 2.5 | 1.7 | 1.5 | 3.32 | 2.35 | 1.20 |
| 7 | 10 | NS | NS | NS | 4.0 | 5.7 | 2.5 | 3.8 | 3.2 | 2.6 | 1.7 | 1.5 | 3.52 | 4.10 | 1.20 |
| 7 | 20 | NS | NS | NS | 4.5 | 5.6 | 3.1 | 3.7 | 3.4 | 2.6 | 2.0 | 0.7 | 3.52 | 4.15 | 1.25 |
| 7 | 40 | NS | NS | NS | NS | NS | NS | NS | NS | NS | 1.7 | 0.8 | 3.49 | 4.15 | 0.83 |
| 7 | 60 | NS | NS | NS | NS | NS | NS | NS | NS | NS | 1.8 | 1.0 | NS | 4.75 | 1.93 |
| 8 | 0 | NS | NS | NS | 4.2 | 4.0 | 3.9 | 3.6 | 3.0 | | | | | | |
| 8 | 10 | NS | NS | NS | 4.0 | 4.3 | 5.4 | 4.0 | 3.0 | | | | | | |
| 8 | 20 | NS | NS | NS | 4.0 | 4.3 | 1.9 | 3.8 | 3.1 | | | | | | |

-11 pH

| LOCATION | DEPTH | MAY28 | JUN17 | JUL4 | JUL16 | AUG2 | AUG15 | AUG28 | SEP12 | OCT13 | NOV22 | DEC12 | FEB5 | MAR17 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 8.58 | 9.05 | 9.45 | 9.33 | 9.05 | 9.05 | 8.90 | 9.05 | | | | | | |
| 1 | 10 | 8.69 | 8.99 | 9.45 | 9.25 | 8.85 | 8.95 | 8.81 | 8.90 | | | | | | |
| 1 | 20 | 8.67 | 9.00 | 9.08 | 9.16 | 8.85 | 8.87 | 8.80 | 8.80 | | | | | | |
| 1 | 40 | 8.67 | 8.71 | 8.72 | 8.40 | 8.32 | 8.00 | 8.12 | 8.35 | | | | | | |
| 1 | 60 | 8.62 | 8.45 | 8.39 | 8.18 | 8.03 | 7.89 | 7.80 | 7.80 | | | | | | |
| 2 | 0 | 8.53 | 9.05 | 9.52 | 9.32 | 9.08 | 9.05 | 8.77 | 8.75 | | | | | | |
| 2 | 10 | 8.58 | 9.07 | 9.40 | 9.19 | 8.89 | 8.92 | 8.80 | 8.75 | | | | | | |
| 2 | 20 | 8.53 | 9.01 | 9.12 | 9.16 | 8.82 | 8.85 | 8.75 | 8.70 | | | | | | |
| 2 | 40 | 8.65 | 8.66 | 8.78 | 8.49 | 8.32 | 8.51 | 8.30 | 8.30 | | | | | | |
| 2 | 60 | 8.69 | 8.47 | 8.33 | 8.21 | 8.02 | 7.90 | 8.75 | 7.75 | | | | | | |
| 3 | 0 | 8.49 | 9.12 | 9.48 | 9.39 | 8.96 | 8.92 | 8.71 | 8.80 | 8.20 | 8.67 | 8.64 | 7.9 | 8.7 | 9.2 |
| 3 | 10 | 8.55 | 9.15 | 9.40 | 9.27 | 8.90 | 8.95 | 8.76 | 8.75 | 8.18 | 8.45 | 8.20 | 7.8 | 8.4 | 9.0 |
| 3 | 20 | 8.52 | 8.95 | 9.20 | 9.19 | 8.81 | 8.90 | 8.77 | 8.70 | 8.16 | 8.15 | 7.96 | 7.7 | 8.4 | 8.8 |
| 3 | 40 | 8.60 | 8.61 | 8.71 | 8.69 | 8.22 | 8.20 | 8.11 | 8.30 | 8.17 | 8.13 | 8.0 | 7.9 | 8.3 | 8.7 |
| 3 | 60 | 8.56 | 8.48 | NS | NS | 8.02 | 7.83 | 7.70 | 7.70 | 8.16 | 8.05 | 8.0 | 7.8 | 8.2 | 8.5 |
| 4 | 0 | 8.49 | 9.12 | 9.49 | 9.28 | 8.90 | 8.91 | 8.80 | 8.80 | | | | | | |
| 4 | 10 | 8.58 | 9.09 | 9.38 | 9.21 | 9.10 | 8.92 | 8.80 | 8.75 | | | | | | |
| 4 | 20 | 8.56 | 8.98 | 9.29 | 9.19 | 8.95 | 8.96 | 8.79 | 8.70 | | | | | | |
| 4 | 40 | 8.62 | 8.74 | 8.78 | 8.72 | 8.35 | 8.00 | 8.15 | 8.35 | | | | | | |
| 4 | 60 | 8.62 | | 8.33 | 8.20 | 8.07 | 7.81 | 7.76 | 7.65 | | | | | | |
| LOCATION | DEPTH | MAY30 | JUN19 | JUL10 | JUL25 | AUG9 | AUG19 | AUG29 | SEP12 | OCT14 | NOV22 | DEC12 | FEB5 | MAR17 | APR17 |
| 5 | 0 | 8.47 | 8.80 | 9.20 | 8.95 | 8.71 | 8.80 | 8.89 | 8.55 | | | | | | |
| 5 | 10 | 8.59 | 8.85 | 9.21 | 8.90 | 8.61 | 8.79 | 8.74 | 8.50 | | | | | | |
| 5 | 20 | 8.61 | 8.81 | 9.09 | 8.90 | 8.58 | 8.75 | 8.72 | 8.40 | | | | | | |
| 5 | 40 | 8.53 | 8.28 | 8.25 | 7.80 | 8.09 | 7.80 | 7.81 | 8.10 | | | | | | |
| 5 | 60 | 8.50 | 8.08 | 7.77 | NS | 7.60 | 7.60 | 7.67 | NS | | | | | | |
| 6 | 0 | 8.45 | 8.78 | 9.21 | 9.01 | 8.61 | 8.82 | 8.71 | 8.55 | | | | | | |
| 6 | 10 | 8.60 | 8.81 | 9.26 | 9.15 | 8.62 | 8.79 | 8.73 | 8.55 | | | | | | |
| 6 | 20 | 8.63 | 8.83 | 9.21 | 8.99 | 8.49 | 8.70 | 8.62 | 8.50 | | | | | | |
| 6 | 40 | 8.45 | 8.22 | 8.18 | 7.80 | 7.90 | 7.70 | 7.71 | 8.00 | | | | | | |
| 7 | 0 | 8.45 | NS | 9.25 | 8.99 | 8.82 | 8.72 | 8.70 | 8.55 | 8.2 | 8.33 | 8.15 | 8.4 | 8.3 | 8.7 |
| 7 | 10 | 8.54 | NS | 9.20 | 9.10 | 8.63 | 8.70 | 8.66 | 8.50 | 8.2 | 8.32 | 8.10 | 8.1 | 8.4 | 8.7 |
| 7 | 20 | 8.60 | NS | 9.10 | 8.95 | 8.58 | 8.70 | 8.68 | 8.50 | 8.2 | 8.26 | 8.15 | 8.1 | 8.5 | 8.7 |
| 7 | 40 | 8.38 | NS | 8.20 | 7.83 | 8.00 | 7.79 | 7.82 | 8.05 | 8.19 | 8.28 | 8.12 | 8.0 | 8.4 | 8.7 |
| 7 | 60 | 8.12 | NS | 7.78 | 7.65 | 7.57 | 7.53 | 7.60 | 7.65 | 8.18 | 8.34 | 8.06 | NS | 8.5 | 8.6 |
| 8 | 0 | 8.49 | NS | 9.26 | 8.95 | 8.60 | 8.73 | 8.69 | 8.50 | | | | | | |
| 8 | 10 | 8.58 | NS | 9.21 | 9.10 | 8.60 | 8.70 | 8.63 | 8.55 | | | | | | |
| 8 | 20 | 8.59 | NS | 9.20 | 8.98 | 8.58 | 8.69 | 8.60 | 8.50 | | | | | | |
| 8 | 40 | 8.27 | NS | 8.33 | 7.92 | 7.75 | 7.75 | 8.01 | 8.00 | | | | | | |
| 8 | 60 | 8.02 | NS | 7.78 | 7.65 | 7.50 | 7.51 | 7.61 | 7.60 | | | | | | |

-12 SEDIMENT VALUES (LAKE BOTTOM SAMPLES)

-12A CALCIUM (PPM)

| LOCATION | JUN17 | JUL16 | AUG 2 | AUG15 | AUG28 | SEP12 |
|---|---|---|---|---|---|---|
| 1 | 633.0 | 888.0 | NS | 496.0 | NS | 448.0 |
| 2 | 568.0 | 1013.0 | NS | 568.0 | NS | 472.0 |
| 3 | 440.0 | 727.0 | NS | 312.0 | NS | 294.0 |
| 4 | 546.0 | 735.0 | NS | 616.0 | NS | 608.0 |
| LOCATION | JUN18 | JUL25 | AUG 9 | AUG19 | AUG29 | SEP12 |
| 5 | 510.0 | 616.0 | 703.0 | NS | 546.0 | 440.0 |
| 6 | 1360.0 | NS | 720.0 | NS | 1272.0 | 1347.0 |
| 7 | 604.0 | NS | NS | NS | 520.0 | 448.0 |
| 8 | 554.0 | NS | 728.0 | NS | 584.0 | 392.0 |
| LOCATION | | | | AUG23 | | |
| 9 | NS | NS | NS | 192.0 | NS | NS |
| 10 | NS | NS | NS | 528.0 | NS | NS |
| 11 | NS | NS | NS | 544.0 | NS | NS |
| 12 | NS | NS | NS | 560.0 | NS | NS |

-12B NITRATE (PPM)

| LOCATION | JUN17 | JUL16 | AUG 2 | AUG15 | AUG28 | SEP12 |
|---|---|---|---|---|---|---|
| 1 | 3.55 | 4.43 | NS | 3.76 | NS | 9.4 |
| 2 | 5.32 | 4.89 | NS | 4.15 | NS | 9.25 |
| 3 | 0.0 | 4.35 | NS | 6.2 | NS | 8.2 |
| 4 | 0.0 | 3.89 | NS | 7.39 | NS | 8.8 |
| LOCATION | JUN18 | JUL25 | AUG 9 | AUG19 | AUG29 | SEP12 |
| 5 | 0.886 | 1.77 | 1.77 | NS | 0.47 | 6.3 |
| 6 | 0.0 | NS | 3.99 | NS | 1.6 | 6.1 |
| 7 | 0.0 | NS | 1.24 | NS | 3.37 | 19.7 |
| 8 | 0.0 | NS | 2.13 | NS | 13.59 | 5.9 |
| LOCATION | | | | AUG23 | | |
| 9 | NS | NS | NS | 0.0 | NS | NS |
| 10 | NS | NS | NS | 8.66 | NS | NS |
| 11 | NS | NS | NS | 3.54 | NS | NS |
| 12 | NS | NS | NS | 1.68 | NS | NS |

-12C PHOSPHATE (PPM)

| LOCATION | JUN17 | JUL16 | AUG 2 | AUG15 | AUG28 | SEP12 |
|---|---|---|---|---|---|---|
| 1 | 3900.00 | 1438.0 | NS | 1250.0 | NS | 1975.0 |
| 2 | 3600.00 | 988.0 | NS | 1525.0 | NS | 2040.0 |
| 3 | 2994.00 | 1305.0 | NS | 1100.0 | NS | 2450.0 |
| 4 | 3390.00 | 1169.0 | NS | 1100.0 | NS | 2630.0 |
| LOCATION | JUN18 | JUL25 | AUG 9 | AUG19 | AUG29 | SEP12 |
| 5 | 2875.0 | 1000.0 | 969.0 | NS | 1025.0 | 1762.0 |
| 6 | 1360.0 | NS | 1125.0 | NS | 1025.0 | 1690.0 |
| 7 | 2415.0 | NS | 906.0 | NS | 1025.0 | 1964.0 |
| 8 | 3270.0 | NS | 1388.0 | NS | 875.0 | 1762.0 |
| LOCATION | | | | AUG23 | | |
| 9 | NS | NS | NS | 950.0 | NS | NS |
| 10 | NS | NS | NS | 450.0 | NS | NS |
| 11 | NS | NS | NS | 1075.0 | NS | NS |
| 12 | NS | NS | NS | 1200.0 | NS | NS |

-13 NITROGEN

-13A AMMONIA NITROGEN (PPM)

| LOCATION | DEPTH | MAY28 | JUN17 | JUL4 | JUL16 | AUG2 | AUG15 | AUG28 | SEP12 | OCT13 | NOV22 | DEC12 | FEB5 | MAR17 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | .000 | .078 | .002 | .010 | .071 | .044 | .026 | .060 | | | | | | |
| 1 | 10 | .000 | .053 | .040 | .030 | .073 | .045 | .022 | .030 | | | | | | |
| 1 | 20 | .000 | .023 | .035 | .029 | .079 | .054 | .021 | .020 | | | | | | |
| 1 | 40 | .000 | .000 | .016 | .010 | .159 | .145 | .015 | .021 | | | | | | |
| 1 | 60 | .000 | .010 | .000 | .000 | .026 | .031 | .002 | .000 | | | | | | |
| 2 | 0 | .000 | .040 | .008 | .050 | .084 | .064 | .024 | .092 | | | | | | |
| 2 | 10 | .000 | .040 | .055 | .039 | .077 | .056 | .026 | .007 | | | | | | |
| 2 | 20 | .000 | .039 | .061 | .054 | .079 | .058 | .024 | .092 | | | | | | |
| 2 | 40 | .000 | .000 | .022 | .042 | .146 | .126 | .026 | .086 | | | | | | |
| 2 | 60 | .000 | .000 | .000 | .032 | .077 | .025 | .011 | .059 | | | | | | |
| 3 | 0 | .000 | .044 | .177 | .056 | .038 | .040 | .031 | .029 | 0.019 | 0.008 | 0.012 | 0.009 | 0.033 | 0.050 |
| 3 | 10 | .000 | .000 | .055 | .051 | .059 | .039 | .007 | .020 | 0.012 | 0.008 | 0.007 | 0.000 | 0.012 | 0.011 |
| 3 | 20 | .000 | .027 | .066 | .068 | .077 | .048 | .037 | .028 | 0.012 | 0.007 | 0.000 | 0.006 | 0.013 | 0.025 |
| 3 | 40 | .000 | .006 | .023 | .042 | .148 | .100 | .035 | .013 | 0.031 | 0.016 | 0.008 | 0.000 | 0.014 | 0.046 |
| 3 | 60 | .000 | .002 | .005 | .000 | .044 | .052 | .003 | .010 | 0.014 | 0.012 | 0.007 | 0.004 | 0.010 | 0.009 |
| 4 | 0 | .000 | .000 | .015 | .030 | .064 | .038 | .046 | .022 | | | | | | |
| 4 | 10 | .000 | .027 | .054 | .054 | .063 | .035 | .033 | .017 | | | | | | |
| 4 | 20 | .000 | .014 | .066 | .064 | .111 | .042 | .033 | .014 | | | | | | |
| 4 | 40 | .000 | .000 | .020 | .047 | .149 | .142 | .033 | .007 | | | | | | |
| 4 | 60 | .000 | .000 | .038 | .030 | .038 | .003 | .018 | .003 | | | | | | |

| LOCATION | DEPTH | MAY30 | JUN19 | JUL10 | JUL25 | AUG9 | AUG19 | AUG29 | SEP12 | OCT14 | NOV22 | DEC12 | FEB5 | MAR17 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 0 | NS | .000 | .014 | .065 | .096 | .041 | .016 | .063 | | | | | | |
| 5 | 10 | NS | .000 | .021 | .026 | .052 | .048 | .017 | .037 | | | | | | |
| 5 | 20 | NS | .000 | .029 | .036 | .046 | .038 | .021 | .040 | | | | | | |
| 5 | 40 | NS | .000 | .054 | .197 | .162 | .156 | .358 | .103 | | | | | | |
| 5 | 60 | NS | .000 | .279 | NS | .520 | .387 | .760 | NS | | | | | | |
| 6 | 0 | NS | .000 | .066 | .039 | .055 | .041 | .066 | .034 | | | | | | |
| 6 | 10 | NS | .000 | .085 | .041 | .054 | .049 | .028 | .045 | | | | | | |
| 6 | 20 | NS | .000 | .184 | .035 | .100 | .053 | .039 | .057 | | | | | | |
| 6 | 40 | NS | .000 | .209 | .172 | .258 | .185 | .147 | .162 | | | | | | |
| 7 | 0 | NS | .007 | .140 | .016 | .054 | .036 | .045 | .022 | 0.082 | 0.025 | 0.053 | 0.025 | 0.072 | 0.018 |
| 7 | 10 | NS | .000 | .011 | .021 | .066 | .035 | .034 | .032 | 0.154 | 0.050 | 0.060 | 0.017 | 0.026 | 0.004 |
| 7 | 20 | NS | .000 | .052 | .016 | .091 | .044 | .037 | .046 | 0.087 | 0.021 | 0.061 | 0.014 | 0.022 | 0.006 |
| 7 | 40 | NS | .000 | .104 | .120 | .212 | .193 | .375 | .117 | 0.09 | 0.049 | 0.052 | 0.033 | 0.000 | 0.030 |
| 7 | 60 | NS | .000 | .252 | .268 | .397 | .313 | .790 | .570 | 0.125 | 0.042 | 0.054 | NS | 0.06 | 0.024 |
| 8 | 0 | NS | .000 | .011 | .082 | .082 | .035 | .047 | .045 | | | | | | |
| 8 | 10 | NS | .000 | .064 | .019 | .024 | .035 | .045 | .032 | | | | | | |
| 8 | 20 | NS | .000 | .057 | .022 | .091 | .045 | .056 | .072 | | | | | | |
| 8 | 40 | NS | .000 | .122 | .104 | .400 | .119 | .285 | .130 | | | | | | |
| 8 | 60 | NS | .000 | .330 | .260 | .612 | .234 | .775 | .495 | | | | | | |

-13B NITRITE NITROGEN (PPM)

| LOCATION | DEPTH | OCT13 | NOV22 | DEC12 | FEB5 | MAR17 | APR17 |
|---|---|---|---|---|---|---|---|
| 3 | 0 | 0.003 | 0.002 | 0.002 | 0.002 | 0.002 | 0.001 |
| 3 | 10 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.001 |
| 3 | 20 | 0.002 | 0.002 | 0.002 | 0.001 | 0.001 | 0.001 |
| 3 | 40 | 0.002 | 0.002 | 0.001 | 0.001 | 0.001 | 0.001 |
| 3 | 60 | 0.002 | 0.003 | 0.001 | 0.002 | 0.001 | 0.001 |

| LOCATION | DEPTH | OCT14 | NOV22 | DEC12 | FEB5 | MAR17 | APR17 |
|---|---|---|---|---|---|---|---|
| 7 | 0 | 0.002 | 0.003 | 0.003 | 0.001 | 0.003 | 0.001 |
| 7 | 10 | 0.001 | 0.003 | 0.002 | 0.002 | 0.004 | 0.002 |
| 7 | 20 | 0.002 | 0.003 | 0.003 | 0.002 | 0.002 | 0.001 |

-13C NITRATE NITROGEN (PPM)

| LOCATION | DEPTH | OCT13 | NOV22 | DEC12 | FEB5 | MAR17 | APR17 |
|---|---|---|---|---|---|---|---|
| 3 | 0 | 0.034 | 0.106 | 0.164 | 0.030 | 0.133 | 0.023 |
| 3 | 10 | 0.024 | 0.118 | 0.182 | 0.033 | 0.160 | 0.001 |
| 3 | 20 | 0.027 | 0.130 | 0.162 | 0.034 | 0.148 | 0.007 |
| 3 | 40 | 0.030 | 0.150 | 0.129 | 0.042 | 0.163 | 0.007 |
| 3 | 60 | 0.030 | 0.120 | 0.163 | 0.070 | 0.169 | 0.009 |

| LOCATION | DEPTH | OCT14 | NOV22 | DEC12 | FEB5 | MAR17 | APR17 |
|---|---|---|---|---|---|---|---|
| 7 | 0 | 0.066 | 0.059 | 0.072 | 0.031 | 0.163 | 0.015 |
| 7 | 10 | 0.041 | 0.052 | 0.070 | 0.043 | 0.102 | 0.011 |
| 7 | 20 | 0.040 | 0.050 | 0.076 | 0.028 | 0.092 | 0.000 |
| 7 | 40 | 0.051 | 0.058 | 0.067 | 0.030 | 0.096 | 0.015 |
| 7 | 60 | 0.049 | 0.066 | 0.074 | NS | 0.200 | 0.007 |

-13D TOTAL NITROGEN (PPM)

| LOCATION | DEPTH | MAY28 | JUN17 | JUL4 | JUL16 | AUG2 | AUG15 | AUG28 | SEP12 | OCT13 | NOV22 | DEC12 | FEB5 | MAR17 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | .004 | .086 | .003 | .023 | .086 | .098 | .055 | .065 | | | | | | |
| 1 | 10 | .000 | .058 | .042 | .037 | .091 | .097 | .074 | .062 | | | | | | |
| 1 | 20 | .001 | .025 | .038 | .039 | .101 | .104 | .048 | .020 | | | | | | |
| 1 | 40 | .000 | .042 | .019 | .018 | .187 | .182 | .160 | .064 | | | | | | |
| 1 | 60 | .000 | .012 | .016 | .036 | .078 | .168 | .289 | .314 | | | | | | |
| 2 | 0 | .000 | .042 | .010 | .084 | .133 | .097 | .051 | .101 | | | | | | |
| 2 | 10 | .000 | .040 | .059 | .045 | .129 | .086 | .060 | .019 | | | | | | |
| 2 | 20 | .007 | .041 | .065 | .072 | .105 | .091 | .079 | .119 | | | | | | |
| 2 | 40 | .001 | .012 | .025 | .043 | .201 | .118 | .096 | .129 | | | | | | |
| 2 | 60 | .000 | .002 | .007 | .006 | .083 | .163 | .153 | .178 | | | | | | |
| 3 | 0 | .000 | .045 | .178 | .067 | .052 | .072 | .097 | .056 | 0.056 | 0.116 | 0.178 | 0.041 | 0.168 | 0.074 |
| 3 | 10 | .015 | .010 | .059 | .069 | .083 | .065 | .034 | .025 | 0.038 | 0.128 | 0.191 | 0.035 | 0.174 | 0.013 |
| 3 | 20 | .001 | .034 | .070 | .088 | .109 | .110 | .063 | .033 | 0.041 | 0.139 | 0.164 | 0.041 | 0.162 | 0.033 |
| 3 | 40 | .000 | .010 | .026 | .056 | .178 | .133 | .139 | .021 | 0.063 | 0.168 | 0.138 | 0.043 | 0.178 | 0.054 |
| 3 | 60 | .000 | .011 | .007 | .009 | .086 | .130 | .216 | .117 | 0.046 | 0.135 | 0.171 | 0.076 | 0.180 | 0.019 |
| 4 | 0 | .000 | .004 | .017 | .037 | .068 | .055 | .070 | .027 | | | | | | |
| 4 | 10 | .000 | .040 | .056 | .144 | .072 | .058 | .054 | .044 | | | | | | |
| 4 | 20 | .000 | .014 | .068 | .100 | .111 | .062 | .083 | .022 | | | | | | |
| 4 | 40 | .000 | .009 | .022 | .054 | .151 | .165 | .146 | .025 | | | | | | |
| 4 | 60 | .000 | .001 | .048 | .048 | .044 | .112 | .306 | .053 | | | | | | |

| LOCATION | DEPTH | MAY30 | JUN19 | JUL10 | JUL25 | AUG9 | AUG19 | AUG29 | SEP12 | OCT14 | NOV22 | DEC12 | FEB5 | MAR17 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 0 | .000 | .027 | .043 | .065 | .097 | .049 | .029 | .087 | | | | | | |
| 5 | 10 | .000 | .000 | .041 | .026 | .055 | .078 | .061 | .044 | | | | | | |
| 5 | 20 | .000 | .022 | .081 | .036 | .069 | .061 | .048 | .105 | | | | | | |
| 5 | 40 | .000 | .027 | .094 | .197 | .163 | .162 | .403 | .234 | | | | | | |
| 5 | 60 | .000 | .072 | .311 | .000 | .522 | .438 | .808 | .000 | | | | | | |
| 6 | 0 | .000 | .000 | .085 | .039 | .057 | .061 | .090 | .041 | | | | | | |
| 6 | 10 | .000 | .010 | .085 | .041 | .054 | .065 | .040 | .072 | | | | | | |
| 6 | 20 | .000 | .000 | .184 | .035 | .102 | .062 | .083 | .065 | | | | | | |
| 6 | 40 | .005 | .032 | .209 | .174 | .274 | .204 | .171 | .219 | | | | | | |
| 7 | 0 | .007 | .016 | .140 | .027 | .082 | .044 | .070 | .126 | 0.150 | 0.087 | 0.128 | 0.057 | 0.225 | 0.034 |
| 7 | 10 | .006 | .015 | .011 | .037 | .097 | .046 | .075 | .039 | 0.196 | 0.105 | 0.132 | 0.062 | 0.132 | 0.017 |
| 7 | 20 | .000 | .000 | .052 | .016 | .127 | .086 | .061 | .051 | 0.129 | 0.074 | 0.140 | 0.044 | 0.116 | 0.007 |
| 7 | 40 | .000 | .027 | .105 | .133 | .260 | .212 | .390 | .200 | 0.143 | 0.111 | 0.122 | 0.065 | 0.097 | 0.046 |
| 7 | 60 | .001 | .022 | .261 | .288 | .426 | .329 | .804 | .593 | 0.175 | 0.112 | 0.131 | NS | 0.263 | 0.032 |
| 8 | 0 | .000 | .000 | .011 | .106 | .118 | .038 | .074 | .053 | | | | | | |
| 8 | 10 | .002 | .002 | .064 | .041 | .053 | .055 | .072 | .035 | | | | | | |
| 8 | 20 | .000 | .000 | .057 | .036 | .172 | .051 | .104 | .099 | | | | | | |
| 8 | 40 | .002 | .010 | .123 | .112 | .447 | .121 | .319 | .135 | | | | | | |
| 8 | 60 | .004 | .011 | .341 | .260 | .650 | .287 | .793 | .497 | | | | | | |

-13E AMMONIA (PPM)

| LOCATION | DEPTH | MAY28 | JUN17 | JUL4 | JUL16 | AUG2 | AUG15 | AUG28 | SEP12 | OCT13 | NOV22 | DEC12 | FEB5 | MAR17 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | NS | .095 | .003 | .012 | .086 | .053 | .031 | .073 | | | | | | |
| 1 | 10 | NS | .064 | .049 | .037 | .088 | .054 | .027 | .036 | | | | | | |
| 1 | 20 | NS | .028 | .042 | .035 | .096 | .066 | .025 | .024 | | | | | | |
| 1 | 40 | NS | .000 | .020 | .012 | .194 | .176 | .018 | .025 | | | | | | |
| 1 | 60 | NS | .012 | .000 | .000 | .031 | .037 | .002 | .000 | | | | | | |
| 2 | 0 | NS | .049 | .010 | .061 | .102 | .078 | .029 | .112 | | | | | | |
| 2 | 10 | NS | .049 | .067 | .047 | .093 | .068 | .031 | .009 | | | | | | |
| 2 | 20 | NS | .047 | .074 | .065 | .096 | .070 | .029 | .112 | | | | | | |
| 2 | 40 | NS | .000 | .027 | .051 | .177 | .153 | .031 | .104 | | | | | | |
| 2 | 60 | NS | .000 | .000 | .039 | .093 | .030 | .013 | .071 | | | | | | |
| 3 | 0 | NS | .054 | .215 | .068 | .046 | .049 | .038 | .035 | 0.023 | 0.010 | 0.014 | 0.010 | 0.04 | 0.061 |
| 3 | 10 | NS | .000 | .067 | .062 | .072 | .047 | .008 | .024 | 0.015 | 0.010 | 0.009 | 0.000 | 0.015 | 0.013 |
| 3 | 20 | NS | .033 | .080 | .082 | .093 | .058 | .045 | .034 | 0.015 | 0.009 | 0.000 | 0.007 | 0.016 | 0.030 |
| 3 | 40 | NS | .007 | .028 | .051 | .180 | .122 | .042 | .016 | 0.038 | 0.020 | 0.010 | 0.000 | 0.016 | 0.056 |
| 3 | 60 | NS | .002 | .006 | .000 | .053 | .063 | .004 | .012 | 0.017 | 0.015 | 0.008 | 0.005 | 0.013 | 0.011 |
| 4 | 0 | NS | .000 | .018 | .036 | .078 | .046 | .056 | .027 | | | | | | |
| 4 | 10 | NS | .033 | .065 | .065 | .077 | .043 | .040 | .021 | | | | | | |
| 4 | 20 | NS | .017 | .080 | .078 | .135 | .051 | .040 | .017 | | | | | | |
| 4 | 40 | NS | .000 | .024 | .057 | .181 | .172 | .040 | .009 | | | | | | |
| 4 | 60 | NS | .000 | .046 | .037 | .046 | .004 | .022 | .004 | | | | | | |
| LOCATION | DEPTH | MAY30 | JUN19 | JUL10 | JUL25 | AUG9 | AUG19 | AUG29 | SEP12 | OCT14 | NOV22 | DEC12 | FEB5 | MAR17 | APR17 |
| 5 | 0 | NS | .000 | .017 | .079 | .117 | .050 | .019 | .076 | | | | | | |
| 5 | 10 | NS | .000 | .025 | .031 | .063 | .058 | .021 | .045 | | | | | | |
| 5 | 20 | NS | .000 | .035 | .044 | .056 | .042 | .025 | .049 | | | | | | |
| 5 | 40 | NS | .000 | .066 | .235 | .197 | .189 | .435 | .125 | | | | | | |
| 5 | 60 | NS | .000 | .339 | NS | .632 | .470 | .923 | NS | | | | | | |
| 6 | 0 | NS | .000 | .080 | .047 | .067 | .050 | .080 | .041 | | | | | | |
| 6 | 10 | NS | .000 | .103 | .050 | .065 | .060 | .034 | .055 | | | | | | |
| 6 | 20 | NS | .000 | .224 | .042 | .122 | .064 | .047 | .069 | | | | | | |
| 6 | 40 | NS | .000 | .254 | .208 | .313 | .225 | .178 | .197 | | | | | | |
| 7 | 0 | NS | .008 | .170 | .019 | .066 | .044 | .054 | .027 | 0.099 | 0.030 | 0.064 | 0.031 | 0.088 | 0.022 |
| 7 | 10 | NS | .000 | .013 | .026 | .080 | .043 | .041 | .039 | 0.187 | 0.061 | 0.073 | 0.021 | 0.031 | 0.005 |
| 7 | 20 | NS | .000 | .063 | .019 | .110 | .053 | .045 | .056 | 0.106 | 0.026 | 0.074 | 0.018 | 0.026 | 0.007 |
| 7 | 40 | NS | .000 | .126 | .146 | .257 | .234 | .455 | .142 | 0.109 | 0.060 | 0.063 | 0.040 | 0.000 | 0.038 |
| 7 | 60 | NS | .000 | .306 | .326 | .480 | .380 | .958 | .609 | 0.152 | 0.051 | 0.066 | NS | 0.098 | 0.029 |
| 8 | 0 | NS | .000 | .013 | .019 | .100 | .044 | .057 | .054 | | | | | | |
| 8 | 10 | NS | .000 | .078 | .023 | .029 | .042 | .054 | .039 | | | | | | |
| 8 | 20 | NS | .000 | .069 | .027 | .110 | .054 | .068 | .087 | | | | | | |
| 8 | 40 | NS | .000 | .147 | .127 | .485 | .145 | .348 | .158 | | | | | | |
| 8 | 60 | NS | .000 | .401 | .310 | .743 | .284 | .940 | .602 | | | | | | |

-13F NITRITE (PPM)

| LOCATION | DEPTH | MAY28 | JUN17 | JUL4 | JUL16 | AUG2 | AUG15 | AUG28 | SEP12 | OCT13 | NOV22 | DEC12 | FEB5 | MAR17 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | .000 | .008 | .004 | .005 | .007 | .004 | .009 | .002 | | | | | | |
| 1 | 10 | .000 | .002 | .007 | .006 | .000 | .009 | .017 | .001 | | | | | | |
| 1 | 20 | .002 | .005 | .010 | .003 | .004 | .000 | .015 | .000 | | | | | | |
| 1 | 40 | .000 | .002 | .009 | .003 | .008 | .007 | .014 | .020 | | | | | | |
| 1 | 60 | .000 | .006 | .001 | .006 | .014 | .004 | .003 | .001 | | | | | | |
| 2 | 0 | .000 | .006 | .005 | .000 | .004 | .000 | .006 | .000 | | | | | | |
| 2 | 10 | .000 | .000 | .014 | .003 | .006 | .000 | .005 | .002 | | | | | | |
| 2 | 20 | .000 | .000 | .003 | .007 | .000 | .000 | .014 | .002 | | | | | | |
| 2 | 40 | .002 | .000 | .008 | .002 | .001 | .000 | .020 | .023 | | | | | | |
| 2 | 60 | .000 | .006 | .005 | .003 | .002 | .005 | .003 | .002 | | | | | | |
| 3 | 0 | .000 | .002 | .002 | .000 | .004 | .002 | .010 | .001 | 0.008 | 0.007 | 0.008 | 0.005 | 0.005 | 0.005 |
| 3 | 10 | .004 | .001 | .012 | .007 | .001 | .000 | .019 | .001 | 0.008 | 0.007 | 0.007 | 0.007 | 0.005 | 0.004 |
| 3 | 20 | .003 | .003 | .014 | .007 | .006 | .000 | .010 | .006 | 0.008 | 0.006 | 0.007 | 0.003 | 0.003 | 0.004 |
| 3 | 40 | .000 | .001 | .000 | .004 | .002 | .005 | .000 | .016 | 0.006 | 0.008 | 0.005 | 0.002 | 0.002 | 0.005 |
| 3 | 60 | .001 | .003 | .008 | .006 | .021 | .000 | .020 | .000 | 0.007 | 0.009 | 0.004 | 0.005 | 0.005 | 0.003 |
| 4 | 0 | .000 | .006 | .005 | .000 | .014 | .002 | .014 | .004 | | | | | | |
| 4 | 10 | .000 | .003 | .007 | .008 | .004 | .000 | .012 | .001 | | | | | | |
| 4 | 20 | .000 | .001 | .007 | .000 | .001 | .000 | NS | .003 | | | | | | |
| 4 | 40 | .000 | .004 | .006 | .000 | .006 | .005 | .036 | .015 | | | | | | |
| 4 | 60 | .000 | .005 | .003 | .003 | .020 | .000 | .006 | .002 | | | | | | |
| LOCATION | DEPTH | MAY30 | JUN19 | JUL10 | JUL25 | AUG9 | AUG19 | AUG29 | SEP12 | OCT14 | NOV22 | DEC12 | FEB5 | MAR17 | APR17 |
| 5 | 0 | .000 | .000 | .000 | .000 | .003 | .002 | .005 | .005 | | | | | | |
| 5 | 10 | .000 | .000 | .000 | .000 | .009 | .006 | .003 | .003 | | | | | | |
| 5 | 20 | .000 | .000 | .000 | .000 | .008 | .000 | .004 | .004 | | | | | | |
| 5 | 40 | .000 | .000 | .005 | .000 | .003 | .001 | .005 | .002 | | | | | | |
| 5 | 60 | .000 | .000 | .022 | .000 | .006 | .042 | .006 | NS | | | | | | |
| 6 | 0 | .000 | .000 | .000 | .000 | .005 | .000 | .004 | .003 | | | | | | |
| 6 | 10 | .000 | .000 | .000 | .000 | .000 | .002 | .003 | .003 | | | | | | |
| 6 | 20 | .000 | .000 | .000 | .000 | .005 | .003 | .002 | .002 | | | | | | |
| 6 | 40 | .000 | .000 | .000 | .006 | .005 | .001 | .003 | .002 | | | | | | |
| 7 | 0 | .000 | .005 | .000 | .000 | .000 | .001 | .005 | .005 | 0.006 | 0.011 | 0.009 | 0.004 | 0.009 | 0.003 |
| 7 | 10 | .000 | .000 | .000 | .000 | .003 | .004 | .005 | .006 | 0.005 | 0.010 | 0.008 | 0.007 | 0.012 | 0.006 |
| 7 | 20 | .000 | .000 | .001 | .000 | .003 | .005 | .007 | .006 | 0.007 | 0.009 | 0.010 | 0.005 | 0.007 | 0.004 |
| 7 | 40 | .000 | .000 | .003 | .000 | .000 | .002 | .006 | .006 | 0.006 | 0.012 | 0.009 | 0.006 | 0.003 | 0.003 |
| 7 | 60 | .002 | .000 | .031 | .000 | .003 | .004 | .006 | .006 | 0.005 | 0.012 | 0.009 | NS | 0.001 | 0.005 |
| 8 | 0 | .000 | .000 | .000 | .000 | .003 | .000 | .001 | .005 | | | | | | |
| 8 | 10 | .000 | .000 | .000 | .000 | .000 | .001 | .004 | .004 | | | | | | |
| 8 | 20 | .000 | .000 | .000 | .000 | .006 | .004 | .003 | .007 | | | | | | |
| 8 | 40 | .000 | .000 | .003 | .001 | .005 | .002 | .006 | .006 | | | | | | |
| 8 | 60 | .015 | .001 | .037 | .000 | .000 | .006 | .009 | .005 | | | | | | |

13G NITRATE (PPM)

| LOCATION | DEPTH | MAY28 | JUN17 | JUL4 | JUL16 | AUG2 | AUG15 | AUG28 | SEP12 | OCT13 | NOV22 | DEC12 | FEB5 | MAR17 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | .018 | .027 | .000 | .047 | .058 | .235 | .106 | .018 | | | | | | |
| 1 | 10 | .000 | .018 | .000 | .022 | .080 | .217 | .208 | .142 | | | | | | |
| 1 | 20 | .000 | .000 | .000 | .038 | .093 | .221 | .098 | .000 | | | | | | |
| 1 | 40 | .000 | .180 | .000 | .022 | .115 | .155 | .625 | .164 | | | | | | |
| 1 | 60 | .000 | .000 | .071 | .149 | .213 | .602 | 1.250 | 1.391 | | | | | | |
| 2 | 0 | .000 | .000 | .000 | .000 | .213 | .146 | .111 | .044 | | | | | | |
| 2 | 10 | .000 | .000 | .000 | .020 | .221 | .133 | .142 | .049 | | | | | | |
| 2 | 20 | .031 | .009 | .013 | .069 | .115 | .146 | .226 | .115 | | | | | | |
| 2 | 40 | .000 | .053 | .000 | .000 | .235 | .080 | .283 | .071 | | | | | | |
| 2 | 60 | .000 | .000 | .000 | .024 | .142 | .483 | .625 | .523 | | | | | | |
| 3 | 0 | .000 | .000 | .000 | .049 | .058 | .137 | .279 | .120 | 0.151 | 0.470 | 0.727 | 0.133 | 0.590 | 0.102 |
| 3 | 10 | .062 | .044 | .000 | .071 | .106 | .115 | .098 | .122 | 0.106 | 0.523 | 0.807 | 0.146 | 0.710 | 0.004 |
| 3 | 20 | .000 | .027 | .000 | .080 | .133 | .274 | .106 | .013 | 0.120 | 0.576 | 0.718 | 0.151 | 0.656 | 0.031 |
| 3 | 40 | .000 | .018 | .013 | .056 | .128 | .137 | .461 | .013 | 0.133 | 0.665 | 0.572 | 0.186 | 0.723 | 0.031 |
| 3 | 60 | .000 | .035 | .000 | .029 | .159 | .354 | .917 | .475 | 0.133 | 0.532 | 0.723 | 0.310 | 0.750 | 0.040 |
| 4 | 0 | .000 | .009 | .000 | .029 | NS | .075 | .089 | .018 | | | | | | |
| 4 | 10 | .000 | .053 | .000 | .387 | .035 | .102 | .075 | .120 | | | | | | |
| 4 | 20 | .000 | .000 | .000 | .160 | .000 | .089 | .221 | .032 | | | | | | |
| 4 | 40 | .000 | .035 | .000 | .029 | .000 | .093 | .452 | .058 | | | | | | |
| 4 | 60 | .000 | .000 | .040 | .076 | .000 | .483 | 1.250 | .217 | | | | | | |
| LOCATION | DEPTH | MAY30 | JUN19 | JUL10 | JUL25 | AUG9 | AUG19 | AUG29 | SEP12 | OCT14 | NOV22 | DEC12 | FEB5 | MAR17 | APR17 |
| 5 | 0 | .000 | .120 | .128 | .000 | .000 | .031 | .049 | .098 | | | | | | |
| 5 | 10 | .000 | .000 | .089 | .000 | .000 | .124 | .190 | .027 | | | | | | |
| 5 | 20 | .000 | .097 | .252 | .024 | .093 | .115 | .115 | .284 | | | | | | |
| 5 | 40 | .000 | .120 | .168 | .000 | .000 | .027 | .190 | .576 | | | | | | |
| 5 | 60 | .000 | .319 | .110 | .000 | .000 | .168 | .204 | NS | | | | | | |
| 6 | 0 | .000 | .000 | .084 | .000 | .000 | .089 | .102 | .027 | | | | | | |
| 6 | 10 | .000 | .044 | .000 | .000 | .000 | .067 | .049 | .115 | | | | | | |
| 6 | 20 | .000 | .000 | .000 | .000 | .000 | .035 | .190 | .032 | | | | | | |
| 6 | 40 | .020 | .142 | .000 | .000 | .062 | .084 | .102 | .248 | | | | | | |
| 7 | 0 | .030 | .035 | .000 | .049 | .122 | .035 | .102 | .452 | 0.293 | 0.261 | 0.319 | 0.138 | 0.723 | 0.067 |
| 7 | 10 | .024 | .066 | .000 | .071 | .132 | .044 | .173 | .022 | 0.182 | 0.231 | 0.310 | 0.191 | 0.452 | 0.049 |
| 7 | 20 | .000 | .000 | .000 | .000 | .157 | .177 | .098 | .013 | 0.177 | 0.222 | 0.337 | 0.124 | 0.417 | 0.000 |
| 7 | 40 | .000 | .120 | .000 | .058 | .211 | .080 | .058 | .802 | 0.226 | 0.257 | 0.297 | 0.133 | 0.425 | 0.067 |
| 7 | 60 | .000 | .097 | .000 | .089 | .122 | .067 | .055 | .093 | 0.217 | 0.293 | 0.328 | NS | 0.886 | 0.031 |
| 8 | 0 | .000 | .000 | .000 | .106 | .157 | .013 | .120 | .027 | | | | | | |
| 8 | 10 | .010 | .009 | .000 | .098 | .130 | .089 | .115 | .009 | | | | | | |
| 8 | 20 | .000 | .000 | .000 | .062 | .349 | .022 | .208 | .111 | | | | | | |
| 8 | 40 | .010 | .044 | .000 | .035 | .202 | .004 | .142 | .013 | | | | | | |
| 8 | 60 | .000 | .044 | .000 | .000 | .170 | .226 | .067 | .000 | | | | | | |

# OSOYOOS LAKE TRANSECTS 73 -

-14 PHOSPHATE

-14A TOTAL PHOSPHATE (PPM)

| LOCATION | DEPTH | MAY28 | JUN17 | JUL4 | JUL16 | AUG2 | AUG15 | AUG28 | SEP12 | OCT13 | NOV22 | DEC12 | FEB5 | MAR17 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | .028 | .033 | .010 | .206 | .057 | .060 | .107 | .062 | | | | | | |
| 1 | 10 | .038 | .000 | .013 | .166 | .119 | .030 | .039 | .044 | | | | | | |
| 1 | 20 | .015 | .028 | .057 | .099 | .083 | .040 | .098 | .026 | | | | | | |
| 1 | 40 | .025 | .000 | .010 | .080 | .123 | .030 | .133 | .147 | | | | | | |
| 1 | 60 | .030 | .000 | .010 | .046 | .006 | .029 | .117 | .073 | | | | | | |
| 2 | 0 | .028 | .000 | .012 | .084 | .125 | .027 | .081 | .059 | | | | | | |
| 2 | 10 | .025 | .000 | .065 | .041 | .083 | .029 | .178 | .080 | | | | | | |
| 2 | 20 | .030 | .028 | .068 | .095 | .135 | .048 | .069 | .062 | | | | | | |
| 2 | 40 | .028 | .031 | .043 | .069 | .048 | .055 | .117 | .116 | | | | | | |
| 2 | 60 | .038 | .000 | .068 | .064 | .018 | .038 | .133 | .080 | | | | | | |
| 3 | 0 | .033 | .000 | .013 | .103 | .027 | .023 | .058 | .100 | 0.022 | 0.053 | 0.09 | 0.070 | 0.053 | 0.020 |
| 3 | 10 | .038 | .028 | .067 | .103 | .243 | .010 | .104 | .047 | 0.090 | 0.079 | 0.096 | 0.105 | 0.083 | 0.017 |
| 3 | 20 | .033 | .025 | .057 | .131 | .119 | .065 | .215 | .073 | 0.061 | 0.089 | 0.100 | 0.082 | 0.083 | 0.020 |
| 3 | 40 | .030 | .000 | .043 | .095 | .285 | .027 | .075 | .097 | 0.038 | 0.136 | 0.115 | 0.119 | 0.075 | 0.033 |
| 3 | 60 | .038 | .210 | .223 | .103 | .123 | .040 | .088 | .137 | 0.025 | 0.127 | 0.054 | 0.076 | 0.120 | 0.030 |
| 4 | 0 | .040 | .025 | .010 | .110 | .252 | .032 | .085 | .111 | | | | | | |
| 4 | 10 | .040 | .000 | .250 | .110 | .135 | .076 | .065 | .097 | | | | | | |
| 4 | 20 | .025 | .038 | .230 | .100 | .060 | .042 | .120 | .077 | | | | | | |
| 4 | 40 | .038 | .038 | .065 | .105 | .088 | .068 | .114 | .023 | | | | | | |
| 4 | 60 | .040 | .053 | .010 | .070 | .057 | .023 | .069 | .050 | | | | | | |
| LOCATION | DEPTH | MAY30 | JUN19 | JUL10 | JUL25 | AUG9 | AUG19 | AUG29 | SEP12 | OCT14 | NOV22 | DEC12 | FEB5 | MAR17 | APR17 |
| 5 | 0 | .323 | .000 | .013 | .070 | .042 | .073 | .011 | .088 | | | | | | |
| 5 | 10 | .140 | .000 | .015 | .095 | .115 | .093 | .025 | .053 | | | | | | |
| 5 | 20 | .107 | .000 | .015 | .067 | .148 | .104 | .053 | .162 | | | | | | |
| 5 | 40 | NS | .000 | .063 | .120 | .080 | .100 | .028 | .137 | | | | | | |
| 5 | 60 | .083 | .040 | .063 | NS | .133 | .381 | .077 | NS | | | | | | |
| 6 | 0 | .030 | .000 | .134 | .047 | .209 | .100 | .065 | .097 | | | | | | |
| 6 | 10 | .040 | .000 | .015 | .085 | .169 | .083 | .163 | .074 | | | | | | |
| 6 | 20 | .030 | .050 | .015 | .093 | .198 | .104 | .003 | .088 | | | | | | |
| 6 | 40 | .040 | .000 | .021 | .143 | .106 | .110 | .065 | .088 | | | | | | |
| 7 | 0 | .000 | .000 | .035 | .343 | .120 | .062 | .028 | .094 | 0.042 | 0.093 | 0.045 | 0.040 | 0.113 | 0.037 |
| 7 | 10 | .000 | .000 | .011 | .195 | .135 | .093 | .020 | .155 | 0.118 | 0.044 | 0.035 | 0.056 | 0.098 | 0.030 |
| 7 | 20 | .000 | .000 | .025 | .200 | .104 | .083 | .016 | .056 | 0.046 | 0.115 | 0.052 | 0.070 | 0.120 | 0.030 |
| 7 | 40 | .000 | .000 | .039 | .175 | .198 | .097 | .068 | .071 | 0.050 | 0.069 | 0.028 | 0.065 | 0.090 | 0.030 |
| 7 | 60 | .000 | .000 | .021 | .095 | .163 | .097 | .068 | .142 | 0.063 | 0.108 | 0.083 | NS | 0.135 | 0.037 |
| 8 | 0 | .010 | .000 | .013 | .085 | .085 | .104 | .075 | .053 | | | | | | |
| 8 | 10 | .000 | .000 | .015 | .105 | .109 | .146 | .018 | .056 | | | | | | |
| 8 | 20 | .000 | .000 | .011 | .080 | .097 | .080 | .033 | .010 | | | | | | |
| 8 | 40 | .000 | .000 | .021 | .095 | .169 | .107 | .071 | .125 | | | | | | |
| 8 | 60 | .000 | .000 | .063 | .215 | .151 | .170 | .099 | .179 | | | | | | |

-14B PHOSPHATE PHOSPHORUS (PPM)

| LOCATION | DEPTH | MAY28 | JUN17 | JUL4 | JUL16 | AUG2 | AUG15 | AUG28 | SEP12 | OCT13 | NOV22 | DEC12 | FEB5 | MAR17 | APR17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | .009 | .011 | .003 | .067 | .019 | .020 | .035 | .020 | | | | | | |
| 1 | 10 | .012 | .000 | .004 | .054 | .037 | .009 | .013 | .014 | | | | | | |
| 1 | 20 | .005 | .009 | .018 | .032 | .025 | .012 | .032 | .008 | | | | | | |
| 1 | 40 | .008 | .000 | .003 | .026 | .040 | .009 | .043 | .048 | | | | | | |
| 1 | 60 | .009 | .000 | .003 | .015 | .002 | .009 | .038 | .024 | | | | | | |
| 2 | 0 | .009 | .000 | .004 | .027 | .040 | .008 | .025 | .019 | | | | | | |
| 2 | 10 | .008 | .000 | .021 | .013 | .027 | .009 | .058 | .026 | | | | | | |
| 2 | 20 | .010 | .009 | .022 | .031 | .044 | .016 | .023 | .020 | | | | | | |
| 2 | 40 | .010 | .010 | .014 | .023 | .015 | .018 | .038 | .038 | | | | | | |
| 2 | 60 | .012 | .000 | .022 | .021 | .006 | .012 | .043 | .026 | | | | | | |
| 3 | 0 | .011 | .000 | .004 | .034 | .008 | .007 | .019 | .031 | 0.007 | 0.017 | 0.029 | 0.023 | 0.017 | 0.007 |
| 3 | 10 | .012 | .009 | .022 | .034 | .079 | .003 | .034 | .015 | 0.029 | 0.026 | 0.031 | 0.034 | 0.027 | 0.006 |
| 3 | 20 | .011 | .008 | .019 | .040 | .039 | .021 | .070 | .024 | 0.02 | 0.029 | 0.033 | 0.027 | 0.027 | 0.007 |
| 3 | 40 | .010 | .000 | .014 | .029 | .093 | .008 | .025 | .032 | 0.012 | 0.044 | 0.038 | 0.039 | 0.025 | 0.011 |
| 3 | 60 | .012 | .069 | .068 | .034 | .040 | .013 | .029 | .045 | 0.008 | 0.041 | 0.018 | 0.025 | 0.039 | 0.010 |
| 4 | 0 | .013 | .008 | .003 | .036 | .082 | .010 | .028 | .036 | | | | | | |
| 4 | 10 | .013 | .000 | .082 | .036 | .044 | .025 | .021 | .032 | | | | | | |
| 4 | 20 | .008 | .013 | .075 | .031 | .020 | .014 | .039 | .024 | | | | | | |
| 4 | 40 | .013 | .013 | .020 | .032 | .029 | .022 | .037 | .007 | | | | | | |
| 4 | 60 | .013 | .017 | .003 | .023 | .019 | .007 | .023 | .016 | | | | | | |
| LOCATION | DEPTH | MAY30 | JUN19 | JUL10 | JUL25 | AUG9 | AUG19 | AUG29 | SEP12 | OCT14 | NOV22 | DEC12 | FEB5 | MAR17 | APR17 |
| 5 | 0 | .106 | .000 | .004 | .023 | .014 | .022 | .003 | .029 | | | | | | |
| 5 | 10 | .043 | .000 | .005 | .029 | .038 | .029 | .008 | .017 | | | | | | |
| 5 | 20 | .035 | .000 | .005 | .022 | .048 | .032 | .017 | .053 | | | | | | |
| 5 | 40 | NS | .000 | .021 | .039 | .026 | .031 | .009 | .045 | | | | | | |
| 5 | 60 | .026 | .013 | .023 | NS | .043 | .124 | .025 | NS | | | | | | |
| 6 | 0 | .010 | .000 | .004 | .015 | .068 | .033 | .021 | .032 | | | | | | |
| 6 | 10 | .013 | .000 | .005 | .028 | .055 | .027 | .053 | .023 | | | | | | |
| 6 | 20 | .010 | .000 | .005 | .031 | .065 | .034 | .001 | .027 | | | | | | |
| 6 | 40 | .013 | .000 | .007 | .047 | .035 | .036 | .021 | .027 | | | | | | |
| 7 | 0 | .000 | .000 | .011 | .112 | .039 | .020 | .009 | .031 | 0.014 | 0.03 | 0.015 | 0.013 | 0.037 | 0.012 |
| 7 | 10 | .000 | .000 | .004 | .064 | .044 | .030 | .007 | .051 | 0.039 | 0.014 | 0.011 | 0.018 | 0.032 | 0.010 |
| 7 | 20 | .000 | .000 | .008 | .061 | .034 | .027 | .005 | .018 | 0.015 | 0.038 | 0.017 | 0.023 | 0.039 | 0.010 |
| 7 | 40 | .000 | .000 | .013 | .057 | .065 | .032 | .022 | .023 | 0.016 | 0.023 | 0.009 | 0.021 | 0.029 | 0.010 |
| 7 | 60 | .000 | .000 | .007 | .031 | .053 | .032 | .022 | .046 | 0.021 | 0.035 | 0.027 | NS | 0.044 | 0.012 |
| 8 | 0 | .003 | .000 | .004 | .028 | .026 | .034 | .025 | .017 | | | | | | |
| 8 | 10 | .000 | .000 | .005 | .034 | .036 | .048 | .006 | .018 | | | | | | |
| 8 | 20 | .000 | .000 | .004 | .026 | .030 | .025 | .011 | .003 | | | | | | |
| 8 | 40 | .000 | .000 | .007 | .031 | .055 | .035 | .023 | .041 | | | | | | |
| 8 | 60 | .000 | .000 | .021 | .070 | .049 | .055 | .032 | .058 | | | | | | |

-15 N/P RATIO

| Location | Depth | May 28 | Jun 17 | Jul 4 | Jul 16 | Aug 2 | Aug 15 | Aug 28 | Sep 12 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0.444 | 7.818 | 1.000 | 0.343 | 4.526 | 4.900 | 1.571 | 3.250 |
| 1 | 10 | 0.000 | NS | 10.500 | 0.685 | 2.459 | 10.778 | 5.692 | 4.429 |
| 1 | 20 | 0.200 | 2.778 | 2.111 | 1.219 | 4.040 | 8.667 | 1.500 | 2.500 |
| 1 | 40 | 0.000 | NS | 6.333 | 0.692 | 4.675 | 20.222 | 3.721 | 1.333 |
| 1 | 60 | 0.000 | NS | 5.333 | 2.400 | 39.000 | 18.667 | 7.605 | 13.083 |
| 2 | 0 | 0.000 | NS | 2.500 | 3.111 | 3.325 | 12.125 | 2.040 | 5.316 |
| 2 | 10 | 0.000 | NS | 2.810 | 3.462 | 4.778 | 9.556 | 1.034 | 0.731 |
| 2 | 20 | 0.700 | 4.556 | 2.955 | 2.323 | 2.386 | 5.687 | 3.435 | 5.950 |
| 2 | 40 | 0.100 | 1.200 | 1.786 | 1.870 | 13.400 | 6.556 | 2.526 | 3.395 |
| 2 | 60 | 0.000 | NS | 0.318 | 0.286 | 13.833 | 13.583 | 3.558 | 6.846 |
| 3 | 0 | 0.000 | NS | 44.500 | 1.971 | 6.500 | 10.286 | 5.105 | 1.806 |
| 3 | 10 | 1.250 | 1.111 | 2.682 | 2.029 | 1.051 | 21.667 | 1.000 | 1.667 |
| 3 | 20 | 0.091 | 4.250 | 3.684 | 2.200 | 2.795 | 5.238 | 0.900 | 1.375 |
| 3 | 40 | 0.000 | NS | 1.857 | 1.931 | 1.914 | 16.625 | 5.560 | 0.656 |
| 3 | 60 | 0.000 | 0.159 | 0.103 | 0.265 | 2.150 | 10.000 | 7.448 | 2.600 |
| 4 | 0 | 0.000 | 0.500 | 5.667 | 1.028 | 0.829 | 5.500 | 2.500 | 0.750 |
| 4 | 10 | 0.000 | NS | 0.683 | 4.000 | 1.636 | 2.320 | 2.571 | 1.375 |
| 4 | 20 | 0.000 | 1.077 | 0.907 | 3.226 | 5.550 | 4.429 | 2.128 | 0.917 |
| 4 | 40 | 0.000 | 0.692 | 1.100 | 1.687 | 5.207 | 7.500 | 3.946 | 3.571 |
| 4 | 60 | 0.000 | 0.059 | 16.000 | 2.087 | 2.316 | 16.000 | 13.304 | 3.312 |
| | | May 30 | Jun 19 | Jul 10 | Jul 25 | Aug 9 | Aug 19 | Aug 29 | Sep 12 |
| 5 | 0 | 0.000 | NS | 10.750 | 2.826 | 6.929 | 2.227 | 9.667 | 3.000 |
| 5 | 10 | 0.000 | NS | 8.200 | 0.897 | 1.447 | 2.690 | 7.625 | 2.588 |
| 5 | 20 | 0.000 | NS | 16.200 | 1.636 | 1.438 | 1.906 | 2.824 | 1.981 |
| 5 | 40 | NS | NS | 4.476 | 5.051 | 6.269 | 5.226 | 44.778 | 5.200 |
| 5 | 60 | 0.000 | 5.538 | 13.522 | NS | 12.140 | 3.532 | 32.320 | NS |
| 6 | 0 | 0.000 | NS | 21.250 | 2.600 | 0.838 | 1.848 | 4.286 | 1.281 |
| 6 | 10 | 0.000 | NS | 17.000 | 1.464 | 0.982 | 2.407 | 0.755 | 3.130 |
| 6 | 20 | 0.000 | NS | 36.800 | 1.129 | 1.569 | 1.824 | 83.000 | 2.407 |
| 6 | 40 | 0.385 | NS | 29.857 | 3.702 | 7.829 | 5.667 | 8.143 | 8.111 |
| 6 | 60 | NS | NS | NS | NS | NS | NS | NS | NS |
| 7 | 0 | NS | NS | 12.727 | 0.241 | 2.103 | 2.200 | 7.778 | 4.065 |
| 7 | 10 | NS | NS | 2.750 | 0.578 | 2.205 | 1.533 | 10.714 | 0.765 |
| 7 | 20 | NS | NS | 6.500 | 0.262 | 3.735 | 3.185 | 12.200 | 2.833 |
| 7 | 40 | NS | NS | 8.077 | 2.333 | 4.000 | 6.625 | 17.727 | 8.696 |
| 7 | 60 | NS | NS | 37.286 | 9.290 | 8.038 | 10.281 | 36.545 | 12.891 |
| 8 | 0 | 0.000 | NS | 2.750 | 3.786 | 4.538 | 1.118 | 2.960 | 3.118 |
| 8 | 10 | NS | NS | 12.800 | 1.206 | 1.472 | 1.146 | 12.000 | 1.944 |
| 8 | 20 | NS | NS | 14.250 | 1.385 | 5.733 | 2.040 | 9.455 | 33.000 |
| 8 | 40 | NS | NS | 17.571 | 3.613 | 8.127 | 3.457 | 13.870 | 3.293 |
| 8 | 60 | NS | NS | 16.238 | 3.714 | 13.265 | 5.218 | 24.781 | 8.569 |

APPENDIX VI MISCELLANEOUS SAMPLES

AMMONIA (PPM)

| LOCATION | JUN 6 | JUN19 | JUL 5 | JUL24 | AUG 6 | AUG20 |
|---|---|---|---|---|---|---|
| OR 1 | .000 | NS | .032 | .005 | .027 | .001 |
| OR 2 | .000 | NS | .418 | .320 | .171 | .477 |
| OR 3 | NS | NS | .000 | .000 | .000 | .000 |
| SC | NS | NS | .000 | .085 | .011 | .000 |
| TL | .051 | NS | .057 | .022 | .008 | .085 |
| OY PL | .056 | NS | .136 | .000 | .165 | .245 |
| OY OD | .000 | NS | .000 | .042 | .000 | .001 |
| OY SS | .075 | NS | .077 | .000 | .000 | .011 |
| MC | .000 | NS | .061 | .011 | .000 | .000 |
| PR | .006 | .027 | .028 | NS | NS | NS |

AMMONIA NITROGEN (PPM)

| LOCATION | JUN 6 | JUN19 | JUL 5 | JUL24 | AUG 6 | AUG20 |
|---|---|---|---|---|---|---|
| OR 1 | .000 | NS | .026 | .004 | .022 | .001 |
| OR 2 | .000 | NS | .344 | .264 | .141 | .393 |
| OR 3 | NS | NS | .000 | .000 | .000 | .000 |
| SC | NS | NS | .000 | .070 | .009 | .000 |
| TL | .042 | NS | .047 | .018 | .007 | .070 |
| OY PL | .046 | NS | .112 | .000 | .136 | .202 |
| OY OD | .000 | NS | .000 | .035 | .000 | .001 |
| OY SS | .062 | NS | .063 | .000 | .000 | .009 |
| MC | .000 | NS | .050 | .009 | .000 | .000 |
| PR | .005 | .022 | .023 | NS | NS | NS |

TOTAL NITROGEN (PPM)

| LOCATION | JUN 6 | JUN19 | JUL 5 | JUL24 | AUG 6 | AUG20 |
|---|---|---|---|---|---|---|
| OR 1 | .009 | .014 | .034 | .008 | .030 | .077 |
| OR 2 | .014 | .011 | .370 | .286 | .158 | .419 |
| OR 3 | NS | .035 | .155 | .642 | .169 | .192 |
| SC | .030 | .020 | .013 | .139 | .022 | .035 |
| TL | .053 | .014 | .049 | .032 | .015 | .280 |
| OY PL | .197 | .061 | .296 | .083 | .171 | .457 |
| OY OD | 3.201 | 2.780 | 4.742 | .636 | .037 | 4.562 |
| OY SS | 1.534 | 1.377 | 1.106 | .555 | .159 | 1.183 |
| MC | .071 | .025 | .121 | .027 | .011 | .039 |
| PR | .046 | .064 | .045 | NS | NS | NS |

NITRITE (PPM)

| LOCATION | JUN 6 | JUN19 | JUL 5 | JUL24 | AUG 6 | AUG20 |
|---|---|---|---|---|---|---|
| OR 1 | .000 | .014 | .004 | .002 | .002 | .003 |
| OR 2 | .000 | .003 | .019 | .021 | .002 | .019 |
| OR 3 | NS | .020 | .016 | .015 | .038 | .020 |
| SC | .010 | .000 | .004 | .003 | .000 | .003 |
| TL | .010 | .000 | .007 | .008 | .008 | .006 |
| OY PL | .035 | .022 | .045 | .069 | .077 | .119 |
| OY OD | .004 | .000 | .007 | .004 | .006 | .003 |
| OY SS | .068 | .087 | .140 | .150 | .161 | .143 |
| MC | .005 | .000 | .004 | .000 | .000 | .011 |
| PR | .001 | .004 | .007 | NS | NS | NS |

TOTAL PHOSPHOROUS (PPM)

| LOCATION | JUN 6 | JUN19 | JUL 5 | JUL24 | AUG 6 | AUG20 |
|---|---|---|---|---|---|---|
| OR 1 | .000 | .023 | .000 | .000 | .000 | .019 |
| OR 2 | .108 | .023 | .078 | .094 | .079 | .062 |
| OR 3 | .050 | .065 | .024 | .063 | NS | .024 |
| SC | .010 | .010 | .019 | .016 | .000 | .018 |
| TL | .016 | .000 | .016 | .033 | .024 | .016 |
| OY PL | .017 | .000 | .016 | .040 | .044 | .047 |
| OY OD | .011 | .010 | .017 | .025 | .025 | .032 |
| OY SS | .000 | .000 | .016 | .000 | .000 | .022 |
| MC | .000 | .000 | .021 | .010 | .010 | .021 |
| PR | .000 | .000 | .013 | NS | NS | NS |

PHOSPHATE (PPM)

| LOCATION | JUN 6 | JUN19 | JUL 5 | JUL24 | AUG 6 | AUG20 |
|---|---|---|---|---|---|---|
| OR 1 | .000 | .070 | .000 | .000 | .000 | .058 |
| OR 2 | .320 | .070 | .240 | .288 | .241 | .190 |
| OR 3 | .152 | .200 | .207 | .191 | NS | .072 |
| SC | .030 | .030 | .059 | .049 | .000 | .055 |
| TL | .050 | .000 | .048 | .100 | .070 | .050 |
| OY PL | .052 | .000 | .048 | .123 | .135 | .145 |
| OY OD | .035 | .030 | .052 | .076 | .076 | .098 |
| OY SS | .000 | .000 | .049 | .000 | .000 | .067 |
| MC | .000 | .000 | .065 | .031 | .031 | .065 |
| PR | .000 | .000 | .040 | NS | NS | NS |

MAGNESIUM (PPM)

| LOCATION | JUN 6 | JUN19 | JUL 5 | JUL24 | AUG 6 | AUG20 |
|---|---|---|---|---|---|---|
| OR 1 | 8.8 | 7.2 | 8.6 | 11.4 | 8.8 | 8.2 |
| OR 2 | 8.8 | 6.3 | 9.6 | 11.1 | 8.9 | 8.0 |
| OR 3 | NS | 6.2 | 1.1 | 6.3 | 1.1 | 1.5 |
| SC | 2.4 | 3.8 | 4.8 | 9.1 | 9.8 | 9.3 |
| TL | 15.9 | 16.5 | 15.6 | 17.5 | 17.0 | 15.2 |
| OY PL | 19.0 | 16.5 | 19.6 | 20.0 | 20.4 | 18.0 |
| OY OD | 37.8 | 20.0 | 31.5 | 30.6 | 38.3 | 35.7 |
| OY SS | 130.0 | 50.0 | 58.4 | 90.8 | 66.0 | 54.8 |
| MC | 1.6 | 1.6 | 3.5 | 4.0 | 5.1 | 5.0 |
| PR | 31.8 | 33.3 | 31.8 | NS | NS | NS |

CALCIUM (PPM)

| LOCATION | JUN 6 | JUN19 | JUL 5 | JUL24 | AUG 6 | AUG20 |
|---|---|---|---|---|---|---|
| OR 1 | 28.3 | 32.1 | 22.5 | 24.8 | 23.2 | 30.4 |
| OR 2 | 31.8 | 27.2 | 28.1 | 29.5 | 14.4 | 29.6 |
| OR 3 | NS | 20.0 | 7.7 | 5.6 | 4.8 | 8.0 |
| SC | 11.2 | 13.6 | 23.2 | 24.8 | 20.8 | 26.4 |
| TL | 26.7 | 34.7 | 24.6 | 23.2 | 23.2 | 28.8 |
| OY PL | 30.2 | 36.9 | 33.8 | 28.8 | 24.0 | 56.8 |
| OY OD | 52.6 | 48.1 | 61.1 | 48.0 | 89.6 | 73.6 |
| OY SS | 186.0 | 168.2 | 216.0 | 209.0 | 216.0 | 128.0 |
| MC | 4.2 | 6.4 | 10.9 | 13.6 | 14.4 | 24.0 |
| PR | 46.3 | 32.2 | 32.2 | NS | NS | NS |

CHLORIDE (PPM)

| LOCATION | JUN 6 | JUN19 | JUL 5 | JUL24 | AUG 6 | AUG20 |
|---|---|---|---|---|---|---|
| OR 1 | 2.5 | 3.2 | 1.6 | 1.2 | 1.0 | 1.2 |
| OR 2 | 2.4 | 3.0 | 2.0 | 1.5 | 1.5 | 1.5 |
| OR 3 | NS | 6.0 | 2.6 | 3.0 | 3.0 | 2.0 |
| SC | 3.5 | 3.0 | 2.0 | 0.9 | 0.9 | 0.9 |
| TL | 2.5 | 4.0 | 3.4 | 1.4 | 1.4 | 1.5 |
| OY PL | 4.4 | 5.8 | 4.3 | 3.7 | 4.1 | 3.9 |
| OY OD | 6.4 | 6.0 | 6.5 | 2.6 | 5.0 | 10.5 |
| OY SS | 35.0 | 41.1 | 40.0 | 39.5 | 44.0 | 44.0 |
| MC | 0.8 | 2.5 | 1.1 | 0.3 | 0.4 | 0.3 |
| PR | 3.6 | 4.0 | 4.1 | NS | NS | NS |

CHEMICAL OXYGEN DEMAND (PPM)

| LOCATION | JUN 6 | JUN19 | JUL 5 | JUL24 | AUG 6 | AUG20 |
|---|---|---|---|---|---|---|
| OR 1 | 5.4 | NS | 6.9 | 2.1 | 0.0 | 3.4 |
| OR 2 | 2.9 | 6.4 | 4.8 | 2.1 | 7.9 | 6.2 |
| OR 3 | NS | NS | 90.0 | 200.0 | 200.0 | 100.0 |
| SC | NS | NS | 6.9 | 1.6 | 15.3 | 1.1 |
| TL | 2.9 | NS | 0.0 | 4.2 | 2.1 | 3.4 |
| OY PL | 90.0 | NS | 2.5 | 7.4 | 11.1 | 14.1 |
| OY OD | 8.4 | 0.0 | 90.0 | 0.0 | 0.0 | 10.2 |
| OY SS | 0.0 | NS | 2.0 | 6.8 | 0.0 | 10.7 |
| MC | 9.8 | NS | 0.0 | 1.6 | 0.0 | 1.7 |
| PR | 0.5 | 0.0 | 9.3 | NS | NS | NS |

TOTAL RESIDUE (PPM)

| LOCATION | JUN 6 | JUN19 | JUL 5 | JUL24 | AUG 6 | AUG20 |
|---|---|---|---|---|---|---|
| OR 1 | 218 | 1003 | 231 | 144 | 163 | 133 |
| OR 2 | 156 | 214 | 230 | 145 | 188 | 154 |
| OR 3 | NS | 530 | 280 | 676 | 1128 | 186 |
| SC | 104 | 132 | 158 | 167 | 183 | 194 |
| TL | 326 | 258 | 268 | 209 | 208 | 228 |
| OY PL | 367 | 313 | 377 | 296 | 281 | 274 |
| OY OD | 728 | 618 | 695 | 432 | 498 | 535 |
| OY SS | 1474 | 470 | 1482 | 1139 | 1158 | 1045 |
| MC | 110 | 059 | 133 | 75 | 89 | 99 |
| PR | 550 | 545 | 518 | NS | NS | NS |