

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL EUTROPHICATION SURVEY**

WORKING PAPER SERIES



REPORT
ON
LAKE CHAMPLAIN
NEW YORK
AND
VERMONT
EPA REGIONS I AND II
WORKING PAPER No. 154

PACIFIC NORTHWEST ENVIRONMENTAL RESEARCH LABORATORY

An Associate Laboratory of the

NATIONAL ENVIRONMENTAL RESEARCH CENTER - CORVALLIS, OREGON

and

NATIONAL ENVIRONMENTAL RESEARCH CENTER - LAS VEGAS, NEVADA

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WITH THE COOPERATION OF THE
NEW YORK DEPARTMENT OF ENVIRONMENTAL CONSERVATION,
THE VERMONT AGENCY OF ENVIRONMENTAL CONSERVATION,
AND THE
NEW YORK AND VERMONT NATIONAL GUARDS
DECEMBER, 1974

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F O R E W O R D

The National Eutrophication Survey was initiated in 1972 in response to an Administration commitment to investigate the nationwide threat of accelerated eutrophication to fresh water lakes and reservoirs.

OBJECTIVES

The Survey was designed to develop, in conjunction with state environmental agencies, information on nutrient sources, concentrations, and impact on selected freshwater lakes as a basis for formulating comprehensive and coordinated national, regional, and state management practices relating to point-source discharge reduction and non-point source pollution abatement in lake watersheds.

ANALYTIC APPROACH

The mathematical and statistical procedures selected for the Survey's eutrophication analysis are based on related concepts that:

- a. A generalized representation or model relating sources, concentrations, and impacts can be constructed.
- b. By applying measurements of relevant parameters associated with lake degradation, the generalized model can be transformed into an operational representation of a lake, its drainage basin, and related nutrients.
- c. With such a transformation, an assessment of the potential for eutrophication control can be made.

LAKE ANALYSIS

In this report, the first stage of evaluation of lake and watershed data collected from the study lake and its drainage basin is documented. The report is formatted to provide state environmental agencies with specific information for basin planning [§303(e)], water quality criteria/standards review [§303(c)], clean lakes [§14(a,b)], and water quality monitoring [§106 and §305(b)] activities mandated by the Federal Water Pollution Control Act Amendments of 1972.

Beyond the single lake analysis, broader based correlations between nutrient concentrations (and loading) and trophic condition are being made to advance the rationale and data base for refinement of nutrient water quality criteria for the Nation's fresh water lakes. Likewise, multivariate evaluations for the relationships between land use, nutrient export, and trophic condition, by lake class or use, are being developed to assist in the formulation of planning guidelines and policies by EPA and to augment plans implementation by the states.

ACKNOWLEDGMENT

The staff of the National Eutrophication Survey (Office of Research & Development, U. S. Environmental Protection Agency) expresses sincere appreciation to the New York Department of Environmental Conservation and the Vermont Agency of Environmental Conservation for professional involvement and to the New York and Vermont National Guards for conduct of the tributary sampling phase of the Survey.

Henry L. Diamond, Commissioner of the New York Department of Environmental Conservation and Martin L. Johnson, Secretary of the Vermont Agency of Environmental Conservation and their respective staff provided invaluable lake documentation and counsel during the Survey.

Major General John C. Baker, the Adjutant General of New York and Project Officer Lieutenant Colonel Fred Peters; Major General Reginald M. Crum, the Adjutant General of Vermont, and Project Officer Major Howard Buxton who directed the volunteer efforts of the New York and Vermont National Guardsmen, are also gratefully acknowledged for their assistance to the Survey.

NATIONAL EUTROPHICATION SURVEY

STUDY LAKES

STATE OF NEW YORK

<u>LAKE NAME</u>	<u>COUNTY</u>
Allegheny Reservoir	Cattaraugus, NY; McLean, Warren, PA
Black	St. Lawrence
Canadaigua	Ontario
Cannonsville	Delaware
Carry Falls	St. Lawrence
Cassadaga	Chautauqua
Cayuga	Seneca, Tompkins
Champlain	Clinton, Essex, NY; Addison, Chittenden, Franklin, VT
Chautauqua	Chautauqua
Conesus	Livingston
Cross	Cayuga, Onondaga
Goodyear	Otsego
Huntington	Sullivan
Keuka	Ontario
Long	Hamilton
Lower St. Regis	Franklin
Otter	Cayuga
Owasco	Cayuga
Raquette Pond	Franklin
Round	Saratoga
Sacandaga Res.	Fulton, Saratoga
Saratoga	Saratoga
Schroon	Essex, Warren
Seneca	Seneca, Schyler, Yates
Swan	Sullivan
Swinging Bridge Res.	Sullivan

NATIONAL EUTROPHICATION SURVEY

STUDY LAKES

STATE OF VERMONT

<u>LAKE NAME</u>	<u>COUNTY</u>
Arrowhead Mountain Lake	Chittenden, Franklin
Clyde Pond	Orleans
Harriman Reservoir	Windham
Lake Champlain	Addison, Chittenden, Franklin
Lake Lamoille	Lamoille
Lake Memphremagog	Orleans
Waterbury Reservoir	Washington, Lamoille

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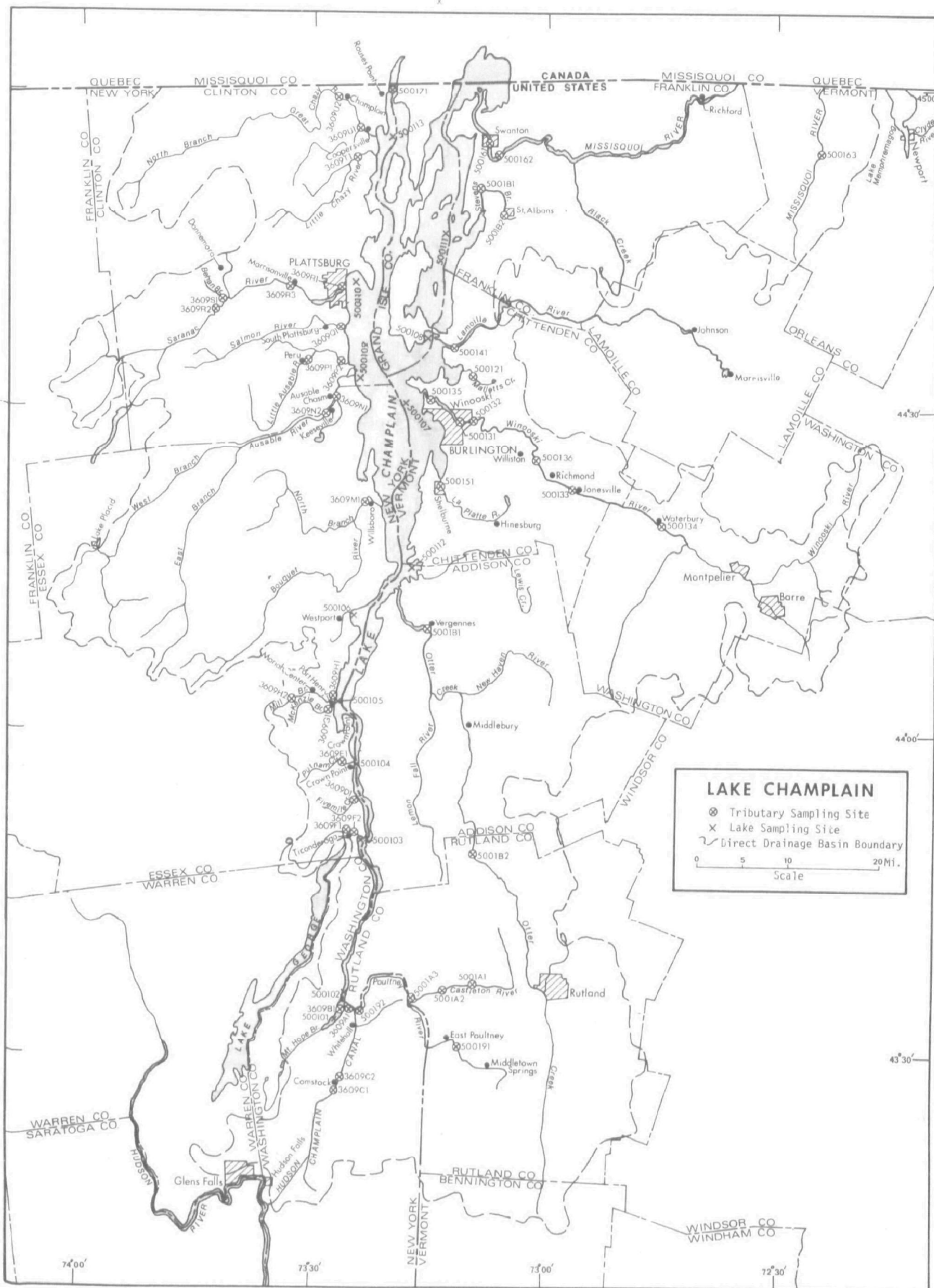
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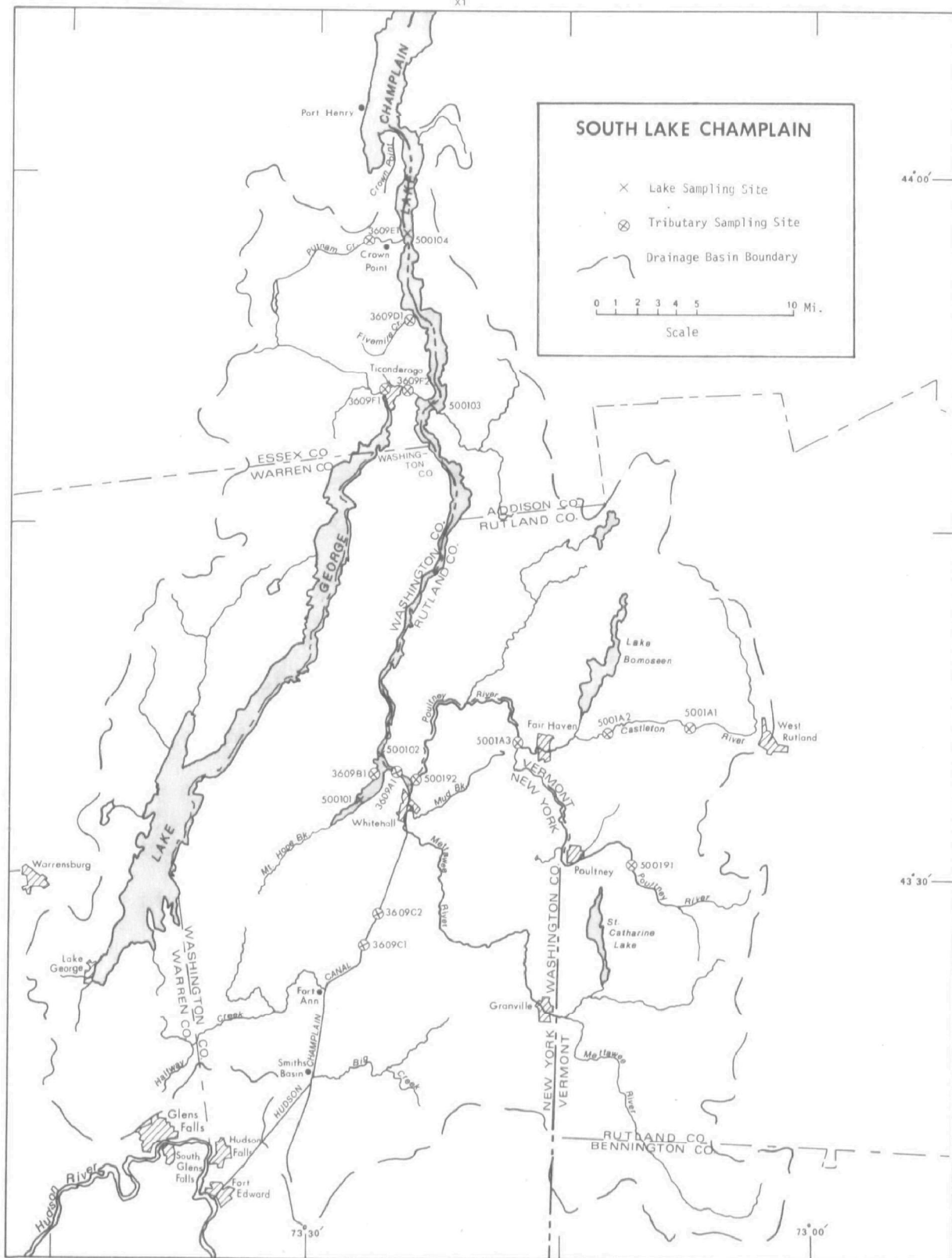
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LAKE CHAMPLAIN

STORET NO. 5001

I. CONCLUSIONS

A. Trophic Condition:

1. Lake Champlain exhibits a variety of trophic conditions ranging from near oligotrophic in the deeper main lake areas to eutrophic in some of the bays and near-shore areas.
2. South Lake Champlain has characteristics commonly associated with eutrophy, i.e., shallow and nutrient rich; however, primary production in South Lake Champlain is apparently suppressed by natural turbidity caused by non-biological materials.
3. While the main water body of Lake Champlain is currently in an acceptable trophic condition, some of the embayments and the South Lake Champlain have shown signs of accelerated eutrophication. It is believed that the continued addition of unnecessarily high quantities of phosphorus will shorten the useful life of the lake.

B. Limiting Nutrient:

1. The algal assay tests indicate that phosphorus is the nutrient of major importance in controlling primary production in Lake Champlain.

C. Nutrient Controllability:

1. The average yearly total phosphorus input from point and non-point sources to Lake Champlain is estimated to be 1,318,650 pounds before the New York phosphate detergent ban.

2. Of the total phosphorus input to Lake Champlain before the New York phosphate detergent ban, New York point sources (municipal and industrial) accounted for 11% (140,270 pounds) of the total annual input and Vermont point sources accounted for 19% (253,100) of the total annual input.
3. After the New York phosphate detergent ban*, the total annual phosphorus input to Lake Champlain is estimated to be 1,260,510 pounds.
4. Of the total phosphorus input to Lake Champlain after the New York phosphate detergent ban*, New York point sources accounted for 7% (82,230 pounds) of the total annual input and Vermont point sources accounted for 20% (253,100 pounds) of the total input.
5. The total annual nitrogen input to Lake Champlain is 28,928,400 pounds.
6. Of the total annual nitrogen input, only a maximum of 9% is contributed by New York and Vermont point sources.
7. The annual total phosphorus loading to South Lake Champlain from all sources before the New York phosphate laundry detergent ban was 197,350 pounds.
8. Of the total phosphorus input to South Lake Champlain before the ban, New York point sources contributed 31% (60,390 lbs) and

* The assumption was made that the New York phosphate laundry detergent ban will decrease the annual phosphorus load from New York municipal sewage treatment plants by 50%.

New York diffuse sources contributed 27% (54,080 lbs) of the total. Vermont point sources contributed 7% (13,650 lbs) and Vermont diffuse sources contributed 35% (69,230 lbs) of the total.

9. After the New York phosphate laundry detergent ban*, the total phosphorus input to South Lake Champlain is estimated to be 179,200 pounds per year.

10. Of the total phosphorus input to South Lake Champlain after the New York ban, New York point sources contributed 24% (42,240 pounds) and New York diffuse sources 30% of the total. Vermont point sources contributed 8% (13,650 pounds) and Vermont diffuse sources 38% (69,230 pounds) of the total.

D. Phosphorus Reduction:

1. In that primary production in the waters of Lake Champlain is stimulated by the addition of phosphorus, phosphorus inputs from all sources should be minimized to reduce the eutrophication rate.

2. Prior to the New York phosphate detergent ban, the loading rate to Lake Champlain was 0.53 grams total phosphorus/m² lake surface area/year.

3. If phosphorus inputs from New York and Vermont municipal and industrial discharges were decreased by 80% or equivalent reductions in phosphorus inputs from non-point sources were

* The assumption was made that the New York phosphate laundry detergent ban will decrease the annual phosphorus load from New York municipal sewage treatment plants by 50%.

attained, the loading rate to Lake Champlain would be reduced to 0.40 grams/m²/year, or to 75% of the pre-ban loading rate.

4. According to the Vollenweider relationship, a loading rate of 0.53 grams total phosphorus/m²/year is equivalent to a eutrophic condition for a lake with the morphometric characteristics of Lake Champlain, whereas a loading rate of 0.40 g/m²/year corresponds to a mesotrophic loading rate.

II. INTRODUCTION

The National Eutrophication Survey was established by EPA in late 1971 with the directive to investigate all significant lakes and reservoirs in the contiguous United States which receive effluents from municipal sewage treatment facilities. The stated objectives of the Survey were to determine the extent of eutrophication in each water body and to assess the total nutrient input to each water body, differentiating between inputs from point-sources (primarily municipal) and diffuse land runoff. The goal was to determine the controllability of nutrients (particularly phosphorus), the impact of point source and non-point source nutrients on each study lake and the expected benefit to each lake by reducing the point-source nutrient inputs.

This report is concerned primarily with the trophic condition, nutrient levels and nutrient loadings of the waters of Lake Champlain and represents a preliminary assessment of the data gathered by the Survey from June, 1972 through June, 1973. Lake Champlain is but one of approximately 484 water bodies east of the Mississippi now being studied by the Survey, albeit an important one due to its size and the fact that it borders the States of New York and Vermont as well as the Canadian Province of Quebec.

In this report "Lake Champlain" refers to the entire lake which is defined as the portion extending from the southern tip of South Bay near Whitehall, NY to the Richelieu River outlet. The total drainage area of

the Lake Champlain basin is approximately 7,744 square miles not including the Lake Champlain water surface area which is approximately 436 square miles. Lake Champlain can be described as long and narrow with a maximum length of 109 miles and a maximum width of 11 miles. The maximum depth of Lake Champlain is 400 feet and the mean depth is 64 feet. The mean hydraulic detention time is approximately 2.6 years.

In this report, "South Lake Champlain" refers to that portion of Lake Champlain extending from the southern tip of South Bay near Whitehall, NY to the Crown Point Bridge. The total drainage area of South Lake Champlain is 1,216 square miles not including the South Lake Champlain water surface area which is 22 square miles. South Lake Champlain is also long and narrow with a maximum length of 37 miles and a maximum width of less than two miles. The maximum depth of South Lake Champlain is 46 feet and the mean depth is 8 feet. The mean hydraulic detention time is approximately 40 days.

Separate phosphorus loading estimates were prepared for Lake Champlain and South Lake Champlain in this report. A nitrogen loading estimate was prepared only for Lake Champlain in its entirety.

The map on page x indicates the approximate location of each sampling site and delineates the U.S. portion of the Lake Champlain drainage area. The map on page xi shows only South Lake Champlain and its drainage area.

III. LAKE AND DRAINAGE BASIN CHARACTERISTICS

The morphometry and hydrology of Lake Champlain has been very thoroughly explained by Henson and Potash (1969); Potash, Sundberg, and Henson (1969); and Hunt, Boardman, and Stein (1971). For details to supplement the basic facts provided in this report, the reader is referred to those sources.

A. Morphometry of Lake Champlain (including South Lake Champlain):

1. Surface area: 436.4 square miles¹
2. Mean depth: 63.6 feet¹
3. Maximum depth: 400 feet¹
4. Volume: 9.12×10^{11} cubic feet¹
5. Mean hydraulic detention time: 2.6 years²

B. Tributary and Outlet Data for Lake Champlain: (See Appendix B for all flow data)

1. Sampled Tributaries -

<u>Name and State</u>	<u>Drainage Area at Sampling Point (sq.mi.)</u>	<u>Mean Flow at Sampling Point (cfs)</u>
Missisquoi River, VT/Quebec	861.0	1,620
Stevens Brook, VT	2.5	5
Lamoille River, VT	715.0	1,322
Malletts Creek, VT	19.1	33
Winooski River, VT	1,062.0	1,638
LaPlatte River, VT	46.1	71
Otter Creek, VT	872.0	1,322

¹ Hunt, Boardman, and Stein (1971).

² Henson and Potash (1969).

<u>Name and State</u>	<u>Drainage Area at Sampling Point (sq mi)</u>	<u>Mean Flow at Sampling Point (cfs)</u>
Barge Canal - Poultney River, NY/VT	692.0	921
Ticonderoga Creek, NY	262.0	281
Fivemile Creek, NY	8.4	11
Putman Creek, NY	61.3	77
McKenzie Brook, NY	10.3	14
Mill Brook, NY	27.1	36
Hoisington Brook, NY	11.4	15
Bouquet River, NY	278.0	370
Ausable River, NY	518.0	689
Little Ausable River, NY	71.8	96
Salmon River, NY	66.0	88
Saranac River, NY	614.0	818
Little Chazy River, NY	51.2	68
Great Chazy River, NY	300.0	399
Minor tributaries and immediate drainage, NY/VT	1,195.0	1,589
Totals	7,744.2	11,483
2. Outlet -		
Richelieu River	8,180 sq.mi.	11,052 cfs ¹

¹ Henson and Potash (1969).

C. Morphometry of South Lake Champlain:
(See Appendix B for all flow data)

1. Surface area: 22.0 square miles¹
2. Mean depth: 8 feet¹
3. Maximum depth: 46 feet¹
4. Volume: 4.94×10^9 cubic feet¹
5. Mean hydraulic detention time: ~ 40 days

D. Tributary and Outlet Data for South Lake Champlain:

1. Sampled Tributaries -

<u>Name and State</u>	<u>Drainage Area at Sampling Point (sq mi)</u>	<u>Mean Flow at Sampling Point (cfs)</u>
Barge Canal - Poultney River System, VT/NY	692.0	921
Ticonderoga Creek, NY	262.0	281
Fivemile Creek, NY	8.4	11
Putnam Creek, NY	61.3	77
Minor tributaries and immdediate drainage, NY/VT	192.3	256
Totals	1,216.0	1,546

2. Outlet -

Crown Point	1,238 sq. mi.	1,441 cfs ¹
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E. Precipitation for Lake Champlain:

1. Year of sampling: 39.8 inches²
2. Mean annual: 32.3 inches³

¹ Potash, Sundberg, and Henson (1969).

² Records from Burlington, VT weather station.

³ Henson and Potash (1969).

IV. LAKE WATER QUALITY SUMMARY

EPA field staff sampled 13 stations in Lake Champlain during the spring, summer, and fall seasons of 1972. Dates for each of the three samplings were June 1 - 2, July 30 - August 2, and October 5 - 8. Approximate locations of the sampling sites are depicted on the maps, on pages x and xi. Specific locations and depth characteristics of each station from the southern to the northern end of Lake Champlain were as follows. The complete set of lake data for each station is in Appendix C of this report.

Station 500101: located in South Bay, one mile south of bridge; maximum depth of 19 feet (Latitude 43°33'10"N, Longitude 73°27'00"W).

Station 500102: located in the combined Delaware-Champlain Canal: Poultney River channel, just east of confluence with South Bay Portal; maximum depth of 20 feet (Latitude 43°34'55"N, Longitude 73°25'20"W).

Station 500103: located in mid-lake, due west of the marina on east shore and south of Fort Ticonderoga; maximum depth of 22 feet (Latitude 43°49'54"N, Longitude 73°23'17"W).

Station 500104: located in mid-lake, off Putts Point near Buoy 34; maximum depth of 25 feet (Latitude 43°57'28"N, Longitude 73°24'25"W).

Station 500105: located near Port Henry, due north of point on the west side of the lake; maximum depth of 21 feet (Latitude 44°03'10"N, Longitude 73°27'01"W).

Station 500106: located in North West Bay, near Westport; maximum depth of 51 feet (Latitude 44°11'25"N, Longitude 73°25'51"W).

Station 500112: located at mouth of Farm Town Bay, midway between Thompson Point and Long Point; maximum depth of 38 feet (Latitude 44°15'42"N, Longitude 73°17'38"W).

Station 500107: located approximately 2 miles due west of mouth of Winooski River; maximum depth of 120 feet (Latitude 44°31'00"N, Longitude 73°19'00"W).

Station 500109: located approximately one mile due east of mouth of the Ausable River; maximum depth of 116 feet (Latitude $44^{\circ}33'17''\text{N}$, Longitude $73^{\circ}24'43''\text{W}$).

Station 500108: located approximately one mile south of the southeastern tip of South Hero Island in the Malletts Bay area; maximum depth of 80 feet (Latitude $44^{\circ}34'30''\text{N}$, Longitude $73^{\circ}16'48''\text{W}$).

Station 500110: located in the center of Cumberland Bay, near Bouy No. 1; maximum depth of 24 feet (Latitude $44^{\circ}41'49''\text{N}$, Longitude $73^{\circ}26'10''\text{W}$).

Station 500111: located in the northeast portion of Lake Champlain, midway between Point Hill and Butler Island; maximum depth of 21 feet (Latitude $44^{\circ}48'00''\text{N}$, Longitude $73^{\circ}12'30''\text{W}$).

Station 500113: located in mid-lake, due west of Point au Fer; maximum depth of 25 feet (Latitude $44^{\circ}56'25''\text{N}$, Longitude $73^{\circ}20'13''\text{W}$).

A. Physical and Chemical Characteristics:

To briefly summarize the grouping of stations according to the morphometry of the lake, stations 500101, -02, -03, and -04 were located in South Lake Champlain (south of Crown Point); stations 500105, -06, -12, -07, -09, -10, and -13 were located in the main lake between Port Henry and Rouses Point; station 500108 was located in the Malletts Bay area; and station 500111 was located in the northeastern portion of Lake Champlain.

To simplify the presentation and discussion of the results of lake sampling, data from stations which were related geographically or morphometrically are grouped. For each grouping, a summary table is provided which gives maximum, minimum, and mean values of all observations at the grouped stations and mean values for each sampling date.

The mean parameter values presented in the tables are not volume-weighted to account for differences in nutrient levels occurring in the various layers of the lake during stratification. Nevertheless, the mean values are useful as a general guide to differences in water quality between areas.

Table 1 summarizes the combined data for stations 500101, -02, -03, and -04, all of which were located in South Lake Champlain.

Secchi disc transparencies in South Lake Champlain were low during EPA visits in 1972 with a maximum depth of 52 inches in Ticonderoga Bay, which may have been caused by the diluting effect of the discharge through the Lake George outlet, and a minimum of 3 inches. Observations by the field staff indicate the turbidity was caused primarily by suspended sediments although some surface algae were also evident. Hensen and Potash (op. cit.) stated that South Lake Champlain was characteristically turbid, apparently due to natural shoreline erosion.

The chemical data indicated that nitrogen and phosphorus were relatively abundant in waters of the South Lake and, particularly, that the contribution from the Delaware-Champlain Canal and Poultney River system was rich in nutrients. The availability of nutrients in South Lake was not matched by correspondingly high chlorophyll a values during EPA samplings--probably due to the high turbidity which prevented plankton blooms from developing;

TABLE 1

SUMMARY OF LAKE CHAMPLAIN WATER QUALITY DATA
 For EPA Stations 500101, 02, 03 and 04
 (See Appendix C for complete data)

	MEAN VALUES		
	1ST SAMPLE 6/ 1/72	2ND SAMPLE 8/ 2/72	3RD SAMPLE 10/ 8/72
TEMP (CENT)	17.7	22.9	14.3
DISS OXY (MG/L)	9.3	7.1	9.4
CNDCTVY (MCROMO)	153.	194.	210.
PH (STAND UNITS)	7.5	7.6	7.8
TOT ALK (MG/L)	58.	70.	71.
TOT P (MG/L)	0.020	0.040	0.085
DISS P (MG/L)	0.011	0.018	0.029
NO2+NO3 (MG/L)	0.130	0.174	0.162
AMMONIA (MG/L)	0.064	0.109	0.114
INORG N (MG/L)	0.194	0.283	0.277
CHLRPHYL (UG/L)	7.2	7.0	16.0
SECCHI (INCHES)	34.	38.	11.
	MIN FOR ALL SAMPLES	MAX FOR ALL SAMPLES	MEAN FOR ALL SAMPLES
TEMP (CENT)	9.0	23.9	18.6
DISS OXY (MG/L)	5.6	11.2	8.5
CNDCTVY (MCROMO)	90.	245.	188.
PH (STAND UNITS)	6.8	8.1	7.6
TOT ALK (MG/L)	26.	91.	67.
TOT P (MG/L)	0.012	0.188	0.050
DISS P (MG/L)	0.006	0.071	0.020
NO2+NO3 (MG/L)	0.010	0.440	0.158
AMMONIA (MG/L)	0.010	0.220	0.098
INORG N (MG/L)	0.020	0.580	0.256
CHLRPHYL (UG/L)	1.5	30.2	10.1
SECCHI (INCHES)	3.	52.	28.

however, during August and September of 1972, algal blooms were observed by staff of the Vermont Department of Water Resources and T. W. Beak Consultants, Limited. The algal genera Aphanizomenon and Melosira predominated on those occasions.

Station 500104, the deepest EPA station in the South Lake, was stratified during the June, 1972 sampling; however, there was no apparent oxygen depletion in the hypolimnion at that time. During the August sampling at station 500104, stratification was not as pronounced, indicating that the shallow depth of the South Lake permits periodic mixing to occur throughout the summer.

In summary, the South Lake area can be characterized as generally having poorer water quality than other areas of the lake as evidenced by high phosphorus concentrations and low Secchi disc readings. South Lake Champlain has the characteristics of a eutrophic water body although primary productivity is apparently suppressed by the high turbidities which occur in that portion of the lake. South Lake Champlain waters, which are relatively high in phosphorus, could conceivably stimulate primary production in the main lake as the waters mix and the turbidity-causing materials settle. It is also possible, however, that the excessive phosphorus is adsorbed to the silt and becomes unavailable for algal assimilation when the silt settles to the lake bed.

Table 2 summarizes the data for stations 500105, -06, and -12. Perhaps station 05 should not have been included in this group as the water quality there reflects the South Lake Champlain influence to a great extent because of proximity to Crown Point. Generally speaking, water quality in Lake Champlain between Crown Point and Thompson's Point was much better than in South Lake Champlain. Secchi disc readings ranged from 27 - 144 inches, total phosphorus concentrations did not exceed 0.032 ppm., and there was no evidence of dissolved oxygen depletion in the hypolimnion. One extremely high chlorophyll a value (67.7 $\mu\text{g/l}$) at station 05 probably resulted from the combination of South Lake Champlain and Port Henry, NY nutrient contributions to the area.

In summary, the area of the lake between Crown Point and Thompson's Point could best be classified as mesotrophic or perhaps mildly eutrophic. Although chlorophyll a values were among the highest measured, there was no evidence of significant dissolved oxygen depletion in the hypolimnion.

Summary data for station 500107, -09, and -10 are presented in Table 3. These stations were all located in the main lake water mass between Schuyler Island and Cumberland Head. Secchi disc readings in this area were relatively high, ranging from 72 to 168 inches and averaging 122 inches. Total phosphorus concentrations were low, averaging only 0.018 ppm in the area. Although the water was thermally stratified at stations 500107 and 500109 during the

TABLE 2

SUMMARY OF LAKE CHAMPLAIN WATER QUALITY DATA
 For EPA Stations 500105, 06, and 12
 (See Appendix C for complete data)

	MEAN VALUES		
	1ST SAMPLE 6/ 1/72	2ND SAMPLE 8/ 2/72	3RD SAMPLE 10/ 8/72
TEMP (CENT)	9.8	17.6	13.7
DISS OXY (MG/L)	12.2	9.3	9.8
CNDCTVY (MCROMO)	126.	154.	153.
PH (STAND UNITS)	7.9	7.9	7.8
TOT ALK (MG/L)	49.	51.	43.
TOT P (MG/L)	0.016	0.021	0.017
DISS P (MG/L)	0.008	0.011	0.009
NO2+NO3 (MG/L)	0.187	0.135	0.123
AMMONIA (MG/L)	0.033	0.059	0.028
INORG N (MG/L)	0.220	0.194	0.151
CHLRPHYL (UG/L)	7.9	29.1	9.5
SECCHI (INCHES)	66.	96.	110.

	MIN FOR ALL SAMPLES	MAX FOR ALL SAMPLES	MEAN FOR ALL SAMPLES
TEMP (CENT)	5.1	22.8	14.1
DISS OXY (MG/L)	8.1	13.1	10.3
CNDCTVY (MCROMO)	100.	170.	146.
PH (STAND UNITS)	7.2	8.6	7.8
TOT ALK (MG/L)	22.	73.	48.
TOT P (MG/L)	0.011	0.032	0.018
DISS P (MG/L)	0.005	0.017	0.010
NO2+NO3 (MG/L)	0.050	0.310	0.145
AMMONIA (MG/L)	0.010	0.080	0.043
INORG N (MG/L)	0.060	0.380	0.187
CHLRPHYL (UG/L)	1.2	67.7	15.5
SECCHI (INCHES)	27.	144.	91.

TABLE 3

SUMMARY OF LAKE CHAMPLAIN WATER QUALITY DATA
 For EPA Stations 500107, 09, and 10
 (See Appendix C for complete data)

	MEAN VALUES		
	1ST SAMPLE 6/ 2/72	2ND SAMPLE 7/30/72	3RD SAMPLE 10/ 8/72
TEMP (CENT)	11.0	16.6	13.5
DISS OXY (MG/L)	11.6	9.0	9.9
CNDCTVY (MCROMO)	135.	136.	141.
PH (STAND UNITS)	7.9	7.3	7.6
TOT ALK (MG/L)	41.	42.	42.
TOT P (MG/L)	0.020	0.020	0.013
DISS P (MG/L)	0.007	0.011	0.007
NO2+NO3 (MG/L)	0.167	0.154	0.146
AMMONIA (MG/L)	0.030	0.050	0.040
INORG N (MG/L)	0.197	0.204	0.186
CHLRPHYL (UG/L)	16.4	9.2	6.6
SECCHI (INCHES)	90.	128.	156.
	MIN FOR ALL SAMPLES	MAX FOR ALL SAMPLES	MEAN FOR ALL SAMPLES
TEMP (CENT)	6.0	22.7	14.6
DISS OXY (MG/L)	6.6	12.4	9.7
CNDCTVY (MCROMO)	100.	160.	137.
PH (STAND UNITS)	6.8	8.3	7.5
TOT ALK (MG/L)	29.	48.	42.
TOT P (MG/L)	0.009	0.040	0.018
DISS P (MG/L)	0.005	0.017	0.009
NO2+NO3 (MG/L)	0.060	0.320	0.154
AMMONIA (MG/L)	0.010	0.090	0.043
INORG N (MG/L)	0.090	0.360	0.198
CHLRPHYL (UG/L)	5.4	29.2	11.1
SECCHI (INCHES)	72.	168.	122.

July sampling, there was no evidence of significant oxygen depletion in the hypolimnion. Chlorophyll a values at stations 500107, -09, and -10 averaged somewhat lower than the previous group of stations further south and ranged from 5.4 to 29.2 micrograms/liter with a mean of 11.1 micrograms/liter. Overall the area would be classified as mesotrophic although signs of oligotrophy were also evident.

Table 4 summarizes the data for station 08 in the Malletts Bay area which was sampled only during July and October of 1972. Secchi disc readings at this station were among the highest observed in the entire lake with a maximum reading of 172 inches. Total phosphorus concentrations were low, ranging from 0.007 ppm to 0.021 ppm and averaging 0.012 ppm. Specific conductance was also somewhat less at this location than other sites on the lake with a mean of 106 micromhos. The lake was stratified in the Malletts Bay area during both the July and October samplings, and dissolved oxygen concentrations in the hypolimnion were approximately 24% of saturation, which is symptomatic of a mesotrophic condition. Settling of previous algal blooms could account for the high Secchi disc readings which were observed. Potash, Sundberg, and Henson (op. cit.) classified the Malletts Bay area as eutrophic and noted that hypolimnetic oxygen concentrations dropped as low as 0.1 mg/l during the summer of 1967.

TABLE 4

SUMMARY OF LAKE CHAMPLAIN WATER QUALITY DATA
For EPA Station 500108
(See Appendix C for complete data)

	MEAN VALUES	
	1ST SAMPLE 7/30/72	2ND SAMPLE 10/ 5/72
TEMP (CENT)	17.3	13.5
DISS OXY (MG/L)	7.7	7.8
CNDCTVY (MCROMO)	102.	114.
PH (STAND UNITS)	6.9	7.2
TOT ALK (MG/L)	32.	30.
TOT P (MG/L)	0.014	0.009
DISS P (MG/L)	0.010	0.006
NO2+NO3 (MG/L)	0.252	0.200
AMMONIA (MG/L)	0.049	0.044
INORG N (MG/L)	0.301	0.244
CHLRPHYL (UG/L)	4.9	5.5
SECCHI (INCHES)	172.	168.

	MIN FOR ALL SAMPLES	MAX FOR ALL SAMPLES	MEAN FOR ALL SAMPLES
TEMP (CENT)	7.5	23.2	15.9
DISS OXY (MG/L)	2.4	9.8	7.7
CNDCTVY (MCROMO)	100.	123.	106.
PH (STAND UNITS)	6.4	7.4	7.0
TOT ALK (MG/L)	27.	36.	31.
TOT P (MG/L)	0.007	0.021	0.012
DISS P (MG/L)	0.005	0.013	0.009
NO2+NO3 (MG/L)	0.150	0.400	0.232
AMMONIA (MG/L)	0.030	0.070	0.047
INORG N (MG/L)	0.190	0.440	0.279
CHLRPHYL (UG/L)	4.9	5.5	5.2
SECCHI (INCHES)	168.	172.	170.

Table 5 summarizes the data from station 500111 in the north-east arm of Lake Champlain. Total phosphorus concentrations averaged higher in this area than for all other Champlain stations except for those in South Lake. Secchi disc readings were generally high with summer and spring values of 168 and 178 inches respectively.

Station 500111 was shallow and was not stratified during the 1972 sampling dates. A significant difference between station 500111 and the other sampled areas of the lake was the low inorganic nitrogen concentrations. Mean inorganic nitrogen values were approximately 41% of the lowest mean observed in any of the other areas. The overall classification in the Northeast area of Lake Champlain is mesotrophic to mildly eutrophic.

Table 6 summarized data from station 13 located in the northwest part of the main water mass of Lake Champlain. This station was relatively shallow (25 feet) and was not stratified during the sampling periods. Total phosphorus concentrations averaged 0.017 ppm and Secchi disc readings were consistently high, ranging from 125 - 168 inches. This area of the lake would be classified as mesotrophic.

Table 7 summarizes the significant mean data parameters for Lake Champlain and assigns a trophic condition to each general

TABLE 5

SUMMARY OF LAKE CHAMPLAIN WATER QUALITY DATA
for EPA Station 500111
(See Appendix C for complete data)

	1ST SAMPLE 6/ 2/72	MEAN VALUES 2ND SAMPLE 7/30/72	3RD SAMPLE 10/ 5/72
TEMP (CENT)	14.4	22.5	15.5
DISS OXY (MG/L)	11.0	7.2	10.3
CNDCTVY (MCROMO)	130.	130.	131.
PH (STAND UNITS)	8.1	7.7	7.7
TOT ALK (MG/L)	39.	38.	35.
TOT P (MG/L)	0.028	0.030	0.042
DISS P (MG/L)	0.010	0.021	0.034
NO2+NO3 (MG/L)	0.025	0.023	0.043
AMMONIA (MG/L)	0.020	0.040	0.037
INORG N (MG/L)	0.045	0.063	0.080
CHLRPHYL (UG/L)	13.6	11.2	5.5
SECCHI (INCHES)	84.	178.	168.

	MIN FOR ALL SAMPLES	MAX FOR ALL SAMPLES	MEAN FOR ALL SAMPLES
TEMP (CENT)	14.0	22.7	17.5
DISS OXY (MG/L)	5.2	11.1	9.5
CNDCTVY (MCROMO)	130.	132.	131.
PH (STAND UNITS)	7.5	8.2	7.8
TOT ALK (MG/L)	35.	39.	37.
TOT P (MG/L)	0.024	0.043	0.034
DISS P (MG/L)	0.009	0.035	0.023
NO2+NO3 (MG/L)	0.020	0.050	0.031
AMMONIA (MG/L)	0.020	0.040	0.034
INORG N (MG/L)	0.040	0.090	0.065
CHLRPHYL (UG/L)	5.5	13.6	10.1
SECCHI (INCHES)	84.	178.	143.

TABLE 6

SUMMARY OF LAKE CHAMPLAIN WATER QUALITY DATA
for EPA Station 500113
(See Appendix C for complete data)

	1ST SAMPLE 6/ 2/72	MEAN VALUES 2ND SAMPLE 7/30/72	3RD SAMPLE 10/ 5/72
TEMP (CENT)	12.9	21.4	14.8
DISS OXY (MG/L)	11.8	8.0	10.5
CNDCTVY (MCROMO)	130.	135.	146.
PH (STAND UNITS)	8.2	7.4	7.8
TOT ALK (MG/L)	39.	42.	45.
TOT P (MG/L)	0.015	0.028	0.009
DISS P (MG/L)	0.005	0.015	0.006
NO2+NO3 (MG/L)	0.147	0.053	0.100
AMMONIA (MG/L)	0.060	0.057	0.053
INORG N (MG/L)	0.207	0.110	0.153
CHLRPHYL (UG/L)	10.1	12.3	2.4
SECCHI (INCHES)	125.	132.	168.
	MIN FOR ALL SAMPLES	MAX FOR ALL SAMPLES	MEAN FOR ALL SAMPLES
TEMP (CENT)	12.4	21.8	15.9
DISS OXY (MG/L)	7.8	12.0	10.3
CNDCTVY (MCROMO)	130.	146.	137.
PH (STAND UNITS)	7.2	8.3	7.8
TOT ALK (MG/L)	37.	46.	42.
TOT P (MG/L)	0.006	0.042	0.017
DISS P (MG/L)	0.004	0.019	0.009
NO2+NO3 (MG/L)	0.040	0.150	0.100
AMMONIA (MG/L)	0.050	0.070	0.057
INORG N (MG/L)	0.100	0.220	0.157
CHLRPHYL (UG/L)	2.4	12.3	8.3
SECCHI (INCHES)	125.	168.	142.

TABLE 7

MEAN SUMMARY OF LAKE CHAMPLAIN WATER QUALITY DATA

Parameter (Units)	Stations 500101, -02, -03, -04 (S. Lake Champlain)	Stations 500105, -06, -12	Stations 500107, -09, -10	Station 500108	Station 500111	Station 500113
Conductivity (micromhos)	188	146	137	106	131	137
Total P (mg/l)	0.050	0.018	0.018	0.012	0.034	0.017
Dissolved P (mg/l)	0.020	0.010	0.009	0.009	0.023	0.009
Inorganic N (mg/l)	0.256	0.187	0.198	0.279	0.065	0.157 $\approx$
Chlorophyll <u>a</u> (μ g/l)	10.1	15.5	11.1	5.2	10.1	8.3
Secchi disc (inches)	28	91	122	170	143	142
Overall Trophic Condition	Eutrophic	Mesotrophic to mildly eutrophic	Mesotrophic to oligotrophic	Mesotrophic	Mesotrophic to mildly eutrophic	Mesotrophic to oligo- trophic

lake area. From an overall standpoint, Lake Champlain waters cover a gamut of trophic conditions ranging from oligotrophic in main lake areas to eutrophic in some embayments and near-shore areas. If one classification were assigned to the entire lake, mesotrophy would be most appropriate.

B. Limiting Nutrient Studies:

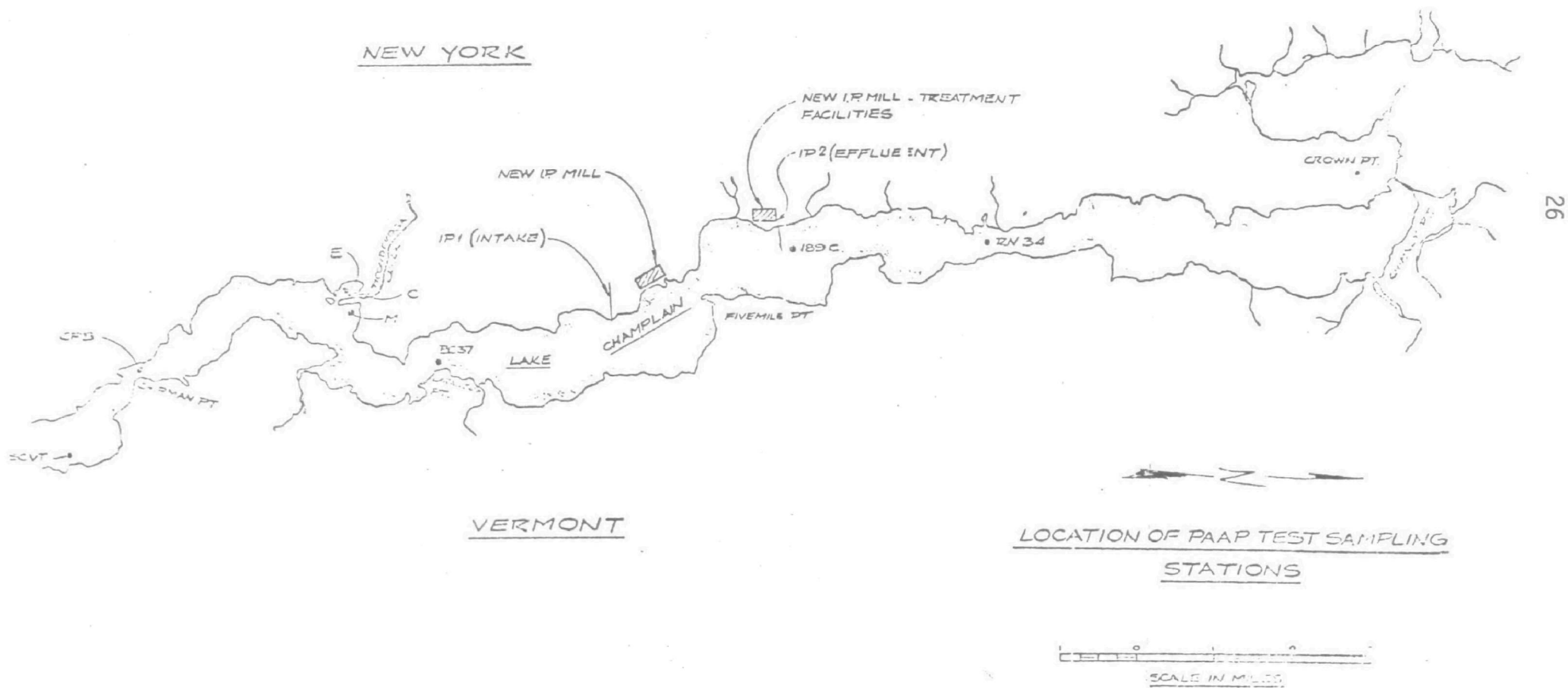
Two sets of algal assay samples were processed by the National Eutrophication Survey. The first set of ten samples was collected by staff members of the Vermont Agency of Environmental Conservation and T. W. Beak Consultants on September 27 and October 3, 1972. These samples were all collected in South Lake Champlain in the general area from two miles south of Chipmans Point to three miles north of the International Paper Company effluent diffuser (see Figure 3). Each sample was frozen and, following the last collection, all of the samples were packed in ice and sent air freight to Corvallis, Oregon on October 3, arriving October 6, 1972.

The second set of algal assay samples, which involved all of Lake Champlain, was collected by EPA during October 5 - 8, 1972. Because of limitations on the number of assay samples which could be processed from each of the lakes included in the Survey, only three samples from Lake Champlain were assayed. Each of the three EPA samples were depth-integrated and composited from multiple sampling sites on the lake as follows:

Assay Sample 72: contained equal portions of water from EPA stations 500101, -02, -03, and -04 (all South Lake Champlain).

Assay Sample 78: contained equal portions of water from EPA stations 500105, -06, -07, and -12.

FIGURE 3



Assay Sample 66: contained equal portions of water from EPA stations 500108, -11, and -13.

EPA stations 500109 and -10 were not included in any of the assay samples.

The algal assays were generally performed according to the procedures outlined in the Algal Assay Procedure Bottle Test published by EPA (1971). The test organism was the green alga, Selenastrum capricornutum. The cultures were inoculated for two weeks at 24⁰C with continuous shaking under 400 foot-candles of lighting. Growth of the cultures was monitored by periodic determination of cell numbers with electronic particle counters. Cell numbers were converted to equivalent dry weight values using a predetermined calibration curve.

The growth curves and chemical analyses of both the Vermont and EPA algal assay samples appear in Appendix D.

The results of the Vermont samples from South Lake Champlain will be discussed first. These results are summarized in Table 8 which (1) identifies the sample, (2) indicates the treatment given to the sample, (3) lists available nutrient concentrations at the time the growth period started, and (4) lists the algal yield in terms of mg/l dry cell weight at the conclusion of the 14 day incubation period. The results are presented in the general order of sample site location from the southernmost sampling site to the northernmost sampling site.

There was laboratory error in the preservation of subsamples taken for chemical analysis from the original Vermont samples (see Appendix E for Gakstatter Memo of February 1, 1973). The preservation error could well have influenced the concentration values for orthophosphate and inorganic nitrogen given in Table 8 although the assay response should not have been affected.

The samples, for which assay results are given in Table 8, were autoclaved and filtered before spiking with nutrients or inoculation with the test organism. Autoclaving served the function of resolubilizing the maximum amount of nutrients which were bound in cellular material or detritus so that these nutrients were available for growth during the assay. The filtration procedure which followed autoclaving was simply a method for removing residual cellular and detrital material which would interfere with the electronic particle counter method of monitoring growth of the test organisms.

As indicated in Table 8, the results demonstrated that, with only one exception, growth was limited by phosphorus in the samples collected from South Lake Champlain on September 27 and October 3, 1972. The exception was the sample collected from station 11 for which the assay indicated limitation by nitrogen. While the samples collected from stations E and 189 B only responded to additions of phosphorus and nitrogen together, productivity under such conditions could be limited by controlling phosphorus.

TABLE 8

Algal Assay Response for the Samples Collected
From South Lake Champlain by Vermont and
T.W. Beak Consultants Limited

Part A: Autoclaved and filtered before nutrient spikes -

<u>Spike</u>	<u>Ortho P Conc (mg/l)</u>	<u>Inorganic N Conc (mg/l)</u>	<u>Maximum yield (mg/l-dry wt.)</u>
(Station SCVT)			
Control	0.001	0.038	0.2
10.0 N			0.2
0.06 P			0.7
0.06 P + 10.0 N			16.6
(Station CPB)			
Control	0.011	0.070	8.0
10.0 N			6.5
0.06 P			24.7
0.06 P + 10.0 N			29.2
(Station E)			
Control	0.039	0.119	1.3
10.0 N			1.6
0.06 P			1.9
0.06 P + 10.0 N			14.7
(Station C)			
Control	0.018	0.123	0.2
10.0 N			0.2
0.06 P			1.4
0.06 P + 10.0 N			26.4
(Station M)			
Control	0.009	0.092	2.1
10.0 N			13.3
0.06 P			1.8
0.06 P + 10.0 N			46.0
(Station IPC-1)			
Control	0.003	0.064	0.2
10.0 N			0.2
0.06 P			1.1
0.06 P + 10.0 N			25.2
(Station IPC-2)			
Control	0.044	0.726	0.2
10.0 N			0.3
0.06 P			0.6
0.06 P + 10.0 N			25.1
(Station Buoy 189B)			
Control	0.020	0.294	4.8
10.0 N			5.3
0.06 P			5.1
0.06 P + 10.0 N			36.2
(Station Buoy 34)			
Control	0.018	0.234	0.4
10.0 N			0.4
0.06 P			1.6
0.06 P + 10.0 N			29.1

TABLE 8
(Page 2)

Part B: Filtered before nutrient spiked -

<u>Spike</u>	<u>Ortho Conc (mg/l)</u>	<u>Inorganic N Conc (mg/l)</u>	<u>Maximum yield (mg/l-dry wt.)</u>
(Station SCUT)			
Control	0.002	0.073	0.2
10.0 N			0.2
0.06 P			0.3
0.06 P			31.2
(Station CPB)			
Control	0.001	0.022	0.4
10.0 N			0.4
0.06 P			21.2
0.06 P + 10.0 N			22.4
(Station E)			
Control		Contaminated	
0.06 P		No result	
0.06 P + 10.0 N			
(Station C)			
Control	0.066	0.145	0.3
10.0 N			0.6
0.06 P			0.3
0.06 P + 10.0 N			13.5
(Station M)			
Control	0.012	0.049	1.7
10.0 N			3.2
0.06 P			2.2
0.06 P + 10.0 N			17.6
(Station Buoy 37)			
Control	0.009	0.019	0.6
10.0 N			0.8
0.06 P			1.4
0.06 P + 10.0 N			35.7
(Station IPC-1)			
Control	0.002	0.047	2.3
10.0 N			2.0
0.06 P			4.1
0.06 P + 10.0 N			30.4
(Station IPC-2)			
Control	0.010	0.775	0.2
10.0 N			0.1
0.06 P			0.2
0.06 P + 10.0 N			11.0
(Station Buoy 189B)			
Control	0.012	0.287	3.3
10.0 N			3.8
0.06 P			7.1
0.06 P + 10.0 N			38.8
(Station Buoy 34)			
Control	0.005	0.156	0.7
10.0 N			1.5
0.06 P			0.5
0.06 P + 10.0 N			6.2

The results of the three EPA composite algal assay samples are summarized in Table 9. Each of the samples were autoclaved and filtered prior to nutrient addition and inoculation with the test organism.

As indicated by Table 9, the algal assay results for all three of the EPA samples indicated that primary productivity in the samples at the time of assay was limited by phosphorus. Maximum yields were not increased above control values when only nitrogen was added but yields were significantly increased above control values by the addition of phosphorus alone.

In summary, samples collected by Vermont and EPA which were assayed by the bottle test using the green alga, Selenastrum capricornutum, indicated that phosphorus was the nutrient which was limiting to primary productivity in both South Lake Champlain and Lake Champlain in its entirety.

To a limited degree, the algal assay test gives a relative comparison of potential productivity of different waters. This information is provided by the autoclaved-filtered control which permits growth of the test organism to the extent of nutrient availability in the lake water.

In the algal assays of 206 lakes which the National Eutrophication Survey has conducted to date, the productivity range of the controls was very large. The most oligotrophic water bodies yielded less than 0.1 mg/l dry cell weight after 14 days

incubation while the richest water body yielded more than 248 mg/l after the same growth period. Although the relationship between assay yield and trophic state has not been clearly defined, Miller (1974) has developed some tentative guidelines from his study of 49 American lakes. Miller reported that (1) control yields ranging from 0 - 0.1 mg/l corresponded to low productivity (oligotrophic) lakes, (2) control yields of 0.11 - 0.8 mg/l corresponded to moderate productivity (mesotrophic) lakes, (3) control yields of 0.81 - 6.0 corresponded to moderately high productivity (eutrophic) lakes and (4) control yields of 6.1 - 20 corresponded to high productivity (eutrophic) lakes. The control yield values cited above represent lake conditions where planktonic algae and not aquatic macrophytes dominate primary production.

According to the above guidelines, the South Lake Champlain and Lake Champlain assay samples represented primarily moderate to moderately high productivity which corresponds to mesotrophic or mildly eutrophic conditions.

TABLE 9

ALGAL ASSAY RESPONSE FOR THE SAMPLES COLLECTED BY
EPA FROM LAKE CHAMPLAIN

Station Identification and Concentrations of Ortho-Phosphorus (OP) and Inorganic Nitrogen (IN) in Controls	Maximum Cell Yield (mg/l dry cell wt.) of <u>Selenastrum capricornutum</u> for Autoclaved-Filtered Samples After 14 Days Incubation for Each of the Indicated Nutrient Additions				Limiting Nutrient Indicated by Assay
	Control	0.06 ppm OP	10.0 ppm IN	0.06 ppm OP plus 10.0 ppm IN	
Sample #72 composite of Stations 01, 02, 03, & 04 0.012 ppm OP 0.234 ppm IN	1.0	6.5	0.7	30.4	Phosphorus
Sample #78 composite of Stations 05, 06, 07, & 12 0.006 ppm OP 0.186 ppm IN	0.1	5.3	0.1	23.3	Phosphorus
Sample #66 composite of Station 08, 11, & 13 0.015 ppm OP 0.154 ppm IN	3.0	5.3	2.2	25.8	Phosphorus

V. NUTRIENT LOADINGS

A. Introduction:

One of the objectives of the National Eutrophication Survey was to estimate nutrient inputs to each studied lake and to determine the relative percentage of the total input which originated from point waste sources. To meet this objective for Lake Champlain, a sampling program was initiated utilizing the volunteer services of both the Vermont and New York National Guard organizations.

National Guard sampling teams from both States collected monthly samples from pre-selected stream sites, preserved the samples with mercuric chloride, and shipped them to the Pacific Northwest Environmental Research Laboratory in Corvallis, Oregon, for the analysis of nitrogen and phosphorus constituents. Sampling of Vermont streams was started in July, 1972, and New York streams were started in November, 1972.

Nutrient concentrations used in loading calculations for New York streams were based on monthly stream samples collected from November, 1972 through July, 1973. For Vermont streams the sampling period was July, 1972 through June, 1973.

Stream flow estimates, which are necessary to calculate total nutrient loads delivered to a lake, were provided by the New York and New England District Offices of the U.S. Geological Survey.

U.S.G.S. also provided the majority of the data on the drainage areas of various stream systems.

Phosphorus loadings were calculated for the entire Lake Champlain water body, which includes the South Lake area, and separately for only that portion of the lake designated as South Lake Champlain.

B. Point Nutrient Sources:

1. Domestic -

Tables 10 and 11 list domestic waste sources in the Lake Champlain watershed from the States of New York and Vermont respectively. Also provided in the Tables are (1) the population served by each system, (2) the type of treatment, if any, (3) the estimated annual discharges of total phosphorus and total nitrogen by each facility, (4) the name of the river or stream which ultimately delivers the nutrients to Lake Champlain, and (5) the approximate watercourse mileage of the discharges from Lake Champlain. For each State, the discharges are listed in the order of river basin from the northern to southern end of the lake.

The raw waste loadings of phosphorus and nitrogen to each facility were estimated on the basis of annual contributions of 3.2 pounds total phosphorus per capita (Hetling and Carcich, 1972) and 9.4 pounds of total nitrogen per capita. For

facilities providing either primary or primary plus secondary treatment, the assumption was made that approximately 22% of the total phosphorus (Bartsch, 1972) and 20% of the total nitrogen was removed. Therefore, if the facility provided any type of treatment, the discharge was estimated to contribute 2.5 pounds of total phosphorus per capita per year and 7.5 pounds of total nitrogen per capita per year. For 12 of the plants, nitrogen and phosphorus loads were estimated on the basis of the analysis of composited effluent samples. The sampled plants are noted in Tables 10 and 11.

Estimates of populations served in each community for the State of New York were taken from the EPA STORET System Municipal Waste Facilities Inventory and from State Inventory Data provided by New York. Population estimates for Vermont communities were obtained directly from staff of the Vermont Agency of Environmental Conservation.

For both States, only those communities which were partially or completely sewered and which had a direct discharge of either treated or untreated wastes to surface waters were considered.

A total New York population of 84,773 was served by systems discharging directly to surface waters in the Lake Champlain drainage basin (Table 10). On an annual basis these discharges contributed 218,410 pounds of total

TABLE 10

DOMESTIC WASTE DISCHARGES* AND NUTRIENT LOADS** TO LAKE CHAMPLAIN BASIN
SURFACE WATERS FROM NEW YORK

<u>Municipality Facility Name</u>	<u>Population Served</u>	<u>Treatment Type</u>	<u>Total Phosphorus Discharged lbs/year*</u>	<u>Total Nitrogen Discharged lbs/year</u>	<u>Receiving Drainage Basin</u>	<u>Approximate Water Course Mileage from Lake Champlain</u>
Rouses Point	2,160	Primary	55,400	16,200	Lake Champlain	direct
Plattsburg Town	1,000	Primary	2,500	7,500	Lake Champlain	direct
Westport	700	Secondary	1,750	5,250	Lake Champlain	direct
Port Henry	1,800	Primary	4,500	13,500	Lake Champlain	direct
Champlain Village	1,550	Primary	3,880	11,620	Great Chazy	7
Saranac Lake Village	6,915	Primary	17,290	51,860	Saranac River	55
Bloomingtondale	400	None	1,280	3,760	Saranac River	45
Dannemora Prison	3,300	Primary	8,250	24,750	Saranac River	20
Morrisonville	5,300	None	16,960	49,820	Saranac River	7
Dannemora Village	1,800	Primary	4,500	13,500	Saranac River	20
Plattsburg***	30,000	Primary	86,770	375,370	Saranac River	<1
Peru	2,800	Primary	7,000	21,000	Little Ausable	5
Lake Placid	3,000	Primary	7,500	22,500	Ausable River	39
Ausable Forks	500	None	1,600	4,700	Ausable River	18
Keesville	2,000	Secondary	5,000	15,000	Ausable River	6
Moriah S.D. #1	270	Primary	680	2,020	Mill Brook	4
Moriah S.D. #2	2,900	Primary	7,250	21,750	Mill Brook	2
Ticonderoga Village	3,268	None	10,460	30,720	Ticonderoga Creek	2
Granville	2,784	Primary	6,960	20,880	Barge Canal	19
Fort Ann	562	Primary	1,400	4,220	Barge Canal	13
Comstock Prison	1,700	None	5,440	15,980	Barge Canal	13
Whitehall	3,764	None	12,040	35,380	Barge Canal	2
Totals	84,773		218,410	767,280		

* Loading values were estimated on basis of population served. Estimates for untreated waste are 3.2 lbs total P/capita/year and 9.4 lbs total N/capita/year and for treated wastes 2.5 lbs total P/capita/year and 7.5 lbs N/capita/year.

** All values given are prior to NY phosphate detergent ban.

*** Loadings determined by sampling old plant, NEW secondary treatment facility now in operation.

phosphorus and 767,280 pounds of total nitrogen to the basin prior to the New York ban on phosphate laundry detergents. After the phosphate ban became effective (July 1, 1973), the New York phosphorus load would theoretically have been reduced by 50% to approximately 109,000 pounds/year while the nitrogen load would have been unaffected.

A total Vermont population of 164,738 was served by systems discharging directly to surface waters in the Lake Champlain drainage basin (Table 11). Annually, these discharges contributed an estimated 444,410 pounds of phosphorus and 1,465,930 pounds of nitrogen to the basin.

Table 12 summarizes domestic nutrient contributions to Lake Champlain by river basin from both New York and Vermont. Also tabulated separately in Table 12 are total pounds of phosphorus discharged from point sources within approximately 25 river miles of Lake Champlain. The total point source phosphorus loading in the basin from both states, prior to the New York phosphate ban, was 662,820 pounds of which 409,650 pounds was discharged within 25 miles of the lake. The total nitrogen loading in the basin from domestic sources in New York and Vermont was 2,233,210 pounds per year.

2. Industrial Sources -

The only major industrial nutrient source known to be discharging directly to Lake Champlain is the International

TABLE 11

DOMESTIC WASTE DISCHARGES AND NUTRIENT LOADS* TO LAKE CHAMPLAIN BASIN
SURFACE WATERS FROM VERMONT

<u>Municipality Facility Name</u>	<u>Population Served</u>	<u>Treatment Type</u>	<u>Total Phosphorus Discharged lbs/year</u>	<u>Total Nitrogen Discharged lbs/year</u>	<u>Receiving Drainage Basin</u>	<u>Approximate Water Course Mileage from Lake Champlain</u>
Alburg	480	Secondary	1,200	3,600	Lake Champlain	direct
Burlington (Main)**	21,500	Secondary	49,450	198,120	Lake Champlain	direct
Shelburne F.D. #1	1,328	Secondary	3,320	9,960	Lake Champlain	direct
South Burlington (Bartletts)**	1,000	Primary	7,810	14,910	Lake Champlain	direct
Troy	36	None	120	340	Missisquoi River	54
North Troy	232	None	12,600 (1)	18,790	Missisquoi River	51
Fairfield	182	None	580	1,710	Missisquoi River	40
Richford	1,497	Secondary	3,740	11,230	Missisquoi River	36
Enosburg Falls	1,400	None	27,200 (2)	45,000	Missisquoi River	27
Sheldon	280	None	900	2,630	Missisquoi River	12
Swanton	2,630	Secondary	6,580	19,720	Missisquoi River	6
St. Albans Corr. Institute	45	Primary	110	340	Stevens Brook	4
St. Albans	9,000	Secondary	22,500	67,500	Stevens Brook	4
Hardwick	1,540	None	4,930	14,480	Lamoille River	72
Morrisville	2,148	None	6,870	20,190	Lamoille River	42
Hyde Park	550	None	1,760	5,170	Lamoille River	40
Cambridge	220	None	700	2,070	Lamoille River	34
Johnson	1,200	Secondary	3,000	9,000	Lamoille River	36
Fairfax	132	Secondary	330	990	Lamoille River	20
Milton	778	None	10,870 (3)	15,180	Lamoille River	10
Barre City	10,575	Primary	26,250	78,750	Winooski River	63
Northfield	3,300	Secondary	8,250	24,750	Winooski River	62
East Barre	4,430	Primary	11,080	33,220	Winooski River	65
Berlin	1,500	Secondary	3,750	11,250	Winooski River	60
Plainfield	949	Secondary	2,370	7,120	Winooski River	68
Williams Town	510	Secondary	1,280	3,820	Winooski River	67
Montpelier	8,860	Primary	22,150	66,450	Winooski River	56
Stowe	1,760	None	5,630	16,540	Winooski River	53
Waterbury	2,800	Secondary	7,000	21,000	Winooski River	44

TABLE 11
(Page 2)

<u>Municipality Facility Name</u>	<u>Population Served</u>	<u>Treatment Type</u>	<u>Total Phosphorus Discharged lbs/year</u>	<u>Total Nitrogen Discharged lbs/year</u>	<u>Receiving Drainage Basin</u>	<u>Approximate Water Course Mileage from Lake Champlain</u>
Waterbury State Hosp.	860	Primary	2,150	6,450	Winooski River	44
Richmond	926	Secondary	2,320	6,940	Winooski River	30
Williston	300	None	960	2,820	Winooski River	23
Essex Junction**	6,350	Primary	12,570	54,660	Winooski River	17
Essex Junction IBM**	875	Secondary	2,010	109,630	Winooski River	17
Marshfield	322	None	1,030	3,030	Winooski River	15
Winooski	7,400	Secondary	18,500	55,500	Winooski River	11
Essex Town	1,000	Primary	2,500	7,500	Winooski River	11
Burlington Riverside**	9,000	Secondary	4,430	17,040	Winooski River	11
Colchester F.D. #1**	2,200	Secondary	2,050	5,180	Winooski River	11
Burlington North End**	7,000	Secondary	21,500	84,610	Winooski River	9
South Burlington Arpt. Parkway**	5,600	Primary	15,450	63,610	Winooski River	10
Hinesburg	350	Secondary	3,820 (4)	6,750	LaPlatte River	10
Shelburne F.D. #2**	800	Primary	2,380	10,020	LaPlatte River	4
Wallingford	580	None	1,860	5,450	Otter Creek	82
West Rutland	2,250	Secondary	5,620	16,880	Otter Creek	72
Rutland City	19,093	Primary	47,730	143,200	Otter Creek	72
Rutland Town	280	Primary	700	2,100	Otthr Creek	72
Proctor	1,980	Primary	4,950	14,850	Otter Creek	64
Pittsford	640	Secondary	1,600	4,800	Otter Creek	60
Brandon	2,700	None	8,640	25,380	Otter Creek	51
Brandon Training School	900	Secondary	2,250	6,750	Otter Creek	51
Middlebury**	3,840	Primary	8,470	34,300	Otter Creek	25
Vergennes	1,970	Primary	4,920	14,780	Otter Creek	7
Benson	120	None	380	1,130	Poultney River	18
Poultney	2,125	Secondary	5,310	15,940	Poultney River	16

TABLE 11
(Page 3)

<u>Municipality Facility Name</u>	<u>Population Served</u>	<u>Treatment Type</u>	<u>Total Phosphorus Discharged lbs/year</u>	<u>Total Nitrogen Discharged lbs/year</u>	<u>Receiving Drainage Basin</u>	<u>Approximate Course Mileage from Lake Champlain</u>
Castleton**	1,715	Secondary	1,040	2,070	Poultney River	14
Fairhaven	2,450	Secondary	6,120	18,380	Poultney River	11
West Pawlet	250	None	800	2,350	Barge Canal	24
Totals	164,738		444,410	1,465,930		

(1) Includes 32.5 lbs P/day from United Farmers and Kraft Cheese.

(2) Includes 62.3 lbs TP/day from Yankee Milk (38) and Franklin Cheese (24.3).

(3) Includes 8,380 lbs TP and 11,730 lbs TN from creamery.

(4) Load includes creamery waste (8.1 lbs/day - 2,947 lbs/year).

* Loadings were estimated on the basis of population served except of those plants which were sampled.

** Loadings based on sample data.

TABLE 12

QUANTITIES OF NITROGEN AND PHOSPHORUS DISCHARGED
TO MAJOR TRIBUTARIES FROM POINT WASTE SOURCES

<u>Tributary Name</u>	<u>Total Phosphorus* Discharged from Point Waste Sources to Tributary System lbs P/year</u>	<u>Total Phosphorus* Discharged from Point Waste Sources Within 25 Miles of Lake Champlain lbs P/year</u>	<u>Total Nitrogen Discharged from Point Waste Sources to Tributary System lbs N/year</u>
Direct to Lake Champlain	75,930	75,930	269,040
Barge Canal - Poultney River System	39,490	39,490	116,330
Otter Creek	86,740	13,390	268,490
LaPlatte River	6,200	6,200	16,770
Winooski River	173,230	81,000	679,870
Lamoille River	28,460	11,200	67,080
Stevens Brook	22,610	22,610	67,840
Missisquoi River	51,740	7,480	99,420
Great Chazy River	3,880	3,880	11,620
Saranac River	135,050	116,480	519,060
Little Ausable River	7,000	7,000	21,000
Ausable River	14,100	6,600	42,200
Mill Brook	7,930	7,930	23,770
Ticonderoga Creek	10,460	10,460	30,720
Totals	662,820	409,650	2,233,210

*Prior to New York phosphate laundry detergent ban.

Paper Company (IPC) facility near Ticonderoga, New York.

Flow data for the mill effluent and phosphorus concentrations in the effluent for all of 1972 and January through June of 1973 were supplied by the New York Department of Environmental Conservation (see Appendix F). Based on these data, the average annual loading to South Lake Champlain from the mill effluent was 24,090 pounds of total phosphorus.

In discussions with staff members of the Vermont Agency of Environmental Conservation it was indicated there was a question concerning sample processing prior to phosphorus analysis--specifically whether or not the samples were filtered prior to analysis. If the mill effluent samples were filtered prior to analysis, the phosphorus loading of 24,090 pounds/year would be a low estimate and would represent total dissolved phosphorus rather than total phosphorus.

No specific data were obtained for total nitrogen loadings from the IPC facility; therefore, the loading figure of 386,900 pounds/year reported by T. W. Beak Consultants was used as the estimated contribution from IPC.

C. Annual Total Phosphorus Loadings to Lake Champlain:

Table 13 lists the annual phosphorus input to Lake Champlain by major sources which includes (1) tributaries sampled by the

TABLE 13

PHOSPHORUS LOADING TO LAKE CHAMPLAIN
(Before New York Phosphate Laundry Detergent Ban)

I. Inputs

<u>Source</u>	<u>lbs P/year</u>	<u>% of total</u>
A. Sampled Tributaries ¹ -		
Missisquoi River	138,800	10.5
Stevens Brook	23,730	1.8
Lamoille River	72,650	5.5
Malletts Creek	2,750	0.2
Winooski River	209,640	15.9
LaPlatte River	17,780	1.3
Otter Creek	187,800	14.2
Barge Canal - Poultney River	135,970	10.3
Ticonderoga Creek	13,830	1.0
Fivemile Creek	1,340	0.1
Putnam Creek	3,370	0.3
McKenzie Brook	580	<0.1
Mill Brook	4,570	0.3
Hoisington Brook	1,090	0.1
Bouquet River	32,070	2.4
Ausable River	32,730	2.5
Little Ausable River	11,860	0.9
Salmon River	3,450	0.3
Saranac River	130,190	9.9
Little Chazy River	8,980	0.7
Great Chazy River	35,640	2.7
Tributary sub-total	(1,068,820)	(81.0)
B. Minor tributaries and immediate drainage ²	126,670	9.6
C. Municipal STP's direct to lake (8)	75,930	5.8
D. Industries direct to lake (1)	24,090	1.8
E. Direct precipitation ³	<u>23,140</u>	<u>1.8</u>
Totals	1,318,650	100.0

2. Output⁴

Richelieu River 652,720

3. Net Annual P Accumulation 665,930 lbs.

1. Tributary load includes point sources.

2. Drainage area of 1,195 sq. mi. and average load of 106 lbs. Total P/sq. mi./year.

3. Used value determined by RPI for Lake George (52.6 lbs Total P/sq. mi./year), Aulenbach (1972).

4. Mean total phosphorus concentration of EPA station 500171 used for calculation. Average Richelieu River discharge of 11,052 cfs from Henson and Potash (1969).

National Eutrophication Survey--accounting for 6,549 square miles of the total Champlain land drainage of 7,744 square miles, (2) unsampled minor tributaries and immediate drainage to Lake Champlain which includes the remaining 1,195 square miles of Lake Champlain drainage, (3) eight municipal sewage effluents which discharge directly to Lake Champlain, (4) one industrial discharge directly to Lake Champlain, and (5) phosphorus contributed directly to the lake in precipitation.

The data in Table 13 indicate that 81.0% of the total phosphorus load to Lake Champlain is input via the sampled tributary streams. The total phosphorus load carried by the sampled tributaries includes not only phosphorus from land runoff but also that discharged from municipalities in treated and untreated wastewater. The problem is to determine the percentage of total phosphorus load in the sampled tributary streams which originate from the point waste sources.

Because of the magnitude of the Champlain drainage basin, and the fact that multiple waste sources are located on some of the streams, it is not feasible to calculate specifically the percentage of total phosphorus originating from each of the point waste sources. It is, however, possible to make some reasonable estimates of the significance of point source input to Lake Champlain.

Table 14 summarizes the phosphorus and nitrogen loads discharged to Lake Champlain by each sampled tributary and also shows the total point source nutrient discharges to each tributary system. If the assumption were made that all phosphorus discharged from point sources to tributaries in the Lake Champlain Basin reached the lake, then 55% of the total tributary load and 52% of the total phosphorus load to Lake Champlain could be attributable to point sources (domestic and industrial). This would be the extreme case since it is unlikely that all of the phosphorus discharged from facilities located up to 82 river miles from Lake Champlain would ever reach the lake. Impoundments such as Arrowhead Lake and Lake Lamoille on the Lamoille River and Waterbury Reservoir in the Winooski basin would permanently trap a portion of the phosphorus load carried by the stream. Some of the remaining phosphorus would be assimilated by periphyton and macrophytic plants in the stream or adsorbed to particulate matter in the stream bed, although it can be argued that eventually the phosphorus would move downstream and reach Lake Champlain.

Point waste sources discharging within 25 miles of Lake Champlain account for 63% (433,740 lbs) of the total phosphorus originating from point sources in the entire drainage basin. If it is assumed that only 50% (293,400 lbs/year) of all the point source phosphorus discharged to sampled tributaries reached the

TABLE 14

COMPARISON OF TOTAL NUTRIENTS DISCHARGED TO LAKE CHAMPLAIN BY EACH
SAMPLED TRIBUTARY AND NUTRIENTS INPUT TO EACH TRIBUTARY SYSTEM FROM POINT WASTE SOURCES

<u>Tributary System</u>	<u>lbs Total P/year Delivered to Lake Including Point Sources</u>	<u>lbs Total P/year Discharged by Point Sources in Basin</u>	<u>lbs Total N/year Delivered to Lake Including Point Sources</u>	<u>lbs Total N/year Discharged by Point Sources in Basin</u>	
Missisquoi River	138,800	51,740	4,053,600	99,420	47
Stevens Brook	23,730	22,610	79,020	67,840	
Lamoille River	72,650	28,460	2,097,840	67,080	
Malletts Creek	2,750	0	61,900	0	
Winooski River	209,640	173,230	3,599,770	679,870	
LaPlatte River	17,780	6,200	127,400	16,770	
Otter Creek	187,800	86,740	3,316,300	268,490	
Barge Canal - Poultney River	135,970	39,490	2,273,700	116,330	
Ticonderoga Creek	13,830	10,460	312,680	30,720	
Fivemile Creek	1,340	0	27,030	0	
Putnam Creek	3,370	0	163,170	0	
McKenzie Brook	580	0	22,160	0	
Mill Brook	4,570	7,930	79,920	23,770	
Hoisington Brook	1,090	0	28,990	0	
Bouquet River	32,070	0	611,930	0	
Ausable River	32,730	14,100	1,696,380	42,200	
Little Ausable River	11,860	7,000	206,830	21,000	
Salmon River	3,450	0	175,950	0	
Saranac River	130,190	135,050	1,901,280	519,060	
Little Chazy River	8,980	0	189,560	0	
Great Chazy River	35,640	3,880	772,400	11,620	
Totals	1,068,820	586,890	21,797,810	1,964,170	

lake, then point sources (municipal and industrial) would account for approximately 27% of the tributary load and 30% of the total phosphorus load to Lake Champlain.

Taking a different approach to estimate the percentage of total phosphorus loading due to point sources, Table 15 presents the average nutrient contribution from eight tributary systems which receive little or no point source nutrient input. The mean total phosphorus contribution for the eight tributary systems is 106 pounds total phosphorus/square mile/year. Multiplying this factor by the drainage area of sampled tributaries (6,549 square miles) results in an estimated non-point loading of 694,190 pounds P/year with the remaining loading of 374,630 pounds attributable to point source discharges to the tributaries. By this estimate, 35% of the tributary phosphorus load originates from point sources and, including direct municipal and industrial discharge to the lake, 36% of the total loading to Lake Champlain originates from point sources. This method agrees well with the results obtained by assuming that 50% of all point source nutrients discharged to tributaries actually reach the lake.

In summary, using the conservative estimate, approximately 30% of the total phosphorus load to Lake Champlain can be attributed to New York and Vermont point waste sources. This estimate was based on conditions through June, 1973, prior to a New York ban on phosphate laundry detergents.

TABLE 15

ANNUAL PHOSPHORUS AND NITROGEN LOADINGS FROM EIGHT LAKE
CHAMPLAIN TRIBUTARIES WHICH RECEIVE NO SIGNIFICANT POINT SOURCE
NUTRIENT LOADS

<u>Tributary Name</u>	<u>Drainage Area (sq mi)</u>	<u>Total lbs P/yr</u>	<u>lbs P/ sq mi/yr</u>	<u>Total lbs N/yr</u>	<u>lbs N/ sq mi/yr</u>
Malletts Creek	19.1	2,750	144	61,900	3,241
Fivemile Creek	8.4	1,345	160	27,032	3,218
Putnam Creek	61.3	3,369	55	163,170	2,662
McKenzie Brook	10.3	580	56	22,160	2,151
Hoisington Brook	11.4	1,090	96	28,990	2,542
Bouquet River	278.0	32,070	115	611,930	2,201
Salmon River	66.0	3,450	52	175,950	2,666
Little Chazy River	51.2	8,980	175	189,560	3,702
Mean Nutrient Loads			106 lbs P/mi ² /yr		2,798 lbs N/mi ² /yr

Effect of Phosphate Detergent Ban

Phosphates in detergents account for approximately 50% of the total phosphorus load in domestic wastewater. In New York, a statewide ban on the sale of phosphate laundry detergents became effective July 1, 1973. Assuming that New York residents in the Champlain drainage basin purchase and use the non-phosphate detergents, a 50% decrease in wastewater phosphorus loads would be expected. The ban, therefore, if effective, would decrease the phosphorus load to Lake Champlain and the percentages of the total load attributed to point sources as indicated in Table 16.

Assuming again that 50% of all point source phosphorus discharged to tributaries reaches Lake Champlain, following the New York ban the total phosphorus load to the lake would decrease to 1,260,510 pounds per year, of which 30% would be from point sources (municipal plus industrial).

If the State of Vermont also initiates a phosphate ban, the total phosphorus load to Lake Champlain would decrease to 1,133,960 pounds per year, of which 18% would originate from point sources (municipal plus industrial).

D. Annual Total Nitrogen Loadings to Lake Champlain:

Table 17 lists the annual total nitrogen input to Lake Champlain by major sources including (1) tributaries sampled by the National Eutrophication Survey which account for 6,549 square miles of the total Champlain land drainage of 7,744 square

TABLE 16

EFFECTS OF PHOSPHATE LAUNDRY DETERGENT BAN ON ANNUAL PHOSPHORUS LOADINGS
TO LAKE CHAMPLAIN AND PHOSPHORUS CONTRIBUTIONS FROM POINT WASTE SOURCES

	<u>Total Annual Phosphorus* Loading lbs Total P</u>	<u>Annual Phosphorus* Loading Attributable to All Point Sources lbs Total P (% of Total Load)</u>	<u>Annual Phosphorus* Loading Attributable to NY Point Sources lbs Total P (% of Total Load)</u>	<u>Annual Phosphorus* Loading Attributable to VT Point Sources lbs Total P (% of Total Load)</u>
No Ban on Phosphates	1,318,650	393,460 (30%)	140,270 (11%)	253,100 (19%)
NY Ban on Phosphates	1,260,510	335,320 (27%)	82,230 (7%)	253,100 (20%)
NY and VT Ban on Phosphates	1,133,960	208,770 (18%)	82,230 (7%)	126,550 (11%)

* Assuming that 50% of all phosphorus discharged to tributaries by point sources reaches Lake Champlain.

TABLE 17
NITROGEN LOADING TO LAKE CHAMPLAIN

1. Inputs

<u>Source</u>	<u>lbs N/year</u>	<u>% of total</u>
A. Sampled Tributaries ¹		
Missisquoi River	4,053,600	14.0
Stevens Brook	79,020	0.3
Lamoille River	2,097,840	7.3
Malletts Creek	61,900	0.2
Winooski River	3,599,770	12.4
LaPlatte River	127,400	0.4
Otter Creek	3,316,300	11.5
Barge Canal - Poultney River	2,273,700	7.9
Ticonderoga Creek	312,680	1.1
Fivemile Creek	27,030	0.1
Putman Creek	163,170	0.6
McKenzie Brook	22,160	0.1
Mill Brook	79,920	0.3
Hoisington Brook	28,990	0.1
Bouquet River	611,930	2.1
Ausable River	1,696,380	5.9
Little Ausable River	206,830	0.7
Salmon River	175,950	0.6
Saranac River	1,901,280	6.6
Little Chazy River	189,560	0.7
Great Chazy River	772,400	2.3
Tributary sub-total	(21,797,810)	(75.2)
B. Minor tributaries and immediate drainage ²	3,343,610	11.7
C. Municipal STP's direct to lake (8)	269,040	1.0
D. Industries direct to lake (1)	386,900	1.3
E. Direct precipitation ³	<u>3,131,040</u>	<u>10.8</u>
Totals	28,928,400	100.0

2. Outputs

Richelieu River⁴ 21,692,026

3. Net Annual Nitrogen Accumulation 7,236,374 lbs.

1. Tributary load includes point sources.
2. Drainage area of 1,195 sq. mi. and average load of 2,798 lbs total nitrogen/sq mi/yr.
3. Used value determined by RPI for Lake George (7,100 lbs TN/ sq mi/yr), Aulenbach (1972).
4. Used mean total nitrogen concentration of EPA station 500171 and average Richelieu River discharge of 11,052 cfs from Henson and Potash (1969).

miles, (2) unsampled minor tributaries and immediate drainage which includes the remaining 1,195 square miles of Champlain drainage, (3) eight municipal sewage discharges which are direct to the lake, (4) one industrial discharge direct to the lake, and (5) nitrogen contributed directly to the lake in precipitation.

The estimated total annual nitrogen loading to Lake Champlain from all major sources is 28,928,400 pounds. Of the total, 75% is input through the sampled tributary streams.

If it is assumed that all nitrogen discharged by point sources reaches Lake Champlain, only about 9% of the total nitrogen input can be attributed to these sources. The remaining 91% of the input results from land runoff and precipitation. Point source nitrogen control from the standpoint of eutrophication would be pointless.

E. South Lake Champlain Phosphorus Loading:

Total phosphorus loadings to South Lake Champlain are presented in Table 18. South Lake tributaries which were sampled by the National Eutrophication Survey included 1,024 square miles or approximately 84% of the entire South Lake drainage area of 1,216 square miles.

The total annual phosphorus input to South Lake prior to the New York ban on phosphate laundry detergents was

TABLE 18

ANNUAL TOTAL PHOSPHORUS LOADING TO SOUTH LAKE CHAMPLAIN
(Before New York Phosphate Laundry Detergent Ban)

1. Inputs

<u>Source</u>	<u>lbs P/year</u>	<u>% of total</u>
A. Sampled Tributary Load, Excluding Point Sources (D.A.)		
Poultney River-Barge Canal (692)	96,480	48.9
Ticonderoga Creek (262)	5,170	2.6
Fivemile Creek (8.4)	1,340	0.7
Putnam Creek (61.3)	3,370	1.7
a. Sub-total	106,360	53.9
B. Minor tributaries & immediate drainage (DA)		
Crown Point Bridge ¹ to East Creek (30.6)	4,220	2.1
East Creek (32.3) ¹	4,460	2.3
East Creek to ² Poultney River (22.1)	2,320	1.2
Barge Canal to Ticonderoga Creek (93) ³	4,000	2.0
Putnam Creek to Crown Point (14.3) ⁴	790	0.4
b. Sub-total	15,790	8.0
C. Municipal Wastes		
NY - Fort Ann	1,400	0.7
- Comstock Prison	5,440	2.8
- Granville	6,960	3.5
- Whitehall	12,040	6.1
- Ticonderoga	10,460	5.3
VT - West Pawlet	800	0.4
- Benson	380	0.2
- Castleton	1,040	0.5
- Fairhaven	6,120	3.1
- Poultney	5,310	2.7
c. Sub-total	49,950	25.3
D. Industrial Wastes		
International Paper Co. ⁵	24,090	12.2
E. Direct precipitation ⁶	<u>1,160</u>	<u>0.6</u>
Totals	197,350	100.0

2. Output⁷

Crown Point Bridge 123,690

3. Net Annual Phosphorus Accumulation 73,660 lbs.

¹ Used factor of 138 lbs P/sq mile/year.

² Used factor of 105 lbs/sq mile/year.

³ Used factor of 43 lbs/sq mile/year.

⁴ Used factor of 55 lbs/sq mile/year.

⁵ Used IPC Mill effluent and NY San. 45 data.

⁶ Used same factors as determined for Lake George by RPI Fresh-Water Institute.

⁷ Used mean phosphorus concentration for EPA Station 500104 and estimated mean flow of 1,441 cfs (Henson).

estimated to be 197,350 pounds. Of the total, 62% originates from diffuse sources, whereas 38% originates from municipal and industrial point sources which are subject to control. Since all domestic waste discharges are located within 25 miles of the lake, the assumption was made that 100% of the discharged phosphorus eventually reached South Lake Champlain.

Table 19 presents the annual phosphorus loading to South Lake Champlain, by State, prior to the New York ban on phosphate laundry detergents. New York diffuse sources accounted for 27% of the total input and Vermont diffuse sources about 35%. Point waste sources from New York and Vermont accounted for 31% and 7% of the total input, respectively. For all sources, New York contributed 58% of the total and Vermont 42% of the total annual phosphorus input. The International Paper Company, prior to the New York ban, contributed 12% of the total phosphorus to South Lake Champlain.

Table 20 summarizes the phosphorus contributions, by State, after the New York phosphate laundry detergent ban (assuming the ban is 100% effective). Under this condition, the total load to South lake would be reduced to 179,200 pounds/year with all New York sources contributing 54% of the total load and all Vermont sources contributing 46%. With the New York phosphate ban in effect, the International Paper Company contribution would be 13% of the total phosphorus load.

TABLE 19

ANNUAL PHOSPHORUS LOADING TO SOUTH LAKE CHAMPLAIN BY STATE
(Before New York Phosphate Laundry Detergent Ban)

<u>Source</u>	<u>lbs P/year</u>	<u>% of total</u>
New York Diffuse Sources	54,080	27
New York Point Sources*	60,390	31
Vermont Diffuse Sources	69,230	35
Vermont Point Sources	<u>13,650</u>	<u>7</u>
Totals	197,350	100

* Prior to the New York phosphate detergent ban, the International Paper Company phosphorus contribution of 24,090 lbs/year was 12% of the total input.

TABLE 20

ANNUAL PHOSPHORUS LOADING TO SOUTH LAKE CHAMPLAIN BY STATE
(After New York Phosphate Laundry Detergent Ban)

<u>Source</u>	<u>lbs P/year</u>	<u>% of total</u>
New York Diffuse Sources	54,080	30
New York Point Sources*	42,240	24
Vermont Diffuse Sources	69,230	38
Vermont Point Sources	<u>13,650</u>	<u>8</u>
Totals	179,200	100

* Following the New York Phosphate detergent ban, the International Paper Company phosphorus contribution of 24,090 lbs/year was 13% of the total.

As an approximate check on the reasonability of the South Lake phosphorus loading from diffuse sources, the average phosphorus loading from eight control tributaries (not receiving major point source discharges) to Lake Champlain was 106 pounds P/square mile/year (see Table 15).

This factor, multiplied by the total South Lake Champlain drainage area of 1,216 square miles, totals 128,900 lbs P/year; this is in very good agreement with the diffuse source load in Table 18 of 123,310 lbs P/year.

F. Relationship Between Nutrient Loading and Trophic Condition:

Based on phosphorus and nitrogen loadings which have been reported in the literature for several European and American lakes of known trophic condition, Vollenweider (1973) established a graphical relationship between annual surface phosphorus loadings, trophic conditions, mean depths, and retention time of lakes. While the validity of the Vollenweider numbers has not been completely established, these numbers are the best presently available and can be used as an additional guideline to relate existing nutrient loadings to ideal loading rates and trophic condition.

Table 21 presents phosphorus loading rates to Lake Champlain for point source phosphorus effluent reductions ranging from the condition prior to the New York ban on phosphate laundry

detergents to a situation where all effluent phosphorus from Vermont and New York is reduced by 90% through treatment. Prior to the New York ban on phosphorus laundry detergents, the estimated loading rate to Lake Champlain was $0.53 \text{ grams/m}^2 \text{ lake surface/year}$ which, following the NY ban, would have been reduced to $0.51 \text{ grams/m}^2/\text{year}$. If Vermont also imposed a ban on phosphate detergents and the International Paper Company plant reduced phosphorus discharges by 50%, the loading to Lake Champlain would be $0.45 \text{ g/m}^2/\text{year}$ or approximately 85% of the loading prior to the New York ban. If both states reduced all effluent phosphorus by 80% or by 90% the loadings would be 0.40 and 0.39 $\text{g/m}^2/\text{year}$ respectively.

The loading data cited in Table 21 are all calculated with the assumption that 50% of the total phosphorus discharged to streams in the Champlain basin eventually reaches the lake. That assumption is not unrealistic because 62% of all tributary point source phosphorus is discharged within 25 miles of Lake Champlain.

According to Vollenweider's relationship between phosphorus loading, mean depth, detention time and hydraulic residence time, a loading of $0.51 \text{ g/m}^2/\text{year}$ corresponds to the so-called "dangerous" loading level which is the cut off between a eutrophic

and mesotrophic condition. If the loading were reduced to $0.40 \text{ g/m}^2/\text{year}$ according to Vollenweider, Lake Champlain would be well within the mesotrophic zone of the loading relationship.

Loading relationships for South Lake Champlain for various conditions of effluent phosphorus reductions are presented in Table 22. South Lake Champlain phosphorus loading rates are about three times higher than for all of Lake Champlain. Prior to the New York ban on phosphate laundry detergents, the loading rate was $1.57 \text{ g/m}^2/\text{year}$ which would be expected to decrease to $1.43 \text{ g/m}^2/\text{year}$ following the New York ban. If Vermont imposed a similar ban and the International Paper Company reduced its phosphorus discharge by 50% the phosphorus loading rate would be $1.28 \text{ g/m}^2/\text{year}$. An 80% reduction by all point source discharges to South Lake Champlain or its tributaries would reduce the loading to $1.10 \text{ g/m}^2/\text{year}$ while a 90% effluent phosphorus reduction would result in a loading of $1.04 \text{ g/m}^2/\text{year}$.

According to the Vollenweider relationship, the "dangerous" phosphorus loading level for South Lake Champlain is $0.85 \text{ g/m}^2/\text{year}$. This level could not be met even if all effluent phosphorus were removed from the South Lake Champlain drainage basin.

TABLE 21

EFFECT OF EFFLUENT PHOSPHORUS REDUCTION ON LOADING RATE TO
LAKE CHAMPLAIN

<u>Effluent Phosphorus Reduction</u>	<u>Annual Total Phosphorus* Load from Point Waste Sources (lbs)</u>	<u>Annual Total Phosphorus* Load Including all Sources (lbs)</u>	<u>Annual Total Phosphorus* Load from Point Waste Sources (g/m²)</u>
Condition prior to NY Phosphate Detergent Ban (0%)	393,460	1,318,650	0.53
Condition after NY Phosphate Detergent Ban (50% NY, 0% VT)	335,320	1,260,510	0.51
50% (equivalent to P Detergent ban in NY and VT, 50% removal from ICo.)	196,720	1,121,920	0.45
80% (both states)	78,690	1,003,890	0.40
90% (both states)	39,347	964,550	0.39

* Assumption in all cases that 50% of point source phosphorus discharged to tributaries actually reaches Lake Champlain.

TABLE 22

EFFECT OF EFFLUENT PHOSPHORUS REDUCTION ON LOADING RATE TO
SOUTH LAKE CHAMPLAIN

<u>Effluent Phosphorus Reduction</u>	<u>Annual Total Phosphorus Load from Point Sources</u>	<u>Annual Total Phosphorus Load from All Sources</u>	<u>Annual Total Phosphorus Loading Rate from All Sources</u>	
Condition prior to NY phosphate detergent ban (0%)	73,540	197,350	1.57	
Condition after NY phosphate detergent ban (50% NY, 0% VT)	55,890	179,700	1.43	29
50% (equivalent to phosphate detergent ban in NY and VT plus 50% reduction by IPCo.)	36,670	160,680	1.28	
80% (both states)	14,710	138,520	1.10	
90% (both states)	7,350	131,160	1.04	

VI. LITERATURE CITED

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APPENDIX A
LAKE CHAMPLAIN TRIBUTARY DATA
COLLECTED BY THE
NATIONAL EUTROPHICATION SURVEY

STORET RETRIEVAL DATE 74/12/27

500171 LS500171
 45 00 00.0 073 21 00.0
 RICHELIEU RIVER
 50 15/ROUSE'S POINT
 0/LAKE CHAMPLAIN
 US2 BRIDGE EAST OF ROUSES POINT
 11EPALES 2111204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/07/15			0.064	0.450	0.033	0.010	0.029
72/08/12	13 30		0.053	0.420	0.040	0.010	0.026
72/10/15			0.195	0.400	0.132	0.005K	0.015
72/11/04	15 15		0.150	0.780	0.037	0.009	0.031
72/12/04	10 35		0.390	0.370	0.032	0.015	0.027
73/01/06	07 45		0.252	0.310	0.011	0.011	0.020
73/02/03	11 50		0.370		0.096	0.008	0.020
73/03/03			0.273	1.800	0.063	0.011	0.027
73/04/07	15 15		0.920	2.600	0.380	0.399	0.660
73/04/15	10 00		0.132	1.470	0.087	0.008	0.035
73/05/06	16 00		0.092	1.380	0.290	0.009	0.045
73/05/12	11 15		0.040	0.950	0.030	0.005K	0.022
73/07/08	11 20		0.010K			0.011	0.063

K VALUE KNOWN TO BE
 LESS THAN INDICATED

STORET RETRIEVAL DATE 74/12/27

500161 LS509161
 44 55 10.0 073 07 40.0
 MISSISSQUOI RIVER
 50 7.5/EAST ALBERG
 I/LAKE CHAMPLAIN
 HOGG AT SWANTON
 11EPALES

2111204
 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/07/15	09 55		0.115	0.400	0.048	0.014	0.034
72/08/12	12 30		0.182	0.325	0.048	0.022	0.036
72/09/23				1.650		0.013	0.040
72/10/15	09 00		0.144	0.600	0.132	0.014	0.048
72/11/04	15 00		0.280	0.860	0.052	0.039	0.072
72/12/04	10 55		0.210	0.400	0.016	0.010	0.020
73/01/06	09 10		0.490	0.420	0.028	0.010	0.025
73/02/03	10 45		0.530	1.600	0.110	0.026	0.085
73/03/03			0.550	0.750	0.430	0.011	0.025
73/04/07	14 30		0.310	0.630	0.100	0.010	0.035
73/04/15	09 00		0.370	4.000	2.400	0.006	0.030
73/05/06	15 10		0.273	0.600	0.058	0.014	0.070
73/05/12	10 15		0.190	0.840	0.025	0.007	0.040
73/07/09	10 45		0.240	1.050	0.140	0.020	0.040

STORET RETRIEVAL DATE 74/12/27

500162 LS500162
 44 54 00.0 073 06 40.0
 MISSISQUOI RIVER
 50 7.5/HIGHGATE CEN
 I/LAKE CHAMPLAIN
 US 7 BRDG SE OF SWANTON
 11EPALES 2111204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS URTHO MG/L P	00665 PHOS-TOT MG/L P
72/07/15	09 15		0.095	0.500	0.046	0.017	0.035
72/08/12	10 50		0.210	0.965	0.056	0.019	0.040
72/09/23	10 00		0.010K	0.280	0.008	0.005K	0.034
72/10/15	08 30		0.098	0.950	0.075	0.022	0.068
72/11/04	14 30		0.299	0.260	0.058	0.010	0.036
72/12/04	10 15		0.380	0.370	0.018	0.014	0.019
73/02/03	11 00		0.520	0.985	0.105	0.022	0.110
73/03/03			0.550	0.700	0.250	0.008	0.025
73/04/07	14 00		0.940	0.920	0.140	0.069	0.200
73/04/15	09 00		0.200	0.720	0.071	0.010	0.030
73/05/06	15 00		0.290	0.720	0.044	0.012	0.035
73/05/12	10 00		0.200	1.400	0.042	0.007	0.040
73/07/08	10 30		0.240	0.440	0.052	0.015	0.040

K VALUE KNOWN TO BE
 LESS THAN INDICATED

STORET RETRIEVAL DATE 74/12/27

500163 LS500163
 44 20 00.0 072 25 00.0
 MISSISSOUI RIVER
 50 15/ IRASHURG
 I/LAKE CHAMPLAIN
 HWY 100 BRIDGE EAST OF TROY
 11EPALES 2111204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/07/15	13 19		0.233	0.500	0.024	0.086	0.124
72/09/19	09 30		0.247	0.600	0.087	0.115	0.180
72/10/15	13 15		0.200	0.500	0.094	0.032	0.054
72/11/09	11 30		0.270	0.960	0.080	0.042	0.160
72/12/07	09 00		0.340	0.500	0.033	0.021	0.053
73/03/21	15 45		0.490	0.300	0.048	0.007	0.025
73/04/07			0.357	1.050	0.042	0.014	0.045
73/04/21	11 00		0.198	1.760	0.059	0.007	0.020
73/05/06	10 50		0.280	0.350	0.022	0.075	0.095
73/05/23	10 30		0.210	0.660	0.088	0.031	0.065
73/06/28	14 30		0.126	0.500	0.240	0.017	0.045

STORET RETRIEVAL DATE 74/12/27

500141 LS500141
 44 48 00.0 973 05 00.0
 STEVENS BROOK
 50 7.5/ST ALBANS
 T/LAKE CHAMPLAIN
 US 7 BRDG IN ST ALBANS
 11EPALES 2111204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00655 PHOS-TOT MG/L P
72/07/15	10 50		0.539	0.550	0.100	0.054	0.093
72/08/12	11 00		0.392	0.500	0.065	0.052	0.270
72/09/10			0.330	0.450	0.320	0.058	0.084
72/10/15			0.169	0.400	0.105	0.042	0.072
72/11/04	14 25		0.540	0.580	0.072	0.046	0.115
72/12/04	10 05		0.830	0.320	0.014		0.072
73/02/03	10 15		0.490	1.050	0.230	0.078	0.210
73/03/03			0.780	0.310	0.100	0.017	0.035
73/04/07	13 25		0.315	0.520	0.105	0.010	0.035
73/04/19	08 00		0.610	2.100	0.830	0.058	0.190
73/05/06	14 20		0.252	1.100	0.090	0.105	0.250
73/05/14			0.630	1.050	0.100	0.072	0.195
73/07/08	09 30		0.340	1.050	0.290	0.054	0.100

STORET RETRIEVAL DATE 74/12/27

5001R2 LS5001R2

44 51 00.0 073 07 25.0

STEVENS BROOK

50 7.5/ST ALBANS

T/LAKE CHAMPLAIN

NEWTON RD BRIDGE

11EPALES

2111204

4

0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/07/15	10 30		0.073	3.750	0.960	1.200	2.200
72/08/12	11 15		0.920	1.150	0.198	0.273	0.390
72/09/23			0.450	7.000	0.170	0.280	1.100
72/10/15			0.311	4.450	1.500		2.400
72/11/04	12 30		0.290	2.600	0.660	0.210	0.820
72/12/04	09 55		0.810	2.400	0.660	0.330	0.630
73/02/03	09 30		0.620	4.900	0.550	0.210	1.350
73/03/03			0.810	0.960	0.132	0.021	0.110
73/04/07	13 00		0.072	0.790	0.189	0.005K	0.030
73/04/19	08 30		0.320	2.440	1.160	0.910	1.150
73/05/06	14 00		0.176	3.000	0.210	0.290	0.410
73/05/14			0.370	1.900	0.360	0.320	0.470
73/07/09	10 20		0.080	7.600	3.400	0.890	1.570

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 74/12/27

500141 LSS00141
 44 36 30.0 073 12 15.0
 LAMPVILLE RIVER
 50 7.5/FT ETIAN ALL
 I/LAKE CHAMPLAIN
 BRDG ON HWY US 2
 11EPALES 2111204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/07/15	12 30		0.147	0.270	0.044	0.011	0.022
72/08/12	13 30		0.234	0.590	0.060	0.011	0.026
72/10/04	08 30		0.132	0.350	0.079	0.009	0.019
72/10/15	10 45		0.210	0.500	0.086	0.005K	0.014
72/11/04	10 40		0.240	0.460	0.044	0.005K	0.023
72/12/02	12 30		0.350	0.610	0.024	0.005K	0.037
73/01/13	13 30		0.460	0.440	0.044	0.014	0.025
73/02/10	10 30		0.430	1.260	0.096	0.011	0.155
73/03/10	11 00		0.530	0.500	0.120	0.022	0.070
73/04/07	11 35		0.320	0.660	0.200	0.009	0.030
73/04/21	08 15		0.360	0.300	0.046	0.008	0.030
73/05/12	09 50		0.240	0.270	0.012	0.005K	0.030
73/06/03	10 05		0.210	1.000	0.570	0.005K	0.025

K VALUE KNOWN TO BE
 LESS THAN INDICATED

STORET RETRIEVAL DATE 74/12/27

500121 L5400121
 44 33 30.0 073 09 30.0
 MALLETT'S CREEK
 50 7.5/FT FTHAN ALL
 T/LAKE CHAMPLAIN
 US 7 AND RT 2 BRDG
 11EPALES 2111204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/07/15	12	45	0.327	0.650	0.019	0.027	0.061
72/08/12	14	00	0.240	0.630	0.052	0.018	0.046
72/10/04	08	00	0.270	0.500	0.056	0.016	0.037
72/10/15	10	30	0.220	1.150	0.084	0.006	0.044
72/11/04	10	40	0.299	0.420	0.044	0.009	0.040
72/12/02	13	35	0.350	0.770	0.036	0.007	0.030
73/01/13	14	15	0.520	3.780	0.176	0.013	0.042
73/02/10	11	15	0.440	1.310	0.088	0.012	
73/03/10	09	00	0.320	0.440	0.084	0.011	0.060
73/04/07	07	30	0.189	0.365	0.044	0.012	0.040
73/04/15	13	30	0.250	0.460	0.024	0.008	0.025
73/04/21	07	00	0.220	0.720	0.176	0.012	0.035
73/05/12	09	05	0.092	0.400	0.008	0.005K	0.040
73/06/03	10	00	0.100	1.000	0.450	0.009	0.035

K VALUE KNOWN TO BE
 LESS THAN INDICATED

STORET RETRIEVAL DATE 74/12/27

500131 LS500131
 44 29 00.0 073 12 00.0
 WINOOSKI RIVER
 50 15/HURLINGTON
 1/LAKE CHAMPLAIN
 PROG ON US 7
 11EPALES 2111204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/12	08 55		0.390	0.480	0.231	0.064	0.120
72/09/10	10 30		0.390	0.650	0.220	0.056	0.115
72/10/14	09 30		0.420	0.750	0.200	0.054	0.110
72/11/05	10 30		0.280	0.440	0.150	0.040	0.096
72/12/03	13 00		0.360	0.370	0.054	0.033	0.042
73/01/06	10 30		0.420	0.340	0.052	0.018	0.035
73/02/03	10 00		0.470		0.076	0.028	0.060
73/03/03			0.550	0.690	0.340	0.025	0.050
73/04/07			0.360	0.340	0.036	0.012	0.045
73/04/21			0.340	0.350	0.056	0.014	0.040
73/05/05	10 00		0.357	0.300	0.060	0.017	0.050
73/05/13			0.250	2.100	0.930	0.011	0.050
73/07/08	11 00		0.520	0.390	0.057	0.013	0.075

STORET RETRIEVAL DATE 74/12/27

509132 LS509132
 44 29 00.0 073 09 30.0
 WINOOSKI RIVER
 50 15/HURLINGTON
 I/LAKE CHAMPLAIN
 BRDG OVER WINOOSKI GORGE
 11EPALES 2111204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2+N03 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/08/12	09 40		0.350	0.440	0.150	0.026	0.080
72/09/10	10 45		0.350	0.550	0.096	0.015	0.058
72/10/14	10 30		0.410	0.900	0.150	0.078	0.130
72/11/05	11 30		0.280	0.920	0.147	0.040	0.090
72/12/02	10 00		0.350	0.420	0.060	0.017	0.048
73/01/06	11 30		0.430	1.260	0.060	0.021	
73/02/03	13 15		0.440	0.480	0.082	0.033	0.070
73/03/03			0.560	0.400	0.100	0.025	0.065
73/04/07	10 30		0.360	1.000	0.300	0.011	0.095
73/04/21			0.380	0.330	0.038	0.012	0.035
73/05/05	09 00		0.370	0.350	0.060	0.016	0.040
73/05/13	18 00		0.240	0.360	0.052	0.009	0.045
73/07/08	11 40		0.320	1.080	0.230	0.021	0.080

STORET RETRIEVAL DATE 74/12/27

500133 LS500133
 44 23 00.0 072 56 00.0
 WINDOSKI RIVER
 50 15/CAMELS HUMP
 I/LAKE CHAMPLAIN
 BRUG AT JONESVILLE
 11EPALES 2111204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/07/15	10 00		0.239	0.500	0.024	0.025	0.046
72/08/12	10 40		0.330	0.750	0.063	0.027	0.054
72/09/16	11 15		0.540	0.350	0.100	0.033	0.056
72/10/14	10 15		0.340	0.400	0.069	0.033	0.060
72/11/04	10 00		0.240	0.400	0.040	0.021	0.062
72/12/03	15 00		0.370	0.280	0.026	0.025	0.035
73/02/04	11 30		0.399	0.420	0.078	0.011	0.045
73/04/22	11 30		0.220	0.330	0.080	0.024	0.115
73/05/05	08 30		0.273	0.560	0.069	0.008	0.050
73/05/24	11 30		0.210	0.350	0.015	0.009	0.045
73/06/10	13 30		0.230	0.960	0.037	0.007	0.035

STORET RETRIEVAL DATE 74/12/27

500134 LS500134
 44 19 30.0 072 45 00.0
 WINOOSKI RIVER
 50 15/MONTPELIER
 I/LAKE CHAMPLAIN
 SMITHS BRDG SE OF WATERBURY
 11EPALES 2111204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2+N03 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/07/15	10 30		0.257	0.600	0.063	0.044	0.075
72/08/12	11 15		0.330	0.280	0.054	0.029	0.056
72/09/16	12 00		0.600	0.500	0.198	0.058	0.120
72/10/14	09 15		0.430	0.550	0.190	0.046	0.088
72/11/04	15 00		0.240	0.420	0.062	0.031	0.088
72/12/03	14 00		0.374	0.340	0.030	0.031	0.056
73/01/06			0.400	0.400	0.043	0.023	0.045
73/02/04	11 00		0.399	0.400	0.072	0.010	0.030
73/03/03	11 01		0.510	0.320	0.085	0.037	0.080
73/04/08	12 00		0.320	0.260	0.046	0.009	0.035
73/04/22	12 00		0.320	0.580	0.240	0.010	0.030
73/05/24	12 00		0.189	0.350	0.012	0.007	0.047
73/06/10	14 30		0.198	1.200	0.042	0.009	0.040

STORET RETRIEVAL DATE 74/12/27

500135 L5500135
 44 31 30.0 073 15 30.0
 WINOOSKI RIVER
 50 15/PLATTSBURG NY
 I/LAKE CHAMPLAIN
 RWDG RT 127
 11EPALES 2111204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/07/15	10 25		0.239	0.750	0.015	0.012	0.046
72/08/12	08 35		0.390	0.310	0.075	0.028	0.058
72/09/10	10 10		0.320	0.500	0.072	0.017	0.069
72/10/14	08 30		0.470	1.300	0.240	0.044	0.105
72/11/05	09 30		0.310	1.050	0.138	0.040	0.092
72/12/02	10 30		0.340	0.440	0.044	0.018	0.050
73/01/04	09 30		0.440	0.540	0.056	0.076	
73/03/03			0.540	0.310	0.091	0.027	0.055
73/04/07	09 00		0.370	0.330	0.060	0.012	0.045
73/04/21			0.340	0.270	0.050	0.014	0.035
73/05/05	11 00		0.360	0.295	0.054	0.015	0.035
73/05/13	17 00		0.240	1.540	0.420	0.008	0.045
73/06/10	08 00		0.320	1.890	0.870	0.008	0.075

STORET RETRIEVAL DATE 74/12/27

500136 LS500136

44 25 30.0 073 01 00.0

WINOOSKI RIVER

50 15/BURLINGTON

I/LAKE CHAMPLAIN

BRDG ON HWY US 2

11EPALES

4

2111204

0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/07/15	12	20	0.287	0.750	0.037	0.017	0.040
72/08/12	10	15	0.342	0.490	0.045	0.021	0.039
72/09/10	12	25	0.450	0.275	0.072	0.017	0.039
72/10/14	11	00	0.312	1.300	0.082	0.048	0.092
72/11/05	13	50	0.280	0.520	0.084	0.027	0.063
72/12/02	13	00	0.357	0.520	0.019	0.009	0.031
73/01/06	13	00	0.420	0.350	0.037	0.016	0.035
73/04/07	11	00	0.370	0.270	0.047	0.012	0.050
73/04/22	10	05	0.360	0.370	0.052	0.009	0.045
73/05/05			0.310	0.200	0.042	0.009	0.025
73/05/13	10	30	0.230	0.420	0.058	0.006	0.035
73/06/10	10	30	0.310	0.440	0.110	0.008	0.080

STORET RETRIEVAL DATE 74/12/27

500151 LS500151
 44 23 00.0 073 13 30.0
 LA PLATTE RIVER
 50 15/BURLINGTON
 T/LAKE CHAMPLAIN
 RT 7 BRDG
 11EPALES 2111204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2AN03 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/07/15	14 20		0.024	1.000	0.078	0.105	0.180
72/08/12	11 31		0.032	0.540	0.039	0.061	0.095
72/09/10	11 10		0.025	0.800	0.066	0.074	0.120
72/10/14	14 00		0.030	1.000	0.075	0.034	0.078
72/11/05	15 00		0.213	0.880	0.050	0.085	0.130
72/12/01	09 35		0.300	0.700	0.006	0.042	0.083
73/01/06	13 30		0.290	1.200	0.044	0.044	0.250
73/02/03	12 45		0.470	1.350	0.273	0.170	0.250
73/04/07			0.180	0.560	0.037	0.040	0.080
73/04/22	11 30		0.016	0.610	0.014	0.071	0.120
73/05/06	09 30		0.010K	0.500	0.024	0.038	0.080
73/05/13	10 30		0.010K	0.690	0.037	0.034	0.090
73/07/08	09 30		0.066	0.400	0.037	0.067	0.110

K VALUE KNOWN TO BE
 LESS THAN INDICATED

STORET RETRIEVAL DATE 74/12/27

500181 LS500181
 44 10 00.0 073 15 30.0
 OTTER CREEK
 50 15/PORT HENRY
 I/LAKE CHAMPLAIN
 ST HWY 22A BRIDGE AT VERGENNES
 11EPALES 2111204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/02/12	11 00		0.400	0.755	0.060	0.037	0.069
72/09/10	13 50		0.340	0.400	0.060	0.028	0.054
72/10/14	12 30		0.280	0.850	0.098	0.037	0.080
72/11/05	14 30		0.273	0.720	0.078	0.038	0.080
72/12/02	11 00		0.357	0.260	0.021		
73/01/06	12 00		0.460	0.510	0.042	0.026	0.075
73/02/03	12 15		0.440	1.400	0.189	0.066	0.190
73/03/03			0.510	0.500	0.110	0.025	0.060
73/04/07	12 30		0.294	1.050	0.140	0.021	0.065
73/04/22	08 30		0.370	0.440	0.021	0.019	0.045
73/05/06	15 00		0.378	0.560	0.110	0.025	0.055
73/05/12	10 00		0.340	2.520	1.000	0.024	0.060
73/07/08	14 00		0.160	1.640	0.189	0.044	0.105

STORET RETRIEVAL DATE 74/12/27

500182 LS500182
 43 48 30.0 073 09 00.0
 OTTER CREEK
 50 7.5/SUDBURY
 I/LAKE CHAMPLAIN
 ST HWY 73 BRIDGE 2.7 MILES W OF BRANDON
 11EPALES 2111204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/07/15	15 40		0.198	1.500	0.063	0.038	0.071
72/08/12	12 30		0.290	0.690	0.071	0.044	0.075
72/09/10	11 00		0.330	0.500	0.115	0.046	0.092
72/10/14	16 00		0.550	1.050	0.062	0.006	0.084
72/11/04			0.280	0.600	0.077	0.039	0.110
72/12/09	14 50		0.399	0.500	0.023	0.020	0.082
73/03/10	13 50		0.510	0.420	0.044	0.015	0.080
73/04/08			0.290	0.370	0.072	0.021	
73/04/22	10 00		0.390	0.820	0.073	0.028	0.050
73/05/06	14 30		0.370	0.390	0.093	0.030	0.055
73/05/16			0.260	0.400	0.060	0.023	0.045
73/06/02	10 30		0.250	0.480	0.078	0.021	0.050

STORET RETRIEVAL DATE 74/12/27

500192 LS500192
 43 34 00.0 073 23 30.0
 POULTNEY RIVER
 50 15/WHITEHALL
 I/LAKE CHAMPLAIN
 BRIDGE ON EAST BAY ROAD N OF WHITEHALL
 11EPALES 2111204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2AM03 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/07/15	14 00		0.217	0.600	0.033	0.030	0.056
72/08/12	11 00		0.319	0.750	0.064	0.031	0.056
72/09/10	10 00		0.167	0.500	0.087	0.030	0.060
72/10/14	14 30		0.250	0.550	0.078	0.025	0.064
72/11/04			0.170	0.630	0.092	0.028	0.094
72/12/09	12 30		0.300	0.630	0.028	0.022	0.069
73/03/10	11 00		0.310	0.560	0.068	0.028	0.118
73/04/08	10 00		0.200	0.390	0.028	0.018	0.070
73/04/22	10 15		0.150	0.400	0.033	0.015	0.040
73/05/05	13 35		0.154	0.500	0.029	0.015	0.050
73/05/16			0.154	0.380	0.016	0.018	0.050

STORET RETRIEVAL DATE 74/12/27

500191 LS500191
 43 30 30.0 073 11 00.0
 POULTNEY RIVER
 50 7.5/POULTNEY
 I/LAKE CHAMPLAIN
 ST RT 140 BETWEEN EPOULTNEYS MIDDLETONSP
 11EPALES 2111204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/07/15			0.412	0.400	0.027	0.010	0.014
72/09/12	11 00		0.447	0.160	0.031		0.011
72/09/10	09 30		0.430	0.200	0.048	0.012	0.017
72/10/14	14 00		0.250	0.400	0.075	0.008	0.015
72/11/04			0.370	0.230	0.025	0.005K	0.012
72/12/09	11 55		0.440	0.180	0.011	0.006	0.018
73/01/18	10 40		0.570	0.270	0.025	0.010	0.045
73/02/16	11 20		0.470		0.350	0.005K	0.005K
73/03/10	13 00		0.378	0.100K	0.008	0.005K	0.020
73/04/08			0.310	0.220	0.050	0.006	0.010
73/04/22	11 00		0.150	0.370	0.016	0.006	0.010
73/05/05	13 15		0.044	0.170	0.039	0.005K	0.005K
73/05/16			0.154	0.270	0.014	0.005K	0.005K
73/06/02	11 30		0.320	0.780	0.530	0.005K	0.010

K VALUE KNOWN TO BE
 LESS THAN INDICATED

STORET RETRIEVAL DATE 74/12/27

5001A1 LS5001A1
 43 37 00.0 073 10 05.0
 CASTLETON RIVER
 50 7.5/POULTNEY
 T/LAKE CHAMPLAIN
 US 4 BRDG E OF CASTLETON
 11EPALES 2111204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/08/12	09 30		0.220	0.260	0.024	0.011	0.013
72/09/10	09 00		0.435	0.450	0.315	0.006	0.009
72/10/14	11 25		0.235	0.250	0.069	0.005K	0.007
72/11/04			0.169	0.360	0.026	0.005K	0.013
72/12/09	11 10		0.240	0.200	0.005K	0.005K	0.010
73/01/18	10 00		0.450	0.170	0.026	0.005K	0.010
73/02/16	11 45		0.460	0.230	0.170	0.005K	0.005K
73/03/10	11 50		0.147	0.140	0.015	0.005K	0.015
73/04/08	11 00		0.120	0.120	0.025	0.005K	0.005K
73/04/22	11 15		0.310	0.460	0.013	0.005K	0.010
73/05/05	12 45		0.310	0.180	0.028	0.005K	0.010
73/05/16			0.200	0.220	0.011	0.005K	0.015
73/06/02	09 10		0.139	0.285	0.046	0.005K	0.010

K VALUE KNOWN TO BE
 LESS THAN INDICATED

STORET RETRIEVAL DATE 74/12/27

5001A2 L55001A2
 43 36 30.0 073 12 30.0
 CASTLETON RIVER
 50 7.5/POULTNEY
 T/LAKE CHAMPLAIN
 HELD RT 30 BRDG S OF CASTLETON CORNER
 11EPALES 2111204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2AN03 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/07/15	11 10		0.322		0.022	0.013	0.018
72/08/12	09 50		0.320	0.500	0.035	0.011	0.011
72/09/10	09 15		0.199	0.800	0.233	0.005K	0.008
72/10/14	13 00		0.320	0.150	0.056	0.011	0.015
72/11/04			0.200	0.280	0.031	0.005K	0.016
72/12/09	11 25		0.295	0.460	0.005K	0.005K	0.013
73/01/18	10 20		0.490	0.120	0.011	0.005K	0.010
73/02/16	11 00		0.510	0.100K	0.040	0.005K	0.005K
73/03/10	12 25		0.220	0.170	0.016	0.005K	0.020
73/04/08			0.220	0.630	0.078	0.006	0.010
73/04/22	10 30		0.357	0.180	0.005K	0.005K	0.007
73/05/05	13 00		0.350	0.400	0.080	0.005K	0.005K
73/05/16			0.260	0.480	0.018	0.005K	0.010
73/06/02	09 45		0.200	0.250	0.026	0.006	0.010

K VALUE KNOWN TO BE
 LESS THAN INDICATED

STORET RETRIEVAL DATE 74/12/27

5001A3 LS5001A3
 43 35 30.0 073 17 00.0
 CASTLETON RIVER
 50 15/WHITEHALL
 T/LAKE CHAMPLAIN
 RT 4W BRDG W OF FAIR HAVEN
 11EPALES 2111204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/07/15	12 20		0.143	1.880	0.049	0.026	0.060
72/09/17	12 00		0.310	0.520	0.088	0.052	0.046
72/09/10	09 20		0.350	0.900	0.220	0.026	0.176
72/10/14	15 30		0.169	0.300	0.120	0.025	0.046
72/11/04			0.130	0.390	0.046	0.015	0.050
72/12/09	12 50		0.230	0.380	0.011	0.007	0.028
73/01/18	12 00		0.480	0.520	0.120	0.048	0.075
73/02/16	12 00		0.273	0.840	0.260	0.022	0.030
73/03/11	13 15		0.210	0.290	0.069	0.010	0.050
73/04/04	11 30		0.170	0.220	0.029	0.012	0.025
73/04/22	10 45		0.340	0.395	0.041	0.006	0.050
73/05/05	14 00		0.300	1.000	0.189	0.060	0.195
73/05/16			0.132	1.320	0.072	0.012	0.050
73/06/02	10 20		0.138	1.050	0.470	0.015	0.050

STORET RETRIEVAL DATE 74/11/26

3609A1 LS3609A1
 43 34 00.0 073 24 30.0
 DELAWARE/CHAMPLAIN CANAL
 36 15 WHITEHALL
 I/LAKE CHAMPLAIN
 ALONG BANK OF RD OFF ST HWY22
 11EPALES 2111204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/11/04	10 00		0.460	0.450	0.066	0.022	0.096
72/12/07	15 15		0.690	0.780	0.042	0.030	0.160
73/01/04	14 02		0.800	0.460	0.042	0.015	0.048
73/02/13	09 30		0.830	0.375	0.066	0.018	0.040
73/04/07	09 20		0.490	0.140	0.065	0.016	0.070
73/04/23	09 15		0.500	0.460	0.022	0.014	0.050
73/05/07	11 00		0.350	0.980	0.042	0.016	0.060
73/05/24	10 30		0.450	1.200	0.058	0.020	0.080
73/06/08	16 15		0.336	1.320	0.068	0.017	0.045
73/07/10	11 30		0.620	0.540	0.069	0.032	0.070
73/08/18	16 45		0.340	0.400	0.027	0.021	0.070
73/09/11	09 30		0.270	0.660	0.132	0.052	0.080
73/10/10	11 15		0.280	0.970	0.071	0.016	0.085

STORET RETRIEVAL DATE 74/11/26

3609C2 LS3609C2
 43 28 00.0 073 26 00.0
 BARGE CANAL
 36 7.5 FORT ANN
 T/LAKE CHAMPLAIN
 BRDG 1 MI N OF GREAT MEADOWINT BELO STP
 11EPALES 2111204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/11/04	09 00		0.400	0.750	0.115	0.026	0.147
72/12/07	16 05		0.630	0.440	0.040	0.021	0.072
73/01/04	14 30		0.630	1.000	0.058	0.024	0.069
73/03/08	11 45		0.570	1.130	0.250	0.081	0.220
73/04/07	09 55		0.420	0.710	0.076	0.020	0.075
73/04/23	09 00		0.310	0.540	0.029	0.015	0.080
73/05/07	11 35		0.300	0.700	0.015	0.016	0.080
73/05/24	11 30		0.360	2.640	0.063	0.023	0.085
73/06/08	14 45		0.252	0.940	0.042	0.015	0.065
73/07/10	16 45		0.480	0.720	0.017	0.018	0.110
73/08/18	18 30		0.273	0.840	0.060	0.016	0.075
73/09/11	10 25		0.280	0.900	0.052	0.017	0.075
73/10/10	11 45		0.273	0.520	0.056	0.011	0.070

STORET RETRIEVAL DATE 74/11/26

3609C1 LS3609C1
 43 27 00.0 073 27 00.0
 BARGE CANAL
 36 7.5 FORT ANN
 T/LAKE CHAMPLAIN
 US 4 BRDG ABOV GRT MEADOWS INST STP
 11EPALES 2111204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/11/04	08 45		0.156	0.540	0.097	0.009	0.060
72/12/07	15 55		0.056	0.200	0.012	0.005K	0.015
73/01/04	14 40		0.160	0.175	0.036	0.006	0.019
73/03/08	12 00		0.176	0.420	0.024	0.010	0.055
73/04/07	10 15		0.034	0.270	0.036	0.006	0.025
73/04/23	08 45		0.198	0.560	0.027	0.007	0.050
73/05/07	10 15		0.320	0.820	0.028	0.013	0.067
73/05/24	11 15		0.294	0.900	0.032	0.019	0.070
73/06/08	14 30		0.231	0.500	0.011	0.011	0.050
73/07/10	16 30		0.580	0.720	0.028	0.018	0.095
73/08/18	18 15		0.270	0.380	0.071	0.013	0.060
73/09/11	10 05		0.340	0.360	0.024	0.031	0.040
73/10/10	12 05		0.273	0.420	0.280	0.008	0.060

* VALUE SHOULD BE
 LESS THAN INDICATED

STORET RETRIEVAL DATE 74/11/26

360981 LS360981
 43 34 30.0 073 26 00.0
 SOUTH BAY
 36 15 WHITEHALL
 1/LAKE CHAMPLAIN
 ST HWY 22 BRDG BELO WHITEHALL
 11EPALES 2111204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/11/04	09 30		0.169	0.350	0.063	0.005K	0.048
72/12/07	15 25		0.330	0.530	0.080	0.015	0.052
73/01/04	13 30		0.126	0.215	0.027	0.006	0.012
73/03/08	11 30		0.210	0.200	0.026	0.010	0.020
73/04/07	09 00		0.115	0.300	0.038	0.010	0.035
73/04/23	09 30		0.147	0.310	0.010	0.011	0.045
73/05/07	10 30		0.126	0.630	0.033	0.013	0.050
73/05/24	10 45		0.220	1.470	0.052	0.017	0.055
73/06/08	15 55		0.138	0.540	0.025	0.016	0.035
73/07/10	11 50		0.160	0.480	0.040	0.013	0.040
73/08/18	16 20		0.018	0.290	0.011	0.008	0.045
73/09/11	09 15		0.020	0.500	0.028	0.013	0.055
73/10/10	11 25		0.092	0.420	0.044	0.008	0.045

K VALUE KNOWN TO BE LESS
 THAN INDICATED

STORET RETRIEVAL DATE 74/11/26

3609F2 LS3609F2
 43 51 00.0 073 25 00.0
 TICONDEROGA CREEK
 36 15 TICONDEROGA
 T/LAKE CHAMPLAIN
 ST HWY 347 BRDG BELO TICONDEROGA STP
 11EPALES 2111204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/11/04	14 15		0.036	0.350	0.072	0.018	0.066
72/12/03			0.034	0.180	0.035	0.008	0.016
73/01/06			0.042	0.200	0.009	0.007	0.020
73/01/28			0.520	0.210	0.031	0.008	0.020
73/02/24			0.021	0.350	0.029	0.007	0.010
73/04/07			0.048	1.980	0.091	0.007	0.030
73/04/22			0.025	1.780	0.035	0.005K	0.010
73/05/06			0.054	0.560	0.042	0.015	0.050
73/05/27			0.054	1.380	0.039	0.010	0.017
73/06/10			0.056	2.100	0.031	0.005K	0.015
73/07/09			0.094	0.480	0.030	0.005K	0.015
73/08/02			0.075	1.050	0.410	0.048	0.070
73/08/31			0.132	1.680	0.273	0.058	0.240
73/09/29			0.048	1.000	0.490	0.052	0.080

K VALUE KNOWN TO BE
 LESS THAN INDICATED

STORET RETRIEVAL DATE 74/11/26

3609F1 LS3609F1
 43 51 00.0 073 25 30.0
 TICONDEROGA CREEK
 36 15 TICONDEROGA
 T/LAKE CHAMPLAIN
 BRDG ABOVE TICONDEROGA STP
 11EPALES 2111204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO ₂ &NO ₃ N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH ₃ -N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/11/04	15 00		0.032	0.200	0.039	0.005K	0.017
72/12/03			0.037	0.160	0.010	0.005K	0.014
73/01/06			0.044	0.180	0.005K	0.005K	0.008
73/01/28			1.220	0.120	0.098		0.010
73/02/24			0.021	0.200	0.028	0.006	0.007
73/04/07			0.046	0.660	0.034	0.007	0.030
73/04/22			0.027	1.000	0.036	0.005K	0.005K
73/05/06			0.046	0.960	0.042	0.006	0.035
73/05/27			0.040	0.230	0.024	0.010	0.015
73/06/10			0.056	0.690	0.019	0.005K	0.015
73/07/09			0.010K	0.365	0.058	0.006	0.020
73/08/02			0.050	0.720	0.036	0.012	0.015
73/08/31			0.039	1.260	0.083	0.014	0.026
73/09/29			0.028	0.980	0.110	0.018	0.035

K VALUE KNOWN TO BE
 LESS THAN INDICATED

STORET RETRIEVAL DATE 74/11/26

360901 LS360901
 43 54 00.0 073 24 30.0
 FIVEMILE CREEK
 36 15 TICONDEROGA
 T/LAKE CHAMPLAIN
 BRDG .5 MI N OF TICONDEROGA AIRPORT
 11EPALES 2111204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/11/04	14	35	0.390	0.750	0.092	0.039	0.115
72/12/02			0.247	0.260	0.008	0.018	0.044
73/01/06			0.340	1.380	0.081	0.027	0.058
73/04/07			0.740	3.200	0.069	0.062	0.210
73/04/22			0.126	0.330	0.015	0.008	0.020
73/05/06			0.140	1.680	0.044	0.013	0.055
73/05/27			0.060	0.210	0.008	0.005K	0.015
73/06/10			0.060	0.560	0.010	0.006	0.015
73/07/09			0.100	0.460	0.072	0.006	0.015
73/08/02			0.198	1.260	0.012	0.022	0.035
73/08/31			0.600	1.890	0.180	0.078	0.315
73/09/29			0.180	1.800	0.510	0.017	0.050

K VALUE KNOWN TO BE
 LESS THAN INDICATED

STORET RETRIEVAL DATE 74/11/26

3609E1 LS3609E1
 43 57 30.0 073 26 00.0
 PUTNAM CREEK
 36 15 TICONDEROGA
 T/LAKE CHAMPLAIN
 ST HWY 9N BRDG
 11EPALES
 4

2111204
 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/11/04			0.064	0.250	0.050	0.005K	0.009
72/12/03			0.088	0.130	0.012	0.006	0.011
73/04/07			0.054	1.505	0.120	0.007	0.030
73/04/22			0.065	0.420	0.025	0.005K	0.010
73/05/06			0.060	2.300	0.054	0.005K	0.025
73/06/10			0.063	1.500	0.029	0.005K	0.015
73/07/09			0.200	0.420	0.058	0.018	0.050
73/08/02			0.168	1.570	0.640	0.005K	0.010
73/08/31			0.350	1.200	0.300	0.014	0.090
73/09/29			0.132	2.730	0.400	0.010	0.035

K VALUE KNOWN TO BE
 LESS THAN INDICATED

STORET RETRIEVAL DATE 74/11/26

350961 LS360961
 44 02 00.0 073 28 00.0
 MCKENZIE BROOK
 36 15 PORT HENRY
 T/LAKE CHAMPLAIN
 WATERFALL AT ST HWY 9N BRDG
 11EPALES 2111204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJFL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/11/04	15 18		0.062	0.360	0.027	0.005K	0.011
72/12/03			0.320	0.310	0.015	0.016	0.016
73/01/06			0.280	0.270	0.005K	0.006	0.010
73/01/28			0.605	0.250	0.052	0.012	0.012
73/04/07			0.115	0.920	0.066	0.007	0.045
73/04/22			0.115	0.890	0.048	0.005K	0.010
73/05/06			0.075	0.580	0.026	0.005K	0.025
73/05/26			0.044	1.500	0.033	0.006	0.020
73/06/10			0.058		0.028	0.005K	0.045
73/07/09			0.099	0.420	0.042	0.005K	0.015
73/08/02			0.280	0.960	0.490	0.020	0.020
73/08/31			0.294	1.260	0.088	0.020	0.150
73/09/29			0.180	1.500	0.076	0.014	0.090

K VALUE ASSUMED TO BE
 LESS THAN INDICATED

STORET RETRIEVAL DATE 74/11/26

3609H1 LS3609H1
 44 03 00.0 073 27 30.0
 MILL BROOK
 36 15 PORT HENRY
 T/LAKE CHAMPLAIN
 FROM BANK NEAR PT HENRY BELO MORIAH STP
 11EPALES 2111204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/11/04	15	30	0.370	0.850	0.054	0.069	0.105
72/12/03			0.310	0.400	0.062	0.037	0.072
73/01/06			0.336	0.340	0.046	0.038	0.073
73/01/28			0.800	0.350	0.105	0.027	0.065
73/02/24			0.023	0.580	0.025	0.006	0.010
73/04/07			0.110	0.720	0.027	0.009	0.080
73/04/27			0.160	1.320	0.048	0.019	0.070
73/05/06			0.160	0.200	0.020	0.014	0.115
73/05/27			0.050	2.520	0.058	0.007	0.020
73/06/10			0.060	1.600	0.029	0.007	0.020
73/07/09			0.200	0.630	0.046	0.016	0.050
73/08/02			0.520	1.380	0.084	0.046	0.330
73/08/31			0.580	2.100	0.170	0.044	
73/09/29			0.640	0.720	0.084	0.040	0.850

STORET RETRIEVAL DATE 74/11/26

3609H2 LS3609H2
 44 03 00.0 073 33 00.0
 MILL BROOK
 36 15 ELIZABETHTOWN
 T/LAKE CHAMPLAIN
 BRDG 2 MI SW OF MORIAH CENTER
 11EPALES 2111204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/11/04	16 00		0.056	0.870	0.086	0.005K	0.007
72/12/03			0.074	0.290	0.024	0.006	0.010
73/01/06			0.056	0.190	0.005K	0.005K	0.006
73/04/07			0.036	1.540	0.108	0.005K	0.030
73/04/22			0.036	0.680	0.015	0.005K	0.025
73/05/06			0.042	1.760	0.044	0.005K	0.020
73/05/27			0.048	2.600	0.058	0.006	0.020
73/06/10			0.056	1.900	0.017	0.005K	0.015
73/07/09			0.097	0.580	0.063	0.006	0.015
73/08/02			0.110	2.500	1.580	0.009	0.010
73/08/31			0.170	0.840	0.126	0.008	0.045
73/09/29			0.072	0.100K	0.042	0.005K	0.010

K VALUE KNOWN TO BE
 LESS THAN INDICATED

STORET RETRIEVAL DATE 74/11/26

3609L1 LS3609L1
 44 11 00.0 073 26 00.0
 HOISINGTON BROOK
 36 15 PORT HENRY
 T/LAKE CHAMPLAIN
 ST HWY 9N BRDG NEAR WESTPORT
 11EPALES 2111204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/11/06	11 00		0.420	0.885	0.105	0.039	0.110
72/12/03			0.240	0.330	0.062	0.016	0.037
73/01/06			0.340	0.310	0.008	0.013	0.034
73/04/22			0.039	0.960	0.038	0.005K	0.005K
73/05/06			0.210	0.230	0.015	0.009	0.035
73/05/27			0.046	1.300	0.034	0.005K	0.020
73/06/10			0.058	1.540	0.018	0.005K	0.020
73/07/09			0.097	0.580	0.105	0.005K	0.020
73/08/02			0.378	1.320	0.058	0.016	0.030
73/08/31			0.336	0.850	0.058	0.013	0.095
73/09/29			0.330	1.900	0.280	0.013	0.035

K VALUE KNOWN TO BE
 LESS THAN INDICATED

STORET RETRIEVAL DATE 74/11/26

3609M1 LS3609M1
 44 22 00.0 073 23 00.0
 HOQUET RIVER
 36 15 WILLSHORO
 T/LAKE CHAMPLAIN
 ST HWY 22 BRDG
 11EPALES
 4 2111204
 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/11/04	15 00		0.104	0.200	0.042	0.005K	0.100
72/12/02	14 00		0.320	0.190	0.012	0.005K	0.015
73/01/06	15 00		0.176	0.200	0.012	0.005K	0.015
73/02/13	08 00		0.360	1.260	0.198	0.083	0.145
73/03/04	08 30		0.280	1.050	0.086	0.015	0.030
73/04/01	09 20		0.132	0.240	0.005K	0.005K	0.022
73/04/15			0.115	0.190	0.012	0.005K	0.025
73/05/07	09 18		0.115	0.460	0.029	0.005K	0.015
73/05/19	08 15		0.160	1.200	0.120	0.005K	0.080
73/06/10			0.024	0.500	0.008	0.005K	0.005K
73/07/14			0.110	1.600	0.034	0.005K	0.010
73/08/19	10 30		0.066	0.100K	0.019	0.008	0.025
73/09/09	10 30		0.075	0.420	0.069	0.010	0.027
73/10/13	11 15		0.031	0.220	0.029	0.005K	0.015

K VALUE KNOWN TO BE
 LESS THAN INDICATED

STORET RETRIEVAL DATE 74/11/26

3609N1 LS3609N1
 44 33 30.0 073 27 00.0
 AUSABLE RIVER
 36 15 PLATTSBURG
 T/LAKE CHAMPLAIN
 US HWY 9 BRDG BELO KEESEVILLE STP
 11EPALES 2111204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/11/05			0.380	0.440	0.050	0.005K	0.021
72/12/01			0.150	0.310	0.014	0.006	0.016
72/12/30	10 00		0.320	0.360	0.034	0.016	0.016
73/02/28	13 30		1.340	1.570	0.400	0.005K	0.065
73/03/03			0.430	1.000	0.066	0.007	0.010
73/03/29	16 45		0.390	1.325	0.052	0.005K	0.015
73/04/16	12 00		0.378	0.190	0.022	0.005K	0.010
73/04/27	14 00		0.500	0.520	0.029	0.005K	0.015
73/05/15	11 45		0.470	1.980	0.835	0.005K	0.015
73/05/30	06 45		0.130	0.690	0.027	0.005K	0.010
73/07/01	15 00		0.176	1.100	0.231	0.010	0.075
73/07/29	15 00		0.115	0.500	0.110	0.008	0.015
73/08/30	16 00		0.065	0.230	0.100	0.008	0.020
73/10/04	18 40		0.154	0.500	0.096	0.011	0.025

K VALUE KNOWN TO BE
 LESS THAN INDICATED

STORET RETRIEVAL DATE 74/11/26

3609N2 LS3609N2
 44 30 30.0 073 29 00.0
 AUSABLE RIVER
 36 15 PLATTSBURG
 T/LAKE CHAMPLAIN
 ST HWY 22 BRDG ABOVE KEESEVILLE STP
 11EPALES 2111204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/11/05			0.382	0.270	0.038	0.005	0.016
72/12/02	11 30		0.350	0.370	0.021	0.006	0.016
73/01/06			0.420	0.260	0.005K	0.005K	0.010
73/02/03			0.850	0.630	0.110	0.031	0.085
73/04/07			0.310	0.460	0.018	0.005K	0.020
73/04/17	13 00		0.450	0.190	0.027	0.005K	0.010
73/05/05	16 00		0.310	1.500	0.032	0.005K	0.015
73/05/19			0.300	1.890	0.048	0.005K	0.030
73/06/01			0.110	0.330	0.024	0.005K	0.010
73/06/30			0.154	0.480	0.138	0.006	0.020
73/08/05			0.027	0.460	0.088	0.005K	0.015
73/09/08			0.126	0.630	0.078	0.005K	0.015
73/10/04			0.380		0.126	0.013	0.080

K VALUE KNOWN TO BE
 LESS THAN INDICATED

STORET RETRIEVAL DATE 74/11/26

3609P1 LS3609P1
 44 34 30.0 073 27 00.0
 LITTLE AUSABLE RIVER
 36 15 PLATTSBURG
 T/LAKE CHAMPLAIN
 US HWY 9 BRDG BELO PERU STP
 11EPALES 2111204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJFL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/11/05	12	15	0.190	0.380	0.090	0.052	0.081
72/12/01			0.200	0.460	0.028	0.022	0.048
72/12/30	10	30	0.300	0.610	0.105	0.009	0.028
73/02/28	13	00	0.350	0.630	0.210	0.065	0.095
73/03/29	16	30	0.130	0.540	0.044	0.018	0.030
73/04/16	14	30	0.160	0.700	0.054	0.016	0.030
73/04/27	14	30	0.110	2.000	0.490	0.034	0.055
73/05/15	11	20	0.120	1.150	0.399	0.032	0.050
73/05/30	06	30	0.068	1.260	0.069	0.020	0.045
73/07/01	14	30	0.210	1.050	0.088	0.034	0.130
73/07/29	14	30	0.280	0.920	0.210	0.035	0.075
73/08/30	15	30	0.300	0.690	0.220	0.050	0.105
73/10/04	18	30	0.340	1.625	0.231	0.019	0.080

STORET RETRIEVAL DATE 74/11/26

3609P2 LS3609P2
 44 34 30.0 073 31 30.0
 LITTLE AUSABLE RIVER
 36 15 DANNEMORA
 T/LAKE CHAMPLAIN
 DAM BELO ST HWY 22 BRDG ABOV PERU STP
 11EPALES 2111204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/11/05	11 25		0.089	0.270	0.040	0.008	0.018
72/12/02	11 00		0.126	0.340	0.013	0.005K	0.014
73/01/06			0.126	0.340	0.005K	0.005K	0.012
73/02/03			1.040	1.050	0.072	0.028	0.140
73/03/03			0.231	0.290	0.060	0.008	0.015
73/04/07			0.014	0.380	0.008	0.005K	0.020
73/04/17	12 30		0.019	1.890	0.064	0.005K	0.025
73/05/05	15 00		0.042	1.050	0.020	0.006	0.025
73/05/19			0.105	2.300	0.052	0.015	0.060
73/06/01			0.019	0.500	0.018	0.011	0.050
73/06/30			0.910	1.600	0.176	0.038	0.185
73/08/05			0.021	0.500	0.058	0.014	0.035
73/09/08			0.115	0.720	0.050	0.011	0.030
73/10/04			0.176	0.350	0.015	0.008	0.015

K VALUE KNOWN TO BE
 LESS THAN INDICATED

STORET RETRIEVAL DATE 74/11/26

360901 LS360901
 44 37 30.0 073 27 00.0
 SALMON RIVER
 36 15 PLATTSBURG
 T/LAKE CHAMPLAIN
 US HWY 9 BRDG 2 M E OF SOUTH PLATTSBURG
 11EPALES 2111204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/11/05	12 30		0.230	0.270	0.036	0.005K	0.013
72/12/01			0.282	0.380	0.011	0.005K	0.015
72/12/30	11 00		0.198	0.680	0.052	0.013	0.023
73/02/28	12 30		0.390	0.100K	0.050	0.006	0.015
73/03/29	16 15		0.189	0.440	0.029	0.005K	0.015
73/04/16	15 00		0.210	1.000	0.038	0.005K	0.015
73/04/28	13 30		0.150	1.380	0.071	0.006	0.015
73/05/15	11 05		0.160	1.050	0.315	0.006	0.020
73/05/30	06 15		0.084	0.920	0.108	0.005K	0.025
73/07/01	14 00		0.189	1.350	0.044	0.019	0.220
73/07/29	14 00		0.180	1.100	0.300	0.011	0.035
73/08/30	15 00		0.240	0.520	0.176	0.010	0.025
73/10/04	18 15		0.340	1.300	0.060	0.024	0.075

K VALUE KNOWN TO BE
 LESS THAN INDICATED

STORET RETRIEVAL DATE 74/11/26

3609R1 LS3609R1
 44 42 00.0 073 27 00.0
 SARANAC RIVER
 36 15 PLATTSBURG
 T/LAKE CHAMPLAIN
 US HWY 9 BRDG BELO PLATTSBURG STP
 11EPALES 2111204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/11/05	12	45	0.110	0.350	0.048	0.008	0.027
72/12/01			0.231	0.560	0.046	0.011	0.034
72/12/30	11	30	0.270	0.520	0.033	0.008	0.025
73/02/28	12	00	0.320	0.260	0.044	0.012	0.025
73/03/29	16	00	0.294	0.780	0.044	0.007	0.030
73/04/16	13	00	0.280	0.630	0.033	0.007	0.020
73/05/01	10	50	0.130	1.750	0.390	0.005K	0.025
73/05/15	11	00	0.138	1.290	0.078	0.007	0.020
73/05/30	06	00	0.090	0.370	0.040	0.005K	0.025
73/07/01	13	30	0.154	1.150	0.034	0.017	0.165
73/07/29	13	30	0.110	0.460	0.036	0.014	0.030
73/08/30	14	30	0.147	1.260	0.390	0.022	0.060
73/10/05	18	00	0.088	0.920	0.210	0.017	0.045

K VALUE KNOWN TO BE
 LESS THAN INDICATED

STORET RETRIEVAL DATE 74/11/26

3609R2 LS3609R2
 44 39 30.0 073 44 00.0
 SARANAC RIVER
 36 15 DANEMORA
 T/LAKE CHAMPLAIN
 BRDG ON RD CONN ST HWY365-HARDSCRABLE RD
 11EPALES 2111204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&N03 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/11/05	10 30		0.093	0.340	0.044	0.005K	0.018
72/12/02	09 00		0.210	0.330	0.031	0.005K	0.016
73/01/06			0.240	0.320	0.038	0.006	0.016
73/02/03			1.400	0.285	0.076	0.005K	0.015
73/03/03			0.290	0.360	0.044	0.008	0.030
73/04/07			0.154	0.360	0.006	0.005K	0.020
73/04/17	09 00		0.120	0.400	0.026	0.005K	0.015
73/05/05	10 30		0.094		0.105	0.005K	0.025
73/05/19			0.069	0.480	0.031	0.005K	0.025
73/06/01			0.061	0.410	0.033	0.005K	0.020
73/06/30			0.120	0.560	0.160	0.014	0.030
73/08/05			0.054	0.760	0.115	0.005K	0.020
73/09/08			0.091	0.850	0.140	0.005K	0.020
73/10/05			0.350		2.200	0.014	0.065

K VALUE KNOWN TO BE
 LESS THAN INDICATED

STORET RETRIEVAL DATE 74/11/26

3609R3 LS3609R3
 44 33 30.0 073 41 30.0
 SARANAC RIVER
 36 15 DANEMORA
 T/LAKE CHAMPLAIN
 ST HWY 22B BRDG ABOVE PLATTSBURG STP
 11EPALES 2111204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/11/05	11 00		0.110	0.320	0.110	0.006	0.021
72/12/02	10 30		0.230	0.380	0.029	0.007	0.018
73/01/06			0.252	0.390	0.042	0.007	0.018
73/02/03			1.020	0.400	0.029	0.012	0.030
73/03/03			0.310	0.340	0.054	0.008	0.020
73/04/07			0.168	0.730	0.017	0.005K	0.025
73/04/17	11 30		0.126	0.400	0.072	0.005K	0.020
73/05/05	12 00		0.115	2.520	0.075	0.005K	0.025
73/05/19			0.110	2.200	0.084	0.013	0.045
73/06/01			0.084	0.360	0.023	0.008	0.035
73/06/30			0.150	0.580	0.132	0.013	0.040
73/08/05			0.063	0.720	0.132	0.022	0.045
73/09/08			0.120	0.660	0.066	0.010	0.030
73/10/05			0.350		0.180	0.044	0.085

K VALUE KNOWN TO BE
 LESS THAN INDICATED

STORET RETRIEVAL DATE 74/11/26

3609S1 LS3609S1
 44 40 00.0 073 43 00.0
 BEHAN BRANCH
 36 15 DANEMORA
 T/LAKE CHAMPLAIN
 ST HWY 365 BRDG 1 MI NE OF PICKET CORNER
 11FPALES 2111204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/11/05	10 45		0.590	0.420	0.071	0.120	0.147
72/12/02	09 30		0.690	1.540	0.075	0.088	0.290
73/01/06			0.540	0.750	0.072	0.064	0.115
73/02/03	09 45		0.300	0.400	0.038	0.008	0.080
73/03/03			0.750	1.050	0.115	0.100	0.400
73/04/07			0.350	1.050	0.042	0.019	0.045
73/04/17	10 00		0.357	2.000	0.080	0.039	0.070
73/05/05	10 00		0.290	0.880	0.058	0.044	0.065
73/05/19			0.180	0.460	0.019	0.028	0.065
73/06/01			0.200	2.200	0.017	0.032	0.370
73/06/30			0.140	1.000	0.130	0.027	0.155
73/08/05			0.590	0.720	0.176	0.079	0.100
73/09/08			0.790	0.420	0.058	0.100	0.100
73/10/05			0.063	1.100	0.088	0.046	0.070

STORET RETRIEVAL DATE 74/11/26

3609T1 LS3609T1
 44 53 30.0 073 25 00.0
 LITTLE CHAZY RIVER
 36 15 ROUSES POINT
 T/LAKE CHAMPLAIN
 BRDG ON RD N FROM NORTH FARM RD
 11EPALES 2111204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/11/05	14 00		0.546	1.300	0.113	0.091	0.147
72/12/02	10 00		0.558	0.540	0.006	0.011	0.029
72/12/30	10 30		0.360	0.500	0.040	0.010	0.020
73/02/28	11 50		0.470	0.210	0.048	0.015	0.025
73/03/29	15 30		0.360	1.300	0.058	0.017	0.035
73/04/16	14 00		0.370	0.390	0.054	0.019	0.030
73/05/01	10 30		0.231	1.400	0.220	0.019	0.040
73/05/15	10 30		0.240	1.050	0.200	0.026	0.035
73/05/30	05 30		0.190	1.150	0.052	0.020	0.055
73/07/01	13 30		0.800	1.600	0.160	0.074	0.230
73/07/29	13 00		0.270	1.380	0.360	0.036	0.065
73/08/30	14 00		0.100	0.660	0.315	0.037	0.050
73/10/04	17 30		0.115	1.200	0.300	0.033	0.085

STORET RETRIEVAL DATE 74/11/26

360901 LS360901
 44 56 00.0 073 24 30.0
 GREAT CHAZY RIVER
 36 15 ROUSES POINT
 T/LAKE CHAMPLAIN
 ST HWY 98 BRDG BELO CHAMPLAIN STP
 11EPALES 2111204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&N03 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/11/05	14 30		0.320	0.560	0.069	0.040	0.086
72/12/02	10 15		0.350	0.540	0.035	0.014	0.037
72/12/30	11 00		0.378	0.460	0.054	0.022	0.032
73/02/28	11 30		0.470	0.440	0.072	0.014	0.025
73/03/29	15 10		0.260	0.660	0.043	0.011	0.025
73/04/16	13 30		0.260	0.915	0.064	0.012	0.025
73/04/27	15 00		0.126	2.400	0.270	0.015	0.030
73/05/15	10 15		0.126	1.260	0.210	0.019	0.030
73/05/30	05 15		0.077	0.860	0.210	0.009	0.030
73/07/01	12 30		0.085	0.660	0.082	0.032	0.095
73/07/29	12 30		0.310	0.650	0.079	0.035	0.065
73/08/30	13 30		0.176	0.725	0.390	0.060	0.100
73/10/04	17 15		0.154	1.700	0.180	0.032	0.060

STORET RETRIEVAL DATE 74/11/26

3609U2 LS3609U2
 44 58 30.0 073 27 30.0
 GREAT CHAZY RIVER
 36 15 ROUSES POINT
 T/LAKE CHAMPLAIN
 BRDG .5 MI W OF CHAMPLAIN ABOV STP
 11EPALES 2111204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&N03 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/11/05	15 00		0.280	0.460	0.052	0.015	0.040
72/12/02	10 30		0.340	0.350	0.016	0.006	0.019
72/12/30	11 00		0.370	1.760	0.320	0.006	0.010
73/02/28	11 00		0.430	0.310	0.038	0.007	0.015
73/03/29	15 00		0.210	0.310	0.029	0.006	0.020
73/04/16	12 30		0.210	0.380	0.028	0.007	0.020
73/04/27	15 30		0.130		0.147	0.006	0.020
73/05/15	09 00		0.120	1.050	0.160	0.008	0.020
73/05/30	05 00		0.068	1.320	0.260	0.006	0.025
73/07/01	12 00		0.115	1.600	0.420	0.016	0.045
73/07/29	12 00		0.105	0.880	0.180	0.014	0.030
73/08/30	13 00		0.105	0.520	0.252	0.022	0.035
73/10/04	17 00		0.230	1.050	0.261	0.020	0.080

APPENDIX B
FLOW DATA FOR
LAKE CHAMPLAIN TRIBUTARIES

TRIBUTARY FLOW INFORMATION FOR NEW YORK

11/26/74

LAKE CODE 3609 LAKE CHAMPLAIN

TOTAL DRAINAGE AREA OF LAKE 8277.00

TRIBUTARY	SUR-DRAINAGE AREA	NORMALIZED FLOWS												
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
3609A1	692.00	714.00	783.00	1210.00	2230.00	1470.00	929.00	621.00	498.00	519.00	625.00	730.00	730.00	920.75
3609H1	43.60	45.00	49.30	76.50	140.00	92.90	58.50	39.20	31.40	32.70	39.40	46.00	46.00	58.02
3609F1	262.00	259.00	324.00	374.00	606.00	488.00	327.00	180.00	149.00	136.00	161.00	176.00	202.00	281.16
3609G1	10.30	10.60	11.70	18.10	33.10	22.00	13.80	9.25	7.41	7.72	9.30	10.90	10.90	13.72
3609L1	27.10	27.90	30.70	47.50	87.20	57.80	36.40	24.30	19.50	20.30	24.50	28.60	28.60	36.08
3609L1	11.40	11.80	12.90	20.00	36.70	24.30	15.30	10.20	8.20	8.55	10.30	12.00	12.00	15.17
3609M1	278.00	287.00	314.00	488.00	895.00	593.00	373.00	250.00	200.00	208.00	251.00	293.00	293.00	370.09
3609N1	518.00	534.00	586.00	908.00	1670.00	1100.00	695.00	465.00	373.00	388.00	468.00	546.00	546.00	689.29
3609P1	71.80	74.00	81.20	126.00	231.00	153.00	96.40	64.50	51.60	53.80	64.80	75.70	75.70	95.56
3609Q1	66.00	68.10	74.70	116.00	212.00	141.00	88.60	59.30	47.50	49.50	59.60	69.60	69.60	87.88
3609R1	614.00	633.00	695.00	1080.00	1980.00	1310.00	824.00	551.00	442.00	460.00	554.00	647.00	648.00	817.94
3609S1	9.92	10.20	11.20	17.40	31.90	21.10	13.30	8.91	7.14	7.44	8.95	10.50	10.50	13.20
3609T1	51.20	52.80	57.90	89.80	165.00	109.00	68.70	46.00	36.80	38.40	46.20	54.00	54.00	68.16
3609U1	300.00	309.00	339.00	526.00	965.00	639.00	403.00	269.00	216.00	225.00	271.00	316.00	316.00	399.15
3609Z2	1483.00	1530.00	1680.00	2600.00	4770.00	3160.00	1990.00	1330.00	1070.00	1110.00	1340.00	1560.00	1560.00	1973.23

NOTE *** NO OUTLET GAGE IN THE U.S.

MEAN MONTHLY FLOWS AND DAILY FLOWS

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
3609A1	11	72	997.00	4	895.00				
	12	72	1060.00	7	1380.00				
	1	73	1100.00	4	1290.00				
	2	73	1030.00	13	860.00				
	3	73	2230.00	8	1950.00				
	4	73	2510.00	7	2960.00	23	2250.00		
	5	73	1800.00	7	1310.00	24	2770.00		
	6	73	1850.00	8	1480.00				
	7	73	853.00	10	804.00				
	8	73	553.00	18	590.00				
	9	73	792.00	11	610.00				
	10	73	711.00	10	778.00				

TRIBUTARY FLOW INFORMATION FOR NEW YORK

11/26/74

LAKE CODE 3609 LAKE CHAMPLAIN

MEAN MONTHLY FLOWS AND DAILY FLOWS

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
3609R1	11	72	62.80	4	56.40				
	12	72	66.80	7	86.80				
	1	73	69.20	4	81.00				
	2	73	65.00	13	54.20				
	3	73	141.00	8	123.00				
	4	73	158.00	7	186.00	23	142.00		
	5	73	113.00	7	82.50	24	174.00		
	6	73	117.00	8	93.20				
	7	73	53.90	10	50.60				
	8	73	34.90	18	37.10				
3609F1	9	73	49.90	11	38.40				
	10	73	44.80	10	49.00				
	11	72	661.00	4	155.00				
	12	72	749.00	3	904.00				
	1	73	571.00	6	608.00	28	547.00		
	2	73	788.00	24	814.00				
	3	73	796.00						
	4	73	0.0	7	1030.00	22	917.00		
	5	73	0.0	27	1060.00				
	6	73	459.00	10	764.00				
3609G1	7	73	203.00	9	174.00				
	8	73	43.30	2	49.00	31	41.00		
	9	73	37.20						
	10	73	35.60						
	11	72	14.90	4	13.30				
	12	72	15.80	3	13.10				
	1	73	16.30	6	16.50	28	7.40		
	2	73	15.40						
	3	73	33.40	8	18.00				
	4	73	37.30	7	29.80	22	16.80		
3609H1	5	73	26.90	6	10.60	26	18.70		
	6	73	27.50	10	7.85				
	7	73	12.70	9	2.38				
	8	73	8.23	2	1.97	31	1.00		
	9	73	11.80						
	10	73	10.60						
	11	72	39.10	4	29.50				
	12	72	41.50	3	29.20				
	1	73	42.90	6	36.80	28	38.80		
	2	73	40.50	24	24.00				
	3	73	87.70						
	4	73	98.30	7	133.00	22	75.50		
	5	73	70.60	6	48.50	27	75.50		
	6	73	72.60	10	42.50				
	7	73	33.40	9	26.20				
	8	73	21.60	2	23.50	31	6.60		
	9	73	31.00						
	10	73	27.90						

TRIBUTARY FLOW INFORMATION FOR NEW YORK

11/26/74

LAKE CODE 3609 LAKE CHAMPLAIN

MEAN MONTHLY FLOWS AND DAILY FLOWS

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
3609L1	11	72	16.40	6	14.00				
	12	72	17.40	3	13.60				
	1	73	18.10	6	17.20				
	2	73	17.00						
	3	73	36.90						
	4	73	41.40	7	40.80	22	24.60		
	5	73	29.70	6	17.60	27	24.60		
	6	73	30.50	10	15.80				
	7	73	14.00	9	8.00				
	8	73	9.10	2	7.80	31	1.66		
3609M1	9	73	13.00						
	10	73	11.70						
	11	72	400.00	4	720.00				
	12	72	425.00	2	725.00				
	1	73	441.00	6	898.00				
	2	73	414.00	13	694.00				
	3	73	901.00	4	656.00				
	4	73	1010.00	1	760.00	15	675.00		
	5	73	724.00	7	555.00	19	764.00		
	6	73	744.00	10	537.00				
3609N1	7	73	364.00	14	385.00				
	8	73	222.00	19	36.00				
	9	73	317.00	9	34.60				
	10	73	286.00	13	440.00				
	11	72	746.00	5	334.00				
	12	72	793.00	1	404.00	30	313.00		
	1	73	821.00						
	2	73	772.00	28	250.00				
	3	73	1680.00	3	290.00	29	800.00		
	4	73	755.00	16	875.00	27	760.00		
3609P1	5	73	1340.00	15	560.00	30	970.00		
	6	73	1390.00						
	7	73	639.00	1	1700.00				
	8	73	414.00	30	73.00				
	9	73	592.00						
	10	73	533.00	4	340.00				
	11	72	103.00	5	30.30				
	12	72	110.00	1	36.70	30	28.40		
	1	73	114.00						
	2	73	107.00	28	22.30				
	3	73	233.00	29	69.50				
	4	73	260.00	16	76.50	27	65.50		
	5	73	187.00	15	48.00	30	77.00		
	6	73	192.00						
	7	73	88.60	1	145.00				
	8	73	57.30	30	1.65				
	9	73	82.10						
	10	73	73.70	4	20.00				

TRIBUTARY FLOW INFORMATION FOR NEW YORK

11/26/74

LAKE CODE 3609 LAKE CHAMPLAIN

MEAN MONTHLY FLOWS AND DAILY FLOWS

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
3609Q1	11	72	95.10	5	34.40				
	12	72	101.00	1	41.80	30	32.30		
	1	73	105.00						
	2	73	98.50	28	25.40				
	3	73	214.00	29	100.00				
	4	73	239.00	16	109.00	28	94.00		
	5	73	172.00	15	69.00	30	125.00		
	6	73	177.00						
	7	73	81.50	1	238.00				
	8	73	52.70	30	5.90				
3609R1	9	73	75.50						
	10	73	67.80	4	38.00				
	11	72	884.00	5	765.00				
	12	72	941.00	1	927.00	30	716.00		
	1	73	97.40						
	2	73	916.00	28	565.00				
	3	73	990.00	29	1520.00				
	4	73	2230.00	16	1650.00				
	5	73	1600.00	1	1370.00	15	1130.00	30	1280.00
	6	73	1640.00						
3609S1	7	73	757.00	1	2540.00				
	8	73	491.00	30	188.00				
	9	73	702.00						
	10	73	630.00	5	919.00				
	11	72	14.30	5	9.60				
	12	72	15.20	2	10.00				
	1	73	15.70	6	12.40				
	2	73	14.80	3	15.80				
	3	73	32.10	3	8.20				
	4	73	36.00	7	34.40	17	21.00		
3609T1	5	73	25.80	5	13.80	19	33.80		
	6	73	26.50	1	26.70	30	17.50		
	7	73	12.20						
	8	73	7.93	5	6.80				
	9	73	11.40	8	4.30				
	10	73	10.20	5	10.70				
	11	72	73.80	5	40.50				
	12	72	78.40	2	42.20	30	38.00		
	1	73	81.20						
	2	73	76.30	28	30.00				
	3	73	166.00	29	129.00				
	4	73	186.00	16	140.00				
	5	73	133.00	1	113.00	15	89.00	30	135.00
	6	73	137.00						
	7	73	63.20	1	238.00				
	8	73	40.90						
	9	73	58.60						
	10	73	52.60	4	31.40				

TRIBUTARY FLOW INFORMATION FOR NEW YORK

11/26/74

LAKE CODE 3609 LAKE CHAMPLAIN

MEAN MONTHLY FLOWS AND DAILY FLOWS

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
360901	11	72	432.00	5	217.00				
	12	72	459.00	2	224.00	30	203.00		
	1	73	475.00						
	2	73	447.00	28	160.00				
	3	73	971.00	29	550.00				
	4	73	1090.00	16	595.00	27	520.00		
	5	73	781.00	15	400.00	30	670.00		
	6	73	804.00						
	7	73	370.00	1	1370.00				
	8	73	240.00						
360927	9	73	343.00						
	10	73	308.00	4	145.00				
	11	72	2130.00	5	1850.00				
	12	72	2270.00	2	1920.00				
	1	73	2350.00	4	2760.00				
	2	73	2210.00	13	1840.00				
	3	73	4800.00	4	1750.00	29	3680.00		
	4	73	5380.00	16	3980.00	27	3510.00		
	5	73	3860.00	7	2800.00	19	4830.00	30	3100.00
	6	73	3970.00	10	2630.00				
	7	73	1830.00	1	6150.00				
	8	73	1190.00	5	1540.00	30	454.00		
	9	73	1690.00	11	1310.00				
	10	73	1520.00	4	1670.00				

TRIBUTARY FLOW INFORMATION FOR VERMONT

12/27/74

LAKE CODE 5001 LAKE CHARLEIN

TOTAL DRAINAGE AREA OF LAKE 8277.00

TRIBUTARY	DRAINAGE AREA	NORMALIZED FLOWS												MEAN
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
500141	2.51	3.26	2.39	6.48	16.30	6.95	3.39	1.87	1.62	2.00	3.54	4.92	3.99	4.72
500177	1483.00	1530.00	1640.00	2600.00	4770.00	3160.00	1440.00	1330.00	1070.00	1110.00	1340.00	1560.00	1560.00	1973.23
500121	19.10	22.90	18.60	41.10	105.00	51.20	26.20	14.90	14.90	16.90	24.40	33.60	27.10	33.14
500135	1062.00	1179.00	967.00	2464.00	5618.00	2751.00	1211.00	652.00	494.00	599.00	933.00	1497.00	1296.00	1637.78
500141	715.00	858.00	697.00	1537.00	3914.00	1916.00	980.00	599.00	557.00	633.00	915.00	1258.00	1015.00	1239.71
500151	46.10	51.20	42.00	107.00	244.00	119.00	52.00	28.30	21.60	26.00	40.50	65.00	56.20	71.07
500161	861.00	1119.00	820.00	2221.00	5544.00	2345.00	1162.00	641.00	556.00	684.00	1214.00	1688.00	1369.00	1619.93
500181	472.00	1168.00	1073.00	2014.00	3591.00	2128.00	1125.00	692.00	527.00	618.00	720.00	1090.00	1125.00	1321.69
500192	261.00	311.00	313.00	645.00	911.00	410.00	225.00	136.00	80.90	120.00	144.00	248.00	300.00	319.77

NOTE *** NO OUTLET GAGE IN THE U.S.

MEAN MONTHLY FLOWS AND DAILY FLOWS

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
500191	7	72	6.06	15	2.02				
	8	72	3.29	12	3.36				
	9	72	0.86	10	1.08				
	10	72	2.09	15	1.77				
	11	72	5.61	4	4.02				
	12	72	5.98	4	4.47				
	1	73	6.52						
	2	73	4.78	3	6.53				
	3	73	14.90	3	3.51				
	4	73	11.30	7	12.10	19	15.80		
	5	73	10.40	6	6.40	14	9.50		
	6	73	7.66						
	7	73	5.70	8	3.20				
500177	11	72	2130.00	5	1450.00				
	12	72	2270.00	2	1920.00				
	1	73	2350.00	4	2760.00				
	2	73	2210.00	13	1840.00				
	3	73	4400.00	4	1750.00	29	3640.00		
	4	73	5380.00	16	3940.00	27	3510.00		
	5	73	3860.00	7	2800.00	19	4430.00	30	3100.00
	6	73	3470.00	10	2630.00				
	7	73	1830.00	1	6150.00				

TRIBUTARY FLOW INFORMATION FOR VERMONT

12/27/74

LAKE CODE 5001 LAKE CHAMPLAIN

MEAN MONTHLY FLOWS AND DAILY FLOWS

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
500121	7	72	34.16	15	18.10				
	8	72	17.10	12	14.40				
	9	72	18.40						
	10	72	22.10	4	13.40	15	21.00		
	11	72	29.70	4	26.70				
	12	72	25.50	2	26.70				
	1	73	43.70	13	43.00				
	2	73	32.60	10	31.50				
	3	73	26.30	10	52.30				
	4	73	91.40	7	96.10	15	44.30	21	79.80
	5	73	72.70	12	80.80				
	6	73	70.70	3	66.30				
500135	7	72	1530.00	15	522.00				
	8	72	717.00	12	638.00				
	9	72	269.00	10	287.00				
	10	72	595.00	14	187.00				
	11	72	2155.00	5	949.00				
	12	72	2009.00	2	1700.00				
	1	73	2063.00	6	1490.00				
	2	73	1450.00						
	3	73	3656.00	3	1960.00				
	4	73	5056.00	7	5926.00	21	3972.00		
	5	73	4264.00	5	3621.00	13	3476.00		
	6	73	4384.00	10	2262.00				
500141	7	72	1274.00	15	679.00				
	8	72	641.00	12	627.00				
	9	72	391.00						
	10	72	820.00	4	500.00	15	786.00		
	11	72	1522.00	4	1000.00				
	12	72	1330.00	2	1000.00				
	1	73	1639.00	13	1608.00				
	2	73	1220.00	10	1140.00				
	3	73	3228.00	10	1960.00				
	4	73	3419.00	7	3596.00	21	2989.00		
	5	73	2721.00	12	3024.00				
	6	73	2646.00	3	2481.00				
500151	7	72	66.80	15	22.70				
	8	72	31.10	12	27.70				
	9	72	11.60	10	12.40				
	10	72	25.80	14	8.10				
	11	72	93.60	5	41.20				
	12	72	47.10	1	78.40				
	1	73	49.60	6	64.50				
	2	73	63.00	3	120.00				
	3	73	160.00	3	46.10				
	4	73	220.00	7	257.00	22	177.00		
	5	73	144.00	6	147.00	13	164.00		
	6	73	190.00						
	7	73	149.00	8	131.00				

TRIBUTARY FLOW INFORMATION FOR VERMONT

12/27/74

LAKE CODE 5001 LAKE CHAMPLAIN

MEAN MONTHLY FLOWS AND DAILY FLOWS

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
500141	7	72	2077.00	15	644.00				
	8	72	1129.00	12	1154.00				
	9	72	244.00	23	207.00				
	10	72	714.00	15	606.00				
	11	72	1924.00	4	1380.00				
	12	72	2054.00	4	1530.00				
	1	73	2234.00	6	1380.00				
	2	73	1640.00	3	2240.00				
	3	73	5124.00	3	1205.00				
	4	73	3989.00	7	4150.00	15	2230.00		
	5	73	3554.00	6	2174.00	12	3633.00		
	6	73	2626.00						
	7	73	1949.00	8	1493.00				
500181	7	72	1990.00	15	2360.00				
	8	72	1090.00	12	950.00				
	9	72	505.00	10	457.00				
	10	72	857.00	14	968.00				
	11	72	2170.00	5	1460.00				
	12	72	2810.00	2	2760.00				
	1	73	3680.00	6	3030.00				
	2	73	1120.00	3	5060.00				
	3	73	3400.00	3	1020.00				
	4	73	2712.00	7	3453.00	22	2337.00		
	5	73	2341.00	6	1474.00	12	1875.00		
	6	73	1575.00						
	7	73	2345.00	8	4342.00				
500192	7	72	382.00	15	266.00				
	8	72	205.00	12	117.00				
	9	72	101.00	10	56.00				
	10	72	204.00	14	244.00				
	11	72	1060.00	4	540.00				
	12	72	900.00	9	1300.00				
	1	73	980.00	18	279.00				
	2	73	626.00	16	418.00				
	3	73	1040.00	10	1300.00				
	4	73	658.00	8	1065.00	22	290.00		
	5	73	541.00	5	146.00	16	446.00		
	6	73	212.00						

APPENDIX C
LAKE CHAMPLAIN DATA
COLLECTED BY THE
NATIONAL EUTROPHICATION SURVEY

STORET RETRIEVAL DATE 74/11/26

350901
43 33 00.0 073 27 00.0
CHAMPLAIN LAKE
36 NEW YORK

11EPALES
5

2111202
0019 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CONDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CAC03 MG/L	00630 NO2&NO3 N-TOTAL MG/L	00610 NH3-N TOTAL MG/L	00665 PHOS-TOT MG/L P	00666 PHOS-DIS MG/L P
72/06/01	11 50	0000	19.6	8.6	15	90	7.10	31	0.030	0.060	0.020	0.007
	11 50	0016	16.5	6.6		120	7.40	26	0.060	0.090	0.021	0.008
72/08/02	15 30	0000			32			52	0.090	0.070	0.020	0.007
	15 30	0004	23.9	8.2		150	7.90	52	0.080	0.070	0.021	0.008
	15 30	0015	23.8	7.7		150	7.90	52	0.090	0.070	0.026	0.007
72/10/08	09 30	0000			13	185	7.80	72	0.080	0.120	0.033	0.012
	09 30	0004	14.2	9.4		175	7.75	65	0.080	0.070	0.032	0.009

DATE FROM TO	TIME OF DAY	DEPTH FEET	32217 CHLRPHYL A UG/L
72/06/01	11 50	0000	1.5J
72/08/02	15 30	0000	6.4J
72/10/08	09 30	0000	16.7J

J VALUE KNOWN TO BE IN ERROR

STORET RETRIEVAL DATE 74/11/26

360902
43 35 00.0 073 35 00.0
CHAMPLAIN LAKE
36 NEW YORK

11EPALES
5

2111202
0020 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CONDUCTIVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00630 NO2&NO3 N-TOTAL MG/L	00610 NH3-N TOTAL MG/L	00665 PHOS-TOT MG/L P	00666 PHOS-DIS MG/L P
72/06/01	12 35	0000	20.6	7.8	36	220	7.10	91	0.360	0.090	0.034	0.021
	12 35	0017	20.4	7.4		210	7.20	91	0.360	0.090	0.035	0.024
72/08/02	15 10	0000			24	220	7.70	78	0.410	0.090	0.060	0.028
	15 10	0004	21.9	7.7		220	7.70	79	0.420	0.100	0.060	0.026
	15 10	0015	21.9	7.7		220	7.60	79	0.420	0.100	0.061	0.026
72/10/08	09 50	0000			3	180	7.60	56	0.420	0.130	0.188	0.065
	09 50	0004	13.0	9.8		180	7.60	54	0.430	0.150	0.159	0.068
	09 50	0009	13.0	9.6		180	7.60	53	0.440	0.140	0.164	0.071

DATE FROM TO	TIME OF DAY	DEPTH FEET	32217 CHLOROPHYL A UG/L
72/06/01	12 35	0030	9.3J
72/08/02	15 10	0000	3.6J
72/10/08	09 50	0000	7.4J

J VALUE KNOWN TO BE 1.1 ERROR

STORET RETRIEVAL DATE 74/11/26

360903
43 50 00.0 073 23 00.0
CHAMPLAIN LAKE
36 NEW YORK

11EPALES
5

2111202
0022 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CAC03 MG/L	00630 NO2&NO3 N-TOTAL MG/L	00610 NH3-N TOTAL MG/L	00665 PHOS-TOT MG/L P	00666 PHOS-DIS MG/L P
72/06/01	13 05	0000	19.4	11.2	48	160	7.90	65	0.020	0.040	0.014	0.008
	13 05	0010	18.5	11.0		140	7.80	56	0.010K	0.010	0.012	0.006
	13 05	0019	15.6	10.1		180	7.20	56	0.100	0.090	0.020	0.012
72/08/02	14 35	0000			52	190	6.80	69	0.120	0.090	0.040	0.015
	14 35	0004	23.8	6.8		200	7.70	80	0.120	0.120	0.032	0.017
	14 35	0015	23.7	7.3				78	0.120	0.110	0.033	0.017
	14 35	0020	23.4	6.4		200	7.50	79	0.130	0.220	0.058	0.031
72/10/08	10 15	0000			18	220	8.10	87	0.020	0.040	0.049	0.015
	10 15	0004	14.9	9.6		220	8.15	85	0.030	0.050	0.058	0.014
	10 15	0011	14.9	9.6		215	8.15	85	0.050	0.060	0.049	0.017

DATE FROM TO	TIME OF DAY	DEPTH FEET	32217 CHLRPHYL A UG/L
72/06/01	13 05	0000	9.4J
72/08/02	14 35	0000	10.0J
72/10/08	10 15	0000	30.2J

K VALUE KNOWN TO BE LESS
THAN INDICATED

J VALUE KNOWN TO BE IN ERROR

STORET RETRIEVAL DATE 74/11/26

360904
43 57 00.0 073 25 00.0
CHAMPLAIN LAKE
36 NEW YORK

11EPALES
S

2111202
0025 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CONDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CAC03 MG/L	00630 NO2&NO3 N-TOTAL MG/L	00610 NH3-N TOTAL MG/L	00665 PHOS-TOT MG/L P	00666 PHOS-DIS MG/L P
72/06/01	13 45	0000	19.4	9.9	36	150	8.10	57	0.050	0.030	0.017	0.008
	13 45	0010	17.7	9.2		150	7.70	57	0.070	0.060	0.013	0.009
	13 45	0024	9.0	11.0		110	7.40	51	0.240	0.080	0.018	0.012
72/08/02	14 00	0000			42	200	7.70	70	0.100	0.090	0.038	0.015
	14 00	0004	23.1	7.5		200	7.70	70	0.100	0.090	0.032	0.017
	14 00	0015	22.5	6.3		200	7.60	70	0.100	0.150	0.036	0.016
	14 00	0020	20.6	5.6		180	7.40	65	0.140	0.150	0.040	0.017
72/10/08	10 40	0000			11	245	7.75	72	0.100	0.170	0.073	0.020
	10 40	0004	15.0	8.9		240	7.75	73	0.110	0.160	0.077	0.022
	10 40	0015	14.9	9.0		235	7.80	72	0.090	0.140	0.070	0.020
	10 40	0035	14.9	8.9		240	7.75	72	0.100	0.140	0.074	0.019

DATE FROM TO	TIME OF DAY	DEPTH FEET	32217 CHLRPHYL A UG/L
72/06/01	13 45	0000	8.8J
72/08/02	14 00	0000	2.7J
72/10/08	10 40	0000	9.8J

J VALUE KNOWN TO BE IN ERROR

STORET RETRIEVAL DATE 74/11/26

360905
44 03 00.0 073 27 00.0
CHAMPLAIN LAKE
36 NEW YORK

11EPALES
S

2111202
0021 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CAC03 MG/L	00630 NO2&NO3 N-TOTAL MG/L	00610 NH3-N TOTAL MG/L	00665 PHOS-TOT MG/L P	00666 PHOS-DIS MG/L P
72/06/01	14 20	0000	7.0	11.8	27	100	7.30	52	0.240	0.060	0.016	0.012
	14 20	0008	5.8	12.0		100	7.30	50	0.290	0.010	0.013	0.005
	14 20	0017	5.1	12.0		100	7.30	40	0.310	0.070	0.024	0.013
72/08/02	12 35	0000			84	170	8.10	56	0.050	0.050	0.024	0.010
	12 35	0004	22.6	8.8		160	8.10	57	0.070	0.060	0.022	0.009
	12 35	0010	22.3	8.9		160	8.00	56	0.080	0.080	0.022	0.012
	12 35	0017	22.0	8.1		160	8.00	57	0.070	0.060	0.013	0.010
72/10/08	11 10	0000			60	160	7.75	49	0.130	0.040	0.020	0.009
	11 10	0004	13.8	9.6		155	7.70	50	0.120	0.030	0.022	0.011
	11 10	0015	13.6	9.4		155	7.70	50	0.130	0.030	0.020	0.009

DATE FROM TO	TIME OF DAY	DEPTH FEET	32217 CHLRPHYL A UG/L
72/06/01	14 20	0000	1.2J
72/08/02	12 35	0000	67.7J
72/10/08	11 10	0000	8.5J

J VALUE KNOWN TO BE IN ERROR

STORET RETRIEVAL DATE 74/11/26

360906
44 11 00.0 073 26 00.0
CHAMPLAIN LAKE
36 NEW YORK

11EPALES
5

2111202
0038 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CONDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CAC03 MG/L	00630 NO2&NO3 N-TOTAL MG/L	00610 NH3-N TOTAL MG/L	00665 PHOS-TOT MG/L P	00666 PHOS-DIS MG/L P
72/06/01	16 25	0000	14.2	13.1	72	120	8.60	51	0.050	0.010	0.013	0.006
	16 25	0009	14.0	12.9		120	8.50	49	0.060	0.050	0.015	0.008
	16 25	0020	10.0	11.9		110	7.60	51	0.180	0.060	0.012	0.008
72/07/30	10 55	0000			120			51	0.060	0.060	0.013	0.010
	10 55	0004	21.7	9.6		150	8.30	50	0.060	0.050	0.015	0.008
	10 55	0015	20.4	9.6		150	8.00	50	0.090	0.060	0.017	0.010
	10 55	0030	12.2	9.6		150	7.40	46	0.280	0.060	0.012	0.009
	10 55	0041	9.2	9.4		150	7.20	47	0.300	0.040	0.015	0.012
	10 55	0051	8.3	10.1		150	7.40	46	0.300	0.050	0.017	0.014
72/10/08	11 30	0000			126	145	8.05	73	0.080	0.030	0.016	0.009
	11 30	0004	14.3	10.3		150	8.10	22	0.080	0.020	0.016	0.009
	11 30	0015	14.2	10.4		145	8.05	23	0.080	0.020	0.018	0.008
	11 30	0034	14.1	10.0		155	7.85	23	0.090	0.040	0.016	0.008

DATE FROM TO	TIME OF DAY	DEPTH FEET	32217 CHLRPHYL A UG/L
72/06/01	16 25	0000	20.7J
72/07/30	10 55	0000	12.9J
72/10/08	11 30	0000	12.9J

J VALUE KNOWN TO BE 11 FROM

STORET RETRIEVAL DATE 74/11/26

360907
44 31 00.0 073 16 00.0
LAKE CHAMPLAIN
36 NEW YORK

11EPALES 2111202
5 0020 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CONDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CAC03 MG/L	00630 NO2&NO3 N-TOTAL MG/L	00610 NH3-N TOTAL MG/L	00665 PHOS-TOT MG/L P	00666 PHOS-DIS MG/L P
72/06/02	10 10	0000	11.5	12.3	96	160	8.30	47	0.150	0.060	0.024	0.008
	10 47	0000	11.4		84	140	8.00	45	0.190	0.030	0.012	0.006
	10 47	0005	10.1	12.4		140	8.20	45	0.180	0.020	0.010	0.005
	10 47	0015	8.5			140	8.00	44	0.190	0.030	0.012	0.006
72/07/30	12 50	0000			144	140	8.10	46	0.060	0.050	0.013	0.005
	12 50	0004	22.3	9.6		140	8.10	46	0.060	0.030	0.015	0.009
	12 50	0015	21.4	9.4		140	7.50	44	0.080	0.040	0.017	0.009
	12 50	0030	20.3	8.4		120	7.10	38	0.200	0.090	0.032	0.014
	12 50	0060	14.4	8.6		145	7.00	48	0.230	0.040	0.015	0.009
	12 50	0090	7.2	11.0		145	6.90	47	0.310	0.040	0.019	0.016
	12 50	0120	6.0	11.0		150	6.90	48	0.320	0.040	0.020	0.016
	14 30	0000			144	140	8.30	46	0.080	0.060	0.013	0.011
	14 30	0004	22.7	10.0		140	8.30	46	0.080	0.050	0.015	0.009
	14 30	0015	21.2	9.8		130	7.90	43	0.120	0.050	0.015	0.010
	14 30	0050	15.2	8.4		145	7.10	48	0.220	0.060	0.013	0.009
	14 30	0075	8.8	10.2		145	7.00	47	0.300	0.040	0.018	0.015
	14 30	0117	6.5	11.2		150	7.00	47	0.310	0.040	0.022	0.017
72/10/08	13 05	0000			144	140	7.70	43	0.160	0.040	0.018	0.009
	13 05	0004	13.3	9.9		140	7.75	45	0.160	0.030	0.012	0.007
	13 05	0015	13.3	10.2		140	7.75	43	0.160	0.020	0.012	0.006

DATE FROM TO	TIME OF DAY	DEPTH FEET	32217 CHLRPHYL A UG/L
72/06/02	10 10	0000	29.2J
	10 47	0000	12.4J
72/07/30	12 50	0000	9.9J
	14 30	0000	10.7J
72/10/08	13 05	0000	8.9J

VALUE KNOWN TO BE IN ERROR

STORET RETRIEVAL DATE 74/11/26

360908
44 37 00.0 073 16 00.0
LAKE CHAMPLAIN
36013 NEW YORK

11EPALES
5

2111202
0068 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CONDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00630 NO2&NO3 N-TOTAL MG/L	00610 NH3-N TOTAL MG/L	00665 PHOS-TOT MG/L P	00666 PHOS-DIS MG/L P
72/07/30	09 40	0000			172	100	7.30	34	0.170	0.050	0.010	0.007
	09 40	0004	23.2	8.6		100	7.20	34	0.170	0.040	0.013	0.009
	09 40	0015	22.8	7.6		100	7.20	36	0.180	0.060	0.015	0.009
	09 40	0024	22.3	8.4		100	7.10	34	0.190	0.060	0.016	0.010
	09 40	0034	21.6	8.0		105	6.80	33	0.190	0.070	0.021	0.012
	09 40	0044	13.8	7.0		105	6.80	30	0.340	0.040	0.011	0.010
	09 40	0054	9.5	7.4		105	6.60	29	0.380	0.030	0.013	0.010
	09 40	0064	7.5	6.6		100	6.60	28	0.400	0.240	0.017	0.013
72/10/05	15 30	0000			168	112	7.35	32	0.150	0.040	0.008	0.006
	15 30	0004	15.3	9.8		108	7.35	27	0.150	0.040	0.008	0.005
	15 30	0015	15.3	9.8		123	7.30	31	0.150	0.040	0.008	0.006
	15 30	0040	15.1	9.3		120	7.38	31	0.160	0.050	0.007	0.005
	15 30	0080	8.3	2.4		105	6.43	28	0.390	0.050	0.012	0.009

32217
DATE TIME DEPTH CHLRPHYL
FROM OF
TO DAY FEET UG/L

72/07/30 09 40 0000 4.9J
72/10/05 15 30 0000 5.5J

J VALUE KNOWN TO BE IN ERROR

STORET RETRIEVAL DATE 74/11/26

360909
44 33 00.0 073 25 00.0
LAKE CHAMPLAIN
36 NEW YORK

11EPALES 2111202
5 0065 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CONDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00630 NO2&NO3 N-TOTAL MG/L	00610 NH3-N TOTAL MG/L	00665 PHOS-TOT MG/L P	00666 PHOS-DIS MG/L P
72/06/02	10 30	0000	11.4	11.8	84	140	8.20	42	0.160	0.060	0.030	0.008
72/07/30	11 30	0000			151	130	7.60	40	0.080	0.060	0.019	0.009
	11 30	0004	21.4	9.2		130	7.60	39	0.070	0.060	0.015	0.009
	11 30	0015	21.1	9.0		100	7.00	36	0.080	0.060	0.017	0.010
	11 30	0025	18.9	7.2		140	6.90	29	0.120	0.060	0.020	0.010
	11 30	0045	12.9	8.0		140	6.80	43	0.250	0.030	0.013	0.010
	11 30	0060	11.3	8.8		145	6.80	42	0.270	0.030	0.014	0.011
72/10/05	17 00	0000			156	140	7.40	43	0.150	0.040	0.009	0.006
	17 00	0004	13.8	10.0		142	7.50	42	0.150	0.040	0.012	0.005
	17 00	0015	13.7	9.5		142	7.45	43	0.150	0.040	0.010	0.006
	17 00	0050	13.5	10.0		142	7.40	43	0.150	0.050	0.010	0.006
	17 00	0085	13.0	9.6		142	7.30	42	0.170	0.050	0.010	0.006
	17 00	0116	12.0	9.2		143	7.20	43	0.200	0.050	0.014	0.008

DATE FROM TO	TIME OF DAY	DEPTH FEET	32217 CHLORPHYL A UG/L
72/06/02	10 30	0000	12.8J
72/07/30	11 30	0000	7.9J
72/10/05	17 00	0000	5.4J

J VALUE KNOWN TO BE IN ERROR

STORET RETRIEVAL DATE 74/11/26

360910
44 42 00.0 073 26 00.0
LAKE CHAMPLAIN
36 NEW YORK

11EPALES
5

2111202
0022 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CONDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CAC03 MG/L	00630 NO2&NO3 N-TOTAL MG/L	00610 NH3-N TOTAL MG/L	00665 PHOS-TOT MG/L P	00666 PHOS-DIS MG/L P
72/06/02	11 00	0000	11.7	10.9	96	120	7.50	36	0.160	0.010	0.026	0.009
	11 00	0010	11.5	11.0		120	7.60	34	0.160	0.020	0.021	0.009
	11 00	0024	11.4	11.2		120	7.60	36	0.150	0.010K	0.027	0.007
72/07/30	09 00	0000			72	125	7.00	38	0.070	0.050	0.040	0.015
	09 00	0004	22.0	7.8		120	6.90	39	0.070	0.050	0.037	0.014
	09 00	0015	21.4	6.6		130	7.10	38	0.070	0.050	0.027	0.013
	09 00	0020	20.7	6.6		130	6.80	38	0.090	0.070	0.026	0.012
72/10/05	16 30	0000			16A	141	7.75	40	0.100	0.040	0.013	0.007
	16 30	0004	14.3	10.5		141	7.7A	41	0.100	0.040	0.015	0.008
	16 30	0015	14.3	10.4		140	7.75	40	0.100	0.040	0.016	0.006

32217
DATE TIME DEPTH CHLRPHYL
FROM OF A
TO DAY FEET UG/L

72/06/02	11 00	0000	11.1J
72/07/30	09 00	0000	8.5J
72/10/05	16 30	0000	5.6J

K VALUE KNOWN TO BE LESS
THAN INDICATED

J VALUE KNOWN TO BE IN ERROR

STORET RETRIEVAL DATE 74/11/26

360911
44 46 30.0 073 10 00.0
LAKE CHAMPLAIN
36 NEW YORK

11EPALES
4

2111202
0021 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CAC03 MG/L	00630 NO2&NO3 N-TOTAL MG/L	00610 NH3-N TOTAL MG/L	00665 PHOS-TOT MG/L P	00666 PHOS-DIS MG/L P
72/06/02	11 40	0000	14.9	11.0	84	130	8.20	38	0.030	0.020	0.032	0.012
	11 40	0015	14.0	11.1		130	8.10	39	0.020	0.020	0.024	0.009
72/07/30	08 30	0000			178	130	7.70	38	0.020	0.040	0.029	0.020
	08 30	0004	22.7	9.2		130	7.70	38	0.020	0.040	0.032	0.023
	08 30	0017	22.3	5.2		130	7.60	38	0.030	0.040	0.030	0.021
72/10/05	14 30	0000			168	130	7.55	36	0.040	0.030	0.042	0.035
	14 30	0004	15.5	10.3		132	7.80	35	0.040	0.040	0.041	0.034
	14 30	0014	15.5	10.2		132	7.70	35	0.050	0.040	0.043	0.034

DATE FROM TO	TIME OF DAY	DEPTH FEET	32217 CHLRPHYL A UG/L
72/06/02	11 40	0000	13.6J
72/07/30	08 30	0000	11.2J
72/10/05	14 30	0000	5.5J

J VALUE KNOWN TO BE IN ERROR

STORET RETRIEVAL DATE 74/11/26

369912
44 15 00.0 073 17 00.0
LAKE CHAMPLAIN
36 NEW YORK

11EPALES
5

2111202
0038 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CONDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CAC03 MG/L	00630 NO2&NO3 N-TOTAL MG/L	00610 NH3-N TOTAL MG/L	00665 PHOS-TOT MG/L P	00666 PHOS-DIS MG/L P
72/06/02	14 00	0000	12.7	12.4	100	160	8.30	48	0.160	0.010	0.021	0.011
	14 00	0010	11.4	12.0		160	8.10	52	0.170	0.010	0.011	0.006
	14 00	0027	8.4	11.6		160	7.70	49	0.220	0.020	0.020	0.007
72/07/30	09 15	0000			84	160	8.30	52	0.060	0.080	0.032	0.017
	09 15	0004	22.8	9.6		150	8.40	51	0.050	0.060	0.031	0.014
	09 15	0015	22.7	9.6		150	8.40	46	0.190	0.060	0.028	0.012
	09 15	0027	15.2	9.2		150	7.40	49	0.100	0.060	0.032	0.012
	09 15	0034	11.5	8.8		150	7.40	44	0.270	0.050	0.015	0.012
72/10/08	11 55	0000			144	155	7.70	46	0.140	0.030	0.012	0.008
	11 55	0004	13.9	10.0		150	7.70	43	0.150	0.030	0.013	0.007
	11 55	0015	13.5	9.7		155	7.65	48	0.150	0.020	0.015	0.007
	11 55	0026	12.4	9.2		155	7.50	46	0.200	0.020	0.016	0.010

32217

DATE FROM TO	TIME OF DAY	DEPTH FEET	CHLOROPHYL A UG/L
72/06/02	14 00	0000	1.8J
72/07/30	09 15	0000	6.7J
72/10/08	11 55	0000	7.2J

J VALUE KNOWN TO BE IN ERROR

STORET RETRIEVAL DATE 74/11/26

340913
44 56 00.0 073 20 30.0
LAKE CHAMPLAIN
36019 NEW YORK

11EPALES
5

2111202
0017 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CONDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CAC03 MG/L	00630 NO2&NO3 N-TOTAL MG/L	00610 NH3-N TOTAL MG/L	00665 PHOS-TOT MG/L P	00666 PHOS-DIS MG/L P
72/06/02	15 15	0000	13.5	11.6	125	130	8.20	41	0.140	0.050	0.017	0.007
	15 15	0010	12.8	12.0		130	8.30	37	0.150	0.060	0.017	0.005
	15 15	0025	12.4	11.8		130	8.10	38	0.150	0.070	0.012	0.004
72/07/30	08 00	0000			132	135	7.60	42	0.050	0.050	0.020	0.013
	08 00	0004	21.8	7.8		130	7.40	43	0.040	0.060	0.042	0.019
	08 00	0015	21.1	8.2		140	7.20	42	0.070	0.060	0.022	0.012
72/10/05	16 05	0000			168	146	7.80	44	0.100	0.050	0.006	0.004
	16 05	0004	14.8	10.4		146	7.85	44	0.100	0.050	0.011	0.007
	16 05	0015	14.7	10.6		145	7.80	46	0.100	0.060	0.010	0.007

DATE FROM TO	TIME OF DAY	DEPTH FEET	32217 CHLOROPHYL A UG/L
72/06/02	15 15	0000	10.1J
72/07/30	08 00	0000	12.3J
72/10/05	16 05	0000	2.4J

J VALUE KNOWN TO BE IN ERROR

STORET RETRIEVAL DATE 74/11/26

360914
44 38 00.0 073 15 00.0
LAKE CHAMPLAIN
36013 NEW YORK

DATE FROM TO		TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CONDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CAC03 MG/L	00630 NO2&NO3 N-TOTAL MG/L	00610 NH3-N TOTAL MG/L	00665 PHOS-TOT MG/L P	00666 PHOS-DIS MG/L P
72/07/30	09 10	0000				72	100	7.20	31	0.180	0.060	0.018	0.012
	09 10	0004		22.4	8.0		100	7.00	30	0.180	0.050	0.016	0.011

DATE FROM TO		TIME OF DAY	DEPTH FEET	32217 CHLRPHYL A UG/L
72/07/30	09 10	0000		4.9J

J VALUE KNOWN TO BE IN ERROR

APPENDIX D
ALGAL ASSAY GROWTH CURVES AND CHEMISTRY
FOR
EPA AND VERMONT-BEAK SAMPLES

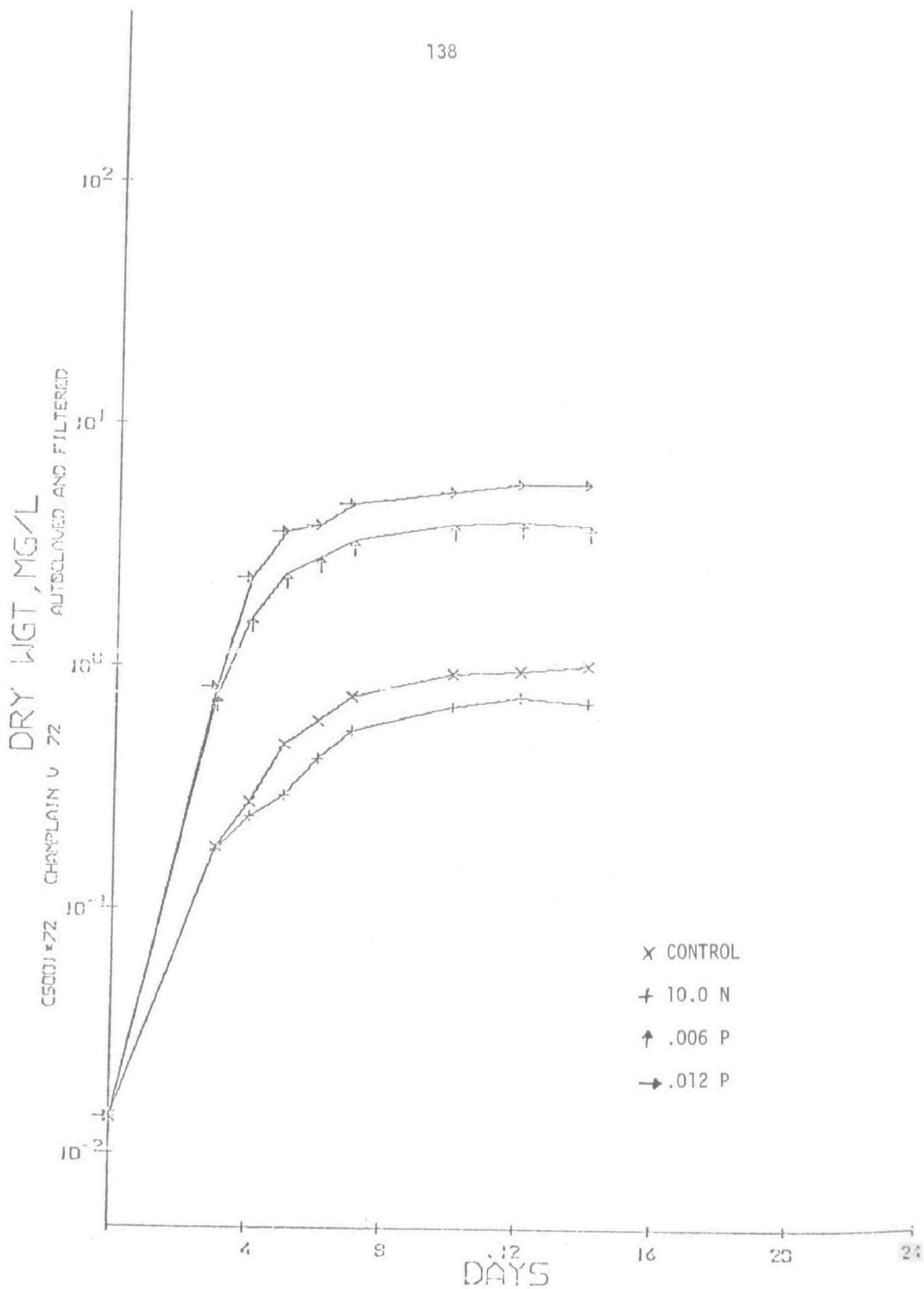
ALGAL ASSAY CHEMISTRY SUMMARY FOR LAKE CHAMPLAIN

LAKE CODE 5001

SAMPLE # 72

	RAW	AUTOCLAVED
	7150001	7150101
	5001-72K	5001-72A
CONDUCT UMHO	A 126.000	A 184.000
PH	8.300	7.500
ALKALINTY MG/L	47.000	52.000
HCO3 ALK MG/L	47.000	52.000
AMMONIA MG/L	.050	.064
NITRITE MG/L	.017	.024
NITRATE MG/L	.091	.150
SOL KJEL MG/L	1.050	.350
KJELNIT MG/L	.630	
NO2+NO3 MG/L	.104	.170
TOT PHOS MG/L	A .079	
DIS PHOS MG/L	.022	.011
ORT AS P MG/L	.017	.012
TOT HARD MG/L	A 56.000	64.000
CALCIUM MG/L	51.000	17.700
MAGNESIUM MG/L	4.400	6.000
SODIUM MG/L	3.800	6.300
CHLORIDE MG/L	8.000	9.000
SULFATE MG/L	36.000	25.000
TOT IRON UG/L	470.000	
DIS IRON UG/L		< 40.000
TOT MANG UG/L	20.000	
DIS MANG UG/L		20.000
REACT SI MG/L	.880	1.150
DIC TIC MG/L	12.000	
DIC DIC MG/L		11.000

A - AVERAGED RESULT



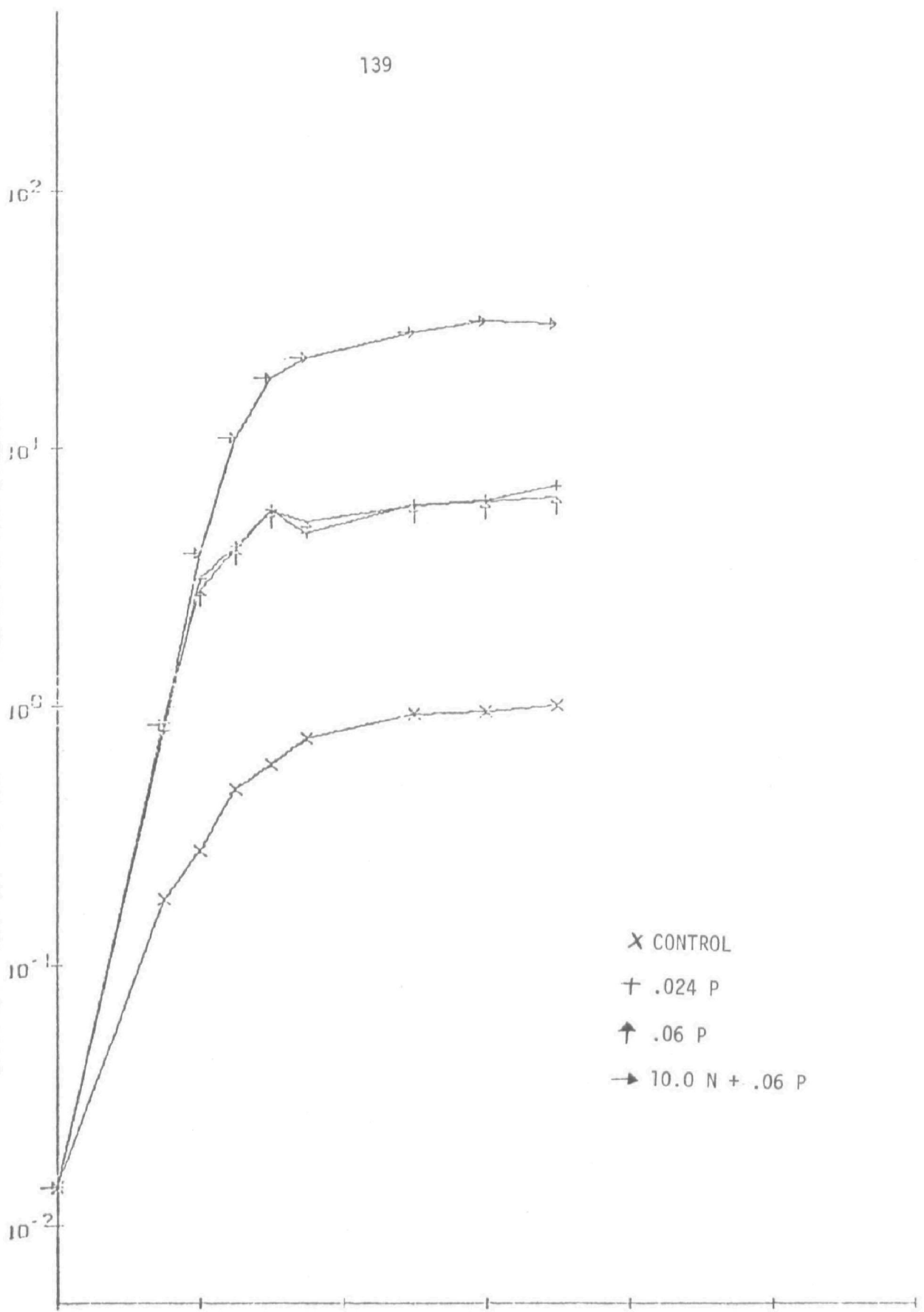
DRY WGT, MG/L
AUTOCLOVED AND FILTERED

CHAMPLAIN U 72

10⁻²
10⁻¹
10⁰
10¹
10²

DAYS

- X CONTROL
- + .024 P
- ↑ .06 P
- 10.0 N + .06 P



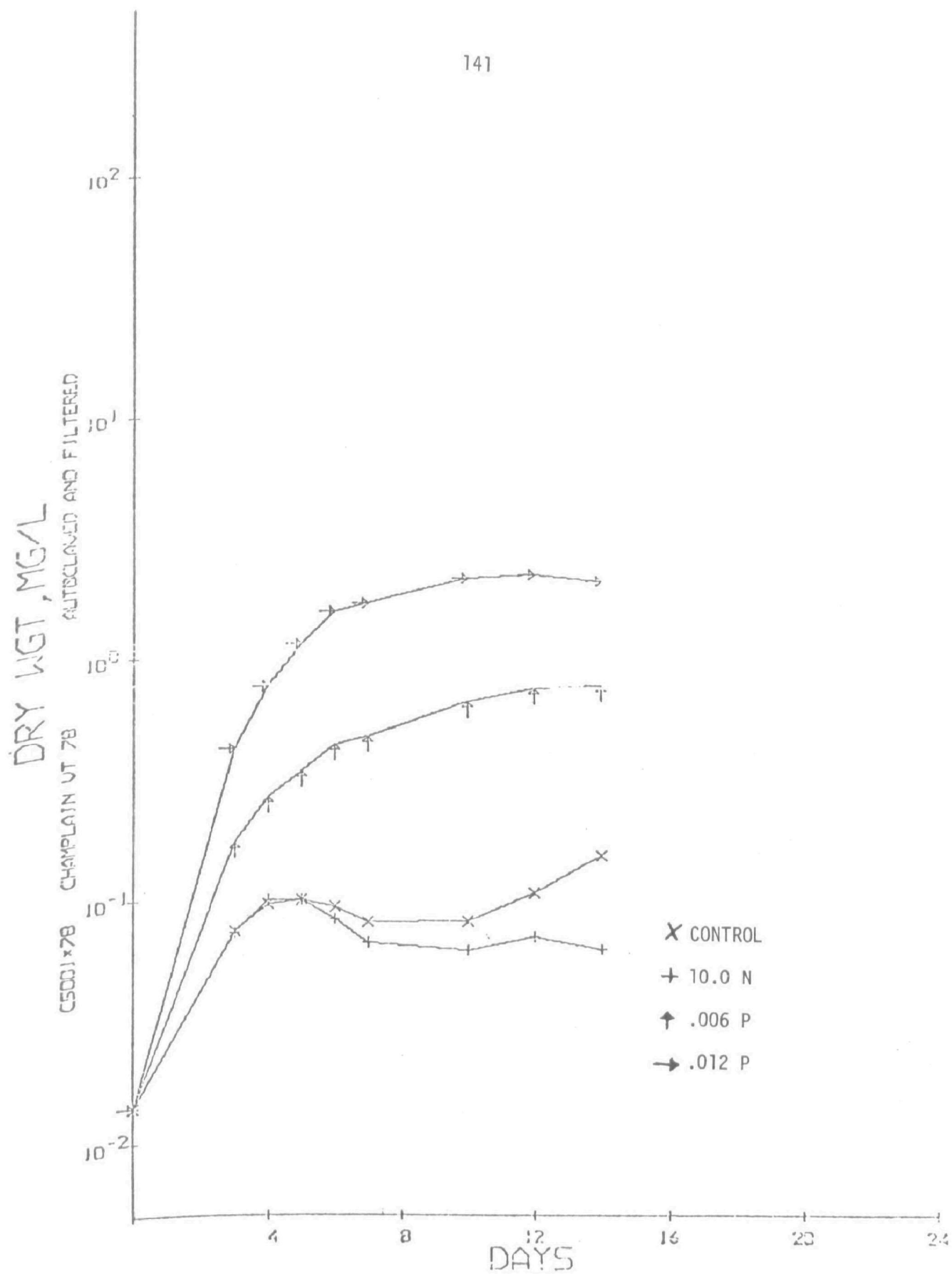
METAL ASSAY CHEMISTRY SUMMARY FOR LAKE CHAMPLAIN

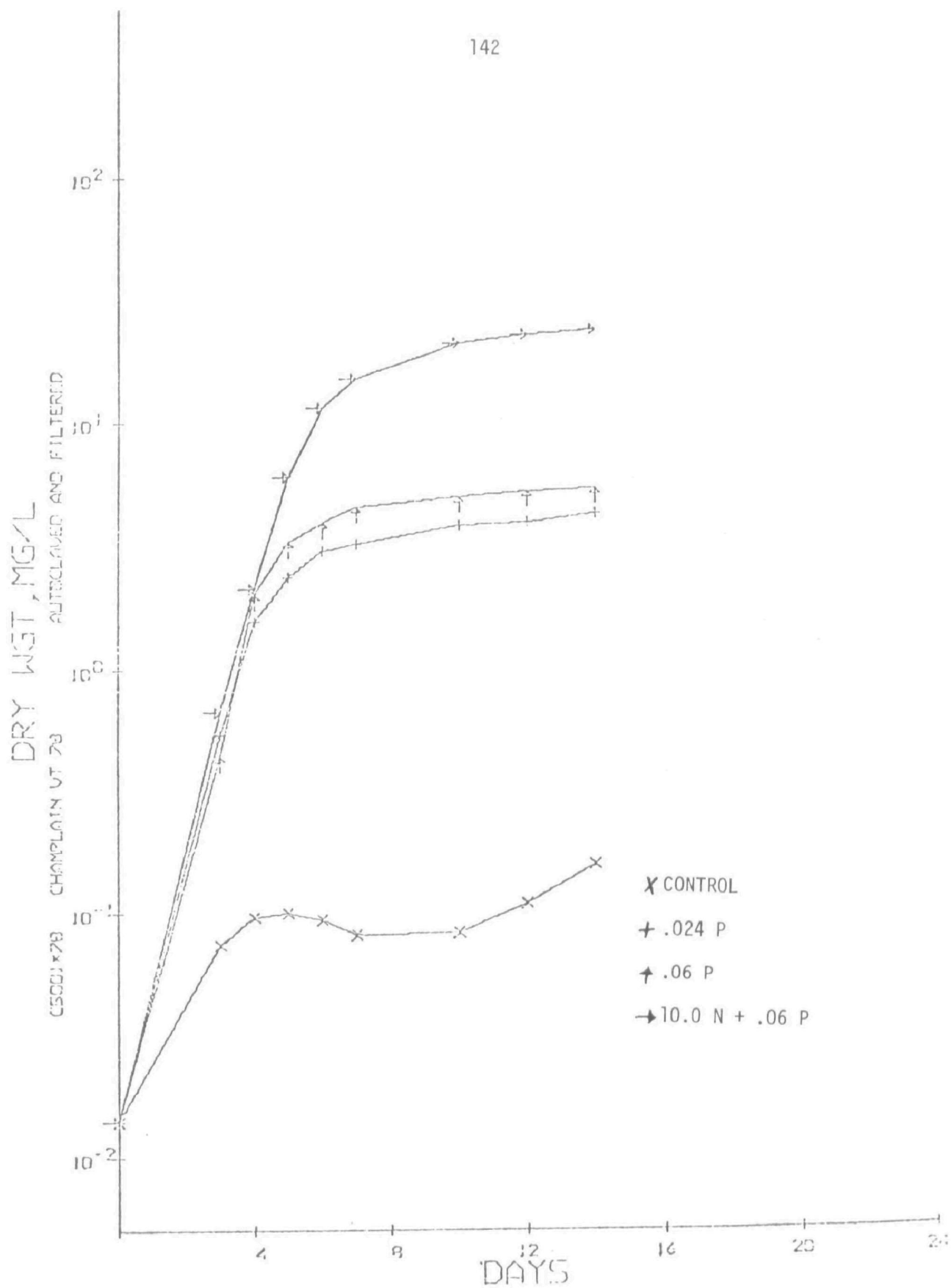
LAKE CODE 5001

SAMPLE # 78

		RAW 7150002 5001-78R	AUTOCLAVED 7150102 5001-78A
CONDUCT	UMHO	138.000	108.000
PH		8.200	7.100
ALKALINTY	MG/L	41.000	26.000
HCO3 ALK	MG/L	41.000	26.000
AMMONIA	MG/L A	.063	.069
NITRITE	MG/L A	.001	.001
NITRATE	MG/L A	.140	.110
SOL KJEL	MG/L	1.300	A .290
KJELNIT	MG/L	.400	
NO2+NO3	MG/L		.117
TOT PHOS	MG/L	.016	
DIS PHOS	MG/L	.006	.009
ORT AS P	MG/L	.005	.006
TOT HARD	MG/L	56.000	35.000
CALCIUM	MG/L	16.700	9.300
MAGNESIUM	MG/L	4.900	3.400
SODIUM	MG/L	5.200	4.000
CHLORIDE	MG/L	8.000	6.000
SULFATE	MG/L	22.000	16.000
TOT IRON	UG/L	80.000	
DIS IRON	UG/L		< 40.000
TOT MANG	UG/L	20.000	
DIS MANG	UG/L		< 20.000
REACT SI	MG/L	.170	A .250
OIC TIC	MG/L	6.000	
OIC DIC	MG/L		4.000

A - AVERAGED RESULT





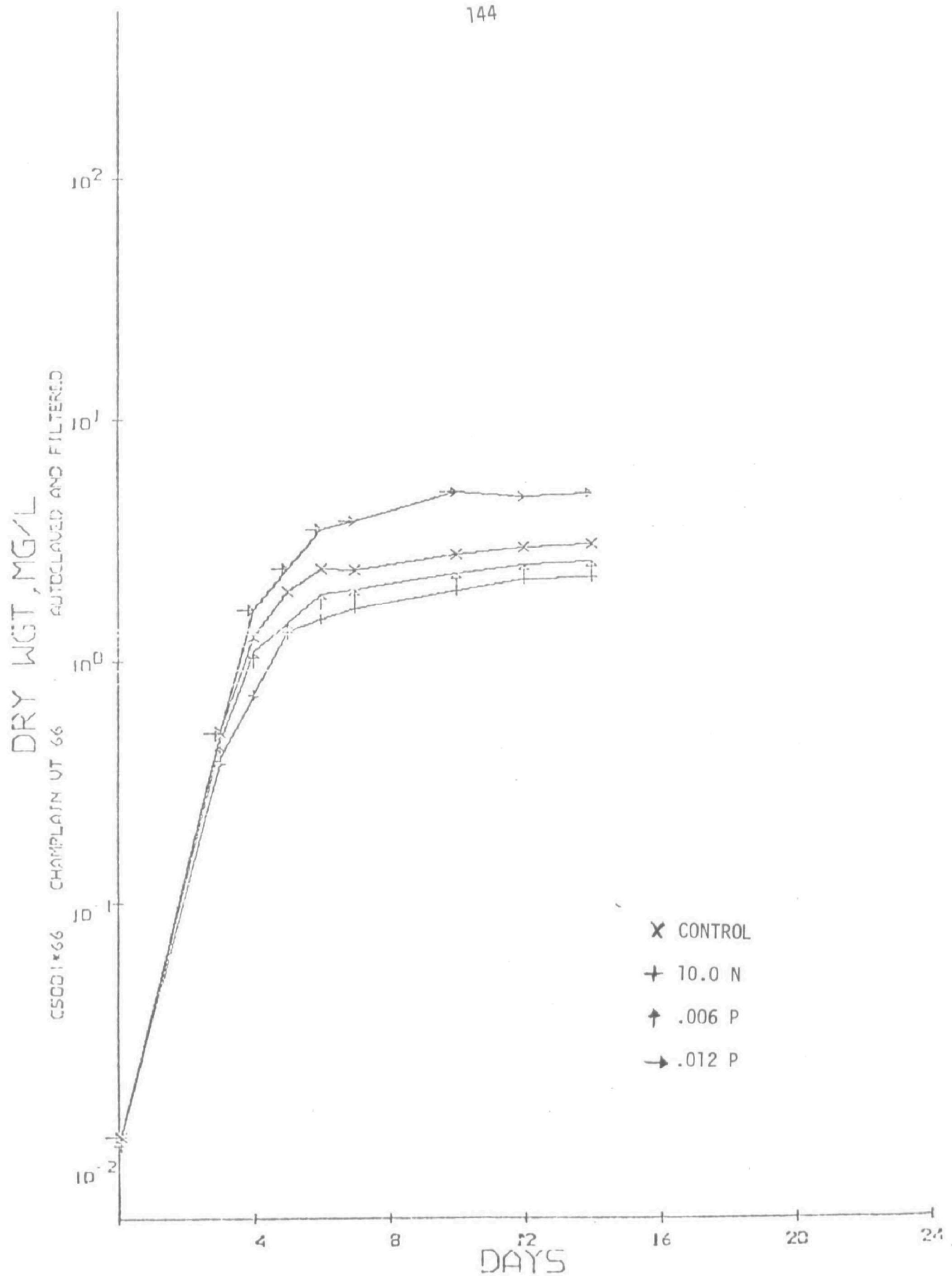
ALGAL ASSAY CHEMISTRY SUMMARY FOR LAKE CHAMPLAIN

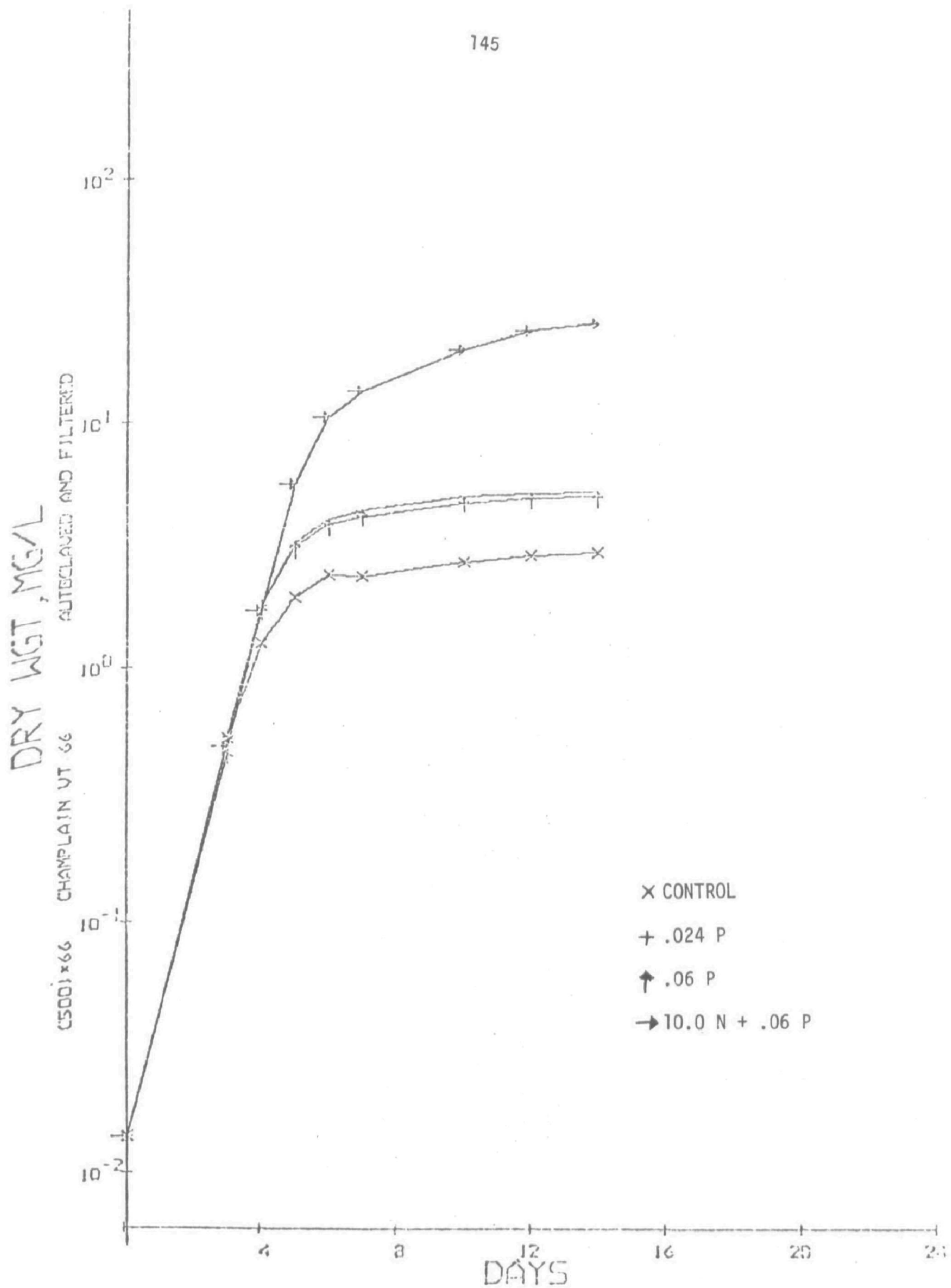
LAKE CODE 5001

SAMPLE # 66

	RAW	AUTOCLAVED
	7150003	7150103
	5001-66R	5001-66A
CONDUCT UMHO	108.000	124.000
PH	8.600	7.400
ALKALINTY MG/L	29.000	30.000
HCO3 ALK MG/L	29.000	30.000
AMMONIA MG/L	.040	A .050
NITRITE MG/L	.002	A .002
NITRATE MG/L	.100	A .102
SOL KUHL MG/L	.750	.440
KUHLNIT MG/L	.400	
NO2+NO3 MG/L	.104	
TOT PHOS MG/L	.026	
DIS PHOS MG/L	.014	.020
ORT AS P MG/L	.009	A .015
TOT HARD MG/L	42.000	42.000
CALCIUM MG/L	12.700	12.700
MAGNESIUM MG/L	3.500	3.000
SODIUM MG/L	4.000	3.900
CHLORIDE MG/L	8.000	6.000
SULFATE MG/L	17.000	17.000
TOT IRON UG/L	< 40.000	
DIS IRON UG/L		< 40.000
TOT MANG UG/L	< 20.000	
DIS MANG UG/L		< 20.000
REACT SI MG/L	.630	.720
OTC TIC MG/L	4.000	
OTC DIC MG/L		5.000

A - AVERAGED RESULT



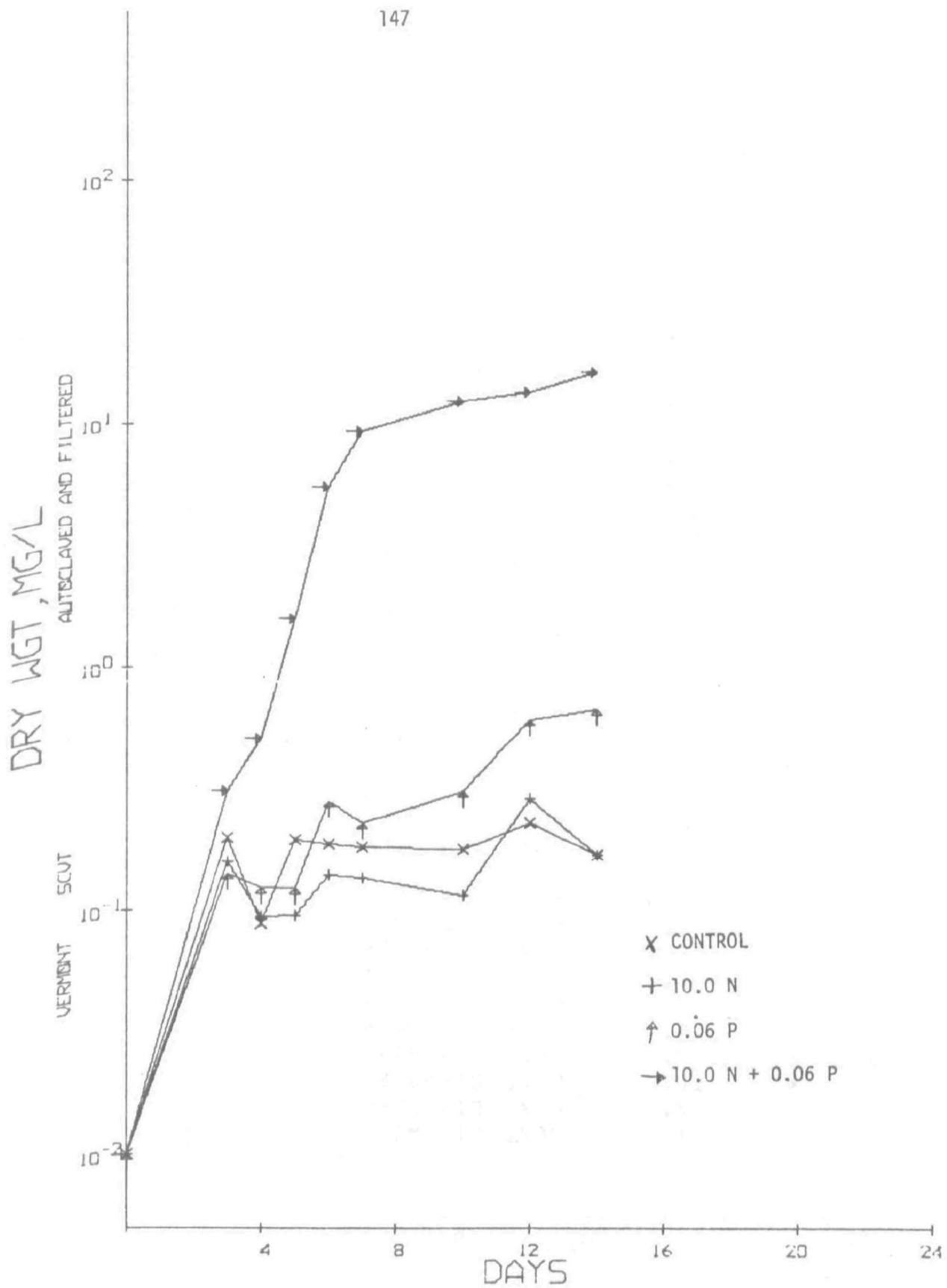


VERMONT - BEAK ALGAL ASSAY CHEMISTRY

Station SCVT

Autoclaved - Filtered

179.	UMHO	CONDUCT	
20.	MG/L	DIS IN C	
24.	MG/L	T DISS C	
4.	MG/L	D ORG C	
6.3		PH	
51.	MG/L	ALKLINTY	
51.	MG/L	HCO3 ALK	
.3	MG/L	KJELNIT	X
.004	MG/L	NITRITE	X
.034	MG/L	AMMONIA	X
.007	MG/L	DIS PHOS	X
< .001	MG/L	CRT AS P	X
18.	MG/L	SULFATE	
73.	MG/L	TOT HARD	
51.	MG/L	CA HARD	
19.	MG/L	CALCIUM	
5.2	MG/L	MAGNSIUM	
5.	MG/L	SODIUM	
1.7	MG/L	POTASium	
1.2	MG/L	REACT SI	
< 25.	UG/L	DISBORCN	58
2.	UG/L	DISCOBLT	
17.	UG/L	DISCOPPR	
18.	UG/L	DIS IRON	
3.	UG/L	DIS MANG	
< 10.	UG/L	DISMOLYB	
12.	UG/L	DIS ZINC	
3.	UG/L	DIS MERC	

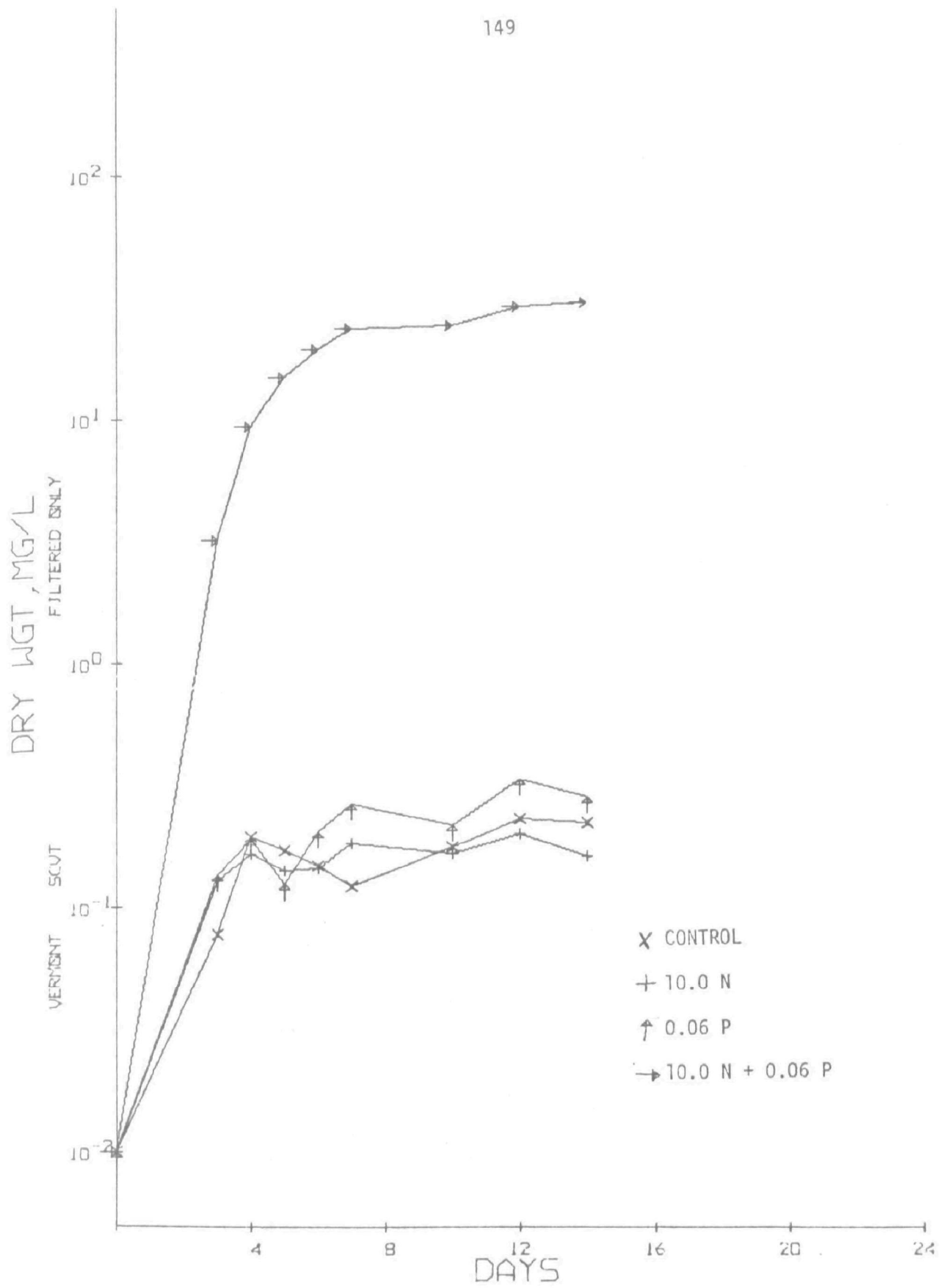


VERMONT - BEAK ALGAL ASSAY CHEMISTRY

Station SCVT

Filtered Only

	247.	UMHO	CONDUCT	
	21.	MG/L	DIS IN C	
	25.	MG/L	T DISS C	
	4.	MG/L	C ORG C	
	7.8		PH	
	92.	MG/L	ALKLINTY	
	92.	MG/L	HCO3 ALK	
	.6	MG/L	KJELNIT	X
	.002	MG/L	NITRITE	X
	.005	MG/L	NITRATE	X
	.009	MG/L	AMMONIA	X
A	.064	MG/L	NO2+NO3	
	.005	MG/L	DIS PHCS	X
	.002	MG/L	ORT AS P	X
	23.	MG/L	SULFATE	
	135.	MG/L	TOT HARD	
	56.	MG/L	CA HARD	
	32.	MG/L	CALCIUM	
	6.3	MG/L	MAGNSIUM	
	4.8	MG/L	SODIUM	
	1.4	MG/L	POTASIUM	
	.09	MG/L	REACT SI	
<	25.	UG/L	DISBORON	58
	2.	UG/L	DISCOBLT	
	7.	UG/L	DISCOFPR	
	49.	UG/L	DIS IRON	
	7.	UG/L	DIS MANG	
<	10.	UG/L	DISMOLYB	
	7.	UG/L	DIS ZINC	
	1.	UG/L	DIS MERC	

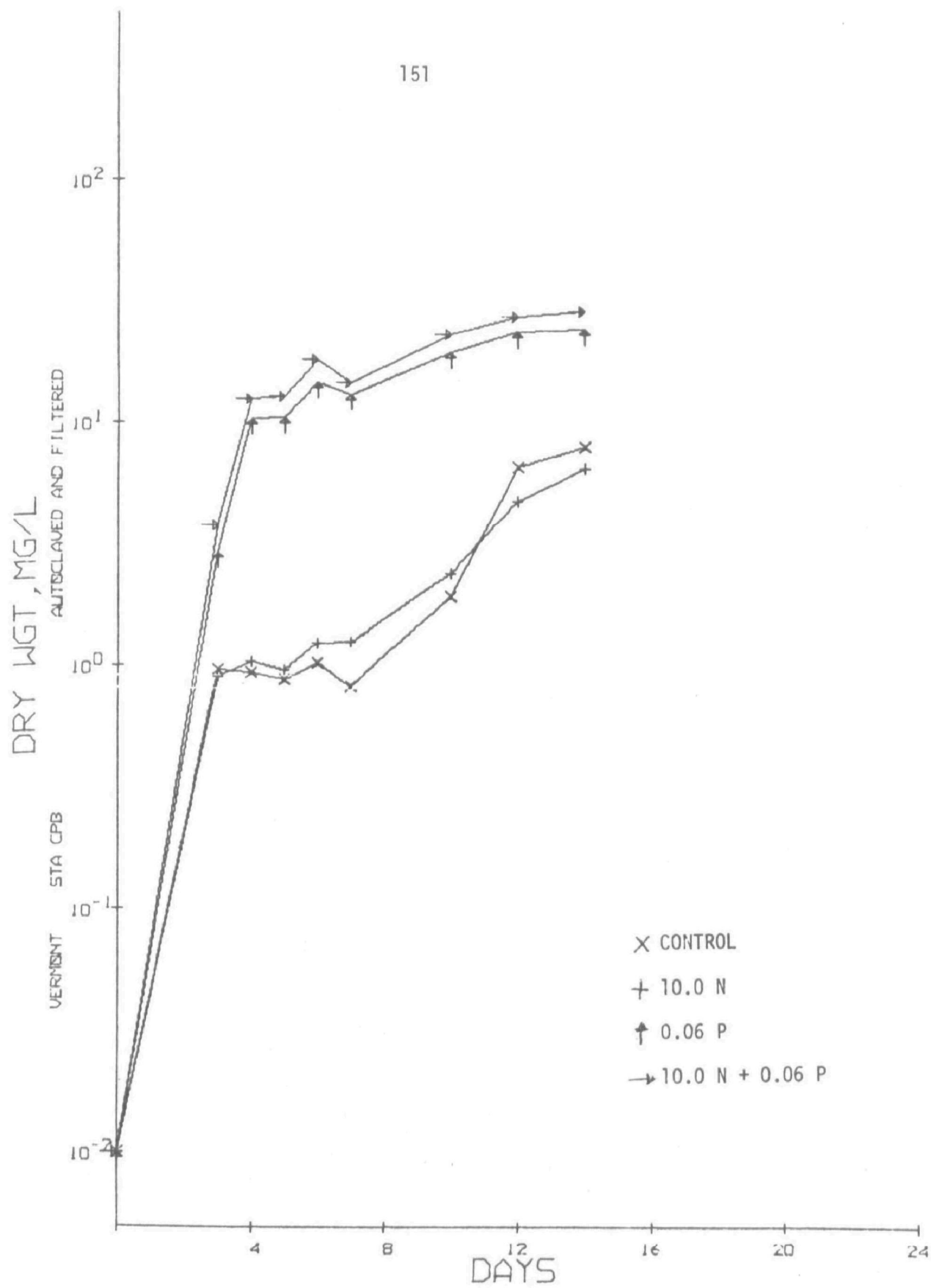


VERMONT - BEAK ALGAL ASSAY CHEMISTRY

Station CPB

Autoclaved - Filtered

	236.	UMHO CONDUCT	
	29.	MG/L DIS IN C	
	33.	MG/L T DISS C	
	4.	MG/L D ORG C	
	6.5	FF	
	86.	MG/L ALKLINTY	
	86.	MG/L HCO3 ALK	
	.4	MG/L KJELNIT	X
<	.001	MG/L NITRITE	X
	.004	MG/L NITRATE	
	.065	MG/L AMMONIA	X
A	.005	MG/L NO2+NO3	
	.015	MG/L DIS PHOS	X
	.011	MG/L CRT AS P	
	13.	MG/L SULFATE	
	109.	MG/L TCT HARD	
	76.	MG/L CA HARD	
	32.	MG/L CALCIUM	
	5.8	MG/L MAGNESIUM	
	4.8	MG/L SODIUM	
	1.5	MG/L POTASium	
A	.94	MG/L REACT SI	
<	25.	UG/L DISBORON	58
	2.	UG/L DISCOBLT	
	18.	UG/L DISCOPPR	
	52.	UG/L DIS IRON	
	3.	UG/L DIS MANG	
<	10.	UG/L DISMOLYB	
	14.	UG/L DIS ZINC	
	1.	UG/L DIS MERC	

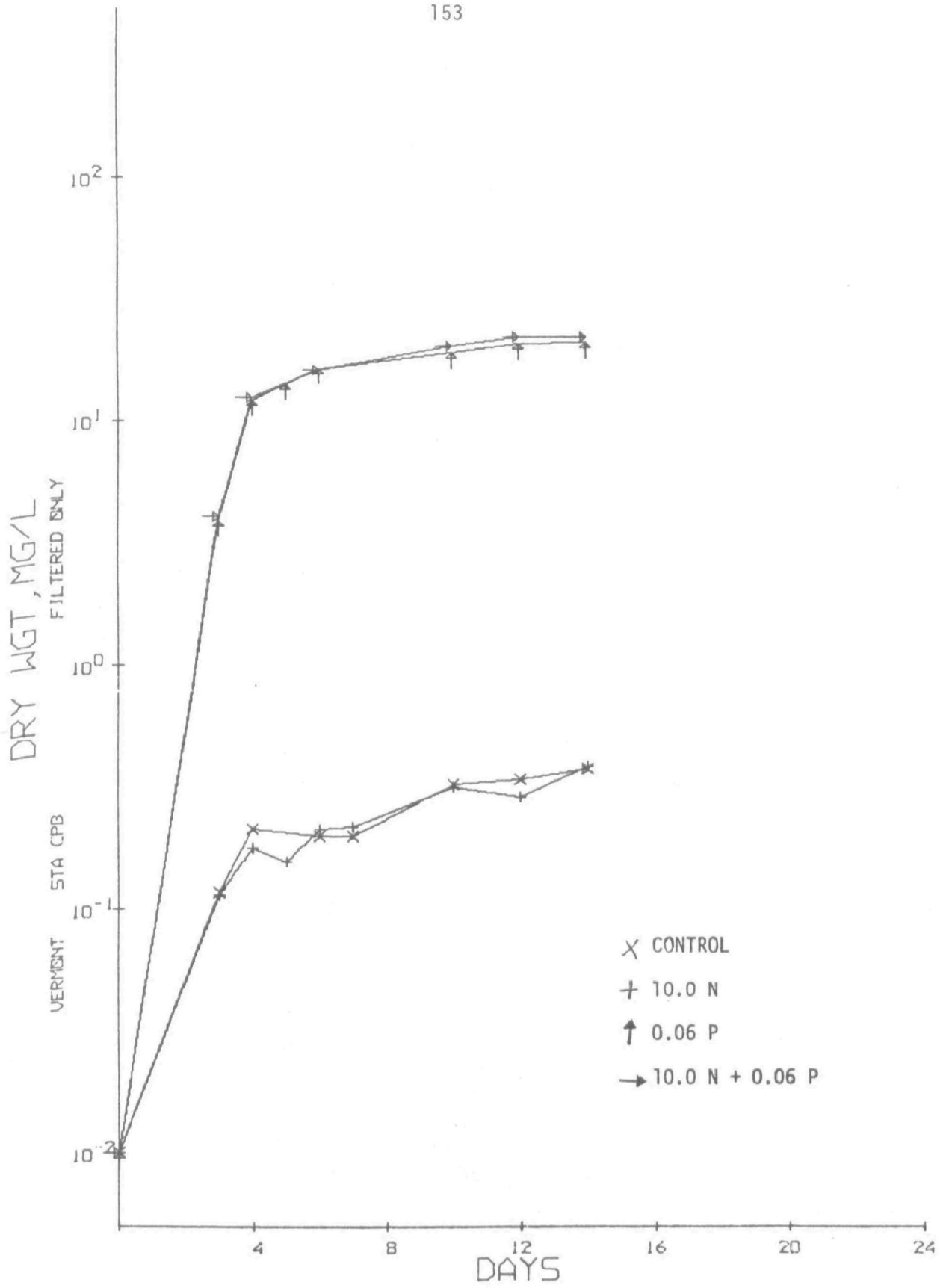


VERMONT - BEAK ALGAL ASSAY CHEMISTRY

Station CPB

Filtered Only

	247.	UMHO CONDUCT	
	21.	MG/L DIS IN C	
	25.	MG/L T DISS C	
	4.	MG/L C ORG C	
	7.9	FH	
	92.	MG/L ALKLINTY	
	92.	MG/L HCO3 ALK	
	.2	MG/L KJELNIT	
<	.001	MG/L NITRITE	X
	.009	MG/L NITRATE	X
	.013	MG/L AMMONIA	X
A	.009	MG/L NO2+NO3	
	.006	MG/L DIS PHOS	X
	.001	MG/L CRT AS P	X
	17.	MG/L SULFATE	
	113.	MG/L TOT HARD	
	42.	MG/L CA HARD	
	33.	MG/L CALCIUM	
	6.2	MG/L MAGNSIUM	
	4.8	MG/L SODIUM	
	1.5	MG/L POTASium	
	.05	MG/L REACT SI	
<	25.	UG/L DISBORON	59
	2.	UG/L DISCOBLT	
	11.	UG/L DISCOPPR	
	52.	UG/L DIS IRON	
	2.	UG/L DIS MANG	
<	10.	UG/L DISMOLYB	
	9.	UG/L DIS ZINC	
	1.5	UG/L DIS MERC	

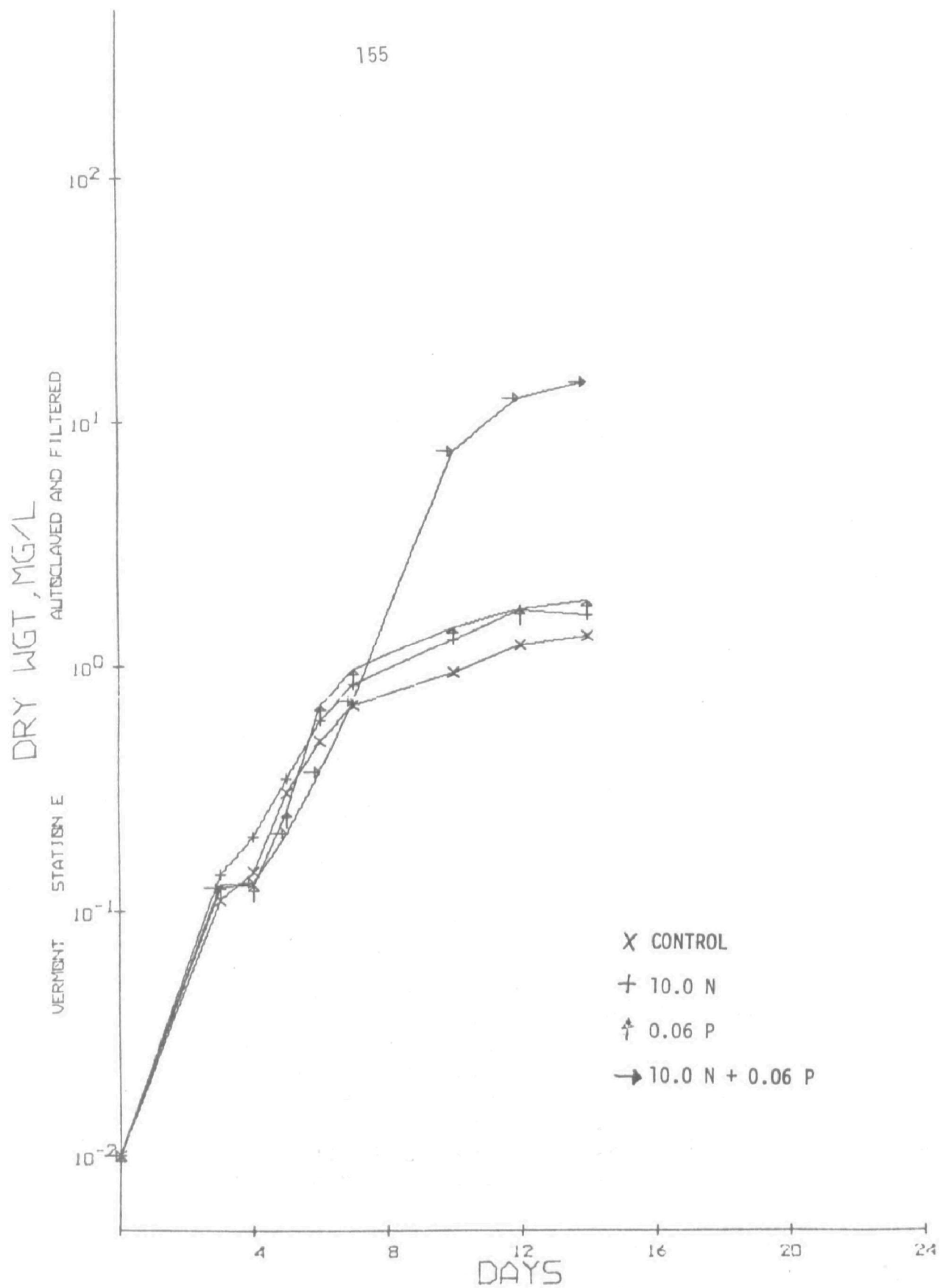


VERMONT - BEAK ALGAL ASSAY CHEMISTRY

Station E

Autoclaved - Filtered

	197.	UMHO CCNDOUCT	
	36.	MG/L DIS IN C	
	41.	MG/L T DISS C	
	5.	MG/L C ORG C	
	6.	PH	
	62.	MG/L ALKLINTY	
	62.	MG/L HCO3 ALK	
	.2	MG/L KJELNIT	X
	.005	MG/L NITRITE	X
	.034	MG/L NITRATE	X
	.085	MG/L AMMONIA	X
A	.034	MG/L NO2+NO3	
	.04	MG/L DIS PHOS	X
	.039	MG/L ORT AS P	X
	16.	MG/L SULFATE	
	78.	MG/L TCT HARD	
	68.	MG/L CA HARD	
	23.	MG/L CALCIUM	
	4.3	MG/L MAGNSIUM	
	6.1	MG/L SODIUM	
	1.2	MG/L POTASIUM	
	1.32	MG/L REACT SI	
<	25.	UG/L DISBORON	58
	2.	UG/L DISCOBLT	
	10.	UG/L DISCOPPR	
	49.	UG/L DIS IRON	
	5.	UG/L DIS MANG	
<	10.	UG/L DISMOLYB	
	19.	UG/L DIS ZINC	
	1.	UG/L DIS MERC	

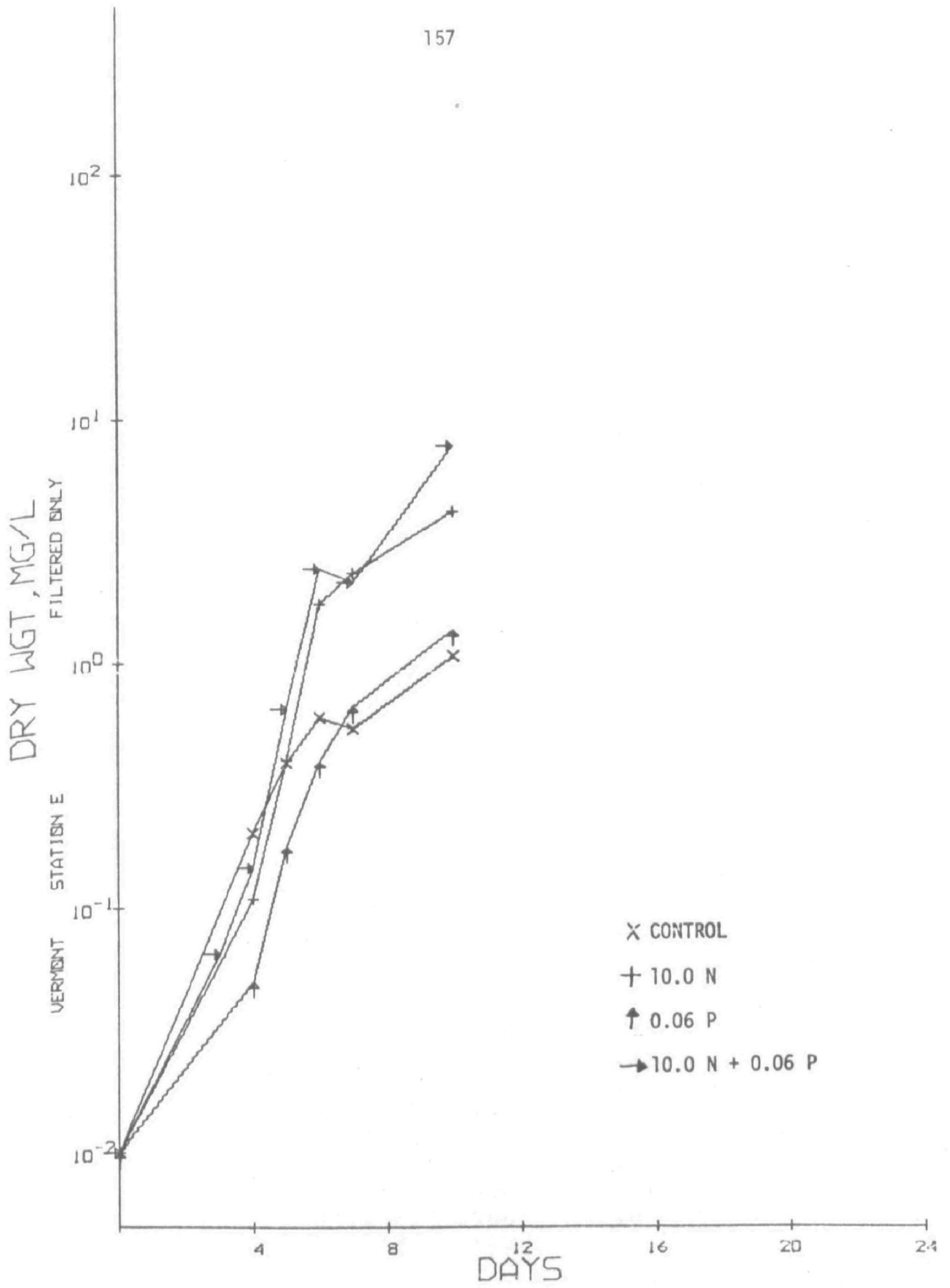


VERMONT - BEAK ALGAL ASSAY CHEMISTRY

Station E

Filtered Only

	194.	UMHO CONDUCT	
	14.	MG/L DIS IN C	
	19.	MG/L T DISS C	
	5.	MG/L D ORG C	
	7.7	PH	
	66.	MG/L ALKLINTY	
	66.	MG/L HCO3 ALK	
	.4	MG/L KJELNIT	X
	.005	MG/L NITRITE	X
	.028	MG/L NITRATE	X
	.046	MG/L AMMCNIA	X
A	.028	MG/L NC2+NO3	
	.016	MG/L DIS PHOS	X
A	.007	MG/L CRT AS P	
	13.	MG/L SULFATE	
	71.	MG/L TOT HARD	
	61.	MG/L CA HARD	
	24.	MG/L CALCIUM	
	4.3	MG/L MAGNSIUM	
	6.1	MG/L SODIUM	
	1.	MG/L POTASIUM	
A	.97	MG/L REACT SI	
<	25.	UG/L DISBORON	58
	2.	UG/L DISCOBLT	
	5.	UG/L DISCOPFR	
	99.	UG/L DIS IRON	
<	1.	UG/L DIS MANG	
<	10.	UG/L DISMOLYB	
	8.	UG/L DIS ZINC	
	1.5	UG/L DIS MERC	

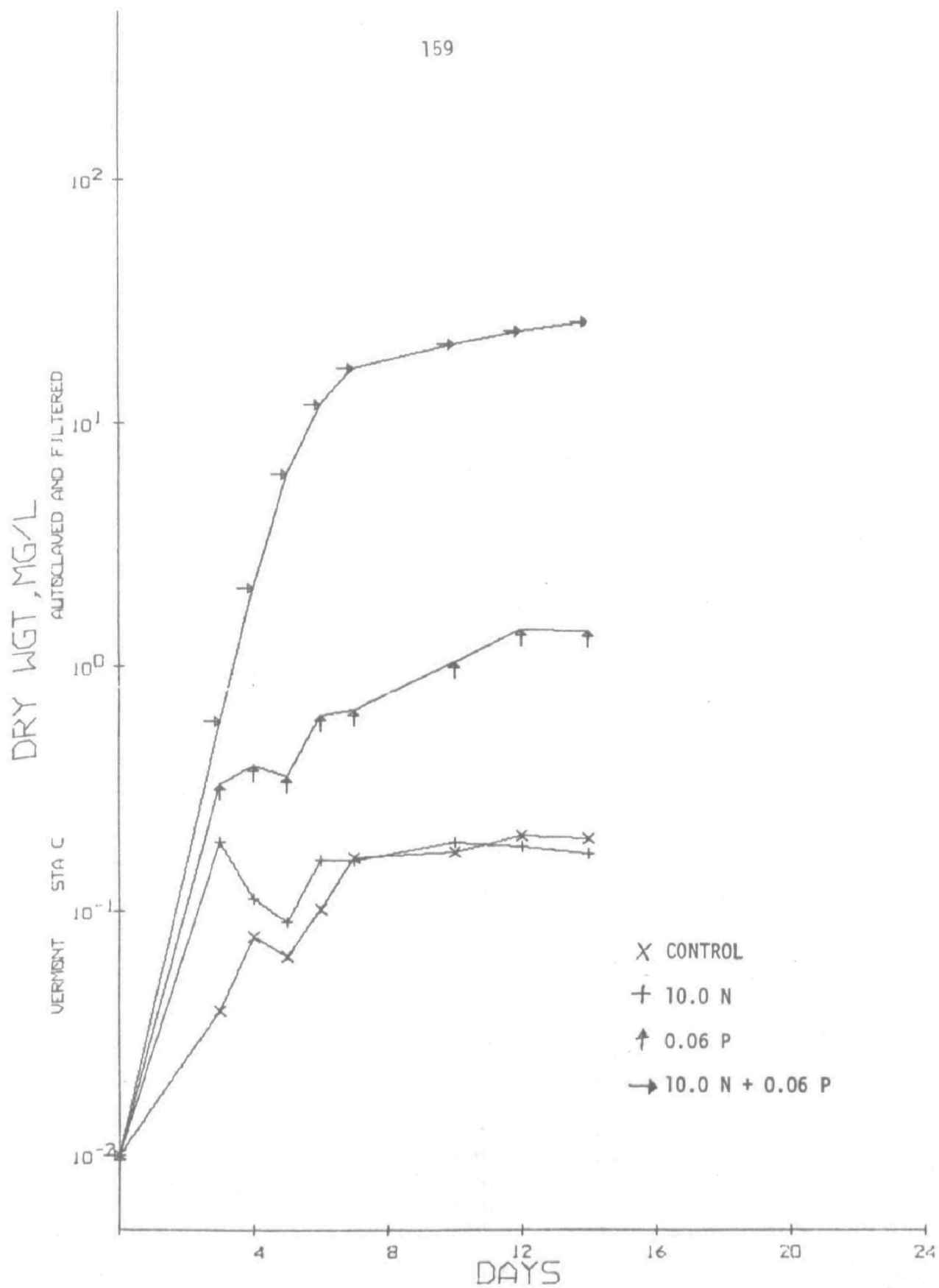


VERMONT - BEAK ALGAL ASSAY CHEMISTRY

Station C

Autoclaved - Filtered

	173.	UMHO	CONDUCT	
	13.	MG/L	DIS IN C	
	17.	MG/L	T DISS C	
	4.	MG/L	D ORG C	
	7.4		FH	
	59.	MG/L	ALKLINTY	
	59.	MG/L	HCO3 ALK	
	.2	MG/L	KJELNIT	X
	.006	MG/L	NITRITE	X
	.052	MG/L	NITRATE	X
	.094	MG/L	AMMONIA	X
A	.051	MG/L	NO2+NO3	
	.033	MG/L	DIS PHCS	X
	.066	MG/L	ORT AS P	X
	15.	MG/L	SULFATE	
	72.	MG/L	TOT HARD	
	52.	MG/L	CA HARD	
	21.	MG/L	CALCIUM	
	3.8	MG/L	MAGNSIUM	
	5.7	MG/L	SODIUM	
	1.	MG/L	POTASium	
	1.5	MG/L	REACT SI	
<	25.	UG/L	DISBORON	58.
	2.	UG/L	DISCOBLT	
	6.	UG/L	DISCOPFR	
	111.	UG/L	DIS IRON	
	1.	UG/L	DIS MANG	
<	10.	UG/L	DISMOLYB	
	8.	UG/L	DIS ZINC	
	3.	UG/L	CIS MERC	

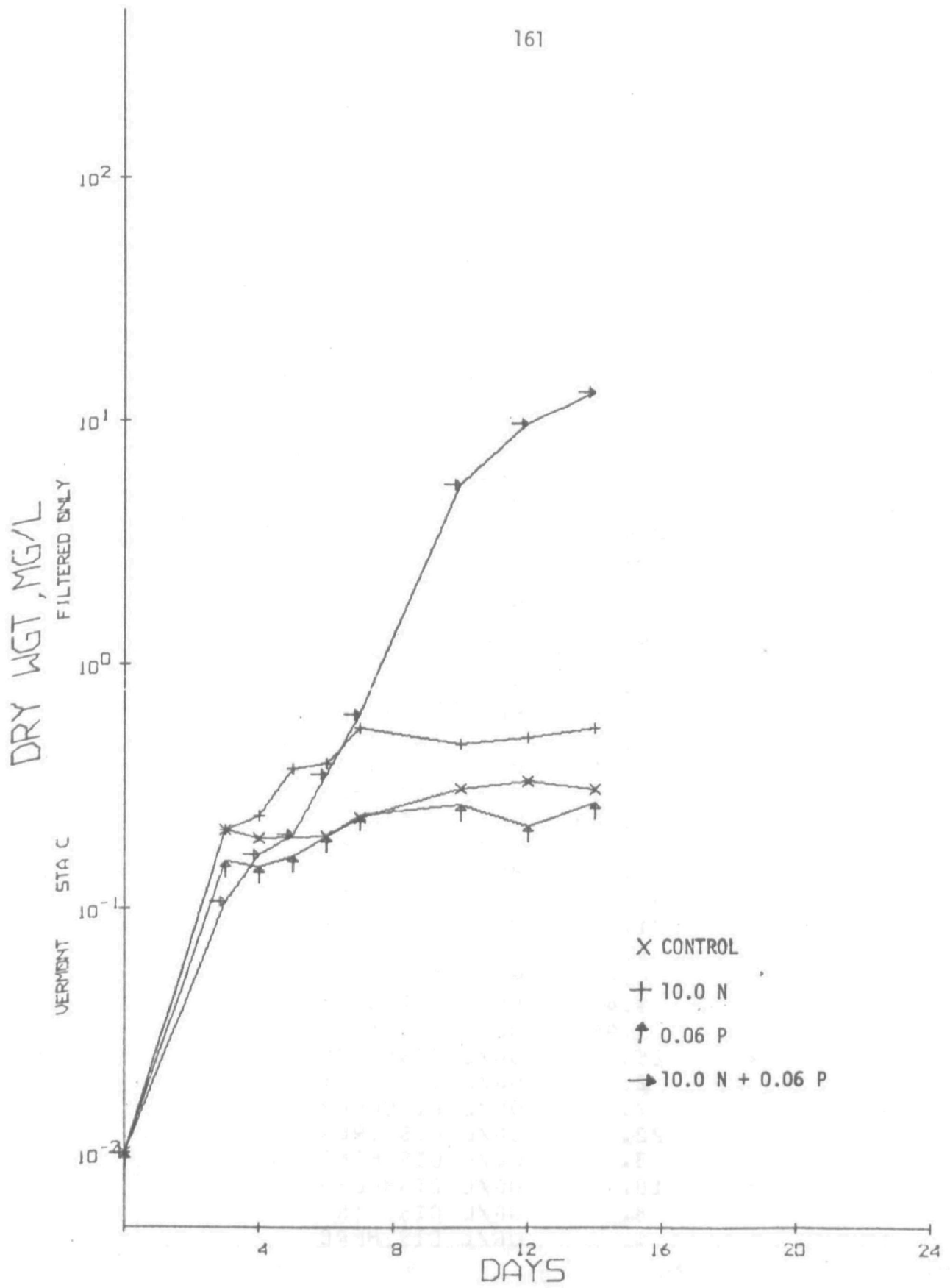


VERMONT - BEAK ALGAL ASSAY CHEMISTRY

Station C

Filtered Only

	179.	UMHO CCNDUCT	
	29.	MG/L DIS IN C	
	33.	MG/L T DISS C	
	4.	MG/L D ORG C	
	6.	PH	
	53.	MG/L ALKLINTY	
	53.	MG/L HCO3 ALK	
	.2	MG/L KJELNIT	X
	.006	MG/L NITRITE	X
	.056	MG/L NITRATE	X
	.067	MG/L AMMCNIA	X
A	.056	MG/L NO2+NO3	
	.015	MG/L DIS PHOS	X
	.018	MG/L CRT AS P	X
	19.	MG/L SULFATE	
	84.	MG/L TOT HARD	
	52.	MG/L CA HARD	
	22.	MG/L CALCIUM	
	3.4	MG/L MAGNSIUM	
	6.2	MG/L SODIUM	
	1.1	MG/L POTASium	
	1.68	MG/L REACT SI	
<	25.	UG/L DISBORON	
	2.	UG/L DISCO9LT	
	5.	UG/L DISCOPPR	
	18.	UG/L DIS IRON	
<	1.	UG/L DIS MANG	
<	10.	UG/L DISMOLYB	
	3.	UG/L DIS ZINC	
	1.	UG/L DIS MERC	

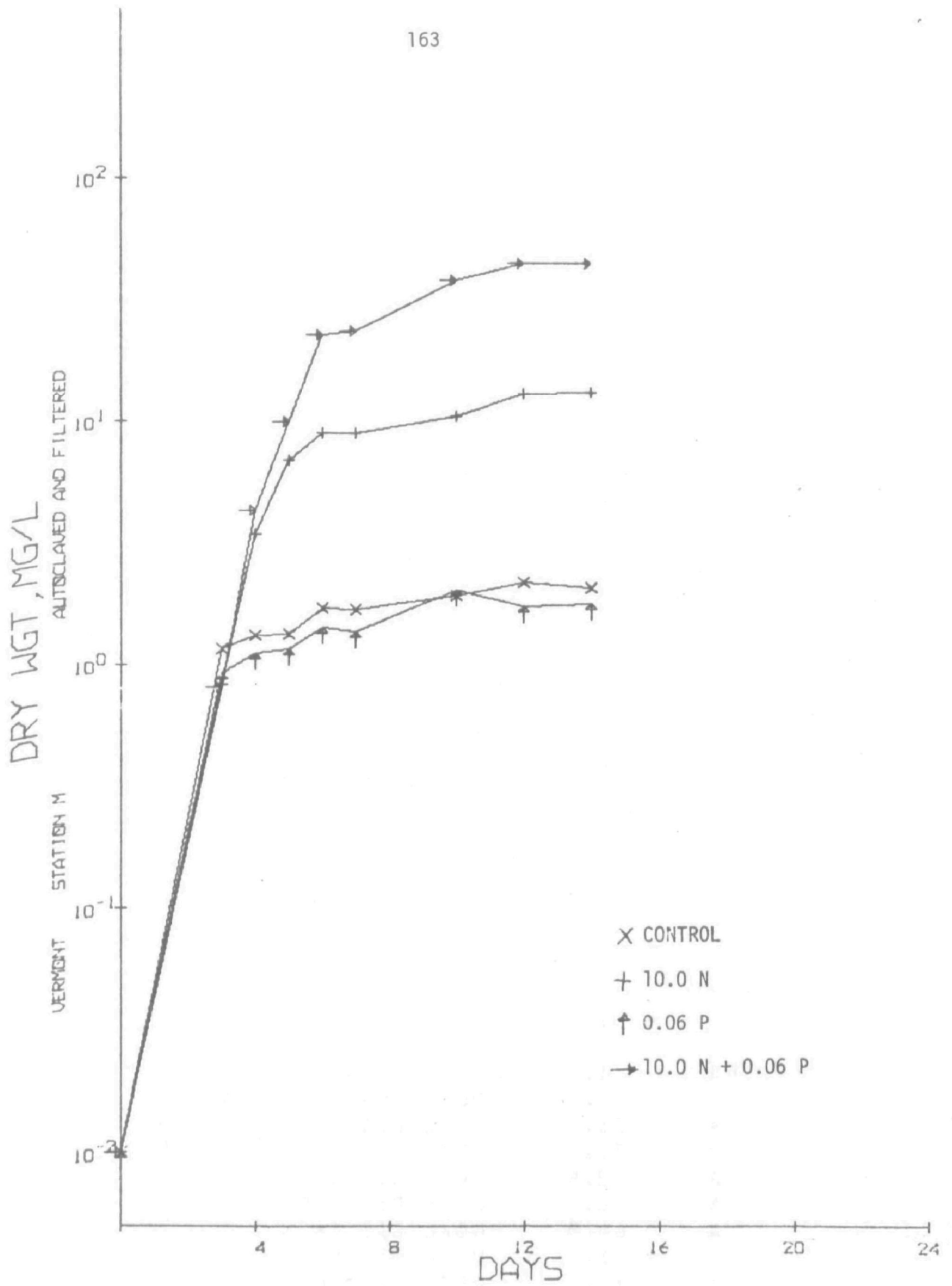


VERMONT - BEAK ALGAL ASSAY CHEMISTRY

Station M

Autoclaved - Filtered

	184.	UMHO CONDUCT	
	21.	MG/L DIS IN C	
	25.	MG/L T DISS C	
	4.	MG/L C ORG C	
	6.3	FH	
	56.	MG/L ALKLINTY	
	56.	MG/L HCO3 ALK	
	.4	MG/L KJELNIT	X
	.004	MG/L NITRITE	X
	.018	MG/L NITRATE	X
	.075	MG/L AMMCNIA	X
A	.016	MG/L NO2+NO3	
	.01	MG/L DIS PHOS	X
	.009	MG/L ORT AS P	X
	19.	MG/L SULFATE	
	71.	MG/L TOT HARD	
	56.	MG/L CA HARD	
	21.	MG/L CALCIUM	
	5.	MG/L MAGNSIUM	
	5.5	MG/L SODIUM	
	1.4	MG/L POTASIUM	
	.95	MG/L REACT SI	
<	25.	UG/L DISBORON	58
	2.	UG/L DISCOBLT	
	7.	UG/L DISCOPFR	
	22.	UG/L DIS IRON	
	3.	UG/L DIS MANG	
<	10.	UG/L DISMOLYB	
	8.	UG/L DIS ZINC	
	1.	UG/L DIS MERC	

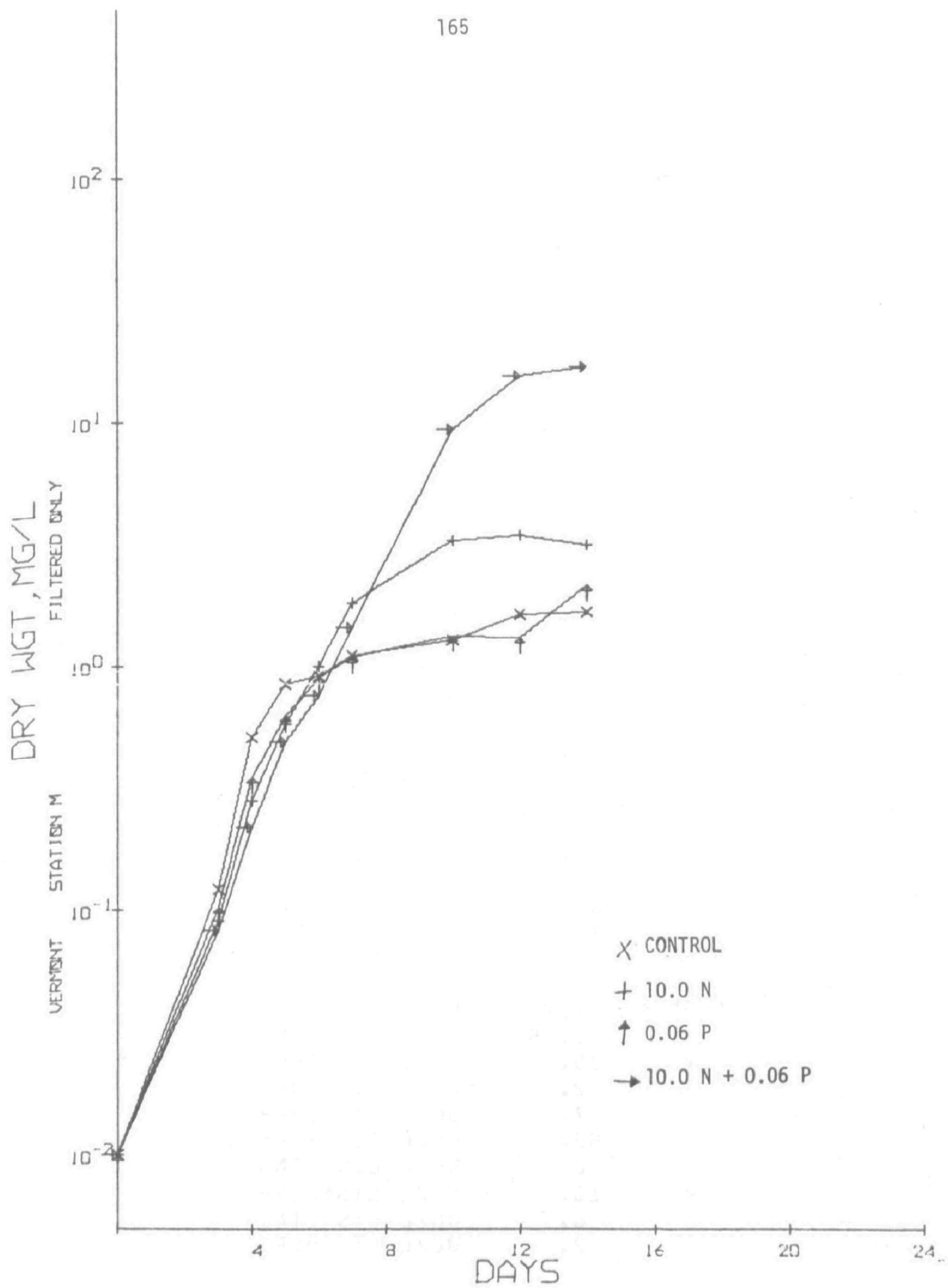


VERMONT - BEAK ALGAL ASSAY CHEMISTRY

Station M

Filtered Only

A	222.	UMHO CONDUCT		
	18.	MG/L DIS IN C		
	22.	MG/L T DISS C		
	4.	MG/L D ORG C		
	7.7	PH		
	31.	MG/L ALKLINTY		
	31.	MG/L HCO3 ALK		
	.2	MG/L KJELNIT	X	
	.003	MG/L NITRITE	X	
	.014	MG/L NITRATE	X	
	.035	MG/L AMMONIA	X	
A	.014	MG/L NO2+NO3		
	.017	MG/L DIS PHCS	X	
	.012	MG/L ORT AS P	X	
	17.	MG/L SULFATE		
	92.	MG/L TCT HARD		
	75.	MG/L CA HARD		
A	30.	MG/L CALCIUM		
	5.4	MG/L MAGNSIUM	3	
	5.4	MG/L MAGNSIUM	3	
A	5.4	MG/L MAGNSIUM		
	5.2	MG/L SODIUM	3	
	5.2	MG/L SODIUM	3	
A	5.2	MG/L SODIUM		
	1.2	MG/L POTASIUM	3	
	1.2	MG/L POTASIUM	3	
A	1.2	MG/L POTASIUM		
	.4	MG/L REACT SI		
<	25.	UG/L DISBORON	3	53
<	25.	UG/L DISBORON	3	53
A	2.5	UG/L DISCOBLT		
A	6.	UG/L DISCOPPR		
A	64.5	UG/L DIS IRON		
	1.	UG/L DIS MANG		
<	10.	UG/L DISMOLYB		
A	8.	UG/L DIS ZINC		
	2.	UG/L DIS MERC		

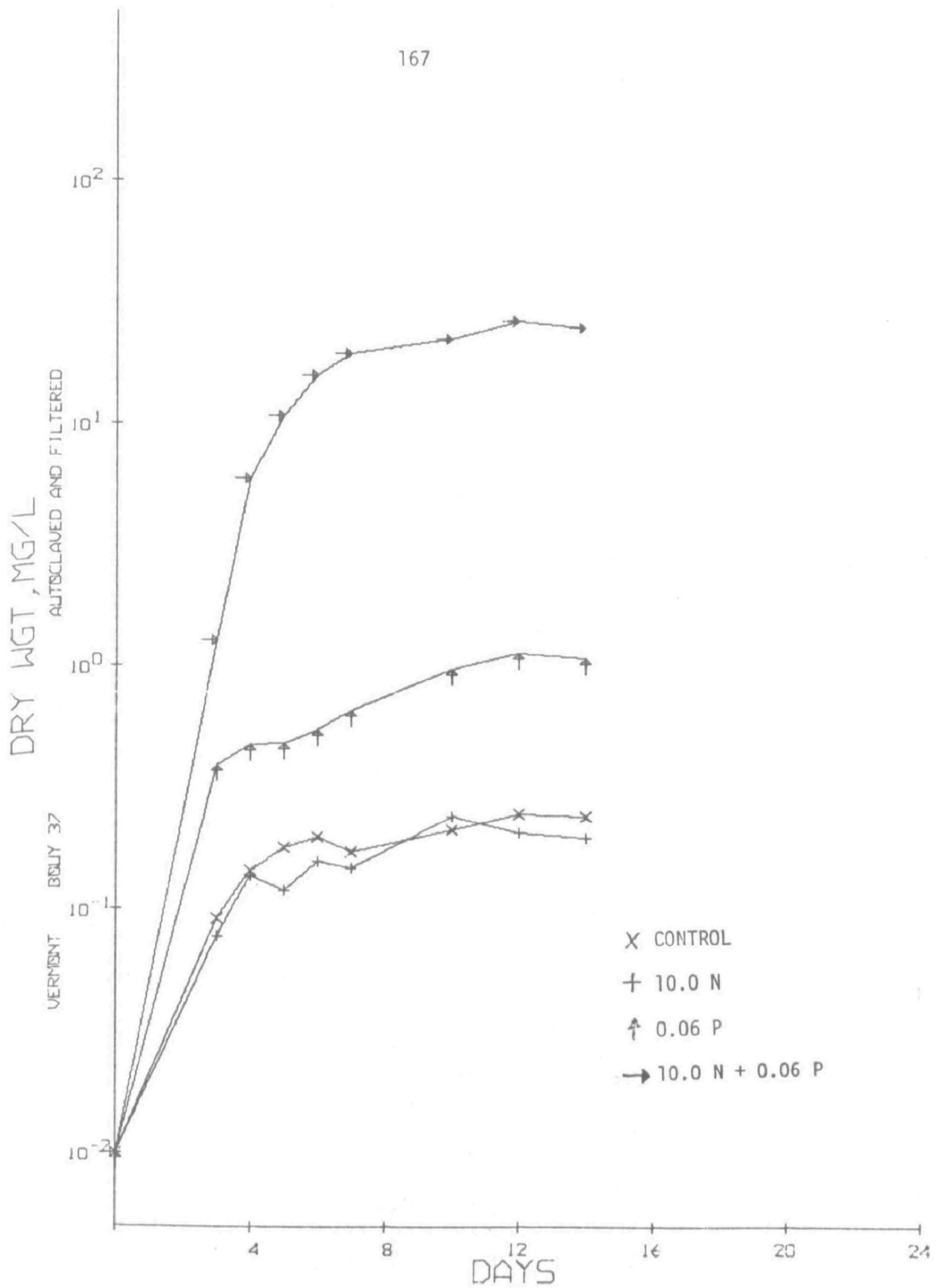


VERMONT - BEAK ALGAL ASSAY CHEMISTRY

Station Buoy 37

Autoclaved - Filtered

236.	UMHO CCNDUCT	
20.	MG/L DIS IN C	
24.	MG/L T DISS C	
4.	MG/L D ORG C	
7.7	FH	
82.	MG/L ALKLINTY	
82.	MG/L HCO3 ALK	
.3	MG/L KJELNIT	X
.002	MG/L NITRITE	X
.011	MG/L NITRATE	X
.016	MG/L AMMONIA	X
.003	MG/L NO2+NO3	
.008	MG/L DIS PHOS	X
.009	MG/L ORT AS P	X
18.	MG/L SULFATE	
98.	MG/L TOT HARD	
61.	MG/L CA HARD	
32.	MG/L CALCIUM	
6.	MG/L MAGNSIUM	
6.2	MG/L SODIUM	
1.7	MG/L POTASIUM	
1.05	MG/L REACT SI	
< 25.	UG/L DISBORCN	58
2.	UG/L DISCOBLT	
7.	UG/L DISCOPFR	
52.	UG/L DIS IRON	
2.	UG/L DIS MANG	
< 10.	UG/L DISMOLYB	
6.	UG/L DIS ZINC	
2.	UG/L DIS MERC	

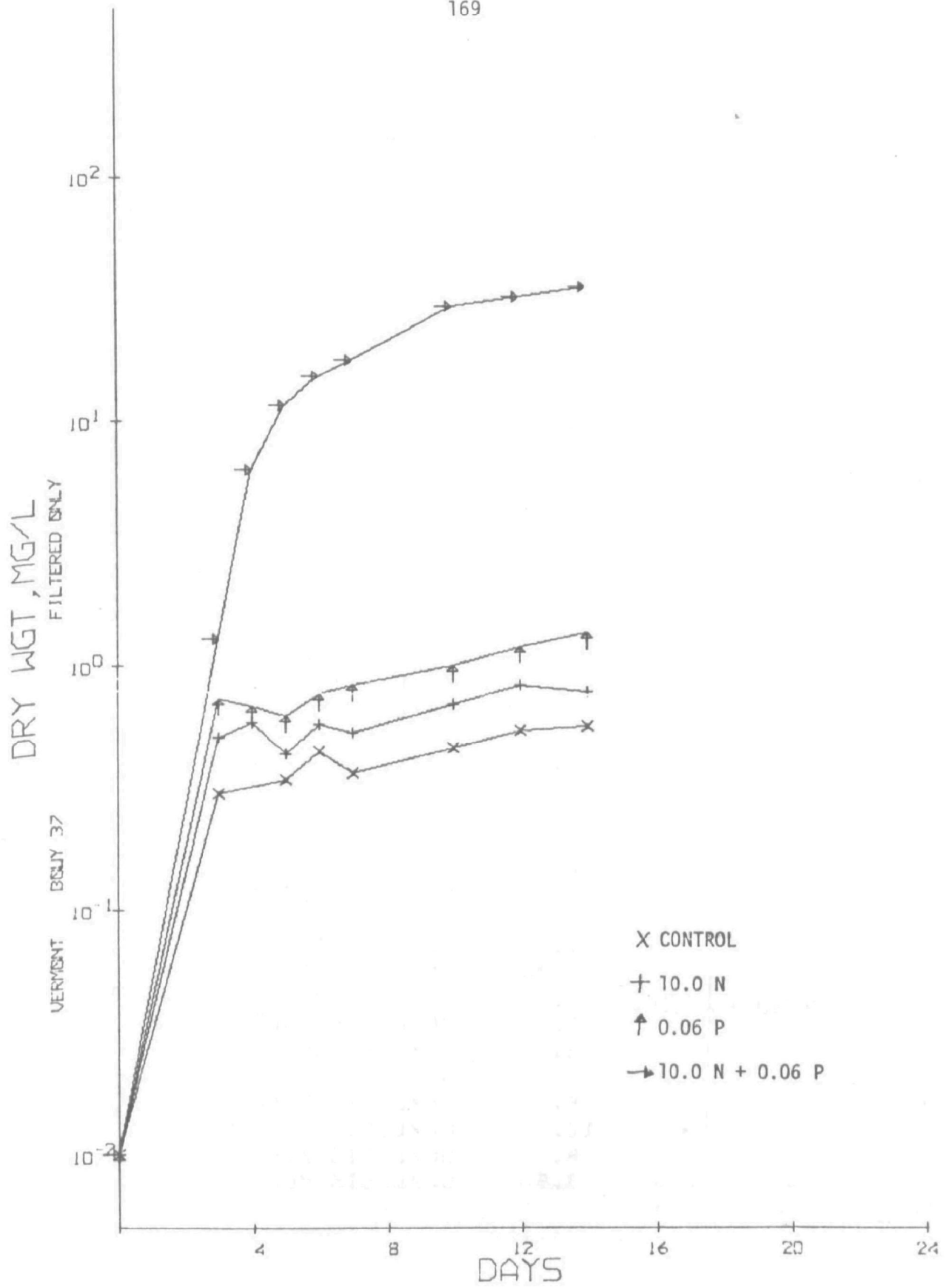


VERMONT - BEAK ALGAL ASSAY CHEMISTRY

Station Bouy 37

Filtered Only

	184.	UMHO CONDUCT	
	31.	MG/L DIS IN C	
	37.	MG/L T DISS C	
	6.	MG/L C ORG C	
	6.	FH	
	50.	MG/L ALKLINTY	
	50.	MG/L HCO3 ALK	
	.3	MG/L KJELNIT	X
	.002	MG/L NITRITE	X
	.012	MG/L NITRATE	X
	.056	MG/L AMMONIA	X
A	.008	MG/L NO2+NO3	
	.006	MG/L DIS PHOS	X
	.003	MG/L CRT AS P	X
	19.	MG/L SULFATE	
	67.	MG/L TOT HARD	
	52.	MG/L CA HARD	
	19.	MG/L CALCIUM	
	5.2	MG/L MAGNESIUM	
	5.9	MG/L SODIUM	
	1.6	MG/L POTASium	
A	.94	MG/L REACT SI	
<	25.	UG/L DISBORON	58
	2.	UG/L DISCOBLT	
	6.	UG/L DISCOPPR	
	21.	UG/L DIS IRCN	
	3.	UG/L DIS MANG	
<	10.	UG/L DISMOLYB	
	10.	UG/L DIS ZINC	
	1.	UG/L DIS MERC	



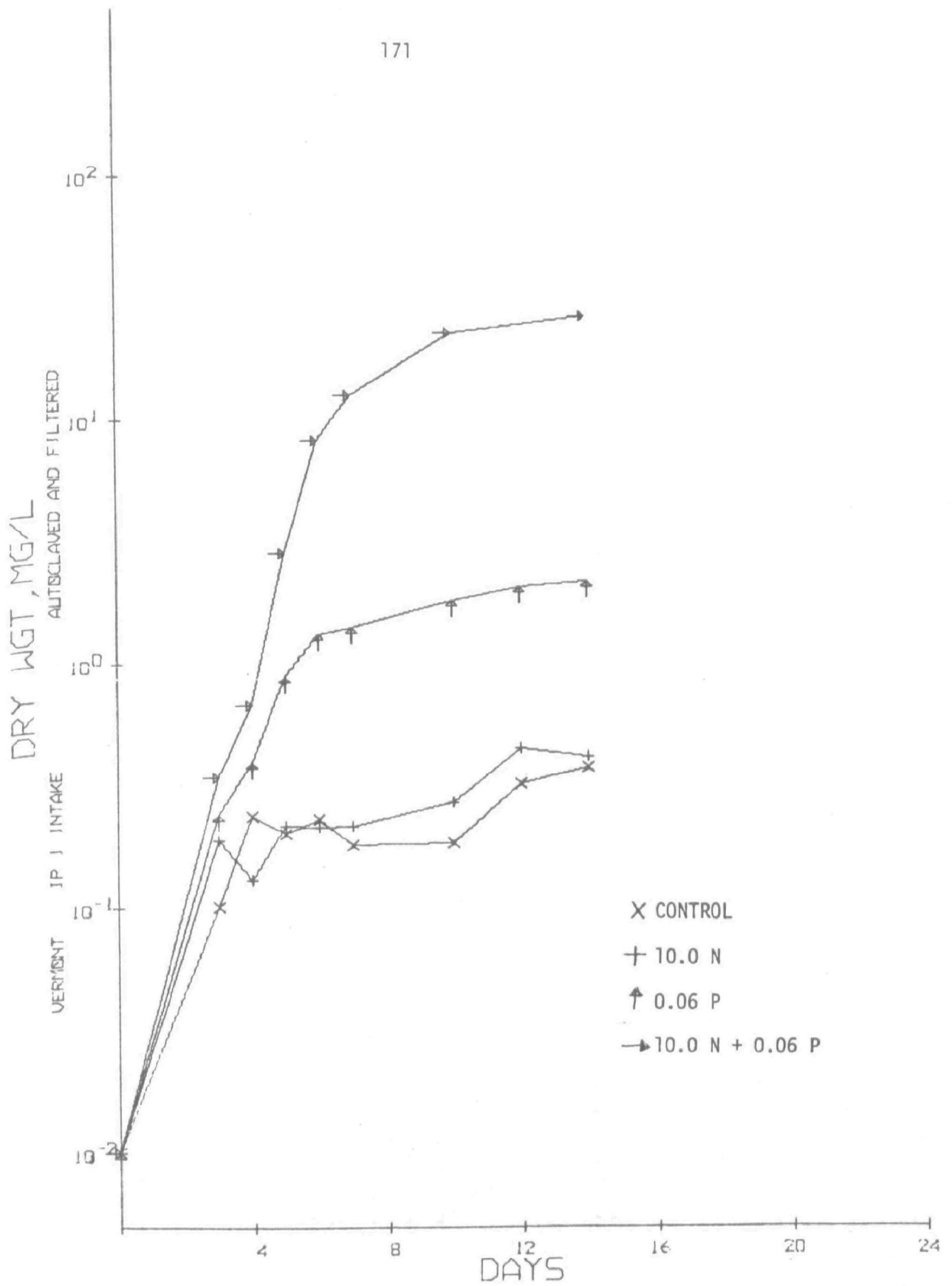
VERMONT - BEAK ALGAL ASSAY CHEMISTRY

Station IP1 (intake)

Autoclaved - Filtered

200.	UMHO	CONDUCT	
44.	MG/L	DIS IN C	
48.	MG/L	T DISS C	
4.	MC/L	D ORG C	
5.8		PH	
55.	MG/L	ALKLINTY	
55.	MG/L	HCO3 ALK	
.4	MG/L	KJELNIT	X
.003	MG/L	NITRITE	X
.078	MG/L	NITRATE	X
.005	MG/L	AMMONIA	X
.079	MG/L	NO2+NO3	
.011	MG/L	DIS PHOS	X
.002	MG/L	CRT AS P	X
19.	MG/L	SULFATE	
76.	MG/L	TCT HARD	
60.	MG/L	CA HARD	
22.	MG/L	CALCIUM	
5.2	MG/L	MAGNSIUM	
6.1	MG/L	SODIUM	
1.4	MG/L	POTASIUM	
.74	MG/L	REACT SI	
25.	UG/L	DISBORON	
2.	UG/L	DISCOBLT	
8.	UG/L	DISCOPFR	
23.	UG/L	DIS IRON	
5.	UG/L	DIS MANG	
10.	UG/L	DISMOLYB	
6.	UG/L	DIS ZINC	
3.5	UG/L	DIS MERC	

58

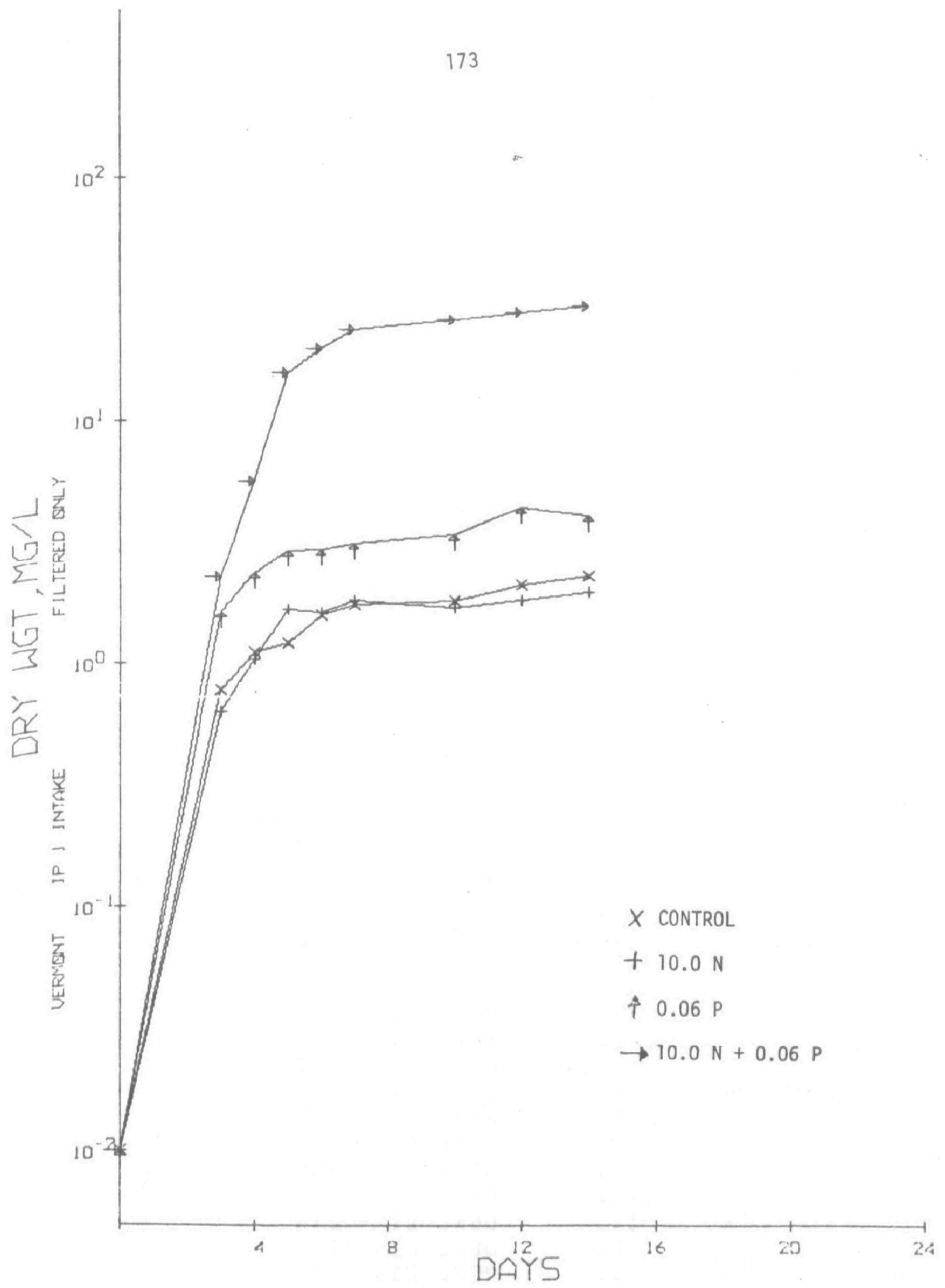


VERMONT - BEAK ALGAL ASSAY CHEMISTRY

Station IP1 (intake)

Filtered Only

	194.	UMHO	CONDUCT	
	12.	MG/L	DIS IN C	
	17.	MG/L	T DISS C	
	5.	MG/L	D ORG C	
	7.7		FH	
	59.	MG/L	ALKLINTY	
	59.	MG/L	HCO3 ALK	
	.3	MG/L	KJELNIT	X
	.002	MG/L	NITRITE	X
	.026	MG/L	NITRATE	X
	.021	MG/L	AMMONIA	X
A	.026	MG/L	NO2+NO3	
	.004	MG/L	DIS PHOS	X
	.002	MG/L	ORT AS P	X
	19.	MG/L	SULFATE	
	76.	MG/L	TOT HARD	
	57.	MG/L	CA HARD	
	23.	MG/L	CALCIUM	
	5.	MG/L	MAGNSIUM	
	5.4	MG/L	SODIUM	
	1.1	MG/L	POTASIUM	
	.12	MG/L	REACT SI	
<	25.	UG/L	DISBORON	59
	2.	UG/L	DISCORLT	
	5.	UG/L	DISCOPPR	
	30.	UG/L	DIS IRON	
	4.	UG/L	DIS MANG	
<	10.	UG/L	DISMOLYB	
	5.	UG/L	DIS ZINC	
	1.	UG/L	DIS MERC	

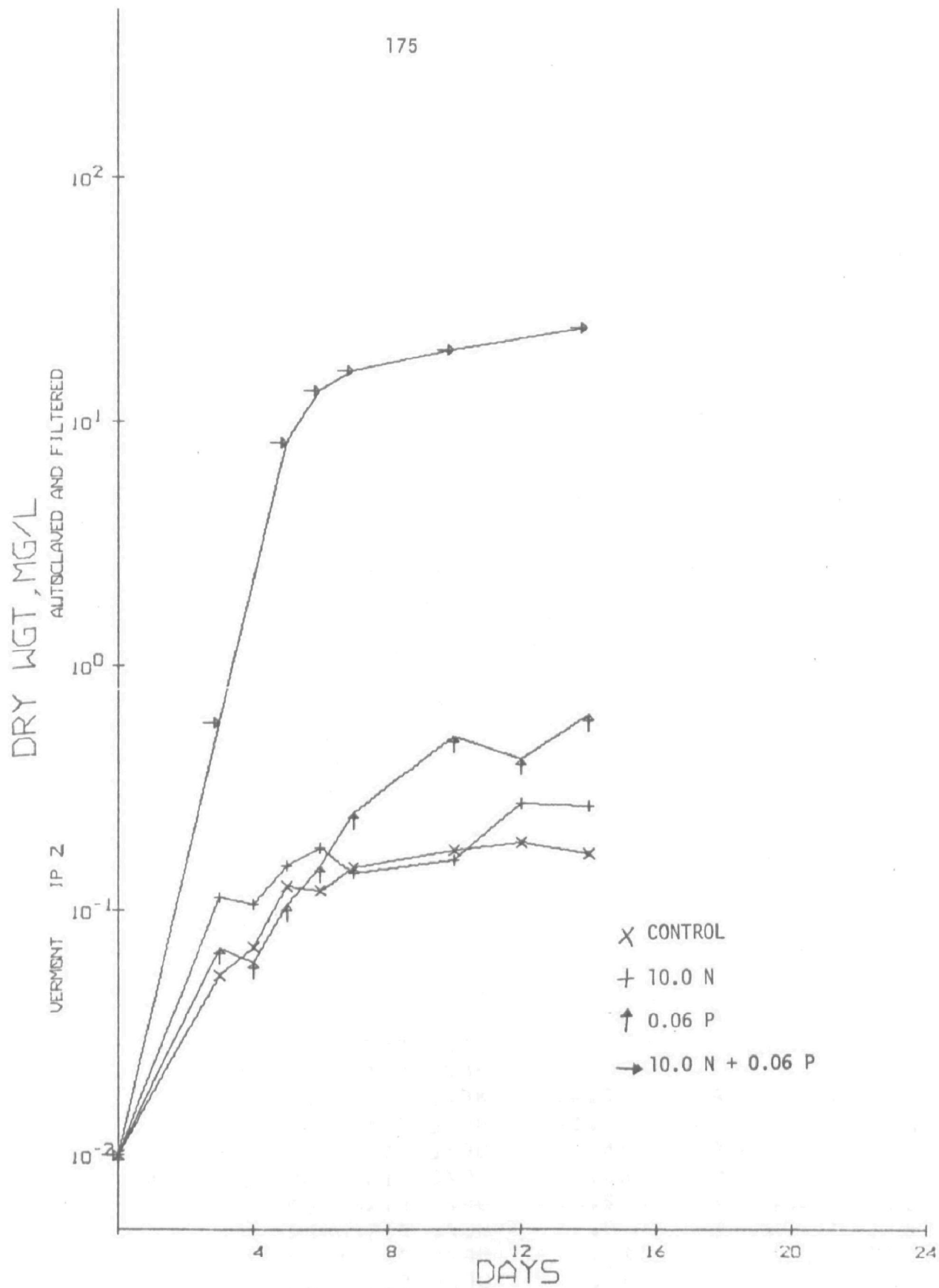


VERMONT - BEAK ALGAL ASSAY CHEMISTRY

Station IP2 (effluent)

Autoclaved - Filtered

	630.	UMHO CCNDOCT	
<	1.	MG/L CIS IN C	
	17.	MG/L T DISS C	
	17.	MG/L C ORG C	
	6.9	PH	
	6.	MG/L ALKLINTY	
	6.	MG/L HCO3 ALK	
	2.5	MG/L KJELNIT	X
	.004	MG/L NITRITE	X
	.006	MG/L NITRATE	X
	.72	MG/L AMMCNIA	X
A	.006	MG/L NO2+NO3	
	.062	MG/L CIS PHOS	X
	.044	MG/L ORT AS P	X
	142.	MG/L SULFATE	
	120.	MG/L TOT HARD	
	90.	MG/L CA HARD	
	42.	MG/L CALCIUM	
	3.4	MG/L MAGNSIUM	
	70.	MG/L SODIUM	
	2.7	MG/L POTASIUM	
	.34	MG/L REACT SI	
<	25.	UG/L DISBORON	59
	3.	UG/L DISCOBLT	
	7.	UG/L DISCOPPR	
	61.	UG/L DIS IRCN	
	245.	UG/L DIS MANG	
<	10.	UG/L DISMOLYB	
	7.	UG/L DIS ZINC	
A	1.	UG/L DIS MERC	

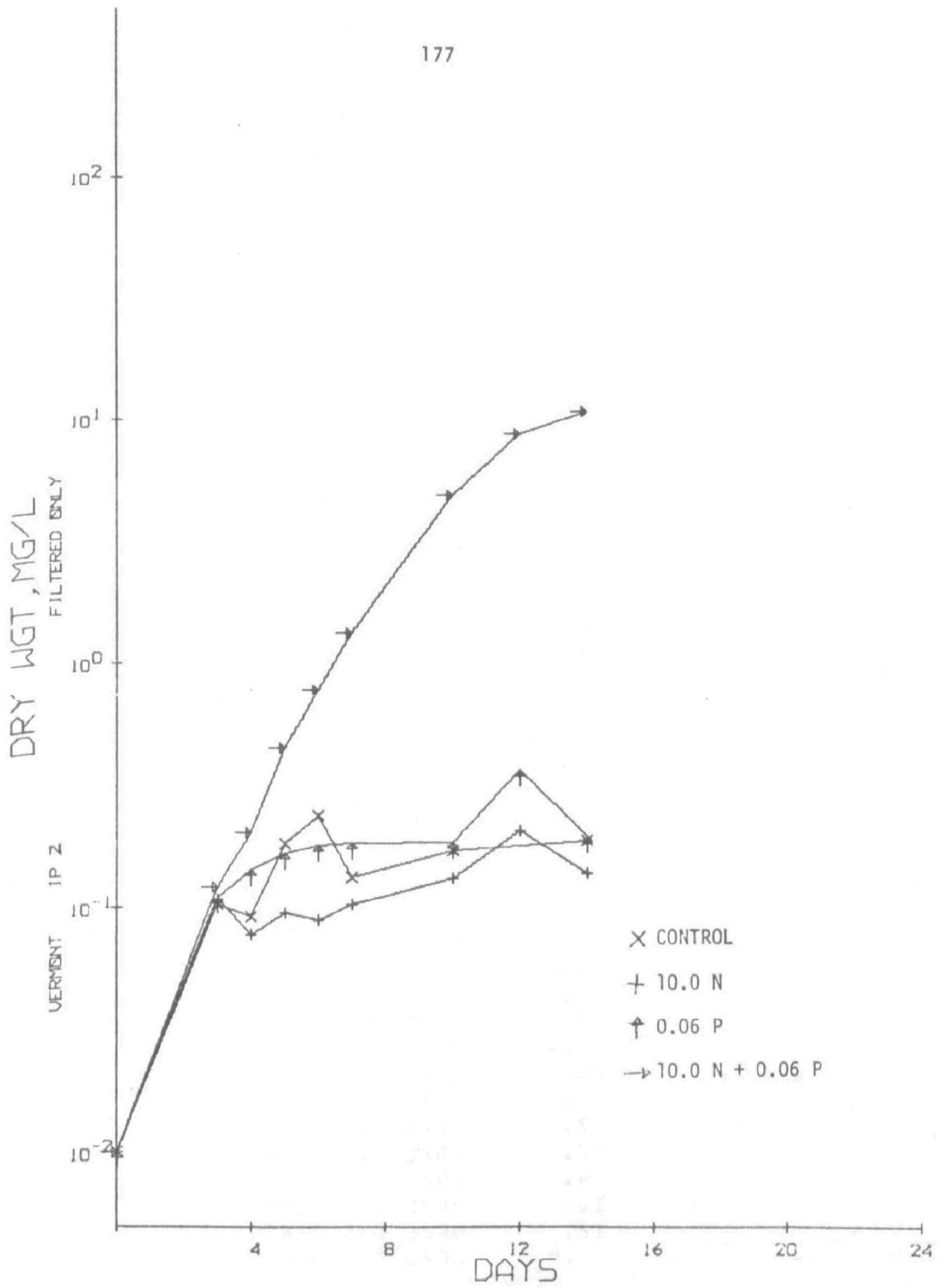


VERMONT - BEAK ALGAL ASSAY CHEMISTRY

Station IP2 (effluent)

Filtered Only

A	599.	UMHO CONDUCT		
	2.	MG/L DIS IN C		
	16.	MG/L T DISS C		
	14.	MG/L D ORG C		
	6.4	PH		
	3.	MG/L ALKLINTY		
	3.	MG/L HCO3 ALK		
	2.4	MG/L KJELNIT	X	
	.002	MG/L NITRITE	X	
	.005	MG/L NITRATE	X	
	.77	MG/L AMMONIA	X	
A	.005	MG/L NO2+NO3		
	.021	MG/L DIS PHOS	X	
	.01	MG/L CRT AS P	X	
	106.	MG/L SULFATE		
	99.	MG/L TCT HARD		
	90.	MG/L CA HARD		
A	40.	MG/L CALCIUM		
	3.	MG/L MAGNESIUM	3	
	3.	MG/L MAGNESIUM	3	
A	3.	MG/L MAGNESIUM		
	70.	MG/L SODIUM	3	
	70.	MG/L SODIUM	3	
A	70.	MG/L SODIUM		
	2.9	MG/L POTASium	3	
	2.4	MG/L POTASium	3	
A	2.45	MG/L POTASium		
	.19	MG/L REACT SI		
<	25.	UG/L DISBORON	3	58
<	25.	UG/L DISBORON	3	58
A	2.	UG/L DISCOBLT		
A	9.	UG/L DISCOPPR		
A	114.	UG/L DIS IRON		
	245.	UG/L DIS MANG		
<	10.	UG/L DISMOLYB		
A	23.	UG/L DIS ZINC		
	INSUF. SAMPL	MG/L DIS MERC	I	

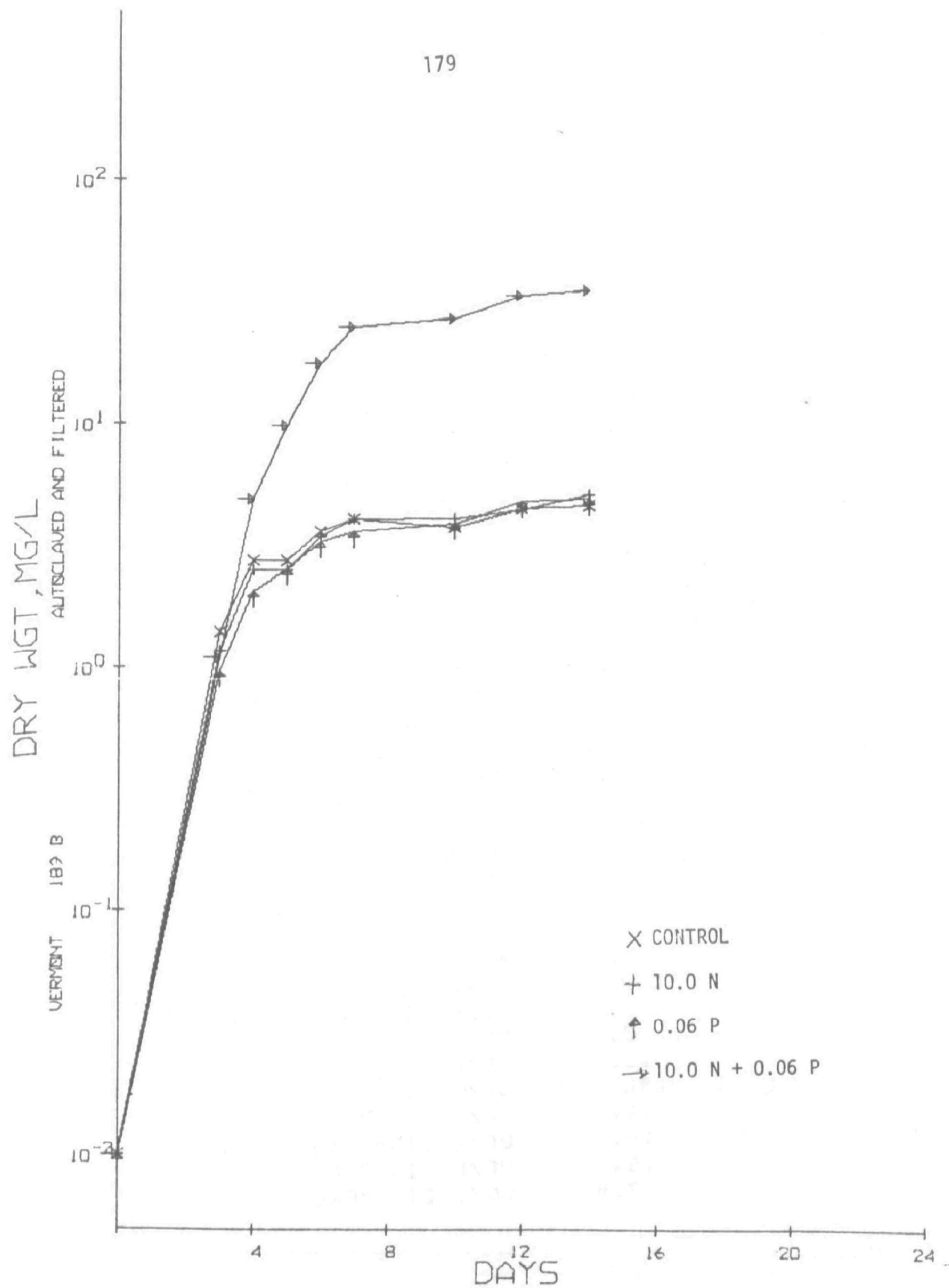


VERMONT - BEAK ALGAL ASSAY CHEMISTRY

Station 189B

Autoclaved - Filtered

	289.	UMHO CONDUCT	
	22.	MG/L DIS IN C	
	28.	MG/L T DISS C	
	6.	MG/L C ORG C	
	6.5	FH	
	66.	MG/L ALKLINTY	
	66.	MG/L HCO3 ALK	
	.5	MG/L KJELNIT	X
	.006	MG/L NITRITE	X
	.089	MG/L NITRATE	X
	.21	MG/L AMMONIA	X
A	.084	MG/L NO2+NO3	
	.022	MG/L DIS PHOS	X
	.02	MG/L CRT AS P	X
	29.	MG/L SULFATE	
	91.	MG/L TOT HARD	
	79.	MG/L CA HARD	
	32.	MG/L CALCIUM	
	4.6	MG/L MAGNESIUM	
	15.	MG/L SODIUM	U
	1.8	MG/L POTASIUM	
	.44	MG/L REACT SI	
	25.	UG/L DISBORON	58
	3.	UG/L DISCOBLT	
	7.	UG/L DISCOPPR	
	17.	UG/L DIS IRON	
	4.	UG/L DIS MANG	
<	10.	UG/L DISMOLYB	
	12.	UG/L DIS ZINC	
	.5	UG/L DIS MERC	

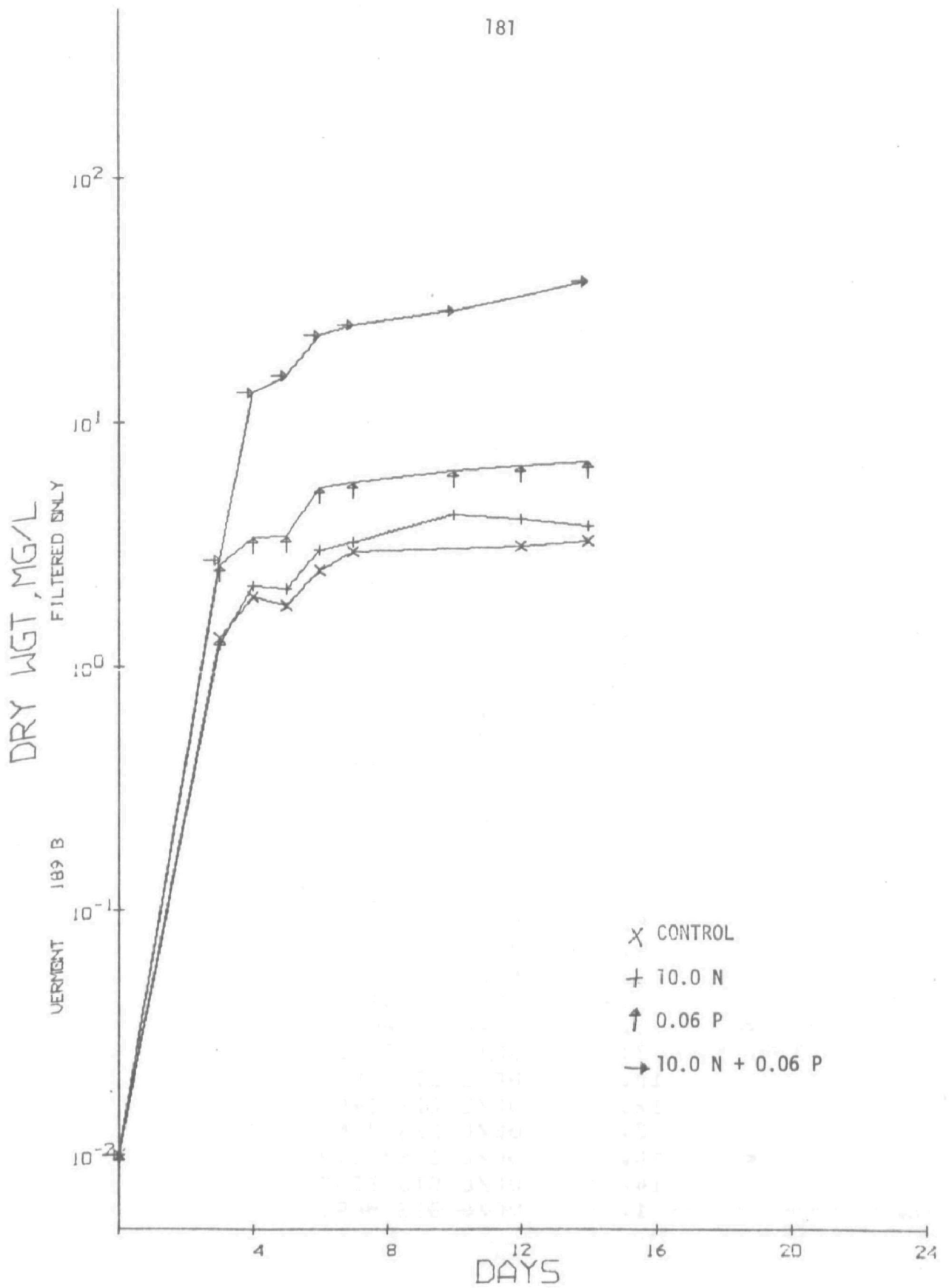


VERMONT - BEAK ALGAL ASSAY CHEMISTRY

Station 189B

Filtered Only

	284.	UMHO CONDUCT	
	18.	MG/L DIS IN C	
	24.	MG/L T DISS C	
	6.	MG/L D ORG C	
	7.5	FH	
	72.	MG/L ALKLINTY	
	72.	MG/L HCO3 ALK	
	.5	MG/L KJELNIT	X
	.007	MG/L NITRITE	X
	.089	MG/L NITRATE	X
	.2	MG/L AMMCNIA	X
A	.087	MG/L NO2+NO3	
	.013	MG/L DIS PHOS	X
	.012	MG/L CRT AS P	X
	21.	MG/L SULFATE	
	88.	MG/L TOT HARD	
	86.	MG/L CA HARD	
	31.	MG/L CALCIUM	
	5.9	MG/L MAGNSIUM	
	14.8	MG/L SODIUM	U
	1.8	MG/L POTASIUM	
	.26	MG/L REACT SI	
<	25.	UG/L DISBORON	58
	3.	UG/L DISCOBLT	
	10.	UG/L DISCOPPR	
	130.	UG/L DIS IRCN	
	31.	UG/L DIS MANG	
<	10.	UG/L DISMOLYB	
	19.	UG/L DIS ZINC	
	2.5	UG/L DIS MERC	

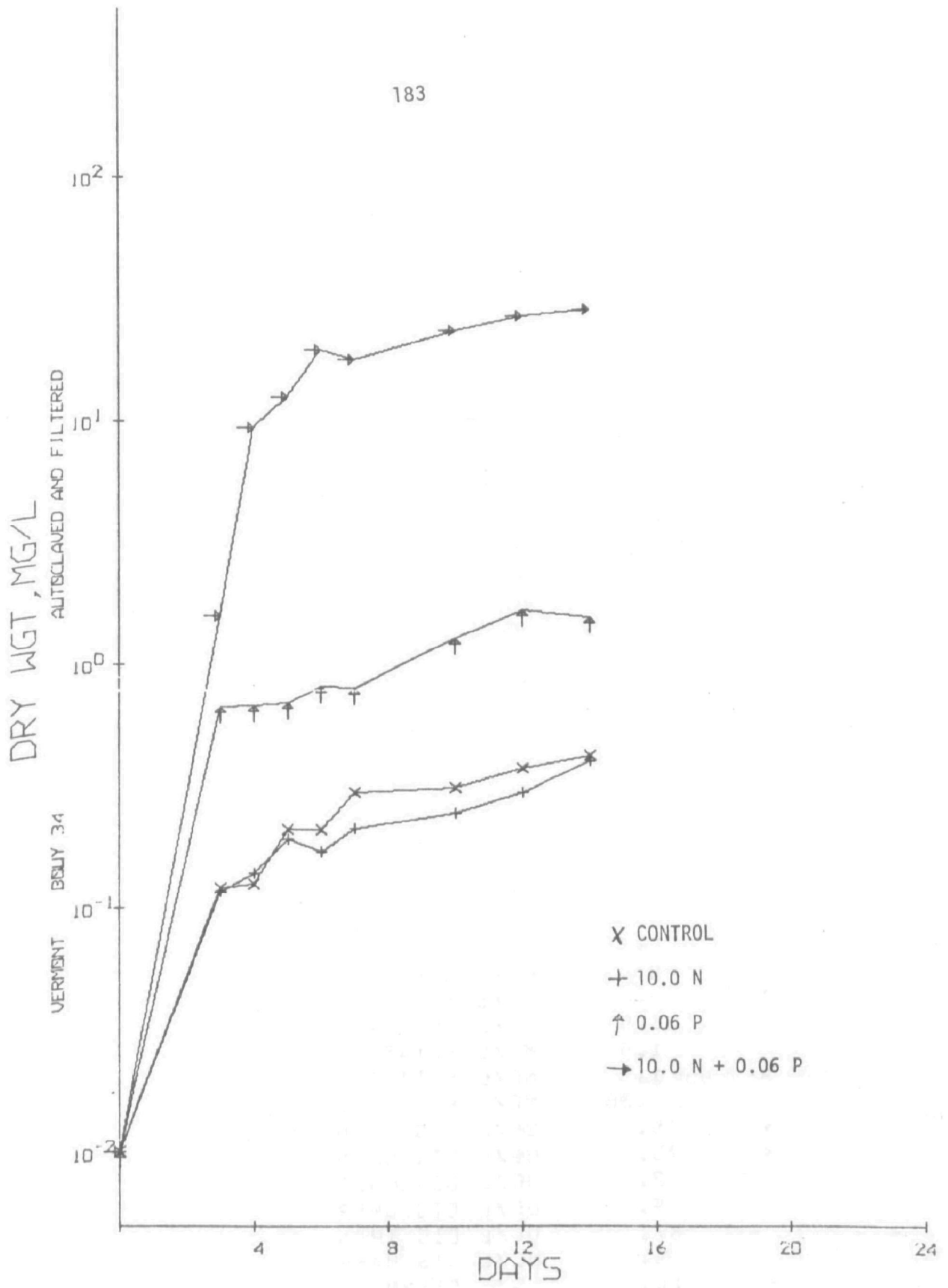


VERMONT - BEAK ALGAL ASSAY CHEMISTRY

Station Buoy 34

Autoclaved -Filtered

	247.	UMHO	CONDUCT	
	25.	MG/L	DIS IN C	
	30.	MG/L	T DISS C	
	5.	MG/L	D ORG C	
	6.4		FH	
	69.	MG/L	ALKLINTY	
	69.	MG/L	HCO3 ALK	
	.5	MG/L	KJELNIT	X
	.007	MG/L	NITRITE	X
	.096	MG/L	NITRATE	X
	.138	MG/L	AMMCNIA	X
A	.096	MG/L	NO2+NO3	
	.016	MG/L	DIS PHOS	X
	.018	MG/L	OPT AS P	X
	25.	MG/L	SULFATE	
	95.	MG/L	TOT HARD	
	77.	MG/L	CA HARD	
	31.	MG/L	CALCIUM	
	5.	MG/L	MAGNSIUM	
	9.5	MG/L	SODIUM	
	1.6	MG/L	POTASIUM	
	.97	MG/L	REACT SI	
<	25.	UG/L	DISBORCN	58
	3.	UG/L	DISCOBLT	
	10.	UG/L	DISCOPFR	
	12.	UG/L	DIS IRON	
	2.	UG/L	DIS MANG	
<	10.	UG/L	DISMOLYB	
	14.	UG/L	DIS ZINC	
	1.	UG/L	DIS MERC	

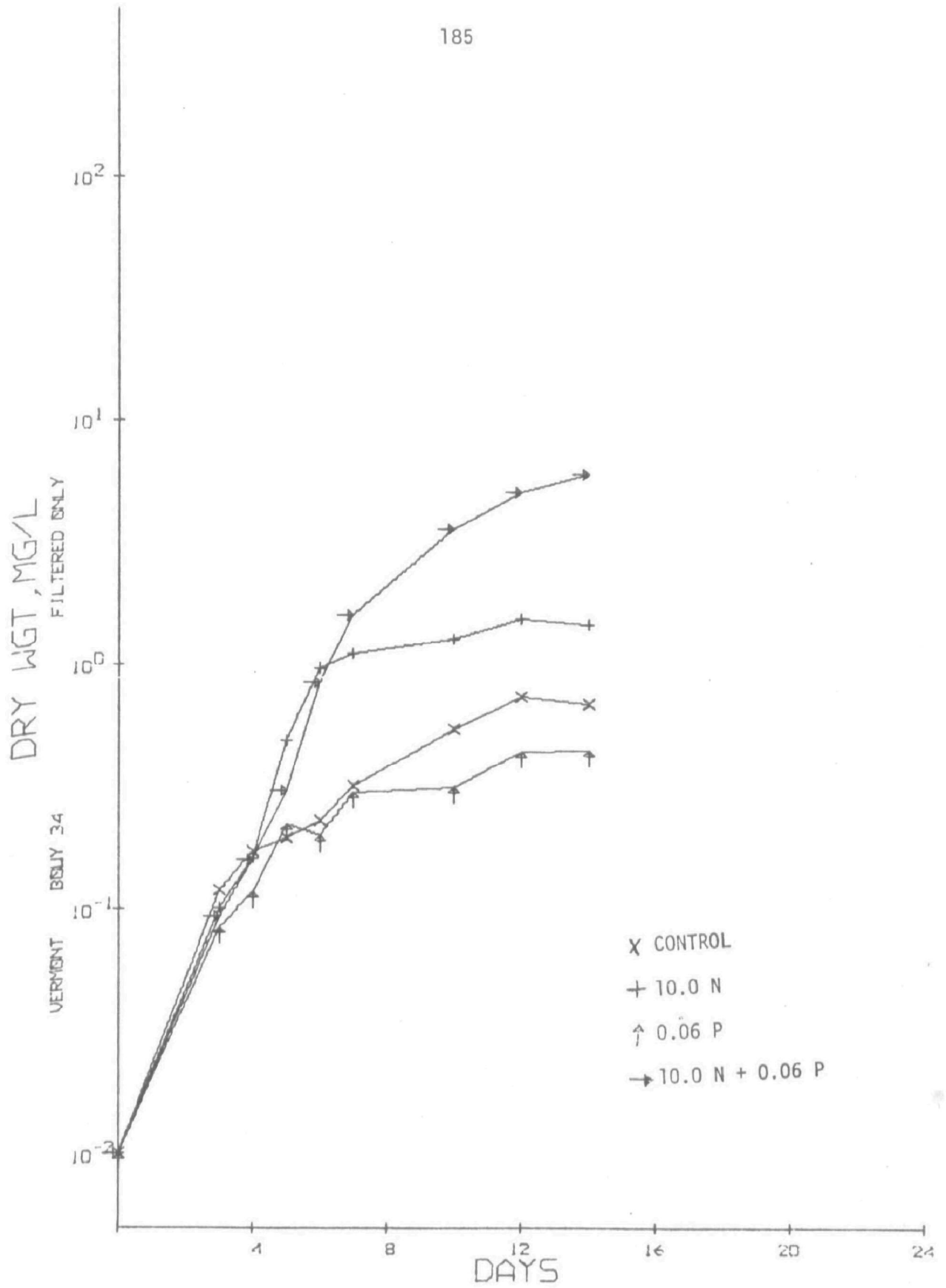


VERMONT - BEAK ALGAL ASSAY CHEMISTRY

Station Bouy 34

Filtered Only

A	257.	UMHO CCNDUCT		
	19.	MG/L DIS IN C		
	23.	MG/L T DISS C		
	7.2	PH		
	76.	MG/L ALKLINTY		
	76.	MG/L HCO3 ALK		
	.5	MG/L KJELNIT	X	
	.008	MG/L NITRITE	X	
	.087	MG/L NITRATE	X	
	.081	MG/L AMMONIA	X	
	.075	MG/L NO2+NO3		
	.009	MG/L DIS PHOS	X	
	.005	MG/L CRT AS P	X	
	27.	MG/L SULFATE		
	99.	MG/L TOT HARD		
	78.	MG/L CA HARD		
	30.	MG/L CALCIUM		
	5.9	MG/L MAGNSIUM	3	
	5.9	MG/L MAGNSIUM	3	
A	5.9	MG/L MAGNSIUM		
	9.5	MG/L SODIUM	3	
	9.5	MG/L SODIUM	3	
A	9.5	MG/L SODIUM		
	1.5	MG/L PCTASIUM	3	
	1.5	MG/L PCTASIUM	3	
A	1.5	MG/L PCTASIUM		
	.36	MG/L REACT SI		
<	25.	UG/L DISBORON	3	58
<	25.	UG/L DISBORON	3	58
	2.	UG/L DISCOBLT		
	9.	UG/L DISCOPFR		
	87.	UG/L DIS IRCN		
	9.	UG/L DIS MANG		
<	10.	UG/L DISMOLYB		
	17.	UG/L DIS ZINC		
	5.	UG/L DIS MERC		



APPENDIX E

MEMO REGARDING PRESERVATION OF SUB-SAMPLES
FOR NUTRIENT ANALYSIS

Memorandum

TO : The Record

FROM : Jack H. Gakstatter
Chief, National Eutrophication Survey Program

SUBJECT: Lake Champlain Algal Assay Samples Collected by Vermont

DATE: February 1, 1973

This memo refers only to those ten samples collected from Lake Champlain by Vermont (and T. W. Beak Consultants) September 27, 1972 and October 3, 1972. After collection the samples were frozen and sent air freight to Corvallis, Oregon arriving on October 6, 1972. Upon receipt the samples were placed in a refrigerator. On October 12 processing of the samples began, i.e. they were split into equal portions and each portion was either filtered (0.45 micron pore size) or autoclaved and then filtered. This is the point at which the improper amount of mercuric chloride preservative was added.

The question will probably arise as to why we bothered to preserve the samples anyway after they had been in a relatively unpreserved state (except for cooling which certainly retards biological activity and is an accepted preservative method for short periods) from October 6 to October 12. The reply to the question is that CLS (Consolidated Laboratory Services) provides analytical services to the entire laboratory on a first come - first serve basis. Samples submitted for analysis are not refrigerated by CLS and since there is no guarantee that the analytical work will be done immediately, it is standard procedure to preserve the samples with mercuric chloride (40 mg/l).

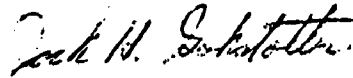
After the filtration or autoclaving-filtration, aliquots were taken from each portion of each sample to be preserved with mercuric chloride and sent to CLS for analysis. My algal assay staff inadvertently picked up the wrong container of mercuric chloride to do the preserving. The net result was that instead of preserving at a concentration of 40 mg/l mercuric chloride, each aliquot contained only 0.04 mg/l mercuric chloride which was insufficient to prevent biological activity. The improperly preserved samples were sent to CLS on October 12 and analyses did not begin until October 25.



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The question has also been raised as to why analyses were not done on the raw samples before autoclaving-filtration or filtration. At the time these samples were received, my staff indicated that there was not enough sample volume to get an analysis for each raw sample, as well as after each treatment. Faced with the choice of either analyzing before or after the autoclaving-filtration or filtration process, they chose to analyze after the treatments but before the samples were set up for the algal assay so that the chemistry in the water just prior to the assay would be known.



Jack H. Gakstatter

cc: Allyn Hemenway, Region I

APPENDIX F
MUNICIPAL SEWAGE TREATMENT PLANT
and
INTERNATIONAL PAPER CO. EFFLUENT DATA

Phosphate Concentrations and Flow Rates
for the
International Paper Company Mill Effluent During 1972-73
Data Provided by the New York Department of Environmental Conservation

<u>Month & Year</u>	<u>Effluent Flow (mgd)</u>	<u>Phosphate Conc. (mg/l as PO₄)</u>	<u>Total pounds Phosphorus discharged daily (as P)</u>
Jan 1972	14.8	1.7	67.9
Feb 1972	15.3	1.8	75.3
Mar 1972	16.1	2.3	100.8
Apr 1972	15.3	2.4	99.5
May 1972	17.1	1.07	48.5
June 1972	18.8	1.34	69.0
July 1972	19.7	1.3	69.0
Aug 1972	21.3	0.78	44.4
Sep 1972	17.2	2.3	107.7
Oct 1972	16.3	1.8	78.9
Nov 1972	16.4	0.8	35.6
Dec 1972	14.8	0.4	16.1
Jan 1973	15.1	0.6	25.2
Feb 1973	12.4	0.6	20.7
Mar 1973	13.4	2.0	72.6
Apr 1973	15.3	1.6	66.4
May 1973	17.9	2.0	97.1
June 1973	20.7	1.7	95.0

Average discharge equals 66 lbs P/day or 24,090 lbs P/year

STORET RETRIEVAL DATE 74/11/27

360952 PR360952 P027000
 44 42 00.0 073 27 00.0
 PLATTSBURG (CITY OF)
 36013 7.5 PLATTSBURG
 D/LAKE CHAMPLAIN
 LAKE CHAMPLAIN
 11EPALES 2141204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/01/09	11 00								
CP(T)-			0.630	24.000	3.400	2.900		6.200	7.100
73/01/09	15 00								
73/02/06	09 45								
CP(T)-			0.700	22.000	2.700	2.850	6.700	7.050	6.700
73/02/06	15 15								
73/03/02	11 00								
CP(T)-			0.260	31.000	5.600	3.500	7.650	6.700	6.300
73/03/02	16 00								
73/04/10	11 00								
CP(T)-			1.200	13.800	1.900	1.400	2.100	7.100	7.120
73/04/10	13 00								
73/05/07	11 00								
CP(T)-			0.470	24.000	3.700	3.160	7.400	6.350	6.600
73/05/07	15 00								
73/05/08									
73/06/07	11 00								
CP(T)-			0.640	15.000	0.520	1.580	3.800	6.560	
73/06/07	16 00								
73/07/05	11 00								
CP(T)-			0.480	16.000	2.500	1.470	3.200	5.100	6.200
73/07/05	15 30								
73/08/06	11 00								
CP(T)-			0.140	17.000	1.680	1.600	3.200	5.950	5.130
73/08/06	14 30								
73/09/07	08 00								
CP(T)-			0.105	15.700		1.320		4.250	5.000
73/09/07	14 00								
73/10/01	10 30								
CP(T)-			0.110	25.100	11.600	3.150	5.900	6.000	5.000
73/10/01	14 45								
73/11/02	09 00								
CP(T)-			14.400	3.500	0.150	2.600	3.300		
73/11/02	13 00								
73/12/05	11 30								
CP(T)-			0.060	15.000	0.277	0.740	2.650	12.000	12.000
73/12/05	15 30								

STORET RETRIEVAL DATE 74/11/27

360952 PR360952 P027000
 44 42 00.0 073 27 00.0
 PLATTSBURG (CITY OF)
 36013 7.5 PLATTSBURG
 D/LAKE CHAMPLAIN
 LAKE CHAMPLAIN
 11EPALES 2141204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
74/01/03	11 00								
CP(T)-			0.480	15.500	0.750	0.800	1.500	16.000	16.000
74/01/03	16 00								

STORET RETRIEVAL DATE 74/12/27

500151 PWS00151 P021500
 44 29 00.0 073 13 30.0
 HURLINGTON MAIN
 50 7.5 HURLINGTON
 O/LAKE CHAMPLAIN
 LAKE CHAMPLAIN
 11EPALES 2141204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 N-NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
72/11/29	08 00								
CP(T)-			0.760	21.000	1.470	2.000	2.650	3.010	3.000
72/11/29	16 00								
72/12/29	08 00								
CP(T)-			0.490	26.000	4.000	3.800	8.475	3.200	3.000
72/12/29	16 00								
73/01/31	08 00								
CP(T)-			0.880	22.000	5.600	2.600	4.300	3.000	3.450
73/01/31	15 00								
73/03/02	08 00								
CP(T)-			0.760	27.000	8.350	3.500	7.200	3.000	3.000
73/03/02	16 00								
73/03/30	08 00								
CP(T)-			3.300	21.000	3.300	3.500	7.500	3.000	3.400
73/03/30	16 00								
73/04/30	08 00								
CP(T)-			0.590	24.000	3.900	3.100	8.250	3.000	3.000
73/04/30	16 00								
73/05/04	08 00								
CP(T)-			1.200	17.000	1.260	1.700	2.800	3.500	3.000
73/05/04	16 00								
73/07/02	08 00								
CP(T)-			0.430	14.000	1.000	1.890	4.800	3.000	3.000
73/07/02	16 00								
73/07/31	08 00								
CP(T)-			0.170	17.600	3.200	1.380		3.000	3.000
73/07/31	16 00								
73/08/31	08 00								
CP(T)-						2.020	2.400	2.990	3.150
73/08/31	16 00								
73/09/30	08 00								
CP(T)-			3.400	15.000	2.800	4.100	4.800	2.860	3.100
73/09/30	16 00								
73/10/31	08 00								
CP(T)-			0.230	13.500	3.300	3.400	4.200	3.490	3.310
73/10/31	16 00								

STORET RETRIEVAL DATE 74/12/27

5001S4 455001S4 P000900
 44 27 30.0 073 13 30.0
 SOUTH HURLINGTON HARTLETS RAY RD
 50 7.5 RUPLINGTON
 D/LAKE CHAMPLAIN
 LAKE CHAMPLAIN
 11EPALES 2141204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00530 NO24NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
72/11/28	09 00								
CP(T)-			2.270	1.200	0.090	4.287		0.450	0.450
72/11/28	16 00								
72/12/28	09 00								
CP(T)-			6.300	2.180	0.078	6.300	6.700	0.480	0.450
72/12/28	16 00								
73/01/25	08 00								
CP(T)-			5.560	1.700	0.140	3.300	3.500	0.600	0.550
73/01/25	12 00								
73/02/21	08 00								
CP(T)-			0.320	3.400	0.330	7.560	7.700	0.490	0.520
73/02/21	14 00								
73/03/23	08 00								
CP(T)-			6.800	0.600	0.042	3.700	3.750	0.624	0.600
73/03/23	16 00								
73/05/07	08 00								
CP(T)-			6.500	1.100	0.125	5.600	5.900	0.520	0.600
73/05/07	16 00								
73/05/23	08 00								
CP(T)-			4.900	11.300	0.145	1.800	2.000	0.740	0.600
73/05/23	16 00								
73/06/25	08 00								
CP(T)-			12.000	0.950	0.057	4.000	4.000	0.550	0.600
73/06/25	15 00								
73/08/24	08 00								
CP(T)-			7.600	0.390	0.006		5.500	0.410	0.500
73/08/24	16 00								
73/10/11	08 00								
CP(T)-			11.200	1.850	0.110	7.100	7.200	0.400	0.500
73/10/11	16 00								
73/10/29	08 00								
CP(T)-			11.200	0.700	0.082	7.000	7.200	0.400	0.410
73/10/29	16 00								
73/12/03	08 00								
CP(T)-			9.800	0.500	0.058	5.100	5.200	0.440	0.450
73/12/03	16 00								

STORET RETRIEVAL DATE 74/12/27

500159 PMS00159 P005350
 44 29 00.0 073 06 30.0
 ESSEX JCT
 50 15 BURLINGTON
 T/LAKE CHAMPLAIN
 WINDOOSKI RIVER
 ILEPALES
 4 2141204
 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2AN03 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
72/11/24	11 00								
CP(T)-			0.250	43.000	2.700	1.160	4.000	0.350	0.500
72/11/24	16 00								
72/12/29	11 00								
CP(T)-			0.630	41.000	10.500	3.900	4.500	0.360	0.400
72/12/29	16 00								
73/01/26	10 00								
CP(T)-			1.500	37.000	11.650	3.950	7.400	0.372	0.424
73/01/26	15 00								
73/02/23	11 00								
CP(T)-			0.620	36.000	14.400	6.100	10.500	0.550	0.513
73/02/23	15 00								
73/03/30	10 00								
CP(T)-			1.400	30.500	8.700	4.100	8.000	0.650	0.650
73/03/30	15 00								
73/04/27	10 00								
CP(T)-			1.200	28.500	9.950	3.950	7.500	0.650	0.650
73/04/27	15 00								
73/05/25	11 00								
CP(T)-			1.470	23.000	8.350	3.200	6.200	0.650	0.650
73/05/25	15 00								
73/06/29	10 00								
CP(T)-			0.620	22.000	8.600	3.100	6.000	0.930	0.923
73/06/29	15 00								
73/07/27	10 00								
CP(T)-			0.630	23.100	8.400	1.400	6.000	0.750	0.300
73/07/27	15 00								
73/08/31	11 00								
CP(T)-				33.600		3.620	6.400	0.750	0.750
73/08/31	15 00								
73/09/28	10 00								
CP(T)-			0.400	26.000	14.700	3.990	7.350	0.750	0.750
73/09/28	14 00								
73/10/29	10 00								
CP(T)-			0.310	34.000	14.000	4.400	6.900	0.750	0.750
73/10/29	14 00								

STORET RETRIEVAL DATE 74/12/27

5001T1 AS5001T1 P004000
 44 29 00.0 073 06 00.0
 ESSEX JCT IHM
 50 15 HURLINGTON
 T/LAKE CHAMPLAIN
 WINOOSKI RIVER
 11EPALES
 2141204
 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
72/12/05	00 00								
CP(T)-			19.000	29.400	28.000	0.198	0.242		0.730
72/12/05	24 00								
73/01/09	00 00								
CP(T)-			18.700	24.000	23.700	0.022	0.250	0.484	0.699
73/01/10	24 00								
73/01/30	11 00								
CP(T)-			0.800	35.700	6.100	3.900	7.900	0.622	0.670
73/01/30	16 00								
73/02/13	08 00								
CP(T)-			19.200	31.100	31.020	0.115	0.172	1.040	0.680
73/02/14	08 00								
73/03/06	08 00								
CP(T)-			17.200	28.000	22.500	0.140	0.400	0.938	0.947
73/03/07	08 00								
73/04/10	08 00								
CP(T)-			21.800	31.000	9.900	0.120	0.190	0.825	0.763
73/04/11	08 00								
73/05/15	08 00								
CP(T)-			20.400	37.800	34.400	0.040	0.170	0.808	0.874
73/05/16	08 00								
73/06/12	08 00								
CP(T)-			14.000	28.700	28.500			0.911	0.868
73/06/13	08 00								
73/07/17	12 00								
CP(T)-			14.400	23.500	20.650	0.230	0.382	1.000	0.981
73/07/18	12 00								
73/08/14	08 00								
CP(T)-			9.900	26.500	25.000	0.058	0.095	0.950	0.900
73/08/15	08 00								
73/09/18	08 00								
CP(T)-			23.000	19.020	17.650	0.170	0.190	0.610	0.933
73/09/19	08 00								
73/10/16	00 00								
CP(T)-			17.800	26.000	5.500	0.140	0.600	0.803	0.814
73/10/16	24 00								

STORET RETRIEVAL DATE 74/12/27

5001T1 AS5001T1 P004000
 44 29 00.0 073 06 00.0
 ESSEX JCT ILM
 50 15 HURLINGTON
 T/LAKE CHAMPLAIN
 WINDUSKI RIVER
 11EPALES 2141204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2AN03 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST-MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/11/27 08 00									
CP(T)-				19.200			0.709	0.814	0.535
73/11/29 08 00									

STORET RETRIEVAL DATE 74/12/27

5001S3 AS5001S3 P009000
 44 29 30.0 073 11 00.0
 BURLINGTON RIVERSIDE
 50 7.5 BURLINGTON
 T/LAKE CHAMPLAIN
 WINOOSKI RIVER
 11EPALES
 4 2141204
 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00525 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
72/11/29	08 00								
CP(T)-			9.540	23.000	4.300	2.150		0.510	0.500
72/11/29	16 00								
72/12/29	08 00								
CP(T)-			0.800	11.750	5.700	3.300	3.500	0.400	
72/12/29	16 00								
73/02/01			8.640	40.000	2.600	1.580	4.100		
73/02/28	09 30		12.000	5.600	3.200	6.275		0.730	0.570
73/03/29	10 00		13.200	2.730	0.790	3.500	3.850	0.550	0.500
73/05/01	08 00								
CP(T)-			6.900	3.800	2.000	2.700	3.150	0.709	0.700
73/05/01	16 00								
73/05/29	08 00								
CP(T)-			8.400	2.700	1.370	2.100	2.400	0.658	
73/05/29	16 00								
73/06/30	10 00								
CP(T)-			5.300	1.680	0.380		1.175	1.010	
73/06/30	16 00								
73/07/30	08 00								
CP(T)-								0.819	0.799
73/07/30	12 00								
73/08/31	08 00								
CP(T)-				1.260	0.115	2.080	2.300	0.894	0.756
73/08/31	16 00								
73/09/30	00 00		12.400	3.800	1.900	3.735	6.200	0.756	1.000
73/12/31	09 00		12.600	0.500K	0.170	4.000	4.200	1.130	1.000

K VALUE KNOWN TO BE
 LESS THAN INDICATED

STORET RETRIEVAL DATE 74/12/27

500156 AS500156 P002000
 44 32 30.0 072 09 00.0
 COLCHESTER
 50 1-250000 LK CHAM
 T/LAKE CHAMPLAIN
 WINUOSKI RIVER
 11EPALES
 4 2141204
 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
72/12/01	09 00								
CP(T)-			0.960	11.000	2.900	2.475	3.250	0.162	0.158
72/12/01	18 00								
73/01/05	08 00								
CP(T)-			5.100	2.100	0.120	3.150	3.600	0.123	0.138
73/01/05	18 00								
73/02/05	08 00								
CP(T)-			0.140	15.400	7.700	4.400	5.300	0.210	0.166
73/02/05	18 00								
73/03/05	08 00								
CP(T)-			0.185	11.000	8.200	2.350	2.350	0.192	0.185
73/03/05	18 00								
73/04/01	08 00								
CP(T)-			0.070	9.500	5.400	2.700	2.900	0.172	0.158
73/04/01	18 00								
73/05/06	08 00								
CP(T)-			0.230	6.100	2.700	2.800	2.900	0.200	0.149
73/05/06	18 00								
73/06/03	08 00								
CP(T)-			0.135	3.500		2.700	2.900	0.153	0.169
73/06/03	18 00								
73/07/04	08 00								
CP(T)-			0.210	5.100	1.050	0.230	0.490	0.218	0.196
73/07/04	18 00								
73/08/04	08 00								
CP(T)-			0.160	5.800	0.260	2.840	3.400	0.197	0.195
73/08/04	18 00								
73/09/01	08 00								
CP(T)-			0.190	3.300	0.240	2.660		0.163	0.174
73/09/01	18 00								
73/09/30	08 00								
CP(T)-			0.210	10.000	4.000	3.300	3.900	0.217	0.221
73/09/30	18 00								
73/11/01	08 00								
CP(T)-			0.230	20.000	7.100	8.000	9.600	0.211	0.197
73/11/01	18 00								

STORET RETRIEVAL DATE 74/12/27

500156 AS500156 P002000
 44 32 30.0 072 09 00.0
 COLCHESTER
 50 1-250000 LK CHAM
 T/LAKE CHAMPLAIN
 WIIHOOSKI RIVER
 11EPALES 2141204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
74/01/12	08 00								
CP(T)-			0.040		0.200	2.400	3.725	0.166	0.181
74/01/12	18 00								

STORET RETRIEVAL DATE 74/12/27

500152 44 31 30.0 073 16 00.0
 HURLINGTON NORTH END
 50 7.5 HURLINGTON
 T/LAKE CHAMPLAIN
 WINDOSKI RIVER
 11EPALES
 4

PR500152 P007000
 2141204
 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO ₃ PAN N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH ₃ -N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
72/12/01	08 00								
CP(T)-			0.420	26.000	16.000	4.675		1.100	1.050
72/12/01	15 00								
72/12/29	08 00								
CP(T)-			0.410	30.000	11.800	4.300	9.350	1.100	1.130
72/12/29	15 00								
73/02/27	09 00		0.430	24.000	10.800	4.100	6.600	1.170	1.330
73/03/30	08 00								
CP(T)-				24.000	8.100	3.942	8.800	1.500	1.200
73/03/30	15 00								
73/05/02	08 00								
CP(T)-			1.580	19.800	4.400	2.000	3.000	1.150	1.200
73/05/02	15 00								
73/05/30	10 30		1.580	21.000	6.300	2.200	3.300	2.000	1.700
73/07/01	09 00		2.000	5.800	0.820	0.530	1.050	1.900	1.700
73/07/30	15 00		0.200	13.000	5.300	1.800	3.750	1.500	1.500
73/08/30	11 00			1.100			5.770	1.150	1.200
73/09/28	08 00								
CP(T)-			0.050	25.700	11.600	4.900	8.400	1.200	1.300
73/09/28	16 00								

STORET RETRIEVAL DATE 74/12/27

500103 PR500103 P005600
 44 29 30.0 073 09 30.0
 SOUTH HURLINGTON AIRPORT PKWY
 50 7.5 HURLINGTON
 T/LAKE CHAMPLAIN
 WINOOSKI RIVER
 11EPALES
 4 2141204
 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/01/10	08 00								
CP(T)-			0.010K	33.300	28.700	6.800	6.820	0.680	0.700
73/01/10	16 00								
73/02/07	08 00								
CP(T)-			0.620	28.000	10.400	4.100	7.800	0.730	0.750
73/02/07	16 00								
73/03/08	08 00								
CP(T)-			0.750	26.000	10.000	3.400	6.000	0.760	0.680
73/03/08	16 00								
73/04/08	08 00								
CP(T)-			1.470	20.500	5.700	2.300	4.400	1.060	0.820
73/04/08	16 00								
73/05/02	08 00								
CP(T)-			0.575	33.600	12.000	4.000	7.600	0.750	0.850
73/05/02	16 00								
73/06/07	08 00								
CP(T)-			0.740	23.600	6.550	3.100	6.350	1.000	0.900
73/06/07	16 00								
73/07/02	08 00								
CP(T)-			0.780	16.000	3.920		5.250	1.300	0.900
73/07/02	16 00								
73/08/07	08 00								
CP(T)-			0.070	25.000	6.200	2.520	8.100	0.850	0.750
73/08/07	16 00								
73/09/05	09 00								
CP(T)-			0.132	34.500	15.200	5.200		0.780	0.800
73/09/05	16 00								
73/10/03	08 00								
CP(T)-			0.050	30.000	15.000	5.500	8.200	0.750	0.800
73/10/03	16 00								
73/11/05	08 00								
CP(T)-			0.040	31.000	16.000	5.200	8.200	0.650	0.600
73/11/05	16 00								
73/12/06	08 00								
CP(T)-			0.520	26.000	9.300	3.780	6.400	0.700	0.650
73/12/06	16 00								

STORET RETRIEVAL DATE 74/12/27

500103 PR500103 P005600
 44 29 30.0 073 09 30.0
 SOUTH BURLINGTON AIRPORT PKWY
 50 7.5 HURLINGTON
 T/LAKE CHAMPLAIN
 WINOOSKI RIVER
 11EPALES 2141204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&N03 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
74/01/07	08 00								
CD(T)-			0.680	8.600	2.400	1.560	2.400	0.850	0.900
74/01/07	16 00								

STORET RETRIEVAL DATE 74/12/27

500118 PR500118 P000600
 44 23 00.0 073 13 30.0
 SHELburnE FIRE DIST #2
 50 7.5 RURLINGTON
 I/LAKE CHAMPLAIN
 LA PLATTE RIVER
 11EPALES
 4 2141204
 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
72/11/30	08 00								
CP(T)-			1.680	24.000	0.044	2.400	4.300	0.130	0.120
72/11/30	16 00								
73/01/02	08 00								
CP(T)-			1.520	18.000	0.078	2.325	6.575	0.140	0.120
73/01/02	16 00								
73/01/31	08 00								
CP(T)-			0.670	24.000	6.000	2.800	4.600	0.120	0.130
73/01/31	16 00								
73/03/05	07 00								
CP(T)-			0.980	18.900	0.710	4.300	8.000	0.130	0.140
73/03/05	15 30								
73/04/23	08 00								
CP(T)-			0.930		5.600	4.586	9.800	0.130	0.130
73/04/23	16 00								
73/06/30	14 00		4.200	17.000	3.700	1.600	3.000	0.130	0.130
73/07/04	13 00		3.780	5.000	3.000	1.600	2.900	0.120	0.130
73/09/30	11 00		0.260	42.000	16.300	4.760	7.900	0.130	0.130
73/10/23	09 30		0.390	43.000	17.000	4.700	7.500	0.130	0.120
73/12/22	12 00		1.320	22.000	1.260	2.600	7.000	0.140	0.140
74/01/03	13 30		1.400	20.000	0.410	2.800	6.850	0.150	0.180

STORET RETRIEVAL DATE 74/12/27

500115 PR500115 P003800
 44 01 00.0 073 10 30.0
 MIDDLEBURY
 50 1/250000 LK CHAM
 T/LAKE CHAMPLAIN
 OTTER CREEK
 11EPALES 2141204
 4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO ₂ +NO ₃ N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH ₃ -N TOTAL MG/L	00671 PHOS-DIS ONTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
72/11/21			0.560	5.500	0.236	0.870	1.200		
72/12/19	07 00		0.760	15.700	1.900	1.787	3.450	0.487	0.500
CP(T)-									
72/12/19	16 00								
73/01/26	09 00		0.940	15.700	3.700	2.000	4.300	1.090	0.500
CP(T)-									
73/01/26	16 00								
73/02/27	07 00		0.410	23.000	7.700	3.200	5.900	0.525	0.500
CP(T)-									
73/02/27	17 00								
73/03/27	07 00		0.680	20.000	1.900	2.100	5.100	0.968	0.500
CP(T)-									
73/03/27	17 00								
73/04/26	07 00		0.337	25.200	6.400	3.300	7.900	0.539	0.500
CP(T)-									
73/04/26	16 30								
73/05/24	07 00		1.200	14.700	0.300	2.000	4.700	1.160	0.500
CP(T)-									
73/05/24	17 00								
73/06/25	07 00		0.240	29.000	3.700	2.500	5.500	0.414	0.500
CP(T)-									
73/06/25	17 00								
73/07/18	07 00		0.140	26.000	4.900	3.300	5.600	0.475	0.500
CP(T)-									
73/07/18	16 00								
73/08/24	06 30		0.089	22.000	7.100	3.320	5.500	0.305	0.400
CP(T)-									
73/08/24	16 30								
73/09/27	07 00		0.100	29.000	18.000	1.200	7.200	0.439	0.500
CP(T)-									
73/09/27	17 00								
73/10/24	06 30		0.070	42.000	18.000	5.500	9.500	0.400	0.500
CP(T)-									
73/10/24	16 30								
73/11/06	07 00		0.130	33.000	15.000	4.200	7.500	0.409	0.500
CP(T)-									
73/11/06	16 30								

STORET RETRIEVAL DATE 74/12/27

500155 45500155 P001715
 43 17 00.0 072 10 10.0
 CASTLETON
 50 7.5 POULTNEY
 T/LAKE CHAMPLAIN
 CASTLETON WIVEN
 11.4ALPS
 2141204
 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO24NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS OPTMO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW WATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
72/12/13	11 00								
CP(T)-			1.240	3.700	2.000	4.410	5.000	0.162	0.160
72/12/13	15 00								
73/01/29	08 00								
CP(T)-			9.830	2.100	0.179	5.488	5.535	0.110	0.135
73/01/29	15 00								
73/02/28	08 00								
CP(T)-			1.900	4.500	1.155	7.400	7.600	0.136	0.130
73/02/28	15 00								
73/03/29	08 00								
CP(T)-			0.575		1.790	5.000	5.000	0.129	0.135
73/03/29	15 00								
73/04/23	08 00								
CP(T)-			6.800	2.200	0.125	4.600	4.900	0.099	0.126
73/04/23	15 00								
73/05/29	08 00								
CP(T)-			15.200	0.600	0.375	5.400	5.800	0.082	0.096
73/05/29	15 00								
73/06/30	08 00								
CP(T)-			10.600	0.100K	0.064			0.084	0.078
73/06/30	15 00								
73/07/26	08 00								
CP(T)-			0.460	4.600	1.760	4.550	6.975	0.075	0.083
73/07/26	15 00								
73/08/27	08 00								
CP(T)-				12.600			7.300	0.083	0.074
73/08/27	15 00								
73/09/26	08 00								
CP(T)-			0.180	13.700	24.000	1.260	2.300	0.103	0.100
73/09/26	15 00								
73/10/22	08 00								
CP(T)-			0.252	4.600	0.115	3.500	3.400	0.102	0.097
73/10/22	15 00								
73/11/29	08 00								
CP(T)-			0.090	23.000	12.000	5.700	6.400	0.098	0.045
73/11/29	15 00								

K VALUE KNOWN TO BE LESS
 THAN INDICATED