COTTAGERS' SELF-HELP PROGRAM

ENRICHMENT STATUS OF LAKES IN THE SOUTHEASTERN REGION OF ONTARIO 1987

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Environment Ontario

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Water Resources Assessment Unit
Technical Support Section
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T A B L E O F C O N T E N T S

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We are especially grateful for the individuals and organizations that have provided a sampling record of 10 or more years.

The following have achieved a 10 or more year record of sampling with respect to their participation in the program:

Bass Lake Cottage Association
Baptiste Lake Association
Battersea - Loughborough Association
Pinnacle Point (Big Gull - Clarendon Lake) Assoc.
Bon Echo Provincial Park
Buck Lake Protective Association
Charleston Lake Provincial Park
Charleston Lake Ratepayers Association
Christie Lake Association
Crowe Lake Cottage Owners Association
Dalhousie Lake Association
Desert Lake Property Owners Association
Diamond Lake Cottagers Association
West Devil Lake Property Owners Association
Gananoque Lake Property Owners Association
Glanmire Lake Cottagers Association
North Shore Grippen Lake Cottage Association
Mr. R. F. Sanderson (Hay Bay)
Limerick Waterways Ratepayers Association
Little Silver Lake Property Owners Association
Mink Lake Betterment Association
Mississippi Lakes Association
Moira Cottagers for Clean Water
Muskrat Lake Improvement Association
Mr. J. O'Dette (Mosque Lake)
Mr. B. Briscoe (Olmstead Lake)
Dr. A. W. Kahn (Otter Lake)
Otty Lake Association
Pike Lake Property Owners Association
Salmon Trout Lake Cottage Association
Sharbot Lake Provincial Park
Silver Lake Protective Association
Mr. J. Arnold (Troy Lake)
White Lake Water Quality Committee

ABSTRACT

Since 1971, the Province has had the assistance of lake organizations, cottagers and other waterfront property owners with testing the water quality of our recreational lakes. The testing involves taking water clarity measurements and collecting water samples every week or two during the summer to determine the amount of algae present. Too much algae in the water of the lake can interfere with its recreational use and enjoyment.

This report presents the results of testing for 101 lakes in the Southeastern Region of Ontario during 1987. The results are summarized and discussed in terms of seasonal and yearly variations in water quality of the lakes. The Southeastern Region includes Hastings and Prince Edward Counties and extends eastward to the Quebec border.

In general, the lakes had very good water quality which was well suited for a variety of recreational purposes including swimming and bathing. With the possible exception of Hay Bay, no lake had algae levels high enough to be considered a nuisance.

The results show that algae growth varies in intensity in some lakes at different times of the year. In lakes, where a seasonal influence was apparent, the most common pattern was one of increasing algal levels and declining water clarity as the summer progressed.

Algal levels were lower and water clarity better in most lakes than they were during 1986. The weather was much drier than that experienced during the summer of 1986. Decreased amounts of rainfall compared to 1986 resulted in less phosphorus and nitrogen being washed into the lakes in stream flow and runoff. Phosphorus and nitrogen promote the growth of algae in a lake.

Since seasonal and yearly fluctuations occur in water quality, trends can only be established through constant monitoring over a long number of years. With this information the Ministry of the Environment will be better able to recommend appropriate management strategies such as restrictions on shoreline development and other land use controls to protect lakes.

The report contains a Section entitled "Protection of the Lake" which offers advice to cottagers on what they can do to help maintain and improve water quality at their lake.

1.0 INTRODUCTION

Ontario has countless thousands of inland lakes and borders on 4 of the 5 Great Lakes. Increasing amounts of leisure time, growing affluence and the easy accessibility of lakes from urban centres of population have resulted in the extensive development of their shorelines with summer cottages, waterfront resorts and campgrounds.

Increasing development, and careless land use practices around a lake can often lead to changes to the lake itself. The clearing of land for building and seepage from sewage disposal systems increases the rate of supply of plant nutrients, particularly nitrogen and phosphorus, from the land to the lake. Phosphorus more than any other nutrient promotes the growth of aquatic plants and algae. Algae are microscopic green plants. Along with other green plants they use the radiant energy of sunlight to convert water, carbon dioxide and inorganic nutrients such as phosphorus and nitrogen to the chemical energy of plant tissue through the process of photosynthesis. Plant growth is referred to as primary production. An increase in primary productivity gives rise to an increase in productivity at all levels of the food chain, up to and including fish. The process of increasing nutrient enrichment and biological productivity in a body of water is known scientifically as eutrophication.

A certain amount of eutrophication is beneficial. All lakes require nutrients for the production of aquatic life. Aquatic plants and algae provide shelter, food and oxygen for fish. Too much growth, however, can interfere with water oriented recreational activities. While individually most algae are invisible to the unaided eye, collectively they contribute to the turbidity of a lake like particles of dust illuminated in a ray of sunlight. Increased amounts of algae cause a lake to become progressively more turbid and water clarity declines as a result. Under conditions of extreme eutrophication the lake turns green and pea-soup scums called "algal blooms" and thick shoreline weed growth can occur. A lake that is plagued with algal blooms and choked with weeds is obviously of little or no recreational value.

Algal blooms and weeds affect more than just the surface of the lake. As they die they sink and decompose using up the limited oxygen supply at the bottom of a lake. If deep water fish such as lake trout and other life that inhabit these depths are present, they may be deprived of the oxygen they need in order to survive. In this manner, highly sought after sports species such as lake trout may be replaced by less desirable fish.

In 1970, in response to growing concerns that the water quality of our lakes was being threatened by too much shoreline development, the Province initiated a comprehensive

lake water quality survey program. Detailed lake surveys were carried out to evaluate the physical, chemical and biological properties of lakes with a special emphasis on defining their nutrient enrichment status. Since 1970 over 300 lakes have been surveyed in the Southeastern Region of Ontario alone.

While these recreational lake surveys provide a detailed base line evaluation of water quality, continual follow up monitoring is necessary to maintain a current record of water quality and to define and understand any changes or trends.

The Ministry of the Environment has neither the funds nor the staff to visit more than a fraction of the hundreds of cottaged lakes in the Province each year. Therefore the assistance of lake associations and cottagers has been enlisted with a "Self Help Program" to carry out the required lake water quality monitoring. The Self Help program follows two key water quality indicators - water clarity as measured by a Secchi disc and the abundance of algae in the lake as reflected by chlorophyll concentrations. Cottagers or other lakefront property owners undertake the necessary water clarity observations and water sample collections. The Ministry of the Environment undertakes the analyses of the water samples and interprets the results.

While Secchi disc readings and chlorophyll concentrations are only two tests of water quality, they allow a fairly direct and very good assessment of the trophic state or biological health of a lake and hence its recreational water quality. Water clarity is an important characteristic of a lake from an aesthetic point of view. It is dependent on the amount of algae in the water and is an indicator of how pristine or nutrient enriched a lake may be. Chlorophyll is a photosynthetic pigment found in all green plants. The concentration of chlorophyll in a water sample is another indication of the amount of algae in a lake.

In 1971 the Self Help Program began with just 12 lakes across Ontario. During 1987 it included 101 lakes in the Southeast Region alone. A total of 1143 observations were made on these 100 lakes averaging over 11 observations per lake.

Over a period of time, the data provided by the Self Help Program will assist in differentiating between year to year changes that occur naturally in our lakes or the development of any long term trends. The data also assist in assessing the sensitivity of a lake to shoreline development

The Southeastern Region includes Hastings, Prince Edward and Renfrew Counties and extends eastward to the Ontario-Quebec border. The region encompasses an area of 35,523 square kilometres and has a population of 1.2 million people.

2.0 METHODS

Volunteers in the Self Help program are supplied with a sampling kit which includes a Secchi disc, a water sampler, sample bottles and detailed sampling instructions. A Secchi disc is a circular steel plate 20 cm. in diameter painted in opposing black and white quadrants (figure 1). It is used to measure the water clarity of a lake by lowering it into the water and noting the depth at which it disappears from view.

Each volunteer is asked to select a single sampling location, at a central or open water area of their lake, well removed from any localized shoreline influences. The volunteers take a Secchi disc visibility depth measurement and collect a sample of water at this location on a regular weekly or biweekly basis throughout the ice free season of the year, depending upon their availability at the lake.

The water samples are submitted to the Ministry of the Environment for analysis of their chlorophyll content. Water samples are filtered using a 1.2 u nylon filter; the residue extracted with 90% acetone and chlorophyll concentrations determined photospectometrically according to standard methods of the Ministry of the Environment Laboratory Services Branch.

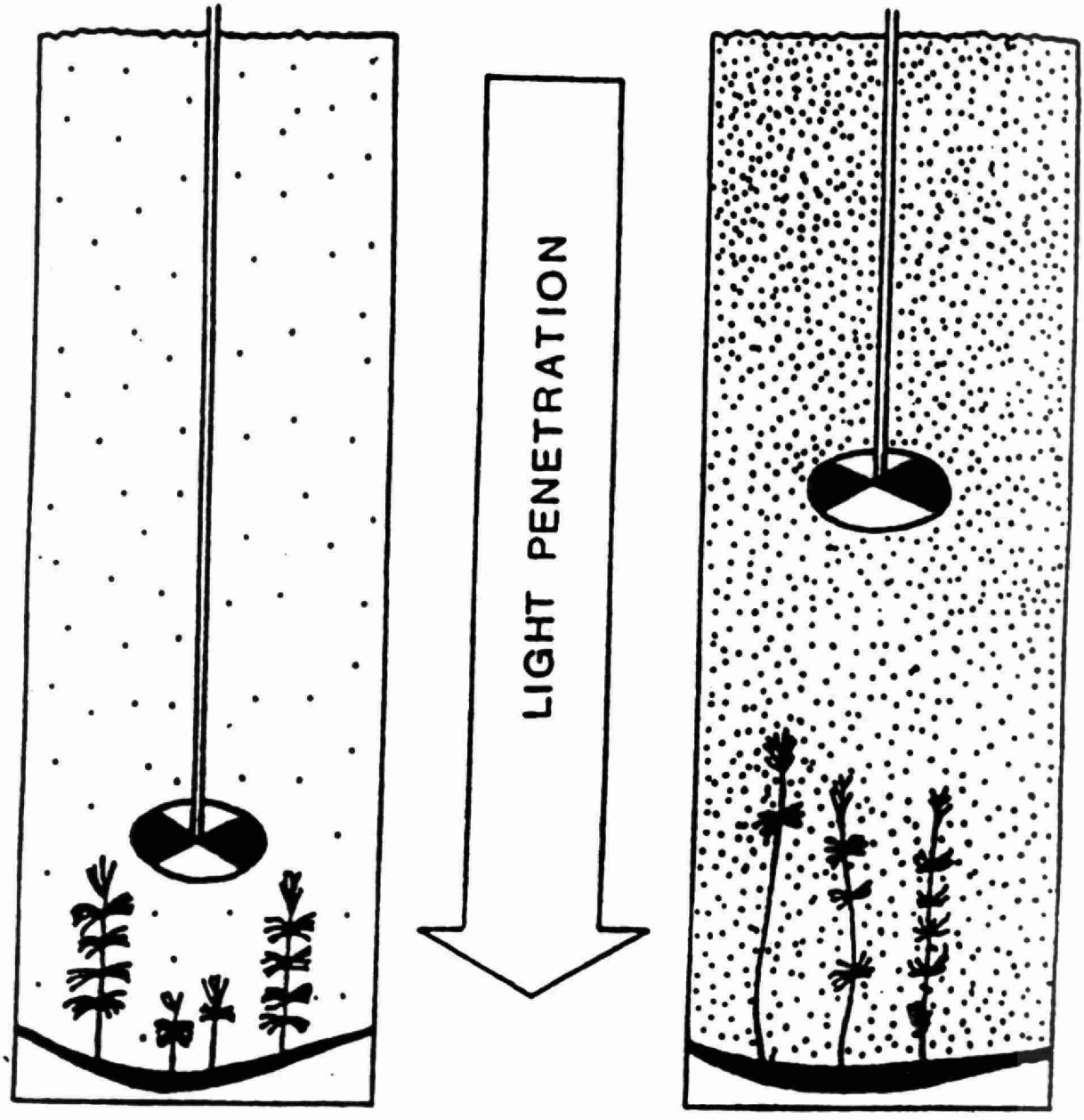


Figure 1: Diagram illustrating the use of a Secchi disc to measure water quality. Good visibility characterizes clear lakes with low algal densities (left panel). Poor visibility characterizes productive lakes with high algal densities (right panel).

3.0 RESULTS AND DISCUSSION

Mean Secchi disc visibility depth and mean chlorophyll concentration results for 1987 are summarized in table 1. Tables with all the 1987 data and a summary of previous years' data for each lake are provided in an appendix to this report. Chlorophyll concentrations for 1984 and previous years are adjusted values. Previously reported values have been multiplied by a factor of 1.5 to account for a change in the analytical method for the determination of chlorophyll concentrations introduced by the laboratory in 1985. The new methodology has improved the recovery of chlorophyll from water samples by fifty per cent. The adjustment allows the direct comparison of chlorophyll samples analyzed before 1985 with chlorophyll samples analyzed since 1985.

3.1 Water Clarity

In general, the results indicate the water quality for most lakes in the Southeast Region during 1987 was quite good for most recreational use purposes. As a seasonal average, Secchi disc visibility depths ranged from 1.5 metres for South Lake to 9.1 metres for Yukes Lake.

For swimming and bathing, the objective for water clarity is a Secchi disc visibility of at least 1.2 metres (4 feet). The basis of the objective is one of safety so that submerged objects and swimmers who may require assistance are clearly

Table 1: Mean Chlorophyll Concentrations (ug/l)
and Mean Secchi Disc Visibility Depths (m) 1987

LAKE	ID NUMBER	CHLORO	SECCHI	CODE
ASHBY	18-3490-001-01	1.5	3.6	1
BAGOT LONG	18-3490-041-01	1.8	4.5	1
BASS	12-0017-001-01	1.0	6.6	
BAY	18-3490-008-01	0.9	6.7	
BEAVER - SOUTH BASIN	17-0031-002-01	2.7	2.3	
BELLAMY	18-0033-003-01	2.2	1.7	1
BIG GULL - CLARENDON	18-3430-003-01	1.8	4.3	
BIG RIDEAU	18-0033-006-01	3.6	3.5	
BIG RIDEAU - BRITON BAY	18-0033-005-01	2.8	4.0	
BLACK	18-0033-026-01	4.3	4.2	
BLACK DONALD	18-3490-043-01	1.8	5.7	
BOBS - EAST BASIN	18-0033-010-01	3.1	4.4	
BOBS - GREEN BAY	18-0033-011-01	1.3	5.0	
BOBS - LONG BAY	18-0033-010-01	2.4	4.4	1
BOBS - MUD BAY	18-0033-008-01	3.6	2.7	
BOIS DUR, LAC DU	18-4930-002-01	1.6	4.0	
BRULE (WENSLEY)	18-3490-010-01	1.1	7.6	
BUCK - NORTH BAY - NORTH END	12-0004-003-01	2.8	4.3	
BUCK - NORTH BAY - SOUTH END	12-0004-002-01	2.8	4.2	
BUCK - SOUTH BAY	12-0004-004-01	2.5	5.2	
BURRIDGE	18-0033-014-01	2.2	4.5	
CASHEL	17-0021-002-01	1.3	4.9	
CHARLESTON - GOOSE ISLAND	12-0017-006-01	2.7	3.9	
CHARLESTON - WEBSTERS BAY	12-0017-004-01	3.2	3.6	
CHARLESTON - WESTERN WATER	12-0017-005-01	3.0	3.6	
CHIPPEGO	17-0035-002-01	3.6	3.4	
CHRISTIE	18-0033-015-01	4.5	4.4	
CLEAR	18-3690-001-01	1.6	4.1	
CROSBY (BIG CROSBY)	18-0033-016-01	2.8	4.2	
CROW	18-0033-017-01	2.0	5.0	
CROWE	17-0021-003-01	1.9	2.6	
DALHOUSIE	18-3490-009-01	2.8	3.4	
DAVERN	18-0033-033-01	2.0	5.4	
DEMPSEYS (VIRGIN)	18-3490-014-01	2.1	4.8	
DESERT	12-0004-009-01	2.6	4.5	
DEVIL	12-0004-010-01	2.3	4.9	
DIAMOND	18-3490-015-01	1.6	4.9	
DICKEY - NORTH BASIN	17-0021-004-01	2.0	3.9	
DICKEY - SOUTH BASIN	17-0021-005-01	1.8	4.3	
DOG - NORTH BASIN	12-0004-011-01	8.5	2.6	1
EAGLE	18-0033-019-01	2.9	5.3	
ELBOW	18-0033-035-01	4.8	2.8	1
FARADAY (TROUT)	18-3490-042-01	3.5	6.2	1
FARREN (FARRELL)	18-0033-020-01	2.6	5.0	
GANANOQUE	12-0017-008-01	5.7	2.7	
GREEN	18-3490-048-01	2.1	6.0	
GRINDSTONE	18-3430-037-01	1.8	4.4	
GRIPPEN	12-0017-010-01	3.3	2.8	
GUNTER	17-0021-007-01	1.7	4.1	1
HAY BAY	17-0037-001-01	20.7	1.6	

LAKE	ID NUMBER	CHLORO	SECCHI	CODE
INDIAN	12-0004-013-01	3.1	4.3	
JEFFERY	18-3490-047-01	1.1	6.7	
JEFFERYS (OLMSTEAD)	18-4810-001-01	1.8	6.0	
JOEPERRY	17-0026-001-01	1.9	3.0	
KASHWAKAMAK	18-3490-010-01	1.8	3.0	1
KENNEBEC - EAST BASIN	17-0031-006-01	3.1	2.9	
KENNEBEC - WEST BASIN	17-0031-007-01	3.4	2.9	
KILLENBECK	12-0017-011-01	7.7	2.6	
LIMERICK	17-0021-010-01	1.8	4.6	
LITTLE SILVER	18-0033-021-01	3.2	3.6	
LONG	18-0033-022-01	4.5	3.5	
LOUGHBOROUGH - EAST BASIN	12-0004-014-01	6.0	3.0	
LOWER BEVERLEY	12-0017-012-01	6.1	2.3	
MAZINAW	18-3430-011-01	1.3	3.6	
MINK	18-3690-006-01	2.5	3.3	
MOIRA - EAST BASIN	17-0026-002-01	12.2	2.7	
MOIRA - WEST BASIN	17-0026-003-01	13.1	1.8	
MOSQUE - NORTH & SOUTH BASINS	18-3490-017-01	1.2	5.2	
MOSQUE - WEST BASIN	18-3430-018-01	1.3	4.3	
MUSKRAT	18-4810-002-01	9.3	2.7	
NORWAY	18-3490-028-01	1.5	3.4	
OPINICON	12-0004-016-01	3.7	3.3	
OTTER	18-0033-024-01	2.7	2.7	
OTTY	18-0033-025-01	2.1	4.1	
PAUGH	18-3690-009-01	1.4	5.6	
PIKE	18-0033-028-01	7.4	3.2	
RED HORSE - EAST BASIN	12-0017-020-01	2.9	3.6	
RED HORSE - WEST BASIN	12-0017-013-01	4.4	4.2	
SAINT ANDREW	17-0035-006-01	5.4	2.5	
SAINT PETER	18-3490-031-01	2.3	4.5	
SALMON TROUT	18-3490-032-01	4.8	4.2	
SAND	12-0004-017-01	3.0	3.4	
SHABOMEKA	18-3430-034-01	2.5	4.9	
SILVER	18-3430-027-01	2.4	4.8	
SKOOTAMATTA - WEST BASIN	17-0026-005-01	1.5	3.6	
SOUTH	12-0017-019-01	12.2	1.5	
STEENBURG	17-0021-011-01	1.7	3.9	
STOCO - NORTH BASIN	17-0026-008-01	4.9	2.1	1
STOCO - SOUTH BASIN	17-0026-009-01	10.9	1.9	
SYDENHAM	06-0180-003-01	1.6	3.5	1
SYDENHAM - EEL BAY	16-0180-004-01	1.2	3.7	1
SYDENHAM - LITTLE LONG LAKE	06-0180-002-01	1.2	3.7	1
THIRTEEN ISLAND	17-0035-015-01	4.1	3.4	
TROY	12-0004-019-01	3.2	3.4	
TWIN SISTER - EAST BASIN	17-0021-012-01	6.0	3.0	
TWIN SISTER - WEST BASIN	17-0021-013-01	4.6	3.3	
UPPER BEVERLY	12-0017-015-01	4.2	2.4	
UPPER RIDEAU	18-0033-030-01	8.0	2.1	
WHITE (DARLING TOWNSHIP)	18-3490-039-01	1.7	2.8	
WHITE (OLDEN TOWNSHIP)	18-3430-031-01	1.4	5.0	
YUKES	18-3490-049-01	0.7	9.1	1

Code 1 means calculated with less than six sets of measurements

visible. Only three lakes failed to meet that objective and then only on occasion. They were South Lake, Moira Lake and Hay Bay. South Lake had a single reading of less than 1.2 metres on July 24, while Moira Lake and Hay Bay experienced poor water clarity for the latter part of August and on into the month of September. This period was one of high algal productivity in these lakes as evidenced by chlorophyll concentrations in excess of 20 ug/l.

Of course, from purely an aesthetic point of view if for no other reason, much better water clarity is desirable. The average Secchi disc visibility depth was greater than 3 metres in 76 per cent of the lakes and greater than 4 metres in 47 per cent of the lakes enrolled in the program during 1987.

3.2 Chlorophyll

The seasonal average chlorophyll concentrations ranged from 0.7 ug/l for Yukes Lake to 20.7 ug/l for Hay Bay. The level of algae or its surrogate measure, chlorophyll, that may impair water quality for recreational use is not precise and depends on the type of algae present in the lake at a given time. Blue green algae that tend to float or accumulate on the surface of the lake are more objectionable at lower concentrations than other types of algae which tend to remain more evenly dispersed throughout the water.

Experience indicates that a seasonal average chlorophyll concentration of 6 ug/l is a value below which water quality problems directly related to excessive levels of algae rarely occur. In lakes with a seasonal average chlorophyll concentration greater than 10 ug/l, an analysis of seasonal algal diversity and taxonomic composition may be warranted to determine if desirable or nuisance types predominate. If nuisance algae are impairing lake use, special studies may be initiated to identify major sources of nutrient loading and to determine cost effective remedial action.

3.3 Classification of Lakes

Lakes are classified on a continuously rising trophic (nutrient enrichment) scale according to their biological productivity. Traditionally, trophic state classification involves narrative descriptions of various factors or manifestations of nutrient enrichment such as nutrient concentrations, water transparency, profiles of dissolved oxygen with depth, the presence or absence of algal "blooms", the numbers and kinds of other plants and animals inhabiting the lake and even the physical dimensions of the lake itself.

At the nutrient poor end of the scale are oligotrophic (unenriched) lakes and at the high end eutrophiclakes. Oligotrophic lakes are characterized by low levels of chlorophyll and exceptionally clear water. They are usually

deep lakes (more than 30 m). The shoreline is sparsely populated with aquatic plants. A stable fish population, often lake trout, provides a fair angling catch. The lake is well suited for a wide variety of recreational pursuits including water contact activities such as swimming and bathing.

In contrast, eutrophic (enriched) lakes are more productive with higher concentrations of phosphorous and chlorophyll and poor water clarity. Typically these lakes are shallow (less than 10 m) and often weedy and muddy. Fish populations do not include lake trout but may contain other sports species such as pickerel and bass. Angling success is generally better than for oligotrophic lakes since a more productive lake can sustain a larger population of fish. There is a good probability of one or more algal blooms developing in late summer or early fall. Under conditions of advanced eutrophication, the lake may sustain a prolonged bloom from June to September.

Mesotrophic (moderately enriched) lakes occupy an intermediate position in the classification scheme. They are intermediate with respect to depth, chlorophyll concentration, water clarity, and weeds. They may contain both warm and cold water fish populations.

While changes from trophic state do not occur at sharply defined stages, numeric criteria are useful to define this classification scheme. The mean values for Secchi disc visibility and chlorophyll concentration presented in table 1 can be used to rank the enrichment status of lakes in the 1987 Self Help program according to the following scheme.

Ministry of the Environment Secchi disc - chlorophyll a Lake Enrichment Status Classification Scheme.

Enrichment Status	Secchi disc (m)	Chlorophyll (ug/L)	Number of lakes
oligotrophic	>5	<3	13
mesotrophic	3 - 5	3 - 6	78
eutrophic	<3	>6	10

A lake that is classified in one category by Secchi disc visibility may be classified in another by its chlorophyll concentration. For the purpose of the above table, a lake was placed in the eutrophic category if both its seasonal mean chlorophyll concentration and its seasonal mean Secchi disc visibility depth so warranted. Thus a lake that had a mean chlorophyll concentration greater than 6 ug/l and a mean Secchi disc visibility depth less than 3 metres was classified as an eutrophic lake. Similarly a lake was classified as oligotrophic only if both the mean Secchi disc depth was greater than 5 metres and the mean chlorophyll concentration less than 3 ug/l. All other lakes were classified as mesotrophic. In this way, the results of the 1987 Self Help water quality monitoring program indicate that

thirteen lakes are oligotrophic, eighty are mesotrophic and ten are eutrophic. Lakes that are borderline between categories may change in classification due to natural variations in lake trophic status between years.

As lake productivity increases water clarity becomes poorer. The impact of these changes depends on the perception of the individual and the intended use of the water. A shallow, productive, weedy lake may be of more value to someone whose main interest is fishing than to someone who is more interested in swimming or water skiing. Although an eutrophic lake has less water clarity and is more likely to experience algal blooms periodically during the summer months than less productive lakes, water quality may still be acceptable for a diversity of recreational uses.

With the possible exception of Hay Bay, no lake was so completely enriched to be entirely unsuitable for water oriented recreational use such as swimming.

3.4 Seasonal Variability within Lakes

An analysis of the data for lakes where adequate seasonal sampling was carried out suggests the presence of several patterns in lake water quality.

Oligotrophic lakes with very low levels of algae and exceptionally clear water transparency exhibited very little variability in both chlorophyll concentrations and Secchi disc visibility depth. Variability of chlorophyll and Secchi disc visibility was greater in more productive lakes. For some of the more productive lakes, the results show that algae growth varies in intensity in different times of the year.

In lakes where a seasonal influence was evident, the predominant trend was one of gradually rising chlorophyll concentrations as the summer progressed, culminating in peak concentrations, generally sometime in late August or early September. Almost invariably, the seasonal increases in chlorophyll concentrations caused a decline in Secchi disc visibility depths.

The increases in chlorophyll during the summer months are likely due to profusions of blue-green algae after the depletion of nitrogen by a variety of algae in the spring. Blue-green algae can fix atmospheric nitrogen and have a competitive advantage later in the season over other types of algae when nitrogen is in scarce supply. This seasonal trend is most apparent in shallow lakes that experience a feedback of phosphorus from the lake sediments.

A seasonal pattern of increasing chlorophyll concentrations and decreasing water clarity was most apparent in Moira,

Black, Christie and South Lakes, but was observed in a number of other lakes as well.

In contrast to the pattern of seasonally increasing algal growth, there are a few lakes that experienced a decline in algae in late May or early June. This type of spring decline was seen in the North Bay of Buck Lake, Crow, Desert, Davern, Desert, and Shabomeka Lakes. Spring declines in algae have been reported in other lakes and are attributed to a die off of spring species, sinking of the heavier diatoms, grazing by zooplankton and depletion of nutrients in the euphotic zone.

The individual interpretive lake summaries in the appendix comment upon seasonality in algal phytoplankton populations where they occur.

Other lakes experience episodic increases in chlorophyll concentrations from time to time that do not conform to any seasonal pattern. Examples of these lakes are Farren, Long, Lower Beverly, Twin Sister and White. The increases in chlorophyll concentration were transitory. Under favorable conditions of warm, sunny and calm weather, algal blooms can materialize rapidly if sufficient phosphorus is available to sustain a period of rapid cell division and algal growth.

The algae comprising these blooms may persist for only a few days and then may die and settle to the bottom of the lake.

In other cases episodically high chlorophyll concentrations may be due to localized accumulations of algae by wind drift. The possibility of temporarily concentrated algal populations emphasizes the need for regular sampling.

3.5 Annual Variability within Lakes

In the preceding section, the 1987 results were examined and discussed primarily for the purpose of providing a better understanding of a lake's water quality as it occurs within a single year.

A matter of greater interest is the variability in water quality which occurs from year to year. The Self Help Program includes a considerable number of lakes for which a record now exists for a growing number of consecutive years. This record is differentiating long term trends from annual variability in water quality conditions due to climatic and other natural factors.

Concerning the 1987 results, the most evident finding is the is the large number of lakes with an improvement in their water quality compared to conditions measured in 1986. The 1987 and 1986 programs have 68 lakes in common. When these 68 lakes in common are compared it is found that 55 experienced a decrease in chlorophyll concentrations from 1986 to 1987. For most of these 55 lakes there was a

corresponding improvement in water clarity. These changes are best exemplified by Troy Lake. During 1986 Troy Lake had a seasonal mean chlorophyll concentration of 13.5 ug/l. During 1987 it was 3.2 ug/l. Secchi disc visibility improved from 1.9 metres to 3.4 metres from 1986 to 1987. While the improvement in water quality for the other lakes was not as great as that for Troy Lake, the phenomenon is noteworthy in terms of the large number of lakes affected.

When meteorological records are examined the amounts and seasonal distribution of rainfall is correlated with chlorophyll concentrations and in turn Secchi disc visibility. During 1986, which was a very wet year, chlorophyll concentrations reached near record high levels and water clarity was markedly reduced. As the record indicates, 1987 was quite dry by comparison and the trend was reversed.

Comparison of monthly precipitation (mm) for the growing season months recorded by Environment Canada at Kingston

Month	1983	1984	1985	1986	1987	norm
April	84.8	155.2	47.7	48.8	78.4	69.6
May	39.6	94.2	76.6	80.6	46.8	71.0
June	71.5	45.4	51.8	131.6	59.6	64.0
July	98.6	41.3	67.4	74.6	47.7	53.2
Aug	50.8	194.0	100.8	129.2	71.0	76.2
September	142.2	41.2	72.2	174.4	119.2	80.9
October	97.6	25.2	84.6	81.8	86.4	77.1

It is believed that the reduced amounts of rainfall limited the supply of algae producing nutrients available to the lake from surface water runoff over the course of the growing season with a resulting improvement in water quality. Not only is the total amount of rainfall received over the course of the growing season important, but also when it occurs. Lake productivity as measured by chlorophyll and Secchi disc visibility was low during 1983. Although the total amount of rainfall of 585 mm received during the growing season from April to October in 1983 exceeded the long term norm of 492 mm, much of the precipitation occurred in September and October at a time when reduced hours of daylight and cooler temperatures limit algae growth. Rainfall during the summer months of June, July and August was well below the seasonal norm during 1983.

In addition to providing information on natural year to year variability in water quality, the Self Help Program monitoring can be used to assess long term trends. For example, the results have been used to assess the benefit of pollution control measures.

Stoco, Kamaniskeg, Moira and Muskrat Lakes all receive treated domestic waste from the municipalities bordering their respective shores. Improvements to the sewage

treatment process were made at the Village of Madoc on Moira

Lake in 1973, at the Village of Tweed on Stoco Lake in 1975

and at the Village of Cobden on Muskrat Lake in 1981. Notwithstanding a nuisance algal bloom that occurred on Stoco Lake during 1984, the Self Help program results demonstrate a lasting improvement in the water quality conditions of these lakes since the introduction of improved waste treatment practices and other efforts to reduce nutrient inputs from within their watersheds. This situation parallels similar improvements observed in the water quality of the lower Great Lakes and the Bay of Quinte as a result of municipal pollution and phosphorus control measures implemented during the 1970's.

Elucidation of trends is dependent on the magnitude of change relative to the magnitude of random and natural variability due to weather and other natural factors. Water quality improvements in the above noted lakes have been dramatic and readily identifiable through the monitoring results. On the other hand, gradual, subtle trends may take longer to recognize, particularly in lakes that have a lot of natural year to year variability. For some lakes in the program that have been sampled regularly for ten or more years a detailed analyses will be required to identify any possible trends. Other lakes appear to have enough long term stability in mean chlorophyll concentrations and mean Secchi disc visibility depth from year to year to confirm the absence of any trends.

Examples of these lakes are Brule, Charleston, Davern, Diamond, Dempseys, Devil, Diamond, Dickey, Limerick, Shabomeka, and Otter.

4.0 CONCLUSIONS AND RECOMMENDATIONS

The Self Help Program in the province of Ontario and in the Southeastern Region in particular has been invaluable in establishing a wealth of information concerning the water quality conditions of inland lakes. With the limited staff and other resources and the many hundreds of lakes in the region, the acquisition of water quality data on a regular yearly basis from any significant number of lakes would otherwise be all but impossible. The Self Help Program provides the Ministry of the Environment the opportunity to determine the enrichment status and water quality variability of our lakes on an on going basis. We are fortunate and grateful for a network of approximately 100 volunteer samplers who have provided many years of highly valuable data.

Each year the Self Help Program provides information that continues to increase our understanding of water quality conditions of lakes in southeastern Ontario. The information reveals basic differences between lakes in terms of their enrichment status, the presence or absence of seasonal patterns in biological productivity, and a better knowledge

of between year variations in water quality conditions. For some lakes, algal levels and water clarity are predictable from spring to fall and the seasonal average chlorophyll concentration and mean Secchi disc visibility depth is fairly stable from year to year. For other lakes a predictable pattern has not become evident. It is important that efforts continue to characterize as many lakes as possible.

The enrollment of lakes in the Self Help Program is diverse enough in terms of geographic distribution to provide a broad picture of the water quality conditions in the Southeastern Region of Ontario. In general, the picture that emerges is one of very low biological productivity and excellent water quality. Water quality in most lakes is well suited for a wide variety of recreational pursuits including water contact use such as swimming and bathing. Only a few bodies of water, such as Hay Bay for example, have chlorophyll concentrations high enough to possibly interfere with their water contact recreational use and enjoyment. It would be impossible to generalize about the water quality conditions of our lakes in this manner without the information provided by the network of volunteer samplers through the Self Help Program.

Year to year variability of some lakes is quite considerable and more than enough to obscure any trends in water quality that might be due to mans' activities. The effect of

shoreline development such as clearing shorelands for building roads and cottage construction and seepage from septic tank installations is often subtle and gradual. Unlike that due to climatic conditions, the effect of mans' activities is cumulative. It is essential that we have long term data, probably on a continuous basis, to identify any emerging trends with regard to these annual variations in water quality. The water clarity and chlorophyll measurements provided through the Self Help Program will establish the necessary record against which any future changes in the water quality of our lakes may be evaluated.

The identification of trends is important in directing and assessing the effectiveness of lake management decisions. We do not want to inappropriately restrict development on a lake. On the other hand, we must be prepared to impose strict land use controls if an increase in shoreline development is going to jeopardize water quality of a lake.

The Self Help Program provides a basis for input into land use planning decisions for lakes in Ontario. The data is used to assist with the establishment of guidelines for the capacity of a lake to support shoreline development. These guidelines are used by municipalities in drafting land use policies for Official Plans and zoning by-laws.

The information is also used by the Ministry of the

Environment when providing comment on the water quality implications of lakefront development proposals to the Ministry of Housing and to the Ontario Municipal Board. Our comments often require that the developer incorporate measures that will reduce the impact of a development proposal on water quality such as increased setbacks for cottages and septic tanks, oversized lots and the preservation of environmentally sensitive areas.

Every one in the Self Help Program is encouraged to continue their participation during 1988. Sampling should be carried out regularly and consistently over the entire period of availability at the lake. Weekly sampling is desirable to define seasonal cycles on lakes where they exist. As a minimum, a program should encompass the three months of June, July and August when lakes receive most of their use. These months are often when chlorophyll concentrations are highest. If a sampling is conducted during May and September as well as during June, July and August then the presence or absence of chlorophyll peaks in the spring and fall can be confirmed.

Cottagers who own property on a lake not enrolled in the Self Help Program are encouraged to contact the Ministry of the Environment for advice and assistance in establishing a sampling program on their lake.

The Self Help Program has been in effect for some 16 years.

Data has been accumulated for ten or more years on a large number of lakes. As stated earlier in the report, some of these lakes have had stable enough average water clarity and chlorophyll concentrations from year to year that it is apparent that their water quality is not changing. For other lakes, year to year fluctuations in these parameters have been considerable and the assessment of long term trends in water quality is difficult to make. For this reason it is proposed to undertake a thorough technical review of the accumulated data base and program protocols. The next report will consist only of a tabular presentation and a narrative summary of the results as contained in the appendix of this report, pending completion of the review. At the completion of the review a report will be issued with the findings and recommendations for changes if required.

The Ministry of the Environment has a responsibility to minimize the potential water quality effects of further shoreline development on lakes. Existing cottage owners can also play an important role in the protection of their lakes. The following Section outlines some of the steps cottagers can adopt to limit nutrient inputs to their lakes and thereby help preserve their water quality.

5.0 PROTECTION OF THE LAKE

In order to prevent problems from developing there are a number of actions and safeguards that cottagers can take. Cottaging impacts are potentially of greater significance than other land uses within a watershed because of their greater proximity to the lake. Of the management options available for dealing with water quality protection, the most effective is prevention. Phosphorus has been identified as a critical element in eutrophication. Phosphorus more than any other nutrient promotes the growth of weeds and algae in a lake. Phosphorus is present in a lake naturally but also occurs as a result of mans' activities. Phosphorus originates in overland runoff, from agricultural practices within the watershed of a lake and by seepage from septic tank systems. Care must be taken to minimize additional phosphorus input from cottage development. Following is a list of suggestions that cottagers can follow to limit phosphorus inputs to the lake.

1) New cottage construction and septic tank systems should be sited well back from the lake. This practice allows phosphorus in runoff and seepage from the tile field to be absorbed by soil and vegetation rather than reaching the lake. Setbacks have the additional advantage of preserving the natural scenic beauty of the shore by

preventing development from intruding unnaturally upon the lake.

2) Building site preparation and construction activities should be carried out in a manner which will minimize disruption to the soil and vegetation on the property. All areas that are exposed during construction should be re-planted as soon as possible to prevent runoff and erosion.

3) Sewage disposal systems must be constructed and installed in compliance with Provincial Regulations and should be properly maintained. Seepage of leachate from improperly located or malfunctioning septic tank tile field systems can contribute substantial amounts of phosphorus to the lake. Septic tanks should be periodically pumped out. The area over the tile bed should be grassed and left open to sunlight and wind to encourage evapotranspiration. Protect the tile field bed from compaction by vehicular traffic including snow mobiles. Snowmobiles compact the snow and this may cause frost damage to the tiles. Check the system every year for damp spots or ponding. If a problem is apparent or suspected contact the local District Office of the Ministry of the Environment for guidance.

4) Minimize the quantity of water used at the cottage to avoid overloading the septic tank system. Dishwashers and automatic washing machines use large volumes of water. Moreover, automatic dishwashers require the use of high phosphate detergents which should not be used at the cottage. Laundry should be returned to the city.

5) If you must have a lawn do not fertilize it. Excess application could wash off into the lake and may end up promoting unwanted nuisance aquatic weed growths.

6) Do not bathe or shampoo in the lake. Many people find this custom offensive and in this day and age when most of us embrace an environmental ethic such practices should not occur.

7) The shallow near shore or "littoral" zone supports most of the plant and animal life found in a lake. Disruption of any part of this life support ecosystem threatens the entire cycle of life in the lake. In particular, habitat for fish and other wildlife may be destroyed. Before undertaking any shoreline modification activities such as dredging or filling, contact the Ministry of Natural Resources for advice. Prior approval may be required under the Navigable Waters Protection Act or the Fisheries Act.

8) Preserve the natural shoreline of the lake. Retain a protective buffer of trees, shrubs and other ground cover between your cottage and the lake. Vegetation slows storm and melt water runoff and filters contaminants from roads, roofs, patios, and parking lots. This runoff contains phosphorus and nitrogen from soil particles, fertilizer residues and animal waste.

9) On lots where the natural ground cover along the shore line has been lost, cottagers should reintroduce vegetation native to the lake environment. The Ministry of Natural Resources introduced a shoreland restoration program on Christie Lake near Perth during 1984 as a pilot project in Ontario. A Mutual Associations for the Protection of the Lake Environment (MAPLE) has been formed to continue the initiative began by the Ministry of Natural Resources and to develop the program into a broader, province wide program. The program involves the active participation of cottage associations in returning shorelines to their natural state with herbaceous shrubs native to the area. Plants are provided free of charge from a nursery established at Christie Lake specifically for this purpose. The main species that are planted are sweet gale, meadow sweet, willow, red osier dog wood and Virginia creeper. Since 1984 the program has been extended to Black, Farren and Mississippi Lakes. For more information about this

program contact J. Patrick Ferris, Managing Director, MAPLE Inc., 152 McLeod Street, Ottawa, K2P OZ7 (telephone 613 230 4548 home or 613 238 8865 business).

10) Participate in the Ministry of the Environment Cottagers lake water quality monitoring Self Help Program. In addition to contributing scientific data about the water quality conditions of our lakes, the Self Help Program involves cottagers in learning about lake ecology and helps to raise their environmental awareness to the point where they can better appreciate what they can do individually to preserve and enhance the quality of their lake and its surroundings.

6.0 A P P E N D I X

Chlorophyll concentrations and Secchi disc visibility depths, and summary of seasonal mean results from previous years for lakes in the Ministry of the Environment Southeastern Region Cottagers Self Help Program.
1987

ASHBY LAKE

Insufficient sampling was carried out during 1987 to reach any definite conclusions about Ashby Lake or make comparisons with other years. A minimum of six sets of measurements are necessary to adequately characterize water quality of a lake. Preferably 12 or more measurements evenly timed throughout the ice free season of the year from May to October should be taken to define any seasonal trends in water quality if they are present

Based on previous years' data Ashby Lake has excellent water quality well suited for a variety of recreational uses including water contact uses such as swimming and bathing.

LAKE : ASHBY LAKE
TWP : ASHBY
COUNTY : LENNOX & ADDINGTON

ID NUMBER : 18-3490-001-01

WATERSHED AREA	: 36.82	sq.km	SHORELINE	: 20.30	km.
SURFACE AREA	: 259.0	ha.	COTTAGES	: 84	
MAX DEPTH	: 36.60	m.	RESORTS	: 0	
VOLUME	: 31.11	mill cu. m.	% CROWN LAND	: 70	

NORTH BASIN

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
07/01/87	3.3	1.3
07/26/87	4.0	1.7
MEAN	3.7	1.5
MAX	4.0	1.7
MIN	3.3	1.3
N	2	2
SD	0.50	0.28

HISTORICAL RECORD'

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1976 **	6.3	1.8
1977	6.8	2.0
1978	6.4	2.2
1979	5.6	2.1
1980	5.9	2.5
1981	5.6	1.8
1982	5.9	1.7
1983 **	5.3	2.0
1987 *	3.7	1.5
MEAN	5.7	2.0
MAX	6.8	2.5
MIN	3.7	1.5
N	9	9
SD	0.89	0.30

NOTE : * based on less than 6 readings.
** Recreational lakes included.

BAGOT LONG LAKE

Insufficient sampling was carried out during 1987 to reach any definite conclusions about Bagot Long Lake or make comparisons with other years. A minimum of six sets of measurements are necessary to adequately characterize water quality of a lake. Preferably 12 or more measurements evenly timed throughout the ice free season of the year from May to October should be taken to define any seasonal trends in water quality if they are present

LAKE : BAGOT LONG LAKE
TWP : BAGOT
COUNTY : RENFREW

ID NUMBER : 18-3490-041-01

WATERSHED AREA	: 4.41	sq.km	SHORELINE	: 9.00	km.
SURFACE AREA	: 56.0	ha.	COTTAGES	: 28	
MAX DEPTH	: 12.20	m.	RESORTS	: 0	
VOLUME	: 2.62	mill cu. m.	% CROWN LAND	: 70	

CENTRE OF LAKE

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
07/29/87	4.9	1.6
08/13/87	4.6	3.2
08/29/87	3.8	1.2
09/13/87	4.6	1.0
MEAN	4.5	1.8
MAX	4.9	3.2
MIN	3.8	1.0
N	4	4
SD	0.47	1.00

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1983 *	3.0	3.3
1986 *	2.7	11.6
1987 *	4.5	1.8
MEAN	3.8	5.6
MAX	4.9	11.6
MIN	2.7	1.8
N	4	3
SD	1.09	5.28

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

BASS LAKE

Eleven samples were collected from July 19 to October 23. Although the absence of more productive conditions in Bass Lake during the spring cannot be confirmed without data for the months of May and June, the results indicate Bass Lake has excellent water clarity with very little algae present. Chlorophyll concentrations were less than 1 ug/l for most of July and throughout the entire month of August. Secchi disc visibility depth increased as the season progressed with a record 9.1 metre reading measured on October 23. The previous best water clarity was a reading of 8.5 metres on October 28, 1985.

Water clarity was higher and chlorophyll concentrations lower than those measured in the lake during 1986. The summer of 1987 was much drier than the weather experienced during the previous summer. It is believed that reduced amounts of surface runoff limited the supply of algae producing nutrients available to the lake over the growing season with a resulting improvement in water quality. Similarly low productivity was documented in Bass Lake in 1983 which was also a year with a dry summer period.

LAKE : BASS LAKE
TWP : REAR OF LEEDS & LANSDOWNE
COUNTY : LEEDS

ID NUMBER : 12-0017-001-01

WATERSHED AREA	: 14.89	sq.km	SHORELINE	: 8.2	km.
SURFACE AREA	: 76.89	ha.	COTTAGES	: 67 (1975)	
MAX DEPTH	: 25.9	m.	RESORTS	: 0	
VOLUME	: 8.67	mill cu. m.	% CROWN LAND	: 0	

OUTLET

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
07/19/87	5.2	1.2
07/23/87	5.0	0.8
08/07/87	5.5	0.6
08/12/87	5.8	0.5
08/17/87	6.4	0.9
08/20/87	7.0	0.6
08/30/87	7.5	0.9
09/07/87	6.7	1.0
09/27/87	7.0	1.3
10/04/87	7.3	2.3
10/23/87	9.1	0.8
MEAN	6.6	1.0
MAX	9.1	2.3
MIN	5.0	0.5
N	11	11
SD	1.20	0.50

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1977	6.6	1.5
1978	5.9	2.2
1979	4.7	2.5
1980	6.5	3.2
1981	5.9	2.5
1982	6.0	1.8
1983	6.5	1.2
1984	6.6	2.5
1985	6.3	1.8
1986 *	5.1	1.9
1987	6.6	1.0
MEAN	6.1	2.0
MAX	6.6	3.2
MIN	4.7	1.0
N	11	11
SD	0.64	0.65

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

BAY LAKE

Eleven sets of samples were collected from July 19 to October 18. Although the absence of more productive conditions during the spring cannot be confirmed with out data from May and June, the results indicate Bay Lake has exceptionally transparent water with very extremely low levels of algae.

Chlorophyll concentrations were lower during 1987 than during 1986 and other previous years of record. The summer of 1987 was much drier than the weather experienced during the previous summer. It is believed that reduced amounts of surface runoff limited the supply of algae producing nutrients available to the lake over the growing season with a resulting improvement in water quality.

LAKE : BAY LAKE
TWP : FARADAY
COUNTY : HASTINGS

ID NUMBER : 18-3490-008-01

WATERSHED AREA	: 7.1	sq.km	SHORELINE	: 6.8	km.
SURFACE AREA	: 87.0	ha.	COTTAGES	: 48	
MAX DEPTH	: 24.0	m.	RESORTS	: 1(10)	
VOLUME	: 9.00	mill cu. m.	% CROWN LAND	: 3	

VICINITY OF LEOFSKY'S POINT

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
07/19/87	6.4	0.9
08/09/87	7.9	0.8
08/16/87	6.7	0.5
08/30/87	6.4	0.4
09/07/87	7.0	0.5
09/13/87	8.5	1.1
09/20/87	6.7	0.8
09/27/87	7.0	0.7
10/04/87	7.0	1.7
10/18/87	7.0	1.7
MEAN	7.1	0.9
MAX	8.5	1.7
MIN	6.4	0.4
N	10	10
SD	0.66	0.47

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1977 **	8.0	1.1
1979 *	4.7	1.4
1985 **	8.5	1.0
1987	7.1	0.9
MEAN	7.1	1.1
MAX	8.5	1.4
MIN	4.7	0.9
N	4	4
SD	1.69	0.22

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

BEAVER LAKE

Seven sets of results were collected from July 24 to September 19 on the South Basin of Beaver Lake. Although the absence of more productive conditions during the spring cannot be confirmed without sampling for the months of May and June, the results for the summer months indicate South Beaver Lake had low levels of algae with satisfactory water quality for recreational use purposes.

Water clarity was higher and chlorophyll concentrations lower than those measured in the lake during 1986. The summer of 1987 was much drier than the weather experienced during the previous summer. It is believed that reduced amounts of surface runoff limited the supply of algae producing nutrients available to the lake over the growing season with a resulting improvement in water quality. Similarly low productivity was documented in Beaver Lake in 1983 which was also a year with a dry summer period.

The Beaver Lake Protective Association is cautioned that wide spread harvesting of aquatic weeds could result in increased levels of algae in the lake by reducing the competition for nutrients from rooted aquatic plants. Harvesting should be confined to the minimum areas needed to facilitate boating and swimming.

LAKE : BEAVER LAKE
TWP : SHEFFIELD
COUNTY : LENNOX & ADDINGTON

ID NUMBER : 17-0031-001-01

WATERSHED AREA	: 534	sq.km	SHORELINE	: 15.6	km.
SURFACE AREA	: 280	ha.	COTTAGES	: 143	
MAX DEPTH	: 6.10	m.	RESORTS	: 1 (10)	
VOLUME	: 9.2	mill cu. m.	% CROWN LAND	: 0	

SOUTH BEAVER - CENTRE

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
07/24/87	1.8	1.2
07/31/87	2.7	1.5
08/07/87	2.1	2.7
08/12/87	2.4	2.8
08/26/87	2.1	4.9
09/02/87	2.4	2.9
09/17/87	2.3	2.7
MEAN	2.3	2.7
MAX	2.7	4.9
MIN	1.8	1.2
N	7	7
SD	0.29	1.20

SOUTH BEAVER LAKE

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1975 **	2.8	6.5
1976 *	3.0	7.5
1982 *	3.1	4.3
1983 **	2.9	2.4
1985 **	2.7	4.6
1986	2.2	6.1
1987	2.3	2.7
MEAN	2.7	4.9
MAX	3.1	7.5
MIN	2.2	2.4
N	7	7
SD	0.34	1.93

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

BELLAMYS LAKE

Insufficient sampling was carried out during 1987 to reach any definite conclusions about Bellamys Lake or make comparisons with other years. A minimum of six sets of measurements are necessary to adequately characterize water quality of a lake. Preferably 12 or more measurements evenly timed throughout the ice free season of the year from May to October should be taken to define any seasonal trends in water quality if they are present.

LAKE : BELLAMYS LAKE
TWP : KITLEY, BASTARD
COUNTY : LEEDS

ID NUMBER : 18-0033-003-01

WATERSHED AREA	: 36.0	sq.km	SHORELINE	: 6.6	km.
SURFACE AREA	: 123	ha.	COTTAGES	: 26	
MAX DEPTH	: 2.3	m.	RESORTS	: 1 (130)	
VOLUME	: 1.23	mill cu. m.	% CROWN LAND	:	

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
06/15/87	1.8	2.2
07/19/87	1.7	2.0
08/26/87	1.4	1.8
09/02/87	1.8	2.9
MEAN	1.7	2.2
MAX	1.8	2.9
MIN	1.4	1.8
N	4	4
SD	0.19	0.48

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1977	2.2	2.1
1978	2.0	2.9
1979 *	1.9	1.8
1980 **	1.7	6.3
1987 *	1.7	2.2
MEAN	1.9	3.1
MAX	2.2	6.3
MIN	1.7	1.8
N	5	5
SD	0.21	1.95

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

BIG GULL (CLARENDON) LAKE

Eight samples collected from mid June to the end of September provided good seasonal coverage of water quality conditions. The results indicate Big Gull Lake has very good water clarity with very low levels of algae.

Water clarity was higher and chlorophyll concentrations lower than those measured in the lake during 1986. The summer of 1987 was much drier than the weather experienced during the previous summer. It is believed that reduced amounts of surface runoff limited the supply of algae producing nutrients available to the lake over the growing season with a resulting improvement in water quality.

LAKE : BIG GULL (CLARENDON) LAKE ID NUMBER : 18-3430-003-01
TWP : KENNEBEC, OLDEN, BARRIE, CLARENDON
COUNTY : FRONTENAC

WATERSHED AREA	: 137.00	sq.km	SHORELINE	: 89.00 km.
SURFACE AREA	: 236.0	ha.	COTTAGES	: 280 (1974)
MAX DEPTH	: 26.00	m.	RESORTS	: 10 (156)
VOLUME	: 919.70	mill cu. m.	% CROWN LAND	: 25

PINNACLE POINT

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
06/14/87	4.0	1.3
06/28/87	4.0	1.3
07/05/87	4.8	1.3
07/19/87	5.2	2.1
08/09/87	4.3	2.1
08/23/87	4.0	2.6
08/30/87	3.7	2.1
09/27/87	4.6	1.3
MEAN	4.3	1.8
MAX	5.2	2.6
MIN	3.7	1.3
N	8	8
SD	0.50	0.52

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1972 **	5.3	2.4
1975 **	3.4	5.0
1976	4.6	3.2
1977	4.6	3.0
1978	4.6	3.0
1979 *	4.1	3.0
1980 *	3.7	4.1
1982	3.9	2.5
1983	3.7	3.2
1984	4.0	2.9
1985	4.2	2.4
1986	4.1	2.6
1987	4.3	1.8
MEAN	4.2	3.0
MAX	5.3	5.0
MIN	3.4	1.8
N	13	13
SD	0.50	0.81

NOTE : * Based on less than 5 readings.
** Recreational lakes included.

BIG RIDEAU LAKE

Four locations were sampled on Big Rideau Lake during 1987. The seasonal mean Secchi disc visibility depth was greater and the chlorophyll concentration lower in Briton Bay of Big Rideau Lake than either the Hudson Bay or vicinity of Sand Island sampling locations. A reason for this variation in water quality is not apparent but is not an established pattern based on previous years' results.

Big Rideau Lake is relatively uninfluenced by local runoff as water clarity did not deteriorate during the extremely wet summer experienced in 1986 or improve during the drier weather experienced in 1987 as happened in other nearby smaller lakes.

Secchi disc visibility has been lower and chlorophyll concentrations higher since 1980 in Big Rideau Lake than for the years prior to 1980. None the less, these parameters indicate Big Rideau Lake has good water clarity with a low level of algae.

LAKE : BIG RIDEAU LAKE ID NUMBER : 18-0033-006-01
TWP : NORTH & SOUTH BURGESS & ELMSLEY, BASTARD
COUNTY : LANARK, LEEDS

WATERSHED AREA	: 478.90	sq.km	SHORELINE	: 172.00km.	
SURFACE AREA	: 4700	ha.	COTTAGES	: 1063+12 HOUSES	
MAX DEPTH	: 95.00	m.	RESORTS	: 12 (621)	
VOLUME	: 799.97	mill cu. m.	% CROWN LAND	: 5	

BRITON BAY

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
06/13/87	2.4	4.3
06/25/87	3.7	0.4
07/03/87	4.3	6.9
07/09/87	4.8	1.9
07/15/87	4.4	2.5
07/29/87	3.3	3.1
08/05/87	3.7	2.6
08/12/87	4.3	2.0
08/20/87	4.3	1.8
08/30/87	4.0	2.9
09/07/87	4.3	2.5
MEAN	4.0	2.8
MAX	4.8	6.9
MIN	2.4	0.4
N	11	11
SD	0.66	1.66

HUDSON BAY

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
05/04/87	3.0	6.3
06/03/87	2.5	4.5
06/24/87	3.3	2.0
07/16/87	4.0	6.7
07/27/87	3.0	3.8
08/10/87	3.7	1.9
08/29/87	3.7	4.3
09/20/87	3.0	3.3
MEAN	3.3	4.1
MAX	4.0	6.7
MIN	2.5	1.9
N	8	8
SD	0.50	1.76

MUSKRAT HOLE

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
05/31/87	1.3	1.1
MEAN	1.3	1.1
MAX	1.3	1.1
MIN	1.3	1.1
N	1	1
SD		

BETWEEN SAND ISLAND AND NORTH SHORE

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
05/31/87	2.9	1.4
06/21/87	2.7	1.0
07/05/87	5.5	1.0
07/26/87	3.3	5.1
08/09/87	4.0	4.5
08/23/87	4.0	3.9
09/07/87	4.2	4.2
MEAN	3.8	3.0
MAX	5.5	5.1
MIN	2.7	1.0
N	7	7
SD	0.96	1.80

LAKE : BIG RIDEAU LAKE ID NUMBER : 18-0033-006-01
TWP : NORTH & SOUTH BURGESS & ELMSLEY, BASTARD
COUNTY : LANARK, LEEDS

WATERSHED AREA	: 478.90	sq.km	SHORELINE	: 172.00km.	
SURFACE AREA	: 4700	ha.	COTTAGES	: 1063+12 HOUSES	
MAX DEPTH	: 95.00	m.	RESORTS	: 12 (621)	
VOLUME	: 799.97	mill cu. m.	% CROWN LAND	: 5	

BRITON BAY HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1975 **	4.8	3.0
1977 *	3.3	2.0
1978	4.5	3.0
1979 *	4.2	3.3
1987	4.0	2.8
MEAN	4.2	2.8
MAX	4.8	3.3
MIN	3.3	2.0
N	5	5
SD	0.57	0.49

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

VARIOUS OPEN WATER LOCATIONS

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1971 **	3.8	2.9
1975 **	4.6	2.9
1976	4.1	3.4
1977	4.2	2.2
1978	4.5	3.0
1979	4.4	3.4
1980 *	3.7	4.7
1981 **	3.3	3.8
1983	2.9	4.7
1984	3.7	3.6
1985	3.7	3.1
1986	4.4	3.7
1987	3.5	3.6
MEAN	3.9	3.5
MAX	4.6	4.7
MIN	2.9	2.2
N	13	13
SD	0.51	0.70

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

BLACK LAKE

A total of ten samples collected from June 1 to September 28 provided good seasonal coverage of water quality conditions in Black Lake.

Chlorophyll concentrations were higher and water clarity poorer during the latter part of the season than the earlier part. This seasonal pattern of increasing productivity as the summer progresses was evident in Black Lake during 1986 as well, and is a characteristic shared by many other lakes enrolled in the Self Help Program, including nearby Pike Lake.

Although Secchi disc visibility was improved over that of 1986, chlorophyll concentrations were somewhat higher. Both the current year's results and the historical record indicate Black Lake has very good water clarity with only a moderate amount of algae. Based on these results the lake has good water quality from a recreational use point of view.

The Black Lake Association participated in a Shoreland Restoration program during 1987. The program involves the co-operation of cottagers in enhancing the lake environment by returning disturbed areas the shoreline to their natural state with cuttings of herbaceous shrubs native to the lake.

LAKE : BLACK LAKE
TWP : NORTH BURGESS
COUNTY : LANARK

ID NUMBER : 18-0033-026-01

WATERSHED AREA	: 67.1	sq.km	SHORELINE	: 20.1	km.
SURFACE AREA	: 3.42	ha.	COTTAGES	: 188	
MAX DEPTH	: 23.0	m.	RESORTS	: 1	
VOLUME	: 24.84	mill cu. m.	% CROWN LAND	: 0	

SOUTH WEST END OF LAKE

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
06/01/87	5.6	1.0
06/22/87	4.9	1.9
07/13/87	4.3	3.3
07/20/87	4.3	4.4
07/27/87	5.0	5.7
08/04/87	4.0	8.6
08/11/87	3.7	3.4
08/17/87	4.0	5.0
08/24/87	3.3	4.0
08/28/87	3.4	6.0
MEAN	4.2	4.3
MAX	5.6	8.6
MIN	3.3	1.0
N	10	10
SD	0.74	2.17

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1975 **	3.7	6.0
1980 *	3.3	5.7
1983 **	5.8	2.4
1985	4.8	3.3
1986	3.9	3.9
1987	4.2	4.3
MEAN	4.3	4.3
MAX	5.8	6.0
MIN	3.3	2.4
N	6	6
SD	0.90	1.39

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

BLACK DONALD LAKE

A total of ten samples were collected from July 5 to October 12. Chlorophyll concentrations were higher during September than at other times during the sampling period but water clarity did not decline as a result.

Although the absence of a spring peak in productivity cannot be confirmed without results for the months of May and June, the Secchi disc visibility and chlorophyll concentrations indicate Black Donald Lake has exceptionally clear water transparency and extremely low levels of algae.

Water clarity was higher and chlorophyll concentrations lower than those measured in the lake during 1986. The summer of 1987 was much drier than the weather experienced during the previous summer. It is believed that reduced amounts of surface runoff limited the supply of algae producing nutrients available to the lake over the growing season with a resulting improvement in water quality. Similarly low productivity was documented in Black Donald Lake during 1983 which was also a year with a dry summer period.

LAKE : BLACK DONALD LAKE
TWP : BROUGHAM
COUNTY : RENFREW

ID NUMBER : 18-3490-043-01

WATERSHED AREA	: 7393.00	sq.km	SHORELINE	:	km.
SURFACE AREA	: 1550.0	ha.	COTTAGES	: 103	
MAX DEPTH	: 44.00	m.	RESORTS	: 2(102)	
VOLUME	:	mill cu. m.	% CROWN LAND	: 20	

EAST BAY

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
07/05/87	5.5	1.1
07/11/87	5.5	1.0
08/01/87	5.8	1.1
08/27/87	6.1	1.4
09/07/87	5.2	2.5
09/13/87	6.1	3.3
09/20/87	5.8	3.0
10/12/87	5.5	1.3
MEAN	5.7	1.8
MAX	6.1	3.3
MIN	5.2	1.0
N	8	8
SD	0.32	0.94

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1978 **	4.2	3.3
1982 *	4.9	3.0
1983	5.6	1.7
1984	5.3	2.9
1985	5.7	1.7
1986	4.9	2.2
1987	5.7	1.8
MEAN	5.2	2.4
MAX	5.7	3.3
MIN	4.2	1.7
N	7	7
SD	0.56	0.68

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

BOBS LAKE

Bobs Lake is composed of a number of different basins and bays that act independently of one another from a water quality point of view. The best water clarity and the lowest chlorophyll concentrations were observed in Green Bay. The poorest water clarity and the highest chlorophyll concentrations were found in Mud Bay. The East Basin and Long Bay are intermediate between these extremes. This ranking of water quality among the basins is consistent with that of other years. The results indicate that the major basins of Bobs Lake are well suited for a variety of recreational uses including water based uses such as swimming and bathing.

The results for all sampling locations on Bobs Lake exemplified a pattern found in other lakes of improved water clarity and reduced chlorophyll concentrations compared to the 1986 results. The summer of 1987 was much drier than the weather experienced during the previous summer. It is believed that reduced amounts of surface runoff lowered the supply of algae producing nutrients to the lake over the growing season. Similarly low productivity was documented in Bobs Lake during 1983 which was also a year with a dry summer period.

LAKE : BOB'S LAKE : EAST BASIN
TWP : BEDFORD
COUNTY : FRONTENAC

ID NUMBER : 18-0033-010-01

WATERSHED AREA	: 351.32	sq.km	SHORELINE	: 66.00	km.
SURFACE AREA	: 927.0	ha.	COTTAGES	: 187	
MAX DEPTH	: 23.00	m.	RESORTS	: 3(33)	
VOLUME	: 88.57	mill cu. m.	% CROWN LAND	: 2	

EAST BASIN

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
06/01/87	4.6	0.9
06/15/87	4.6	2.1
07/05/87	4.3	2.8
07/20/87	4.3	1.9
08/04/87	4.4	5.0
08/17/87	4.3	3.2
08/31/87	4.1	4.3
09/08/87	4.3	4.4
MEAN	4.4	3.1
MAX	4.6	5.0
MIN	4.1	0.9
N	8	8
SD	0.17	1.42

EAST BASIN HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1972 **	4.1	5.6
1975 **	5.0	4.1
1981	3.6	4.1
1982	4.2	4.7
1983	3.3	2.4
1984 *	5.0	3.3
1985	4.5	4.6
1986	4.2	5.0
1987	4.4	3.1
MEAN	4.3	4.1
MAX	5.0	5.6
MIN	3.6	2.4
N	9	9
SD	0.47	1.01

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

LONG BAY OF EAST BASIN

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
07/10/87	4.6	1.5
07/28/87	4.7	2.1
08/09/87	4.6	1.0
08/30/87	3.8	5.1
MEAN	4.4	2.4
MAX	4.7	5.1
MIN	3.8	1.0
N	4	4
SD	0.42	1.84

LONG BAY HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1975 *	5.3	3.6
1981	3.9	4.7
1982	2.6	4.3
1983	2.2	4.2
1984	3.0	3.2
1985 *	2.8	5.1
1986 *	3.5	3.8
1987 *	4.4	2.4
MEAN	3.5	3.9
MAX	5.3	5.1
MIN	2.2	2.4
N	8	8
SD	1.03	0.86

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

LAKE : BOB'S LAKE : GREEN BAY ID NUMBER : 18-0033-011-01
TWP : BEDFORD
COUNTY : FRONTENAC

WATERSHED AREA	: 22.00	sq.km	SHORELINE	:	km.
SURFACE AREA	: 534.0	ha.	COTTAGES	: 106	
MAX DEPTH	: 26.00	m.	RESORTS	: 5 (54)	
VOLUME	:	mill cu. m.	% CROWN LAND	: 0	

GREEN BAY

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
04/27/87	3.6	1.4
05/21/87	4.0	1.6
06/10/87	4.3	0.7
06/25/87	7.3	0.2
07/12/87	5.5	1.3
07/23/87	5.2	0.8
08/07/87	4.9	1.2
08/20/87	5.5	2.2
09/02/87	5.5	2.4
09/15/87	4.6	1.5
MEAN	5.0	1.3
MAX	7.3	2.4
MIN	3.6	0.2
N	10	10
SD	1.04	0.67

GREEN BAY HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1972 **	4.9	3.3
1975 **	5.6	3.6
1978	6.0	2.7
1979 *	5.8	2.7
1980 *	5.3	5.0
1981 **	4.7	2.5
1982 *	2.8	2.5
1984 *	5.6	2.7
1985	5.8	1.8
1986	4.6	1.9
1987	5.0	1.3
MEAN	5.1	2.7
MAX	6.0	5.0
MIN	2.8	1.3
N	11	11
SD	0.90	1.00

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

LAKE : BOB'S LAKE : MUD BAY ID NUMBER : 18-0033-008-01
TWP : BEDFORD
COUNTY : FRONTENAC

WATERSHED AREA	: 6.11	sq.km	SHORELINE	: 0.00 km.
SURFACE AREA	: 202.0	ha.	COTTAGES	: 150+15 HOUSES
MAX DEPTH	: 7.30	m.	RESORTS	: 4 (62)
VOLUME	: 6.40	mill cu. m.	% CROWN LAND	: 20

MUD BAY

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
04/10/87	3.0	0.4
06/16/87	2.7	1.5
06/30/87	2.7	0.8
07/15/87	3.3	4.4
07/27/87	2.6	3.6
08/11/87	2.1	7.2
08/26/87	2.3	7.1
MEAN	2.7	3.6
MAX	3.3	7.2
MIN	2.1	0.4
N	7	7
SD	0.40	2.84

MUD BAY HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1975 **	4.0	7.6
1976	3.5	6.0
1977	3.8	3.8
1980	3.5	7.4
1981	2.9	6.0
1982	3.2	6.0
1983	2.8	4.1
1984	2.5	5.2
1985	3.1	5.5
1986	2.3	9.2
1987	2.7	3.6
MEAN	3.1	5.9
MAX	4.0	9.2
MIN	2.3	3.6
N	11	11
SD	0.54	1.72

NOTE : * Based on less then 5 readings.
** Recreational lakes included.

LAC DU BOIS DUR

A total of six samples were collected beginning on August 20 and finishing on October 1. Although summer conditions were not adequately assessed in the absence of samples from June and July, the results do indicate that Lac du Bois Dur has good water quality.

LAKE : BOIS DUR, LAC DU - PETAWAWA RIVER ID NUMBER : 18-4930-002-01
TWP : PETAWAWA
COUNTY : RENFREW

WATERSHED AREA	:	sq.km	SHORELINE	:	24.15 km.
SURFACE AREA	: 2.42	ha.	COTTAGES	:	22
MAX DEPTH	: 58.0	m.	RESORTS	:	
VOLUME	: 10.85	mill cu. m.	% CROWN LAND	:	

100 METRES OFF SOUTH SHORE

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
08/20/87	3.8	3.1
08/28/87	3.7	1.0
09/03/87	4.7	1.2
09/11/87	4.4	1.0
10/01/87	3.7	1.5
10/01/87	3.7	1.5
MEAN	4.0	1.6
MAX	4.7	3.1
MIN	3.7	1.0
N	6	6
SD	0.44	0.79

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1986 *	3.8	1.6
1987	4.0	1.6
MEAN	3.9	1.6
MAX	4.0	1.6
MIN	3.8	1.6
N	2	2
SD	0.14	0.00

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

BRULE (WENSLEY) LAKE

Ten sets of measurements were collected from June 21 to Sept 5 providing good seasonal coverage of water quality conditions in Brule Lake. Chlorophyll concentrations were higher during the three consecutive sampling dates in September than through out the rest of the season but water clarity declined only very slightly. The results indicate that Brule Lake has exceptionally clear water transparency with a very low amount of algae.

Water clarity was higher and chlorophyll concentrations lower than those measured in the lake during 1986. The summer of 1987 was much drier than the weather experienced during the previous summer. It is believed that reduced amounts of surface runoff limited the supply of algae producing nutrients available to the lake over the growing season with a resulting improvement in water quality. Similarly low productivity was documented in Brule lake during 1983 which was also a year with a dry summer period.

LAKE : BRULE (WENSLEY) LAKE
TWP : MILLER
COUNTY : FRONTENAC

ID NUMBER : 18-3490-010-01

WATERSHED AREA	: 52.79	sq.km	SHORELINE	: 26.60	km.
SURFACE AREA	: 571.0	ha.	COTTAGES	: 85	
MAX DEPTH	: 56.40	m.	RESORTS	: 2(3)	
VOLUME	: 126.65	mill cu. m.	% CROWN LAND	: 35	

CENTRE OF LAKE

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
06/21/87	7.6	1.3
06/21/87	7.6	0.7
07/12/87	7.6	0.7
07/12/87	7.6	1.1
07/29/87	7.6	1.1
08/12/87	7.5	0.4
08/13/87	7.8	0.8
09/03/87	7.6	1.8
09/04/87	7.5	1.3
09/05/87	7.5	1.6
MEAN	7.6	1.1
MAX	7.8	1.8
MIN	7.5	0.4
N	10	10
SD	0.09	0.44

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1976 **	7.7	2.9
1979	6.5	1.8
1980	6.8	2.1
1981	7.3	1.8
1982	7.5	1.4
1983	8.3	1.1
1984	6.6	2.2
1985	7.2	1.8
1986	7.7	1.6
1987	7.6	1.1
MEAN	7.3	1.8
MAX	8.3	2.9
MIN	6.5	1.1
N	10	10
SD	0.56	0.54

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

BUCK LAKE - NORTH BAY

An intensive sampling program running from April 11 to October 12, encompassing the entire growing season, provided excellent seasonal coverage of water quality conditions in the North Bay. The spring pulse and fall peak in chlorophyll concentrations characteristic of the North Bay in previous years was not as pronounced as it was in 1986 and overall the lake was less productive.

Water clarity was higher and chlorophyll concentrations lower than those measured in the lake during 1986. The summer of 1987 was much drier than the weather experienced during the previous summer. It is believed that reduced amounts of surface runoff limited the supply of algae producing nutrients available to the lake over the growing season with a resulting improvement in water quality. Similarly low productivity was documented in the North Bay during 1983 which was another year with a very dry summer period.

The Secchi disc visibility and chlorophyll concentration results indicate the North Bay has very good water quality well suited for a variety of recreational pursuits.

LAKE : BUCK LAKE : NORTH BAY — ID NUMBER : 12-0004-002-01
TWP : LOUGHBOROUGH, BEDFORD, STORRINGTON
COUNTY : FRONTENAC

WATERSHED AREA	: 19.16	sq.km	SHORELINE	: 15.00	km.
SURFACE AREA	: 276.0	ha.	COTTAGES	: 77 (1976)	
MAX DEPTH	: 32.00	m.	RESORTS	: 1 (25)	
VOLUME	: 27.78	mill cu. m.	% CROWN LAND	: 10	

NORTH BAY - NORTH END

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
04/11/87	3.6	2.1
04/17/87	3.2	2.1
05/10/87	3.8	1.4
07/12/87	4.3	2.8
07/19/87	3.7	2.7
07/24/87	3.7	2.8
07/30/87	4.0	2.4
08/03/87	4.3	3.2
08/08/87	4.4	2.1
08/10/87	5.3	1.3
08/13/87	4.9	1.6
08/15/87	5.0	1.4
08/18/87	4.6	2.0
08/25/87	4.3	3.9
09/01/87	4.3	3.6
09/07/87	4.1	3.9
09/27/87	4.2	5.2
10/01/87	4.8	4.5
10/11/87	4.9	4.0
MEAN	4.3	2.8
MAX	5.3	5.2
MIN	3.2	1.3
N	19	19
SD	0.55	1.14

NORTH BAY - SOUTH END

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
04/26/87	3.4	
05/31/87	5.3	2.1
06/21/87	4.9	1.2
07/01/87	5.3	0.6
07/12/87	3.7	3.6
07/19/87	3.5	4.1
08/03/87	4.0	3.5
09/06/87	4.1	2.6
10/12/87	3.9	4.3
MEAN	4.2	2.8
MAX	5.3	4.3
MIN	3.4	0.6
N	9	8
SD	0.74	1.36

NORTH AND SOUTH ENDS COMBINED

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1975 **	4.3	3.9
1976 *	3.2	5.2
1977	3.5	3.4
1978	3.9	4.9
1979	3.2	5.8
1980	3.8	4.6
1981	4.1	3.7
1982	3.9	3.1
1983	4.7	2.5
1984	3.9	4.8
1985	3.5	4.9
1986	3.8	5.0
1987	4.3	2.8
MEAN	3.9	4.2
MAX	4.7	5.8
MIN	3.2	2.5
N	13	13
SD	0.44	1.03

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

BUCK LAKE - SOUTH BAY

A total of 25 sets of measurements taken between April 12 and November 1, encompassing the entire growing season, provided excellent seasonal coverage of water quality conditions in the South Bay. Neither a spring pulse or fall peak in chlorophyll concentration was evident, perhaps because weekly variability obscured any seasonality in lake productivity.

As in previous years, water clarity was better and chlorophyll concentrations lower in the South Bay than in the North Bay of Buck Lake. The results indicate the South Bay has excellent water quality well suited for a variety of recreational uses.

Water clarity was higher and chlorophyll concentrations lower than those measured in the lake during 1986. The summer of 1987 was much drier than the weather experienced during the previous summer. It is believed that reduced amounts of surface runoff limited the supply of algae producing nutrients available to the lake over the growing season with a resulting improvement in water quality.

LAKE : BUCK LAKE : SOUTH BAY — ID NUMBER : 12-0004-004-01
TWP : LOUGHBOROUGH, BEDFORD, STORRINGTON
COUNTY : FRONTENAC

WATERSHED AREA	: 62.14	sq.km	SHORELINE	: 30.9	km.
SURFACE AREA	: 467.4	ha.	COTTAGES	: 181	(1976)
MAX DEPTH	: 39	m.	RESORTS	: 1(4)	
VOLUME	: 61.0	mill cu. m.	% CROWN LAND	: 0	

SOUTH BAY NEAR PORCUPINE ISLAND

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
04/12/87	4.3	1.9
04/26/87		1.3
05/19/87	3.9	5.1
06/06/87	5.1	3.0
06/14/87	4.6	1.7
06/21/87	5.4	2.7
06/27/87	5.0	0.6
07/10/87	5.3	0.5
07/13/87	4.9	1.4
07/20/87	4.7	1.6
07/26/87	5.6	2.0
08/03/87	5.2	2.8
08/06/87		2.1
08/10/87	5.1	2.6
08/17/87	4.9	2.1
08/23/87	5.0	1.9
09/07/87		2.5
09/13/87	6.3	2.3
09/20/87	5.7	3.8
09/27/87	5.7	2.7
10/04/87	6.4	4.0
10/11/87	5.2	2.8
10/19/87	5.7	3.6
10/25/87	5.5	3.8
11/01/87	5.1	3.9
MEAN	5.2	2.5
MAX	6.4	5.1
MIN	3.9	0.5
N	22	25
SD	0.58	1.10

SOUTH BAY - HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1975 **	4.3	3.9
1978	5.8	3.4
1979 **	4.3	6.4
1986	4.4	3.0
1987	5.2	2.5
MEAN	4.8	3.8
MAX	5.8	6.4
MIN	4.3	2.5
N	5	5
SD	0.67	1.52

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

BURRIDGE LAKE

A total of 19 sets of measurements collected from April 12 to October 29, encompassing the entire growing season, provided excellent seasonal coverage of water quality conditions in Burridge Lake.

A different volunteer looks after the sampling for each month of the program. The decline in water clarity as the season progresses observed in Burridge Lake in some previous years was not apparent during 1987. However, as there is an element of individual subjectivity in Secchi disc readings, caution must be applied in interpretation of water clarity results.

The water clarity and chlorophyll concentration results for 1987 are comparable with those of other years since 1980 and indicate Burridge Lake has very good water quality well suited for a variety of recreational uses.

LAKE : BURRIDGE LAKE
TWP : BEDFORD
COUNTY : FRONTENAC

ID NUMBER : 18-0033-014-01

WATERSHED AREA	: 4.53	sq.km	SHORELINE	: 6.90	km.
SURFACE AREA	: 81.0	ha.	COTTAGES	: 47 (1974)	
MAX DEPTH	: 16.20	m.	RESORTS	:	
VOLUME	: 5.89	mill cu. m.	% CROWN LAND	: 0	

CENTRE OF LAKE

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
05/08/87	4.8	
05/24/87	3.1	10.5
05/29/87	3.4	5.3
06/03/87	2.6	2.1
06/10/87	3.2	0.5
06/17/87	4.4	1.3
06/25/87	4.7	1.6
07/05/87	4.6	0.6
07/13/87	5.5	1.2
07/19/87	5.2	0.8
07/26/87	5.5	2.3
08/02/87	4.0	0.5
08/08/87	6.1	0.4
08/16/87	4.0	1.5
08/23/87	4.0	1.7
08/29/87	5.8	2.1
10/01/87	4.8	
10/15/87	4.9	
10/29/87	5.4	
MEAN	4.5	2.2
MAX	6.1	10.5
MIN	2.6	0.4
N	19	15
SD	0.98	2.60

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1980	4.5	3.6
1981	4.4	2.5
1982	4.7	1.1
1983 **	5.6	1.8
1984	4.1	3.0
1985	4.9	2.1
1986	4.6	2.6
1987	4.5	2.2
MEAN	4.7	2.4
MAX	5.6	3.6
MIN	4.1	1.1
N	8	8
SD	0.45	0.76

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

CASHEL LAKE

A total of 15 samples taken from April 29 to September 28, encompassing most of the active growing season, provided very good coverage of seasonal water quality conditions in Cashel Lake. Secchi disc visibility was lower and chlorophyll concentrations higher in September than at any other time during the season. A late summer increases in lake productivity is a widespread occurrence at this time of year and is due to an upwelling of nutrient laden water from the deeper regions of the lake which occurs with seasonal cooling of the water.

Water clarity was higher and chlorophyll concentrations lower than those measured in the lake during 1986. The summer of 1987 was much drier than the weather experienced during the previous summer. It is believed that reduced amounts of surface runoff limited the supply of algae producing nutrients available to the lake over the growing season with a resulting improvement in water quality.

The chlorophyll concentration and Secchi disc visibility data indicate Cashel Lake has very good water quality from a recreational use point of view.

LAKE : CASHEL LAKE
TWP : CASHEL
COUNTY : HASTINGS

ID NUMBER : 17-0021-002-01

WATERSHED AREA	: 28.59	sq.km	SHORELINE	: 10.2	km.
SURFACE AREA	: 168	ha.	COTTAGES	: 39	
MAX DEPTH	: 27.4	m.	RESORTS	: 0	
VOLUME	: 13.10	mill cu. m.	% CROWN LAND	: 82	

SOUTH END (AUG 23 & 29 NORTH END)

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
05/29/87	6.1	1.6
06/06/87	7.2	0.3
06/20/87	6.7	0.9
06/28/87	5.5	0.2
07/05/87	5.0	0.5
07/12/87	5.2	1.1
07/23/87	3.3	0.4
08/02/87	3.7	1.2
08/08/87	5.8	0.6
08/14/87	6.4	0.4
08/23/87	5.5	1.5
08/29/87	4.3	1.1
09/12/87	3.0	3.7
09/19/87	3.1	3.5
09/28/87	3.1	2.9
MEAN	4.9	1.3
MAX	7.2	3.7
MIN	3.0	0.2
N	15	15
SD	1.42	1.15

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1977 **	5.2	1.5
1980	5.8	2.1
1981	5.7	2.1
1985 **	4.4	1.6
1987	4.9	1.3
MEAN	5.2	1.7
MAX	5.8	2.1
MIN	4.4	1.3
N	5	5
SD	0.58	0.36

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

CHARLESTON LAKE

Three locations were sampled on eight occasions from July 12 to August 30. Water quality was generally better with greater Secchi disc visibility and lower chlorophyll concentrations at the end of the sampling period than at the beginning but the absence of a spring or fall peak in productivity cannot be confirmed.

Water clarity was higher and chlorophyll concentrations lower than those measured in the lake during 1986. The summer of 1987 was much drier than the weather experienced during the previous summer. It is believed that reduced amounts of surface runoff limited the supply of algae producing nutrients available to the lake over the growing season with a resulting improvement in water quality.

The three sampling locations, Websters Bay, Western Water and the vicinity of Goose Island all share similar water quality with good clarity and only moderate levels of algae. The water quality of Charleston Lake is well suited for a variety of recreational uses including water oriented uses such as swimming.

LAKE : CHARLESTON LAKE ID NUMBER : 12-0017-002-01
TWP : REAR OF LEEDS & LANSDOWNE, FRONT & REAR OF YONGE
COUNTY : LEEDS

WATERSHED AREA	: 300.00	sq.km	SHORELINE	:	152.00km.
SURFACE AREA	: 2517.0	ha.	COTTAGES	:	627 +63 HOUSES
MAX DEPTH	: 91.00	m.	RESORTS	:	3(40)+(227) PR
VOLUME	: 437.00	mill cu. m.	% CROWN LAND	:	20

NEAR GOOSE ISLAND

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
07/12/87	3.7	4.8
07/19/87	2.7	2.7
07/26/87	2.4	3.1
08/02/87	4.0	2.0
08/09/87	4.6	1.1
08/16/87	4.3	2.9
08/23/87	4.3	2.5
08/30/87	5.2	2.3
MEAN	3.9	2.7
MAX	5.2	4.8
MIN	2.4	1.1
N	8	8
SD	0.94	1.06

NEAR GOOSE ISLAND

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1978	3.9	2.9
1979	4.2	3.2
1980	4.2	3.4
1981	3.6	5.0
1982	4.1	3.4
1983	4.4	2.5
1984	3.4	3.3
1985	4.2	2.3
1986	3.5	3.9
1987	3.9	2.7
MEAN	3.9	3.3
MAX	4.4	5.0
MIN	3.4	2.3
N	10	10
SD	0.34	0.80

WEBSTERS BAY

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
07/12/87	3.3	5.2
07/19/87	2.4	5.0
07/26/87	2.7	3.2
08/02/87	3.7	2.0
08/09/87	4.0	1.6
08/16/87	3.7	2.3
08/23/87	4.3	2.9
08/30/87	4.9	3.2
MEAN	3.6	3.2
MAX	4.9	5.2
MIN	2.4	1.6
N	8	8
SD	0.82	1.32

WEBSTERS BAY

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1976	3.6	3.3
1978	3.9	3.4
1979	4.4	3.2
1980	4.4	3.9
1981	3.7	5.2
1982	4.4	3.8
1983	4.5	2.2
1984	3.5	2.9
1985	4.5	2.2
1986	3.4	3.6
1987	3.6	3.2
MEAN	4.0	3.4
MAX	4.5	5.2
MIN	3.4	2.2
N	11	11
SD	0.45	0.83

LAKE : CHARLESTON LAKE ID NUMBER : 12-0017-002-01
TWP : REAR OF LEEDS & LANSDOWNE, FRONT & REAR OF YONGE
COUNTY : LEEDS

WATERSHED AREA	: 300.00	sq.km	SHORELINE	: 152.00km.	
SURFACE AREA	: 2517.0	ha.	COTTAGES	: 627 +63 HOUSES	
MAX DEPTH	: 91.00	m.	RESORTS	: 3(40)+(227) PR	
VOLUME	: 437.00	mill cu. m.	% CROWN LAND	: 20	

WESTERN WATER

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
07/12/87	3.0	5.1
07/19/87	2.4	3.7
07/26/87	2.4	5.0
08/02/87	3.3	2.0
08/09/87	4.0	0.8
08/16/87	4.0	1.8
08/23/87	5.2	2.6
08/30/87	4.9	2.9
MEAN	3.7	3.0
MAX	5.2	5.1
MIN	2.4	0.8
N	8	8
SD	1.06	1.53

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1971 **	3.2	3.9
1978	4.0	3.0
1979	4.5	4.7
1980	4.3	4.2
1981	3.8	5.6
1982	4.5	3.9
1983	4.8	2.9
1984	3.3	2.7
1985	4.6	2.1
1986	3.5	4.0
1987	3.7	3.0
MEAN	4.0	3.6
MAX	4.8	5.6
MIN	3.2	2.1
N	11	11
SD	0.55	1.01

NOTE : + Based on less then 6 readings.
** Recreational lakes included.

CHIPPEGO LAKE

A good sampling program was carried out with a total of 11 samples collected from June 1 to October 25. No seasonal pattern in the results was discernable.

Water clarity was higher and chlorophyll concentrations lower than those measured in the lake during 1986. The summer of 1987 was much drier than the weather experienced during the previous summer. It is believed that reduced amounts of surface runoff limited the supply of algae producing nutrients available to the lake over the growing season with a resulting improvement in water quality. Similarly low productivity was documented in the lake during 1983 which was also a year with a dry summer period.

The results indicate Chippego Lake has good water quality for recreational use purposes including water based activities such as swimming and bathing.

LAKE : CHIPPEGO LAKE
TWP : HINCHINBROOKE
COUNTY : FRONTENAC

ID NUMBER : 17-0035-002-01

WATERSHED AREA	: 11.90	sq.km	SHORELINE	: 7.90	km.
SURFACE AREA	: 103.0	ha.	COTTAGES	: 57 (1983)	
MAX DEPTH	: 8.30	m.	RESORTS	: 1	
VOLUME	: 6.85	mill cu. m.	% CROWN LAND	: 0	

CENTRE OF SOUTH END OF LAKE

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
06/01/87	3.0	3.3
06/15/87	3.2	3.7
07/05/87	3.7	4.4
07/19/87	3.2	3.6
07/28/87	3.5	1.6
08/08/87	3.3	4.1
09/04/87	3.7	3.0
09/16/87	3.7	4.4
09/28/87	3.5	3.8
10/12/87	3.5	4.3
10/25/87	2.9	3.7
MEAN	3.4	3.6
MAX	3.7	4.4
MIN	2.9	1.6
N	11	11
SD	0.28	0.81

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1979	3.1	6.0
1980	3.1	7.8
1981	3.2	5.6
1982	3.1	4.1
1983 ++	3.2	3.9
1984	3.3	5.2
1985	3.6	6.1
1986	3.2	5.9
1987	3.4	3.6
MEAN	3.2	5.4
MAX	3.6	7.8
MIN	3.1	3.6
N	9	9
SD	0.17	1.33

NOTE : * Based on less then 6 readings.
++ Recreational lakes included.

CHRISTIE LAKE

A thorough sampling program was carried out with a total of 13 samples collected from May 17 to September 27. Water clarity was good and chlorophyll concentrations low indicating very good water quality until the end of August. In September extremely high chlorophyll concentrations resulted in much reduced Secchi disc visibility. This same pattern of events was observed during 1986 and previous years for Christie Lake. The reason for this late season peak in productivity is not known but may relate to phosphorus recycling from bottom waters.

A clam mortality was reported again this year but the die off was of shorter duration and involved fewer numbers than a mortality that occurred in 1986.

The Christie Lake Association is a participant in the Lake Shoreland Restoration Program. The program involves cottagers in enhancing the lake environment by returning disturbed areas of lakeshore to their natural condition with cuttings of plants native to the lake.

LAKE : CHRISTIE LAKE
TWP : SHERBROOKE, BATHURST
COUNTY : LANARK

ID NUMBER : 18-0033-015-01

WATERSHED AREA	: 416	sq.km	SHORELINE	: 27.4	km.
SURFACE AREA	: 646	ha.	COTTAGES	: 265	
MAX DEPTH	: 18.3	m.	RESORTS	: 5 (20)	
VOLUME	: 55.17	mill cu. m.	% CROWN LAND	: 0	

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
05/17/87	5.5	1.1
05/24/87	5.5	1.3
05/31/87	5.2	0.8
06/13/87	4.9	1.9
06/20/87	4.6	1.3
06/28/87	4.6	0.7
07/04/87	4.6	2.0
07/11/87	5.2	2.2
07/19/87	4.3	2.2
07/26/87	4.3	3.9
08/29/87	3.1	6.6
09/06/87	2.7	12.0
09/27/87	2.1	22.0
MEAN	4.4	4.5
MAX	5.5	22.0
MIN	2.1	0.7
N	13	13
SD	1.08	6.13

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1971	7.6	0.8
1975 **	4.5	4.7
1976	4.8	4.2
1977	4.4	5.8
1978	4.8	4.2
1979	4.4	6.1
1980	4.7	5.0
1981	3.4	4.8
1982	4.2	2.9
1985	4.6	5.3
1986	4.6	4.2
1987	4.4	4.5
MEAN	4.7	4.4
MAX	7.6	6.1
MIN	3.4	0.8
N	12	12
SD	0.99	1.41

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

CLEAR LAKE

A good sampling program was carried out with a total of nine samples collected from June 27 to August 30. Chlorophyll concentrations increased and water clarity declined as the summer progressed but other seasonal variations in productivity cannot be confirmed without of spring and fall results.

Although the absence of a spring or fall peak in lake productivity cannot be confirmed, the data collected indicate Clear Lake has very good water clarity and very low chlorophyll concentrations. Although the amount of algae in the water in Clear Lake is very low, cottagers have observed increasing amounts of algae attached to rocks and other substrates on the lake bottom.

LAKE : CLEAR, LAKE
TWP : SEBASTOPOL
COUNTY : RENFREW

ID NUMBER : 18-3690-001-01

WATERSHED AREA	: 94.32	sq.km	SHORELINE	: 31.5	km.
SURFACE AREA	: 1730	ha.	COTTAGES	: 242	
MAX DEPTH	: 42.7	m.	RESORTS	: 2 (161)	
VOLUME	: 193.04	mill cu. m.	% CROWN LAND	: 0	

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
06/27/87	6.1	0.7
07/05/87	6.6	1.5
07/11/87	5.0	0.9
07/23/87	3.3	0.8
08/01/87	3.7	2.1
08/09/87	3.0	1.1
08/16/87	2.9	2.1
08/22/87	2.8	2.2
08/30/87	3.7	2.6
MEAN	4.1	1.6
MAX	6.6	2.6
MIN	2.8	0.7
N	9	9
SD	1.43	0.71

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1976 ++	4.7	2.7
1977 ++	3.7	2.9
1978 ++	3.8	3.4
1979	4.1	2.5
1980	4.2	3.6
1981	3.0	2.2
1985 ++	3.4	2.9
1987	4.1	1.6
MEAN	3.9	2.7
MAX	4.7	3.6
MIN	3.0	1.6
N	8	8
SD	0.52	0.64

NOTE : + Based on less then 6 readings.
++ Recreational lakes included.

CROSBY (BIG CROSBY) LAKE

A total of 12 samples collected from May 24 to November 11, encompassing practically the entire growing season, provided good seasonal coverage of water quality conditions in Crosby Lake. Chlorophyll concentrations increased while water clarity declined as the summer progressed. This pattern of seasonally increasing productivity as the summer progresses was evident in Crosby Lake during 1986 as well, and is a characteristic of other lakes enrolled in the Self Help Program including nearby Pike and Black Lakes. Nevertheless, Crosby Lake has very good water clarity. Chlorophyll concentrations were never of a magnitude to interfere with recreational use of the lake at any time during the year.

Water clarity was higher and chlorophyll concentrations lower than those measured in the lake during 1986. The summer of 1987 was much drier than the weather experienced during the previous summer. It is believed that reduced amounts of surface runoff limited the supply of algae producing nutrients available to the lake over the growing season with a resulting improvement in water quality. Similarly low productivity was documented in the lake during 1983 which was another year with a dry summer period.

LAKE : CROSBY (BIG CROSBY) LAKE ID NUMBER : 18-0033-016-01
TWP : NORTH CROSBY
COUNTY : LEEDS

WATERSHED AREA	: 26.60	sq.km	SHORELINE	: 17.70	km.
SURFACE AREA	: 263.0	ha.	COTTAGES	: 158	(1974)
MAX DEPTH	: 19.00	m.	RESORTS	: 0	
VOLUME	: 21.68	mill cu. m.	% CROWN LAND	: 0	

CENTRE OF LAKE

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
05/24/87	5.5	0.9
06/07/87	4.3	0.7
06/21/87	4.3	1.7
06/28/87	4.0	1.1
07/05/87	4.9	2.8
07/19/87	4.0	1.0
08/03/87	4.0	2.0
08/16/87	3.8	4.4
08/30/87	3.8	6.5
09/07/87	4.0	4.9
09/27/87	4.0	5.3
11/10/87	3.9	1.7
MEAN	4.2	2.8
MAX	5.5	6.5
MIN	3.8	0.7
N	12	12
SD	0.51	2.00

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1974 **	3.7	5.0
1975 **	4.1	5.4
1979 *	3.4	7.1
1980	4.0	3.9
1981	4.4	3.8
1982	4.2	3.2
1983	4.0	2.2
1984	4.5	2.7
1985	4.3	3.9
1986	3.5	6.3
1987	4.2	2.8
MEAN	4.0	4.2
MAX	4.5	7.1
MIN	3.4	2.2
N	11	11
SD	0.36	1.56

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

CROW LAKE

A comprehensive sampling effort was carried out with a total of fourteen samples from May 31 to September 2. This program provided good seasonal coverage of water quality conditions in Crow Lake.

Secchi disc visibility was less and chlorophyll concentrations higher for the initial three sampling dates than they were for the rest of the sampling period but otherwise no seasonal pattern was discernable. The results indicate Crow Lake has very good water quality well suited for all forms of water based recreation including swimming.

Water clarity was higher and chlorophyll concentrations lower than those measured in the lake during 1986. The summer of 1987 was much drier than the weather experienced during the previous summer. It is believed that reduced amounts of surface runoff limited the supply of algae producing nutrients available to the lake over the growing season with a resulting improvement in water quality.

LAKE : CROW LAKE
TWP : OSO, BEDFORD
COUNTY : FRONTENAC

ID NUMBER : 18-0033-017-01

WATERSHED AREA	: 49	sq.km	SHORELINE	: 17	km.
SURFACE AREA	: 436	ha.	COTTAGES	: 95 (1972)	
MAX DEPTH	: 38	m.	RESORTS	: 7 (53)	
VOLUME	: 63.38	mill cu. m.	% CROWN LAND	: 5	

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
05/31/87	3.2	4.1
06/07/87	3.4	3.4
06/14/87	3.7	2.6
06/21/87	5.5	1.4
07/05/87	5.5	2.3
07/12/87	4.0	1.5
07/20/87	5.2	1.6
07/28/87	6.1	1.7
08/05/87	5.2	2.3
08/12/87	5.1	0.8
08/23/87	5.2	0.2
09/01/87	5.5	1.5
09/13/87	6.1	2.8
09/27/87	5.2	1.6
MEAN	5.0	2.0
MAX	6.1	4.1
MIN	3.2	0.2
N	14	14
SD	1.00	1.02

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1972 **	4.4	3.8
1975 **	5.7	4.7
1977	4.8	3.3
1978 *	5.9	4.2
1980 *	4.1	5.2
1981 **	4.3	2.5
1982	5.2	3.2
1986	4.7	2.6
1987	5.0	2.0
MEAN	4.9	3.5
MAX	5.9	5.2
MIN	4.1	2.0
N	9	9
SD	0.62	1.07

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

CROWE LAKE

Seven samples collected from July 5 to September 13. Although the presence or absence of a spring peak in productivity cannot be confirmed without results for the months of May and June, the data indicate Crowe Lake has very low levels of algae with satisfactory water quality for all forms of water based recreational activity. An apparent decline in water clarity from 1977 to 1978 occurred when sampling changed hands and is probably a result of subjective differences between individuals in interpreting Secchi disc visibility.

Water clarity was higher and chlorophyll concentrations lower than those measured in the lake during 1986. The summer of 1987 was much drier than the weather experienced during the previous summer. It is believed that reduced amounts of surface runoff limited the supply of algae producing nutrients available to the lake over the growing season with a resulting improvement in water quality. Similarly low productivity was documented in Crowe Lake during 1983 which was also a year with a dry summer period.

LAKE : CROWE LAKE
TWP : MARMORA
COUNTY : HASTINGS

ID NUMBER : 17-0021-003-01

WATERSHED AREA	: 1444.00	sq.km	SHORELINE	: 21.00	km.
SURFACE AREA	: 876.0	ha.	COTTAGES	: 328	
MAX DEPTH	: 15.80	m.	RESORTS	: 6 (548)	
VOLUME	: 49.38	mill cu. m.	% CROWN LAND	: 0	

REGULAR LOCATION

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
07/05/87	2.9	1.5
07/19/87	2.4	2.3
07/26/87	2.7	1.6
08/03/87	2.7	1.2
08/16/87	2.4	2.0
08/30/87	2.6	3.3
09/13/87	2.4	1.2
MEAN	2.6	1.9
MAX	2.9	3.3
MIN	2.4	1.2
N	7	7
SD	0.20	0.75

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1972 **	3.8	2.5
1974	4.7	1.8
1975 *	4.7	4.1
1976	4.7	5.0
1977 *	3.9	4.5
1978	2.4	3.2
1979	2.5	5.0
1980	3.0	5.0
1981	2.9	3.0
1982	3.2	2.4
1983	2.9	2.4
1984 *	2.7	4.8
1985	2.5	4.1
1986	2.4	3.5
1987	2.6	1.9
MEAN	3.3	3.6
MAX	4.7	5.0
MIN	2.4	1.8
N	15	15
SD	0.87	1.18

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

DALHOUSIE LAKE

Eight samples collected from July 22 to September 7. Although the presence or absence of a spring peak in lake productivity cannot be confirmed without samples for the months of May and June, the results indicate Dalhousie Lake has good water clarity and low levels of algae.

Water clarity was higher and chlorophyll concentrations lower than those measured in the lake during 1986. The summer of 1987 was much drier than the weather experienced during the previous summer. It is believed that reduced amounts of surface runoff limited the supply of algae producing nutrients available to the lake over the growing season with a resulting improvement in water quality. Similarly low productivity was documented in Dalhousie during 1983 which was also a year with a dry summer period.

LAKE : DALHOUSIE LAKE
TWP : DALHOUSIE
COUNTY : LANARK

ID NUMBER : 18-3430-009-01

WATERSHED AREA	: 1288.00	sq.km	SHORELINE	: 13.50	km.
SURFACE AREA	: 591.0	ha.	COTTAGES	: 184 + 8	HOUSES
MAX DEPTH	: 13.41	m.	RESORTS	: 4 (73)	
VOLUME	: 43.22	mill cu. m.	% CROWN LAND	: 0	

BROWN'S BAY

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
07/22/87	3.7	3.6
07/28/87	4.0	2.5
08/04/87	3.7	1.6
08/10/87	3.7	1.7
08/17/87	3.3	2.5
08/26/87	3.0	3.3
08/31/87	2.7	3.4
09/07/87	3.4	4.0
MEAN	3.4	2.8
MAX	4.0	4.0
MIN	2.7	1.6
N	8	8
SD	0.43	0.89

VARIOUS OPEN WATER LOCATIONS

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1975 **	3.6	5.1
1976	3.9	3.4
1977	4.1	2.4
1978	4.6	2.1
1979	3.5	3.0
1980 **	4.4	3.6
1981	5.1	2.0
1982	4.6	2.7
1983 *	4.8	1.2
1986	2.8	3.2
1987	3.4	2.3
MEAN	4.1	2.9
MAX	5.1	5.1
MIN	2.8	1.2
N	11	11
SD	0.70	1.02

NOTE : * Based on less then 5 readings.
** Recreational lakes included.

DAVERN LAKE

A total of eleven samples collected from May 26 to September 18 provided good seasonal coverage of water quality conditions in Davern Lake. A singularly high chlorophyll concentration of 5.1 ug/l was recorded for the first sample collected but there was no seasonal pattern discernable in water quality.

The results indicate Davern Lake has excellent water quality with low very levels of algae present in the lake.

No change in water quality was observed compared to 1986 results. Most other lakes experienced less productivity during 1987.

LAKE : DAVERN LAKE
TWP : SOUTH SHERBROOKE
COUNTY : LANARK

ID NUMBER : 18-0033-033-01

WATERSHED AREA	: 2.40	sq.km	SHORELINE	: 4.10	km.
SURFACE AREA	: 52.0	ha.	COTTAGES	: 17	
MAX DEPTH	: 25.10	m.	RESORTS	: 1 (15)	
VOLUME	: 6.01	mill cu. m.	% CROWN LAND	: 0	

VARIOUS LOCATIONS AROUND THE LAKE

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
05/26/87	5.2	5.1
06/16/87	5.2	1.4
07/05/87	7.9	1.9
07/12/87	5.5	2.1
07/19/87	5.5	1.9
07/26/87	5.2	2.5
08/07/87	4.9	1.0
08/18/87	5.2	1.7
08/30/87	5.0	1.8
09/07/87	4.9	1.2
09/18/87	4.9	1.6
MEAN	5.4	2.0
MAX	7.9	5.1
MIN	4.9	1.0
N	11	11
SD	0.86	1.10

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1980 **	5.1	1.7
1981 **	5.0	2.9
1982	5.0	1.7
1983	5.7	2.0
1984	5.2	2.5
1985	5.7	1.6
1986	5.4	2.0
1987	5.4	2.0
MEAN	5.3	2.1
MAX	5.7	2.9
MIN	5.0	1.6
N	8	8
SD	0.29	0.45

NOTE : * Based on less than 3 readings.
** Recreational lakes included.

DEMPSEYS (VIRGIN) LAKE

Once monthly sampling from April to September provided good seasonal coverage but more frequent sampling would have provided a better picture of water quality conditions. The results indicate Dempseys Lake has very good water clarity with very low levels of algae present in the water.

Chlorophyll concentrations were lower than those recorded in previous years but there was no corresponding increase in water clarity. The summer of 1987 was much drier than the weather experienced during the previous summer. It is believed that reduced amounts of surface runoff limited the supply of algae producing nutrients available to the lake over the growing season with a resulting improvement in water quality. Similarly low productivity was documented in Dempseys Lake during 1983 which was also a year with a dry summer period.

LAKE : DEMPSEYS (VIRGIN) LAKE ID NUMBER : 18-3490-014-01
TWP : BAGOT, BLYTHFIELD
COUNTY : RENFREW

WATERSHED AREA	: 13.80	sq.km	SHORELINE	:	km.
SURFACE AREA	: 46.0	ha.	COTTAGES	:	
MAX DEPTH	:	m.	RESORTS	:	
VOLUME	:	mill cu. m.	% CROWN LAND	: 35	

MIDWAY BETWEEN POINT AND ISLAND

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
04/26/87	4.1	0.5
05/19/87	4.6	1.5
06/23/87	5.3	1.6
07/28/87	4.7	3.9
08/26/87	5.0	3.9
09/28/87	4.8	1.4
MEAN	4.8	2.1
MAX	5.3	3.9
MIN	4.1	0.5
N	6	6
SD	0.41	1.42

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1980	4.2	3.6
1982	5.5	1.8
1983	5.7	2.0
1984	5.0	3.6
1985	5.3	2.5
1986	5.5	2.5
1987	4.8	2.1
MEAN	5.1	2.6
MAX	5.7	3.6
MIN	4.2	1.8
N	7	7
SD	0.52	0.74

DESERT LAKE

A total of 12 samples collected from each of South Bay and Deyos Bay from June 7 to September to October 4 provided good seasonal coverage of water quality conditions in Desert Lake.

Secchi disc visibility recorded for Deyos Bay was greater than that recorded for South Bay. The chlorophyll concentrations, however, are comparable indicating that there was no significant difference in water quality between the two locations. The apparent discrepancy in water clarity is likely a result of a subjective difference between individuals in reading the Secchi disc visibility depth.

The results indicate Desert Lake has very good water quality with no evidence of any deterioration over the period of record.

Water clarity was higher and chlorophyll concentrations lower than those measured in the lake during 1986. The summer of 1987 was much drier than the weather experienced during the previous summer. It is believed that reduced amounts of surface runoff limited the supply of algae producing nutrients available to the lake over the growing season with a resulting improvement in water quality. Similarly low productivity was documented in Desert Lake during 1983 which was also a year with a dry summer period.

LAKE : DESERT LAKE
TWP : BEDFORD, LOUGHBOROUGH
COUNTY : FRONTENAC

ID NUMBER : 12-0004-009-01

WATERSHED AREA	: 97.00	sq.km	SHORELINE	: 28.00	km.
SURFACE AREA	: 382.0	ha.	COTTAGES	: 71 (1976)	
MAX DEPTH	: 68.00	m.	RESORTS	: 3 (95)	
VOLUME	: 85.50	mill cu. m.	% CROWN LAND	: 0	

DEYOS BAY

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
06/07/87	3.9	3.3
06/13/87	4.3	3.3
06/21/87	4.0	1.8
07/05/87	4.9	2.1
07/12/87	5.5	1.9
08/09/87	4.3	3.2
08/16/87	4.6	2.2
08/23/87	5.2	3.2
08/30/87	5.2	2.8
09/13/87	5.4	2.5
09/21/87	5.5	3.0
10/04/87	5.8	2.9
MEAN	4.9	2.7
MAX	5.8	3.3
MIN	3.9	1.8
N	12	12
SD	0.65	0.56

SOUTH BAY

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
06/07/87	3.4	4.0
06/24/87	3.7	2.4
07/01/87	4.4	1.4
07/08/87	4.6	2.5
07/15/87	4.0	3.0
07/29/87	4.0	1.8
08/05/87	4.1	1.5
08/13/87	4.2	2.5
08/18/87	4.1	2.8
08/27/87	4.1	3.2
09/09/87	4.1	2.4
09/15/87	4.2	2.7
MEAN	4.1	2.5
MAX	4.6	4.0
MIN	3.4	1.4
N	12	12
SD	0.31	0.73

VARIOUS OPEN WATER LOCATIONS

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1975 **	5.9	3.9
1977	4.9	2.5
1978	5.5	2.5
1979	4.5	3.0
1980	4.6	3.4
1981	4.6	3.4
1982	4.9	2.0
1983	5.2	2.1
1984	5.0	3.3
1985	4.4	3.0
1986	4.5	2.9
1987	4.5	2.6
MEAN	4.9	2.9
MAX	5.9	3.9
MIN	4.4	2.0
N	12	12
SD	0.46	0.57

NOTE : * Based on less then 6 readings.

DEVIL LAKE

Six samples collected from mid June to the end of September from each of Buce Bay and Hays Bay provided good seasonal coverage but more frequent sampling would provide a better picture of water quality conditions. As in previous years chlorophyll concentrations were higher during the latter part of the season than during the earlier part.

The results from both locations indicate Devil Lake has excellent water clarity with very low levels of algae present in the water.

Devil Lake is relatively uninfluenced by local runoff as water clarity did not deteriorate during the extremely wet summer experienced in 1986 or improve during the drier weather experienced in 1987 as happened in other nearby smaller lakes.

LAKE : DEVIL LAKE
TWP : BEDFORD
COUNTY : FRONTENAC

ID NUMBER : 12-0004-010-01

WATERSHED AREA	: 174.00	sq.km	SHORELINE	: 36.20 km.	
SURFACE AREA	: 1061.0	ha.	COTTAGES	: 220 + 3 HOUSES	
MAX DEPTH	: 45.00	m.	RESORTS	: 4 (51)	
VOLUME	: 152.39	mill cu. m.	% CROWN LAND	: 20	

BUCE BAY

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
06/15/87	4.6	1.9
07/07/87	5.3	1.2
07/19/87	5.2	1.3
08/03/87	4.9	3.0
08/30/87	4.7	2.9
09/27/87	5.1	3.4
MEAN	5.0	2.3
MAX	5.3	3.4
MIN	4.6	1.2
N	6	6
SD	0.28	0.94

HAYS BAY

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
06/15/87	4.5	2.1
07/07/87	5.0	1.3
07/19/87	5.0	1.7
08/03/87	4.6	3.1
08/30/87	4.7	2.8
09/27/87	5.1	3.0
MEAN	4.8	2.3
MAX	5.1	3.1
MIN	4.5	1.3
N	6	6
SD	0.25	0.75

VARIOUS OPEN WATER LOCATIONS

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1974 **	5.6	2.4
1975 **	6.1	3.2
1976	5.2	2.2
1977	4.8	2.5
1978	5.3	2.9
1979	4.5	2.7
1980 *	4.6	2.7
1981 **	5.3	3.4
1982	5.7	2.7
1983	5.7	2.2
1984	5.2	3.3
1985	5.5	2.3
1986	5.2	2.3
1987	4.9	2.3
MEAN	5.3	2.6
MAX	6.1	3.4
MIN	4.5	2.2
N	14	14
SD	0.45	0.42

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

DIAMOND LAKE

A total of nine samples collected between the middle of June and the beginning of October provided good seasonal coverage of water quality conditions in Diamond Lake. Chlorophyll concentrations were slightly higher at the last two sampling visits than they were previously during the season but no clear cut seasonal pattern was discernable.

The results indicate Diamond Lake has very good water clarity with very low levels of algae present in the water.

Although Secchi disc visibility was not improved over that of 1986 chlorophyll concentrations were lower. The summer of 1987 was much drier than the weather experienced during the previous summer. It is believed that reduced amounts of surface runoff limited the supply of algae producing nutrients available to the lake over the growing season with a resulting improvement in water quality. Similarly low productivity was documented in Diamond Lake during 1983 which was also a year with a dry summer period.

LAKE : DIAMOND LAKE
TWP : HERSHEL
COUNTY : HASTINGS

ID NUMBER : 18-3490-015-01

WATERSHED AREA	: 32.70	sq.km	SHORELINE	: 10.00 km.
SURFACE AREA	: 150.0	ha.	COTTAGES	: 65 + 16 HOUSES
MAX DEPTH	: 23.80	m.	RESORTS	: 1 (6)
VOLUME	: 12.48	mill cu. m.	% CROWN LAND	: 60

ACROSS FROM CLIFFS AT 15 M DEPTH

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
06/13/87	4.9	1.6
07/16/87		0.9
07/21/87	4.9	1.7
07/25/87	4.9	1.4
08/03/87	4.9	1.4
08/18/87	4.9	1.5
08/29/87	5.2	1.5
09/27/87	4.9	2.1
10/03/87	4.6	2.7
MEAN	4.9	1.6
MAX	5.2	2.7
MIN	4.6	0.9
N	8	9
SD	0.16	0.51

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1977 ++	5.4	1.7
1978	5.1	1.5
1979 +	4.9	2.0
1980	4.3	2.0
1981	5.3	1.5
1982 +	5.2	1.8
1983 ++	5.9	1.5
1984 ++	5.1	2.1
1985 ++	5.5	2.5
1986	5.1	2.4
1987	4.9	1.6
MEAN	5.2	1.9
MAX	5.9	2.5
MIN	4.3	1.5
N	11	11
SD	0.41	0.36

NOTE : + Based on less then 6 readings.
++ Recreational lakes included.

DICKEY LAKE

A total of 14 samples collected from each of the north and south basins between April 20 and September 7 provided excellent seasonal coverage of water quality conditions in Dickey Lake. Analysis of the two samples collected in April was considerably delayed beyond the date of sampling and degradation of the chlorophyll pigment may have occurred. Therefore the extremely low results recorded should be viewed with some caution.

As in previous years the deeper south basin was less productive than the smaller north basin of Dickey Lake. The results for both basins indicate Dickey Lake has good water clarity with very little algae present in its water.

Water clarity was higher and chlorophyll concentrations lower than those measured in the lake during 1986. The summer of 1987 was much drier than the weather experienced during the previous summer. It is believed that reduced amounts of surface runoff limited the supply of algae producing nutrients available to the lake over the growing season with a resulting improvement in water quality. Similarly low productivity was documented in Dickey Lake during 1983 which was also a year with a dry summer period.

LAKE : DICKEY LAKE : NORTH BASIN ID NUMBER : 17-0021-004-01
TWP : LAKE
COUNTY : HASTINGS

WATERSHED AREA	: 49.00	sq.km	SHORELINE	: 4.59	km.
SURFACE AREA	: 54.0	ha.	COTTAGES	: 73	
MAX DEPTH	: 12.20	m.	RESORTS	: 0	
VOLUME	: 9.69	mill cu. m.	% CROWN LAND	: 0	

NORTH BASIN

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
04/20/87	3.8	0.2
04/26/87	3.4	0.8
05/18/87	2.9	2.5
06/15/87	3.2	2.4
07/06/87	3.4	2.1
07/13/87	4.4	2.3
07/20/87	3.7	2.6
07/27/87	3.9	2.1
08/03/87	4.3	2.4
08/10/87	4.6	2.5
08/17/87	4.2	1.6
08/27/87	4.2	2.3
09/01/87	4.0	1.4
09/07/87	4.6	2.2
MEAN	3.9	2.0
MAX	4.6	2.6
MIN	2.9	0.2
N	14	14
SD	0.53	0.71

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1971 *	4.4	1.5
1972	4.3	2.1
1973	4.3	2.2
1976 **	5.0	1.7
1980 **	4.5	2.0
1981	5.2	2.0
1982	4.6	1.8
1983	4.2	1.7
1984 *	4.8	2.9
1985	4.1	2.0
1986	3.6	2.2
1987	3.9	2.0
MEAN	4.4	2.0
MAX	5.2	2.9
MIN	3.6	1.8
N	12	12
SD	0.45	0.35

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

LAKE : DICKEY LAKE : SOUTH BASIN ID NUMBER : 17-0021-005-01
TWP : LAKE
COUNTY : HASTINGS

WATERSHED AREA	: 5.46	sq.km	SHORELINE	: 12.55	km.
SURFACE AREA	: 149.0	ha.	COTTAGES	: 24	
MAX DEPTH	: 46.30	m.	RESORTS	: 0	
VOLUME	: 26.74	mill cu. m.	% CROWN LAND	: 0	

SOUTH BASIN

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
04/20/87	3.6	0.6
04/26/87	3.8	0.6
05/18/87	3.7	2.3
06/15/87	3.4	1.8
07/06/87	4.3	1.9
07/13/87	4.3	2.8
07/20/87	3.6	1.5
07/27/87	4.5	1.8
08/03/87	4.5	1.7
08/10/87	4.2	1.1
08/17/87	4.6	1.7
08/27/87	5.3	2.7
09/01/87	5.0	2.4
09/07/87	5.3	2.2
MEAN	4.3	1.8
MAX	5.3	2.8
MIN	3.4	0.6
N	14	14
SD	0.62	0.68

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1971 *	4.1	2.2
1972	4.5	2.0
1973	4.8	1.7
1976 **	5.2	1.5
1980	5.1	2.0
1981	5.4	1.8
1982	5.2	1.8
1983	4.5	1.2
1984	5.0	2.9
1985	4.6	1.9
1986	4.2	2.1
1987	4.3	1.8
MEAN	4.7	1.9
MAX	5.4	2.9
MIN	4.1	1.2
N	12	12
SD	0.44	0.41

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

DOG LAKE

Insufficient sampling was carried out during 1987 to reach any definite conclusions about Dog Lake or make comparisons with other years. A minimum of six sets of measurements are necessary to adequately characterize water quality of a lake. Preferably 12 or more measurements evenly timed throughout the ice free season of the year from May to October should be taken to define any seasonal trends in water quality if they are present

Previous data indicate high chlorophyll concentrations in some years result in poor water clarity in Dog Lake

LAKE : DOG LAKE : NORTH BASIN ID NUMBER : 12-0004-011-01
TWP : STORRINGTON
COUNTY : FRONTENAC

WATERSHED AREA	: 62.00	sq.km	SHORELINE	: 23.00	km.
SURFACE AREA	: 471.0	ha.	COTTAGES	: 105	
MAX DEPTH	: 49.70	m.	RESORTS	: 2 (78)	
VOLUME	: 39.90	mill cu. m.	% CROWN LAND	: 0	

NEAR ST.HELENA ISLAND

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
06/10/87	3.0	1.4
06/17/87	3.0	5.5
06/24/87	2.7	8.2
08/12/87	1.8	19.0
MEAN	2.6	8.5
MAX	3.0	19.0
MIN	1.8	1.4
N	4	4
SD	0.57	7.52

NORTH BASIN HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1975 **	2.8	13.0
1979	1.9	14.1
1980	1.2	34.2
1983	2.4	8.6
1984 **	2.1	17.9
1987 *	2.6	8.5
MEAN	2.2	16.1
MAX	2.8	34.2
MIN	1.2	8.5
N	6	6
SD	0.58	9.58

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

EAGLE LAKE

A combined total of 23 samples collected by two volunteers from May 24 to October 12 provided excellent seasonal coverage of water quality conditions in Eagle Lake. Chlorophyll concentrations were higher during the spring and fall than they were during the summer.

The results indicate Eagle Lake has excellent water clarity with very little algae in its water.

Eagle Lake is relatively uninfluenced by local runoff as water clarity did not deteriorate much during the extremely wet summer experienced in 1986 or improve during the drier weather experienced in 1987 as happened in other nearby smaller lakes.

LAKE : EAGLE LAKE
TWP : OLDEN, HINCHINBROOKE
COUNTY : FRONTENAC

ID NUMBER : 18-0033-019-01

WATERSHED AREA	: 40.10	sq.km	SHORELINE	: 41.40	km.
SURFACE AREA	: 665.0	ha.	COTTAGES	: 135 + 1	HOUSE
MAX DEPTH	: 31.10	m.	RESORTS	: 2	
VOLUME	: 67.20	mill cu. m.	% CROWN LAND	: 5	

NORTH SIDE OF OPEONGO POINT

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
05/24/87	4.7	6.4
06/08/87	5.0	4.2
06/14/87	5.0	1.7
06/21/87	6.2	1.1
07/14/87	5.9	2.6
07/26/87	5.0	2.0
08/03/87	5.3	2.4
08/16/87	5.3	1.8
08/30/87	5.0	2.6
09/14/87	5.2	3.5
09/27/87	5.1	4.1
10/12/87	5.1	4.2
MEAN	5.2	3.1
MAX	6.2	6.4
MIN	4.7	1.1
N	12	12
SD	0.42	1.49

NORTH END OF LAKE

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
06/23/87	6.4	1.0
07/06/87	5.2	1.5
07/19/87	4.7	2.0
07/24/87	6.1	3.2
07/31/87	5.2	4.7
08/05/87	4.9	1.5
08/15/87	5.8	2.1
08/21/87	5.5	3.2
08/31/87	4.7	2.4
09/05/87	5.6	4.3
09/10/87	6.4	4.2
MEAN	5.5	2.7
MAX	6.4	4.7
MIN	4.7	1.0
N	11	11
SD	0.62	1.27

LAKE : EAGLE LAKE ID NUMBER : 18-0033-019-01
TWP : OLDEN, HINCHINBROOKE
COUNTY : FRONTENAC

WATERSHED AREA	: 40.10	sq.km	SHORELINE	: 41.40 km.
SURFACE AREA	: 665.0	ha.	COTTAGES	: 135 + 1 HOUSE
MAX DEPTH	: 31.10	m.	RESORTS	: 2
VOLUME	: 67.20	mill cu. m.	% CROWN LAND	: 5

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1975 **	5.1	3.6
1977	4.3	2.0
1979	4.7	3.3
1980	4.8	4.3
1981 **	4.5	3.0
1982	4.9	2.7
1983	5.3	2.5
1984	5.9	3.4
1985	5.4	2.4
1986	5.4	2.9
1987	5.3	2.9
MEAN	5.1	3.0
MAX	5.9	4.3
MIN	4.3	2.0
N	11	11
SD	0.47	0.63

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

ELBOW LAKE

Insufficient sampling was carried out during 1987 to reach any definite conclusions about Elbow Lake or make comparisons with other years. A minimum of six sets of measurements are necessary to adequately characterize water quality of a lake. Preferably 12 or more measurements evenly timed throughout the ice free season of the year from May to October should be taken to define any seasonal trends in water quality if they are present

Based on the results for previous years, Elbow Lake has satisfactory water quality for recreational use purposes.

LAKE : ELBOW LAKE
TWP : HINCHINBROOKE
COUNTY : FRONTENAC

ID NUMBER : 18-0033-035-01

WATERSHED AREA	: 19.20	sq.km	SHORELINE	: 13.32	km.
SURFACE AREA	: 126.0	ha.	COTTAGES	: 46	
MAX DEPTH	: 9.80	m.	RESORTS	: 1 (5)	
VOLUME	: 6.56	mill cu. m.	% CROWN LAND	: 0	

NORTH END

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
04/11/87	2.4	
07/13/87	3.2	4.8
MEAN	2.8	4.8
MAX	3.2	4.8
MIN	2.4	4.8
N	2	1
SD	0.57	

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1982 **	2.4	3.9
1983	3.3	3.3
1984	3.1	5.7
1985	3.2	6.3
1986	2.4	8.0
1987 *	2.8	4.8
MEAN	2.9	5.3
MAX	3.3	8.0
MIN	2.4	3.3
N	6	6
SD	0.40	1.71

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

FARADAY (TROUT) LAKE

Insufficient sampling was carried out during 1987 to reach any definite conclusions about Faraday Lake or make comparisons with other years. A minimum of six sets of measurements are necessary to adequately characterize water quality of a lake. Preferably 12 or more measurements evenly timed throughout the ice free season of the year from May to October should be taken to define any seasonal trends in water quality if they are present

Based on previous years results Faraday Lake has excellent water clarity with very little algae present in its water.

LAKE : FARADAY (TROUT) LAKE
TWP : FARADAY
COUNTY : HASTINGS

ID NUMBER : 18-3490-042-01

WATERSHED AREA	: 19.20	sq.km	SHORELINE	: 7.57	km.
SURFACE AREA	: 113.0	ha.	COTTAGES	: 89	
MAX DEPTH	: 24.40	m.	RESORTS	: 1 (15)	
VOLUME	: 10.19	mill cu. m.	% CROWN LAND	: 35	

CENTRE OF LAKE

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
08/16/87	5.8	3.5
09/15/87	6.5	2.0
09/23/87	6.3	5.0
MEAN	6.2	3.5
MAX	6.5	5.0
MIN	5.8	2.0
N	3	3
SD	0.36	1.50

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1978 **	6.1	2.1
1982 *	5.5	1.8
1983 **	6.2	2.1
1984 **	4.4	2.1
1985 **	6.0	1.5
1987 *	6.2	3.5
MEAN	5.7	2.2
MAX	6.2	3.5
MIN	4.4	1.5
N	6	6
SD	0.70	0.69

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

FARREN LAKE

An excellent sampling program was carried out with a combined total of 12 samples between May 20 and November 2. A singularly high chlorophyll concentration of 12.5 ug/l was detected on September 1 along with a reduction in water clarity. The results indicate there may have been a slight algal bloom or localized concentration of algae due to wind drift on that date. No seasonal pattern in the results was discernable.

Farren Lake has excellent water clarity and apart from the September 1 sampling date very low levels of algae present in its water.

Water clarity was higher and chlorophyll concentrations lower than those measured in the lake during 1986. The summer of 1987 was much drier than the weather experienced during the previous summer. It is believed that reduced amounts of surface runoff limited the supply of algae producing nutrients available to the lake over the growing season with a resulting improvement in water quality.

The Farren Lake Association participated in a Shoreland Restoration program during 1987. The program involves the co-operation of cottagers in enhancing the lake environment by returning disturbed areas of the shoreline to their natural state with cuttings of plants native to the lake.

LAKE : FARREN (FARRELL) LAKE ID NUMBER : 18-0033-020-01
TWP : SOUTH SHERBROOKE
COUNTY : LANARK

WATERSHED AREA	: 12.25	sq.km	SHORELINE	: 9.50	km.
SURFACE AREA	: 173.0	ha.	COTTAGES	: 101 (1974)	
MAX DEPTH	: 21.30	m.	RESORTS	: 1 (6)	
VOLUME	: 14.32	mill cu. m.	% CROWN LAND	: 0	

CENTRE / EAST END OF LAKE

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
05/20/87	5.4	5.4
06/10/87	4.8	1.5
07/09/87	5.5	0.9
07/17/87	5.3	0.8
07/26/87	4.6	1.4
08/06/87	4.9	0.8
08/12/87	4.9	1.0
08/26/87	4.9	2.4
09/01/87	4.1	12.5
09/15/87	5.5	1.2
09/30/87	4.9	1.2
11/02/87	4.8	
MEAN	5.0	2.6
MAX	5.5	12.5
MIN	4.1	0.8
N	12	11
SD	0.41	3.53

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1975 **	4.7	3.0
1980 **	5.2	3.3
1981	5.7	2.4
1982	5.0	2.0
1983	4.9	1.8
1984	4.8	2.9
1985	5.0	1.8
1986 *	4.1	2.7
1987	5.0	2.5
MEAN	4.9	2.5
MAX	5.7	3.3
MIN	4.1	1.8
N	9	9
SD	0.43	0.54

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

GANANOQUE LAKE

A total of eight samples collected between June 23 and October 6 provided good coverage of water quality conditions in Gananoque Lake. No seasonal pattern in water quality was discernable. The results indicate although Gananoque Lake has levels of algae present in its waters, it has satisfactory water quality for recreational use purposes.

Gananoque Lake is relatively uninfluenced by local runoff as water clarity did not deteriorate during the extremely wet summer experienced in 1986 or improve during the drier weather experienced in 1987 as happened in other nearby lakes.

LAKE : GANANOQUE LAKE ID NUMBER : 12-0017-008-01
TWP : REAR & FRONT OF LEEDS LANSDOWNE
COUNTY : LEEDS

WATERSHED AREA	: 424.40	sq.km	SHORELINE	: 33.17	km.
SURFACE AREA	: 617.0	ha.	COTTAGES	: 111	
MAX DEPTH	: 23.77	m.	RESORTS	: 2 (19)	
VOLUME	: 42.82	mill cu. m.	% CROWN LAND	: 3	

NEAR TURTLE ISLAND

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
06/23/87	2.7	8.8
07/05/87	2.7	6.0
07/12/87	2.4	4.0
07/19/87	2.6	3.6
07/26/87	2.5	5.3
08/23/87	2.9	6.2
09/20/87	2.9	6.6
10/06/87	2.6	5.1
MEAN	2.7	5.7
MAX	2.9	8.8
MIN	2.4	3.6
N	8	8
SD	0.18	1.63

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1977	2.2	4.7
1978	3.0	7.1
1979	3.2	4.7
1980	1.8	8.0
1981 **	3.1	6.9
1982 **	2.6	5.2
1983 **	3.2	4.5
1984 **	4.1	7.4
1985	2.6	7.6
1986	2.8	5.7
1987	2.7	5.7
MEAN	2.8	6.1
MAX	4.1	8.0
MIN	1.8	4.5
N	11	11
SD	0.60	1.30

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

GREEN LAKE

A total of seven samples were collected during the months of August and September. The results indicate Green Lake has excellent water clarity with very little algae dispersed through out the water.

In recent years a profuse growth of filamentous algae characteristic of acidic waters has materialized in the shallow areas around the shoreline of Green Lake. The presence of this algae is not detected by chlorophyll analyses of water samples. An experimental liming program with the co-operation of property owners on the lake is being planned to evaluate the effectiveness of lake neutralization as a control approach in dealing with this algae.

LAKE : GREEN LAKE
TWP : RADCLIFFE
COUNTY : RENFREW

ID NUMBER : 18-3490-048-01

WATERSHED AREA	: 15.61	sq.km	SHORELINE	: 2.9	km.
SURFACE AREA	: 29.1	ha.	COTTAGES	: 3	
MAX DEPTH	: 22.5	m.	RESORTS	: 0	
VOLUME	: 2.12	mill cu. m.	% CROWN LAND	: 0	

CENTRE OF LAKE

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
08/02/87	5.8	1.9
08/18/87	5.8	1.5
08/25/87	5.5	1.5
09/02/87	6.4	4.0
09/10/87	5.8	1.6
09/15/87	6.4	1.8
09/22/87	6.4	2.6
MEAN	6.0	2.1
MAX	6.4	4.0
MIN	5.5	1.5
N	7	7
SD	0.38	0.91

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1986	5.6	2.2
1987	6.0	2.1
MEAN	5.8	2.2
MAX	6.0	2.2
MIN	5.6	2.1
N	2	2
SD	0.28	0.10

GRINDSTONE LAKE

Grindstone Lake was included in the Self Help Program for the first time during 1987. Previous information for Grindstone Lake was collected by the Ministry in 1976 and 1980 as part of our lake survey program.

A total of 12 samples collected from June 1 to August 17 provided a good picture of water quality conditions. The data indicate that Grindstone Lake has very good clarity with very low levels of algae. The water quality of Grindstone Lake should be well suited for a variety of recreational uses including swimming and bathing use of the lake.

LAKE : GRINDSTONE LAKE
TWP : MILLER, CLARENDON
COUNTY : FRONTENAC

ID NUMBER : 18-3430-037-01

WATERSHED AREA	: 6.51	sq.km	SHORELINE	: 17.07	km.
SURFACE AREA	: 174.82	ha.	COTTAGES	:	
MAX DEPTH	: 18.29	m.	RESORTS	:	
VOLUME	:	mill cu. m.	% CROWN LAND	:	

NORTH EAST END OF LAKE

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
06/01/87	5.5	2.8
06/08/87	4.7	0.8
06/15/87	4.1	1.6
06/21/87	4.1	1.4
06/29/87	3.8	1.2
07/06/87	4.0	2.6
07/13/87	4.1	1.7
07/20/87	4.3	1.6
07/27/87	4.3	1.6
08/03/87	4.6	2.3
08/09/87	4.3	2.1
08/17/87	4.7	1.3
MEAN	4.4	1.8
MAX	5.5	2.8
MIN	3.8	0.8
N	12	12
SD	0.45	0.59

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1976 **	5.2	2.7
1980 **	4.6	2.4
1987	4.4	1.8
MEAN	4.7	2.3
MAX	5.2	2.7
MIN	4.4	1.8
N	3	3
SD	0.42	0.46

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

GRIPPEN LAKE

A total of eight samples collected from May 18 to September 20 provided good seasonal coverage of water quality conditions in Grippen Lake. Secchi disc visibility was better in September than at other times over the course of the sampling program but there was no evidence of seasonality in the chlorophyll results. The variation in water clarity may have been due to factors not related to the presence of algae in the water of the lake.

Water clarity was higher and chlorophyll concentrations lower than those measured in the lake during 1986. The summer of 1987 was much drier than the weather experienced during the previous summer. It is believed that reduced amounts of surface runoff limited the supply of algae producing nutrients available to the lake over the growing season with a resulting improvement in water quality. Similarly low productivity was documented in Crowe Lake during 1983 which was also a year with a dry summer period.

The current year's results and the historical record data indicate that Grippen Lake has good water quality which should not limit its recreational use.

LAKE : GRIPPEN LAKE
TWP : REAR OF LEEDS & LANSDOWNE
COUNTY : LEEDS

ID NUMBER : 12-0017-010-01

WATERSHED AREA	: 20.30	sq.km	SHORELINE	: 7.72	km.
SURFACE AREA	: 191.0	ha.	COTTAGES	: 76	
MAX DEPTH	: 16.00	m.	RESORTS	: 1 (24)	
VOLUME	: 22.03	mill cu. m.	% CROWN LAND	: 0	

NORTH EAST END OF LAKE

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
05/18/87	1.9	3.6
06/28/87	2.9	0.3
07/10/87	2.1	2.3
07/19/87	3.2	3.0
07/28/87	2.4	3.4
08/17/87	2.1	3.8
09/07/87	4.1	4.2
09/20/87	3.5	5.9
MEAN	2.8	3.3
MAX	4.1	5.9
MIN	1.9	0.3
N	8	8
SD	0.78	1.60

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1975	2.9	3.9
1976	3.9	4.7
1977	2.6	3.2
1978	3.3	4.7
1979	2.9	3.8
1980	3.8	6.0
1981 **	3.2	6.9
1982 **	3.3	5.0
1983 **	2.8	5.6
1984 **	2.4	4.5
1985	3.6	4.2
1986	2.9	5.4
1987	2.8	3.3
MEAN	3.1	4.7
MAX	3.9	6.9
MIN	2.4	3.2
N	13	13
SD	0.46	1.08

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

GUNTER LAKE

Insufficient sampling was carried out during 1987 to reach any definite conclusions about Gunter Lake or make comparisons with other years. A minimum of six sets of measurements are necessary to adequately characterize water quality of a lake. Preferably 12 or more measurements evenly timed throughout the ice free season of the year from May to October should be taken to define any seasonal trends in water quality if they are present

Based on the historical record Gunter Lake has good water quality which should be well suited for a variety of recreational pursuits including swimming and bathing.

LAKE : GUNTER LAKE
TWP : CASHEL
COUNTY : HASTINGS

ID NUMBER : 17-0021-007-01

WATERSHED AREA	: 20.60	sq.km	SHORELINE	: 5.50	km.
SURFACE AREA	: 69.0	ha.	COTTAGES	: 46 +9	HOUSES
MAX DEPTH	: 18.30	m.	RESORTS	: 2	
VOLUME	: 12.63	mill cu. m.	% CROWN LAND	: 18	

SOUTH END OF LAKE

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
08/03/87	4.0	1.3
08/30/87	4.6	1.6
09/07/87	3.7	1.4
09/14/87	4.1	1.7
09/20/87	4.3	2.3
MEAN	4.1	1.7
MAX	4.6	2.3
MIN	3.7	1.3
N	5	5
SD	0.34	0.39

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1977 **	5.2	3.0
1980	3.6	3.0
1981	4.3	3.8
1982	3.9	2.5
1983	3.5	1.5
1984	3.6	2.7
1987 *	4.1	1.7
MEAN	4.0	2.6
MAX	5.2	3.8
MIN	3.5	1.5
N	7	7
SD	0.59	0.80

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

HAY BAY

An excellent sampling program that was initiated April 1 and continued until October 20 provided good seasonal coverage of water quality conditions in Hay Bay. Chlorophyll concentrations were generally very high except for the three sampling dates during the month of June. A Secchi disc visibility depth of 3.7 metres on June 3 is the best water clarity measurement on record for Hay Bay.

Water quality in Hay Bay is not particularly well suited for water oriented activities such as swimming and bathing.

Hay Bay has not responded to reductions in nutrient loads with an improvement in water quality as has the rest of the Bay of Quinte. Major nutrient load reductions have been achieved over recent years by improved treatment of sewage by municipalities discharging to the Bay of Quinte.

LAKE : HAY BAY - BAY OF QUINTE ID NUMBER : 17-0037-001-01
TWP : NORTH & SOUTH FREDERICKSBURG
COUNTY : LENNOX & ADDINGTON

WATERSHED AREA	:	sq.km	SHORELINE	:	km.
SURFACE AREA	:	ha.	COTTAGES	:	
MAX DEPTH	:	m.	RESORTS	:	6 (211)
VOLUME	:	mill cu. m.	% CROWN LAND	:	0

SOUTH SHORE OF HAY BAY

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
04/01/87	1.7	3.2
05/08/87	2.0	15.5
05/13/87	1.8	12.0
05/25/87	2.3	12.0
06/03/87	3.7	4.5
06/17/87	1.7	2.9
07/01/87	1.5	1.3
07/08/87	1.7	17.0
08/21/87	0.7	91.5
08/26/87	0.8	26.0
09/02/87	1.0	42.0
09/11/87	1.2	18.5
10/15/87	1.4	20.0
10/20/87	1.4	23.5
MEAN	1.6	20.7
MAX	3.7	91.5
MIN	0.7	1.3
N	14	14
SD	0.74	23.14

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1976 *	0.8	24.0
1977	1.1	24.9
1978	1.5	18.3
1979	1.2	24.9
1980	1.0	29.8
1981	1.4	21.3
1982	1.6	17.0
1983	2.0	16.8
1984 *	1.2	28.3
1985 *	1.3	24.2
1986	1.3	25.0
1987	1.6	20.7
MEAN	1.3	22.9
MAX	2.0	29.8
MIN	0.8	16.8
N	12	12
SD	0.32	4.19

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

INDIAN LAKE

A very thorough sampling program was carried out with a total of 18 samples taken from June 18 to October 18. Although chlorophyll concentrations ranged from 1.1 ug/l to 5.3 ug/l, was no seasonal pattern discernable.

Water clarity was higher and chlorophyll concentrations lower than those measured in the lake during 1986. The summer of 1987 was much drier than the weather experienced during the previous summer. It is believed that reduced amounts of surface runoff limited the supply of algae producing nutrients available to the lake over the growing season with a resulting improvement in water quality. Similarly low productivity was documented in Indian Lake during 1983 which was also a year with a dry summer period.

The results show that Indian Lake has very good water clarity with little algae present in its water.

LAKE : INDIAN LAKE
TWP : SOUTH CROSBY
COUNTY : LEEDS

ID NUMBER : 12-0004-013-01

WATERSHED AREA	: 359.00	sq.km	SHORELINE	: 16.58 km.
SURFACE AREA	: 266.0	ha.	COTTAGES	: 106
MAX DEPTH	: 26.00	m.	RESORTS	: 2 (11)
VOLUME	: 26.79	mill cu. m.	% CROWN LAND	: 0

CENTRE OF LAKE

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
06/18/87	4.0	1.9
06/24/87	3.7	3.2
07/03/87	2.9	1.1
07/08/87	3.0	3.0
07/15/87	3.7	4.3
07/27/87	4.6	3.2
08/03/87	3.7	2.9
08/10/87	4.6	1.8
08/17/87	4.3	2.5
08/23/87	4.3	2.8
09/02/87	5.0	3.8
09/07/87	5.5	3.1
09/16/87	4.9	1.5
09/20/87	4.9	5.3
09/27/87	5.2	3.5
10/04/87	5.5	4.7
10/12/87	4.6	2.5
10/18/87	3.9	4.4
MEAN	4.3	3.1
MAX	5.5	5.3
MIN	2.9	1.1
N	18	18
SD	0.77	1.13

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1971 **	4.2	3.0
1975 **	4.6	5.4
1977	3.6	3.0
1980	3.9	4.5
1982	4.3	3.3
1983 **	4.0	2.2
1984	3.7	3.8
1985	4.3	3.6
1986	3.9	3.7
1987	4.3	3.1
MEAN	4.1	3.6
MAX	4.6	5.4
MIN	3.6	2.2
N	10	10
SD	0.31	0.89

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

JEFFREY LAKE

A sampling program that was initiated May 18 and continued until September 27 provided good seasonal coverage of water quality conditions in Jeffrey Lake.

Water clarity was excellent and chlorophyll concentrations very low over the entire sampling period.

Water clarity was higher and chlorophyll concentrations lower than those measured in the lake during 1986. The summer of 1987 was much drier than the weather experienced during the previous summer. It is believed that reduced amounts of surface runoff limited the supply of algae producing nutrients available to the lake over the growing season with a resulting improvement in water quality.

LAKE : JEFFREY LAKE
TWP : FARADAY
COUNTY : HASTINGS

ID NUMBER : 18-3490-047-01

WATERSHED AREA	: 19.20	sq.km	SHORELINE	: 7.57	km.
SURFACE AREA	: 113.0	ha.	COTTAGES	: 89	
MAX DEPTH	: 24.4	m.	RESORTS	: 1 (15)	
VOLUME	: 10.19	mill cu. m.	% CROWN LAND	: 35	

CENTRE OF LAKE

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
05/10/87	7.0	0.7
05/24/87	7.1	1.0
06/14/87	5.9	1.1
06/28/87	6.1	0.7
07/09/87	5.2	1.2
07/19/87	5.8	0.8
07/26/87	6.4	1.1
08/03/87	6.7	1.4
08/08/87	7.0	1.5
08/29/87	7.9	1.2
09/07/87	6.9	1.9
09/27/87	8.5	1.1
MEAN	6.7	1.1
MAX	8.5	1.9
MIN	5.2	0.7
N	12	12
SD	0.92	0.35

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1977 **	7.9	1.2
1985	7.0	1.8
1986	6.2	2.0
1987	6.7	1.1
MEAN	7.0	1.5
MAX	7.9	2.0
MIN	6.2	1.1
N	4	4
SD	0.72	0.44

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

JEFFREYS (OLMSTEAD) LAKE

A total of seven samples were collected from July 13 to November 16. Chlorophyll concentration was higher and water clarity less after the end September than measured during the summer. This change in water quality might be the result of upwelling of nutrient laden bottom water as the lake begins the process of fall overturn.

Water clarity was higher and chlorophyll concentrations lower than those measured in the lake during 1986. The summer of 1987 was much drier than the weather experienced during the previous summer. It is believed that reduced amounts of surface runoff limited the supply of algae producing nutrients available to the lake over the growing season with a resulting improvement in water quality. Similarly low productivity was documented in Jeffreys Lake during 1983 which was also a year with a dry summer period.

The results demonstrate that Jeffreys Lake has excellent water quality which should lend its self well to a variety of recreational uses including swimming and bathing.

LAKE : JEFFREY'S (OLMSTEAD) LAKE ID NUMBER : 18-4810-001-01
TWP : ROSS
COUNTY : RENFREW

WATERSHED AREA	: 26.80	sq.km	SHORELINE	: 10.60	km.
SURFACE AREA	: 180.0	ha.	COTTAGES	: 98	
MAX DEPTH	: 29.30	m.	RESORTS	: 2 (305)	
VOLUME	: 11.6	mill cu. m.	% CROWN LAND	: 0	

CENTRE OF LAKE

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
07/13/87	5.8	1.5
07/30/87	6.1	1.2
08/17/87	7.0	1.4
09/02/87	6.1	1.4
09/21/87	7.0	1.0
10/05/87	5.5	4.2
11/16/87	4.3	
MEAN	6.0	1.8
MAX	7.0	4.2
MIN	4.3	1.0
N	7	6
SD	0.93	1.20

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1977	6.3	2.1
1978 **	6.0	2.2
1979	6.3	1.8
1980	5.4	3.9
1981	5.7	3.0
1982	6.2	1.8
1983	6.7	1.7
1984	5.4	4.1
1985 *	5.4	5.8
1986	5.3	1.9
1987	6.0	1.8
MEAN	5.9	2.7
MAX	6.7	5.8
MIN	5.3	1.7
N	11	11
SD	0.47	1.33

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

JOEPERRY LAKE

A total of 12 samples were collected from the middle of June to the beginning of September. Although chlorophyll concentrations ranged from a low of 0.9 ug/l on July 16 to a high of 4 ug/l on August 27 no seasonal pattern was discernable.

Water clarity was higher and chlorophyll concentrations lower than those measured in the lake during 1986. The summer of 1987 was much drier than the weather experienced during the previous summer. It is believed that reduced amounts of surface runoff limited the supply of algae producing nutrients available to the lake over the growing season with a resulting improvement in water quality.

The results indicate Joeperry Lake has good water quality.

LAKE : JOEPERRY LAKE
TWP : EFFINGHAM
COUNTY : LENNOX & ADDINGTON

ID NUMBER : 17-0026-001-01

WATERSHED AREA	: 15.40	sq.km	SHORELINE	: 9.00	km.
SURFACE AREA	: 169.0	ha.	COTTAGES	: 0	
MAX DEPTH	: 23.00	m.	RESORTS	: 0	
VOLUME	: 12.35	mill cu. m.	% CROWN LAND	: 100	

BON ECHO PROVINCIAL PARK

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
06/18/87		1.5
06/25/87	2.7	1.7
07/02/87	2.7	1.3
07/09/87	3.3	2.5
07/16/87	3.0	0.9
07/23/87	3.0	2.8
07/30/87	2.7	1.6
08/06/87	3.7	2.4
08/13/87	3.3	1.7
08/20/87	2.7	1.4
08/27/87	2.7	4.0
09/03/87	3.1	1.3
MEAN	3.0	1.9
MAX	3.7	4.0
MIN	2.7	0.9
N	11	12
SD	0.34	0.86

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1976 **	4.4	2.4
1977	4.2	3.8
1978 *	3.8	3.9
1979 *	3.6	3.2
1980 *	3.1	3.2
1981 *	5.6	2.5
1982	3.8	3.0
1983 **	4.0	3.3
1984 **	3.0	2.7
1985 **	3.1	3.0
1986	2.7	2.8
1987	3.0	1.9
MEAN	3.7	3.0
MAX	5.6	3.9
MIN	2.7	1.9
N	12	12
SD	0.81	0.57

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

KASHWAKAMAK LAKE

Insufficient sampling was carried out during 1987 to reach any definite conclusions about Kashwakamak Lake or make comparisons with other years. A minimum of six sets of measurements are necessary to adequately characterize water quality of a lake. Preferably 12 or more measurements evenly timed throughout the ice free season of the year from May to October should be taken to define any seasonal trends in water quality if they are present

Based on previous years' data Kashwakamak Lake has good water quality well suited for a variety of recreational uses including water contact uses such as swimming and bathing.

LAKE : KASHWAKAMAK LAKE
TWP : CLARENDON, BARRIE, MILLER
COUNTY : FRONTENAC

ID NUMBER : 18-3430-010-01

WATERSHED AREA	: 409.8	sq.km	SHORELINE	: 66	km.
SURFACE AREA	: 119.1	ha.	COTTAGES	: 445	
MAX DEPTH	: 21.9	m.	RESORTS	: 12	
VOLUME	: 96.71	mill cu. m.	% CROWN LAND	:	

NEAR WEISS POINT

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
08/06/87	2.4	1.9
08/06/87	2.4	2.4
08/06/87	4.0	1.7
08/06/87	3.3	1.3
MEAN	3.0	1.8
MAX	4.0	2.4
MIN	2.4	1.3
N	4	4
SD	0.78	0.46

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1974 **	6.4	1.5
1976 **	5.4	2.4
1980 **	3.1	3.2
1986	5.2	2.0
1987 *	3.0	1.8
MEAN	4.6	2.2
MAX	6.4	3.2
MIN	3.0	1.5
N	5	5
SD	1.50	0.66

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

KENNEBEC LAKE

A good sampling program was carried out in the west basin beginning on June 8 and finishing on October 12. A shorter sampling program was carried out in the east basin. Generally, chlorophyll concentrations were higher during July than during the other months of the sampling program.

There was no appreciable difference in Secchi disc visibility or chlorophyll concentrations between the east basin and west basin. The results indicate that Kennebec Lake has good water quality with no problems related to algae in the water of the lake.

LAKE : KENNEBEC LAKE
TWP : KENNEBEC, OLDEN
COUNTY : FRONTENAC

ID NUMBER : 17-0031-006-01

WATERSHED AREA	: 286.3	sq.km	SHORELINE	: 30.6	km.
SURFACE AREA	: 5.47	ha.	COTTAGES	: 99	
MAX DEPTH	: 30.5	m.	RESORTS	: 3(29)	
VOLUME	: 43.60	mill cu. m.	% CROWN LAND	: 10	

BASIN EAST OF CAUSEWAY

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
07/05/87	2.7	1.9
07/11/87	2.7	4.3
07/19/87	2.7	2.2
07/19/87	2.4	4.2
08/03/87	3.0	2.5
08/16/87	3.0	3.0
08/30/87	3.4	3.4
09/01/87	2.9	3.4
09/07/87	3.7	3.4
08/10/87	2.6	2.9
MEAN	2.9	3.1
MAX	3.7	4.3
MIN	2.4	1.9
N	10	10
SD	0.39	0.79

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1976 **	3.6	5.1
1977	3.7	2.9
1978	3.5	3.2
1979	3.2	3.4
1980	2.6	9.6
1981	3.3	2.9
1984 **	2.6	4.8
1987	2.9	3.1
MEAN	3.2	4.4
MAX	3.7	9.6
MIN	2.6	2.9
N	8	8
SD	0.43	2.28

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

BASIN WEST OF CAUSEWAY

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
06/08/87	2.7	0.8
06/17/87	2.6	6.2
06/23/87	2.6	3.4
06/30/87	2.7	1.2
07/08/87	3.7	5.1
07/26/87	3.3	5.2
08/07/87	2.9	2.3
08/19/87	2.4	2.7
MEAN	2.9	3.4
MAX	3.7	6.2
MIN	2.4	0.8
N	8	8
SD	0.43	1.97

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1976 **	3.2	4.1
1977	3.7	2.9
1978	3.5	3.4
1979	3.2	3.6
1980	2.4	7.6
1981	3.1	3.6
1984 **	2.9	5.2
1987	2.9	3.3
MEAN	3.1	4.2
MAX	3.7	7.6
MIN	2.4	2.9
N	8	8
SD	0.40	1.53

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

KILLENBECK LAKE

An extremely thorough and comprehensive sampling program was carried out beginning on May 13 and ending on October 20 with a total of 24 measurements collected.

Chlorophyll concentrations were much higher and water clarity somewhat less during the summer months than during either the spring or fall periods. However, the results indicate that water quality was much improved over conditions experienced during 1986. The summer of 1987 was much drier than the weather experienced during the previous summer. It is believed that reduced amounts of surface runoff limited the supply of algae producing nutrients available to the lake over the growing season with a resulting improvement in water quality.

The results indicate that Killenbeck Lake has satisfactory water quality for swimming and bathing but that during the summer months the presence of algae may be visibly apparent.

LAKE : KILLENBECK LAKE
TWP : REAR OF LEEDS & LANSDOWNE
COUNTY : LEEDS

ID NUMBER : 12-0017-011-01

WATERSHED AREA	: 10.90	sq.km	SHORELINE	: 4.70	km.
SURFACE AREA	: 44.0	ha.	COTTAGES	: 14	
MAX DEPTH	: 27.70	m.	RESORTS	:	
VOLUME	: 4.3	mill cu. m.	% CROWN LAND	: 0	

SOUTHWEST END OF LAKE

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
05/13/87	2.9	3.6
05/20/87	2.4	5.2
05/27/87	2.4	5.6
06/03/87	2.4	2.5
06/10/87	2.4	5.0
06/17/87	3.0	6.4
06/24/87	2.4	11.5
07/01/87	1.8	17.3
07/07/87	1.5	16.5
07/14/87	1.8	10.5
07/21/87	2.1	11.9
07/28/87	2.1	15.5
08/05/87	1.8	11.0
08/11/87	2.4	10.0
08/19/87	2.4	9.4
08/26/87	2.7	6.0
09/02/87	3.4	7.5
09/09/87	3.4	7.0
09/16/87	4.0	3.2
09/23/87	2.7	6.6
09/29/87	3.4	2.9
10/06/87	2.7	6.2
10/14/87	3.1	3.0
10/20/87	3.4	1.7
MEAN	2.6	7.7
MAX	4.0	17.3
MIN	1.5	1.7
N	24	24
SD	0.62	4.48

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1978 *	3.1	6.5
1984	2.6	6.0
1985	3.1	6.1
1986	2.0	13.9
1987	2.6	7.7
MEAN	2.7	8.0
MAX	3.1	13.9
MIN	2.0	6.0
N	5	5
SD	0.46	3.35

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

LIMERICK LAKE

A sampling program that began on May 19 and finished on September 20 with a total of 10 sets of measurements provided very good seasonal coverage of water quality conditions in Limerick Lake. Although some sampling variability is evident no seasonal pattern was discernable.

The results indicate Limerick Lake has very good water quality.

Water clarity was higher and chlorophyll concentrations lower than those measured in the lake during 1986. The summer of 1987 was much drier than the weather experienced during the previous summer. It is believed that reduced amounts of surface runoff limited the supply of algae producing nutrients available to the lake over the growing season with a resulting improvement in water quality. The improvement was less pronounced for Limerick Lake than for other lakes. Low productivity was also observed in Limerick Lake during 1983 which was also a year with a dry summer period.

LAKE : LIMERICK LAKE
TWP : LIMERICK
COUNTY : HASTINGS

ID NUMBER : 17-0021-010+01

WATERSHED AREA	: 181.41	sq.km	SHORELINE	: 27.00 km.
SURFACE AREA	: 744.0	ha.	COTTAGES	: 130 + 3 HOUSES
MAX DEPTH	: 29.00	m.	RESORTS	: 1 (14)
VOLUME	: 62.87	mill cu. m.	% CROWN LAND	: 1

OFF WALTER COTTAGE

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
05/19/87	3.7	1.0
06/15/87	4.9	1.5
07/02/87	4.0	2.1
07/15/87	4.6	2.3
07/22/87	5.2	1.6
07/31/87	4.9	1.6
08/12/87	5.2	1.6
08/21/87	4.9	1.8
09/01/87	4.3	1.5
09/20/87	4.3	2.5
MEAN	4.6	1.8
MAX	5.2	2.5
MIN	3.7	1.0
N	10	10
SD	0.51	0.44

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1975	5.0	1.7
1976	4.9	1.7
1977 **	5.0	1.8
1978	4.9	2.0
1979	4.5	2.1
1980	4.7	2.2
1981 *	4.4	2.0
1982	4.4	1.8
1983	4.4	1.4
1984	4.5	2.7
1985 **	4.7	2.4
1986	4.5	1.9
1987	4.6	1.8
MEAN	4.7	2.0
MAX	5.0	2.7
MIN	4.4	1.4
N	13	13
SD	0.23	0.34

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

LITTLE SILVER LAKE

A total of 23 observations made at two locations from May 9 to September 26 provided very good seasonal coverage of water quality conditions of Little Silver Lake.

A slight deterioration in water clarity during September was marked by higher chlorophyll concentrations than observed previously during the year. A weak fall peak in the abundance of algae as reflected by chlorophyll concentrations and Secchi disc visibility was detected by sampling on Little Silver Lake during 1986 and 1985 as well.

Water clarity was higher and chlorophyll concentrations lower than those measured in the lake during 1986. The summer of 1987 was much drier than the weather experienced during the previous summer. It is believed that reduced amounts of surface runoff limited the supply of algae producing nutrients available to the lake over the growing season with a resulting improvement in water quality. Similarly low productivity was documented in Little Silver Lake during 1983 which was also a year with a dry summer period.

Overall, the results show that Little Silver Lake has good water quality.

LAKE : LITTLE SILVER LAKE
TWP : SOUTH SHERBROOKE
COUNTY : LANARK

ID NUMBER : 18-0033-021-01

WATERSHED AREA	: 8.10	sq.km	SHORELINE	: 10.10	km.
SURFACE AREA	: 83.0	ha.	COTTAGES	: 31	
MAX DEPTH	: 12.20	m.	RESORTS	: 0	
VOLUME	: 3.82	mill cu. m.	% CROWN LAND	: 0	

BASIN "B"

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
05/09/87	2.9	0.4
05/17/87	2.4	
06/06/87	3.2	0.7
06/14/87	3.7	1.3
06/21/87	4.1	1.6
07/07/87	3.8	3.4
07/12/87	4.3	1.0
07/26/87	4.4	3.2
08/09/87	4.0	2.5
09/07/87	2.7	7.1
09/26/87	2.7	8.1
MEAN	3.5	2.9
MAX	4.4	8.1
MIN	2.4	0.4
N	11	10
SD	0.72	2.67

TURTLE ROCK BAY

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
05/09/87	3.2	0.6
05/17/87	2.7	6.0
05/23/87	3.0	5.7
06/06/87	3.8	1.0
06/14/87	3.7	1.1
06/21/87	4.3	0.9
07/07/87	3.8	3.8
07/12/87	4.4	1.8
07/26/87	4.7	2.3
08/09/87	4.3	2.5
09/07/87	3.5	5.9
09/26/87	2.6	8.6
MEAN	3.7	3.4
MAX	4.7	8.6
MIN	2.6	0.6
N	12	12
SD	0.69	2.61

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1976 *	3.7	2.5
1977 **	4.0	6.6
1978	5.3	3.9
1979 **	3.6	6.9
1982	4.4	3.2
1983	4.3	2.1
1984	3.9	4.1
1985	3.9	4.2
1986	3.6	3.6
1987	3.6	3.2
MEAN	4.0	4.0
MAX	5.3	6.9
MIN	3.6	2.1
N	10	10
SD	0.53	1.58

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

LONG LAKE

A total of ten samples were collected from August 24 to October 23. Chlorophyll concentrations and water clarity after mid September showed some improvement over measurements made earlier in the sampling program but any clear cut seasonal pattern was obscured by considerable variability from one sampling date to the next.

Chlorophyll concentrations revealed the presence of generally only moderate levels of algae in Long Lake, although without samples for the months of June and July summer conditions were not fully assessed.

The results therefore indicate that water quality is satisfactory for swimming and bathing and other water related recreational uses of the lake.

LAKE : LONG LAKE
TWP : OLDEN, HINCHINBROOKE
COUNTY : FRONTENAC

ID NUMBER : 18-0033-022-01

WATERSHED AREA	: 79.8	sq.km	SHORELINE	: 16.91	km.
SURFACE AREA	: 301	ha.	COTTAGES	: 64	
MAX DEPTH	: 13.4	m.	RESORTS	: 1 (16)	
VOLUME	: 18.50	mill cu. m.	% CROWN LAND	: 0	

VARIOUS

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
08/24/87	2.3	6.4
08/30/87	2.3	5.1
09/07/87	2.2	13.0
09/15/87	3.9	2.5
09/22/87	4.8	1.1
09/27/87	5.4	3.0
10/04/87	3.5	4.5
10/11/87	4.5	1.0
10/18/87	3.2	6.6
10/23/87	3.2	1.8
MEAN	3.5	4.5
MAX	5.4	13.0
MIN	2.2	1.0
N	10	10
SD	1.12	3.62

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1977	2.4	7.1
1979 **	1.9	11.7
1987	3.5	4.5
MEAN	2.6	7.8
MAX	3.5	11.7
MIN	1.9	4.5
N	3	3
SD	0.82	3.65

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

LOUGHBOROUGH LAKE

A total of ten sets of measurements were made on the east basin of Loughborough Lake from July 20 to October 26. Water clarity showed some improvement as the season progressed but there was no corresponding decline observed in chlorophyll concentrations.

The east basin is relatively uninfluenced by local runoff as water clarity did not deteriorate during the extremely wet summer experienced in 1986 or improve during the drier weather experienced in 1987 as happened in other nearby lakes.

These results indicate that although the east basin is moderately productive, water clarity is good and nuisance algae are not a problem. The east basin has water quality suitable for water based recreation such as swimming and bathing.

LAKE : LOUGHBOROUGH LAKE : EAST BASIN ID NUMBER : 12-0004-014-01
TWP : STORRINGTON, LOUGHBOROUGH
COUNTY : FRONTENAC

WATERSHED AREA	: 120.00	sq.km	SHORELINE	: 72.40 km.
SURFACE AREA	: 1065.0	ha.	COTTAGES	: 240 + 10 HOUSES
MAX DEPTH	: 6.10	m.	RESORTS	: 2 (74)
VOLUME	: 22.08	mill cu.'m.	% CROWN LAND	: 0

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
07/20/87	2.7	6.6
07/30/87	2.3	8.4
08/08/87	2.4	4.2
08/19/87	2.4	3.9
08/30/87	2.4	7.2
09/09/87	3.2	6.6
09/20/87	3.4	7.1
09/29/87	3.4	6.4
10/11/87	4.0	3.7
10/26/87	3.5	
MEAN	3.0	6.0
MAX	4.0	8.4
MIN	2.3	3.7
N	10	9
SD	0.60	1.67

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1973 *	3.3	5.0
1974	2.7	3.9
1975 **	2.4	6.9
1976	3.4	3.2
1977	2.8	5.6
1978	3.0	5.4
1979	3.3	5.4
1980	3.2	7.6
1981	2.9	7.4
1982	2.8	4.7
1983	3.6	3.3
1984	2.9	5.2
1985	2.6	6.4
1986	3.3	5.9
1987	3.0	6.0
MEAN	3.0	5.5
MAX	3.6	7.6
MIN	2.4	3.2
N	15	15
SD	0.33	1.33

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

LOWER BEVERLY LAKE

Very good seasonal coverage of water quality conditions of Lower Beverly Lake was provided by sampling programs on Oak Bay and on the eastern and central areas of the lake.

Water clarity was lower and chlorophyll concentrations higher by the end of the summer than they were at the beginning of the sampling program. This pattern of seasonally increasing productivity as the summer progresses was evident in Lower Beverly Lake during 1986 as well and is a characteristic of moderately productive lakes.

The results indicate that although Lower Beverly Lake is a productive body of water, Secchi disc visibility is satisfactory for swimming and bathing use of the lake and nuisance algae are not a problem.

LAKE : LOWER BEVERLEY LAKE
TWP : SOUTH CROSBY, BASTARD
COUNTY : LEEDS

ID NUMBER : 12-0017-012-01

WATERSHED AREA	: 281.80	sq.km	SHORELINE	: 44.00 km.	
SURFACE AREA	: 766.0	ha.	COTTAGES	: 247 + 13 HOMES	
MAX DEPTH	: 25.90	m.	RESORTS	: 4 (272)	
VOLUME	: 70.2	mill cu. m.	% CROWN LAND	: 0	

OAK BAY

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
04/20/87	2.1	2.2
05/18/87	2.1	6.0
05/31/87	1.9	8.1
06/21/87	2.1	4.5
06/28/87	2.0	4.6
07/15/87	1.7	8.8
07/24/87	1.8	9.8
07/29/87	1.7	7.4
08/02/87	1.8	11.0
08/09/87	1.7	1.4
08/23/87	1.5	6.7
09/07/87	1.5	15.0
MEAN	1.8	7.1
MAX	2.1	15.0
MIN	1.5	1.4
N	12	12
SD	0.22	3.81

CENTRAL AND EAST END LOCATIONS

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
06/02/87	2.9	2.0
06/17/87	3.0	4.1
06/22/87	2.9	3.0
07/02/87	2.9	9.3
07/09/87	2.9	3.7
07/17/87	3.3	3.0
07/21/87	2.4	6.4
07/30/87	2.4	4.0
08/03/87	2.1	5.3
08/05/87	2.9	6.3
08/20/87	2.1	6.7
08/26/87	2.7	6.3
MEAN	2.4	9.1
MAX	3.5	14.6
MIN	1.7	3.9
N	10	10
SD	0.55	3.60

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

LAKE : LOWER BEVERLEY LAKE
TWP : SOUTH CROSBY, BASTARD
COUNTY : LEEDS

ID NUMBER : 12-0017-012-01

WATERSHED AREA	: 281.80	sq.km	SHORELINE	: 44.00 km.
SURFACE AREA	: 766.0	ha.	COTTAGES	: 247 + 13 HOMES
MAX DEPTH	: 25.90	m.	RESORTS	: 4 (272)
VOLUME	: 70.2	mill cu. m.	% CROWN LAND	: 0

VARIOUS OPEN WATER LOCATIONS

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1971 **	2.0	9.0
1975 **	3.5	6.1
1977	2.4	7.8
1978	2.4	5.4
1981	2.5	9.6
1982 **	2.4	3.9
1983 **	3.0	8.6
1984 **	2.2	12.9
1985	1.7	13.6
1986	1.7	14.6
1987	2.3	6.1
MEAN	2.4	8.9
MAX	3.5	14.6
MIN	1.7	3.9
N	11	11
SD	0.53	3.54

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

MAZINAW LAKE

Reasonably good seasonal coverage of water quality conditions in Mazinaw Lake was provided by two separate programs. Although water clarity and chlorophyll levels varied from one sampling date to the next, there was no apparent seasonal pattern. The higher Secchi disc visibility readings for Hungry Bay may be the result of individual subjectivity in interpreting the disappearance of the disc rather than a reflection of better water clarity.

The results indicate that Mazinaw Lake has very good water clarity with very little algae.

Chlorophyll concentrations were lower than those measured in the lake during 1986. The summer of 1987 was much drier than the weather experienced during the previous summer. It is believed that reduced amounts of surface runoff limited the supply of algae producing nutrients available to the lake over the growing season with a resulting improvement in water quality. Similarly low productivity was documented in Mazinaw 1983 which was also a year with a dry summer period.

LAKE : MAZINAW LAKE
TWP : ABINGER, BARRIE
COUNTY : FRONTENAC, LENNOX & ADDINGTON

ID NUMBER : 18-3430-011-01

WATERSHED AREA	: 137.85	sq.km	SHORELINE	: 49.10 km.	
SURFACE AREA	: 1590.0	ha.	COTTAGES	: 254 (1972)	
MAX DEPTH	: 144.80	m.	RESORTS	: 2(47), 5(765)	
VOLUME	: 655.00	mill cu. m.	% CROWN LAND	: 50	

NORTH EAST END NEAR HUNGRY BAY

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
06/18/87	3.0	0.6
06/25/87	2.7	1.1
07/02/87	2.7	0.6
07/09/87	4.0	1.2
07/16/87	3.0	0.4
07/23/87	2.7	1.6
07/30/87	3.0	0.8
08/06/87	3.0	1.0
08/13/87	3.3	1.1
08/20/87	2.7	1.7
08/27/87	2.7	2.2
09/03/87	3.1	0.9
MEAN	3.0	1.1
MAX	4.0	2.2
MIN	2.7	0.4
N	12	12
SD	0.38	0.52

BON ECHO PROVINCIAL PARK

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
07/22/87	4.6	2.0
07/29/87	5.2	1.6
08/05/87	5.2	2.1
08/18/87	5.2	1.9
08/25/87	4.9	1.4
09/01/87	4.3	1.7
MEAN	4.9	1.8
MAX	5.2	2.1
MIN	4.3	1.4
N	6	6
SD	0.38	0.26

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1971 **	5.2	1.5
1975	5.6	1.5
1976	5.6	1.8
1977	5.7	1.8
1978	5.6	1.5
1979	5.2	2.1
1980	4.9	2.1
1981	4.7	1.8
1982	3.5	1.8
1983 *	3.6	1.5
1984	4.0	2.2
1985	3.6	1.7
1986	3.7	1.7
1987	3.6	1.3
MEAN	4.6	1.7
MAX	5.7	2.2
MIN	3.5	1.3
N	14	14
SD	0.89	0.27

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

MINK LAKE

A total of four samples were collected from each of two locations from August 3 to September 27.

Both the eastern and western areas of the lake contain water with good clarity and relatively low levels of algae.

The historical record provides no evidence of any continuing trend towards improving or deteriorating conditions in water quality in Mink Lake.

LAKE : MINK LAKE
TWP : WILBERFORCE
COUNTY : RENFREW

ID NUMBER : 18-3690-006-01

WATERSHED AREA	: 40.20	sq.km	SHORELINE	:	km.
SURFACE AREA	: 556.0	ha.	COTTAGES	: 119	
MAX DEPTH	: 13.70	m.	RESORTS	: 2 (102)	
VOLUME	: 72.3	mill cu. m.	% CROWN LAND	: 0	

SITE 1

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
08/03/87	3.2	1.9
08/29/87	3.0	2.5
09/13/87	5.2	2.0
09/27/87	3.1	3.7
MEAN	3.6	2.5
MAX	5.2	3.7
MIN	3.0	1.9
N	4	4
SD	1.05	0.83

SITE 2

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
08/03/87	3.2	1.6
08/29/87	3.2	2.4
09/13/87	2.6	1.5
09/27/87	3.1	4.2
MEAN	3.0	2.5
MAX	3.2	4.2
MIN	2.6	1.5
N	4	4
SD	0.29	1.21

HISTORICAL

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1973 *	3.4	1.8
1975	3.8	2.7
1976	3.6	2.7
1977	3.5	2.2
1978 **	4.1	3.0
1979	4.2	2.1
1980	4.1	5.2
1981	3.0	3.8
1982 *	2.7	2.7
1984 **	3.3	4.7
1985 **	3.6	2.0
1986 *	3.5	1.8
1987	3.3	2.5
MEAN	3.5	2.9
MAX	4.2	5.2
MIN	2.7	1.8
N	13	13
SD	0.44	1.08

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

MOIRA LAKE

A good sampling program was carried out on each of the east and west basins of Moira Lake during 1987. Chlorophyll concentrations rose markedly in July in both basins of Moira Lake and remained high for the duration of the sampling programs. In the west basin algal turbidity became high enough that water clarity was unsuitable for swimming and bathing.

There have been a long history of water quality investigations of Moira Lake dating back to 1960 with major surveys in 1964, 1967 and 1972 to 1975. These investigations established that Moira Lake is naturally eutrophic and productive of weeds and algae.

The historical record results indicate there has been a continuing improvement in water quality since 1973. In that year sewage treatment facilities at the Village of Madoc were upgraded. Sewage is discharged to the west basin via Deer Creek in the spring and fall of the year, before and after the growing season for aquatic plants, respectively. The sewage is treated for the removal of phosphorus before it is discharged.

LAKE : MOIRA LAKE : EAST BASIN ID NUMBER : 17-0026-002-01
TWP : HUNTINGTON
COUNTY : HASTINGS

WATERSHED AREA	: 596.00	sq.km	SHORELINE	: 14.70	km.
SURFACE AREA	: 611.0	ha.	COTTAGES	:	
MAX DEPTH	: 11.00	m.	RESORTS	:	
VOLUME	:	mill cu. m.	% CROWN LAND	: 0	

EAST BASIN

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
06/13/87	4.1	3.2
06/24/87	4.0	
07/04/87	2.7	3.1
07/13/87	3.0	6.1
07/25/87	2.4	8.8
07/30/87	2.1	34.0
08/06/87	2.1	10.0
08/16/87	2.4	12.0
08/24/87	2.1	17.0
08/30/87	2.2	16.0
MEAN	2.7	12.2
MAX	4.1	34.0
MIN	2.1	3.1
N	10	9
SD	0.76	9.55

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1972 **	1.2	37.8
1974	2.1	13.8
1977	2.4	10.8
1978	2.0	12.0
1979 *	2.0	15.3
1981	3.1	7.6
1982	2.0	17.0
1983	1.8	15.2
1984	2.3	15.9
1985	2.0	14.7
1986	1.9	11.0
1987	2.7	12.2
MEAN	2.1	15.3
MAX	3.1	37.8
MIN	1.2	7.6
N	12	12
SD	0.47	7.57

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

LAKE : MOIRA LAKE : WEST BASIN ID NUMBER : 17-0026-003-01
TWP : HUNTINGTON
COUNTY : HASTINGS

WATERSHED AREA	: 546.00	sq.km	SHORELINE	: 9.30	km.
SURFACE AREA	: 216.0	ha.	COTTAGES	: 64 (1972)	
MAX DEPTH	: 7.30	m.	RESORTS	:	
VOLUME	: 7.47	mill cu. m.	% CROWN LAND	: 0	

WEST BASIN

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
06/04/87	2.7	1.6
06/10/87	2.9	2.1
06/17/87	2.4	4.3
06/24/87	2.6	3.6
07/02/87	2.0	6.5
07/08/87	2.3	5.3
07/21/87	1.8	8.5
07/27/87	1.5	14.0
08/05/87	1.4	15.0
08/10/87	1.1	19.0
08/24/87	0.9	23.0
09/01/87	0.8	25.0
09/09/87	1.1	21.5
MEAN	1.8	11.5
MAX	2.9	25.0
MIN	0.8	1.6
N	13	13
SD	0.73	8.48

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1972 **	1.1	39.0
1973 **	1.6	15.6
1974	1.7	13.8
1979	1.9	9.8
1983	1.8	6.9
1984	2.0	16.5
1986	1.5	9.5
1987	1.8	11.5
MEAN	1.7	15.3
MAX	2.0	39.0
MIN	1.1	6.9
N	8	8
SD	0.28	10.10

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

MOSQUE LAKE

A total of six samples was collected from each of three locations on Mosque Lake, the small west basin and the north and south areas of the main basin.

The three locations shared similar water quality in terms of chlorophyll concentrations, but Secchi disc visibility was appreciably better in the main part of the lake than it was in the west basin. In previous years the main basin has had lower levels of chlorophyll than the west basin as well as better water clarity.

The results from all three sampling locations indicate that Mosque Lake has excellent water quality.

Water clarity was higher and chlorophyll concentrations lower than those measured in the lake during 1986. The summer of 1987 was much drier than the weather experienced during the previous summer. It is believed that reduced amounts of surface runoff limited the supply of algae producing nutrients available to the lake over the growing season with a resulting improvement in water quality. Similarly low productivity was documented in Mosque Lake in 1983 which was also a year with a dry summer period.

LAKE : MOSQUE LAKE
TWP : MILLER, CLARENDON
COUNTY : FRONTENAC

ID NUMBER : 18-3430-017-01

WATERSHED AREA	: 6.21	sq.km	SHORELINE	: 13.20	km.
SURFACE AREA	: 138.0	ha.	COTTAGES	: 43	
MAX DEPTH	: 34.10	m.	RESORTS	: 1 (3)	
VOLUME	: 9.7	mill cu. m.	% CROWN LAND	: 65	

NORTH BASIN

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
06/27/87	5.5	
07/15/87	4.0	2.9
07/15/87	5.5	1.2
08/22/87	5.2	0.8
09/05/87	4.9	1.1
10/11/87	4.6	1.2
MEAN	5.0	1.4
MAX	5.5	2.9
MIN	4.0	0.8
N	6	5
SD	0.58	0.83

SOUTH BASIN

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
06/27/87	5.5	0.3
07/15/87	5.0	1.1
08/06/87	5.5	1.4
08/22/87	5.2	0.9
09/05/87	5.2	1.0
10/11/87	4.6	2.3
MEAN	5.2	1.2
MAX	5.5	2.3
MIN	4.6	0.3
N	6	6
SD	0.34	0.66

NORTH & SOUTH BASINS COMBINED

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1976 **	6.3	2.7
1977	5.2	2.5
1978	5.5	2.5
1979	5.6	2.1
1980 **	6.0	2.4
1981	5.6	2.4
1982	5.0	2.1
1983	5.4	1.4
1984	5.2	2.7
1985	4.9	1.8
1986	4.6	2.1
1987	5.1	1.3
MEAN	5.4	2.2
MAX	6.3	2.7
MIN	4.6	1.3
N	12	12
SD	0.47	0.47

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

LAKE : MOSQUE LAKE
TWP : MILLER, CLARENDON
COUNTY : FRONTENAC

ID NUMBER : 18-3430-017-01

WATERSHED AREA	: 6.21	sq.km	SHORELINE	: 13.20	km.
SURFACE AREA	: 138.0	ha.	COTTAGES	: 43	
MAX DEPTH	: 34.10	m.	RESORTS	: 1 (3)	
VOLUME	: 9.7	mill cu. m.	% CROWN LAND	: 65	

WEST BASIN

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
06/27/87	4.0	0.2
08/06/87	5.5	1.7
08/06/87	4.6	0.9
08/22/87	4.0	1.8
09/05/87	3.8	1.7
10/11/87	3.7	1.5
MEAN	4.3	1.3
MAX	5.5	1.8
MIN	3.7	0.2
N	6	6
SD	0.68	0.63

WEST BASIN HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1976 **	4.8	6.9
1977	3.9	4.3
1978	4.5	5.6
1979	4.6	4.8
1980 *	5.1	3.9
1981	4.5	2.5
1982	4.0	2.0
1983	4.2	2.1
1984	4.6	3.0
1985	3.7	3.1
1986	3.8	2.4
1987	4.3	1.3
MEAN	4.3	3.5
MAX	5.1	6.9
MIN	3.7	1.3
N	12	12
SD	0.43	1.66

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

MUSKRAT LAKE

A good sampling program was carried out on Muskrat Lake during 1987 with a total of ten samples collected from July 1 to September 2. While the presence or absence of a spring peak in chlorophyll cannot be confirmed the results clearly show an increase in chlorophyll concentrations and a deterioration in water quality during the month of August. This seasonal pattern of increasing productivity as the summer progresses is characteristic of the lake. In some years late summer algal blooms detract from the aesthetic appeal of the water and interfere with the use of the lake for swimming and bathing.

The historical record continues to indicate an improvement in the water quality of Muskrat Lake since improvements to the sewage treatment facilities serving the Village of Cobden in 1981 and other efforts to reduce nutrient inputs to Muskrat Lake.

Stop logs were removed from the control dam at Pembroke for a three year experimental period to determine if a further improvement in water quality or other benefit to Muskrat Lake can be brought about. The results this year show that water quality has deteriorated compared to conditions in Muskrat Lake during the previous year. This trend may relate to annual variability in weather conditions in which case it may reverse itself or it may be due to other factors such as the new operating level for the control dam. Continuing water quality monitoring is required to clarify this trend and the reasons for it.

LAKE : MUSKRAT LAKE
TWP : WESTMEATH, ROSS
COUNTY : RENFREW

ID NUMBER : 18-4810-002-01

WATERSHED AREA	: 481.00	sq.km	SHORELINE	: 34.00 km.	
SURFACE AREA	: 1202.0	ha.	COTTAGES	: 132 + 21 HOUSES	
MAX DEPTH	: 64.00	m.	RESORTS	: 5 (357)	
VOLUME	: 213.2	mill cu. m.	% CROWN LAND	: 0	

MID LAKE

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
07/01/87	3.5	2.6
07/08/87	3.3	5.2
07/22/87	3.2	8.7
07/29/87	3.0	13.0
08/06/87	2.6	9.4
08/12/87	2.1	12.0
08/19/87	1.7	17.0
08/26/87	2.4	6.0
09/02/87	2.3	9.5
MEAN	2.7	9.3
MAX	3.5	17.0
MIN	1.7	2.6
N	9	9
SD	0.61	4.38

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1977	1.7	15.5
1978 **	2.8	12.0
1979	2.4	10.7
1981	1.6	29.4
1982 **	2.3	14.9
1983	2.3	14.0
1984	3.1	12.0
1985	4.4	3.5
1986	3.4	10.4
1987	2.7	9.3
MEAN	2.7	13.2
MAX	4.4	29.4
MIN	1.6	3.5
N	10	10
SD	0.83	6.65

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

NORWAY LAKE

One sample for the month of May and another nine samples running from July 5 to Oct 11 were collected from Norway Lake. Water clarity was very good and the lake has very low levels of algae.

Water clarity was higher and chlorophyll concentrations lower than those measured in the lake during 1986. The summer of 1987 was much drier than the weather experienced during the previous summer. It is believed that reduced amounts of surface runoff limited the supply of algae producing nutrients available to the lake over the growing season with a resulting improvement in water quality.

LAKE : NORWAY LAKE
TWP : BAGOT, BLYTHFIELD
COUNTY : RENFREW

ID NUMBER : 18-3490-028-01

WATERSHED AREA	: 14.40	sq.km	SHORELINE	: 12.90	km.
SURFACE AREA	: 271.0	ha.	COTTAGES	: 124	
MAX DEPTH	: 36.60	m.	RESORTS	: 0	
VOLUME	: 25.38	mill cu. m.	% CROWN LAND	: 99	

CENTRE OF LAKE

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
05/31/87	5.5	0.4
07/05/87	5.8	1.1
07/29/87	5.2	2.0
08/05/87	5.2	0.5
08/12/87	6.1	1.0
08/20/87	5.3	1.9
08/27/87	5.2	1.4
09/06/87	4.3	1.8
09/24/87	5.8	3.1
10/11/87	6.1	2.2
MEAN	5.4	1.5
MAX	6.1	3.1
MIN	4.3	0.4
N	10	10
SD	0.54	0.83

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1978 **	4.8	2.4
1979	4.7	2.5
1981 *	5.1	1.5
1982 *	4.8	1.4
1983	5.1	3.3
1984 *	4.6	5.0
1985 **	5.4	1.6
1986 *	5.1	2.7
1987	5.4	1.5
MEAN	5.0	2.4
MAX	5.4	5.0
MIN	4.6	1.4
N	9	9
SD	0.29	1.17

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

OPINICON LAKE

A comprehensive sampling program which ran from June 7 to October 10 provided very thorough seasonal coverage of water conditions in Opinicon Lake. Chlorophyll concentrations were generally higher and Secchi disc visibility generally less at the end of the season than at the beginning. This pattern of seasonally increasing productivity has been observed previously in Opinicon Lake.

Water clarity was higher and chlorophyll concentrations lower than those measured in the lake during 1986. The summer of 1987 was much drier than the weather experienced during the previous summer. It is believed that reduced amounts of surface runoff limited the supply of algae producing nutrients available to the lake over the growing season with a resulting improvement in water quality. Similarly low productivity was documented in Opinicon Lake in 1983 which was also a year with a dry summer period.

The results indicate Opinicon Lake has good water quality. and is well suited for recreational use purposes.

LAKE : OPINICON LAKE
TWP : BEDFORD, SOUTH CROSBY, STORRINGTON
COUNTY : FRONTENAC, LEEDS

ID NUMBER : 12-0004-016-01

WATERSHED AREA	: 580.00	sq.km	SHORELINE	: 52.00 km.
SURFACE AREA	: 785.0	ha.	COTTAGES	: 120 (1971)
MAX DEPTH	: 9.15	m.	RESORTS	: 6 (104)
VOLUME	: 38.61	mill cu. m.	% CROWN LAND	: 0

BETWEEN SNAKE & HUCKLEBERRY ISLANDS

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
06/07/87	3.0	0.2
06/14/87	3.2	3.1
06/21/87	4.1	1.8
06/28/87	3.2	0.6
07/05/87	3.8	2.3
07/12/87	4.1	2.5
07/22/87	3.7	3.4
07/28/87	3.7	3.4
08/04/87	3.0	4.2
08/10/87	3.3	4.3
08/17/87	3.2	2.3
08/24/87	2.4	5.5
08/31/87	2.9	5.6
09/07/87	3.4	3.9
09/13/87	3.7	3.9
09/21/87	2.9	7.0
09/27/87	2.9	5.9
10/10/87	3.3	6.2
MEAN	3.3	3.7
MAX	4.1	7.0
MIN	2.4	0.2
N	18	18
SD	0.46	1.89

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1971 **	2.9	4.1
1975 **	3.0	4.7
1977	2.8	3.9
1978	3.0	5.4
1979	3.3	5.6
1980	3.2	5.8
1981	3.2	4.7
1982	3.1	4.1
1983	3.2	3.3
1984	3.1	5.8
1985	3.1	3.8
1986	3.1	5.1
1987	3.3	3.7
MEAN	3.1	4.6
MAX	3.3	5.8
MIN	2.8	3.3
N	13	13
SD	0.15	0.86

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

OTTER LAKE

Two separate programs resulted in the collection of 18 samples from June 13 to September 27. Chlorophyll concentrations were slightly higher by the end of the season than they were at the beginning.

Water clarity was higher and chlorophyll concentrations lower than those measured in the lake during 1986. The summer of 1987 was much drier than the weather experienced during the previous summer. It is believed that reduced amounts of surface runoff limited the supply of algae producing nutrients available to the lake over the growing season with a resulting improvement in water quality.

The results indicate Otter Lake has little algae present in its water and the clarity is satisfactory for recreational use purposes such as swimming and bathing.

LAKE : OTTER LAKE ID NUMBER : 18-0033-024-01
TWP : BASTARD, SOUTH ELMSLEY, SOUTH BURGESS, KITLEY
COUNTY : LEEDS

WATERSHED AREA	: 46.55	sq.km	SHORELINE	: 20.1	km.
SURFACE AREA	: 602.0	ha.	COTTAGES	: 291 + 5	HOUSES
MAX DEPTH	: 36.60	m.	RESORTS	: 6 (214)	
VOLUME	: 60.46	mill cu. m.	% CROWN LAND	: 1	

STATION 2

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
06/14/87	3.4	2.4
06/28/87	3.0	1.0
07/12/87	2.4	2.4
07/19/87	2.4	2.6
07/25/87	2.1	1.8
08/02/87	2.3	2.9
08/15/87	2.1	2.2
08/29/87	2.7	2.6
09/06/87	2.7	2.4
09/27/87	3.4	3.3
MEAN	2.7	2.4
MAX	3.4	3.3
MIN	2.1	1.0
N	10	10
SD	0.49	0.62

STATION 1 - FRAYN ROAD

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
06/13/87	3.2	3.1
07/12/87	2.6	2.2
07/22/87	2.6	3.8
07/26/87	2.4	2.6
08/04/87	2.6	3.3
08/12/87	3.0	2.8
08/19/87	2.9	4.0
09/02/87	2.9	3.9
MEAN	2.8	3.2
MAX	3.2	4.0
MIN	2.4	2.2
N	8	8
SD	0.27	0.66

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1975 **	3.4	2.4
1976	3.1	3.8
1977	3.0	3.2
1978	3.3	3.0
1979	3.1	3.4
1980	2.7	3.4
1981 **	3.1	3.2
1982 **	3.1	2.2
1983	3.2	2.1
1984	3.0	3.2
1985	3.0	2.3
1986	2.9	3.4
1987	2.7	2.7
MEAN	3.0	2.9
MAX	3.4	3.8
MIN	2.7	2.1
N	13	13
SD	0.21	0.55

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

OTTY LAKE

A very good sampling program was carried out with a total of 12 samples collected from each of two locations on Otty Lake from June 9 to August 30. No seasonal pattern in the results is discernable. The two locations share similar water quality.

The Secchi disc visibility and chlorophyll results indicate Otty Lake has very good water quality.

Water clarity was higher and chlorophyll concentrations lower than those measured in the lake during 1986. The summer of 1987 was much drier than the weather experienced during the previous summer. It is believed that reduced amounts of surface runoff limited the supply of algae producing nutrients available to the lake over the growing season with a resulting improvement in water quality. Similarly low productivity was documented in Otty Lake in 1983 which was also a year with a dry summer period.

LAKE : OTTY LAKE ID NUMBER : 18-0033-025-01
TWP : NORTH BURGESS, NORTH ELMSLEY
COUNTY : LANARK

WATERSHED AREA	: 47.9	sq.km	SHORELINE	: 35.4	km.
SURFACE AREA	: 625	ha.	COTTAGES	: 336 + 41	HOUSES
MAX DEPTH	: 27.4	m.	RESORTS	: 3 (27)	
VOLUME	: 56.41	mill cu. m.	% CROWN LAND	: 0	

SITE "A"

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
06/09/87	3.0	0.6
06/15/87	4.0	2.3
07/02/87	4.0	1.3
07/06/87	4.3	2.0
07/13/87	3.3	2.1
07/20/87	3.0	2.7
07/27/87	4.3	2.6
08/04/87	4.9	2.5
08/10/87	4.0	1.9
08/17/87	4.6	1.9
08/24/87	5.2	2.1
08/30/87	4.0	2.9
MEAN	4.1	2.1
MAX	5.2	2.9
MIN	3.0	0.6
N	12	12
SD	0.69	0.63

SITE "B"

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
06/09/87	3.0	0.4
06/15/87	4.0	2.3
07/02/87	3.9	0.8
07/06/87	4.9	1.2
07/13/87	3.0	2.4
07/20/87	3.0	3.1
07/27/87	4.0	3.3
08/04/87	5.2	1.6
08/10/87	4.3	1.9
08/17/87	4.6	2.2
08/24/87	4.9	2.4
08/31/87	4.0	2.9
MEAN	4.1	2.0
MAX	5.2	3.3
MIN	3.0	0.4
N	12	12
SD	0.77	0.90

LAKE : OTTY LAKE
TWP : NORTH BURGESS, NORTH ELMSLEY
COUNTY : LANARK

ID NUMBER : 18-0033-025-01

WATERSHED AREA	: 47.9	sq.km	SHORELINE	: 35.4 km.
SURFACE AREA	: 625	ha.	COTTAGES	: 336 + 41 HOUSES
MAX DEPTH	: 27.4	m.	RESORTS	: 3 (27)
VOLUME	: 56.41	mill cu. m.	% CROWN LAND	: 0

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1971 **	3.2	3.3
1973 **	4.1	2.9
1974 **	4.1	3.0
1975 **	4.4	3.2
1976	4.5	2.7
1977	4.0	2.5
1978	4.2	3.2
1979	4.4	3.2
1980	4.5	4.1
1981	3.9	3.3
1982	4.7	3.3
1983	4.5	2.0
1984	4.1	4.2
1985	4.7	2.4
1986	4.2	3.4
1987	4.1	2.1
MEAN	4.2	3.1
MAX	4.7	4.2
MIN	3.2	2.0
N	16	16
SD	0.37	0.62

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

PAUGH LAKE

A total of seven samples were collected during July and August. While the presence or absence of a spring peak in chlorophyll cannot be confirmed the results indicate that Paugh Lake has excellent clarity with very little algae.

Water clarity was higher and chlorophyll concentrations lower than those measured in the lake during 1986. The summer of 1987 was much drier than the weather experienced during the previous summer. It is believed that reduced amounts of surface runoff limited the supply of algae producing nutrients available to the lake over the growing season with a resulting improvement in water quality.

LAKE : PAUGH LAKE
TWP : BURNS, SHERWOOD
COUNTY : RENFREW

ID NUMBER : 18-3690-009-01

WATERSHED AREA	: 75.00	sq.km	SHORELINE	: 18.00 km.
SURFACE AREA	: 713.0	ha.	COTTAGES	: 77
MAX DEPTH	: 51.80	m.	RESORTS	: 1 (7)
VOLUME	: 100	mill cu. m.	% CROWN LAND	: 80

WEST END OF LAKE

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
07/05/87	5.5	0.6
07/12/87	5.6	1.1
07/27/87	6.4	1.6
07/31/87	5.5	0.6
08/05/87	5.8	2.2
08/16/87	5.3	2.1
08/30/87	4.9	1.9
MEAN	5.6	1.4
MAX	6.4	2.2
MIN	4.9	0.6
N	7	7
SD	0.46	0.68

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1977 **	5.4	1.5
1980	5.2	2.2
1981	5.3	2.0
1982	5.2	1.4
1983 **	5.3	1.4
1984 **	4.2	2.4
1985 **	5.2	1.0
1986 *	5.0	1.9
1987	5.6	1.4
MEAN	5.2	1.7
MAX	5.6	2.4
MIN	4.2	1.0
N	9	9
SD	0.40	0.46

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

PIKE LAKE

A total of 18 samples collected from May 24 to November 1 provided very good seasonal coverage of water quality conditions in Pike Lake. Chlorophyll concentrations increased and water clarity declined as the season progressed. This pattern of seasonally increasing productivity as the summer progresses was evident in Pike during 1986 and is a characteristic shared by many other lakes including nearby Black Lake.

This late season increase in chlorophyll and reduction in water clarity probably did not interfere with recreational use of the lake. In general, the Secchi disc depth and chlorophyll record indicate Pike Lake has good water quality for recreational use purposes.

LAKE : PIKE LAKE
TWP : NORTH BURGESS, NORTH CROSBY
COUNTY : LANARK, LEEDS

ID NUMBER : 18-0033-028-01

WATERSHED AREA	: 60.00	sq.km	SHORELINE	: 22.10 km.
SURFACE AREA	: 316.0	ha.	COTTAGES	: 143 (1974)
MAX DEPTH	: 32.60	m.	RESORTS	: 2 (38)
VOLUME	: 26.58	mill cu. m.	% CROWN LAND	: 0

CENTRE OF LAKE

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
05/24/87	4.4	1.4
06/21/87	4.6	2.5
07/19/87	3.3	5.1
08/05/87	3.2	4.0
08/16/87	2.7	7.3
09/07/87	3.1	9.4
09/27/87	2.9	14.0
10/11/87	2.6	9.6
11/01/87	2.9	
MEAN	3.3	6.7
MAX	4.6	14.0
MIN	2.6	1.4
N	9	8
SD	0.72	4.22

NORTH END OF LAKE

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
07/19/87	3.3	5.4
07/27/87	3.3	6.0
08/03/87	3.3	6.1
08/10/87	2.9	5.0
08/18/87	3.2	5.0
08/30/87	3.0	6.1
09/07/87	2.9	8.3
09/27/87	2.6	14.0
10/04/87	2.6	16.0
MEAN	3.0	8.0
MAX	3.3	16.0
MIN	2.6	5.0
N	9	9
SD	0.29	4.12

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1975 **	3.9	5.1
1976	2.4	6.6
1977	3.1	6.0
1978	4.2	4.3
1979	3.7	6.0
1980	3.8	6.5
1981	3.7	5.4
1982	2.5	5.4
1983 **	4.3	2.5
1984 *	3.0	7.6
1985	2.6	5.5
1986	3.2	6.8
1987	3.2	7.4
MEAN	3.4	5.8
MAX	4.3	7.6
MIN	2.4	2.5
N	13	13
SD	0.63	1.36

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

RED HORSE LAKE

An extremely thorough sampling program was carried out on the east basin with a total of 20 samples collected from May 9 to November 18 while nine samples were collected on the west basin from July 19 to October 21. Chlorophyll concentrations were lower and water clarity somewhat better during the month of August and the first part of September in both basins of Red Horse Lake than during other times of the sampling period. This is in contrast to the situation during 1986 when water quality was a little better during the spring and fall than during the month of August.

Water clarity was higher and chlorophyll concentrations lower than those measured in the lake during 1986. The summer of 1987 was much drier than the weather experienced during the previous summer. It is believed that reduced amounts of surface runoff limited the supply of algae producing nutrients available to the lake over the growing season with a resulting improvement in water quality.

The chlorophyll and Secchi disc visibility depth record show that Redhorse Lake is moderately productive with good water clarity.

LAKE : RED HORSE LAKE : EAST BASIN ID NUMBER : 12-0017-020-01
TWP : REAR OF LEEDS & LANSDOWNE
COUNTY : LEEDS

WATERSHED AREA	: 335.00	sq.km	SHORELINE	: 12.90	km.
SURFACE AREA	: 135.0	ha.	COTTAGES	: 24	
MAX DEPTH	: 37.00	m.	RESORTS	: 1 (16)	
VOLUME	: 15.55	mill cu. m.	% CROWN LAND	: 0	

EAST BASIN

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
05/09/87	2.1	2.3
05/09/87	2.1	2.3
05/16/87	2.7	2.1
05/30/87	3.4	1.4
06/14/87	2.7	5.6
06/20/87	2.6	5.8
07/04/87	3.7	1.3
07/15/87	3.0	2.4
07/20/87	3.7	2.8
07/29/87	4.6	2.9
08/01/87	4.9	1.5
08/08/87	4.0	1.2
08/15/87	3.7	1.9
09/05/87	4.6	1.8
09/12/87	3.9	2.6
09/26/87	3.9	3.0
10/03/87	4.5	4.8
10/17/87	4.0	4.6
10/24/87	4.5	3.9
11/18/87	3.4	
MEAN	3.6	2.9
MAX	4.9	5.8
MIN	2.1	1.2
N	20	19
SD	0.84	1.43

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1975 ##	3.8	5.6
1981 ##	2.8	7.8
1982 ##	2.7	4.7
1983 ##	3.7	3.9
1984 ##	3.0	7.4
1985	3.8	4.0
1986	3.5	4.3
1987	3.6	2.9
MEAN	3.4	5.1
MAX	3.8	7.8
MIN	2.7	2.9
N	8	8
SD	0.46	1.74

NOTE : # Based on less then 6 readings.
Recreational lakes included.

LAKE : RED HORSE LAKE : WEST BASIN ID NUMBER : 12-0017-013-01
TWP : REAR OF LEEDS & LANSDOWNE
COUNTY : LEEDS

WATERSHED AREA	: 330.00	sq.km	SHORELINE	: 13.80	km.
SURFACE AREA	: 167.0	ha.	COTTAGES	: 18	
MAX DEPTH	: 37.00	m.	RESORTS	: 0	
VOLUME	: 15.07	mill cu. m.	% CROWN LAND	: 0	

WEST BASIN

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
07/19/87	4.0	3.9
07/26/87	4.3	3.6
08/03/87	4.3	4.2
08/11/87	3.7	2.4
08/27/87	4.6	2.5
09/06/87	5.8	2.7
09/25/87	3.5	9.1
10/11/87	4.3	7.3
10/21/87	3.7	3.7
MEAN	4.2	4.4
MAX	5.8	9.1
MIN	3.5	2.4
N	9	9
SD	0.69	2.30

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1975 **	3.7	6.0
1979	3.4	6.6
1980	3.4	9.2
1981 **	3.2	7.8
1982 **	3.3	4.3
1983 **	3.8	4.2
1984 **	3.0	7.1
1985	3.2	5.6
1986	3.2	7.9
1987	4.2	4.4
MEAN	3.4	6.3
MAX	4.2	9.2
MIN	3.0	4.2
N	10	10
SD	0.36	1.72

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

SAINT ANDREW LAKES

A total of 13 samples collected from June 22 to September 19 provided good seasonal coverage of water quality conditions in Saint Andrew Lakes. Although variability from one sampling date to the next obscures any seasonal pattern in the results, chlorophyll concentrations were generally higher and Secchi disc visibility less at the end of the season than at the beginning.

Although not confirmed by water clarity readings, chlorophyll concentrations indicate algae levels were much lower in Saint Andrew Lakes than they were during 1986. The summer of 1987 was much drier than the weather experienced during the previous summer. It is believed that reduced amounts of surface runoff limited the supply of algae producing nutrients available to the lake over the growing season with a resulting improvement in water quality.

Although Saint Andrew Lakes are slightly eutrophic the results indicate that the water quality is satisfactory for recreational purposes.

LAKE : SAINT ANDREW LAKES
TWP : HINCHINBROOKE
COUNTY : FRONTENAC

ID NUMBER : 17-0035-006-01

WATERSHED AREA	: 2.80	sq.km	SHORELINE	: 7.60	km.
SURFACE AREA	: 79.0	ha.	COTTAGES	: 20 (1983)	
MAX DEPTH	: 15.80	m.	RESORTS	: 0	
VOLUME	: 5.05	mill cu. m.	% CROWN LAND	: 0	

UPPER LAKE

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
06/22/87	2.9	3.5
06/28/87	2.9	0.9
07/05/87	2.6	6.3
07/13/87	2.9	4.4
07/19/87	2.3	6.4
07/26/87	2.6	5.5
08/04/87	2.9	6.9
08/09/87	2.9	7.9
08/16/87	1.7	4.0
08/23/87	2.0	3.8
08/30/87	2.0	7.0
09/07/87	2.6	6.0
09/19/87	2.3	8.2
MEAN	2.5	5.4
MAX	2.9	8.2
MIN	1.7	0.9
N	13	13
SD	0.41	2.05

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1977	1.8	10.2
1978 *	1.9	8.9
1980	1.8	15.8
1981	1.7	12.3
1982	2.8	3.9
1983 **	3.5	3.4
1984	3.1	5.4
1985	3.3	2.8
1986	2.9	10.4
1987	2.5	5.4
MEAN	2.5	7.9
MAX	3.5	15.8
MIN	1.7	2.8
N	10	10
SD	0.69	4.33

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

SAINT PETER, LAKE

Seven samples collected from June 18 to September 4. Water clarity was better and chlorophyll concentrations were lower during August than they were during July. The water quality in deep lakes of low productivity generally improves through out the ice free season as the nutrient pool is depleted by the growth and demise of algae.

The Secchi disc visibility was better in Lake Saint Peter during 1987 than during any previous year of record.

The chlorophyll and water clarity record indicate Lake Saint Peter has very good water quality.

LAKE : SAINT PETER, LAKE
TWP : MCLURE
COUNTY : HASTINGS

ID NUMBER : 18-3490-031-01

WATERSHED AREA	: 67.00	sq.km	SHORELINE	: 13.20	km.
SURFACE AREA	: 234.0	ha.	COTTAGES	: 182	
MAX DEPTH	: 28.70	m.	RESORTS	: 10 (301)	
VOLUME	: 17.78	mill cu. m.	% CROWN LAND	: 10	

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
06/18/87	3.8	2.2
07/08/87	4.3	2.6
07/12/87	4.4	3.4
07/27/87	4.6	2.3
08/05/87	4.6	1.6
08/18/87	4.3	1.9
09/04/87	5.2	1.8
MEAN	4.5	2.3
MAX	5.2	3.4
MIN	3.8	1.6
N	7	7
SD	0.43	0.61

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1976 **	3.8	2.7
1977 **	4.8	1.7
1978 **	3.9	2.4
1979 **	3.4	2.7
1980	3.3	3.3
1983 **	3.9	2.0
1984 **	3.8	2.5
1985 **	3.8	1.7
1986 **	4.0	1.6
1987	4.5	2.3
MEAN	3.9	2.3
MAX	4.8	3.3
MIN	3.3	1.6
N	11	10
SD	0.44	0.54

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

SALMON TROUT LAKE

A total of nine sets of measurements from May 10 to November 9 provided good seasonal coverage of water quality conditions of Salmon Trout Lake.

Chlorophyll concentrations tended to increase during the summer months but did not affect Secchi disc depth visibility to any appreciable degree. In fact water clarity was very good in Salmon Trout Lake. The Secchi disc visibility matched a record for water clarity in Salmon Trout Lake of 4.2 metres set in 1978.

Water clarity was higher and chlorophyll concentrations lower than those measured in the lake during 1986. The summer of 1987 was much drier than the weather experienced during the previous summer. It is believed that reduced amounts of surface runoff limited the supply of algae producing nutrients available to the lake over the growing season with a resulting improvement in water quality.

LAKE : SALMON TROUT LAKE
TWP : MONTEAGLE
COUNTY : HASTINGS

ID NUMBER : 18-3490-032-01

WATERSHED AREA	: 9.25	sq.km	SHORELINE	: 7.90	km.
SURFACE AREA	: 100.0	ha.	COTTAGES	: 70	
MAX DEPTH	: 14.00	m.	RESORTS	: 0	
VOLUME	: 3.8	mill cu. m.	% CROWN LAND	: 21	

CENTRE OF LAKE

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
05/10/87	4.2	1.7
07/05/87	4.6	1.9
07/21/87	4.1	4.6
08/07/87	4.7	6.1
08/18/87	4.1	7.4
09/10/87	4.2	6.7
09/21/87	3.5	8.3
10/13/87	4.8	1.6
11/09/87	4.0	
MEAN	4.2	4.8
MAX	4.8	8.3
MIN	3.5	1.6
N	9	8
SD	0.41	2.74

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1974	3.7	2.1
1975 *	3.0	11.9
1976 **	3.4	9.9
1977 **	3.8	6.1
1978	4.2	7.5
1979	3.2	11.1
1980	3.3	17.6
1981	3.5	5.6
1982	3.7	3.6
1983	3.9	4.7
1984	3.6	4.1
1985	3.3	9.8
1986	3.6	5.7
1987	4.2	4.8
MEAN	3.6	7.5
MAX	4.2	17.6
MIN	3.0	2.1
N	14	14
SD	0.35	4.16

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

SAND LAKE

A very thorough sampling program running from May 19 to October 28 provided a total of 25 sets of measurements of water quality for Sand Lake. Chlorophyll concentrations were higher and Secchi disc visibility lower towards the end of the sampling program than they were at the beginning. This pattern of seasonally increasing productivity as the summer progresses was observed in Sand Lake during 1985 and is characteristic of many lakes.

Water clarity was higher and chlorophyll concentrations lower than those measured in the lake during 1986. The summer of 1987 was much drier than the weather experienced during the previous summer. It is believed that reduced amounts of surface runoff limited the supply of algae producing nutrients available to the lake over the growing season with a resulting improvement in water quality.

The results indicate Sand Lake has good water clarity with only moderate levels of algae. The water quality is well suited for recreational uses such as swimming and bathing.

LAKE : SAND LAKE
TWP : SOUTH CROSBY
COUNTY : LEEDS

ID NUMBER : 12-0004-017-01

WATERSHED AREA	: 7.32	sq.km	SHORELINE	: 51.50	km.
SURFACE AREA	: 732.0	ha.	COTTAGES	: 110	
MAX DEPTH	: 14.30	m.	RESORTS	: 3 (36)	
VOLUME	: 37.81	mill cu. m.	% CROWN LAND	: 0	

13 TO 14 METRE DEPTH

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
05/19/87	3.7	0.5
05/27/87	3.7	2.4
06/04/87	3.9	1.1
06/11/87	3.9	0.8
06/17/87	3.3	2.2
06/23/87	4.0	1.0
07/01/87	3.3	1.6
07/14/87	3.3	1.7
07/18/87	4.3	1.2
07/21/87	3.7	3.2
07/23/87	3.7	1.2
07/28/87	4.3	2.7
08/06/87	3.3	1.9
08/11/87	3.3	3.0
08/18/87	4.3	4.6
08/24/87	3.7	4.1
09/02/87	3.1	5.2
09/09/87	3.1	6.6
09/15/87	3.1	2.1
09/23/87	2.4	5.9
09/30/87	2.7	4.2
10/08/87	2.7	4.6
10/16/87	3.1	4.7
10/21/87	3.7	3.3
10/28/87	3.4	4.0
MEAN	3.5	3.0
MAX	4.3	6.6
MIN	2.4	0.5
N	25	25
SD	0.50	1.71

HISTORICAL RECORD MAIN BASIN

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1971 **	2.9	2.5
1975 **	3.7	5.7
1980	3.0	7.2
1983	2.7	3.3
1984	2.8	5.2
1985	3.4	5.1
1986	3.0	4.5
1987	3.5	3.0
MEAN	3.1	4.6
MAX	3.7	7.2
MIN	2.7	2.5
N	8	8
SD	0.36	1.57

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

SHABOMEKA LAKE

An extremely thorough sampling program running from May 5 to October 12 provided excellent seasonal coverage of water quality conditions in Shabomeka Lake. Chlorophyll concentrations were higher in the spring and fall than during the summer months. This stands in contrast to the pattern observed during 1986 when mid summer values were slightly higher than those at other times of the sampling period.

The results indicate Shabomeka Lake has very good water quality with relatively low levels of algae. There is very little year to year variability in the water quality.

LAKE : SHABOMEKA LAKE
TWP : BARRIE
COUNTY : FRONTENAC

ID NUMBER : 18-3430-034-01

WATERSHED AREA	: 40.90	sq.km	SHORELINE	: 13.70	km.
SURFACE AREA	: 268.0	ha.	COTTAGES	: 104	
MAX DEPTH	: 32.00	m.	RESORTS	: 0	
VOLUME	: 33.19	mill cu. m.	% CROWN LAND	: 50	

CENTRE OF LAKE

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
05/05/87	3.0	3.9
05/12/87	4.1	4.9
05/19/87	3.9	5.0
05/28/87	4.2	1.8
06/01/87	4.8	0.5
06/10/87	4.8	1.3
06/15/87	4.9	2.2
06/22/87	4.9	2.3
06/29/87	5.0	1.1
07/06/87	5.2	2.9
07/13/87	5.1	3.0
07/21/87	5.1	2.9
07/29/87	5.5	2.1
08/06/87	5.2	1.6
08/19/87	5.1	1.8
08/26/87	5.0	1.7
09/02/87	4.7	1.1
09/08/87	5.6	2.8
09/13/87	6.1	3.3
09/20/87	5.3	2.2
09/28/87	5.8	3.2
10/05/87	4.5	3.3
10/12/87	5.1	2.3
MEAN	4.9	2.5
MAX	6.1	5.0
MIN	3.0	0.5
N	23	23
SD	0.66	1.14

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1976 **	5.1	2.7
1980 **	5.1	3.8
1981	4.4	3.2
1983 *	4.8	2.1
1984	5.2	3.2
1985	4.3	2.5
1986	4.5	2.4
1987	4.9	2.5
MEAN	4.8	2.8
MAX	5.2	3.8
MIN	4.3	2.1
N	8	8
SD	0.35	0.56

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

SILVER LAKE

A total of 13 samples collected from June 17 to October 7 provided good coverage of conditions of water quality conditions in Silver Lake. Although Secchi disc visibility was somewhat less during the month of August than it was during the months of July and September no clear cut seasonal was detected.

Although water clarity declined in August readings remained extremely good. In fact, the seasonal mean Secchi disc visibility depth of 4.8 metres establishes a record high water clarity reading for Silver Lake. Chlorophyll concentrations were much lower than those observed during 1986.

The summer of 1987 was much drier than the weather experienced during the previous summer. It is believed that reduced amounts of surface runoff limited the supply of algae producing nutrients available to the lake over the growing season with a resulting improvement in water quality.

The Secchi disc visibility depth and chlorophyll concentration record indicate that the lake has very good water quality.

An introduction of Eurasian milfoil along the southeast shoreline of Silver Lake was investigated in 1986 and found to occupy an area of about 9.4 hectares. A follow up inspection in 1987 indicated there has been some further spread of the weed.

LAKE : SILVER LAKE
TWP : OSO, SOUTH SHERBROOKE
COUNTY : FRONTENAC, LANARK

ID NUMBER : 18-3430-027-01

WATERSHED AREA	: 29.70	sq.km	SHORELINE	: 9.20	km.
SURFACE AREA	: 246.0	ha.	COTTAGES	: 87 + 1 HOUSE	
MAX DEPTH	: 24.40	m.	RESORTS	: 3 (185)	
VOLUME	: 24.91	mill cu. m.	% CROWN LAND	: 10	

CENTRE OF LAKE

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
06/17/87	3.8	4.5
07/01/87	5.7	1.1
07/07/87	5.6	2.4
07/15/87	5.6	2.5
07/19/87	4.7	2.7
07/28/87	4.3	2.2
08/03/87	4.9	3.5
08/18/87	4.4	1.7
08/23/87	4.2	2.0
09/02/87	4.7	1.0
09/10/87	5.0	1.7
09/27/87	5.1	3.8
10/07/87	4.9	2.5
MEAN	4.8	2.4
MAX	5.7	4.5
MIN	3.8	1.0
N	13	13
SD	0.58	1.02

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1975 **	3.7	2.5
1977	3.5	2.4
1978	3.5	2.7
1979 **	4.0	2.7
1980	3.4	3.6
1981	3.6	3.0
1982	4.1	2.4
1983	3.9	2.0
1984	3.4	3.0
1985	3.7	2.3
1986	4.3	3.2
1987	4.8	2.4
MEAN	3.8	2.7
MAX	4.8	3.6
MIN	3.4	2.0
N	12	12
SD	0.42	0.45

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

SKOOTAMATTA LAKE

Six samples collected from June 27 to August 5 indicated good water quality, but the absence of an early spring or lake fall algae bloom cannot be confirmed.

Water clarity was higher and chlorophyll concentrations lower than those measured in the lake during 1986. The summer of 1987 was much drier than the weather experienced during the previous summer. It is believed that reduced amounts of surface runoff limited the supply of algae producing nutrients available to the lake over the growing season with a resulting improvement in water quality.

The results indicate Skootamatta Lake has good water clarity and very little algae. The water quality is well suited for recreational use such as swimming and bathing.

LAKE : SKOOTAMATTA LAKE : UPPER LAKE (W.B) ID NUMBER : 17-0026-005-01
TWP : ANGLESEA
COUNTY : LENNOX & ADDINGTON

WATERSHED AREA	: 49.34	sq.km	SHORELINE	: 9.60	km.
SURFACE AREA	: 456.0	ha.	COTTAGES	: 36 (1974)	
MAX DEPTH	: 29.30	m.	RESORTS	: 0	
VOLUME	: 4.33	mill cu. m.	% CROWN LAND	: 0	

UPPER LAKE (WEST BASIN)

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
06/27/87	3.8	1.0
07/09/87	3.8	2.0
07/19/87	3.8	2.8
07/29/87	3.5	1.5
08/04/87	3.2	0.8
08/05/87	3.5	1.1
MEAN	3.6	1.5
MAX	3.8	2.8
MIN	3.2	0.8
N	6	6
SD	0.24	0.75

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1974 **	4.2	3.0
1975 **	3.7	5.2
1980 *	3.7	3.2
1982 *	4.0	3.4
1983	3.4	1.5
1984	3.3	3.0
1985	3.5	2.3
1986	3.0	2.4
1987	3.6	1.5
MEAN	3.6	2.8
MAX	4.2	5.2
MIN	3.0	1.5
N	9	9
SD	0.36	1.13

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

SOUTH LAKE

Six samples collected from the end of July to the beginning of September provided an indication of water quality conditions comparable to those for the same period during 1986.

While Secchi disc depth measurements indicated adequate visibility for swimming and bathing purposes, chlorophyll concentrations were high and the presence of algae in the lake may have been visibly apparent.

Recyling of nutrients from lake sediments and bottom waters may be instrumental in maintaining a high level of productivity in the waters of South Lake.

LAKE : SOUTH LAKE ID NUMBER : 12-0017-019-01
TWP : FRONT & REAR OF LEEDS & LANSDOWNE
COUNTY : LEEDS

WATERSHED AREA	: 38.91	sq.km	SHORELINE	: 10.94	km.
SURFACE AREA	: 220.0	ha.	COTTAGES	: 17 + 1	HOUSE
MAX DEPTH	: 14.63	m.	RESORTS	: 0	
VOLUME	: 11.73	mill cu. m.	% CROWN LAND	: 1	

VICINITY OF WILLY'S BROOK

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
07/24/87	1.1	3.7
08/05/87	2.1	9.3
08/10/87	1.8	8.0
08/17/87	1.2	19.0
08/24/87	1.5	15.0
09/02/87	1.2	18.0
MEAN	1.5	12.2
MAX	2.1	19.0
MIN	1.1	3.7
N	6	6
SD	0.40	6.10

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1981 **	2.1	8.9
1982 **	1.5	13.5
1983 **	2.1	8.0
1984 **	2.0	8.2
1986	1.3	17.5
1987	1.5	12.2
MEAN	1.8	11.4
MAX	2.1	17.5
MIN	1.3	8.0
N	6	6
SD	0.36	3.75

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

STEENBURG LAKE

Although a total of six samples were collected from Steenburg Lake, sampling occurred on only three dates and therefore the results may not be representative of water quality conditions as they occurred over the season in the lake. The data are therefore insufficient to draw any definite conclusions about Steenburg Lake or make comparisons with previous years.

A minimum of six sampling dates are necessary to adequately characterize water quality of a lake. Preferably 12 or more measurements evenly timed throughout the ice free season of the year from May to October should be taken to define any seasonal trends in water quality if they are present.

Based on the historical record the Secchi disc visibility depth and chlorophyll concentrations indicate Steenburg Lake has very good water quality.

LAKE : STEENBURG LAKE
TWP : TUDOR, LIMERICK
COUNTY : HASTINGS

ID NUMBER : 17-0021-011-01

WATERSHED AREA	: 21.50	sq.km	SHORELINE	: 13.70	km.
SURFACE AREA	: 277.0	ha.	COTTAGES	: 203	
MAX DEPTH	: 20.10	m.	RESORTS	: 0	
VOLUME	: 15.62	mill cu. m.	% CROWN LAND	: 0	

BEACH BAY

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
07/19/87	3.0	1.9
08/02/87	4.0	2.1

PHILLIPS BAY

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
07/19/87	4.3	
08/02/87	4.0	1.6

WEST BAY

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
08/02/87	3.7	1.7
08/16/87	4.3	1.1

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1976 **	4.6	2.4
1977	4.7	3.0
1978	4.3	3.0
1979	4.5	3.2
1983	4.3	2.4
1984	3.8	3.6
1985 *	4.2	3.1
1986	3.8	3.1
1987	3.9	1.7
MEAN	4.2	2.8
MAX	4.7	3.6
MIN	3.8	1.7
N	9	9
SD	0.34	0.57

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

STOCO LAKE

A total of nine samples collected by a program running from the end of April to mid September provided good seasonal coverage of water quality conditions in Stoco Lake. High chlorophyll concentrations were intermittently encountered, which during the first and second week of August were accompanied by diminished water clarity.

While Secchi disc depths indicated adequate visibility for swimming and bathing purposes chlorophyll concentrations were high and the presence of algae may have been visibly apparent from time to time.

Recyling of nutrients from lake sediments and bottom waters is believed to be instrumental in maintaining a high level of productivity in the waters of Stoco Lake.

LAKE : STOCO LAKE
TWP : HUNGERFORD
COUNTY : HASTINGS

ID NUMBER : 17-0026-008-01

WATERSHED AREA	: 2230.00	sq.km	SHORELINE	: 16.00	km.
SURFACE AREA	: 500.0	ha.	COTTAGES	: 90	
MAX DEPTH	: 9.76	m.	RESORTS	: 4 (26)	
VOLUME	: 19.93	mill cu. m.	% CROWN LAND	: 0	

NORTH BASIN

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
07/15/87	2.1	4.9

SOUTH BASIN

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
05/26/87	2.1	7.8
06/17/87	2.1	6.4
07/07/87	1.8	7.0
07/15/87	2.1	11.0
07/27/87	2.3	4.6
08/06/87	1.5	18.5
08/18/87	1.5	25.5
08/31/87	1.8	8.6
09/17/87	1.8	8.5
MEAN	1.9	10.9
MAX	2.3	25.5
MIN	1.5	4.6
N	9	9
SD	0.28	6.77

SOUTH BASIN HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1972 **	1.3	9.0
1973 **	1.5	22.5
1974 **	2.4	5.8
1975 **	2.0	20.1
1984 **	1.2	22.6
1985	1.5	11.9
1986 *	2.0	10.7
1987	1.9	10.9
MEAN	1.7	14.2
MAX	2.4	22.6
MIN	1.2	5.8
N	8	8
SD	0.41	6.55

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

SYDENHAM LAKE

Although a total of six samples were collected from Sydenham Lake, sampling occurred on only two dates and therefore the results may not be representative of water quality conditions as they occurred over the season. The data are therefore insufficient to draw any definite conclusions about Sydenham Lake or make comparisons with previous years.

A minimum of six sampling dates are necessary to adequately characterize water quality of a lake. Preferably 12 or more measurements evenly timed throughout the ice free season of the year from May to October should be taken to define any seasonal trends in water quality if they are present.

Based on the historical record the Secchi disc visibility depth and chlorophyll concentrations indicate Sydenham Lake has good water quality.

LAKE : SYDENHAM LAKE
TWP : LOUGHBOROUGH
COUNTY : FRONTENAC

ID NUMBER : 06-0180-003-01

WATERSHED AREA	: 49.00	sq.km	SHORELINE	: 42.00	km.
SURFACE AREA	: 451.0	ha.	COTTAGES	: 152	
MAX DEPTH	: 37.00	m.	RESORTS	: 2 (51)	
VOLUME	: 32.05	mill cu. m.	% CROWN LAND	: 0	

CENTRE OF LAKE

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
06/21/87	4.3	2.3
06/28/87	3.7	2.6
MEAN	4.0	2.5
MAX	4.3	2.6
MIN	3.7	2.3
N	2	2
SD	0.42	0.22

MAIN LAKE HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1977	5.0	5.1
1978	3.6	3.2
1979	3.6	4.5
1980	4.3	4.8
1982 *	3.7	3.6
1983	3.8	2.2
1984	3.8	4.2
1987 *	4.0	2.5
MEAN	4.0	3.8
MAX	5.0	5.1
MIN	3.6	2.2
N	8	8
SD	0.48	1.07

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

EEL BAY

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
06/21/87	3.7	2.7
06/28/87	3.3	0.5
MEAN	3.5	1.6
MAX	3.7	2.7
MIN	3.3	0.5
N	2	2
SD	0.28	1.56

EEL BAY HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1977 *	4.3	4.7
1983	2.9	4.2
1987 *	3.5	1.6
MEAN	3.6	3.5
MAX	4.3	4.7
MIN	2.9	1.6
N	3	3
SD	0.70	1.66

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

LAKE : LITTLE LONG LAKE
TWP : LOUGHBOROUGH
COUNTY : FRONTENAC

ID NUMBER : 06-0180-002-01

WATERSHED AREA	:	sq.km	SHORELINE	:	km.
SURFACE AREA	:	ha.	COTTAGES	:	
MAX DEPTH	:	m.	RESORTS	:	
VOLUME	:	mill cu. m.	% CROWN LAND	:	

LITTLE LONG LAKE

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
06/21/87	3.7	1.2
06/28/87	3.7	1.3
MEAN	3.7	1.3
MAX	3.7	1.3
MIN	3.7	1.2
N	2	2
SD		0.10

LITTLE LONG LAKE

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1977 *	4.9	4.3
1987 *	3.7	1.3
MEAN	4.3	2.8
MAX	4.9	4.3
MIN	3.7	1.3
N	2	2
SD	0.85	2.12

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

THIRTEEN ISLAND LAKE

A very thorough sampling program with a total of 23 samples taken from April 20 to October 25 provided excellent seasonal coverage of water quality conditions in Thirteen Island Lake.

While chlorophyll concentrations were generally a little higher during July and August than at other times of the year water clarity did not vary much.

Chlorophyll concentrations were lower and Secchi disc visibility higher than they were during 1986. The summer of 1987 was much drier than the weather experienced the previous summer. It is believed that reduced amounts of surface runoff limited the supply of algae producing nutrients available to the lake over the growing season with a resulting improvement in water quality.

The Secchi disc visibility and chlorophyll concentration results indicate the lake has good water quality.

LAKE : THIRTEEN ISLAND LAKE ID NUMBER : 17-0035-015-01
TWP : BEDFORD, HINCHINBROOKE, LOUGHBOROUGH, PORTLAND
COUNTY : FRONTENAC

WATERSHED AREA	: 40.00	sq.km	SHORELINE	: 13.80	km.
SURFACE AREA	: 132.0	ha.	COTTAGES	: 60	
MAX DEPTH	: 25.90	m.	RESORTS	: 2 (4)	
VOLUME	: 6.63	mill cu. m.	% CROWN LAND	: 0	

CENTRE OF LAKE

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
04/20/87	3.0	0.7
04/26/87	3.0	0.4
05/18/87	3.4	2.0
05/24/87	3.3	9.3
06/07/87	3.4	3.9
06/14/87	3.3	1.6
06/21/87	3.7	2.1
06/28/87	3.3	0.3
07/05/87	3.3	5.2
07/12/87	3.3	5.2
07/19/87	3.7	4.7
07/26/87		4.8
08/03/87	3.0	8.4
08/09/87	3.7	5.7
08/16/87	3.3	3.0
08/20/87	3.4	5.7
08/23/87	3.3	3.7
08/30/87	3.4	4.9
09/07/87	3.4	3.9
09/13/87	3.5	4.8
09/27/87	3.7	5.6
10/04/87	3.7	4.5
10/12/87	3.7	3.9
10/25/87	3.6	3.6
MEAN	3.4	4.1
MAX	3.7	9.3
MIN	3.0	0.3
N	23	24
SD	0.23	2.22

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1975 **	4.3	4.2
1983	3.3	3.4
1984 **	3.8	4.3
1985	3.5	3.7
1986	3.3	6.7
1987	3.4	4.1
MEAN	3.6	4.4
MAX	4.3	6.7
MIN	3.3	3.4
N	6	6
SD	0.39	1.18

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

TROY LAKE

A total of 16 samples collected from April 10 to October 12 provided excellent seasonal coverage of water quality conditions in Troy Lake. The best water quality conditions occurred from the end of May to the middle of July during which time Secchi disc visibility depth reached 4.6 metres.

Chlorophyll concentrations were much lower and Secchi disc visibility much higher than they were during 1986. The summer of 1987 was much drier than the weather experienced the previous summer. It is believed that reduced amounts of surface runoff limited the supply of algae producing nutrients available to the lake over the growing season with a resulting improvement in water quality.

The results during 1987 indicate that Troy Lake had good water quality with low levels of algae present. The lake was well suited for recreation including swimming and bathing.

LAKE : TROY LAKE
TWP : SOUTH CROSBY
COUNTY : LEEDS

ID NUMBER : 12-0004-019-01

WATERSHED AREA	: 8.17	sq.km	SHORELINE	: 8.50	km.
SURFACE AREA	: 119.0	ha.	COTTAGES	: 16 (1974)	
MAX DEPTH	: 5.20	m.	RESORTS	: 0	
VOLUME	: 2.74	mill cu. m.	% CROWN LAND	: 0	

CENTRE OF LAKE

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
04/10/87	2.4	0.9
05/10/87	3.5	2.6
05/18/87	3.1	5.6
05/24/87	2.9	2.1
05/30/87	3.2	0.9
06/07/87	4.6	1.1
06/14/87	4.6	3.0
06/21/87	2.5	2.3
06/28/87	4.0	1.4
07/05/87	4.3	3.2
07/12/87	4.3	2.7
07/19/87	3.4	5.2
07/27/87	3.1	2.9
08/03/87	2.7	6.8
09/27/87	3.1	7.2
10/12/87	2.7	3.8
MEAN	3.4	3.2
MAX	4.6	7.2
MIN	2.4	0.9
N	16	16
SD	0.74	2.00

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1975 **	2.1	9.3
1977	1.7	10.4
1978	1.9	11.1
1979	2.0	12.0
1980	2.3	10.1
1981	2.3	6.3
1982	2.4	8.4
1983	2.0	10.7
1984	2.4	8.0
1985	2.6	8.5
1986	1.9	13.5
1987	3.4	3.2
MEAN	2.3	9.3
MAX	3.4	13.5
MIN	1.7	3.2
N	12	12
SD	0.45	2.72

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

TWIN SISTERS LAKE

A total of 16 samples from June 5 to September 30 provided good seasonal coverage of water quality conditions in the east basin of Twin Sisters Lake. Fewer samples were collected from the west basin but the number was sufficient to conclude that the water quality in the two basins is similar. Chlorophyll concentrations were higher from the end of July to mid September than they were earlier in the season and water clarity declined as a result.

The results indicate that although Twin Sister Lake has moderate levels of algae present in the water, the clarity is good. The lake is suitable for recreational uses such as swimming and bathing.

LAKE : TWIN SISTER LAKES : EAST BASIN ID NUMBER : 17-0021-012-01
TWP : MARMORA
COUNTY : HASTINGS

WATERSHED AREA	: 6.90	sq.km	SHORELINE	: 4.40	km.
SURFACE AREA	: 51.0	ha.	COTTAGES	: 20	
MAX DEPTH	: 8.54	m.	RESORTS	: 0	
VOLUME	: 1.74	mill cu. m.	% CROWN LAND	: 0	

EAST BASIN

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
06/05/87	3.2	3.5
06/16/87	3.5	1.9
06/24/87	3.8	1.0
07/02/87	3.5	6.9
07/12/87	3.2	0.7
07/20/87	3.2	2.7
07/26/87	3.0	8.4
08/01/87	3.2	9.5
08/04/87	3.0	14.0
08/09/87	2.9	11.0
08/21/87	2.7	7.5
08/28/87	2.3	6.5
09/02/87	2.3	7.7
09/09/87	2.6	6.0
09/13/87	2.6	6.0
09/30/87	2.3	3.3
MEAN	3.0	6.0
MAX	3.8	14.0
MIN	2.3	0.7
N	16	16
SD	0.46	3.72

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1980 **	3.9	5.2
1981 *	3.5	5.0
1982	3.4	2.2
1983	3.5	3.3
1984	3.8	5.0
1985	3.6	4.7
1986	3.4	4.0
1987	3.0	6.0
MEAN	3.5	4.4
MAX	3.9	6.0
MIN	3.0	2.2
N	8	8
SD	0.28	1.21

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

LAKE : TWIN SISTER LAKES : WEST BASIN ID NUMBER : 17-0021-013-01
TWP : MARMORA
COUNTY : HASTINGS

WATERSHED AREA	: 8.70	sq.km	SHORELINE	: 3.20	km.
SURFACE AREA	: 35.0	ha.	COTTAGES	: 21	
MAX DEPTH	: 13.40	m.	RESORTS	: 0	
VOLUME	: 1.96	mill cu. m.	% CROWN LAND	: 0	

WEST BASIN

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
05/18/87	3.5	1.8
06/16/87		1.9
08/01/87	4.1	10.0
08/29/87	3.5	7.9
09/07/87	3.4	6.5
09/19/87	3.1	1.5
10/04/87	3.1	5.3
10/10/87	2.9	1.5
10/31/87	3.1	
11/07/87	2.7	
MEAN	3.3	4.6
MAX	4.1	10.0
MIN	2.7	1.5
N	9	8
SD	0.41	3.35

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1977	3.6	2.9
1980 **	3.9	4.3
1981	4.4	2.9
1982	3.6	3.3
1983	3.5	2.5
1984	3.5	4.7
1985	3.8	5.3
1986	3.0	3.7
1987	3.3	4.6
MEAN	3.6	3.8
MAX	4.4	5.3
MIN	3.0	2.5
N	9	9
SD	0.39	0.97

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

UPPER BEVERLEY LAKE

A good sampling program provided a total of 10 observations of water quality from June 15 to August 24. Chlorophyll concentrations were higher and Secchi disc visibility lower at the end of the sampling period than they were at the beginning. This seasonal increase in productivity as the summer progresses is characteristic of many lakes.

Water quality was comparable to that measured from 1981 to 1984. The Secchi disc visibility depth and chlorophyll concentration record indicate Lower Beverley Lake has satisfactory water quality for recreational purposes such as swimming and bathing.

LAKE : UPPER BEVERLEY LAKE ID NUMBER : 12-0017-015-01
TWP : BASTARD, REAR OF LEEDS & LANSDOWNE
COUNTY : LEEDS

WATERSHED AREA	: 100.06	sq.km	SHORELINE	: 25.70	km.
SURFACE AREA	: 551.0	ha.	COTTAGES	: 57 + 2	HOUSES
MAX DEPTH	: 7.01	m.	RESORTS	: 2 (7)	
VOLUME	: 13.3	mill cu. m.	% CROWN LAND	: 0	

VICINITY OF GIFFORDS POINT

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
06/15/87		3.5
06/21/87	2.9	2.3
06/28/87	2.4	2.0
07/05/87	2.7	3.4
07/12/87	2.7	3.3
07/19/87	2.3	4.2
07/25/87	2.4	5.2
07/31/87	2.3	3.7
08/09/87	2.0	6.2
08/24/87	1.8	7.9
MEAN	2.4	4.2
MAX	2.9	7.9
MIN	1.8	2.0
N	9	10
SD	0.35	1.81

VARIOUS OPEN WATER LOCATIONS

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1981 **	2.5	4.1
1982 **	1.8	6.1
1983 **	3.3	3.2
1984 **	2.6	6.3
1987	2.4	4.2
MEAN	2.5	4.8
MAX	3.3	6.3
MIN	1.8	3.2
N	5	5
SD	0.54	1.36

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

UPPER RIDEAU LAKE

Eight samples were collected from July 12 to September 27. Water quality was not as good during the month of August as during the months of July and September. Although the August water clarity was satisfactory for swimming and bathing the chlorophyll concentrations indicate the presence of algae in the water may have been visibly apparent.

LAKE : UPPER RIDEAU LAKE
TWP : NORTH CROSBY
COUNTY : LEEDS

ID NUMBER : 18-0033-030-01

WATERSHED AREA	: 155	sq.km	SHORELINE	: 39.0	km.
SURFACE AREA	: 136.2	ha.	COTTAGES	: 240 (1971)	
MAX DEPTH	: 22.0	m.	RESORTS	: 10 (307)	
VOLUME	: 109.74	mill cu. m.	% CROWN LAND	: 0	

NOT SPECIFIED

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
07/12/87	3.0	1.1
07/20/87	1.8	5.8
08/03/87	2.0	8.4
08/09/87	2.2	15.0
08/16/87	1.3	11.0
08/30/87	1.9	7.2
09/07/87	2.1	7.8
09/27/87	2.2	7.6
MEAN	2.1	8.0
MAX	3.0	15.0
MIN	1.3	1.1
N	8	8
SD	0.48	3.99

VARIOUS OPEN WATER LOCATIONS

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1971 **	2.6	8.9
1975 **	2.7	13.7
1977	2.6	7.8
1980 **	2.8	13.8
1983 **	3.4	3.9
1987	2.1	8.0
MEAN	2.7	9.4
MAX	3.4	13.8
MIN	2.1	3.9
N	6	6
SD	0.42	3.82

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

WHITE LAKE

A very thorough sampling program running from April 6 to September 23 was carried out on White Lake. The results indicate there is no difference in water quality between the two sampling locations. Chlorophyll concentrations were higher and Secchi disc visibility lower at the end of the sampling program than they were at the beginning. This seasonal increase in productivity as the summer progresses is characteristic of many lakes.

The results indicate that White Lake has suitable water quality for recreational uses such as swimming and bathing.

LAKE : WHITE LAKE
TWP : DARLING, BAGOT, MCNAB, PAKENHAM
COUNTY : LANARK & RENFREW

ID NUMBER : 18-3490-039-01

WATERSHED AREA	: 211.00	sq.km	SHORELINE	: 97.80 km.	
SURFACE AREA	: 2269.0	ha.	COTTAGES	: 449 + 5 HOUSES	
MAX DEPTH	: 9.20	m.	RESORTS	: 10 (508)	
VOLUME	: 74.74	mill cu. m.	% CROWN LAND	: 50	

STATION 1

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
05/06/87	2.9	1.2
05/13/87	2.9	0.9
05/20/87	3.2	6.4
05/29/87	3.3	1.6
06/03/87	3.8	1.9
06/18/87	3.2	1.8
06/25/87	3.0	0.7
07/02/87	2.4	7.1
07/07/87	2.7	7.6
07/15/87	2.4	2.6
07/22/87	3.3	10.8
07/29/87	2.4	5.4
08/05/87	2.3	7.6
08/12/87	2.0	5.5
08/19/87	2.0	3.7
08/27/87	2.1	6.1
09/10/87	3.2	3.8
09/18/87	2.7	5.7
09/23/87	2.6	10.0
MEAN	2.8	4.8
MAX	3.8	10.8
MIN	2.0	0.7
N	19	19
SD	0.51	3.07

STATION 2

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
05/06/87	2.9	3.5
05/13/87	2.9	0.9
05/20/87	3.2	6.9
05/29/87	3.6	1.7
06/03/87	4.1	2.4
06/18/87	3.2	2.4
06/25/87	3.3	0.2
07/02/87	3.2	6.0
07/07/87	2.4	10.0
07/15/87	3.0	2.1
07/22/87	3.3	5.0
07/29/87	2.4	4.2
08/05/87	2.3	7.3
08/12/87	2.1	6.4
08/19/87	2.1	5.5
08/27/87	1.8	7.8
09/18/87	2.6	6.4
09/23/87	2.6	10.0
MEAN	2.8	4.9
MAX	4.1	10.0
MIN	1.8	0.2
N	18	18
SD	0.59	2.94

LAKE : WHITE LAKE
TWP : DARLING, BAGOT, MCNAB, PAKENHAM
COUNTY : LANARK & RENFREW

ID NUMBER : 18-3490-039-01

WATERSHED AREA	: 211.00	sq.km	SHORELINE	: 97.80 km.	
SURFACE AREA	: 2269.0	ha.	COTTAGES	: 449 + 5 HOUSES	
MAX DEPTH	: 9.20	m.	RESORTS	: 10 (508)	
VOLUME	: 74.74	mill cu. m.	% CROWN LAND	: 50	

STATIONS 1 AND 2 COMBINED

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1972 *	1.8	7.2
1973	2.6	6.5
1974	3.0	3.3
1975 **	3.2	5.7
1976	2.4	9.6
1977	2.8	5.4
1978	3.2	5.6
1979	3.0	4.5
1980	2.7	8.0
1981	2.8	5.8
1982	2.4	5.1
1983	2.8	4.3
1984	2.7	5.4
1985	2.5	7.9
1986	2.9	5.0
1987	2.8	4.8
MEAN	2.7	5.9
MAX	3.2	9.6
MIN	1.8	3.3
N	16	16
SD	0.35	1.61

NOTE : * Based on less then 6 readings.
** Recreational lakes included.

WHITE LAKE

A total of 12 samples were collected from June 10 to August 19. There was little seasonal variation in chlorophyll results but water clarity appeared to decline somewhat after mid summer.

The results indicate White Lake has very good water quality with very little algae present in the water of the lake.

LAKE : WHITE LAKE
TWP : OLDEN
COUNTY : FRONTENAC

ID NUMBER : 18-3430-031-01

WATERSHED AREA	: 10.9	sq.km	SHORELINE	:	km.
SURFACE AREA	: 253	ha.	COTTAGES	: 14	(1972)
MAX DEPTH	: 29.6	m.	RESORTS	: 0	
VOLUME	:	mill cu. m.	% CROWN LAND	:	

MAIN BASIN

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
06/10/87	6.0	1.0
06/17/87	6.0	0.8
08/26/87	4.9	2.1
06/23/87	5.5	0.5
07/02/87	4.6	1.5
07/09/87	5.0	1.6
07/15/87	5.0	2.2
07/29/87	4.1	1.6
08/05/87	4.6	1.7
08/10/87	5.5	1.6
08/12/87	4.9	1.0
08/19/87	4.4	1.3
MEAN	5.0	1.4
MAX	6.0	2.2
MIN	4.1	0.5
N	12	12
SD	0.60	0.51

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1975	4.9	2.0
1976	4.8	2.1
1977	4.6	2.1
1987	5.0	1.4
MEAN	4.8	1.9
MAX	5.0	2.1
MIN	4.6	1.4
N	4	4
SD	0.17	0.34

YUKES LAKE

The very limited sampling that was conducted indicate that Yukes Lake has exceptionally clear water with extremely low levels of algae in the lake.

Six sets of measurements are required to adequately characterize the water quality of a lake. Preferably 12 or more sets of measurements evenly timed from May until October are needed to define any seasonal trends if they are present.

LAKE : YUKES LAKE
TWP : BRUDENELL
COUNTY : RENFREW

ID NUMBER : 18-3490-049-01

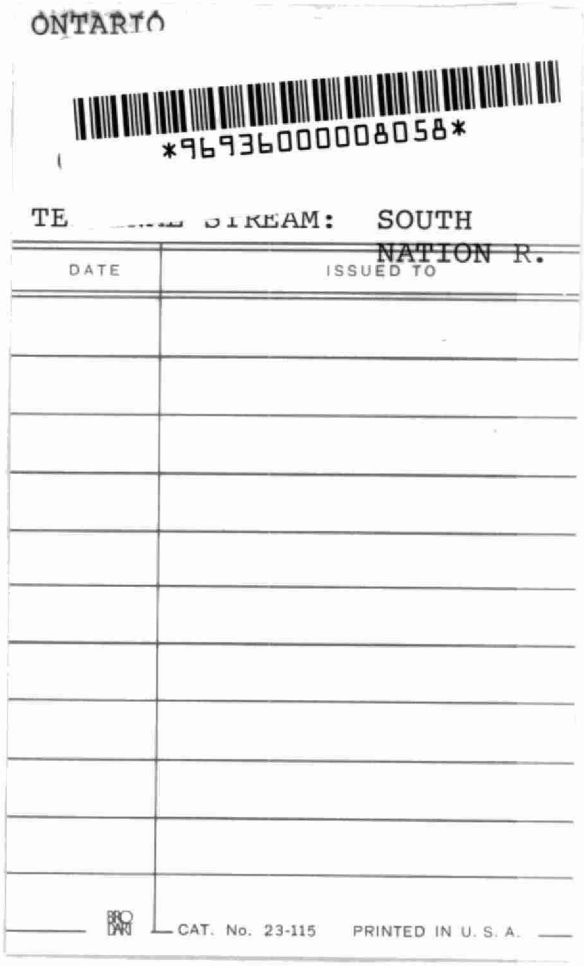
WATERSHED AREA	:	sq.km	SHORELINE	:	km.
SURFACE AREA	:	ha.	COTTAGES	:	
MAX DEPTH	: 10	m.	RESORTS	:	
VOLUME	:	mill cu. m.	% CROWN LAND	:	

CENTRE OF LAKE

SAMPLE DATE (MM/DD/YY)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
09/06/87	8.7	0.8
09/13/87	9.6	0.6
09/20/87	9.1	0.7
MEAN	9.1	0.7
MAX	9.6	0.8
MIN	8.7	0.6
N	3	3
SD	0.45	0.10

HISTORICAL RECORD

SAMPLE DATE (YEAR)	SECCHI DEPTH (METERS)	CHLOROPHYLL A (UG/L)
1987 *	9.1	0.7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