



**THE
ONTARIO WATER RESOURCES
COMMISSION**

REPORT ON

LAKEFRONT SURVEY

of

WATER QUALITY

WASTE OUTFALLS and DRAINAGE INLETS

of

LAKE ONTARIO

within the area

Town of Burlington to Scarborough Township

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MAY 1962

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REPORT

on a

LAKEFRONT SURVEY

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WATER QUALITY,

WASTE OUTFALLS AND DRAINAGE INLETS

of

LAKE ONTARIO

within the area

Town of Burlington to Scarborough Township Inclusive

May 1962

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LAKEFRONT SURVEY

LAKE ONTARIO - BURLINGTON TO SCARBOROUGH

This report records the results of surveys carried out in 1960 and 1961. The area between Burlington and Scarborough of Lake Ontario borders a thickly populated and highly industrialized section of the province. The survey was a joint effort of the Ontario Water Resources Commission, Metropolitan Toronto Works Department, and the Toronto Health Department. The analytical results are voluminous, and maps are included to show the locations of sampling points and the identifying numbers of these points used in the tabulated findings. These results are valuable both to indicate conditions existing at the time of the sampling, and for comparison with surveys which may be made later.

Regular investigations of water quality are essential in the pollution control program of the Ontario Water Resources Commission. In this survey two objectives were involved:

- (a) to obtain information on the quality of the water of the lake a short distance offshore, and
- (b) to check on all discharges or inflows to the lake from any source, and to determine by testing the amount of pollution carried into these waters.

Appropriate steps were taken to collect sufficient samples and to carry out the laboratory tests which would permit interpretation of conditions.

The "Objectives for Water Quality" adopted by the Commission

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were used as a measuring unit in assessing the results. The most significant analyses were the B.O.D. (Biochemical Oxygen Demand), suspended solids, coliform counts, and phenols.

Sources of Pollution

The report records all known sources of pollution including the effluents from sewage works, untreated wastes, industrial wastes, storm drains, watercraft of different kinds, and streams entering the waterfront. The lake must be the recipient of natural runoff and wastes of various kinds. The significant item must be the effects produced in the lake waters by these discharges, both initially and after reasonable mixing and dilution. The lake sampling points were so selected as to assess these effects.

Conditions Found

It must be expected that in such a long stretch of lakefront there will be wide variation in results. At many places the water was of acceptable quality while at some sampling points there was heavy pollution. In 1961 over 2000 samples were collected from the lake. This number, spread over 31 sampling periods, was sufficient to provide a means for assessing the degree of pollution and for comparing these figures with the water quality objectives. In this total number of samples in 1961 some 67% were within the OWRC maximum objective (2400 per 100 ml) for coliform counts, and 52% met the maximum B.O.D. objective of 4 ppm. The phenol content was within the OWRC maximum average figure of 2 ppb in 70% of the samples.

In the Metropolitan Toronto area the bacteriological analyses showed that 555 of 715 total samples were within the limits set by the Commission. In the remainder of the area 540 samples were satisfactory out of a total of 564. These latter figures are encouraging, and it was only at certain points in the lake that excess bacterial pollution was found.

More important than the analytical results themselves was the origin of pollution and the steps being taken to control this. Storm drainage and land runoff will contribute to wastes reaching the lake. This does not lend itself to control in any measurable degree. Sewage and industrial wastes can be the most serious sources of pollution. They must be purified before entering these watercourses whether to the streams or directly to the lake.

In this lakefront area, municipal sewage works exist at many places, and industrial wastes are widespread. In Metropolitan Toronto where the greatest concentration of population exists rapid progress has been made toward construction of sewage treatment plants. The abandonment of upstream treatment facilities in favor of new modern works at the lakefront can be expected to bring a major improvement. Storm flows will periodically wash down wastes to the streams and to the lake. Trunk sewers will provide outlets for much industrial wastes formerly reaching watercourses. The full program for sewage and waste treatment in the metropolitan area will reach its full objective shortly.

In the section between Metropolitan Toronto and Burlington, sewage treatment is well advanced and effective treatment works will keep pace with increasing population. In the industrial field progressive steps have been taken by the oil industry to prevent the wastes from impairing water quality. Some industrial wastes still cause problems here largely because of the difficulties of treatment.

The necessity for a clean lakefront is well recognized. The program for control must be a continuous one, with close supervision at all times to protect these waters. To this end these periodic surveys serve a valuable purpose.

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REPORT

on a

LAKEFRONT SURVEY OF LAKE ONTARIO

within the area

Town of Burlington to Scarborough Township Inclusive

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WATER QUALITY SURVEY

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based on field surveys performed in 1961

May

1962

LAKEFRONT SURVEY

LAKE ONTARIO - BURLINGTON TO SCARBOROUGH

1960 - 1961

INTRODUCTORY STATEMENT

This report deals principally with the collection and examination of samples taken from Lake Ontario and waste outlets or drainage inlets to the lake. The area involved extends from the Town of Burlington on the west to the Township of Scarborough on the east. The samples were collected in 1960 and 1961. The survey constituted a close examination of all sources of pollution whether these be from sewage, industrial wastes, storm water, or surface drainage. The usual laboratory tests were employed to interpret the extent of the pollution entering the lake and the effects this was having on the water.

This survey is one of considerable magnitude, the planning for which had to be carefully prepared and the identification of sampling points clearly shown for the records. Two Divisions of the Water Resources Commission were involved in the work. Sampling of the lake proper was carried out by the staff of the Laboratory Division while the staff of the Sanitary Engineering Division sampled outfalls, located the sampling points, and prepared the numbers for these locations. The surveys and the report were under the direction of Mr. F. A. Voegel, Director of Laboratories, and Mr. G. Kay, District Engineer for the Sanitary Engineering Division. The planning of the survey was so arranged that this could be continued annually or as required in order to maintain a close check and supervision over these waters.

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The report is prepared in two sections so that these can be combined into one complete document or used separately to serve the interests of certain specific groups. Section 1 is devoted to the investigations of sewer outfalls and inlets to the lake. Section 2 concerns the sampling of the waters of the lake proper. Each of these sections is further subdivided into two parts; part 1 dealing with that area of the lake fronting on the municipality of Metropolitan Toronto, namely between the Village of Long Branch and the Township of Scarborough; part 2 dealing with that part of the lake fronting on the Towns of Burlington, Oakville, and Port Credit, and the Township of Toronto. These are all of the waterfront municipalities between the City of Hamilton and the easterly boundary of Metropolitan Toronto.

It is desirable also to point out that the surveys were conducted during periods when precipitation and surface runoff would be at a minimum. It is expected that in times of heavy rainfall the amount of pollutants would increase further. Lake samples were collected, for the most part, at 100 feet from shore and at a depth of approximately 1 foot below the water surface. It was believed that these results would give the most desirable information, but it was recognized that sampling at other depths would give probably different values. No biological examination of these waters was included in these surveys.

Generally, the municipal sewer outfalls discharging directly to the lake or Toronto Harbour were the only ones investigated. These outfalls discharge all the flows contributed through this system including those at its extreme limits, which in most cases were several miles from the lake. In other cases

some industries have outfalls discharging directly to the water. The watercourses flowing into the lake may have had these waters contaminated initially at points located as far as 10 to 20 miles from their mouths in the case of the major streams. The investigation of these watercourses is another part of the Commission's program for investigation of water quality.

Both Sections 1 and 2 of this report contain summaries and conclusions related to the prevention of these wastes going to the lake.

In these surveys use was made of sanitary chemical, bacteriological, and phenol tests. These were considered as the most significant in the interpretation of water quality, but other surveys, which may be carried out later, might involve turbidity, colour, temperature, pH, conductivity, alkalinity, oxygen content, phosphates, nitrates, syndets, algae, chlorides, etc., all of which may be of significance in examining water quality and the effects of waste discharges on the waters.

Other groups have been actively concerned with water pollution in this area, and have taken steps to obtain information. The Commission is grateful for the assistance given by these groups, and some of the results are included in the report. Particular reference must be made to the work done by Metropolitan Toronto in the waterfront adjacent to that municipality. These analyses have been included in this report in order to make it more complete.

SUMMARY AND CONCLUSIONS

It may be pointed out that these surveys are not only important in determining the quality of the water in the lake,

but also in assessing the nature and severity of the pollutants themselves. The investigations must be continued if full information is to be made available and control measures undertaken with effectiveness.

Some of the sources of pollution are well indicated. Others are less distinct. When the source and the intensity of this are known the municipality or industry responsible is asked to take corrective measures, and to ensure that the waters will not continue to be polluted contrary to the Ontario Water Resources Commission Act.

Much progress has been made in preventing and abating the discharge of pollutants to the lake. At the same time there has been a rapid growth, residentially and industrially, in this area, and it becomes a question of taking appropriate measures which will permit this growth to continue without jeopardizing the quality of the receiving watercourse. It is expected that these waters will be available for all normal uses, and if this is to be the case pollution control must be exercised effectively. This will require also the close cooperation among all interested parties, particularly the municipalities, the industries, and the Ontario Water Resources Commission. In this program there is much to be gained by all.

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REPORT

by

THE ONTARIO WATER RESOURCES COMMISSION

on a

WATER QUALITY and OUTFALL SURVEY

OF LAKE ONTARIO

BURLINGTON TO SCARBOROUGH TOWNSHIP INCLUSIVE

SECTION I

A Survey of Outfalls to the Waterfront Area

PART I

in the Municipality of Metropolitan Toronto

INTRODUCTION

This part of the report primarily concerns examinations that were made by the Ontario Water Resources Commission during 1960 and 1961, of the effluents from waste outfalls and drainage inlets in the Municipality of Metropolitan Toronto discharging to Lake Ontario between the Village of Long Branch and the Township of Scarborough inclusive. Samples were also collected from the lake proper in this area and are reported in Part I of Section II.

The procedure was to locate each sewer outlet, catalogue the same, and where flow was noted to collect a "grab" sample for laboratory analysis. If the outlet was partly or totally submerged the flow was sampled where accessible via a manhole having its invert above lake level. In some instances samples were collected near the submerged sewer outlets. These would represent diluted vicinity samples.

The staffs of the Metropolitan Toronto Industrial Waste Control Branch and Scarborough Township Works Department

co-operated in collecting a number of these samples where it was necessary to enter a manhole at a busy intersection or under other difficult circumstances. Their assistance in this manner and otherwise is especially appreciated.

The analyses of the samples collected from the mouths of the five major streams discharging to the lake through Metropolitan Toronto are included also in this report.

During the sampling periods the weather was generally clear and dry with the following exception. Heavy rain was falling on November 15, 1960 when the samples were collected from the sewers having outfalls numbered LO-76.3(W), LO-76.7(W), and LO-77.3(W).

ANALYSES

The analyses performed generally included determinations of biochemical oxygen demand (B.O.D.), solids or turbidity, and phenolic equivalents, in addition to bacteriological (coliform) examinations. In limited instances the samples were tested for ether solubles, pH, chrome, and copper.

"Grab" samples were collected: forty (40) ounce samples for sanitary chemical analysis, and six (6) ounce samples for bacteriological examination being used. All these laboratory tests were performed at the Ontario Water Resources Commission Laboratory in Toronto.

The most common analyses of sanitary significance are: biochemical oxygen demand, suspended solids, and the total coliform determination.

Biochemical Oxygen Demand (B.O.D.)

The B.O.D. of sewage, industrial wastes, or surface waters, including lake or river waters is the oxygen required during stabilization, (natural purification in a stream), of the decomposable organic matter, or chemical material by aerobic biochemical action. Unless otherwise noted a 5-day B.O.D. determination is performed, and it is reported in parts per million (ppm.). A high B.O.D. is often indicative of recent organic or chemical pollution. This quality of a material tends to reduce the dissolved oxygen of the water and could cause suffocation of fish therein and the production of offensive conditions. A desirable upper limit of this value in surface waters normally is 4 parts per million.

Suspended Solids

These results are reported in parts per million (ppm) and indicate the measure of undissolved solids of organic or inorganic nature. Where suspended solids values approach 20 parts per million or less, laboratory difficulties usually are experienced and result in the values being determined as turbidity which is reported in silica units.

Membrane Filter Coliform Count

The membrane filter technique is employed to obtain a direct enumeration of coliform organisms in the sample, and the number is reported per 100 millilitres.

Waters having total coliform counts as determined by this technique in excess of the upper limit of 2,400 organisms per 100 millilitres, are considered by the Commission as being

undesirable for municipal water supplies or bathing purposes.

WATER QUALITY AND EFFLUENT OBJECTIVES

The desirable objectives for all surface waters in the Province of Ontario are as follows:

5-Day B.O.D.	-----	not greater than	4 p.p.m.
M.F. Coliform Count	----	" " "	2,400/100 ml.
Phenolic Equivalents -			
- Average		" " "	2 p.p.b.
- Maximum		" " "	5 p.p.b.
pH Range			6.7 - 8.5

A few pertinent maximum concentration limits of contaminants in storm sewers, sewage treatment plant and industrial waste effluents, are listed below. Adequate protection for surface waters, except in certain specific instances influenced by local conditions, should be provided if the following concentrations and pH range, are not exceeded.

5-Day B.O.D.	---	not greater than	15 p.p.m.
Suspended Solids	---	" " "	15 p.p.m.
Phenolic Equivalents	---	" " "	20 p.p.b.
Ether Solubles (oil)	---	" " "	15 p.p.m.
pH Range			5.5 - 10.6

RESULTS OF ANALYSES

The results of the bacteriological and chemical analyses of the samples collected are recorded in Table I of this report, together with a brief description of all known sewer outfalls from Metropolitan Toronto to Lake Ontario and Toronto Harbour.

The locations of the outfalls are shown on accompanying plans numbered 15-31 inclusive. A key plan of this area is attached.

DISCUSSION

Some of the lakefront municipalities have combined sewers which discharge to associated storm sewers via relief mechanisms, during most periods of runoff.

Combined sewers carry sanitary sewage and/or industrial wastes as well as storm and run-off waters. Due to the costs of collecting and treating the high flows that occur at times of storms or surface run-off, they are diverted in part to storm sewers or storm relief sewers to be discharged, without treatment, to a watercourse. This represents a pollution problem in the receiving waters. This condition is aggravated if sanitary sewage and/or industrial wastes is discharged unnecessarily from the storm sewer or other outlets, during periods of zero or negligible run-off as during the periods of these surveys.

During this survey period, very little flow and certainly no contaminated combined sewer overflows, should be expected in storm sewer outfalls. But, in fact, appreciable severely contaminated flows were occurring, as indicated by their high bacterial (coliform) contents. Raw or untreated sanitary sewage could cause a high count to exist.

From Etobicoke to Scarborough high coliform counts were obtained in most of the outfall effluents. The maximum total coliform count of sixty-seven million per 100 ml. was recorded at the creek on the Ontario Hospital grounds at New Toronto LO-72.2(D). This creek periodically receives untreated industrial wastes together with overflows from a Township of Etobicoke sewage pumping station. A value of forty-one million was recorded at the Cherry Street storm sewer LOT-9(W). Values of one million or greater were recorded at

the Etobicoke Creek LO-70.7(D), Long Branch sewage treatment plant outfall LO-70.7(D), Park Lawn Road storm sewer LO-75.1(W), Parkside Drive storm sewer LO-76.7(W), Roncesvalles Avenue storm sewer LO-77.3(W), Dufferin Street storm sewer LO-78.5(W), Garrison Creek storm sewer LOT-2(W), the storm sewer between Parliament and Small Streets LOT-8(W), the Don River at Cherry Street LOT-10(D), Leslie Street storm sewer LOT-19(W), Main sewage treatment plant outfall LO-86.6(T), Ashbridges Bay LO-86.6(D), Coxwell Avenue storm sewer LOA-3(W), Scarborough Crescent storm sewer LO-91.7(W), and Highland Creek LO-98.6(D). Values approaching these concentrations were recorded at many other outfalls and are shown in Table I.

All the points mentioned above, almost invariably also were discharging wastes having B.O.D. and suspended solids concentrations in excess of the Commission's objective maximums. Locations LOT-11(W), LOT-12(W), LOT-13(W), and LOT-14(W), all in Toronto Harbour, revealed similar excesses.

Excessive phenol concentrations were revealed at the 23rd Street storm sewer LO-71.9(W), 2nd Street storm sewer LO-73.1 (W-1), Sand Beach storm sewer LO-73.3(W), Mimico Creek LO-75.0(D), Parkside Drive storm sewer LO-76.7(W), Roncesvalles Avenue storm sewer LO-77.3(W), Dufferin Street storm sewer LO-78.5(W), Garrison Creek storm sewer LOT-2(W), Simcoe Street storm sewer LOT-5(W), Sherbourne Street storm sewer LOT-7(W), Cherry Street storm sewer LOT-9(W), Polson Street storm sewer LOT-12(W), Carlaw Avenue storm sewer LOT-17(W), Commissioners Street storm sewer LOT-18(W), Leslie Street storm sewer LOT-19(W), Main sewage treatment plant outfall LO-86.6(T), ditch to Ashbridges Bay LOA-1(D), Scarborough Crescent storm sewer LO-91.7(W), and Highland Creek LO-98.6(D).

Excessive concentrations of ether solubles (oil) were recorded at the Hospital Creek in New Toronto LO-72.2(D) and at the Second Street storm sewer LO-73.1(W-D). Ether solubles evaluations were not made at all locations.

Low pH (acidic) results were obtained at the Hospital Creek LO-72.2(D) and at the Second Street storm sewer LO-73.1(W-2).

ASSESSMENT OF ANALYSES

The analyses revealed that the B.O.D. and suspended solids of the effluents from many of the sewers were excessive, and there were some very high coliform counts. While the flows in the storm sewers were not estimated they were quite significant in many cases, so that the total weight of the polluting material thereof, was appreciable even during these periods of dry flow.

Gross deposition of solids was observed in some of the storm sewers receiving combined sewer overflows.

Attention is also directed to sampling points numbered LO-70.7(D), LO-75.0(D), LO-75.9(D), LO-98.6(D) which represent samples collected at the mouths of the Etobicoke and Mimico Creeks, Humber and Don Rivers, and Highland Creek, respectively. The B.O.D. of the waters in all these streams generally exceeded desired objectives in each investigation. The minimum and the maximum B.O.D. results for the above watercourses were as follows:

	<u>Minimum B.O.D.</u>	<u>Maximum B.O.D.</u>
Etobicoke Creek	3.2	17
Mimico Creek	6.4	23
Humber River	6.0	32
Don River	14	76
Highland Creek	9	15

Gross bacterial contamination was revealed in several of the samples collected from the mouths of the streams. The minimum and the maximum coliform counts obtained for each stream

are recorded below:

	<u>Minimum Coliform Count</u>	<u>Maximum Coliform Count</u>
Etobicoke Creek	10	1,040,000
Mimico Creek	0	10,400
Humber River	2,260	257,000
Don River	14,000	1,340,000
Highland	10	2,160,000*

*This last value may have been caused by a malfunctioning of the effluent chlorination devices at the Highland Creek sewage treatment plant.

TORONTO HARBOUR - SEDIMENT

The Don River terminates at the Keating Channel. As well as other pollutants, excessive quantities of silt and debris are deposited here and are often visually evident. The effect on the bay area itself is not visible but is measurable. With continued urbanization and increased soil erosion in the drainage area of the Don, the annual quantities in the channel requiring dredging by the Toronto Harbour Commission, have risen from approximately 65,000 cubic yards ten years ago to approximately 225,000 cubic yards at present. A similar increased rate of siltation in the bay might be anticipated.

Deposition near Garrison Creek outlets LOT-3(W) and LOT-2(W), the Sherbourne Street outlet LOT-7(W), Carlaw Ave. LOT-17(W) and Cherry Street LOT-14(W) is also appreciable. Surveys may reveal that a greater part of this material originates in the Don River.

These deposits and other associated polluting material would in part be forced out of the bay to the lake during the periods of storms and severe runoff. Some of this material may also, of necessity, have been barged to the lake proper.

TORONTO HARBOUR COMMISSIONERS

As stated in A Review of the Lake Pollution Problem in the Toronto Area by the City of Toronto Planning Board, -"the Harbour Commission is responsible for the control over the discharge of material by shipping to harbour waters. The Animal Contagious Diseases Act, requires the collection and incineration of garbage and other refuse from foreign ships. A regular service of garbage collection, under the authority of a Federal By-Law, is in effect for all ships in the harbour. Oil Pollution Prevention Regulations, under the authority of the Canada Shipping Act have been in use since March 21, 1957, and have the effect of prohibiting the discharge of oil in the lake and authorizing the Harbour Police to act as oil inspectors who can board an offending ship and take whatever steps may be necessary. An additional safeguard is provided by periodic aerial inspection by the Harbour Commission for traces of oil in the harbour area.

There is no sewage collection service from boats in the harbour, although a plan for such service is understood now to be under consideration."

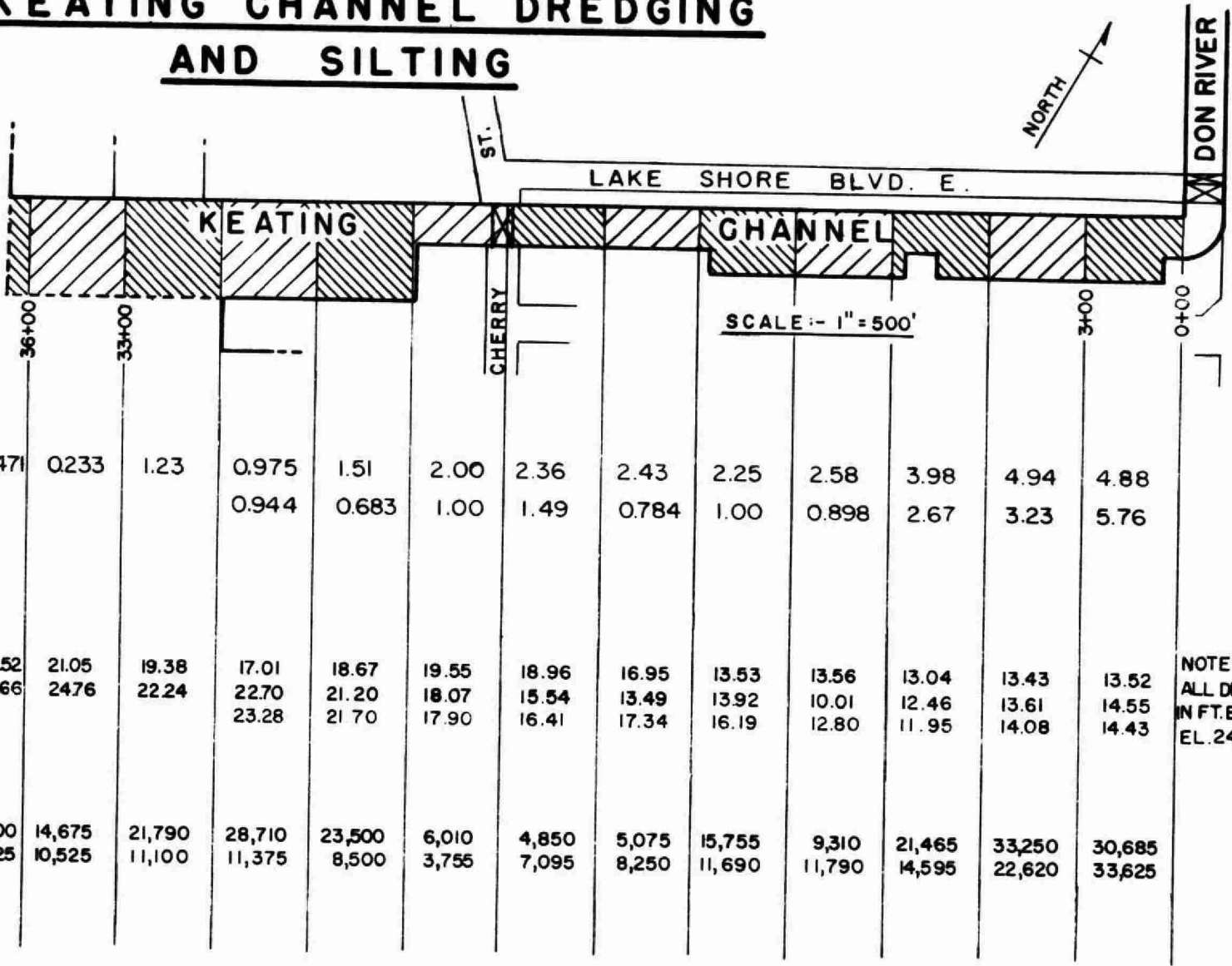
The polluting effects of discharges from the two thousand or so ships docking in the harbour each year (1958 - 2,260; 1959 - 2,336) should be borne in mind.

The Harbour Commission makes an inspection of the harbour in the vicinity of some thirty-one outlets daily. Most of these outlets are submerged. Once a week, about seventy-two manholes and catch basins on these sewers are examined for the presence of oil. Any accumulation of oil or grease in these manholes or catch basins is pumped out so that it will not escape

KEATING CHANNEL DREDGING AND SILTING

Q. E. DOCKS

TORONTO
BAY



SILTING, 1960, CU. Y./SQ. YD. 0.471

" 1961 " "

AVG. DEPTH, JAN. 1960

" " DEC. 1960

DEC. 1961

DREDGING, 1960, CU. YDS.

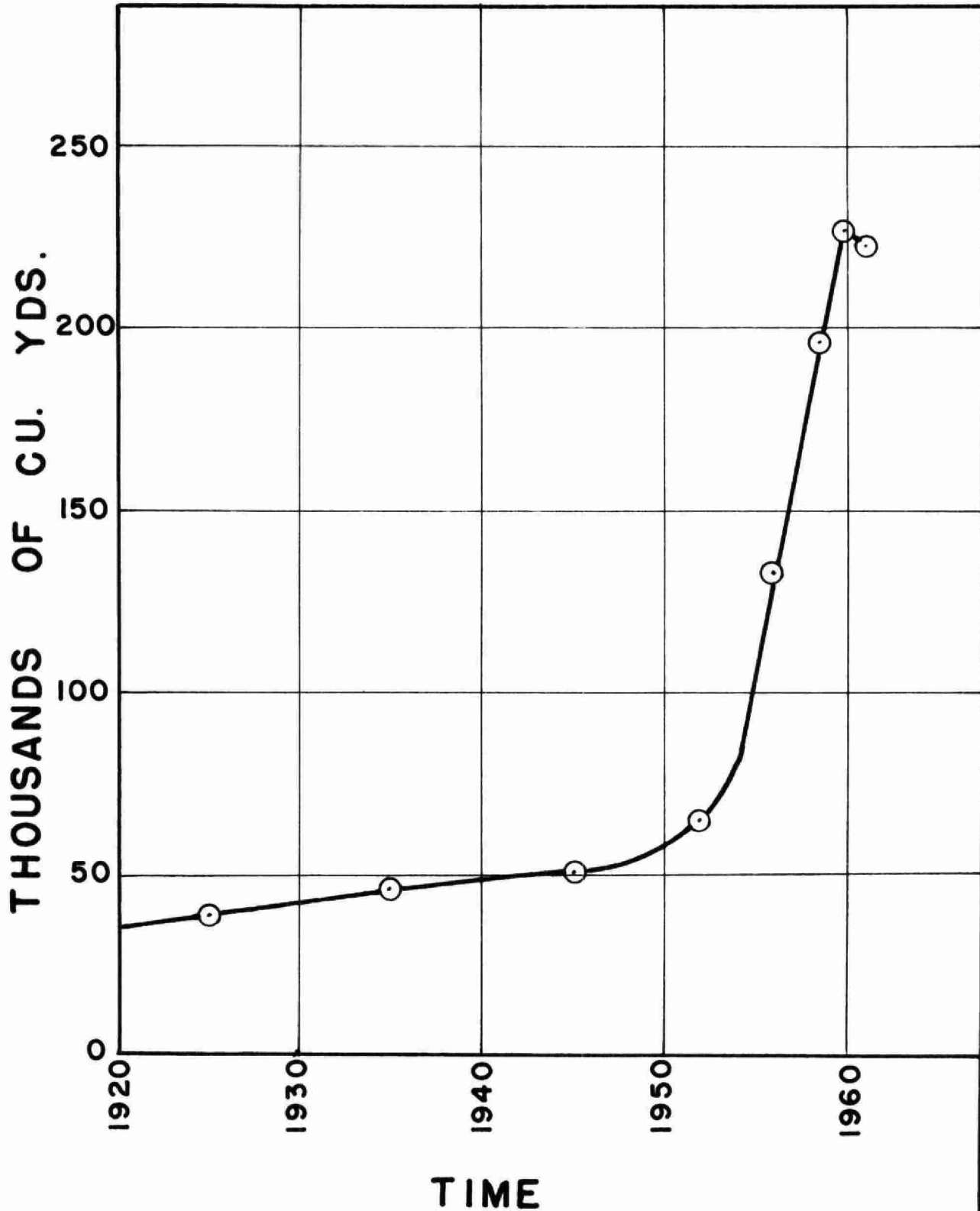
" 1961 " "

0.233	1.23	0.975	1.51	2.00	2.36	2.43	2.25	2.58	3.98	4.94	4.88
0.944	0.683	1.00	1.49	0.784	1.00	0.898	2.67	3.23	5.76		
24.52	21.05	19.38	17.01	18.67	19.55	18.96	16.95	13.53	13.56	13.04	13.43
26.66	24.76	22.24	22.70	21.20	18.07	15.54	13.49	13.92	10.01	12.46	13.61
		23.28	21.70	17.90	16.41	17.34	16.19	12.80	11.95	14.08	14.43
2,600	14,675	21,790	28,710	23,500	6,010	4,850	5,075	15,755	9,310	21,465	33,250
3,225	10,525	11,100	11,375	8,500	3,755	7,095	8,250	11,690	11,790	14,595	22,620
											30,685
											33,625

NOTE:
ALL DEPTHS
IN FT. BELOW
EL. 245.0'

PERIOD	1920-29	1930-39	1940-49	1950-54	1955-57	1958-59	1960	1961
AVG. ANNUAL DREDGING, CU. YDS.	38,600	45,300	50,900	65,000	133,000	196,000	227,170	222,300

KEATING CHANNEL DREDGING



to the harbour.

Together with oil pollution, siltation in the harbour is becoming more severe each year and is the subject of extensive investigation by that body, in association with Dr. R. H. Deane of the Great Lakes Institute. A sketch showing dredging quantities is attached by kind permission of the Commissioners.

During the navigation season there is danger of oil spills from boats, and hence the Commissioners have maintained daily oil inspection flights over the bay and lake from Whitby to Oakville.

The Commissioners have had an intensive policy of locating and plotting all known intakes and outlets in their waterfront areas. These are especially useful in assessing and abating pollution problems.

SAMPLING BY METROPOLITAN TORONTO WORKS DEPARTMENT

The Metropolitan Toronto Works Department has been active in attempting to minimize water pollution and to this end collects effluent samples in this area at basically the same locations as used by the Ontario Water Resources Commission. The results of analyses performed by the Department on samples collected in 1961 are attached, with an associated map, by kind permission of the Department. Generally these indicate the gross bacteriological pollution being discharged to the lake and the bay, suggesting the presence of raw or inadequately treated sanitary sewage therein.

The coliform index used here is derived by another method of coliform content determination, yielding values approximating those derived by the membrane filter technique.

The Industrial Waste Control Branch of the Water

Pollution Control Division of this Department has been especially active in investigating industrial waste discharges and co-operating with industry in abating these discharges.

A summary of coliform indeces of samples collected at Metropolitan Toronto water works intakes by staff of the Works Department and later analysed at their laboratory, is attached by kind permission. These average results indicate the extent of the bacterial pollution of the Metropolitan Toronto water source. Since it is desirable to kill all coliform organisms present in water to be used for drinking purposes, the need for adequate disinfection by chlorination procedures to avoid the occurrence of water-borne diseases is apparent.

LAKE ONTARIO WATER AT METROPOLITAN
TORONTO WATER WORKS
INTAKES

COLIFORM INDEX PER 100 ML.

YEARLY AVERAGES-1957-61.

	R.C.HARRIS PLANT	SCARBORO PLANT	NEW TORONTO PLANT	ISLAND FILTRATION PLANT
1957	94	17,342	3,461	8,527
1958	195	101,040	6,684	28,413
1959	106	54,873	12,897	12,312
1960	318	17,978	4,113	3,659
1961	365	15,586	4,404	3,564

Note: The Island Filtration Plant results are for the Eastern Intake only. Operation of the Western Intake is intermittent and therefore the results are not representative of the entire year.

METROPOLITAN TORONTO WORKS DEPT.
DRAINAGE DIVISION

POLLUTION CONTROL AND WATER EVALUATION
LAKE AND STREAM SAMPLING

DATE July 26, 1961
SOURCE Lakefront

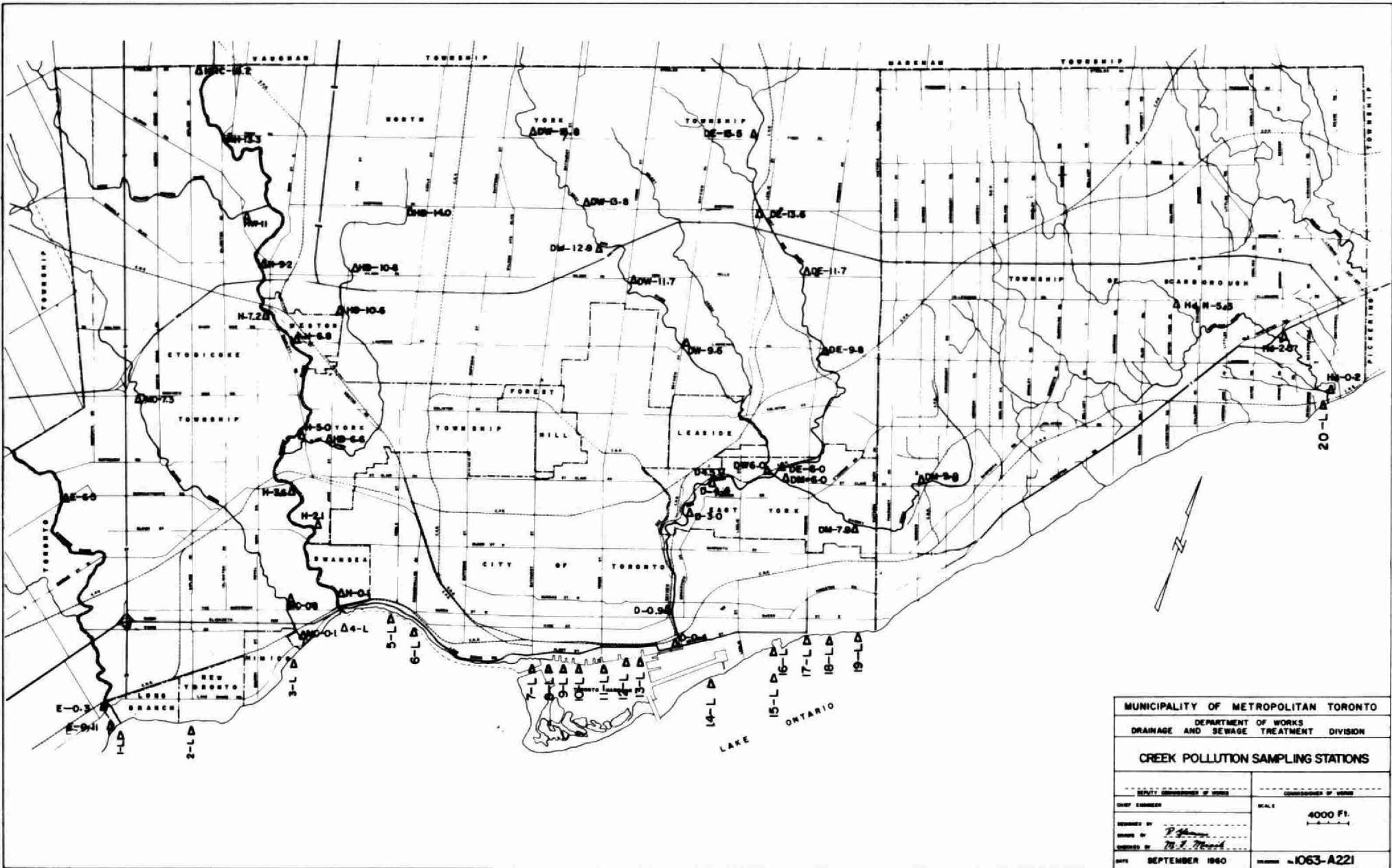
MONTH OF June
SAMPLING DATE see remarks

SAMPLING LOCATION	DISSOLVED OXYGEN		WATER Temp.	SOLIDS		BOD	COLIFORM BACTERIA	REMARKS	
	ppm	%Sat.	°F	Suspended ppm	% Volatile	ppm	index/100ML	Date	Weather
Approx. 5-15' from Outlets									
L 7 Strachan	10.6	94	50	28	49	3	1,000		
L 8 Western Gap	8.4	79	65	32	61	17	100,000		
L 9 Spadina Slip	8.0	88	60	9	74	2	10,000		
L10 Simcoe Slip	5.5	58	60	18	65	5	10,000	June 28	Light Rain
L11 Yonge Slip	6.3	66	60	16	73	1	100,000		
L12 Sherbourne	5.2	55	60	23	64	8	100,000		
L13 Parliament	5.4	59	68	136	74	20	100,000		
L14 Turning Basin	3.0	33	68	80	74	65	1,000,000		
L15 Outfall M.S.T.P.	-	-	50	8	100	7	NIL		
L16 Coatsworth Cut	-	-	54	12	86	3	1,000		
L17 Woodbine	-	-	52	3	100	NIL	10,000	June 7	Sunny
L18 Lee	-	-	54	7	100	NIL	100		
L19 Maclean	-	-	53	6	100	NIL	100		

T - Turbidity - Suspended Solids test carried out only when indicated turbidity is 20 units or more.
NAP - No apparent pollution - Dissolved Oxygen at or near saturation, and indicated turbidity less than 20 units.

Acknowledgement not necessary.

COMMISSIONER OF WORKS



MUNICIPALITY OF METROPOLITAN TORONTO	
DEPARTMENT OF WORKS DRAINAGE AND SEWAGE TREATMENT DIVISION	
CREEK POLLUTION SAMPLING STATIONS	
DATE OF SURVEY	SCALE
DRAWN BY <i>R. Johnson</i>	4000 FT.
CHECKED BY <i>T. J. McLeod</i>	
DATE SEPTEMBER 1960	DRAWING NO. I063-A221

METROPOLITAN TORONTO WORKS DEPT.
DRAINAGE DIVISION

POLLUTION CONTROL AND WATER EVALUATION
LAKE AND STREAM SAMPLING

DATE Nov. 27/61
SOURCE Lake Ontario

MONTH OF July
SAMPLING DATE as below

SAMPLING LOCATION Approx. 5-15' from Outlets	DISSOLVED OXYGEN		WATER Temp.	SOLIDS		BOD	COLIFORM BACTERIA	REMARKS	
	ppm	%Sat.	°F	Suspended ppm	% Volatile	ppm	index/100ML	Date	Weather
L 1 Long Branch S.T.P.	8.0	66.2	45	34	79.3	22	100,000	July 5	Sunny
L 2 Ont. Hospital Creek	3.5	39.8	72	780	44.9	40+	10,000	" "	"
L 3 Superior Ave. Mimico	8.3	79.1	56	12	96.0	NIL	10,000	" "	"
L4&5 Eliminated									
L 6 Breakwater opposite Sunnyside	11.2	91.7	45	NIL	NIL	NIL	100	" "	"
Roncesvalles	11.1	92.8	46	12	68.0	5	1,000,000	" "	"
L 7 Strachan	10.6	93.8	50	28	49.2	3	1,000	" "	"
L 8 Western Gap	9.0	86.5	57	NAP	-	-	100	" 20	Partly Sunny
L 9 Spadin Slip	5.6	51.3	53	54	45.1	10	100	" "	"
L10 NW Corner of Pier 5 Slip	8.2	78.8	57	NAP	-	-	1,000	" 12	
L11 Yonge St. Slip	10.4	100.1	58	NAP	-	-	10,000	" "	
L12 Sherbourne	9.2	88.5	57	NAP	-	-	100,000	" "	
L13 Parliament	5.6	56.0	61	24	83.6	49	1,000,000	" "	
L14 Turning Basin	Sample points L14 to L19 inclusive were not taken by Main Plant personnel due to bad weather, holidays, etc.								
L15 Outfall M.S.T.P.									
L16 Coatsworth Cut									
L17 Woodbine									
L18 Lee									
L19 MacLean									
L20 Highland Creek S of Outfall	8.0	80.8	62	64	49.1	4	NIL	" 6	Sunny

T - Turbidity - Suspended Solids test carried out only when indicated turbidity is 20 units or more.
NAP - No apparent pollution - Dissolved Oxygen at or near saturation, and indicated turbidity less than 20 units.

COMMISSIONER OF WORKS

Acknowledgement not necessary.

METROPOLITAN TORONTO WORKS DEPT.
DRAINAGE DIVISION

POLLUTION CONTROL AND WATER EVALUATION
LAKE AND STREAM SAMPLING

DATE Nov. 27/61
SOURCE Lake Ontario

MONTH OF Aug.
SAMPLING DATE as below

SAMPLING LOCATION Approx. 5-15' from Outlets	DISSOLVED OXYGEN		WATER Temp.	SOLIDS		BOD	COLIFORM BACTERIA	REMARKS
	ppm	%Sat.	°F	Suspended ppm	% Volatile	ppm	index/100ML	
L 1 Long Branch S.T.P. Outfall	10.8	93.9	49	16	52.5	4	10,000	Aug. 16
L 2 Ont. Hospital	9.1	88.3	58	23	45.6	7	100	" "
L 3 Superior Ave. Mimico	7.9	79.8	62	16	25.0	6	1,000	" "
L 4 Breakwater opp. Sunnyside	8.7	76.9	50	33	20.5	3	100	" "
L 5 Roncesvalles	10.3	88.8	48	7	22.2	1	1,000	" "
L 6 Eliminated								" "
L 7 Strachan	6.9	65.7	56	23	31.6	7	100,000	" "
L 8 Western Gap	11.7	121.8	64	21	32.7	5	100	" 17
L 9 Spadina	9.5	95.0	61	6	42.8	2	10,000	" 16
L10 NW Corner Pier 5 Slip	(Main Plant Personnel unable to take these samples due to boats unloading.)							
L11 Yonge St.								
L12 Sherbourne	3.3	34.4	65	48	95.1	57	100,000	" 24
L13 Parliament	NIL	-	92	51	83.7	74	100,000	" "
L14 NW Corner Turning Basin	NIL	-	95	64	88.1	120	10,000	" "
L15 Outfall Main S.T.P.	(
L16 Coatsworth Cut	(Bacteriological only							
L17 Woodbine	(done on these							
L18 Lee	(samples							
L19E MacLean East	(
L19W MacLean West	(

T - Turbidity - Suspended Solids test carried out only when indicated turbidity is 20 units or more.
NAP - No apparent pollution - Dissolved Oxygen at or near saturation, and indicated turbidity less than 20 units.

COMMISSIONER OF WORKS

Acknowledgement not necessary.

METROPOLITAN TORONTO WORKS DEPT.
DRAINAGE DIVISION

POLLUTION CONTROL AND WATER EVALUATION
LAKE AND STREAM SAMPLING

DATE Nov. 27/61
SOURCE Lake Ontario

MONTH OF Sept.
SAMPLING DATE as below

SAMPLING LOCATION Approx. 5-15' from Outlets	DISSOLVED OXYGEN		WATER Temp.	SOLIDS		BOD	COLIFORM BACTERIA	REMARKS Date
	ppm	%Sat.	°F	Suspended ppm	% Volatile	ppm	index/100ML	
L 1 Long Branch S.T.P.								Samples L1 to L7 incl. and L9 and L15 to L19 west were unable to be taken by Main Plant Personnel
L 2 Ontario Hospital Creek								
L 3 Superior Ave. Mimico								
L 4 Breakwater opp. Sunnyside								
L 5 Roncesvalles								
L 6 Eliminated								
L 7 Strachan Ave.								
L 8 Western Gap	9.4	97.8	66	22	37.5	4	10,000	Sept. 21
L 9 Spadina Slip	Must be taken by boat							Not Taken
L10 NW Corner Pier 5 Slip	6.4	72.7	72	4	33.3	5	10,000	Sept. 14
L11 Yonge St. Slip	0.4	4.6	73	15	75.5	17	1,000,000	" "
L12 Sherbourne St. Slip	NIL	NIL	59	35	91.4	22	*	*samples contaminated in lab
L13 Parliament	1.7	20.3	78	6	99.9	>85	*	
L14 NW Corner Turning Basin	0.7	7.8	71	76	97.4	>85	*	
L15 Outfall Main S.T.P.								
L16 Coatsworth Cut								
L17 Woodbine								
L18 Lee Ave.								
L19E MacLean East								
L19W MacLean West								

T - Turbidity - Suspended Solids test carried out only when indicated turbidity is 20 units or more.
NAP - No apparent pollution - Dissolved Oxygen at or near saturation, and indicated turbidity less than 20 units.

COMMISSIONER OF WORKS

Acknowledgement not necessary

METROPOLITAN TORONTO WORKS DEPT.
DRAINAGE DIVISION

POLLUTION CONTROL AND WATER EVALUATION
LAKE AND STREAM SAMPLING

DATE Nov. 27/61
SOURCE Lake Ontario

MONTH OF Oct.
SAMPLING DATE as below

SAMPLING LOCATION Approx. 5-15' from Outlet	DISSOLVED OXYGEN		WATER Temp.	SOLIDS		BOD	COLIFORM BACTERIA	REMARKS	
	ppm	%Sat.	°F	Suspended ppm	% Volatile	ppm	index/100ML	Date	Weather
L 1 Long Branch S.T.P.									Samples L1 & L7 incl. L9 & L15 to L19 west inclusive were unable to be taken by Main Plant Personnel.
L 2 Ontario Hospital Creek									
L 3 Superior Ave. Mimico									
L 4 Breakwater opp. Sunnyside									
L 5 Roncesvalles									
L 6 Eliminated									
L 7 Strachan Ave.									
L 8 Western Gap	3.0	29.4	59	45	62.8	25	10,000	Oct. 19	Sunny
L 9 Spadina Slip	5.6	56.6	62	16	99.9	6	10,000	Oct. 12	
L10 NW Corner Pier 5 Slip	9.2	99.9	62	T 8	-	-	*		
L11 Yonge St. Slip									NAP *Bottle broken on receipt
L12 Sherbourne St. Slip	NIL	-	59	55	38.2	82	100,000	Oct. 26	Cloudy
L13 Parliament	3.4	31.8	54	34	63.2	29	10,000	" "	"
L14 NW Corner Turning Basin	3.9	38.6	60	23	72.0	70	10,000	" "	"
L15 Main S.T.P. Outfall									
L16 Coatsworth Cut									
L17 Woodbine									
L18 Lee Ave.									
L19E MacLean Ave. East									
L19W MacLean West									

T - Turbidity - Suspended Solids test carried out only when indicated turbidity is 20 units or more.
 NAP - No apparent pollution - Dissolved Oxygen at or near saturation, and indicated turbidity less than 20 units.

 COMMISSIONER OF WORKS

Acknowledgement not necessary.

METROPOLITAN TORONTO WORKS DEPT.
DRAINAGE DIVISION

POLLUTION CONTROL AND WATER EVALUATION
LAKE AND STREAM SAMPLING

DATE Dec. 6/61
SOURCE Lake Ontario

MONTH OF Nov.
SAMPLING DATE as below

	SAMPLING LOCATION	DISSOLVED OXYGEN		WATER	SOLIDS		BOD	COLIFORM	REMARKS	
		ppm	%Sat.	Temp. °F	Suspended ppm	% Volatile	ppm	BACTERIA index/100ML	Date	Weather
L 1	Long Branch S.T.P.									Samples L1 to L7 incl L9 & L15 to L19W were unable to be taken by Main Plant Personnel
L 2	Ontario Hospital Creek									
L 3	Superior Ave. Mimico									
L 4	Breakwater opposite Sunnyside									
L 5	Roncesvalles									
L 6	Eliminated									
L 7	Strachan Ave.									
L 8	Western Gap	7	60	46	50	52.0	9	10,000	Nov. 16	Rain
L 9	Spadina Slip									
L10	NW Corner Pier 5 Slip	7	57	46	18	40.0	7	10,000	Nov. 9	Cloudy
L11	Yonge St. Slip	8	67	44	17	41.9	3	10,000	"	"
L12	Sherbourne St. Slip	NIL	-	50	58	87.8	15	100,000	" 23	Rain
L13	Parliament	2	20	50	52	57.7	116	100,000	" "	"
L14	NW Corner Turning Basin	3	31	53	120	76.6	125	10,000	" "	"
L15	Outfall Main S.T.P.									
L16	Coatsworth Cut									
L17	Woodbine									
L18	Lee Ave.									
L19E	MacLean Ave. East									
L19W	MacLean Ave. West									

T - Turbidity - Suspended Solids test carried out only when indicated turbidity is 20 units or more.
NAP - No apparent pollution - Dissolved Oxygen at or near saturation, and indicated turbidity less than 20 units.

COMMISSIONER OF WORKS

Acknowledgement not necessary.

SAMPLING BY CITY OF TORONTO HEALTH DEPARTMENT

The City of Toronto has experienced adverse effects of bacteriological pollution by the necessary closing of some, and in mid-summer 1959, all of the city's lakeshore beaches but one. On the western beaches this pollution is considered to be caused in greater part, by a portion of the Humber River flow which is forced behind the breakwater by the prevailing wind action, as well as by the storm sewer outlet discharges in those areas.

The waterfront is sampled intensively and regularly during the summer months by the City of Toronto Health Department, and the results of bacteriological analyses performed at the Commission laboratory during 1960 and 1961 are attached, by kind permission of the Department. The excessively high coliform counts that occurred at some times in 1960 and 1961 in the Humber River mouth (#150, 151, 152), inside the breakwater at the Sunnyside central bathing area (#55B), at the foot of Strachan Avenue (#23), and at the foot of Dowling Avenue (#56A), should be noted.

CITY OF TORONTO - WATERFRONT SURVEY - BACTERIOLOGICAL REPORT -- 1960

MEMBRANE FILTER
TOTAL COLIFORM

AREA	LOCATION OF TEST POINT	MAY 17	MAY 24	MAY 31	JUNE 7	JUNE 14	JUNE 21	JUNE 28	JULY 5	JULY 12
# 2	BALMY BEACH 100 YDS FROM SHORE	3	153	9	0	3,900	400	165	1,500	0
# 3	KEW BEACH 30 YDS FROM SHORE	26	181	147	6	8,000	800	530	1,400	57
# 4	WOODBINE BEACH 50 YDS FROM SHORE	75	176	11	0	1,500	200	220	6,400	17
# 7	CHERRY BEACH (AT STATION) 100 YDS FROM SHORE	29,000	50	10	11	700	3,300	60	48	13
# 9	WARD'S IS. (BEACH AREA 7) 100 YDS FROM SHORE	26	30	120	190	NO SAMPLE	20	124	1,000	30
# 51	HANLAN'S PT. BATHING AREA NO 10 (BATH HOUSE) 50 YDS FROM SHORE	154	195	83	7	NO SAMPLE	70	0	130	30
# 52	CHEROKEE BATHING AREA 8A (FOOT OF CHEROKEE AVE.) 50 YDS FROM SHORE	0	180	50	130	NO SAMPLE	150	220	37,000	30
# 53	CENTRE IS. BATHING AREA 8 (BATH HOUSE)	63	203	87	13	NO SAMPLE	78	210	630	20
# 55A	SUNNYSIDE-WEST OF SUPERVISED AREA FOOT OF HOWARD AVE. INSIDE BREAKWATER	210	183,000	5,000	10	840	7,000	640	18,000	570
# 55B	SUNNYSIDE-CENTRE SUPERVISED AREA CENTRE OF PAVILION INSIDE BREAKWATER	100	180,000	280	10	780	14,000	500	55,000	6,000
# 55C	SUNNYSIDE-EAST OF SUPERVISED AREA-EAST END OF POOL INSIDE BREAKWATER	150	171,000	100	50	3,800	11,000	300	8,700	40
# 56A	WEST FREE AREA (WOMEN'S) FOOT OF DOWLING AVE. INSIDE BREAKWATER	40	23,000	9,000	6,000	116	4,600	92	4,300	810
# 56B	EAST FREE AREA (MEN'S) FOOT OF DOWLING AVE. INSIDE BREAKWATER	30	72,000	510	2,000	1,000	16,000	100	2,600	70
# 50	OLYMPIC BATHING AREA 9 (BATH HOUSE) 100 YDS FROM SHORE	200	290	330	470	950	1,800	560	1,200	30
# 21½	FOOT OF DUNN AVENUE A INSIDE BREAKWATER A OUTSIDE BREAKWATER	130 100	670 70	790 430	1,000 420	7,000 29,000	850 400	14,000 100	3,000 630	160 20
# 22	FOOT OF DUFFERIN ST. A INSIDE BREAKWATER A OUTSIDE BREAKWATER	40 154	560 102	910 126	960 26	167,000 60	200 115	7,000 40	240,000 2,100	61 210
# 23	FOOT OF STRACHAN AVE. A INSIDE BREAKWATER A OUTSIDE BREAKWATER	162 194	43,000 214	6,000 98	20 160	740,000 1,800	500 3,000	340 750	590,000 600	600 430
	TEMPERATURE	65	55	62	63	59	72	75	66	79
	WIND DIRECTION	E.	N.W.	E.S.E.	S.E.	E.N.E.	S.E.	S.W.	N.W.	S.W.
	VELOCITY M.P.H.	2	8	5	10	12	8	6	12	8

CITY OF TORONTO - WATERFRONT SURVEY - BACTERIOLOGICAL REPORT -- 1960

MEMBRANE FILTER
TOTAL COLIFORM

AREA	LOCATION	JULY 19	JULY 26	AUG 2	AUG 9	AUG 16	AUG 23	AUG 30	SEPT 6	SEPT 13
# 2	BALMY BEACH 100 YDS FROM SHORE	7,200	1	1,700	560	430	180	14	0	50
# 3	KEW BEACH 30 YDS FROM SHORE	32	68	3,400	14,000	37,000	950	47,000	120	32
# 4	WOODBINE BEACH 50 YDS FROM SHORE	5,800	71	3,100	170	490	850	30	40	39
# 7	CHERRY BEACH (AT STATION) 100 YDS FROM SHORE	900	61	6,100	550	28,000	30,000	52,000	116	NO SAMPLE
# 9	WARD IS. BEACH AREA 7 100 YDS FROM SHORE	1,500	150	760	NO SAMPLE	6,000	123,000	25,000	9	71
# 51	HANLAN'S PT. AREA NO 10 (BATH HOUSE) 50 YDS FROM SHORE	390	3	410	NO SAMPLE	70	22,000	140	22	1,000
# 52	CHEROKEE BATHING AREA 8A (FOOT OF CHEROKEE AVE.) 50 YDS FROM SHORE	60	90	7,600	NO SAMPLE	220	350	2,000	20	37
# 53	CENTRE IS. BATHING AREA 8 (BATH HOUSE)	220	80	17,000	NO SAMPLE	210	1,000	740	40	14
# 55A	SUNNYSIDE-WEST OF SUPER- VISED AREA FOOT OF HOWARD AVE. INSIDE BREAKWATER	32,000	630	24,000	140	6,000	180,000	140,000	56	900
# 55B	SUNNYSIDE-CENTRE SUPERVISED AREA CENTRE OF PAVILION INSIDE BREAKWATER	7,000	690	510	390	9,000	390,000	390,000	700	610
# 55C	SUNNYSIDE-EAST OF SUPERVISED AREA EAST END OF POOL INSIDE BREAKWATER	1,100	15,000	2,200	87	15,000	198,000	340,000	900	440
# 56A	WEST FREE AREA (WOMEN'S) FOOT OF DOWLING AVE. INSIDE BREAKWATER	715,000	400	17,000	1,110	37,000	172,000	37,000	139	9,700
# 56B	EAST FREE AREA (MEN'S) FOOT OF DOWLING AVE. INSIDE BREAKWATER	62,000	150	11,000	920	33,000	224,000	17,000	97	8,200
# 50	OLYMPIC BATHING AREA 9 (BATH HOUSE) 100 YDS FROM SHORE	17,000	100	970	NO SAMPLE	1,280	12,000	11,000	86	1,100
# 21½	FOOT OF DUNN AVENUE A INSIDE BREAKWATER A OUTSIDE BREAKWATER	380 30	50 290	730 1,100	830 490	1,310 260	79,000 12,000	10,000 23,000	7 97	18,700 9,000
# 22	FOOT OF DUFFERIN ST A INSIDE BREAKWATER A OUTSIDE BREAKWATER	520 120	370 1,000	6,000 3,200	170 290	1,120 690	34,000 13,000	8,000 3,000	1,300 110	20,000 12,000
# 23	FOOT OF STRACHAN AVE. A INSIDE BREAKWATER A OUTSIDE BREAKWATER	140,000 39,000	500 310	4,800 7,500	310 500	17,000 14,000	62,000 82,000	14,000 600	690 30	17,000 600
	TEMPERATURE	74	79	67	68	74	71	78	74	64
	WIND DIRECTION	S.W.	S.S.E.	S.W.	E.	S.E.	N.	S.E.	S.E.	S.W.
	VELOCITY M.P.H.	6	6	4	12	10	10		6	8

CITY OF TORONTO - WATERFRONT SURVEY - BACTERIOLOGICAL REPORT - 1961

MEMBRANE FILTER
TOTAL COLIFORM

AREA	LOCATION OF TEST POINT	MAY 23	MAY 30	JUNE 6	JUNE 13	JUNE 20	JUNE 27	JULY 4	JULY 11
# 2	BALMY BEACH 100 YDS. FROM SHORE	1	0	41	0	184	1	61	13
# 3	KEW BEACH 30 YDS. FROM SHORE	17	1	11	15	147	0	102	105
# 4	WOODBINE BEACH 50 YDS. FROM SHORE	19	3	9	2	34,000	10	250	142
# 7	CHERRY BEACH (AT STATION) 100 YDS. FROM SHORE	0	1,100	5	82	129	20	56	53
# 9	WARD'S IS. (BEACH AREA 7) 100 YDS. FROM SHORE	67	0	18	15	2	0	3	42
#51	HANLAN'S PT. BATHING AREA NO. 10(BATH HOUSE) 50 YDS. FROM SHORE	2	1	175	0	187	0	2	6
#52	CHEROKEE BATHING AREA 8A (FOOT OF CHEROKEE AVE.) 50 YDS. FROM SHORE	10	0	7	0	71	0	4	2
#53	CENTRE IS. BATHING AREA 8 (BATH HOUSE) 11	11	0	15	2	13	1	11	4
#55A	SUNNYSIDE-WEST OF SUPERVISED AREA FOOT OF HOWARD AVE. INSIDE BREAKWATER	63	4	300	100	422,000	870	68,000	5,800
#55B	SUNNYSIDE-CENTRE SUPERVISED AREA CENTRE OF PAVILLION INSIDE BREAKWATER	8	233	20,100	40	133,000	480	45,000	5,300
#55C	SUNNYSIDE-EAST OF SUPERVISED AREA - EAST OF POOL INSIDE BREAKWATER	500	194	17,300	50	124,000	620	30,000	6,300
#56A	WEST FREE AREA (WOMEN'S) FOOT OF DOWLING AVE. INSIDE BREAKWATER	83	32	7,400	80	790	43	0	20
#56B	EAST FREE AREA (MEN'S) FOOT OF DOWLING AVE. INSIDE BREAKWATER	61	19	7,400	110	8,000	150	1,030	10
#50	OLYMPIC BATHING AREA 9 (BATH HOUSE) 100 YDS. FROM SHORE	400	0	85	81	114	74	320	520
#21½	FOOT OF DUNN AVENUE A INSIDE BREAKWATER A OUTSIDE BREAKWATER	6 4	0 0	57 3,500	4 0	249 367	35 59	133 129	70 21
#22	FOOT OF DUFFERIN ST. 8 A INSIDE BREAKWATER A OUTSIDE BREAKWATER	12 9	247 800	71 89	184 61	12,400 117	81 30	94 37	293 166
#23	FOOT OF STRACHAN AVE. A INSIDE BREAKWATER A OUTSIDE BREAKWATER	78 3	3,500 1,700	2,600 135	47 4	120,000 8,400	22 27	201 14	44 101
	TEMPERATURE	50°	60°	58°	81°	56°	71°	65°	71°
	WIND DIRECTION	N.N.W.	N.W.	N.E.	SMOOTH	S.W.	S.	WEST	SOUTH
	VELOCITY M.P.H.	15MPH	10	4MPH	2MPH	6MPH	8MPH	12MPH	3MPH

CITY OF TORONTO - WATERFRONT SURVEY - BACTERIOLOGICAL REPORT -- 1961

MEMBRANE FILTER
TOTAL COLIFORM

AREA	LOCATION OF TEST POINT	JULY 18	JULY 25	AUG. 2	AUG. 8	AUG. 15	AUG. 22	AUG. 29	SEPT 5	SEPT 11
# 2	BALMY BEACH 100 Yds. FROM SHORE	0	2	32	254	6,000	40	610	0	4
# 3	KEW BEACH 30 Yds. FROM SHORE	0	3	22	280	18,000	1	960	0	29
# 4	WOODBINE BEACH 50 Yds. FROM SHORE	94	2,200	20	700	710	9	7,150	0	152
# 7	CHERRY BEACH (AT STATION) 100 Yds. FROM SHORE	10	44	24	500	150	1,840	270	<10	4
# 9	WARD'S IS. (BEACH AREA 7) 100 Yds. FROM SHORE	90	190	30	380	90	120	12	0	28
# 51	HANLAN'S PT. AREA (BATH HOUSE) 50 Yds. FROM SHORE	2	230	42	200	0	1,470	31	200	700
# 52	CHEROKEE BATHING AREA 8A (FOOT OF CHEROKEE AVE.) 50 Yds. FROM SHORE	840	1,260	54	900	110	350	91	2	67
# 53	CENTRE IS. BATHING AREA 8 (BATH HOUSE)	780	138	58	234	320	630	63	1,500	64
# 55A	SUNNYSIDE-WEST OF SUPER- VISED AREA FOOT OF HOWARD AVE. INSIDE BREAKWATER	3,400	5,600	0	2,700	370	108	18	162	1,400
# 55B	SUNNYSIDE-CENTRE SUPERVISED AREA CENTRE OF PAVILION INSIDE BREAKWATER	400	2,900	780	2,100	120	80	468,000	212	2,500
# 55C	SUNNYSIDE-EAST OF SUPERVISED AREA-EAST END POOL INSIDE BREAKWATER	800	2,400	30	1,430	230	420	84	800	7,200
# 56A	WEST FREE AREA (WOMEN'S) FOOT OF DOWLING AVE. INSIDE BREAKWATER	242	10,100	16	4,300	210	30	352,000	470	5,200
# 56B	WEST FREE AREA (MEN'S) FOOT OF DOWLING AVE. INSIDE BREAKWATER	140	22,700	64	4,700	60	20	40	300	4,100
# 50	OLYMPIC BATHING AREA 9 (BATH HOUSE) 100 Yds FROM SHORE	580	260	4	2,900	240	80	9,000	166	92
# 21½	FOOT OF DUNN AVENUE A INSIDE BREAKWATER A OUTSIDE BREAKWATER	3 106	3,500 14,800	37 34	2,800 1,200	0 0	196 290	4,900 1,200	44 1,800	2,100 3,600
# 22	FOOT OF DUFFERIN ST. A INSIDE BREAKWATER A OUTSIDE BREAKWATER	120 1,020	13,600 1,900	12 0	3,200 900	67,000 30	1,280 320	7,100 7,300	100,000 0	6,600 3,000
# 23	FOOT OF STRACHAN AVE. A INSIDE BREAKWATER A OUTSIDE BREAKWATER	102 434	22,000 20,000	99 112	26,100 1,500	140 10	950 120	520,000 134,000	<10 0	5,900 4,900
	TEMPERATURE	72°	79°	74°	77°	83°	63°	75°	78°	71°
	WIND DIRECTION	S.W.	SOUTH	S.E.	S.W.	S.W.	CALM	N.N.W.	WEST	N.W.
	VELOCITY M.P.H.	10	2	4	4	15		10	4	6

CITY OF TORONTO - WATERFRONT SURVEY - BACTERIOLOGICAL REPORT - 1960

MEMBRANE FILTER
TOTAL COLIFORM

AREA	HUMBER MOUTH	MAY 17	MAY 24	MAY 31	JUNE 7	JUNE 15	JUNE 21	JUNE 28	JULY 5	JULY 12
150	EAST	7,000	87,000	63,000	6,000	1,000	17,000	11,600	80,000	3,800
151	CENTRE	17,000	71,000	120,000	4,000	100	7,000	120	160,000	6,300
152	WEST	1,500	49,000	103,000	11,000	2,300	4,000	200	23,000	4,800
<u>EASTERN BEACHES</u>										
2	<u>BALMY BEACH</u>									
2A	SILVERBIRCH AVE. E.	38	90	15	0	3,800	300	121	2,000	0
2B	MACLEAN AVE. C.	51	155,000	19,000	0	3,000	500	60	7,000	164
2C	HAMMERSMITH AVE. W.	500	121	2	0	1,900	900	190	3,600	0
3	<u>KEW BEACH E.</u>									
3A	LEUTY AVE. E.	112	167	17	53	6,500	3,000	7,600	700	20
3B	WAVERLY ROAD C.	2,500	2,100	830	0	4,200	1,000	5,700	1,200	48
3C	KIPPENDAVIE AVE. W.	77	151	184,000	100	9,300	200	210	900	1,700
4	<u>WOODBINE BEACH E.</u>									
4A	STATION -1 E.	111	80	860	6	3,800	100	450	5,400	10
4B	STATION -3 C.	106	60	40	0	1,000	27	115	4,700	5,500
4C	STATION -5 W.	163	90	90	0	400	2,000	900	9,000	2,100
7	<u>CHERRY BEACH E.</u>									
7A	EASTERLY LIMIT E.	84	22	15	20	1,300	200	160	41	60
7B	CENTER C.	95	26	21	13	3,600	400	590	58	46
7C	WESTERLY LIMIT W.	15,000	27	120	430	4,700	15,000	60,000	90	80

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MEMBRANE FILTER
TOTAL COLIFORM

AREA	HUMBER MOUTH	JULY 19	JULY 26	AUG. 2	AUG. 9	AUG. 16	AUG. 23	AUG. 30	SEPT. 6	SEPT. 13
150	EAST	140,000	5,400	1,000	6,000	80,000	170,000	490,000	1,400	1,000
151	CENTER	270,000	8,700	70,000	10,100	8,200	139,000	430,000	600	780
152	WEST	240,000	9,200	90,000	10,700	100,000	95,000	280,000	500	540
<u>EASTERN BEACHES</u>										
<u>BALMY BEACH E.</u>										
2A	SILVERBIRCH AVE. E.	43	0	5,700	53,000	1,200	160	950	190	310
2B	MACLEAN AVE. C.	2,900	7	2,800	1,170	790	22,000	1,200	140	180
2C	HAMMERSMITH AVE. W.	72	19	800	1,080	960	530	830	50	127
<u>KEW BEACH E.</u>										
3A	LEUTY AVE. E.	200	590	37,000	810	11,000	18,000	5,000	110	260
3B	WAVERLY ROAD C.	102	34	3,100	920	760	800	11,000	40	58
3C	KIPPENDAVIE AVE. W.	134,000	320	42,000	1,070	980	700	98,000	840	440
<u>WOODBINE BEACH E.</u>										
4A	STATION -1 E.	2,300	64	5,900	1,080	450	100	880	40	89
4B	STATION -3 C.	5,000	30	9,800	190	730	460	5,000	30	71
4C	STATION -5 W.	2,200	2	11,900	770	280	200	930	10	190
<u>CHERRY BEACH E.</u>										
7A	EASTERLY LIMIT E.	6,300	2,800	7,000	810	18,000	115,000	39,000	80	520
7B	CENTER C.	24,000	89	6,200	1,130	11,000	3,800	2,000	300	650
7C	WESTERLY LIMIT W.	4,700	590,000	8,400	7,000	4,100	20,000	15,000	200	400

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MEMBRANE FILTER
TOTAL COLIFORM

AREA	HUMBER MOUTH	MAY 23	MAY 30	JUNE 6	JUNE 13	JUNE 20	JUNE 27	JULY 4	JULY 11
# 150	EAST	300	27,800	2,900	160,000	320,000	18,900	60,000	25,800
# 151	CENTRE	67	26,700	100,090	190,000	90,000	180,000	280,000	80,000
# 152	WEST	117	24,900	40,000	140,000	170,000	80,000	430,000	1,200
<u>EASTERN BEACHES</u>									
<u>BALMY BEACH EAST</u>									
# 2-A	SILVERBIRCH AVE. E.	0	0	26	2	111	0	90	12
# 2-B	MACLEAN AVE. C.	0	2	72	0	147	74	81	87
# 2-C	HAMMERSMITH AVE. W.	0	2	0	2	170	8	114	3
<u>KEW BEACH E.</u>									
# 3-A	LEAUTY AVE. E.	116	0	61	34	102	38	NO SAMPLE	34
# 3-B	WAVERLY RD. C.	9	176	14	27	57	53	143	22
# 3-C	KIPPENDAVIE AVE. W.	6	29	34	26	98	27	107	12
<u>WOODBINE BEACH E.</u>									
# 4-A	STATION - 1 E.	5,700	5	12	51	1,130	9	110	700
# 4-B	STATION - 3 C.	7	8	3	25	247	1	81	20
# 4-C	STATION - 5 W.	12	3	20	1	12,000	0	64	24
<u>CHERRY BEACH</u>									
# 7-A	EASTERNLY LIMIT E.	0	700	6	63	83	1	79	15
# 7-B	CENTRE C.	0	400	1	40	36	19	63	24
# 7-C	WESTERLY LIMIT W.	0	263	0	32	34	24	61	44

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MEMBRANE FILTER
TOTAL COLIFORM

AREA	HUMBER MOUTH		JULY 18	JULY 25	AUG. 2	AUG. 8	AUG. 15	AUG. 22	AUG. 29	SEPT 5	SEPT 12
# 150	EAST		210,000	110,000	7400	3,400	900	1,400	20,000	20	108
# 151	CENTRE		170,000	40,000	300	1,300	1,500	600	400	28	1800
# 152	WEST		17,600	90,000	1200	2,160	900	400	400	0	2400
<u>EASTERN BEACHES</u>											
<u>BALMY BEACH EAST</u>											
# 2-A	SILVERBIRCH AVE.	E.	0	380	40	950	1,810	30	40	0	0
# 2-B	MACLEAN AVE.	C.	0	103	60	410	1,280	30	1,780	0	356
# 2-C	HAMMERSMITH AVE.	W.	0	10	100	240	980	8	700	0	11
<u>KEW BEACH EAST</u>											
# 3-A	LEUTY AVE.	E.	0	31,000	120	1,550	630	370	127	0	85
# 3-B	WAVERLY ROAD	C.	6	19,700	134	940	10,000	1,410	117	0	3
# 3-C	KIPPENDAVIE	W.	18	13,300	32	370	43,000	40	121	0	24
<u>WOODBINE BEACH EAST</u>											
# 4-A	STATION - 1	E.	0	200	62	950	63,000	30	7	0	19
# 4-B	STATION - 3	C.	4	400	18	700	27,000	11	138	0	169
# 4-C	STATION - 5	W.	24	600	20	700	53,000	2	163	3	57
<u>CHERRY BEACH EAST</u>											
# 7-A	EASTERLY LIMIT	E.	600	140	0	900	830	100	0	0	4
# 7-B	CENTRE	C.	558	72	56	7,900	60	190	73	0	0
# 7-C	WESTERLY LIMIT	W.	60	88	6	7,000	140	160	41	0	34

REPORT ON SEWER IMPROVEMENTS IN METROPOLITAN TORONTO

A report on pollution and flooding occasioned by and in Toronto's sewerage system was prepared for the City of Toronto in 1960 by James F. MacLaren Associates, Consulting Engineers. This report contained a number of specific recommendations which if implemented, would eliminate entirely many sources of surface water pollution in the City of Toronto and possibly control the remainder to approach acceptable limits.

MAJOR PROJECTS IN PROGRESS OR ACCOMPLISHED

There are certain projects underway throughout Metropolitan Toronto which should reduce pollution problems in the areas concerned.

These projects include:

1. Lakeshore Trunk Sewer

The Lakeshore trunk sanitary sewer of the Municipality of Metropolitan Toronto, which presently is under construction on Lakeshore Boulevard West, will carry sewage from Long Branch, the western area of New Toronto, the Ontario Hospital, and the southern section of Etobicoke Township, to the new Lakeview Water Pollution Control Plant, located in Toronto Township.

The western section of this trunk sewer is now in operation and has relieved an overloaded condition of the Long Branch sewage treatment plant, resulting in an improvement in the water quality of the lake in this area. On completion it will relieve an overloaded condition of sewer facilities in the Mimico area.

It will also allow abandonment of the Township of Etobicoke sewage lift station at Town's Road which has

occasionally discharged to the watercourse on the Ontario Hospital property in New Toronto.

2. New Toronto Storm Sewer Outlets and Hospital Creek

A few industries are still discharging industrial wastes to the lake via these outfalls, LO-73.1 (W-1), LO-73.1 (W-2), and LO-72.2 (D). Efforts by the municipalities and the Metropolitan Toronto Industrial Waste Control Branch, and the co-operation of industry, have resulted in the elimination of some of these sources and the reduction of others. Further improvements in the near future are anticipated.

3. Storm Sewer Effluents and Drainage Inlets in the City of Toronto.

Sanitary sewage apparently is entering the lake and harbour area from some storm sewers and watercourses even during periods of dry weather flow. This is indicated by the high coliform count in samples taken from storm sewers and watercourses.

A number of industries are discharging industrial wastes which find entry to storm sewers and watercourses. Oil discharges are still experienced in some outlets in the harbour area.

The co-operation of industry and efforts by the personnel of the City of Toronto, the Harbour Commissioners and the Municipality of Metropolitan Toronto, have aided in reducing these discharges.

An improvement in the quality of the effluent flowing to the Turning Basin from the Commissioners St. storm sewer at LOT-17 (W) was effected in 1961 by the reduction in discharge of phenolic bearing wastes by an industry there. The discharge of phenolic wastes and an occasional accidental spill in the past has resulted in chlorophenolic tastes tending to occur

in the Metropolitan Toronto water supplies. Further improvements are being effected in regard to avoiding these discharges.

The vulnerability of the drinking supplies was increased when the H.E.P.C. Richard L. Hearn generating plant went into operation. This plant draws vast quantities of cooling water from the Ship Channel and Turning Basin and discharges it to the lake.

Phenolic materials combine with chlorine at water treatment plants to produce objectionable chlorophenolic tastes, so that taste and odour removal facilities are required to guard these quantities of the water.

Paper mill wastes and paintwastes being discharged to the Turning Basin from the Carlaw and Commissioners St. storm sewers at LOT-17 (W) and LOT-18 (W), and paper mill wastes from the Polson St. storm sewer at LOT-13 (W), should be reduced or eliminated, when adjacent industries have completed alterations and installations now in process.

To reduce oil losses at the Spadina and Simcoe St. storm sewers having outfalls designated as LOT-4 (W) and LOT-5 (W) respectively, oil interceptors were installed by the contributing railway firms. Additional improvements to minimize oil losses to these sewers are planned. Some oil discharges still are occasionally being experienced, emphasizing the need for proper maintenance of these units.

PACKING HOUSE WASTE TREATMENT

Some consideration has been given to the transportation of the strong wastes from the meat packing houses in the St. Clair Avenue - Keele Street area, to a Metropolitan Toronto sewage

treatment plant nearer this area. At present these flows, particularly during periods of heavy run-off, constitute part of the flows to storm overflow sewers, which are discharged untreated to the receiving waters.

METROPOLITAN TORONTO AND REGION CONSERVATION AUTHORITY

This body, with the aid of Federal and Provincial financial assistance, is engaged in a program including dam and reservoir construction on the Don and Humber Rivers. It is considered that eventually this program will increase average summer flows in these rivers by approximately forty per cent and so provide greater dilutional flows there for assimilation of wastes at those times.

4. Extension of Combined Sewer Overflow Outlets Beyond the Breakwater

Some sewers within the City of Toronto receiving combined sewer overflows, have discharged to the lake behind breakwaters. The resulting pollution of these waters has restricted recreational usage thereof.

In the Canadian National Exhibition area east of the Argonaut Rowing Club building, all five storm sewers will eventually discharge beyond the breakwater to allow improved dilution and diffusion of these flows. All breakwater openings there but three, will be closed with ventilated cribbing.

Approximately five years ago one of these, a storm sewer serving the Frederick Gardiner Expressway, was installed to discharge beyond the breakwater.

Work on another, the Garrison Creek relief sewer has just recently been completed.

Extensions of the Dufferin Street, Strachan Avenue and two other relief sewer outlets from the Canadian National Exhibition Grounds, are at various stages of construction. The entire contract is expected to be completed by July, 1962.

In the east end of the city, at Lee Avenue a similar extension has been completed.

The extension of these outfalls beyond the breakwater, will not reduce the polluting of the lake, but will reduce the trapping of discharged material in these inshore areas.

5. Metropolitan Toronto Sewage Treatment Facilities

On August 3, 1961, the new Humber sewage treatment plant outfall sewer which now extends 3,000 feet into the lake, was placed in operation. Previously, the effluent from the plant had discharged, temporarily directly to the Humber River. With the increased effluent dilution and diffusion provided, it is expected that shoreline pollution in this locality will be reduced. The plant itself, of 50 million gallons per day capacity replaces several smaller units and allows a superior effluent to be discharged.

Commencing in late November 1961, the secondary treatment units at the Main sewage treatment plant at Ashbridges Bay have been placed in operation progressively in 15 MGD increments. The present capacity of this section of the treatment works is 75 MGD. It is planned to have the remaining units operating in the near future to provide secondary treatment capacity of 90 MGD and ultimately 120 MGD. This will produce an improved effluent.

In November, 1961, the new Lakeview Water Pollution Control Plant in Toronto Township was placed in operation. This was financed through the Commission with the co-operation of the Municipality of Metropolitan Toronto and Township of Toronto. Flows from Long Branch, Etobicoke and New Toronto which previously overloaded the Long Branch sewage treatment plant and aggravated its effluent, can now be diverted to this new plant via the Lake shore trunk sewer and so allow the Long Branch plant to produce improved effluents while it remains in operation.

The Highland Creek sewage treatment plant is in the process of having its capacity doubled from 5 MGD to 8 MGD. This plant will ultimately have capacity of 50 MGD or greater.

In regard to other sewage treatment plants which have been operated by Metropolitan Toronto, a continuing major program of abandoning numerous small "upstream" plants in favour of a few large lakeshore plants, is proceeding. Operation of the Baker Downs plant has just recently been discontinued. This will leave nine sewage treatment plant in operation, and ultimately this will be reduced to four. This should allow greater dilution and diffusion of the total improved effluent flows.

SUMMARY

There are approximately 18 major combined sewer overflow outlets from the city of Toronto to Lake Ontario. These outlets are referred to sometimes as storm sewer outlets in portions of this report.

This survey indicates that in Metropolitan Toronto, many of the combined sewer overflow outlets, as well as several

of the storm sewer outlets, are contributing polluting wastes to Lake Ontario and Toronto Harbour even during periods of dry weather flow.

The coliform counts and B.O.D. of the samples collected from the five major streams discharging to Lake Ontario, were excessive on a number of occasions.

Storm sewer discharges behind the Lake Ontario breakwall seriously pollute these waters in these locations.

Industrial wastes are also reaching these waters via various outfalls.

It should be borne in mind that the magnitude of this work has allowed only three sampling runs. It will be required that these investigations be continued to complement this information.

RECOMMENDATIONS

As a result of this survey, and as a means of correcting pollution problems within the Municipality of Metropolitan Toronto, the following recommendations are made:

1. That a sewer use and waste control By-law be utilized by the Municipality of Metropolitan Toronto to regulate the discharge of water and wastes into the sanitary and storm sewer systems of Metropolitan Toronto and providing penalties for violations thereof.

2. That the municipalities in the area concerned provide adequate intercepting sewer capacity including diversion structures, to permit the interception of at least two and one-half times the average future dry weather flow from any combined sewerage system, and its diversion to ~~the~~ sewage treatment plants for at least primary treatment.

Implementation of this recommendation should reduce the present pollution loading discharged to the lake.

3. That regular sampling of the waterfront and the major contributing watercourses be continued, and all sewer outlets to these waters be located, recorded, and sampled where discharge is noted. Together with continuing surveys of the lake proper, these results will allow assessments of the contributing polluttional loadings and their effects on the receiving waters.

4. That the regular inspections of all storm water diversion arrangements, and the systematic program of sewer inspection and maintenance be continued and improved throughout the Municipality of Metropolitan Toronto by the staff of the municipalities concerned.

5. That the selection, construction and operation of sanitary landfill sites draining to the lake or tributaries thereof, be performed in a manner to prevent these from discharging polluting material to the adjacent watercourses.

6. That since pollution abatement of necessity must be a co-operative venture, the parties concerned in carrying out these measures continue to co-operate closely, and hold meetings as necessary, for this purpose.

ALL ANALYSES EXCEPT PH REPORTED IN PPM
UNLESS OTHERWISE INDICATED

TABLE I

SAMPLING POINT NO.	LOCATION	PLAN NO.	DATE EXAMINED	COLIFORMS		5-DAY B.O.D.	SOLIDS			TURBID- IDY	PHENOLS (PPB)	ETHER SOLUBLES	PH	CHROME	COPPER
				I. N. PER 100 ML	M. F. PER 100 ML		TOTAL	SUSP.	DISS.						
LO-70.7 D	ETOBICOKE CREEK AT LAKE SHORE RD.	15	SEPT. 15/60	-	5,600	7.2	476	46	430	-	2	-	-	-	-
			OCT. 20/60	-	14,000	4.4	770	-	-	3	-	-	-	-	-
			FEB. 15/61	-	680	17	1352	-	-	11	-	-	-	-	-
			SEPT. 14/61	-	<10	3.2	708	-	-	2	15	-	-	-	-
			NOV. 29/61	-	1,040,000	4.8	666	-	-	3.8	4	-	-	-	
LO-70.7 T	OUTFALL SEWER LONG BRANCH SEWAGE TREATMENT PLANT	15	SEPT. 15/60	-	NOT SAMPLED										
			OCT. 20/60	-	8,000,000	195	730	278	452	-	-	-	-	-	-
			NOV. 29/61	-	610,000	325	954	-	-	310	10	-	-	-	-
LO-70.9 W	42" Ø STORM SEWER - 40TH ST.	15	SEPT. 15/60	-	NO FLOW	NOTED									
			OCT. 20/60	-	"	"	"								
			NOV. 29/61	-	"	"	"								
LO-71.1 W	1'-6"x5'-0" STORM SEWER - 37TH ST.	15	SEPT. 15/60	-	17,000	18	366	20	346	-	4	-	-	-	-
			OCT. 20/60	-	14,000	2.6	204	6	198	-	10	-	-	-	-
			NOV. 29/61	-	221	27	318	-	-	8.0	6	-	-	-	-
LO-71.3 W	42" Ø STORM SEWER - LAKE PROMENADE WEST OF 31ST. ST.	16	SEPT. 15/60	-	NO FLOW	NOTED									
			OCT. 20/60	-	53,000	45	428	70	358	-	0	-	-	-	-
			NOV. 29/61	-	NO FLOW	NOTED									
LO-71.5 W	48" Ø STORM SEWER - 28TH ST.	16	SEPT. 15/60	-	FLOW INSUFFICIENT	FOR SAMPLING									
			OCT. 20/60	-	NO FLOW	NOTED									
			NOV. 29/61	-	FLOW INSUFFICIENT	FOR SAMPLING - TRACE OF SEWAGE									
LO-71.7 W	STORM SEWER - 25TH ST.	16	SEPT. 15/60	-	NO FLOW	NOTED									
			OCT. 20/60	-	"	"	"								
			NOV. 29/61	-	FLOW INSUFFICIENT	FOR SAMPLING									
LO-71.9 W	STORM SEWER - 23RD ST.	16	SEPT. 15/60	-	190,000	440	652	96	556	-	60	-	-	-	-
			OCT. 20/60	100,000	-	14	390	12	378	-	90	-	-	-	-
			NOV. 29/61	-	12,000	1140	952	-	-	240	600	-	-	-	-
LO-72.2 D	CREEK AT ONTARIO HOSPITAL	16	SEPT. 15/60	-	67,000,000	32	1160	20	1140	-	0	7	7.2	0.02	-
			OCT. 20/60	-	490	104	1126	34	1092	-	-	21	3.3	0.006	-
			JULY 20/61	-	-	56	1100	-	-	8	15	10	-	0.60	-
			AUG. 30/61	-	104,000	5.6	604	-	-	7	-	-	-	-	-
			NOV. 29/61	-	8,000	30	1200	-	-	3.6	0	-	-	-	-

TABLE I

SAMPLING POINT NO.	LOCATION	PLAN NO.	DATE EXAMINED	COLIFORMS		5-DAY B.O.D.	SOLIDS			TURBID- ITY	PHENOLS (PPB)	ETHER SOLUBLES	PH	CHROME	COPPER
				I. N. PER 100 ML	M. F. PER 100 ML		TOTAL	SUSP.	DISS.						
LO-72.6 W	STORM SEWER - 12TH ST.	16	SEPT. 15/60	-	19,000	90	246	24	222	-	4	-	-	-	-
			OCT. 20/60	-	400	5.6	210	6	204	-	5	-	7.5	-	-
			NOV. 29/61	-	NOT SAMPLED, OUTFALL OBSTRUCTED TODAY										
LO-72.7 I	INDUSTRIAL SEWER - 9TH ST.	16	SEPT. 15/60	100	-	5.6	220	18	202	-	6	-	-	-	-
			OCT. 20/60	-	890	4.4	218	24	194	-	0	-	-	-	-
			NOV. 29/61	-	28	6.0	280	-	-	5.5	6	-	-	-	-
LO-72.9 W	24" Ø STORM SEWER - 7TH ST.	16	SEPT. 15/60	-	NO FLOW	NOTED									
			OCT. 20/60	-	" "	" "									
			NOV. 29/61	-	" "	" "									
LO-72.9 W-1	STORM SEWER - 5TH ST.	16	SEPT. 15/60	-	NO FLOW	NOTED									
			OCT. 20/60	-	" "	" "									
			NOV. 29/61	-	" "	" "									
LO-72.9 W-2	STORM SEWER - 5TH ST.	16	SEPT. 15/60	-	NO FLOW	NOTED									
			OCT. 20/60	-	" "	" "									
			NOV. 29/61	-	" "	" "									
LO-73.0 W	STORM SEWER - 4TH ST.	17	SEPT. 15/60	-	NO FLOW	NOTED									
			OCT. 20/60	-	" "	" "									
			NOV. 29/61	-	" "	" "									
LO-73.1 W	STORM SEWER - 2ND ST.	17	SEPT. 15/60	-	NO FLOW	NOTED									
			OCT. 20/60	-	" "	" "									
			NOV. 29/61	-	" "	" "									
LO-73.1 W-1	4'-6" Ø STORM SEWER - 2ND ST.	17	SEPT. 15/60	1,000	-	70.0	460	82	378	-	30	21	7.0	-	-
			OCT. 20/60	-	280	62.0	856	32	824	-	100	2.5	7.1	-	-
			NOV. 29/61	-	0	10	488	-	-	12.5	6	-	7.4	0.76	0.76
LO-73.1 W-2	3'-0" Ø STORM SEWER 2ND ST.	17	SEPT. 15/60	0	-	11.0	562	10	552	-	4	11	2.5	3.0	24
			OCT. 20/60	0	-	10.0	-	-	-	15	TRACE	2.9	4.4	7.7	
			NOV. 29/61	-	0	14	494	-	-	34.0	0	-	3.0	5.0	24
LO-73.3 W	36" Ø STORM SEWER- SAND BEACH RD.	17	SEPT. 15/60	10	-	1020	1122	80	1042	-	280	-	8.3	.02	-
			OCT. 20/60	-	14,000	142	660	32	628	-	80	-	6.1	-	-
			NOV. 29/61	-	0	14	672	-	-	32	4	-	-	-	-

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TABLE I

SAMPLING POINT NO.	LOCATION	PLAN NO.	DATE EXAMINED	COLIFORMS			SOLIDS			TURBIDITY	PHENOLS (PPB)	ETHER SOLUBLES	PH	CHROME	COPPER	
				I. N. PER 100 ML	M. F. PER 100 ML	5-DAY B.O.D.	TOTAL	SUSP.	DISS.							
LO-73.5 W	2-30" Ø STORM SEWERS-ROYAL YORK RD.	17	SEPT. 15/60	-	NO FLOW	NOTED										
			OCT. 20/60	-	" "	" "										
			NOV. 29/61	-	" "	" "										
LO-73.9 W	24" Ø STORM SEWER-EDITH AVE.	17	NOV. 29/61	-	NO FLOW	NOTED										
LO-73.9 W-1	STORM SEWER - MILES RD.	17	SEPT. 15/60	-	NO FLOW	NOTED										
			OCT. 20/60	-	" "	" "										
			NOV. 29/61	-	" "	" "										
LO-74.0 W	18" Ø STORM SEWER-NORRIS CRES.	17	SEPT. 15/60	-	NO FLOW	NOTED										
			OCT. 20/60	-	" "	" "										
			NOV. 29/61	-	" "	" "										
LO-74.3 W	STORM SEWER - SUPERIOR AVE.	17	NOV. 22/61	-	62,000	4.2	606	-	-	8.5	17	-	-	-	-	
LO-74.9 W	15" Ø STORM SEWER - 300' WEST OF MIMICO CREEK	18	NOV. 22/61	-	OUTFALL OBSTRUCTED - EVIDENCE OF SEPTIC DISCHARGE											
LO-75.0 D	MIMICO CREEK AT LAKE SHORE RD.	18	SEPT. 15/60	0	-	17	528	14	514	-	12	-	-	-	-	
			OCT. 20/60	-	460	23	472	32	440	-	220	-	-	-	-	
			NOV. 22/60	-	460	17	544	-	-	-	-	-	-	-	-	
			OCT. 24/61	-	10,400	12	468	-	-	7.8	-	-	-	-	-	
			NOV. 22/61	-	42	6.4	524	-	-	40	275	-	-	-	-	
LO-75.1 W	24" Ø STORM SEWER-PARK LAWN RD.	18	SEPT. 15/60	100,000	-	74	362	60	302	-	2	-	-	-	-	
			OCT. 20/60	1,000,000	-	580	942	154	788	-	-	-	-	-	-	
			NOV. 22/61	-	71,000	16	272	-	-	8	10	-	-	-	-	
LO-75.6 W	21" Ø STORM SEWER - WEST OF SANDY BEACH MOTEL	18	NOV. 22/61	-	FLOW INSUFFICIENT FOR SAMPLING											
LO-75.8 T	OUTFALL SEWER - HUMBER SEWAGE TREATMENT PLANT	18	NOV. 17/60	-	-	9	-	30	-	-	-	-	7.6*	-	-	
			NOV. 21/61	-	-	11	-	38	-	-	-	-	-	7.6*	-	
			DEC. 14/61	-	-	16	-	13	-	-	-	-	-	7.5*	-	

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* COMPOSITE SAMPLES COLLECTED AND ANALYSED BY THE METROPOLITAN TORONTO STAFF.

TABLE I

SAMPLING POINT NO.	LOCATION	PLAN NO.	DATE EXAMINED	COLIFORMS		5-DAY B.O.D.	SOLIDS			TURBIDITY	PHENOLS (PPB)	ETHER SOLUBLES	PH	CHROME	COPPER	
				I. N. PER 100 ML	M. F. PER 100 ML		TOTAL	SUSP.	DISS.							
LO-75.9 D	HUMBER RIVER AT LAKE SHORE BLVD.	18	JULY 26/60	-	8,200	16	-	-	-	47	-	-	-	-	-	
			SEPT. 15/60	-	4,500	18	486	36	450	-	2	-	-	-	-	-
			OCT. 20/60	-	170,000	12	418	28	390	-	-	-	-	-	-	-
			JAN. 18/61	-	257,000	32	458	44	414	-	-	-	-	-	-	-
			SEPT. 27/61	-	212,000	6.0	362	-	-	-	18	-	-	-	-	-
			NOV. 15/61	-	2,260	8.0	422	-	-	48	14	-	-	-	-	
LO-75.9 W	30" Ø STORM SEWER - LAKE SHORE BLVD.	18					NO FORWARD MOVEMENT, NOT SAMPLED									
LO-76.3 W	52" Ø STORM SEWER-ELLIS AVE.	18	NOV. 15/60	-	95,000	75	602	408	194	-	10	-	-	-	-	
			NOV. 15/61	-	70	1.6	450	-	-	10.5	10	-	-	-	-	-
LO-76.7 W	9' Ø STORM SEWER-PARKSIDE DR.	19	NOV. 15/60	-	3,300,000	170	810	346	464	-	28	-	-	-	-	
			NOV. 28/61	-	5,100	44	390	62	328	-	18	-	-	-	-	-
LO-77.3 W	7'-6" x 7'-6" STORM SEWER - RONCESVALLES AVE.	19	NOV. 15/60	-	2,500,000	130	944	722	222	-	45	-	-	-	-	
			NOV. 28/61	-	1,700	114	496	68	428	-	0	-	-	-	-	-
LO-77.9 W	11' Ø STORM SEWER OPPOSITE JAMESON AVE.	20	NOV. 15/61	-			NOT SAMPLED									
LO-78.2 W	9' Ø STORM SEWER - GARRISON CREEK	20	NOV. 15/61	-			OUTFALL EXTENSION UNDER CONSTRUCTION									
LO-78.5 W	6'-6" x 6'-6" STORM SEWER - DUFFERIN ST.	20	NOV. 15/60	-	153,000	15	944	30	914	-	4	-	-	-	-	
			NOV. 15/61	-	1,950,000	205	536	-	-	62	30	-	-	-	-	
			NOV. 28/61	-	250	205	760	248	512	-	18	-	-	-	-	
LO-78.9 W	STORM SEWER - 525' EAST OF ABERDEEN RD.	21N	NOV. 15/61	-			NOT LOCATED									
LO-79.4 R	RELIEF SEWER - FROM LAKE SHORE BLVD. & STRACHAN AVE.	21N	NOV. 15/61	-			NOT LOCATED									
LO-79.4 W	12'-0" x 10'-0" STORM SEWER - STRACHAN AVE.	21N	NOV. 15/61	-			NOT SAMPLED DUE TO CONSTRUCTION AND TEMPORARY BY-PASSING TO STORM SEWER.									

ALL ANALYSES EXCEPT pH REPORTED IN PPM
UNLESS OTHERWISE INDICATED

TABLE I

SAMPLING POINT NO.	LOCATION	PLAN NO.	DATE EXAMINED	COLIFORMS		5-DAY B.O.D.	SOLIDS			TURBID- ITY	PHENOLS (PPB)	ETHER SOLUBLES	PH	CHROME	COPPER
				I. N. PER 100 ML	M. F. PER 100 ML		TOTAL	SUSP.	DISS.						
LO-79.7 W	24" Ø STORM SEWER-STADIUM RD.	21N	Nov. 15/61	-		OUTFALL SUBMERGED									
LO-79.9 D	WESTERN CHANNEL AT LAKE ONTARIO	21N	Nov. 15/61	-		NOT SAMPLED									
LOT-1 I	SEWER OUTLET EAST OF CANADA MALTING CO. LTD.	21N	Nov. 15/61	-		NOT LOCATED									
LOT-2 W	6'-0"x9'-0" GARRISON CREEK STORM SEWER	21N	Oct. 13/60 Nov. 28/61	1,000,000	-	80 NOT SAMPLED,	960	52	908	-	25	-	-	-	-
						CAR	PARKED		OVER						
									MANHOLE						
LOT-3 W	6'-0"x9'-0" GARRISON CREEK STORM SEWER	21N	Nov. 28/61		600	76	548	162	386	42	18	-	-	-	-
LOT-4 W	6'-0"x8'-0" STORM SEWER - SPADINA AVE.	21N	Nov. 28/61	-		SUITABLE	SAMPLING	POINT	NOT	LOCATED					
LOT-5 W	8'-2"x5'-5" STORM SEWER - SIMCOE ST.	21N	Oct. 13/60 Nov. 28/61	-	131,000	65	334	18	316	-	3000	-	-	-	-
						58	512	78	434	-	46	-	-	-	-
LOT-6 W	8'-6"x6'-6" STORM SEWER - YONGE ST.	22N	Oct. 13/60 Nov. 28/61	-	189,000	14	248	16	232	-	10	-	-	-	-
						NOT SAMPLED,	NO	FORWARD	MOVEMENT.						
LOT-7 W	10'-0"x10'-0" STORM SEWER - SHERBOURNE ST.	22N	Oct. 13/60 Nov. 28/61	100,000	-	90	352	18	334	-	60	-	-	-	-
					600	136	534	82	452	-	18	-	-	-	-
LOT-8 W	7'-0"x6'-0" STORM SEWER - BETWEEN PARLIAMENT & SMALL STS.	22N	Oct. 13/60 Nov. 16/61	-	3,800,000	295	1502	84	1418	-	0	-	-	-	-
					181,000	98	324	-	-	13.5	0	-	-	-	-
LOT-9 W	4'-6"x4'-6" STORM SEWER - CHERRY ST.	22N	SEPT. 19/60 Oct. 13/60 Nov. 28/61	-	41,000,000	120	434	138	296	-	60	-	-	-	-
					1,300,000	200	560	192	368	-	35	-	-	-	-
					6,000	310	1118	654	464	-	20	-	-	-	-

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TABLE I

SAMPLING POINT NO.	LOCATION	PLAN NO.	DATE EXAMINED	COLIFORMS		5-DAY B.O.D.	SOLIDS			TURBIDITY	PHENOLS (PPB)	ETHER SOLUBLES	PH	CHROME	COPPER		
				I. N. PER 100 ML	M. F. PER 100 ML		TOTAL	SUSP.	DISS.								
LOT-10 D	DON RIVER AT CHERRY ST.	22N	AUG. 24/60	-	1,340,000	14	-	-	-	27	-	-	-	-	-		
			SEPT. 19/60	-	14,000	23	380	42	338	-	0	-	-	-	-	-	
			FEB. 9/61	-	990,000	76	904	160	744	-	-	-	-	-	-	-	
			OCT. 18/61	-	201,000	33	430	-	-	-	23	-	-	-	-	-	-
			NOV. 16/61	-	148,000	17	400	-	-	-	26	20	-	-	-	-	-
LOT-11 W	3'-0" x 3'-0" STORM SEWER - COMMISSIONERS ST.	22N	NOV. 21/61	-	36,000	35	324	88	236	-	15	-	-	-	-		
LOT-12 W	18" Ø STORM SEWER - TO SLIP NORTH OF POLSON ST.	22N	NOV. 16/61	-	1,290	60	428	-	-	26	28	-	-	-	-		
LOT-13 W	24" Ø STORM SEWER - POLSON ST.	22N	NOV. 21/61	-	200	165	964	250	714	-	13	-	-	-	-		
					OUTLET	SUBMERGED,	SAMPLE	DILUTED	WITH	LAKE	WATER						
LOT-14 W	24" Ø STORM SEWER - CHERRY ST. TO NORTH SIDE OF SHIP CHANNEL.	22S	NOV. 21/61	-	400	130	686	180	506	-	20	-	-	-	-		
LOT-15 I	INDUSTRIAL SEWER - TEXACO CANADA LTD.	22S	NOV. 21/61	-	NOT LOCATED												
LOT-16 W	30" Ø STORM SEWER - BASIN ST.	23	NOV. 21/61	-	FLOW INSUFFICIENT FOR SAMPLING												
LOT-17 W	6'-0" x 8'-6" Ø STORM SEWER - CARLAW AVE.	23	SEPT. 15/60	10,000	-	225	830	438	392	-	3000	-	-	-	-		
			OCT. 13/60	-	800,000	100	462	148	314	-	40	-	-	-	-		
			NOV. 28/61	-	4	270	994	202	792	-	90	-	-	-	-		
LOT-18 W	6'-0" x 8'-6" STORM SEWER - CARLAW AVE.	23	OCT. 13/60	-	700,000	75	386	66	320	-	30	-	-	-	-		
			NOV. 28/61	-	NO FLOW	NOTED											
LOT-19 W	8'-6" x 8'-3" STORM SEWER - LESLIE ST.	23	SEPT. 15/60	1,000,000	-	155	364	76	288	-	4000	13	-	-	-		
			OCT. 13/60	-	180,000	120	362	34	328	-	25	-	-	-	-		
			NOV. 28/61	-	NOT SAMPLED,	MANHOLE COVERED WITH EARTH											

ALL ANALYSES EXCEPT PH REPORTED IN PPM
UNLESS OTHERWISE INDICATED

TABLE I

SAMPLING POINT NO.	LOCATION	PLAN NO.	DATE EXAMINED	COLIFORMS		5-DAY B.O.D.	SOLIDS			TURBID- ITY	PHENOLS (PPB)	ETHER SOLUBLES	PH	CHROME	COPPER
				I. N. PER 100 ML	M. F. PER 100 ML		TOTAL	SUSP.	DISS.						
LOT-20 W	8'-6"x8'3" STORM SEWER - LESLIE ST.	23	Nov. 28/61	-		NOT SAMPLED,	MANHOLE COVERED WITH EARTH								
LOT-21 W	18" Ø STORM SEWER - CHERRY ST. TO SOUTH SIDE OF SHIP CHANNEL	22S	Nov. 21/61	-		NOT LOCATED									
LO-84.2 D	EASTERN CHANNEL AT LAKE ONTARIO	22S	Nov. 21/61	-		NOT SAMPLED									
LO-86.2 W	18" Ø STORM SEWER-LESLIE ST.	23	Nov. 21/61	-		NOT LOCATED									
LO-86.6 T	9' Ø OUTFALL SEWER - MAIN SEWAGE TREATMENT PLANT.	24	SEPT. 19/60 Nov. 17/60 Nov. 21/61	- - -	4,000,000 19,600,000 930,000	275 275 320	642 842 930	94 182 278	548 660 652	- - -	18 - 100	- - -	- - -	- - -	- - -
LO-86.8 D	ASHBRIDGES BAY AT LAKE ONTARIO.	24	Nov. 21/61	-		NOT SAMPLED									
LOA-1 D	DITCH TO NORTH- WEST CORNER OF ASHBRIDGES BAY	24	OCT. 13/60 Nov. 22/61	>10,000,000 -	- 630,000	80 50	586 650	12 214	574 436	- 50	80 16	- -	- -	- -	- -
LOA-2 R	42" Ø RELIEF SEWER TO NORTH - EAST CORNER OF ASHBRIDGES BAY	24	Nov. 21/61	-		NO FLOW NOTED									
LOA-3 W	9'x7'-3" STORM SEWER COXWELL AVE. TO NORTH-EAST CORNER OF ASHBRIDGES BAY	24	Nov. 17/60 Nov. 21/61	- -	2,200,000 1,530,000	66 90	488 620	92 60	396 560	- -	2 12	- -	- -	- -	- -
LOA-4 W	9'x7'-3" STORM SEWER COXWELL AVE. TO NORTH- EAST CORNER OF ASHBRIDGES BAY	24	Nov. 21/61	-		NO FLOW NOTED									

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ALL ANALYSES EXCEPT PH REPORTED IN PPM
UNLESS OTHERWISE INDICATED

TABLE I

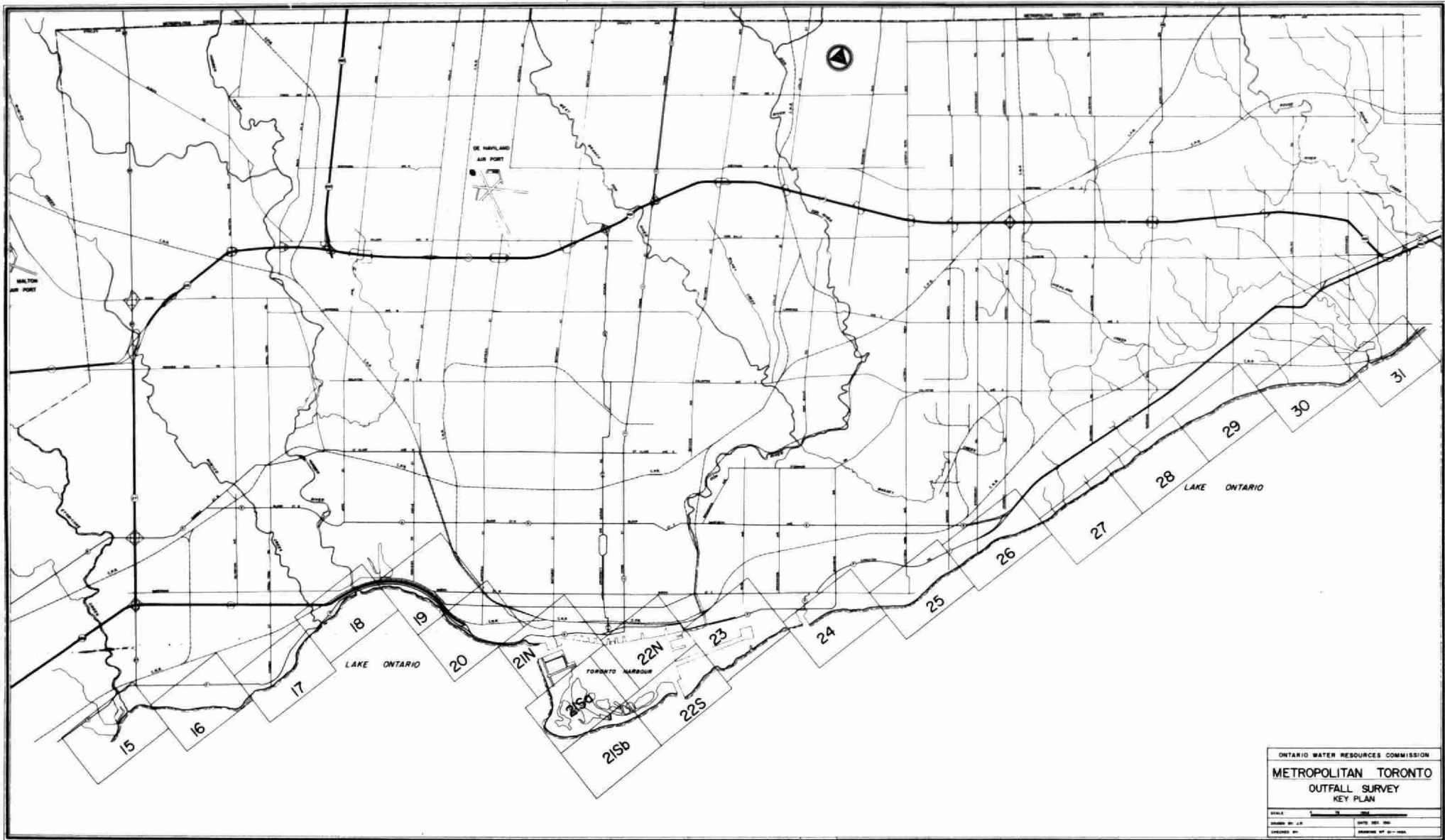
SAMPLING POINT NO.	LOCATION	PLAN NO.	DATE EXAMINED	COLIFORMS		5-DAY B.O.D.	SOLIDS			TURBID- ITY	PHENOLS (PPB)	ETHER SOLUBLES	PH	CHROME	COPPER
				I. N. PER 100 ML	M. F. PER 100 ML		TOTAL	SUSP.	DISS.						
LO-87.4 W	2'x3' STORM SEWER-WOODBINE AVE.	24	Nov.22/61	-	NO FLOW	NOTED									
LO-87.5 W	3'-6"x3'-3" STORM SEWER- KIPPENDAVIE AVE.	24	Nov.22/61	-	NO FORWARD	MOVEMENT, NOT SAMPLED									
LO-87.6 W	3'-3"x3'-0" STORM SEWER- KENILWORTH AVE.	24	Nov.22/61	-	NO FORWARD	MOVEMENT, NOT SAMPLED									
LO-87.7 W	3'-3"x3'-0" STORM SEWER WAVERLEY RD.	24	Nov.22/61	-	NO FLOW	NOTED									
LO-87.9 W	3'-6"x3'-0" STORM SEWER LEE AVE.	24	Nov.22/61	-	14,000	5.2	902	-	-	3.5	0	-	-	-	-
LO-88.3 W	6'-6"x3'-0" STORM SEWER - MACLEAN AVE.	24	SEPT.14/60 Nov. 22/61	- -	0 NO FLOW	2.4 NOTED	734	20	714	-	2	-	-	-	-
LO-88.3 W-1	6'-6"x3'-0" STORM SEWER - MACLEAN AVE.	24	SEPT.14/60 Nov. 22/61	- -	<10 NO FLOW	2 NOTED	842	42	800	-	2	-	-	-	-
LO-88.8 W	3'-0"x2'-6" STORM SEWER NURSEWOOD RD.	25	SEPT.14/60 Nov. 22/61	- -	0 NOT SAMPLED	4	668	8	660	-	2	-	-	-	-
LO-89.1 W	STORM SEWER - FALLINGBROOK RD.	25	DEC. 21/61	-	660,000	132	1170	564	606	-	0	-	-	-	-
LO-89.3 W	48" Ø STORM SEWER SOUTH END OF FALLINGBROOK DRIVE	25	Nov. 22/61 DEC. 21/61	- -	590 180	1.6 2.4	568 576	- -	- -	7.5 4.0	8 0	- -	- -	- -	- -
LO-89.7 R	60" Ø RELIEF SEWER- WARDEN AVE.	25	DEC. 21/61	-	350	8.6	578	296	282	-	10	-	-	-	-
LO-90.4 R	48" Ø RELIEF SEWER BIRCHMOUNT RD.	26	DEC. 21/61	-	6,300	1.9	3426	-	-	4.0	0	-	-	-	-
LO-90.9 W	60" Ø STORM SEWER LAKEHURST CRES.	26	DEC. 21/61	-	73,000	24	1806	-	-	20	0	-	-	-	-
LO-91.3 W	STORM SEWER - GLEN EVEREST RD.	26	DEC. 21/61	-	80	2.1	3600	-	-	17	TRACE	-	-	-	-

TABLE I

ALL ANALYSES EXCEPT pH REPORTED IN PPM
UNLESS OTHERWISE INDICATED

SAMPLING POINT NO.	LOCATION	PLAN NO.	DATE EXAMINED	COLIFORMS		5-DAY B.O.D.	SOLIDS			TURBID- ITY	PHENOLS (PPB)	ETHER SOLUBLES	PH	CHROME	COPPER
				I. N. PER 100 ML	M. F. PER 100 ML		TOTAL	SUSP.	DISS.						
LO-91.6 W	48" Ø STORM SEWER MIDLAND AVE.	26	DEC. 21/61	-	34,000	13	4262	360	3902	-	8	-	-	-	-
LO-91.7 W	24" Ø STORM SEWER - SCARBORO CRES.	27	DEC. 21/61	-	>1,500,000	315	1020	214	806	-	60	-	-	-	-
LO-91.8 W	48" Ø STORM SEWER - CHINE DR.	27	DEC. 21/61	-	>15,000	7	1390	-	-	7.5	0	-	-	-	-
LO-92.0 D	LOCAL WATERCOURSE WEST OF BRIMLEY RD.	27	DEC. 21/61	-	1,400	2.1	3260	-	-	6.5	2	-	-	-	-
LO-92.2 W	48" Ø STORM SEWER - SOUTH OF LARWOOD BLVD.	27	DEC. 21/61	-	>150,000	5	1318	-	-	11.5	0	-	-	-	-
LO-93.9 D	LOCAL WATERCOURSE EAST OF PINERIDGE DR.	28	DEC. 21/61	-	350,000	9	1200	108	1092	-	0	-	-	-	-
LO-95.2 W	72" Ø STORM SEWER - FOOT OF LIVINGSTON RD.	29	DEC. 21/61	-	940	4	906	-	-	17	3	-	-	-	-
LO-95.8 W-1	36" Ø STORM SEWER-EAST OF GALLOWAY RD.	29	SEPT. 14/60 NOV. 17/60 DEC. 21/61	- - -	<10 900 78	2.6 2.8 2.2	600 766 700	28 86 -	572 680 -	- - 2.8	0 - -	- - -	- - -	- - -	- - -
LO-95.8 W-2	21" Ø STORM SEWER-EAST OF GALLOWAY RD.	29	SEPT. 14/60 NOV. 17/60 DEC. 21/61	- - -	NO FLOW " "	NOTED " "	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
LO-95.8 W-3	8" Ø STORM SEWER-EAST OF GALLOWAY RD.	29	SEPT. 14/60 NOV. 17/60 DEC. 21/61	- - -	0 - 2	2.8 6 2.9	560 784 792	80 24 -	480 760 -	- - 8.5	3 - 0	- - -	- - -	- - -	- - -
LO-96.6 W	60" Ø STORM SEWER -FOOT OF MORNINGSIDE AVE.	30	DEC. 21/61	-	8,700	3.8	1528	-	-	4	4	-	-	-	-
LO-98.6 D	HIGHLAND CREEK AT LAKE ONTARIO	31	SEPT. 14/60 NOV. 17/60 MAY 10/61 JULY 26/61	- - - -	<10 980,000 12 2,160,000	13 11 15 9	474 522 698 584	28 66 -	446 456 -	- - 16 15	8 28 17 0	- - - -	- - - -	- - - -	- - - -
LO-99.1 I	3'-0"X3'-0" INDUSTRIAL SEWER- JOHNS-MANVILLE CO. LTD.	31	SEPT. 14/60 NOV. 17/60	- -	4,800 100	34 21	490 372	172 164	318 208	- -	6 4	- -	- -	- -	- -

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LAKE ONTARIO OUTFALL SURVEYNomenclature For Outfalls

Outfalls were designated by the shore line mileage measured clockwise from the International Boundary in the Niagara River along the shore and outside any bays or harbours. A letter signifying the type of outfall follows the Lake Ontario (LO) shore line mileage.

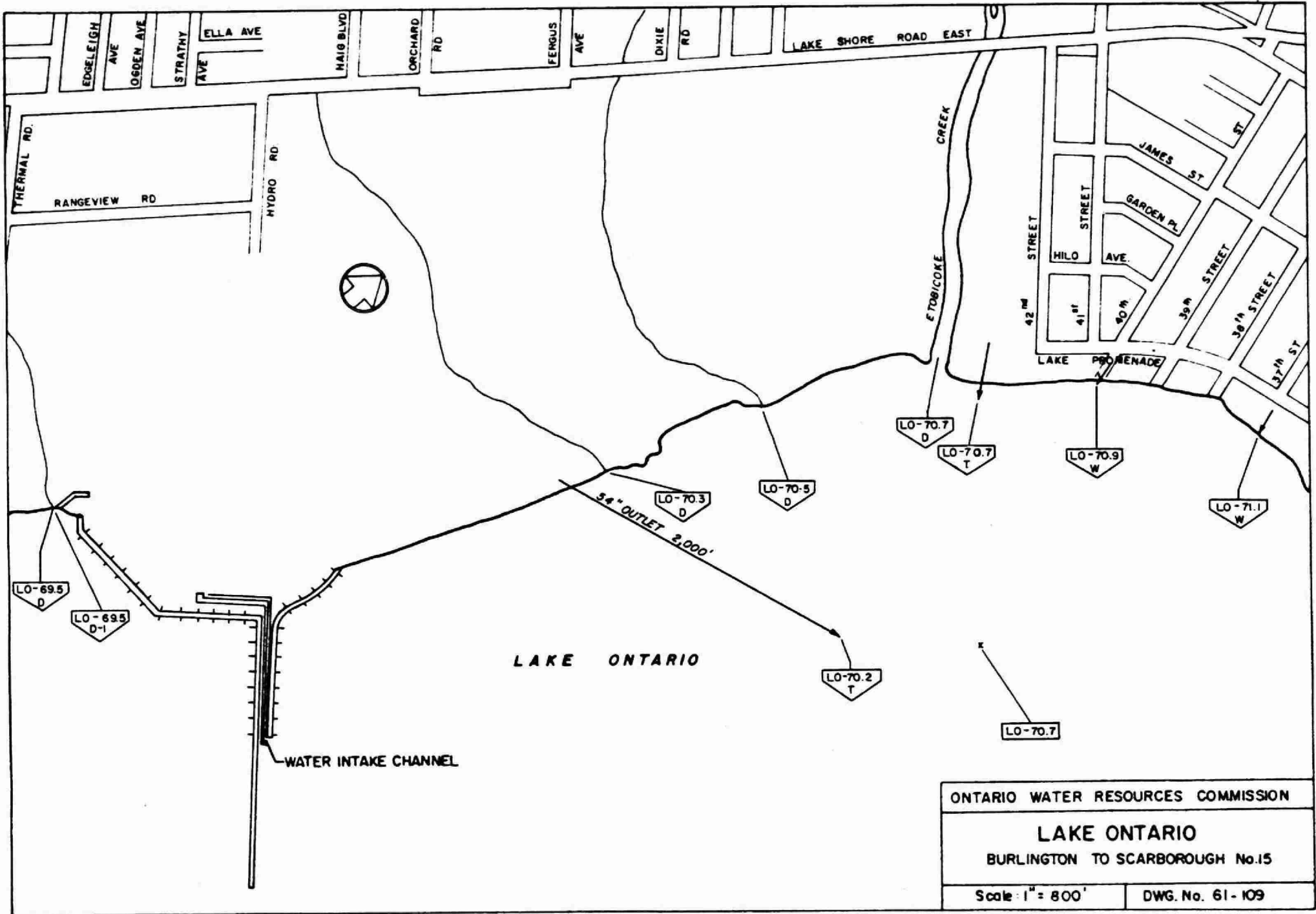
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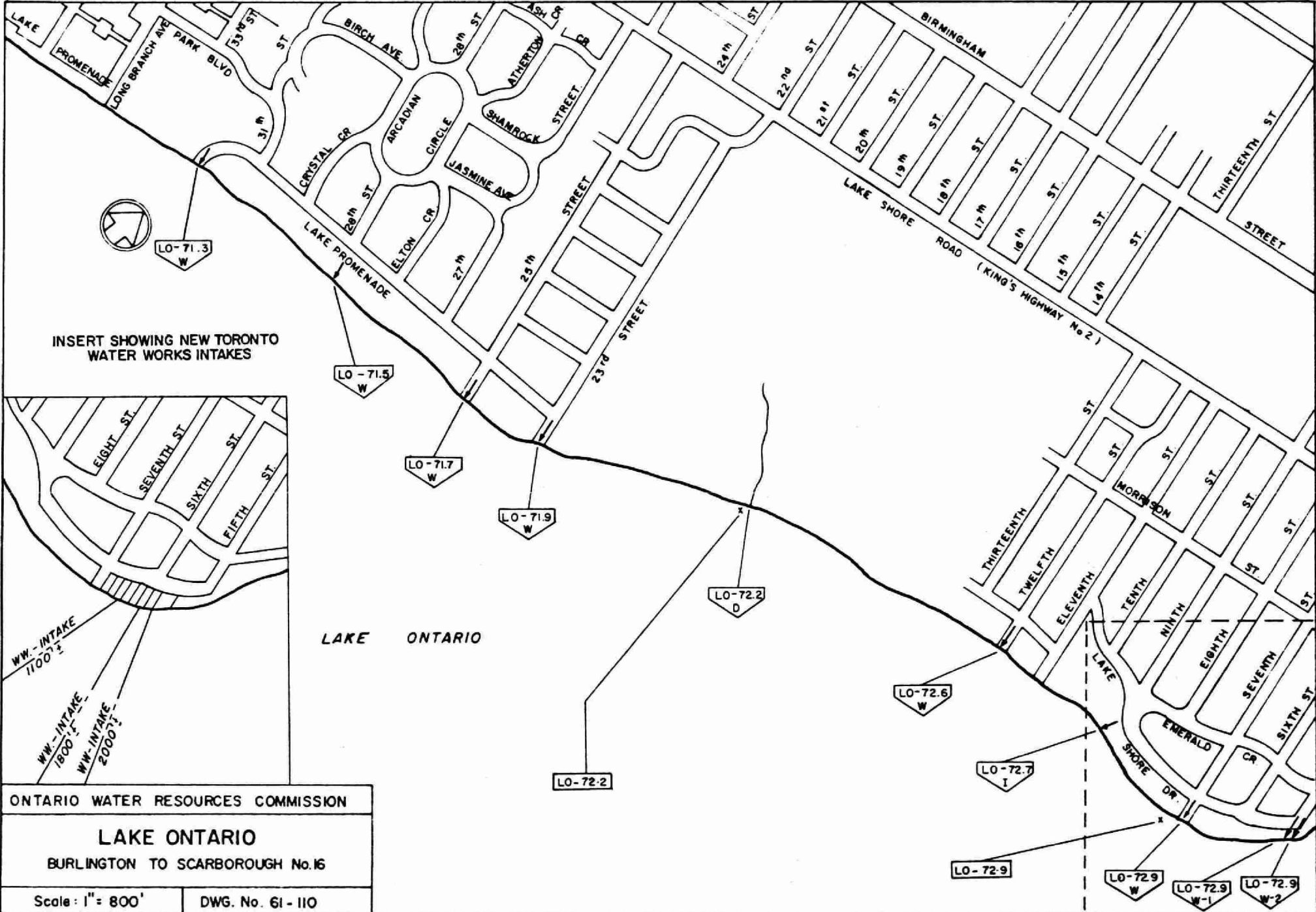
Inside harbours, outfalls were designated by numbers prefixed by the initial letter of the harbour (Toronto-T). Numbering thereof was done in a clockwise direction in numerical order.

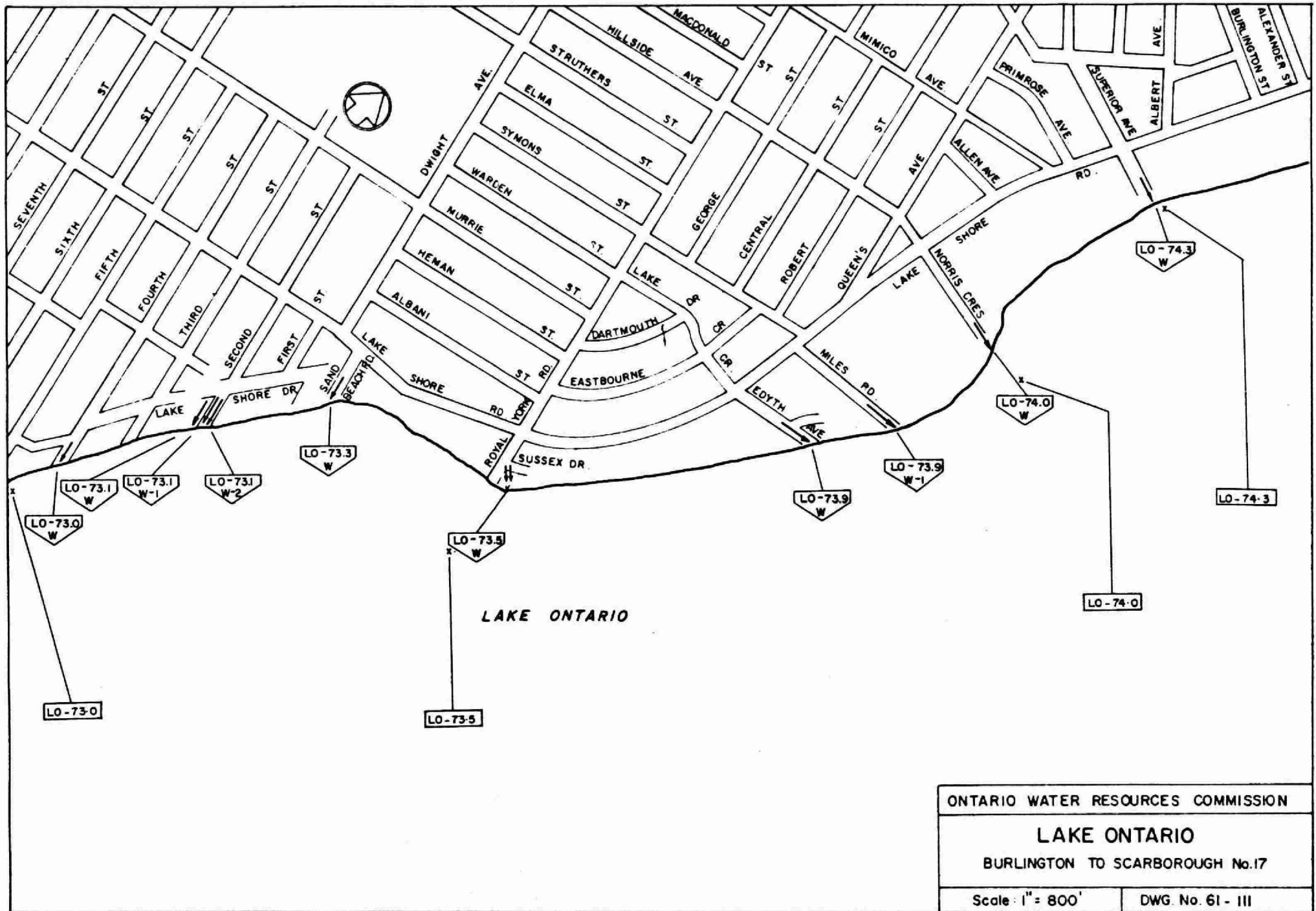
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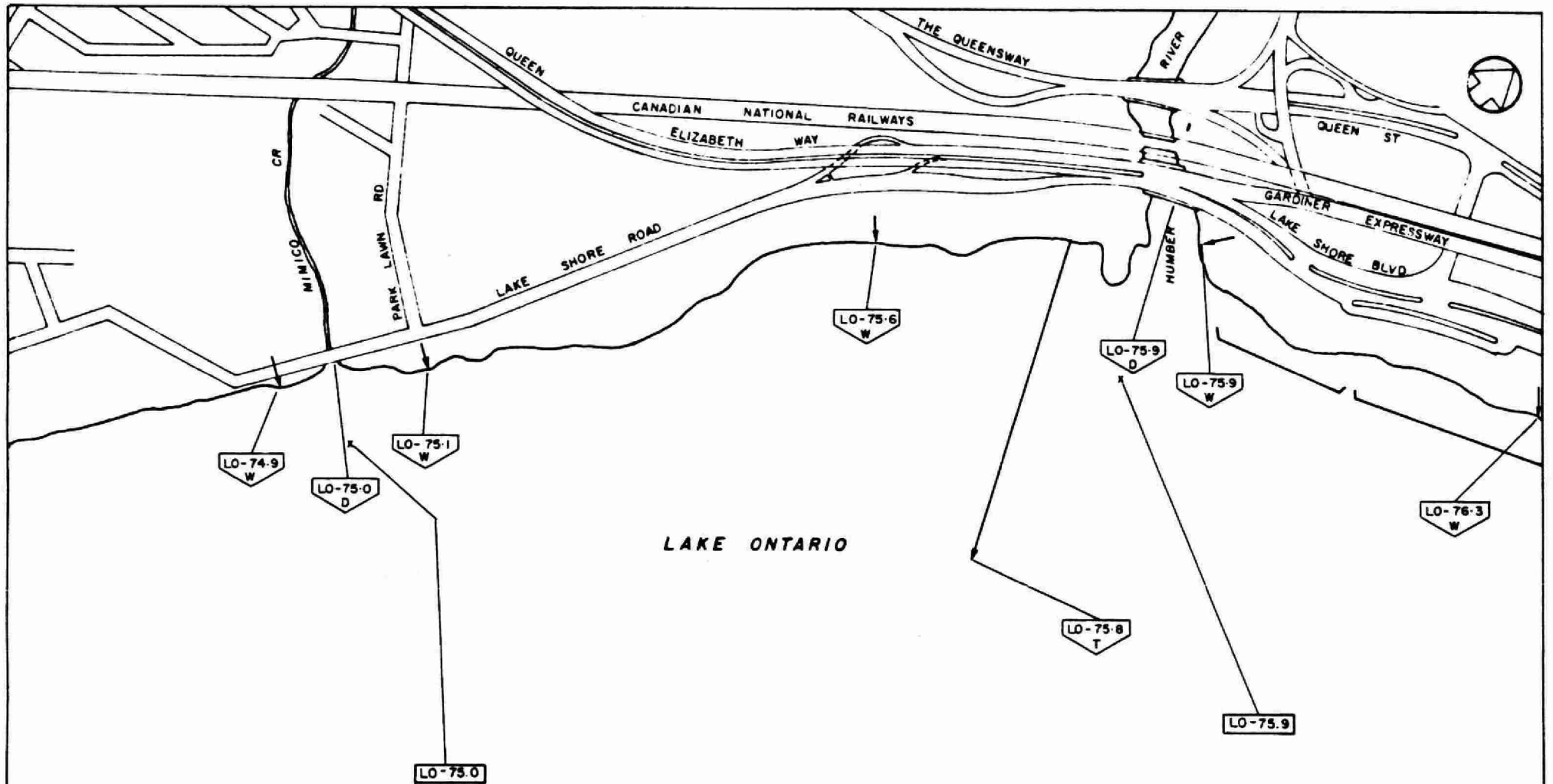
Outfall Symbol Letters

- W - Storm sewer.
- T - Sewage treatment plant outfall sewer.
- I - Industrial waste sewer.
- R - Relief sewer from a pumping station or from a sanitary or combined sewer.
- D - Drainage ditch, creek or river.









ONTARIO WATER RESOURCES COMMISSION

LAKE ONTARIO

BURLINGTON TO SCARBOROUGH No. 18.

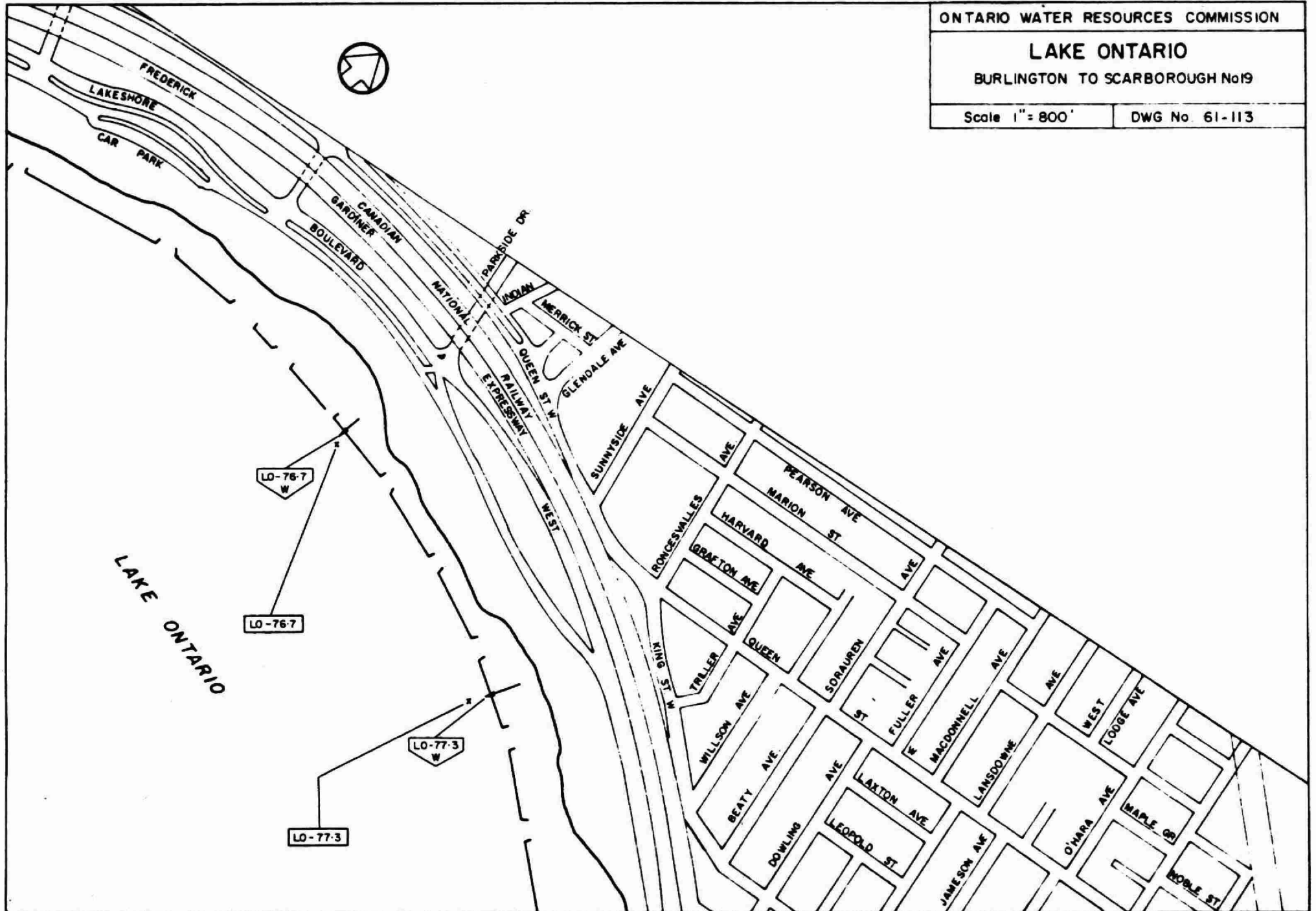
Scale : 1" = 800'

DWG. No. 61 - 112

LAKE ONTARIO
BURLINGTON TO SCARBOROUGH No19

Scale 1" = 800'

DWG No 61-113





LAKE ONTARIO

LO-77-9
W

LO-78-2
W

LO-78-5
W

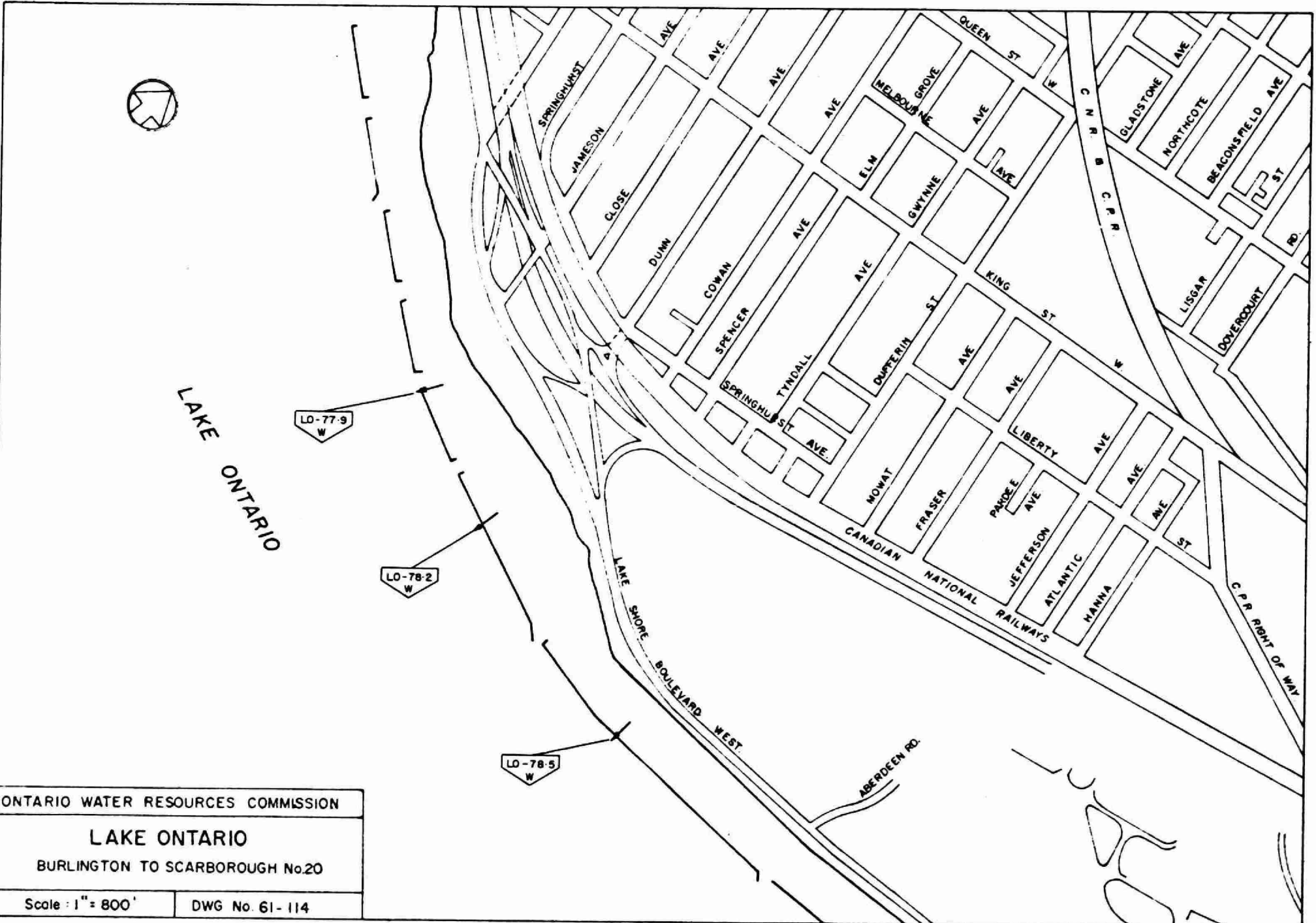
ONTARIO WATER RESOURCES COMMISSION

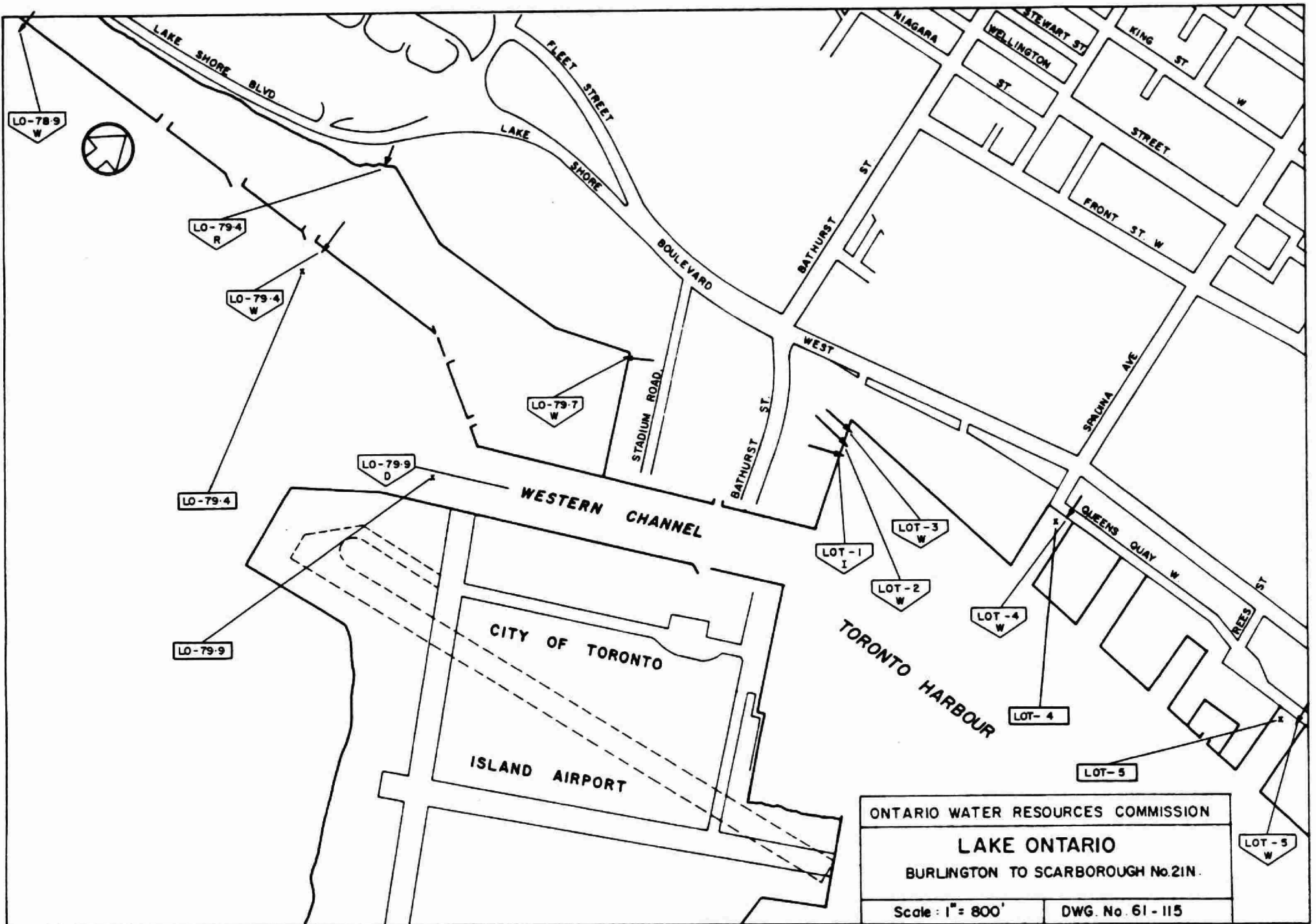
LAKE ONTARIO

BURLINGTON TO SCARBOROUGH No.20

Scale: 1" = 800'

DWG No. 61-114





ONTARIO WATER RESOURCES COMMISSION	
LAKE ONTARIO	
BURLINGTON TO SCARBOROUGH No.21N.	
Scale: 1" = 800'	DWG. No. 61-115

ONTARIO WATER RESOURCES COMMISSION

LAKE ONTARIO

BURLINGTON TO SCARBOROUGH No.21.S.a.

Scale: 1" = 800' DWG. No. 61-116



TORONTO HARBOUR

MUGGS ISLAND

LIGHTHOUSE POND

LAGOON

NIAMATHA AVE

LAKE FRONT

CONCRETE WALK

ST ANDREWS CUT

MANITOU RD

CIBOLA AVE

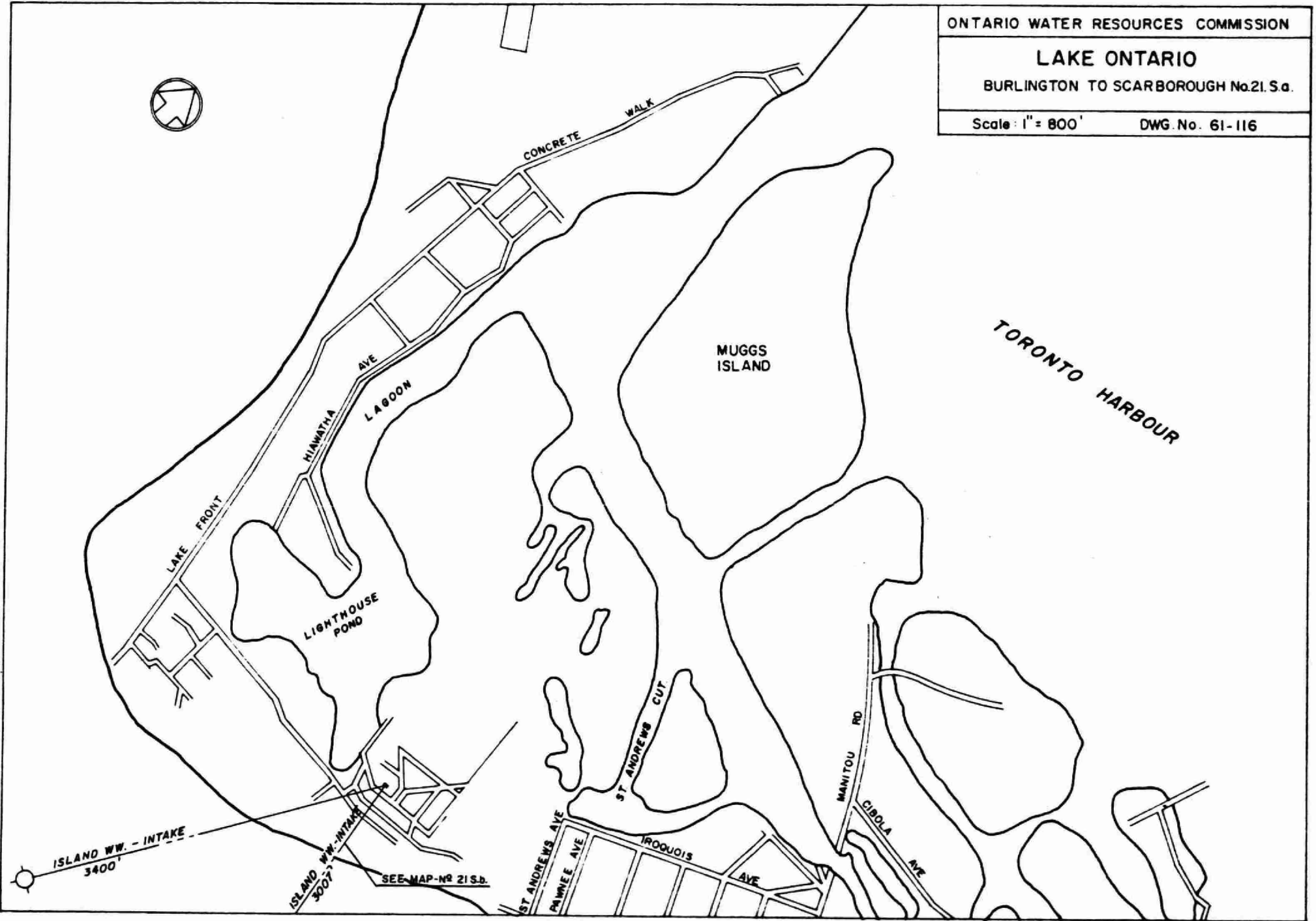
IROQUOIS AVE

ST ANDREWS AVE
PINNAC AVE

ISLAND WW. - INTAKE
3400'

ISLAND WW. INTAKE
3007'

SEE MAP-NR 21.S.b.





ISLAND W.W. - INTAKE
3007

SEE MAP-NO 21 S.o.

LAKE ONTARIO

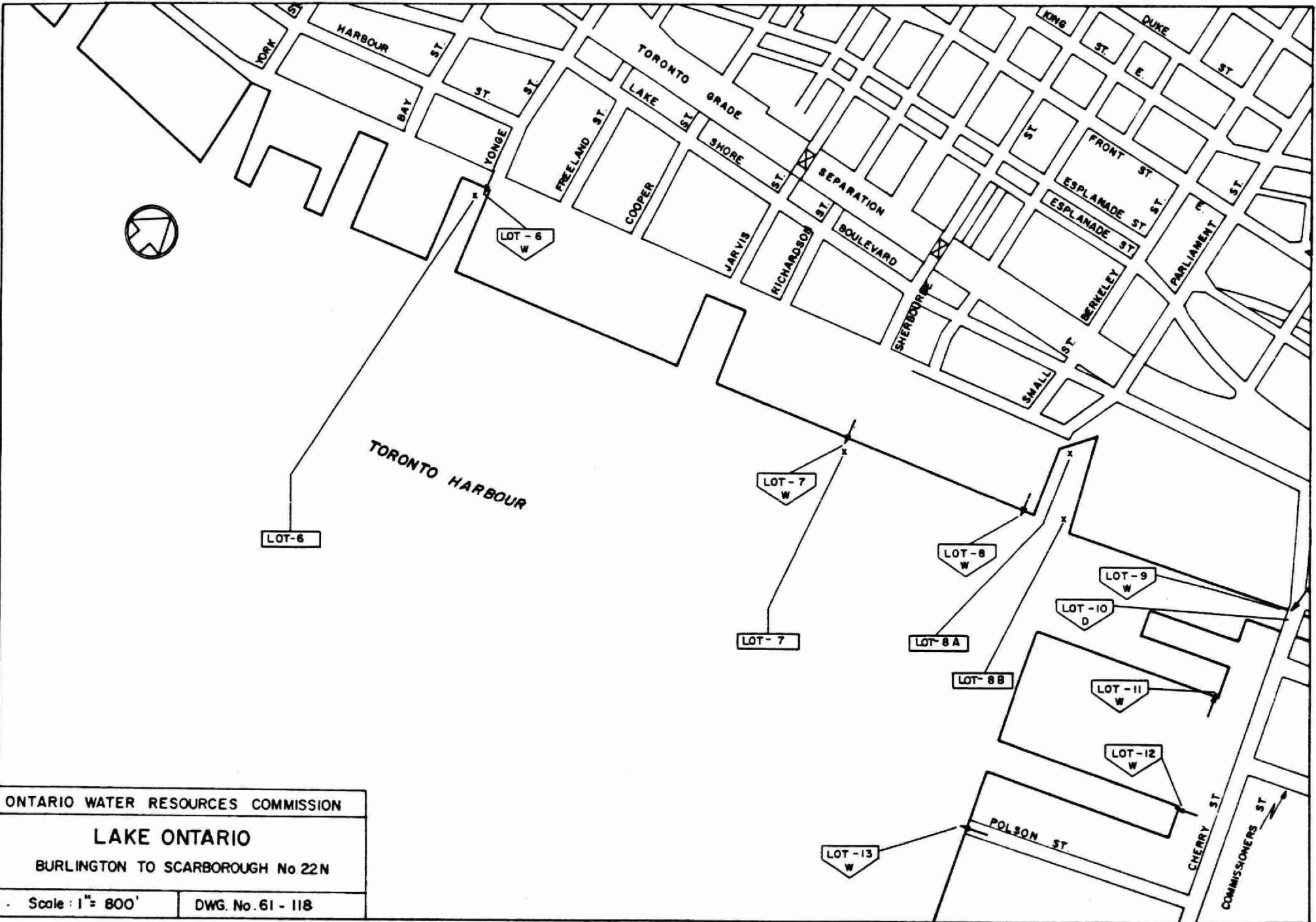
ONTARIO WATER RESOURCES COMMISSION

LAKE ONTARIO

BURLINGTON TO SCARBOROUGH No.21S.b.

Scale : 1" = 800'

DWG. No. 61 - 117

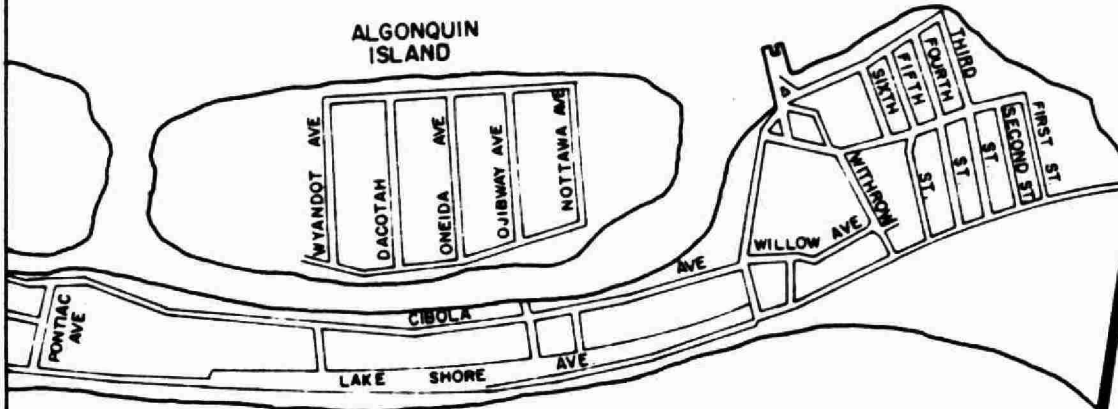


ONTARIO WATER RESOURCES COMMISSION
LAKE ONTARIO
BURLINGTON TO SCARBOROUGH No 22N
Scale: 1" = 800'
DWG. No. 61 - 118

TORONTO HARBOUR

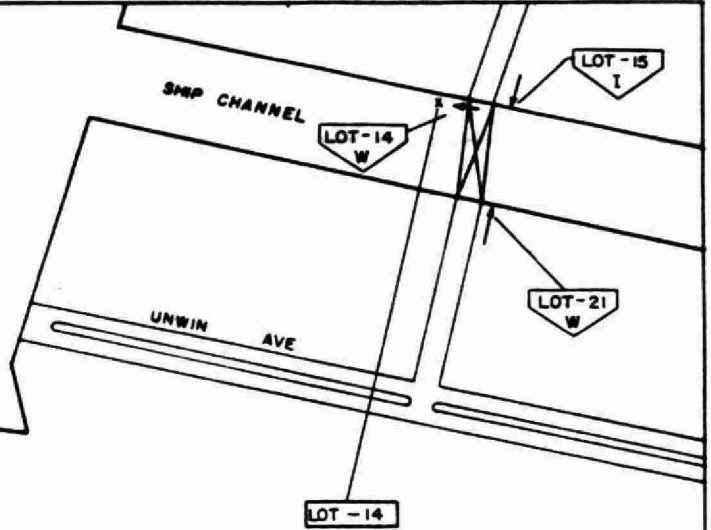


ALGONQUIN ISLAND

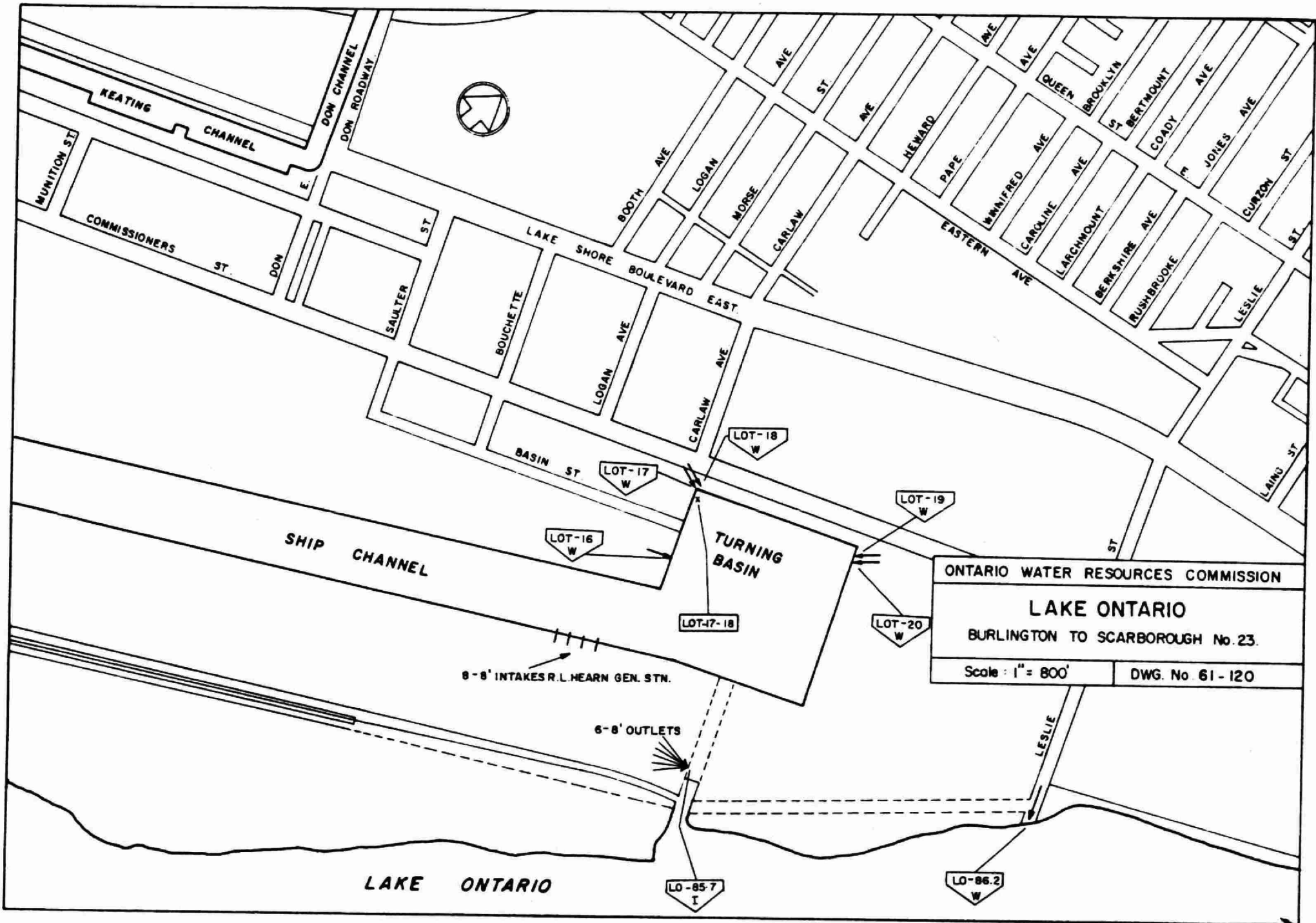


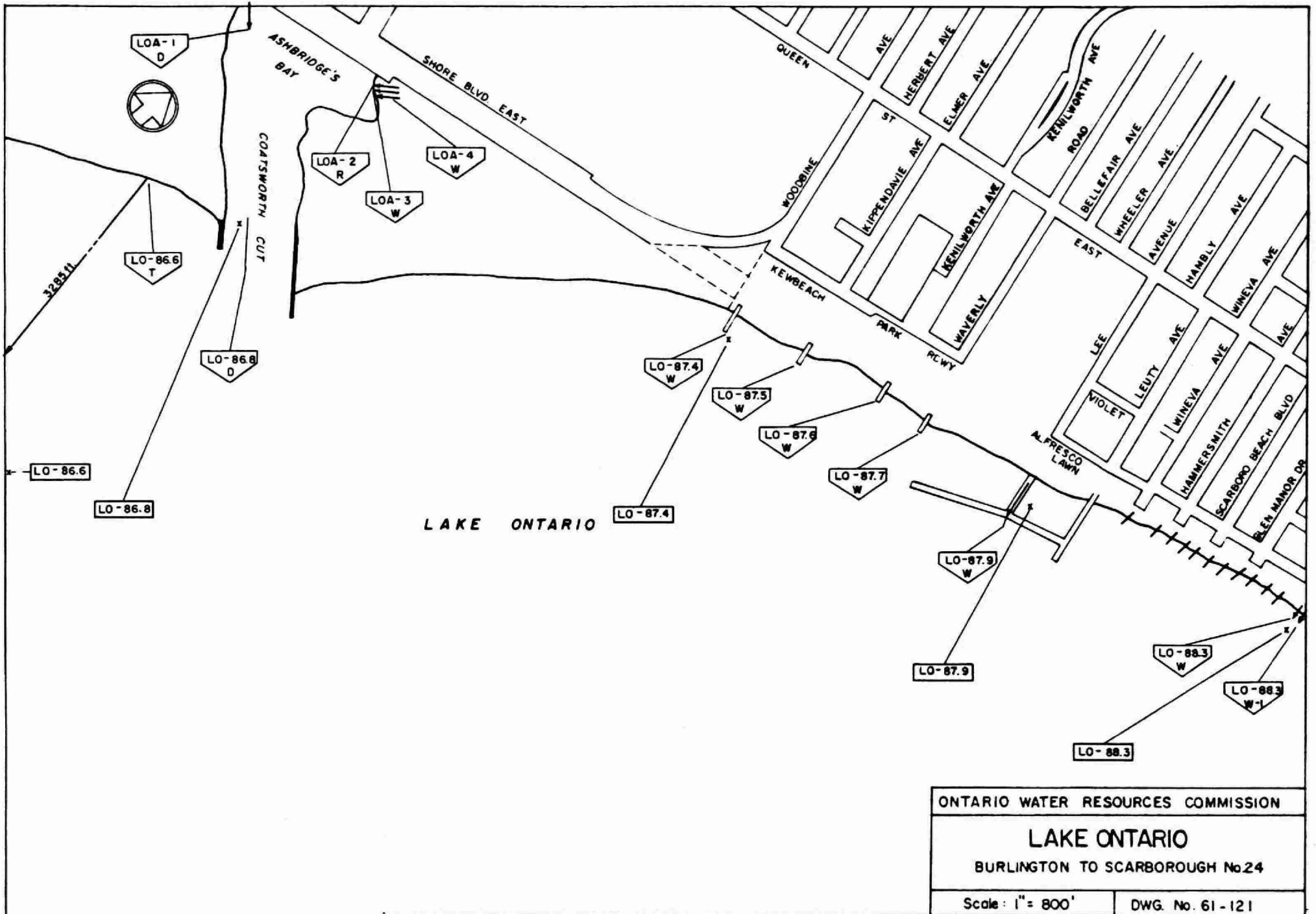
LO-84.2
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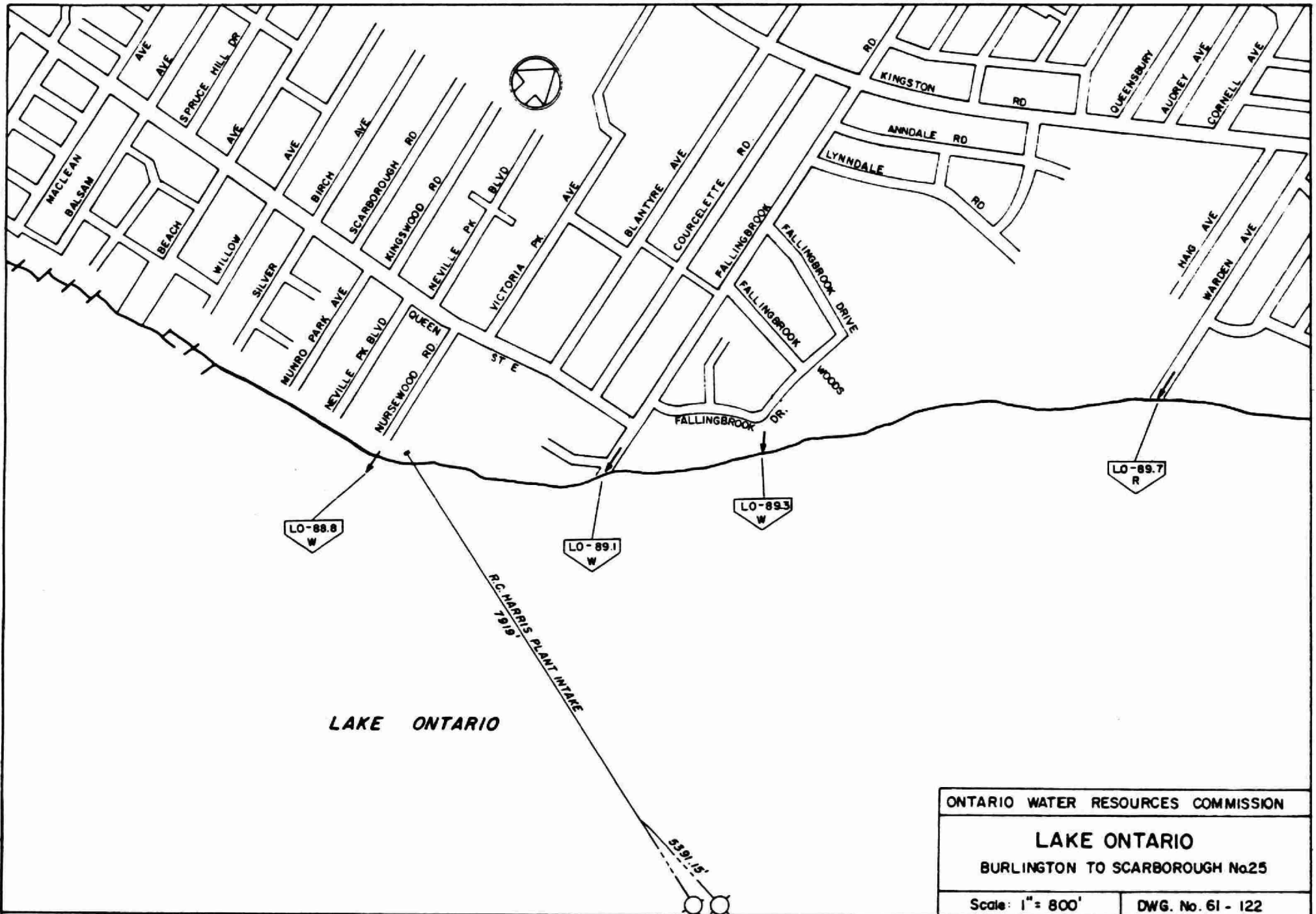
EASTERN CHANNEL



ONTARIO WATER RESOURCES COMMISSION	
LAKE ONTARIO	
BURLINGTON TO SCARBOROUGH No.22 S.	
Scale: 1" = 800'	DWG. No. 61-119







LAKE ONTARIO

R.C. HARRIS PLANT INTAKE
7519

5391.15'

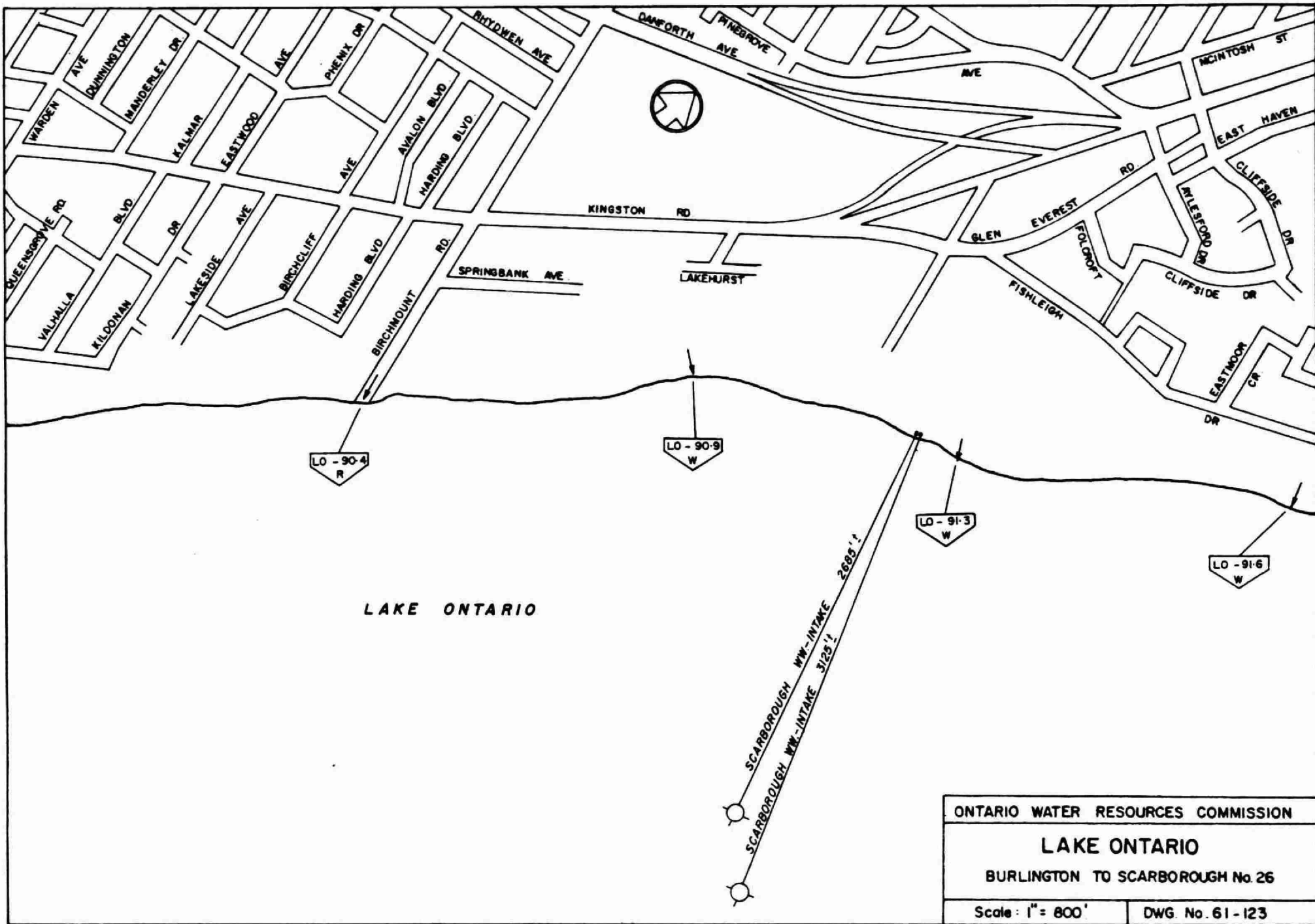
ONTARIO WATER RESOURCES COMMISSION

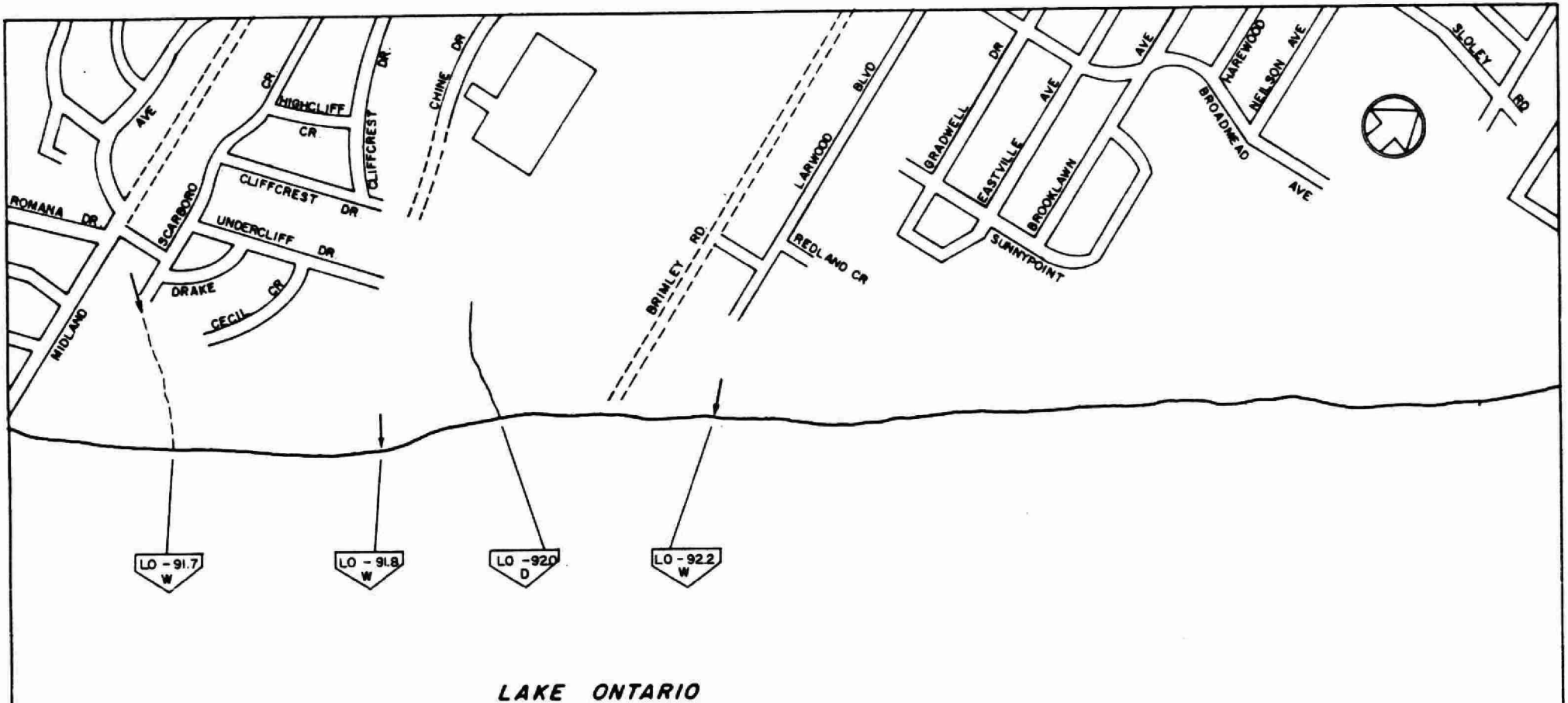
LAKE ONTARIO

BURLINGTON TO SCARBOROUGH No25

Scale: 1" = 800'

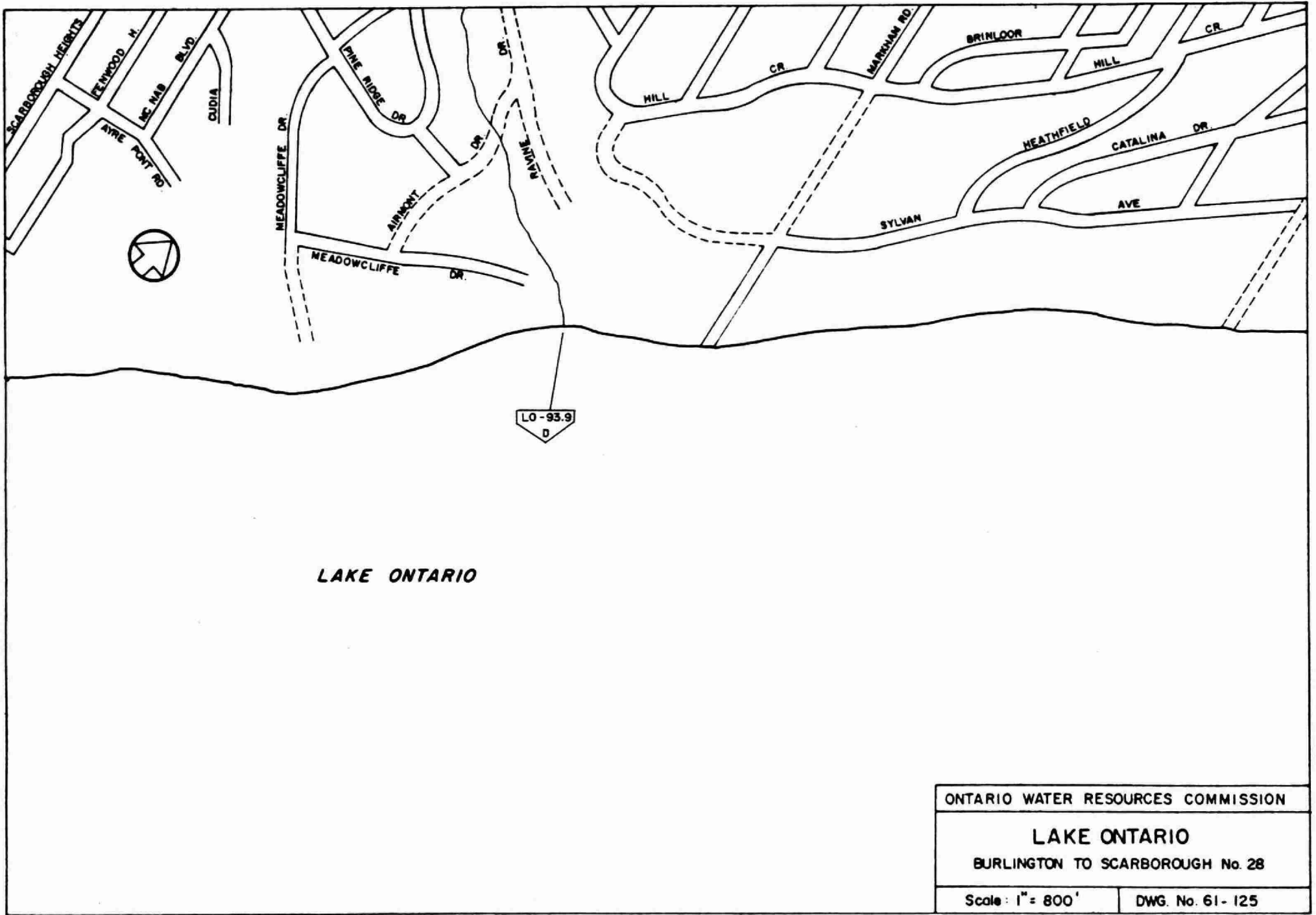
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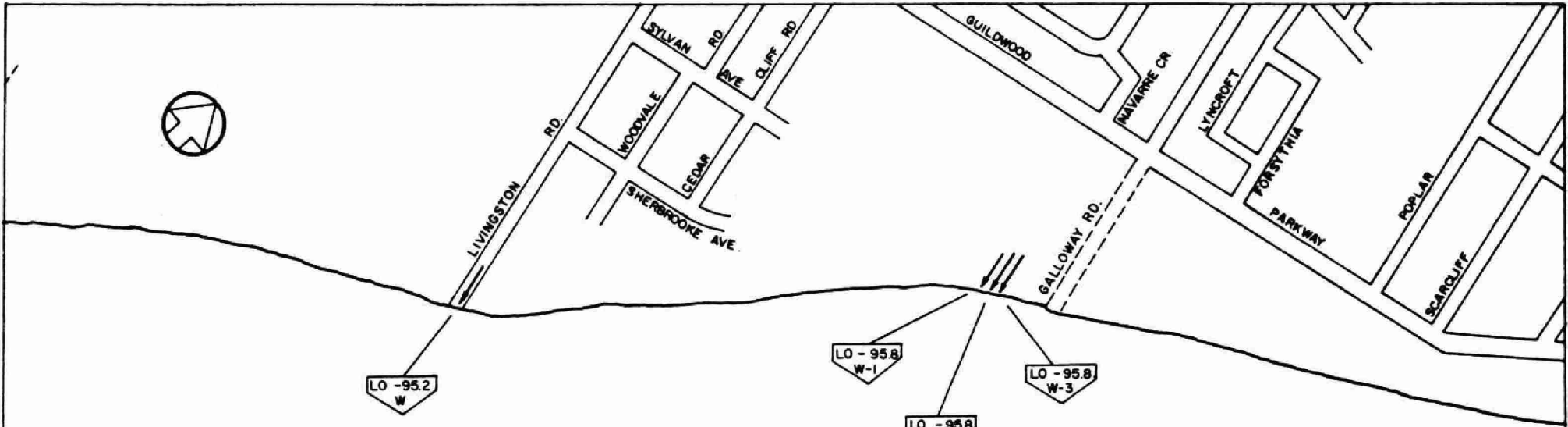
LAKE ONTARIO

ONTARIO WATER RESOURCES COMMISSION	
LAKE ONTARIO	
BURLINGTON TO SCARBOROUGH No.27.	
Scale: 1" = 800'	DWG. No. 61 - 124



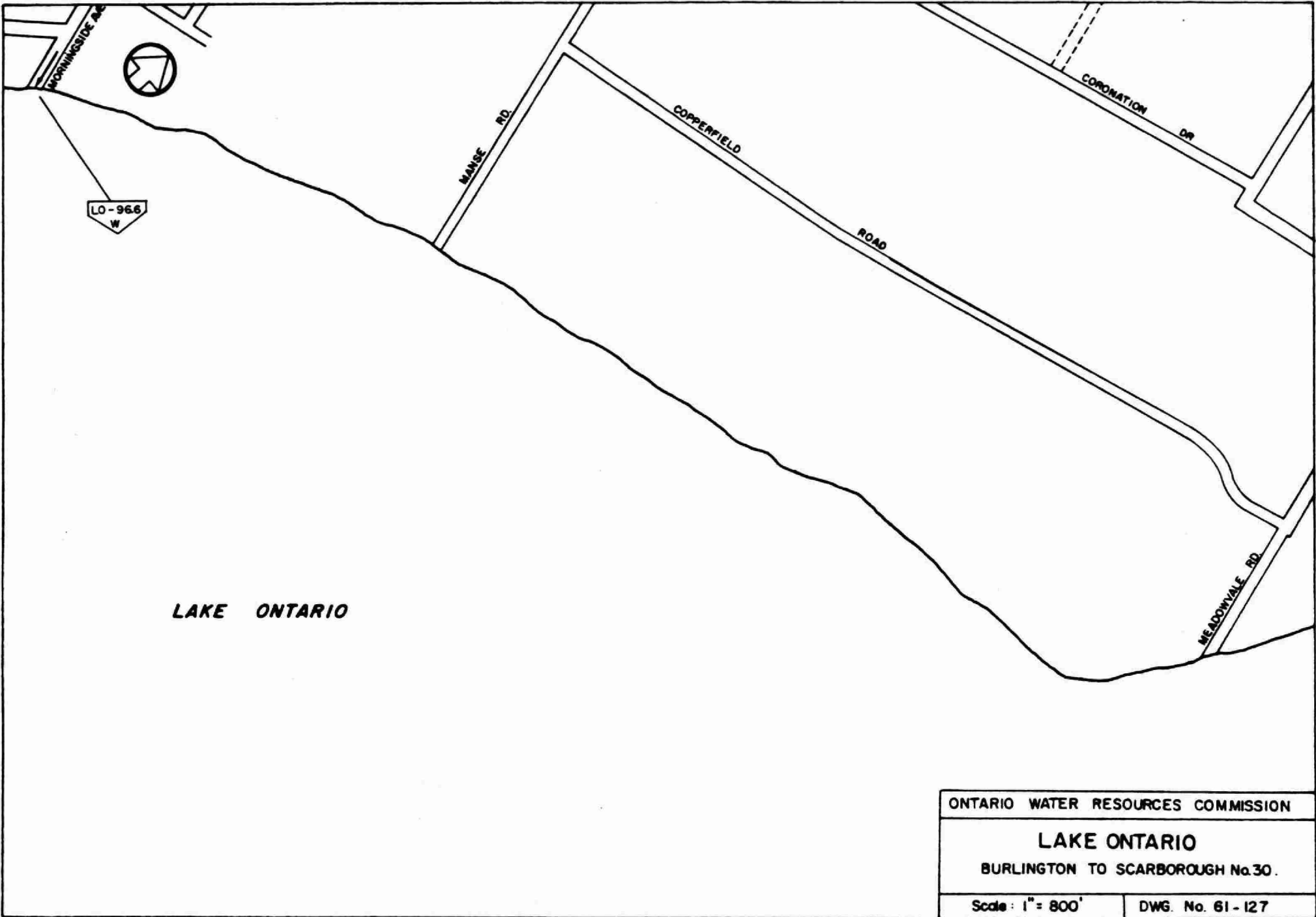
LAKE ONTARIO

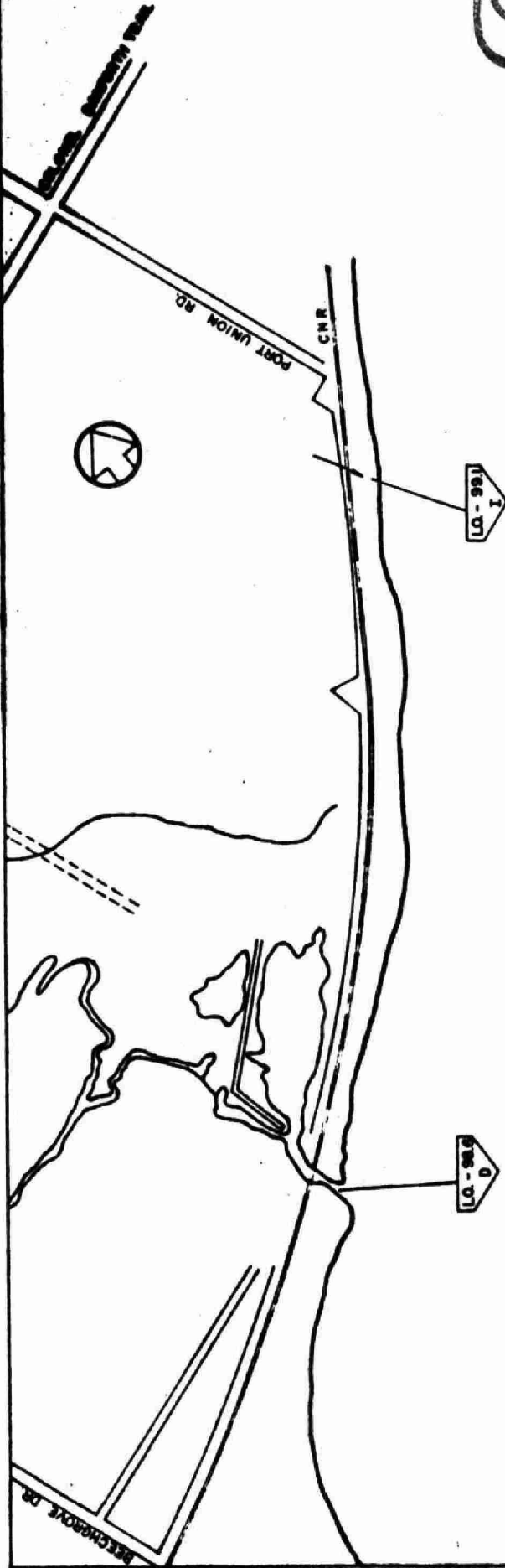
ONTARIO WATER RESOURCES COMMISSION	
LAKE ONTARIO	
BURLINGTON TO SCARBOROUGH No. 28	
Scale: 1" = 800'	DWG. No. 61-125



LAKE ONTARIO

ONTARIO WATER RESOURCES COMMISSION	
LAKE ONTARIO	
BURLINGTON TO SCARBOROUGH No.29	
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ONTARIO WATER RESOURCES COMMISSION

LAKE ONTARIO

BURLINGTON TO SCARBOROUGH No. 31

Scale: 1" = 800'

DWG. No. 61-136

A
REPORT

by

THE ONTARIO WATER RESOURCES COMMISSION

on a

WATER QUALITY and OUTFALL SURVEY

OF LAKE ONTARIO

BURLINGTON TO SCARBOROUGH TOWNSHIP INCLUSIVE

SECTION I

Survey of Outfalls to Waterfront Area

PART II

in the Towns of Burlington, Oakville and
Port Credit and the Township of Toronto

INTRODUCTION

This part of the report concerns inspections made by the Ontario Water Resources Commission during 1960 and 1961, of waste effluents from outfalls and drainage inlets discharging to Lake Ontario in the municipalities of Burlington, Oakville, Toronto Township and Port Credit.

All known sewer outlets were located, and where flow was noted "grab" samples were collected therefrom, for analysis at the Commission's laboratory. If the outlet was totally or partly submerged, a sample of the discharge was collected from a manhole upstream from the outlet.

Samples were collected also from the mouths of the nine principal watercourses emptying into Lake Ontario in the area under review.

WEATHER OBSERVATIONS

During and immediately prior to the sampling periods, appreciable precipitation did not occur, therefore, flow in the

storm sewers was not at a maximum.

ANALYSES

The analyses made included determinations of biochemical oxygen demand (B.O.D.), solids or turbidity, and phenolic equivalents. The samples were also examined for coliform bacteria, and those collected from the oil refineries outfalls were analysed for ether solubles (oil).

"Grab" samples were collected: forty (40) ounce samples for sanitary chemical analysis, and six (6) ounce samples for bacteriological examination being used. All laboratory tests were performed at the Ontario Water Resources Commission laboratory in Toronto.

The most common analyses of sanitary significance are: biochemical oxygen demand, suspended solids, and the total coliform determination.

Biochemical Oxygen Demand (B.O.D.)

The B.O.D. of sewage, industrial wastes, or surface waters, including lake or river waters, is the oxygen required during stabilization, (natural purification in a stream), of the decomposable organic matter or chemical material, by aerobic biochemical action. Unless otherwise noted a 5-day B.O.D. determination is performed and reported in parts per million (ppm.). A high B.O.D. is often indicative of recent organic or chemical pollution. A desirable upper limit in surface waters normally is 4 parts per million. This potential demand for oxygen to stabilize a discharged material tends to reduce the dissolved oxygen content of the water and so promotes suffocation of fish and the production of offensive conditions.

Suspended Solids

These results are reported in parts per million and indicate the measure of undissolved solids of organic or inorganic nature. Where suspended solids values approach 20 parts per million or less, laboratory difficulties usually are experienced and result in the values being determined as turbidity which is reported in silica units.

Membrane Filter Coliform Count

The membrane filter technique was employed to obtain a direct enumeration of coliform organisms, and the number is reported per 100 millilitres.

Waters having a total coliform count in excess of 2,400 organisms as determined by this technique are considered by the Commission as being undesirable for municipal water supplies or bathing purposes.

WATER QUALITY AND EFFLUENT OBJECTIVES

The following are the Commission's objectives for all surface waters in the Province of Ontario:

5-Day B.O.D.-----	not to exceed	more than	4 p.p.m.
M.F. Coliform Count	"	"	" 2,400/100 ml.
Phenolic Equivalents-Average	"	"	" 2 p.p.b.
-Maximum	"	"	" 5 p.p.b.
ph ----- -range			6.7 - 8.5

Some maximum allowable concentrations of pertinent contaminants in storm sewer, sewage treatment plant and industrial waste effluents are listed below. With the exception of certain specific instances influenced by local conditions, adequate safeguarding for surface water should be provided if the following effluent concentrations or ranges are not exceeded.

5-Day B.O.D. -----	not greater than 15 p.p.m.
Suspended solids -----	" " " 15 p.p.m.
Phenolic Equivalents --	" " " 20 p.p.b.
pH ----- (Range)	5.5 -10.6
Ether Solubles -----	not greater than 15 p.p.m.

In this area, severe taste problems have occurred in some municipal water supplies due to the receipt of excess concentrations of phenol or phenolic equivalents by Lake Ontario. These materials tend to combine with chlorine at the water treatment plants, to produce objectionable chloro-phenolic tastes in the water unless adequate taste and odour control procedures are in use. This problem is aggravated by the fact that these phenolic problems have been intermittent in nature. Some persons are able to detect chloro-phenolic tastes in water having the very low concentration of 2 p.p.b. (parts per billion) of phenolic equivalents. Therefore treatment facilities for taste and odour control are required.

It should be noted that whereas the terminology phenol, phenols, or phenolic compounds may be used, the determination results of this survey, are reported in phenolic equivalent units.

ANALYSES OF SAMPLES

The results of the bacteriological and sanitary chemical analyses performed on the samples collected are presented in Table 2 of this report. The table also contains a brief description of all presently located sewer outfalls which discharge to Lake Ontario in the area under study.

The locations of the outfalls are shown on accompanying plans designated as 1 - 15 inclusive. A key plan of this series of maps is also appended.

An examination of the results of the analyses revealed that the B.O.D. and coliform counts of the effluents from six storm sewers at some times were unsatisfactory. The phenol concentrations in some instances were significant.

Storm and runoff flows did not occur during the periods of sampling so that excessive flows and certainly contaminated flows should not be experienced in the storm sewers. However, appreciable severely contaminated flows, in fact, were revealed.

From Burlington to Long Branch high total coliform counts were obtained in most of the outfalls.

The worst occurrence of bacterial (coliform) pollution recorded was on Sept. 20, 1960 at the Reynolds St. storm sewer in Oakville LO-58.2 (W), when thirty-six million coliforms per 100 ml. were present.

Values in excess of one million were revealed in the storm sewer west of the Brant Inn LO-46.2 (W), Locust St. storm sewer LO-46.6 (W), Drury Lane S.T.P. outfall LO-47.5 (T), Guelph Line storm sewer LO-47.8 (W), Inglewood Dr. Storm sewer LO-49.6 (W), Elizabeth Gardens S.T.P. outfall LO-51.5 (TW), George St. storm sewer LO-58.0 (W), Highway #10 watercourse LO-67.5 (D), St. Lawrence Starch Co. outfall LO-67.6 (I), watercourse east of Lakeview Water Pollution Control Plant LO-70.3 (D), and Etobicoke Creek LO-70.7 (D). The presence of raw or inadequately treated sanitary sewage in these flows could cause a high coliform content.

Severe coliform concentrations were revealed also at other sampling locations as shown on Table 2.

At almost all of the above mentioned points, B.O.D. and/or suspended solids concentrations also exceeded the objective

maximums.

This was also true at the Elizabeth Street storm sewer LO-46.8 (W), Trafalgar S.T.P. outfall LO-55.3 (T), and the Regent Refining (Canada) Ltd. open cut LO-66.4 (I).

Phenol concentrations were excessive at the Locust St. storm sewer LO-46.6 (W), Elizabeth St. storm sewer LO-46.8 (W), George St. storm sewer LO-58.0 (W), Reynolds St. storm sewer LO-58.2 (W), Southdown Rd. storm sewer LO-62.8 (W), British American Oil Co. Ltd. outfall LO-63.0 (I-2), Highway #10 watercourse LO-67.6 (I), Hiawatha Park Blvd. storm sewer LO-67.9 (W) and Montbeck Cresc. storm sewer LO-69.1 (D). Excessive ether solubles (oil) were observed in the British American Oil Co. Ltd. outfall LO-63.0 (I-2).

A summary is presented below of the analytical results for the samples taken from nine watercourses.

<u>STREAM</u>	B.O.D. p.p.m.		Phenolic Equivalents (p.p.b.)		Coliform Count per 100 ml. - Membrane Filter Technique	
	<u>Min.</u>	<u>Max.</u>	<u>Avg.</u>	<u>Max.</u>	<u>Min.</u>	<u>Max.</u>
Hager Creek	2.8	12.0	2.5	3	1,000	10,000
Rambo Creek	4.7	14.0	3	6	5,700	25,000
Bronte Creek	2.2	3.2	0	0	34	90
Palermo Creek	2.0	3.3	3	3	2	4,800
Oakville Creek	3.2	3.9	1.5	3	27	39,000
Morrison Creek	2.4	4.1	1	2	0	800
Joshua's Creek	2.7	4.3	8.3	13	630	16,000
Credit River	1.6	5.3	1	2	10	368
Etobicoke Creek	3.2	17	7	15	10	1,040,000

The samples taken at the mouths of Rambo, Hager, Palermo, Joshua's, and Etobicoke Creeks showed average phenol concentrations

exceeding the desired objective. The high values of 13 ppb and 15 ppb were found in Joshua's, and Etobicoke Creeks respectively. With the exception of Etobicoke Creek which had a high coliform count of 1,040,000 per 100 ml., these streams had maximum coliform counts ranging from 4,800 per 100 ml., to 25,000 per 100ml. The biochemical oxygen demand in four instances exceeded the objective of 4 ppm with maximum values of 4.3 ppm to 17 ppm, except for Palermo Creek where the high value was 3.3 ppm.

The biochemical oxygen demand, phenol, and coliform results for Bronte, Morrison, and Oakville Creeks, and the Credit River generally did not exceed desired objective maximums. Exceptions to this were found in Oakville Creek (Sixteen Mile Creek) which had a maximum coliform count of 39,000 per 100 ml., and in the Credit River where one biochemical oxygen demand result of 5.3 ppm was noted.

Sample analyses results revealed that waste flows to Lake Ontario from the St. Lawrence Starch Company Limited plant, at outlet LO-67.6 (I) were unsatisfactory due to excessive sanitary chemical and coliform concentrations. This has been the situation for an extended period of time. The average B.O.D. of the waste at the time of sampling of 1265 p.p.m. is approximately six times the concentration of raw sanitary sewage. At the estimated flow of 1 million gallons per day, this is equivalent to the B.O.D. loading from a population of approximately seventy-five thousand people.

MAJOR POLLUTION-ABATEMENT PROJECTS PROPOSED OR COMPLETED

A number of projects have been completed throughout Burlington, Oakville, Port Credit, and Toronto Township which tend to abate previous pollution problems in the areas concerned.

Work is also in progress in some municipalities to correct existing problems which cause water pollution.

These projects are as follows:

1 - Burlington

Hager Creek

Abatement of waste discharges by a local chemical industry to Hager Creek had been initiated since the 1960 survey.

Rambo Creek

Early in 1961, a chemical plant began to treat its waste which discharges to Rambo Creek. Since that time the quality of the water in this watercourse downstream from this plant has improved.

Drury Lane Sewage Treatment Plant

This is a complete-treatment plant, located on Drury Lane extended, which was financed through the Commission by the Town of Burlington.

In February 1961 the construction of duplicate units here to double the original capacity was completed and placed in operation. An improved effluent discharge to Lake Ontario from this plant is now possible.

Elizabeth Gardens Sewage Treatment Plant

This is a Commission-financed plant located on Hampton Heath Rd. Primary-type treatment only, was originally provided and secondary-type, (complete) treatment was commenced in May 1960. An improvement in the quality of the effluent collected on November 22, 1961, over those of previous examinations was noted. Severe organic loadings, aggravated by wastes from a local packing plant, have caused treatment problems here. The installation of primary treatment units at the packing house has been of assistance.

Flows to Hamilton Bay

A portion of the Town of Burlington has outfalls discharging to Hamilton Bay. These were not sampled in this survey and will be presented in a later survey of the entire municipality. Included in these is the effluent from a temporary primary-type sewage treatment plant, located just west of LaSalle Park. This unit will be replaced by the proposed secondary-type treatment plant (Skyway), in the Burlington Beach area, which will also discharge to the bay.

The Bellview Street area is served by a common septic tank with effluent discharge to the bay via Indian Creek.

2- Oakville

Oakville Sewage Treatment Plant

This is a secondary-type (complete) treatment plant located near Rebecca and Navy Streets. The plant is in need of extensive renovation and was previously severely overloaded. Recently, flows constituting the hydraulic overload to the plant were re-directed to the Trafalgar sewage treatment plant from the westerly Oakville drainage area and in December 1961, other flows via the new Rebecca Street trunk sanitary sewer.

This flow diversion and proposed renovation will allow this previously overloaded plant to produce a consistently good effluent and thereby should improve the quality of the water in Oakville Creek (Sixteen Mile Creek), near its mouth.

Trafalgar Sewage Treatment Plant

This is a secondary-type (complete) plant located between Woodhaven Park Drive and Sandwell Drive and is presently capable of producing a superior effluent while receiving the extra

flows from the Oakville plant. This quality is critical due to the proximity of extensive bathing areas. There is also a storm tank outfall associated with this plant.

Cities Service Refining (Canada) Limited

Cities Service Refining (Canada) Ltd. has taken extensive measures at its refinery to avoid polluting the lake.

Shell Oil Company of Canada Limited

The Shell Oil Company of Canada Limited is constructing a refinery in the town and will be expected to control the qualities of its effluents.

3- Township of Toronto

British American Oil Company Limited

Improvements in the quality of one of the effluents from the British American Oil Company Limited refinery at Clarkson should be evident when the new biological phenol-reduction waste treatment plant is put into service early in 1962. Care will continue to be necessary to avoid the accidental escape of petroleum products particularly those having phenolic characteristics.

Lakeview Water Pollution Control Plant

In November 1961, the new Lakeview Water Pollution Control Plant was placed into operation. Previously, sewage from this sewered area of Toronto Township was conveyed temporarily, to a municipal septic tank with the incompletely treated effluent being discharged to a local watercourse having an outfall to Lake Ontario designated as LO-70.3 (D). Sample analyses results showed a marked improvement in the B.O.D. and coliform content of this stream following the establishment of treatment at this new plant.

This was financed through the Ontario Water Resources Commission with the co-operation of the Municipality of Metropolitan

Toronto and Toronto Township and opened on November 24th, 1961. The advent of this plant and Lakeshore trunk sewer has already allowed diversion thereto of some of the excess flows that previously overloaded the Long Branch sewage treatment plant and aggravated its effluent. When the Metro Lakeshore interceptor trunk sewer presently under construction on the Lakeshore Boulevard West is completed, this overloading will be reduced further and the Long Branch plant will become capable of producing an acceptable effluent during the period that it remains in operation.

Also, tenders have been called for sewers and appurtenances to allow the total sewage flow from the Town of Port Credit to be pumped to the Lakeview plant. This will allow the abandonment of the grossly overloaded Port Credit sewage treatment plant. The effluent from this plant has been a source of concern due to its polluting potential, particularly due to its point of discharge being in the Credit River just upstream from the Lake Ontario intake of the Port Credit water works.

4 - Port Credit

Regent Refining (Canada) Ltd.

The new biological oxidation unit and the American Petroleum Institute oil-water separator at the Regent Refining (Canada) Limited oil refinery were placed in service in July, 1961. There has been a marked reduction in the amount of petroleum contaminants discharged to the lake since improved waste treatment facilities have been provided. Care will continue to be necessary to avoid accidental escape of petroleum products particularly those which have phenolic characteristics.

SUMMARY

It should be borne in mind that the magnitude of this work has allowed only three sampling runs. It will be required that these investigations be continued to complement this information. However, as a result of these investigations, it is apparent that inadequately treated wastes were gaining access to Lake Ontario through eight municipal and two industrial sewer outlets.

Generally the values of the samples collected from seven of the nine major watercourses flowing to the lake, exceeded one or more of the Commissions objective maximums during these two years of sampling.

RECOMMENDATIONS

On the basis of the analyses the waste flows being discharged at the following sewer outfalls, particularly required attention.

<u>MUNICIPALITY OR INDUSTRY</u>	<u>SAMPLING POINT NUMBER</u>
Burlington	LO-46.2 (W)
	LO-46.6 (W)
	LO-46.8 (W)
	LO-47.8 (W)
Oakville	LO-58.0 (W)
	LO-58.2 (W)
Toronto Township	LO-62.8 (W)
Port Credit	LO-67.9 (W)
St. Lawrence Starch Co. Ltd.	LO-67.6 (I)

It is therefore recommended:

1. That the "Water Quality and Effluent Objectives", prescribed in this report, be observed in the development of remedial and pollution-preventive measures by the municipalities

and industry to which reference is made above. These objectives should apply to both existing and new sources of wastes.

2. That all sewer outfalls in these municipalities be located and recorded and sampled where a discharge is noted to the lake proper or contributing watercourses. If the analytical results exceed the "Water Quality and Effluent Objectives" outlined in this report remedial measures should then be initiated by the municipalities or industries involved, to reduce the quantities of polluting material reaching the lake and avoid contravention of the Ontario Water Resources Commission Act.

TABLE 2

SAMPLING POINT NO.	LOCATION	PLAN NO.	DATE EXAMINED	COLIFORMS		5-DAY B.O.D.	SOLIDS			TURBID- ITY	PHENOLS (PPB)	ETHER SOLUBLES	pH	CHROME	COPPER
				I. N. PER 100 ML	M. F. PER 100 ML		TOTAL	SUSP.	DISS.						
LO-46.2 W	21" Ø STORM SEWER WEST OF BRANT INN	1	SEPT. 19/60	-	FLOW INSUFFICIENT FOR SAMPLING										
			OCT. 18/60	-	1,500,000	52	376	28	348	-	6	-	-	-	-
			NOV. 21/61	-	115,000	11	580	-	-	2.5	12	-	-	-	-
LO-46.3 W	30" Ø STORM SEWER NELSON AVE.	1	SEPT. 19/60	-	NO FLOW NOTED										
			OCT. 18/60	-	1,200	4.8	710	-	-	1	4	-	-	-	-
			NOV. 21/61	-	10,300	7.9	818	-	-	2.9	2	-	-	-	-
LO-46.4 W	12" Ø STORM SEWER OPPOSITE HAGER AVE.	1	SEPT. 19/60	-	FLOW INSUFFICIENT FOR SAMPLING										
			OCT. 18/60	-	NO FLOW NOTED										
			NOV. 21/61	-	" " "										
LO-46.5 D	HAGER CREEK AT WATER ST.	1	SEPT. 19/60	-	1,000	8.4	880	18	862	-	2	-	-	-	-
			OCT. 18/60	-	1,200	12	620	-	-	16	-	-	-	-	-
			NOV. 21/61	-	10,000	2.8	618	-	-	12.5	3	-	-	-	-
LO-46.6 W	18" Ø STORM SEWER LOCUST ST.	1	SEPT. 19/60	-	NOT LOCATED										
			OCT. 18/60	-	1,900,000	1280	888	160	728	-	1200	-	-	-	-
			NOV. 21/61	-	FLOW INSUFFICIENT FOR SAMPLING										
LO-46.7 W	15" Ø STORM SEWER BRANT STREET	1	SEPT. 19/60	-	NOT LOCATED										
			OCT. 18/60	-	" "										
			NOV. 21/61	-	" "										
LO-46.8 W	12" Ø STORM SEWER ELIZABETH ST.	1	SEPT. 19/60	-	NOT LOCATED										
			OCT. 18/60	-	" "										
			NOV. 21/61	-	22,000	620	610	-	-	7.1	25	-	-	-	-
LO-47.1 D	RAMBO CREEK AT HWY. #2 (WATER ST.)	1	SEPT. 19/60	-	25,000	6.0	222	2	220	-	6	-	-	-	-
			OCT. 18/60	-	5,700	14	334	-	-	3	-	-	-	-	
			NOV. 21/61	-	13,100	4.7	462	-	-	3.1	0	-	-	-	-
LO-47.2 D	DRAINAGE DITCH BETWEEN TORRANCE ST. & SMITH AVE.	1	SEPT. 19/60	-	FLOW INSUFFICIENT FOR SAMPLING										
			OCT. 18/60	-	NO FLOW NOTED										
			NOV. 21/61	-	FLOW INSUFFICIENT FOR SAMPLING										
LO-47.4 D	DRAINAGE DITCH EAST OF SENECA ST.	2	SEPT. 19/60	-	FLOW INSUFFICIENT FOR SAMPLING										
			OCT. 18/60	-	1,000	4.0	226	-	-	3	2	-	-	-	-
			NOV. 21/61	-	FLOW INSUFFICIENT FOR SAMPLING										

ALL ANALYSES EXCEPT PH REPORTED IN PPM
UNLESS OTHERWISE INDICATED

TABLE 2

SAMPLING POINT NO.	LOCATION	PLAN NO.	DATE EXAMINED	COLIFORMS		5-DAY B.O.D.	SOLIDS			TURBIDITY	PHENOLS (PPB)	ETHER SOLUBLES	PH	CHROME	COPPER	
				I. N. PER 100 ML	M.F. PER 100 ML		TOTAL	SUSP.	DISS.							
LO-47.5 R	30" Ø RELIEF SEWER FROM DRURY LANE SEWAGE TREATMENT PLANT OUTFALL	2	SEPT. 19/60	-	NO FLOW NOTED											
			OCT. 18/60	-	" " "											
			NOV. 20/61	-	" " "											
LO-47.5 T	30" Ø OUTFALL SEWER DRURY LANE SEWAGE TREATMENT PLANT	2	SEPT. 19/60	-	7,000,000	104	546	54	492	-	10	-	-	-	-	
			OCT. 18/60	-	840,000	46	958	422	536	-	-	-	-	-	-	-
			NOV. 30/61	-	12,300	84	596	70	526	5	0	-	-	-	-	-
LO-47.6 W	30" Ø STORM SEWER GREEN STREET	2	SEPT. 19/60	-	NO FLOW NOTED											
			OCT. 18/60	-	" " "											
			NOV. 21/61	-	" " "											
LO-47.7 W-1	14" Ø STORM SEWER MARKET STREET	2	SEPT. 19/60	-	OUTLET SUBMERGED, OTHER SUITABLE SAMPLING POINT NOT LOCATED.											
			OCT. 18/60	-	" " "											
			NOV. 21/61	-	" " "											
LO-47.7 W-2	15" Ø STORM SEWER MARKET STREET	2	SEPT. 19/60	-	NO FLOW NOTED											
			OCT. 18/60	-	" " "											
			NOV. 21/61	-	" " "											
LO-47.8 W	24" Ø STORM SEWER GUELPH LINE	2	SEPT. 19/60	-	12,000,000	300	710	184	526	-	20	-	-	-	-	
			OCT. 18/60	-	210,000	62	528	-	-	4	4	-	-	-	-	-
			NOV. 21/61	-	1,400,000	11	530	-	-	2.6	12	-	-	-	-	-
LO-48.2 W	12" Ø STORM SEWER POMONA AVE.	2	SEPT. 19/60	-	OUTLET SUBMERGED, OTHER SAMPLING POINT NOT LOCATED.											
			OCT. 18/60	-	" " "											
			NOV. 21/61	-	" " "											
LO-48.4 D	WATERCOURSE AT HWY. #2	2	SEPT. 19/60	-	670,000	11	514	44	470	-	0	-	-	-	-	
			OCT. 18/60	-	18,000	10	552	-	-	1	-	-	-	-	-	
			NOV. 21/61	-	137,000	4.1	804	-	-	3.5	3	-	-	-	-	-
LO-49.0 D	WATERCOURSE AT HWY. #2 EAST OF LAKEVIEW AVE.	3	SEPT. 19/60	-	NO FLOW NOTED											
			OCT. 18/60	-	350	7.4	570	-	-	1	-	-	-	-	-	
			NOV. 21/61	-	28,000	2.7	552	-	-	2.8	6	-	-	-	-	-
LO-49.2 W	30" Ø STORM SEWER WALKERS LINE	3	SEPT. 19/60	-	FLOW INSUFFICIENT FOR SAMPLING											
			OCT. 18/60	-	2,700	7.2	572	-	-	2	2	-	-	-	-	
			NOV. 21/61	-	7,000	3.2	670	-	-	2.6	13	-	-	-	-	-

TABLE 2

SAMPLING POINT NO.	LOCATION	PLAN NO.	DATE EXAMINED	COLIFORMS		5-DAY B.O.D.	SOLIDS			TURBIDITY	PHENOLS (PPB)	ETHER SOLUBLES	pH	CHROME	COPPER
				I. N. PER 100 ML	M. F. PER 100 ML		TOTAL	SUSP.	DISS.						
LO-49.6 W	12" Ø STORM SEWER INGLEWOOD DR.	3	SEPT. 19/60	-	2,700,000	12	660	6	654	-	2	-	-	-	-
			OCT. 18/60	-	15,000	6.8	700	-	-	4	4	-	-	-	-
			NOV. 21/61	-	179,000	5.6	678	-	-	3.3	3	-	-	-	-
LO-49.8 D	WATERCOURSE EAST OF SHOREACRES RD.	3	SEPT. 19/60	-	NO FLOW NOTED										
			OCT. 18/60	-	19,000	7.8	624	-	-	1	-	-	-	-	-
			NOV. 22/61	-	34,000	2.6	716	-	-	9.0	6	-	-	-	-
LO-50.0 D	WATERCOURSE EAST OF POPLAR DR.	3	SEPT. 19/60	-	FLOW INSUFFICIENT FOR SAMPLING										
			OCT. 18/60	-	34,000	3.2	746	-	-	3	-	-	-	-	-
			NOV. 22/61	-	13,200	4.5	648	-	-	4.5	0	-	-	-	-
LO-50.7 D	WATERCOURSE 0.25 MILES EAST OF APPLEBY LINE	4	SEPT. 19/60	-	NO FLOW NOTED										
			OCT. 18/60	-	" " "										
			NOV. 22/61	-	1,700	2.3	636	-	-	4.0	0	-	-	-	-
LO-51.5 TW	18" Ø OUTFALL SEWER ELIZABETH GDNS. SEWAGE TREATMENT PLANT	4	SEPT. 19/60	-	14,000,000	235	610	68	542	-	18	-	-	-	-
			OCT. 18/60	-	1,800,000	120	646	52	594	-	-	-	-	-	-
			NOV. 22/61	-	<10	33	788	-	-	27	6	-	-	-	-
LO-51.5 TW	48" Ø SEWAGE TREATMENT PLANT OUTFALL & STORM SEWER-HAMPTON HEATH ROAD	4	SEPT. 19/60	-	FLOWING TO LAKE VIA OUTLET - LO-51.5T										
			OCT. 18/60	-	" " "										
			NOV. 22/61	-	" " "										
LO-52.5 I	30" Ø OUTFALL SEWER - CITIES SERVICE REFINING (CANADA) LIMITED	5	SEPT. 20/60	-	110	2.9	724	34	690	-	4	-	-	-	-
			OCT. 19/60	1,000	-	5.6	414	4	410	-	90	-	-	-	-
			NOV. 30/61	-	64	4.2	1456	-	-	6.0	8	-	-	-	-
LO-53.0 D	WATERCOURSE AT HWY. #2 WEST OF CUDMORE RD.	5	SEPT. 20/60	-	NO FLOW NOTED										
			OCT. 19/60	-	0	1.9	568	-	-	1	-	-	-	-	
			NOV. 22/61	-	980	3.2	578	-	-	38	0	-	-	-	-
LO-53.8 D	BRONTE CREEK AT LAKE SHORE RD.	5	SEPT. 20/60	-	90	3.0	216	-	-	2	0	-	-	-	-
			OCT. 19/60	-	34	3.2	260	-	-	3	-	-	-	-	-
			NOV. 22/61	-	59	2.2	364	-	-	4.5	-	-	-	-	-
LO-54.1 D	WATERCOURSE AT FOOT OF EAST ST.	6	NOV. 30/61	-	FLOW INSUFFICIENT FOR SAMPLING										

ALL ANALYSES EXCEPT PH REPORTED IN PPM
UNLESS OTHERWISE INDICATED

TABLE 2

SAMPLING POINT NO.	LOCATION	PLAN NO.	DATE EXAMINED	COLIFORMS		5-DAY B.O.D.	SOLIDS			TURBID- ITY	PHENOLS (PPB)	ETHER SOLUBLES	PH	CHROME	COPPER
				I. N. PER 100 ML	M. F. PER 100 ML		TOTAL	SUSP.	DISS.						
LO-55.2 T	OUTFALL SEWER TRAFALGAR SEWAGE TREATMENT PLANT	6	SEPT.20/60	-	5	10	504	34	470	-	4	-	-	-	-
			OCT. 19/60	100	-	18	540	14	526	-	-	-	-	-	-
			NOV. 30/61	-	500	60	612	78	534	18	12	-	-	-	-
LO-55.8 D	PALERMO CREEK AT LAKE SHORE RD.	7	SEPT.20/60	-	NO FLOW NOTED			-	-	-	-	-	-	-	-
			OCT. 19/60	-	2	2.0	736	-	-	1	-	-	-	-	-
			NOV. 22/61	-	4,800	3.3	496	-	-	2.3	3	-	-	-	-
LO-56.3 D	STREAM "A" AT LAKE ONTARIO	7	SEPT.20/60	-	22,000	8	290	-	-	4	0	-	-	-	-
			OCT. 19/60	-	2,000	3.2	312	-	-	2	-	-	-	-	-
			NOV. 22/61	-	2,200	3.1	538	-	-	2.6	2	-	-	-	-
LO-56.6 D	WATERCOURSE AT BIRCHHILL LANE	7	NOV. 30/61	-	1,800	3.8	724	-	-	20	8	-	-	-	-
LO-57.3 D	WATERCOURSE AT LAKWOOD DRIVE	8	SEPT.20/60	-	47,000	6.2	706	-	-	8	0	-	-	-	-
			OCT. 19/60	-	1,200	4.0	804	-	-	4	-	-	-	-	-
			NOV. 22/61	-	30,000	2.9	894	-	-	5	4	-	-	-	-
LO-57.4 D	WATERCOURSE AT BROCK STREET	8	SEPT.20/60	-	FLOW INSUFFICIENT FOR SAMPLING			-	-	-	-	-	-	-	
			OCT. 19/60	-	"	"	"	"	-	-	-	-	-	-	
			NOV. 22/61	-	173,000	11	826	-	-	7	5	-	-	-	
LO-57.5 W	36" Ø STORM SEWER KERR STREET	8	SEPT. 20/60	-	500	2.5	324	-	-	31	0	-	-	-	-
			OCT. 19 /60	-	0	6.8	222	-	-	1	-	-	-	-	-
			NOV. 22 /61	-	18	0.7	198	-	-	2.6	2	-	-	-	-
LO-57.8 D	OAKVILLE CREEK AT LAKE ONTARIO	8	SEPT.20/60	-	39,000	3.9	234	-	-	3	3	-	-	-	-
			OCT. 19/60	-	27	3.2	256	-	-	1	-	-	-	-	-
			NOV. 22/61	-	252	3.8	276	-	-	5.0	0	-	-	-	-
LO-58.0 W	15" Ø STORM SEWER GEORGE STREET	8	SEPT.20/60	-	3,500,000	17	248	18	230	-	100	-	-	-	-
			OCT. 19/60	-	500	125	484	78	406	-	150	-	-	-	-
			NOV. 22/61	-	13,300	6.2	262	-	-	2.1	6	-	-	-	-
LO-58.1 W	12" Ø STORM SEWER DUNDAS STREET (WEST OUTLET)	8	SEPT.20/60	-	NO FLOW NOTED			-	-	-	-	-	-		
			OCT. 18/60	-	"	"	"	-	-	-	-	-	-		
			NOV. 22/61	-	"	"	"	-	-	-	-	-	-		

ALL ANALYSES EXCEPT pH REPORTED IN PPM
UNLESS OTHERWISE INDICATED

TABLE 2

SAMPLING POINT NO.	LOCATION	PLAN NO.	DATE EXAMINED	COLIFORMS			SOLIDS			TURBID- ITY	PHENOLS (PPB)	ETHER SOLUBLES	pH	CHROME	COPPER
				I. N. PER 100 ML	M. F. PER 100 ML	5-DAY B.O.D.	TOTAL	SUSP.	DISS.						
LO-58.1 W-1	12" Ø STORM SEWER DUNDAS STREET (EAST OUTLET)	8	SEPT. 20/60 OCT. 19/60 NOV. 22/61	- - -	NO FLOW NOTED " " " " " "	- - -	-	-	-	-	-	-	-	-	
LO-58.2 W	12" Ø STORM SEWER REYNOLDS STREET	8	SEPT. 20/60 OCT. 19/60 NOV. 22/61	- - -	36,000,000 8,700 210,000	38 760 106	300 388 536	30 28 -	270 360 -	- - 42	10 500 12	- - -	- - -	- - -	
LO-58.3 W	12" Ø STORM SEWER ALLAN STREET	8	SEPT. 20/60 OCT. 19/60 NOV. 22/61	- - -	NO FLOW NOTED " " " " " "	- - -	-	-	-	-	-	-	-	-	
LO-58.4 W	48" Ø STORM SEWER FIRST STREET	8	SEPT. 20/60 OCT. 19/60 NOV. 22/61	- - -	NO FLOW NOTED " " " 15,100	- - 2.9	660	-	-	2.0	0	-	-	-	
LO-58.4 R	8" Ø RELIEF SEWER FIRST ST. SEWAGE PUMPING STATION	8	SEPT. 20/60 OCT. 19/60 NOV. 22/61	- - -	NO FLOW NOTED " " " " " "	- - -	-	-	-	-	-	-	-	-	
LO-58.6 D	WATERCOURSE BETWEEN PARK AVE. & SECOND STREET	8	SEPT. 20/60 OCT. 19/60 NOV. 22/61	- - -	NO FLOW NOTED " " " " " "	- - -	-	-	-	-	-	-	-	-	
LO-58.7 W	12" Ø STORM SEWER ESPLANADE	8	SEPT. 20/60 OCT. 19/60 NOV. 22/61	- - -	NO FLOW NOTED " " " 13,100	- - 2.0	482	-	-	1.4	4	-	-	-	
LO-58.9 D	WATERCOURSE AT ESPLANADE BETWEEN HOWARD AVE. & EIGHTH LINE	8	SEPT. 20/60 OCT. 19/60 NOV. 30/61	- - -	FLOW INSUFFICIENT FOR SAMPLING " " " " " "	- - -	-	-	-	-	-	-	-	-	
LO-58.9 R	RELIEF SEWER EIGHTH LINE SEWAGE PUMPING STATION	8	SEPT. 20/60 OCT. 19/60 NOV. 22/61	- - -	NO FLOW NOTED " " " " " "	- - -	-	-	-	-	-	-	-	-	
LO-59.1 D	STREAM AT ARGYLE DR.	9	SEPT. 20/60 OCT. 19/60 NOV. 30/61	- - -	NOT SAMPLED " " " 6,400	- - 2.6	626	-	-	2.6	6	-	-	-	

ALL ANALYSES EXCEPT PH REPORTED IN PPM
UNLESS OTHERWISE INDICATED

TABLE 2

SAMPLING POINT NO.	LOCATION	PLAN NO.	DATE EXAMINED	COLIFORMS		5-DAY B.O.D.	SOLIDS			TURBIDITY	PHENOLS (PPB)	ETHER SOLUBLES	PH	CHROME	COPPER	
				I. N. PER 100 ML	M. F. PER 100 ML		TOTAL	SUSP.	DISS.							
LO-59.6 D	MORRISON CREEK AT LAKE SHORE RD.	9	SEPT. 20/60	-	540	2.6	230	-	-	2	0	-	-	-	-	
			OCT. 19/60	-	0	2.4	214	-	-	2	-	-	-	-	-	-
			NOV. 30/61	-	800	4.1	400	-	-	3.1	2	-	-	-	-	-
LO-59.7 W	12" Ø STORM SEWER - ENNISCLARE DR. W.	9	SEPT. 20/60	-	NOT SAMPLED											
			OCT. 19/60	-	" "											
			NOV. 30/61	-	21,800	7.2	654	-	-	2.1	3	-	-	-	-	-
LO-59.9 D	WATERCOURSE BETWEEN CAULDER DR. & TRELAWN AVE.	9	SEPT. 20/60	-	740	2.8	624	-	-	4	3	-	-	-	-	
			OCT. 19/60	-	0	2.3	512	-	-	1	-	-	-	-	-	
			NOV. 30/61	-	1,800	5.1	630	-	-	3.3	8	-	-	-	-	
LO-60.0 D	WATERCOURSE WEST OF NINTH LINE AT LAKE SHORE RD.	9	SEPT. 20/60	-	NOT SAMPLED											
			OCT. 19/60	-	" "											
			NOV. 30/61	-	32,000	3.3	600	-	-	7.0	4	-	-	-	-	
LO-60.1 T	60" Ø OUTFALL SEWER - FORD MOTOR CO. OF CANADA LTD. SEWAGE TREATMENT PLANT	9	SEPT. 20/60	-	<5	2.8	274	44	230	-	6	-	-	-	-	
			DEC. 1/60	-	30	1.8	190	12	178	-	2	-	-	-	-	
			NOV. 30/61	-	<10	4.4	226	26	200	-	2	-	-	-	-	∞
LO-61.6 D	JOSHUA'S CREEK AT LAKE SHORE RD.	10	SEPT. 20/60	-	16,000	2.7	418	6	412	-	6	-	-	-	-	
			NOV. 9/60	-	630	4.0	532	-	-	5	13	-	-	-	-	
			NOV. 30/61	-	7,000	4.3	562	-	-	5	6	-	-	-	-	
LO-62.1 I	INDUSTRIAL SEWER-ST. LAWRENCE CEMENT CO.	10	NOV. 30/61	-	130	2.8	310	-	-	5.5	6	-	-	-		
LO-62.2 T	42" Ø OUTFALL SEWER- CLARKSON SEWAGE TREATMENT PLANT	11	SEPT. 20/60	-	51,000	15	630	16	614	-	10	-	-	-	-	
			NOV. 9/60	-	20	5.6	664	-	-	12	2	-	-	-	-	
			DEC. 1/61	-	<10	0.7	594	-	-	20.0	7	-	-	-	-	
LO-62.4 D	LOCAL WATERCOURSE BETWEEN AVONHEAD & SOUTHDOWN RDS.	11	DEC. 1/61	-	900	2.2	816	-	-	2.9	6	-	-	-		
LO-62.8 W	27" Ø STORM SEWER - SOUTHDOWN RD.	11	DEC. 1/61	-	760,000	420	1194	220	974	-	1200	-	-	-		

ALL ANALYSES EXCEPT pH REPORTED IN PPM
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TABLE 2

SAMPLING POINT NO.	LOCATION	PLAN NO.	DATE EXAMINED	COLIFORMS		5-DAY B.O.D.	SOLIDS		TURBIDITY	PHENOLS (PPB)	ETHER SOLUBLES	pH	CHROME	COPPER
				I. N. PER 100 ML	M. F. PER 100 ML		TOTAL	SUSP. DISS.						
LO-63.0 1	48" Ø INDUSTRIAL SEWER - BRITISH AMERICAN OIL CO. LTD.	11	DEC. 1/61	-	-	66	330	-	53.0	30	5.3	-	-	-
LO-63.0 1-1	42" Ø INDUSTRIAL SEWER - BRITISH AMERICAN OIL CO. LTD.	11	SEPT. 20/61 DEC. 6/60 DEC. 1/61	-	NO FLOW NOTED	8.4 1.6	188 198	22 -	166 2.5	8 4	0	-	-	-
LO-63.0 1-2	42" Ø INDUSTRIAL SEWER - BRITISH AMERICAN OIL CO. LTD.	11	SEPT. 20/60 DEC. 6/60 DEC. 1/61	-	-	4.8 8.0 2.1	226 176 200	22 8 -	204 168 -	140 110 3	-	17	-	-
LO-64.4 D	LOCAL WATERCOURSE OPPOSITE FOOT OF BEXHILL RD.	12	SEPT. 20/60 NOV. 9/60 DEC. 1/61	-	900 29 1,600	2.6 2.6 3.1	626 488 658	- - -	3 3 2.6	2 -	-	-	-	-
LO-64.6 D	LOCAL WATERCOURSE SOUTH EDELWEISS DR.	12	SEPT. 20/60 NOV. 9/60 DEC. 1/61	-	280,000 3,100 900	4.0 5.0 3.0	706 670 682	10 -	696 -	0 -	-	-	-	-
LO-64.9 D	LOCAL WATERCOURSE WEST LUGSDIN AVE.	12	SEPT. 20/60 NOV. 9/60 DEC. 1/61	-	7,000 43 86	2.4 2.1 2.9	464 458 480	- -	2 1 1.7	2 -	-	-	-	-
LO-65.3 D	LOCAL WATERCOURSE BETWEEN MOORE AVE. & WHITTIER CRES.	12	DEC. 1/61	-	FLOW INSUFFICIENT FOR SAMPLING									
LO-65.4 D	LOCAL WATERCOURSE BETWEEN ORIENT AVE. & WHITTIER CRES.	12	DEC. 1/61	-	FLOW INSUFFICIENT FOR SAMPLING									
LO-65.5 D	LOCAL WATERCOURSE EAST OF ORIENT AVE.	12	SEPT. 20/60 NOV. 9/60 DEC. 1/61	-	8,000 51 50	4.8 1.9 2.6	452 492 524	- -	3 3 3.5	9 5 3	-	-	-	-
LO-65.9 D	LOCAL WATERCOURSE BETWEEN CROZIER CT. & BEN MACHREE DR.	13	SEPT. 20/60 NOV. 9/60 NOV. 30/61	-	NO FLOW NOTED 1,000 16	4.0 17	538 650	- -	5 11.5	- 8	-	-	-	-

ALL ANALYSES EXCEPT pH REPORTED IN PPM
UNLESS OTHERWISE INDICATED

TABLE 2

SAMPLING POINT NO.	LOCATION	PLAN NO.	DATE EXAMINED	COLIFORMS			SOLIDS			TURBIDITY	PHENOLS (PPB)	ETHER SOLUBLES	pH	CHROME	COPPER	
				I. N. PER 100 ML	M. F. PER 100 ML	5-DAY B.O.D.	TOTAL	SUSP.	DISS.							
LO-66.1 W	18" Ø STORM SEWER OPPOSITE BEN MACHREE DR.	13	SEPT. 20/60	-	NO FLOW NOTED											
			OCT. 9/60	-	" " "											
			NOV. 30/61	-	" " "											
LO-66.4 I	OPEN CUT (STATION NO. 4) - REGENT REFINING (CANADA) LTD.	13	SEPT. 20/60	-	22,000	38	308	24	284	-	25	TRACE	-	-	-	
			DEC. 6/60	-	0	28	220	20	200	-	30	*	-	-	-	
			NOV. 30/61	-	2	2.4	252	-	-	3.1	8	0	-	-	-	
LO-67.0 D	CREDIT RIVER AT LAKE SHORE RD.	13	SEPT. 20/60	-	300	3.0	264	-	-	3	0	-	-	-	-	
			NOV. 9/60	-	15	3.5	272	-	-	1	-	-	-	-	-	
			JAN. 27/61	-	72	5.3	286	-	-	3	-	-	-	-	-	
			SEPT. 14/61	-	<10	2.3	278	-	-	4	-	-	-	-	-	
			NOV. 30/61	-	368	1.6	332	-	-	2.9	2	-	-	-	-	
LO-67.0 R	RELIEF SEWER - STAVEBANK RD. S. SEWAGE PUMPING STATION.	13	NOV. 30/61	-	NOT LOCATED											
LO-67.2 W	18" Ø STORM SEWER - WEST SIDE OF ELIZABETH ST.	13	NOV. 30/61	-	NO FLOW NOTED											
LO-67.4 W	45" Ø STORM SEWER - BETWEEN HELENE & ANN STS.	13	SEPT. 19/60	-	300,000	5.4	264	8	256	-	0	-	-	-	-	
			NOV. 9/60	-	2,500	6.9	216	-	-	3	-	-	-	-	-	
			NOV. 30/61	-	90	6.6	406	-	-	11.5	6	-	-	-	-	
LO-67.5 D	LOCAL WATERCOURSE EAST SIDE HWY. NO. 10	13	SEPT. 19/60	-	256,000	13	312	12	300	-	4	-	-	-	-	
			NOV. 9/60	1,000,000	-	10	674	-	-	5	27	-	-	-	-	
			NOV. 30/61	-	296	9.2	834	-	-	4.5	8	-	-	-	-	
LO-67.6 I	23" Ø INDUSTRIAL WASTE SEWER - ST. LAWRENCE STARCH CO. LTD.	13	SEPT. 20/60	-	4,800,000	1750	3046	264	2782	-	0	-	-	-	-	
			NOV. 9/60	-	680,000	940	2018	210	1808	-	-	-	-	-	-	
			NOV. 30/61	-	100	1040	1732	216	1516	-	0	-	-	-	-	
LO-67.7 W	21" Ø STORM SEWER - OAKWOOD ST.	14	SEPT. 19/60	-	279,000	30	334	6	328	-	9	-	-	-	-	
			NOV. 9/60	-	NOT SAMPLED											
			NOV. 30/61	-	28	2.3	342	-	-	3.3	2	-	-	-	-	
LO-67.9 W	36" Ø STORM SEWER OPPOSITE HIAMATHA PARK BLVD.	14	SEPT. 19/60	-	NO FLOW NOTED											
			NOV. 9/60	-	" " "											
			NOV. 30/61	-	187,000	35	628	-	-	43.0	25	-	-	-	-	

ALL ANALYSES EXCEPT pH REPORTED IN PPM
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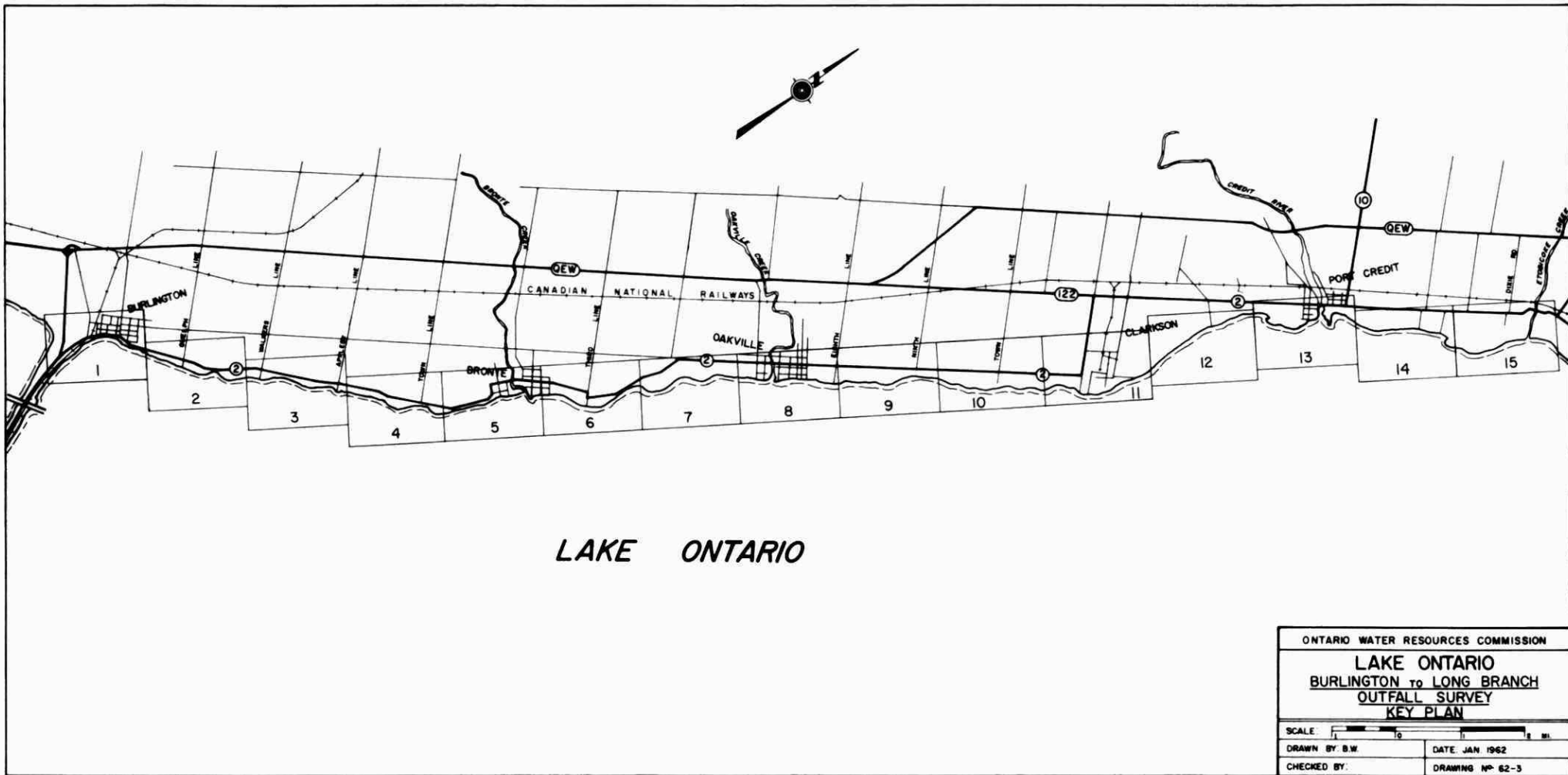
TABLE 2

SAMPLING POINT NO.	LOCATION	PLAN NO.	DATE EXAMINED	COLIFORMS		5-DAY B.O.D.	SOLIDS			TURBID- ITY	PHENOLS (PPB)	ETHER SOLUBLES	pH	CHROME	COPPER	
				I. N. PER 100 ML	M. F. PER 100 ML		TOTAL	SUSP.	DISS.							
LO-68,2 W	30" Ø STORM SEWER - BETWEEN 126 & 130 CUMBERLAND DR.	14	SEPT. 19/60	-	200,000	6.2	216	10	206	-	0	-	-	-	-	
			Nov. 9/60	-	7,800	7.8	190	-	-	6	-	-	-	-	-	
			Nov. 30/61	-	4	2.8	400	-	-	1.8	5	-	-	-	-	
LO-68,2 R	8" Ø RELIEF SEWER - BETWEEN 126 & 130 CUMBERLAND DR.	14	SEPT. 19/60	-	NO FLOW NOTED											
			Nov. 9/60	-	" "	" "	" "									
			Nov. 30/61	-	" "	" "	" "									
LO-68,5 D	LOCAL WATERCOURSE OPPOSITE WEST END RICHEY CR.	14	Nov. 30/61	-	424	5.2	642	-	-	20	6	-	-	-	-	
LO-68,7 D	COOKSVILLE CREEK OPPOSITE EAST END RICHEY CR.	14	SEPT. 19/60	-	200,000	4.0	606	20	586	-	8	-	-	-	-	
			Nov. 9/60	-	9,700	3.6	792	-	-	3	4	-	-	-	-	
			Nov. 30/61	-	256	4.3	856	-	-	3.5	8	-	-	-	-	
LO-69,1 D	LOCAL WATERCOURSE AT MONTBECK CRES.	14	SEPT. 19/60	-	290,000	23	286	10	276	-	2	-	-	-	-	
			Nov. 9/60	-	9,500	5.1	412	-	-	3	-	-	-	-	-	
			Nov. 30/61	-	520	34	714	-	-	24	40	-	-	-	-	
LO-69,2 W	12" Ø STORM SEWER - TORONTO TWP. WATER WORKS	14	Nov. 30/61	-	NO FLOW NOTED											
LO-69,2 P-1	24" Ø SURGE DRAIN - TORONTO TWP. WATER WORKS	14	Nov. 30/61	-	NO FLOW NOTED											
LO-69,2 P-2	21" Ø BACKWASH DRAIN - TORONTO TWP. WATER WORKS	14	Nov. 30/61	-	0	3.2	246	-	-	2.3	2	-	-	-	-	
LO-69,2 P-3	36" Ø BACKWASH DRAIN - TORONTO WATER WORKS	14	Nov. 30/61	-	0	2.4	234	-	-	2.3	3	-	-	-	-	
LO-69,5 D	DRAINAGE DITCH AT COOLING WATER CHANNEL	15	Nov. 29/61	-	NO FLOW NOTED											
LO-69,5 D-1	COOLING WATER CHANNEL-LAKEVIEW GENERATING STATION	15	Nov. 29/61	-	-	2.9	204	-	-	2.6	0	-	-	-	-	

ALL ANALYSES EXCEPT PH REPORTED IN PPM
UNLESS OTHERWISE INDICATED

TABLE 2

SAMPLING POINT NO.	LOCATION	PLAN NO.	DATE EXAMINED	COLIFORMS		5-DAY B.O.D.	SOLIDS			TURBID- ITY	PHENOLS (PPB)	ETHER SOLUBLES	PH	CHROME	COPPER
				I. N. PER 100 ML	M. F. PER 100 ML		TOTAL	SUSP.	DISS.						
LO-70.2 T	OUTFALL SEWER LAKEVIEW WATER POLLUTION CONTROL PLANT	15	Nov. 29/61	-	46	6.8	656	-	-	24	0	-	-	-	-
LO-70.3 D	LOCAL WATERCOURSE EAST OF LAKEVIEW WATER POLLUTION CONTROL PLANT	15	SEPT. 19/60 Nov. 9/60 Nov. 29/61	- - -	1,300,000 7,300,000 24,000	230 180 23	1028 590 816	348 80 -	680 510 -	- - 10.5	15 3 6	- - -	- - -	- - -	- - -
LO-70.5 D	LOCAL WATERCOURSE BETWEEN FERGUS AVE. & DIXIE RD.	15	SEPT. 19/60 Nov. 9/60 Nov. 29/61	- - -	NOT SAMPLED " 1,000	5.1	780	-	-	2.8	4	-	-	-	-
LO-70.7 D	ETOBICOKE CREEK AT LAKE SHORE RD	15	SEPT. 15/60 OCT. 20/60 FEB. 15/61 SEPT. 14/61 Nov. 29/61	- - - - -	5,600 14,000 680 <10 1,040,000	7.2 4.4 17 3.2 4.8	476 770 1362 708 666	46 -	430 -	- 3 11 2 3.8	2 - - 15 4	- - - - -	- - - - -	- - - - -	- - - - -



LAKE ONTARIO

ONTARIO WATER RESOURCES COMMISSION	
LAKE ONTARIO BURLINGTON TO LONG BRANCH OUTFALL SURVEY KEY PLAN	
SCALE:	
DRAWN BY: B.W.	DATE: JAN 1962
CHECKED BY:	DRAWING NO: 62-3

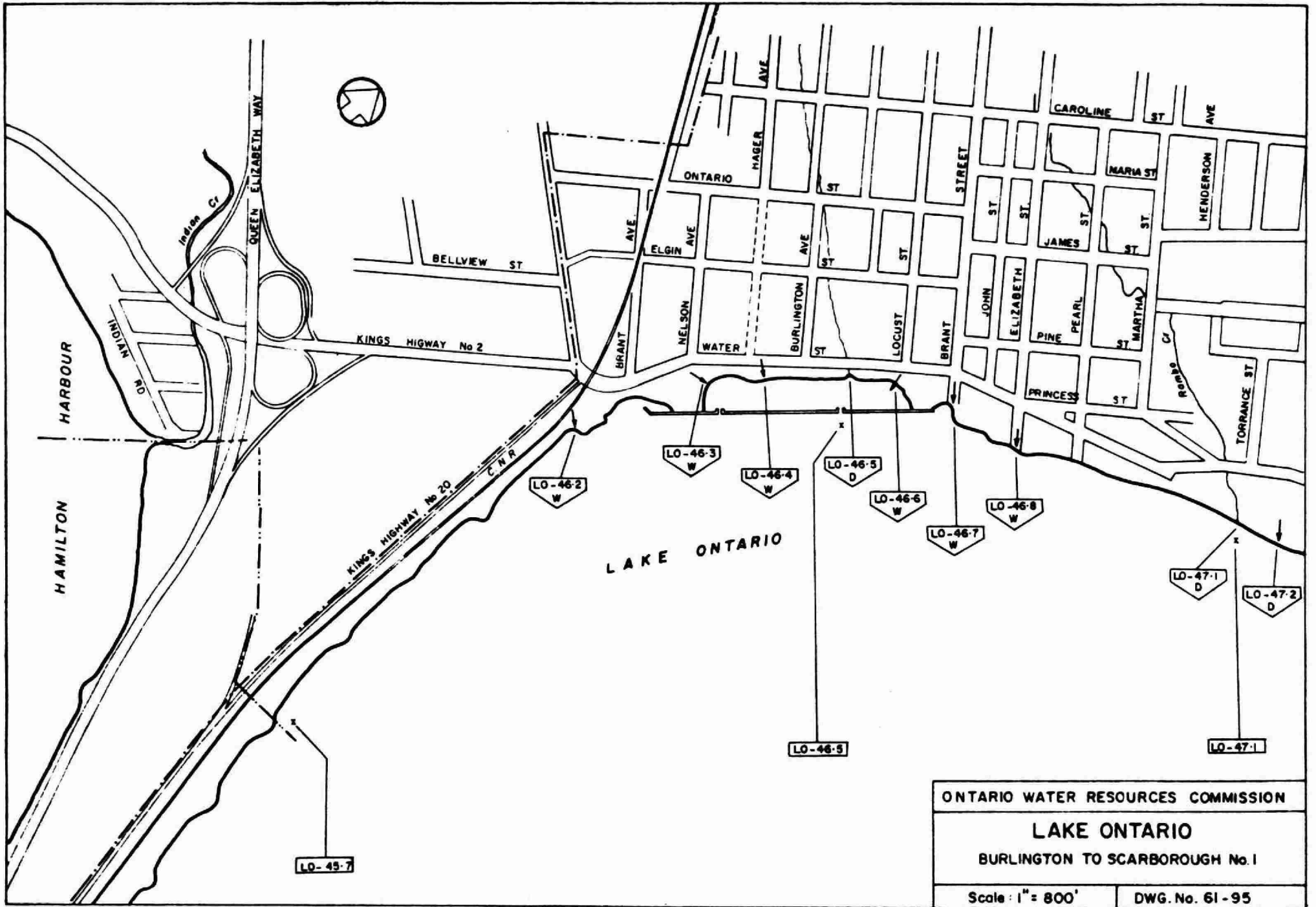
LAKE ONTARIO OUTFALL SURVEYNomenclature For Outfalls

Outfalls were designated by the shore line mileage measured clockwise from the International Boundary in the Niagara River along the shore and outside any bays or harbours. A letter signifying the type of outfall follows the Lake Ontario (LO) shore line mileage.

Example - 

Outfall Symbol Letters

- W - Storm sewer.
- T - Sewage treatment plant outfall sewer.
- I - Industrial waste sewer.
- R - Relief sewer from a pumping station or from a sanitary or combined sewer.
- D - Drainage ditch, creek or river.



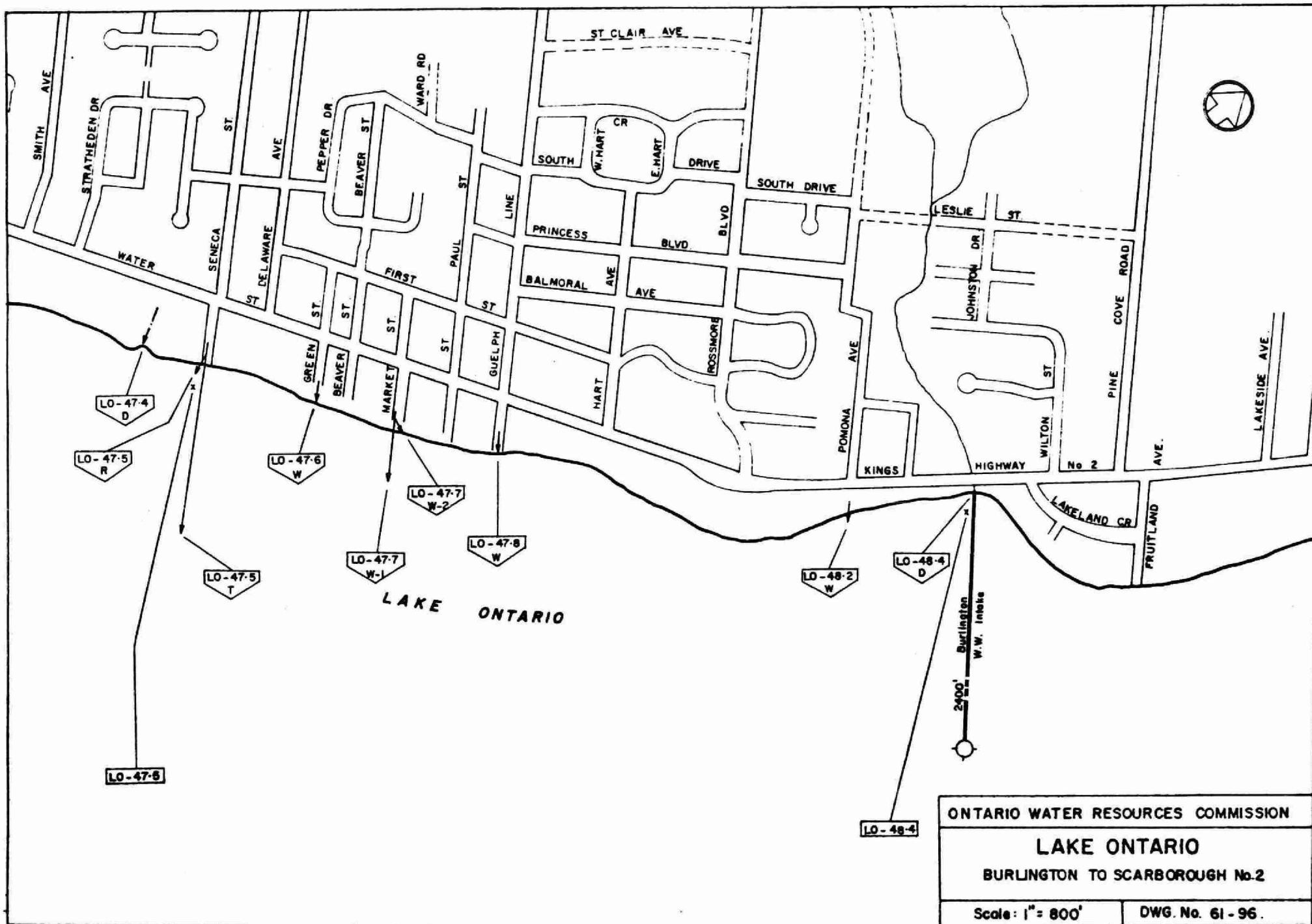
ONTARIO WATER RESOURCES COMMISSION

LAKE ONTARIO

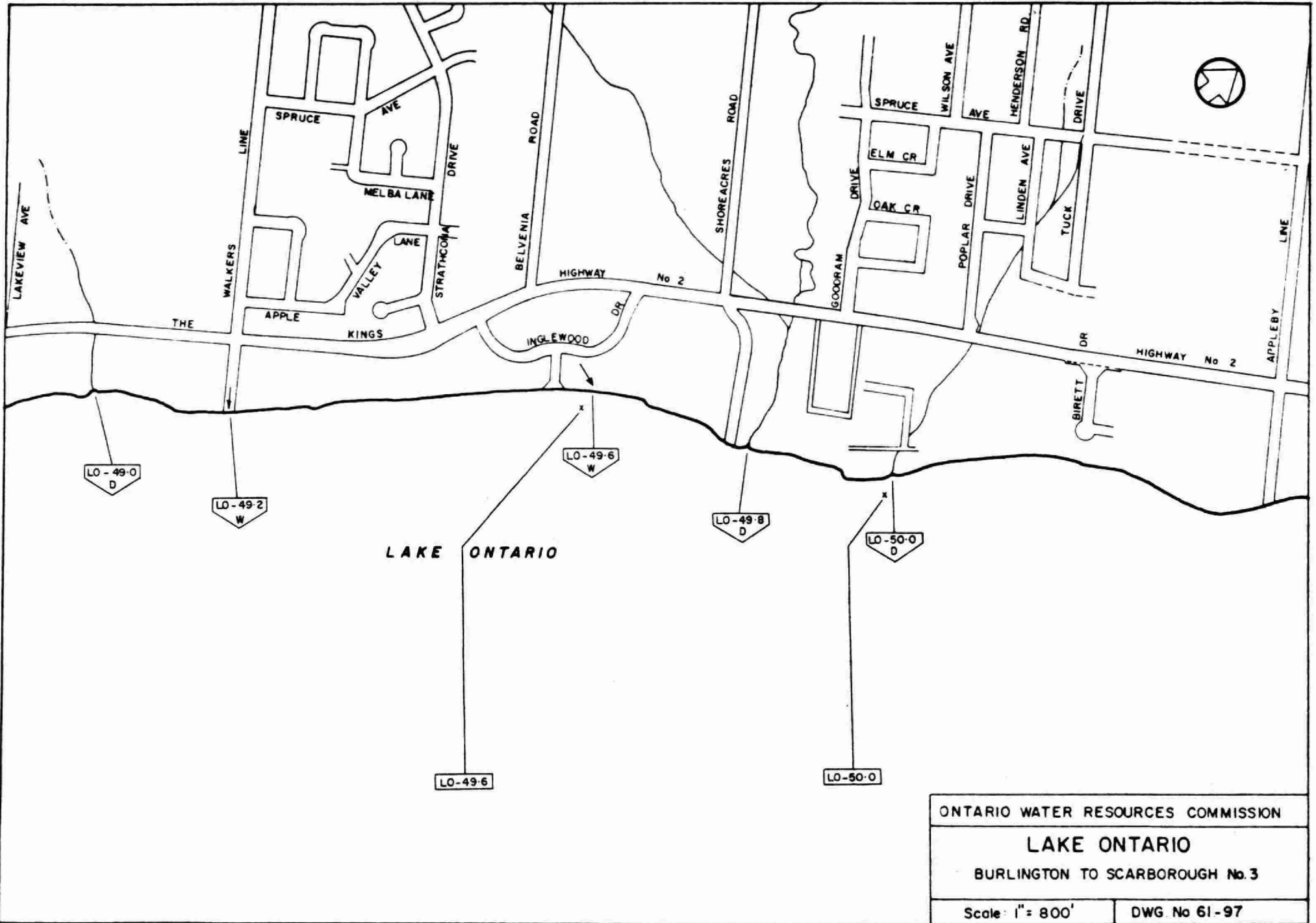
BURLINGTON TO SCARBOROUGH No. 1

Scale: 1" = 800'

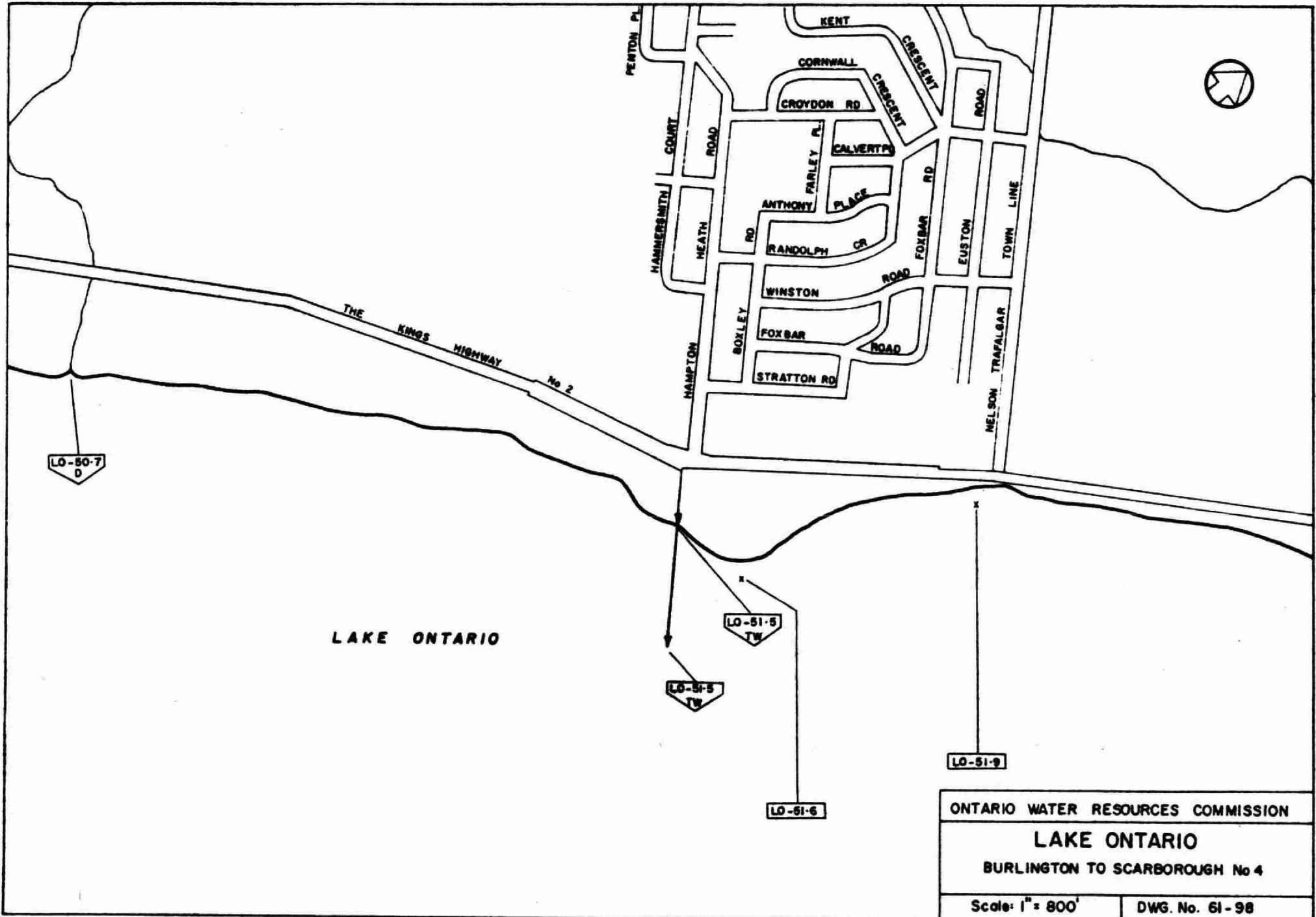
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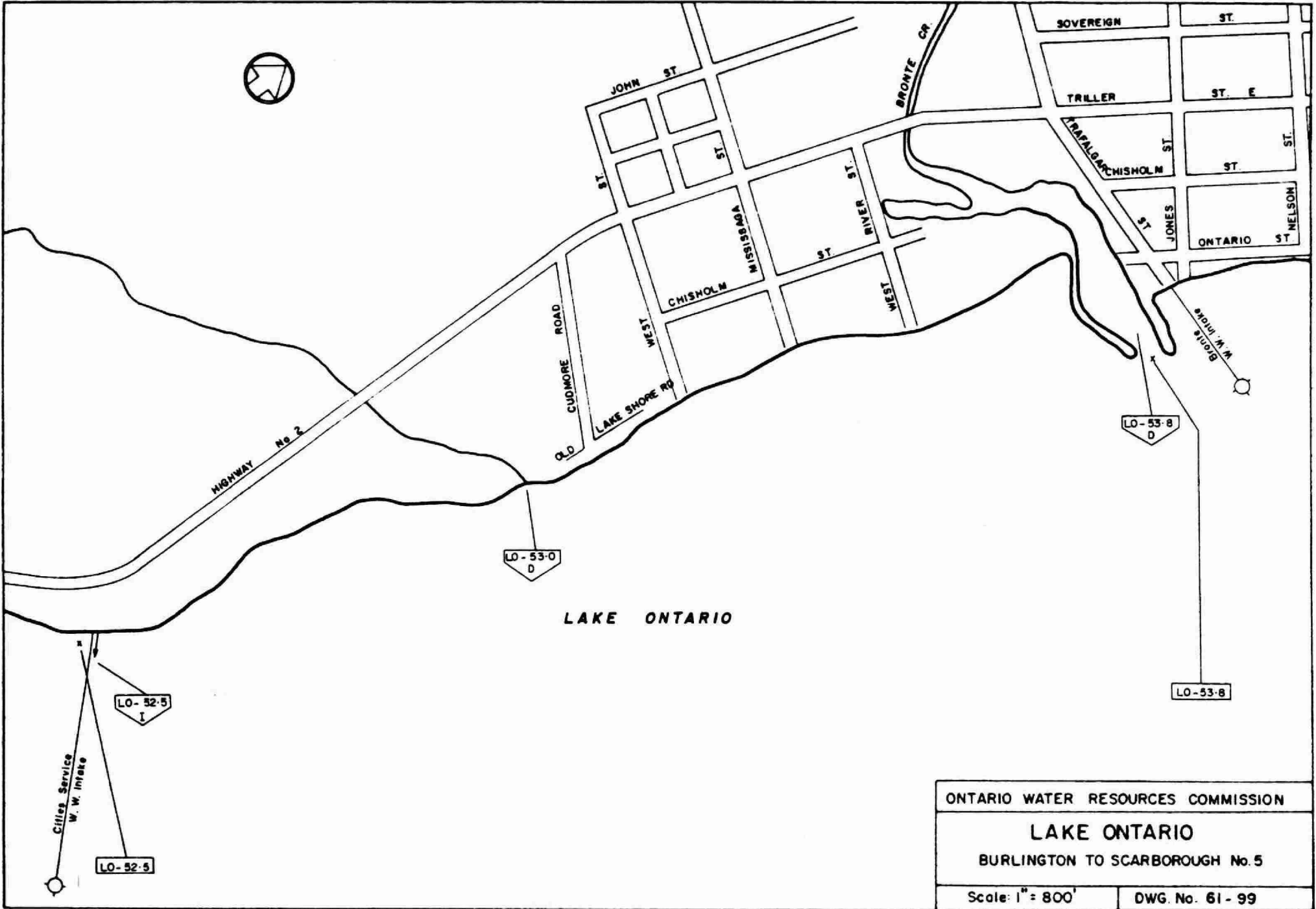
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LAKE ONTARIO	
BURLINGTON TO SCARBOROUGH No.2	
Scale: 1" = 800'	DWG. No. 61-96.



ONTARIO WATER RESOURCES COMMISSION	
LAKE ONTARIO	
BURLINGTON TO SCARBOROUGH No. 3	
Scale: 1" = 800'	DWG No 61-97



ONTARIO WATER RESOURCES COMMISSION	
LAKE ONTARIO	
BURLINGTON TO SCARBOROUGH No 4	
Scale: 1" = 800'	DWG. No. 61-98



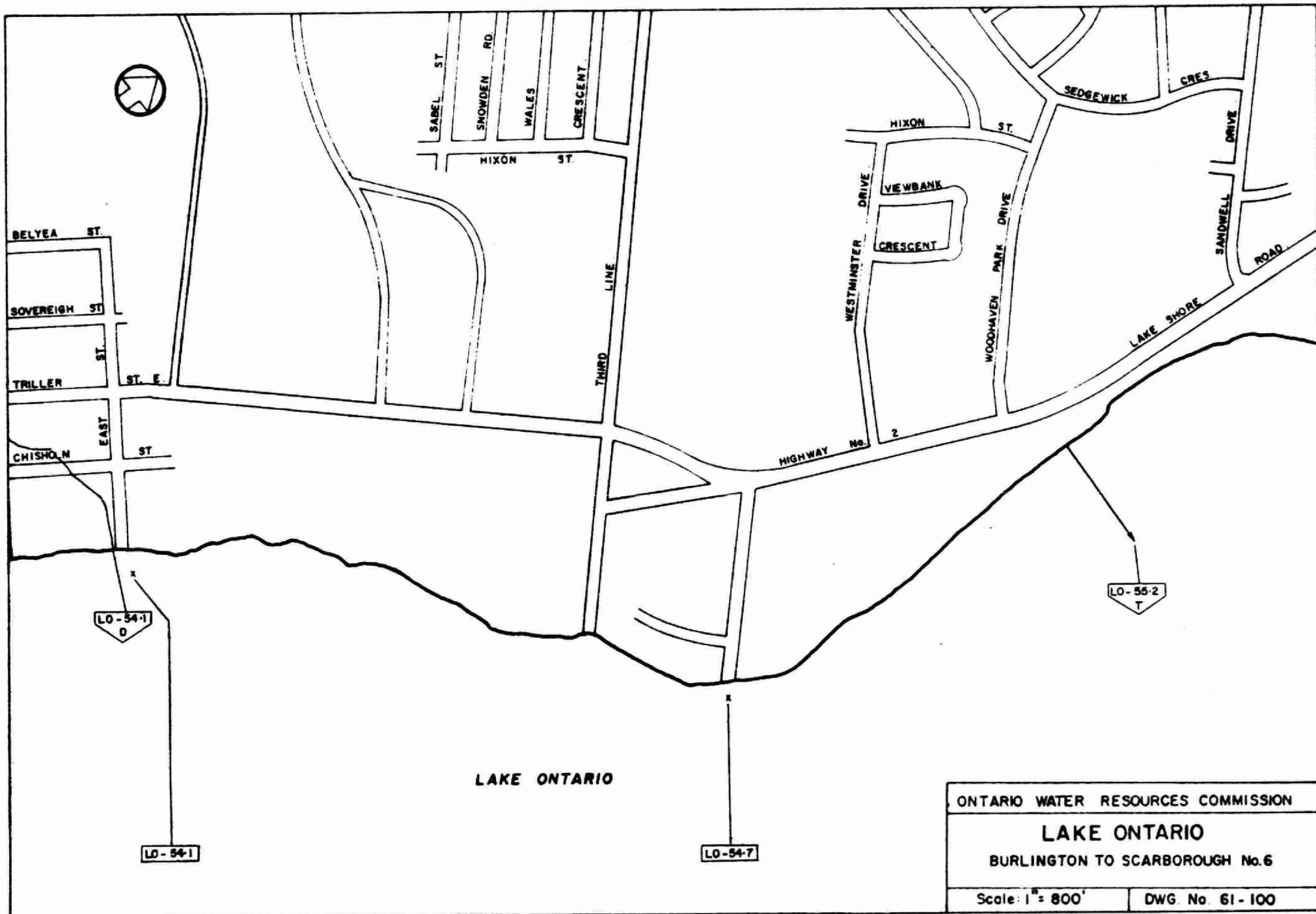
ONTARIO WATER RESOURCES COMMISSION

LAKE ONTARIO

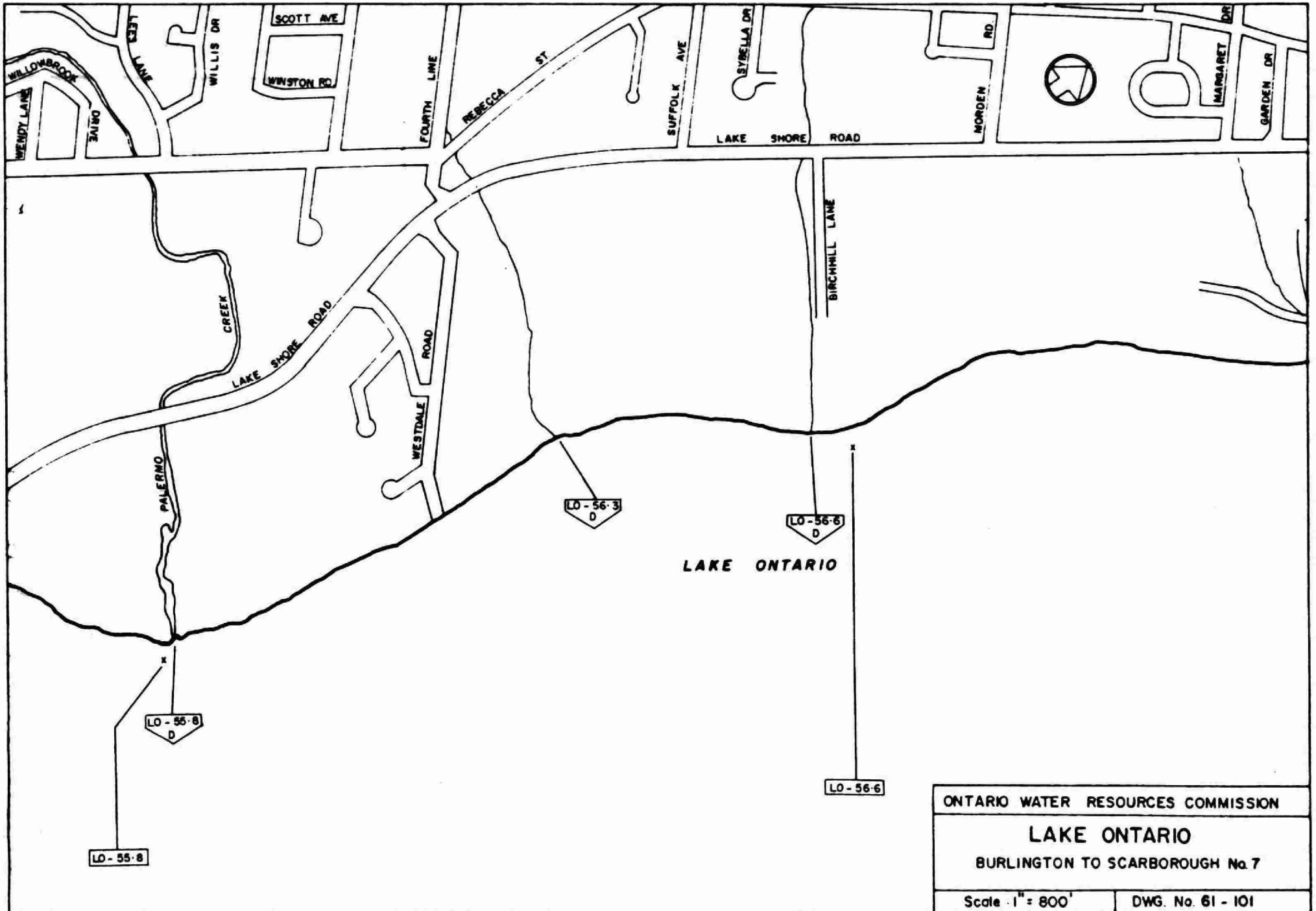
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Scale: 1" = 800'

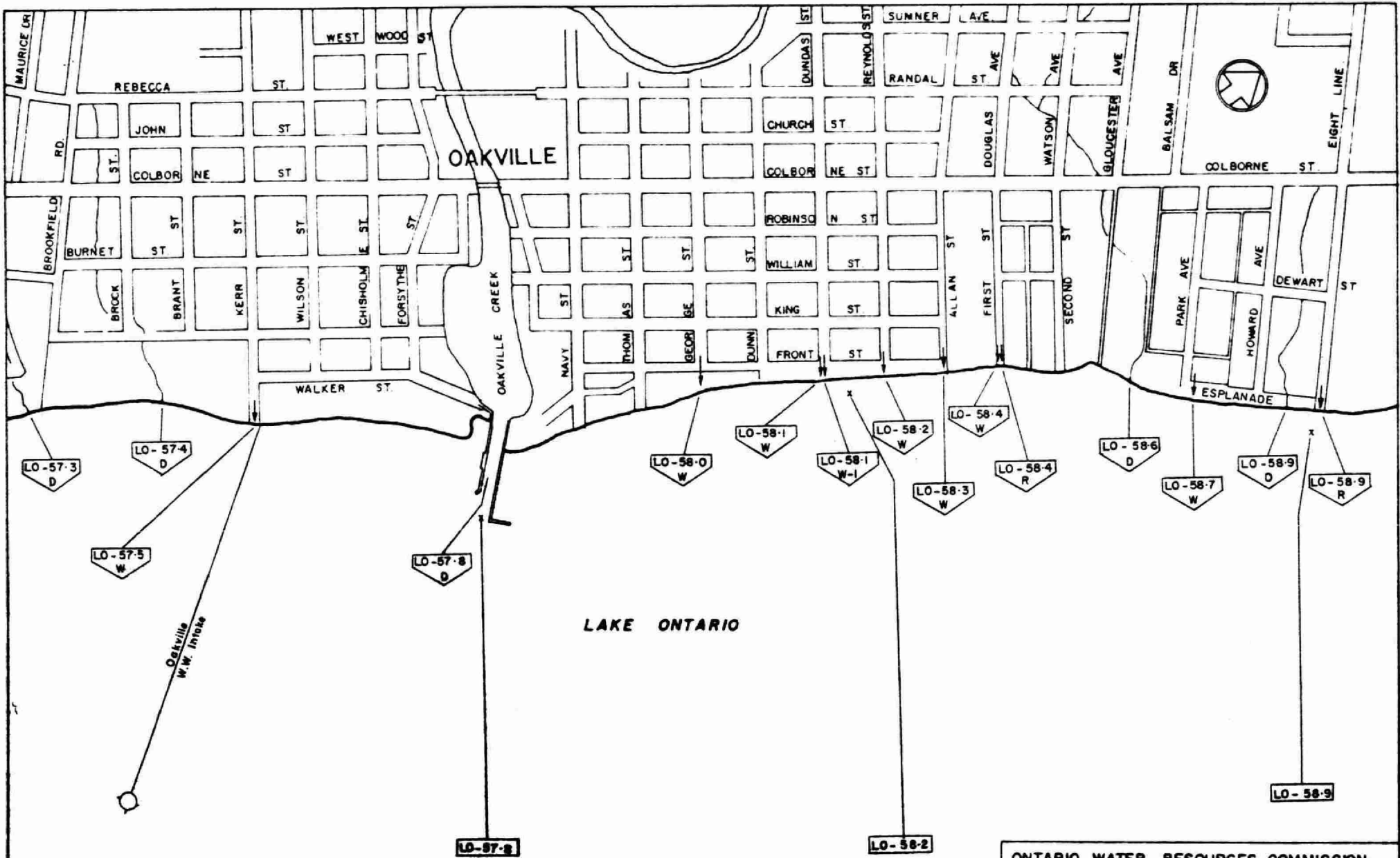
DWG. No. 61 - 99



ONTARIO WATER RESOURCES COMMISSION	
LAKE ONTARIO	
BURLINGTON TO SCARBOROUGH No. 6	
Scale: 1" = 800'	DWG. No. 61-100



ONTARIO WATER RESOURCES COMMISSION	
LAKE ONTARIO	
BURLINGTON TO SCARBOROUGH No. 7	
Scale: 1" = 800'	DWG. No. 61 - 101



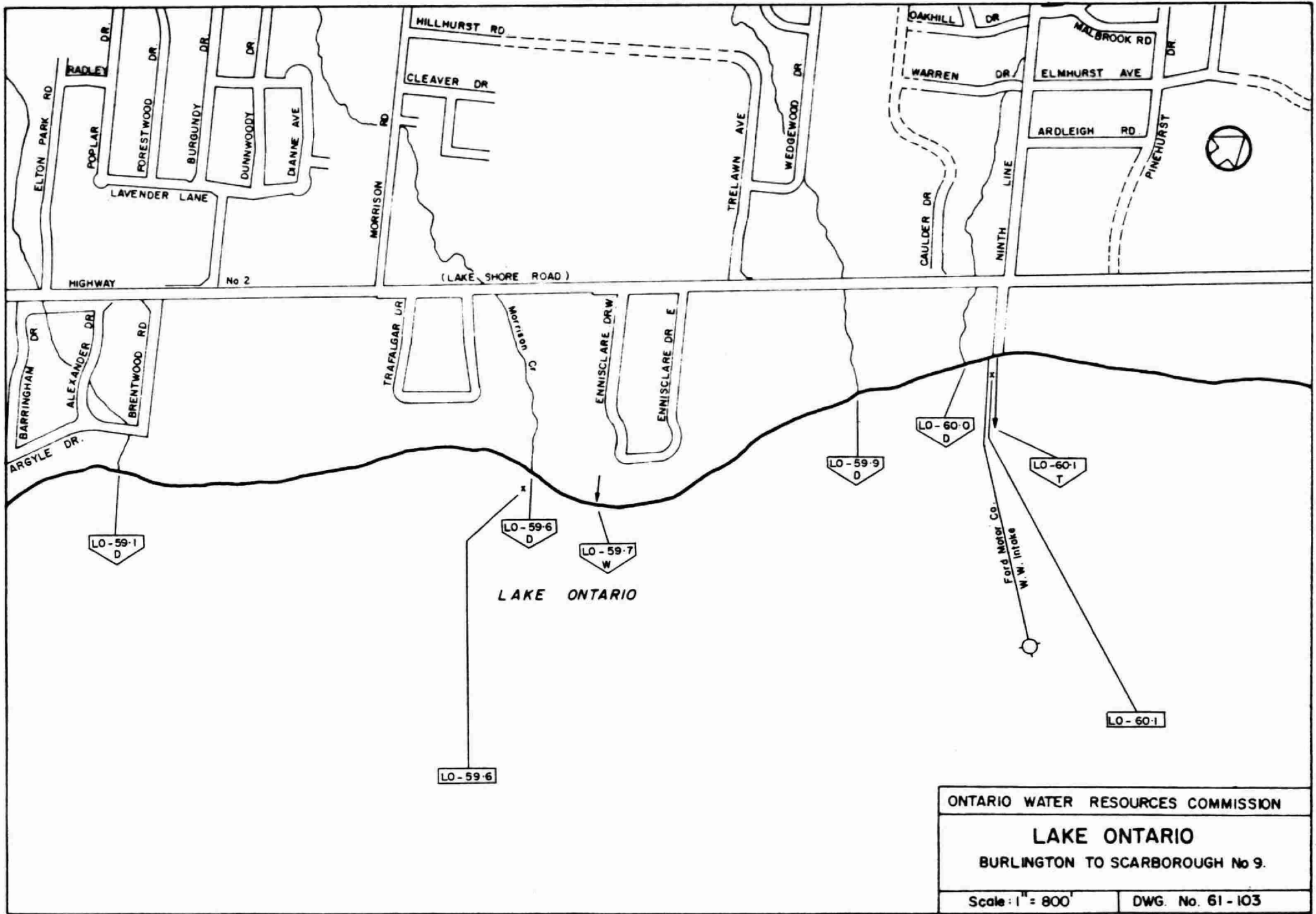
ONTARIO WATER RESOURCES COMMISSION

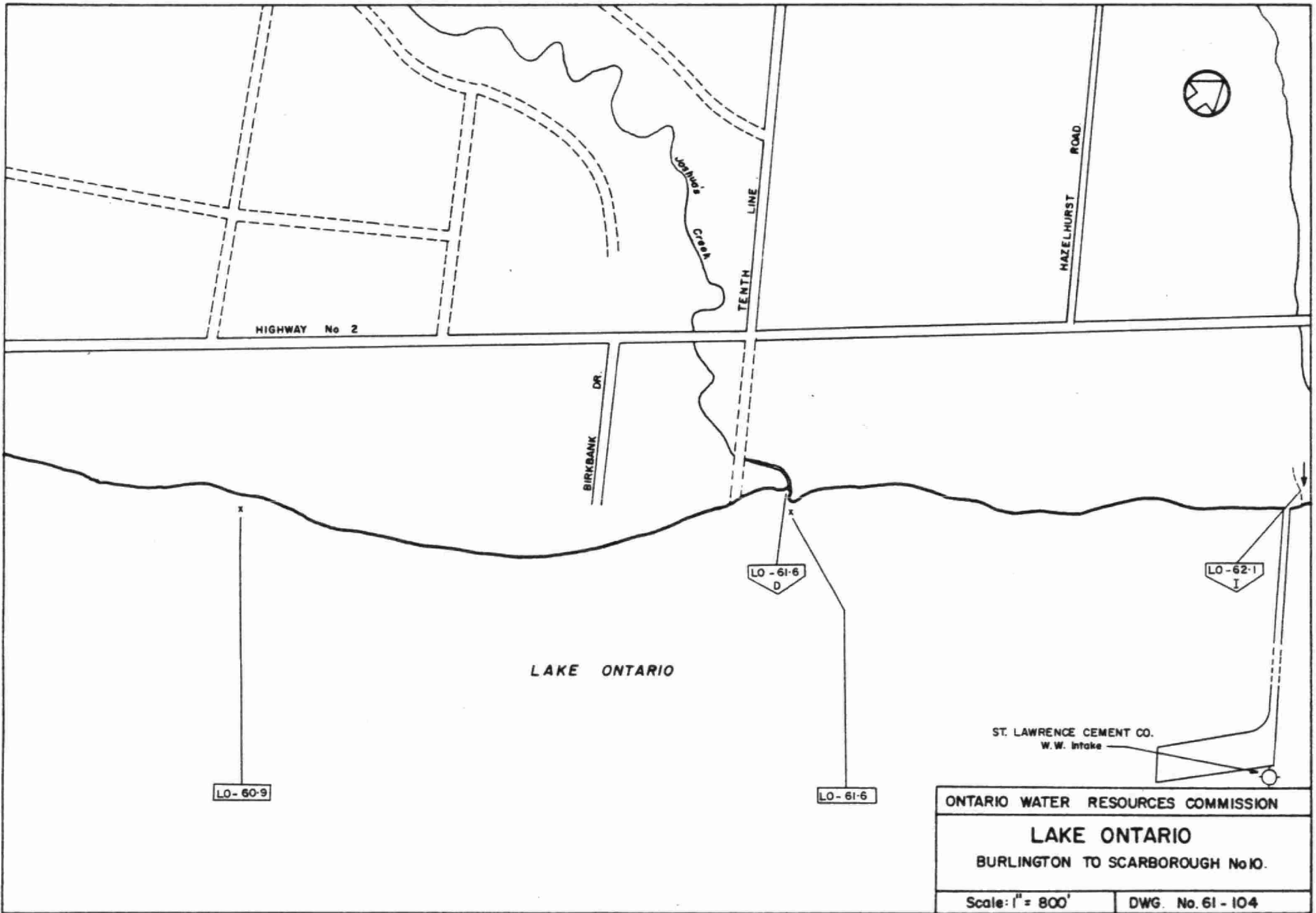
LAKE ONTARIO

BURLINGTON TO SCARBOROUGH No.8

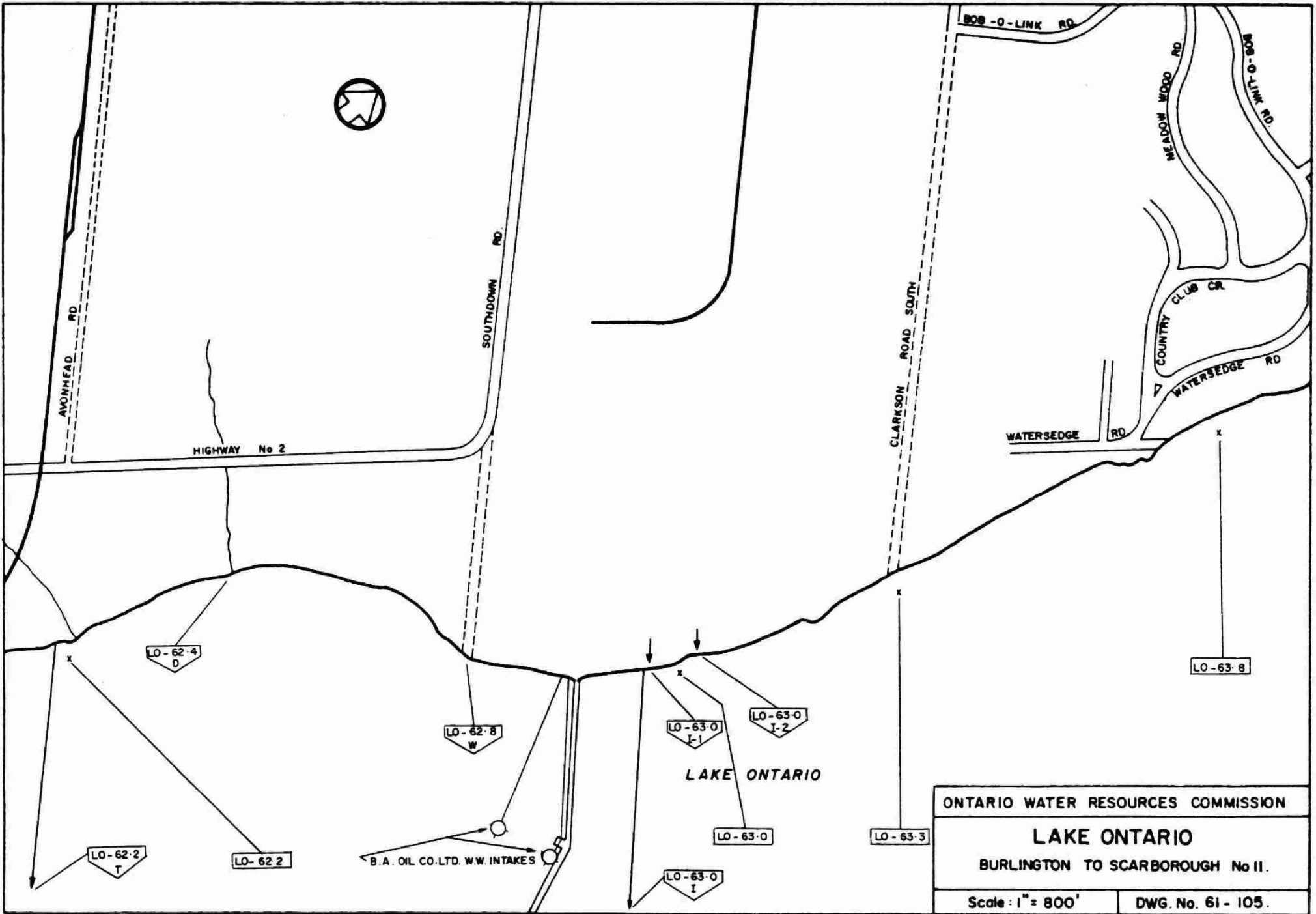
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DWG. No. 61 - 102





ONTARIO WATER RESOURCES COMMISSION	
LAKE ONTARIO	
BURLINGTON TO SCARBOROUGH No 10.	
Scale: 1" = 800'	DWG. No. 61-104



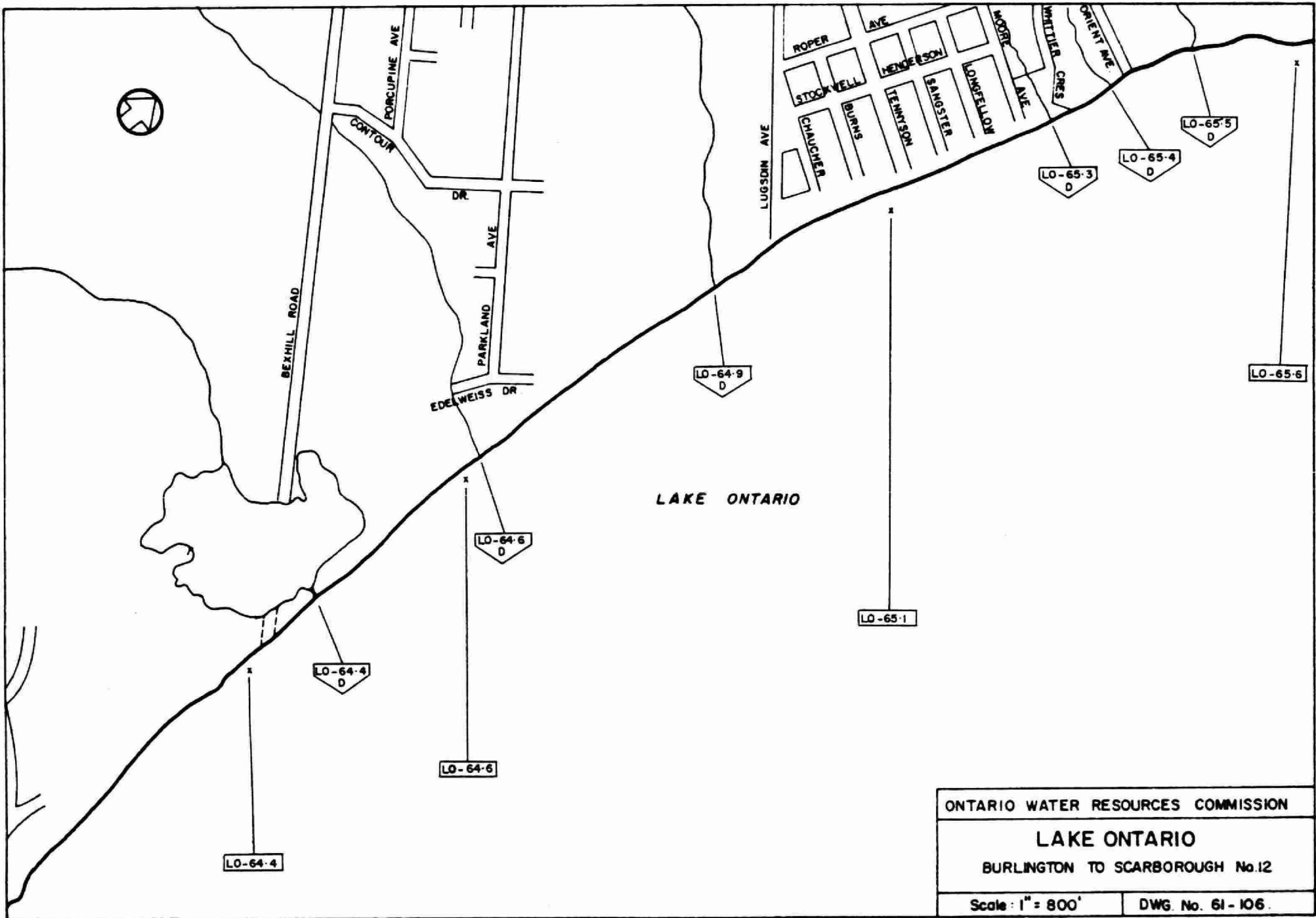
ONTARIO WATER RESOURCES COMMISSION

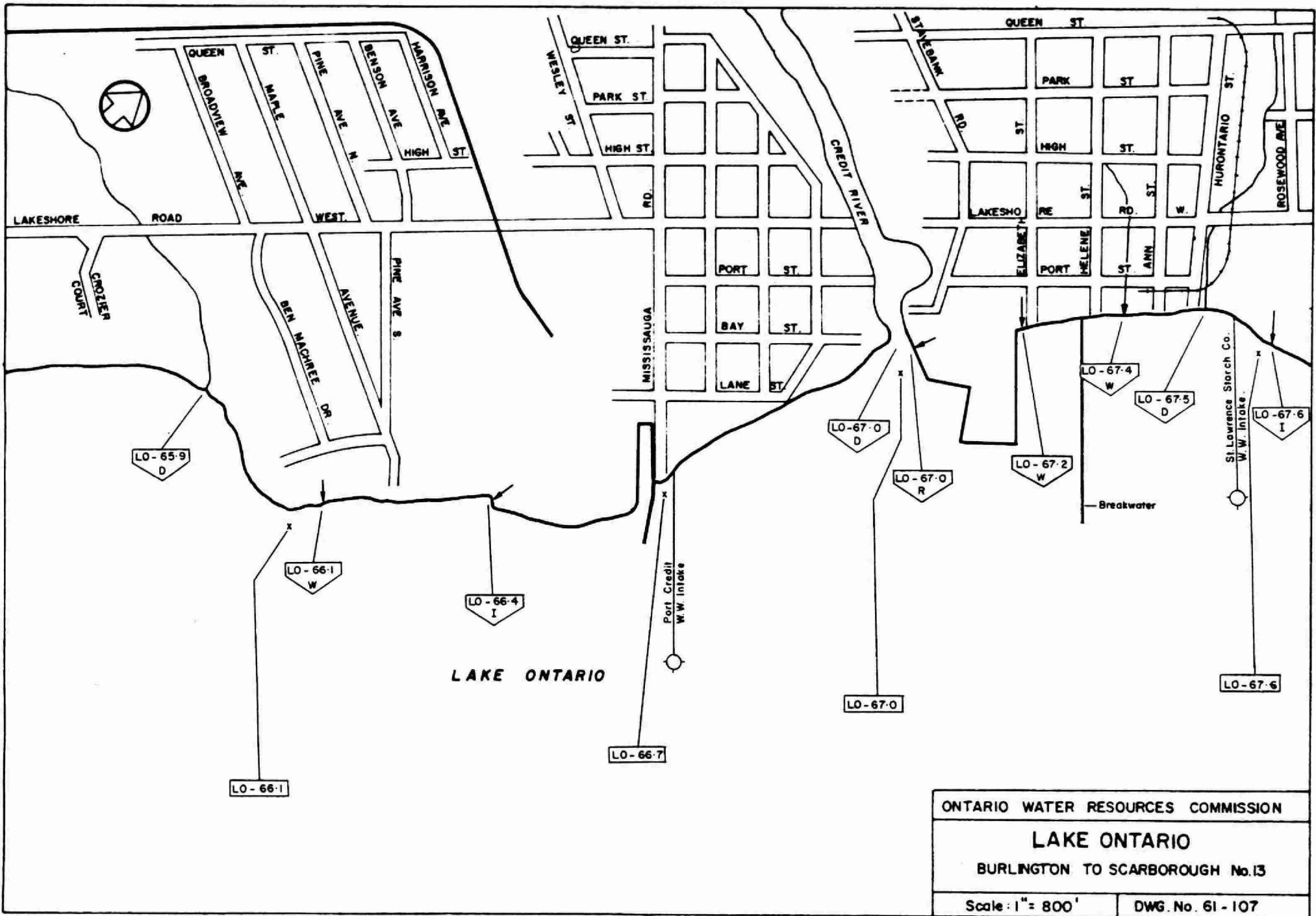
LAKE ONTARIO

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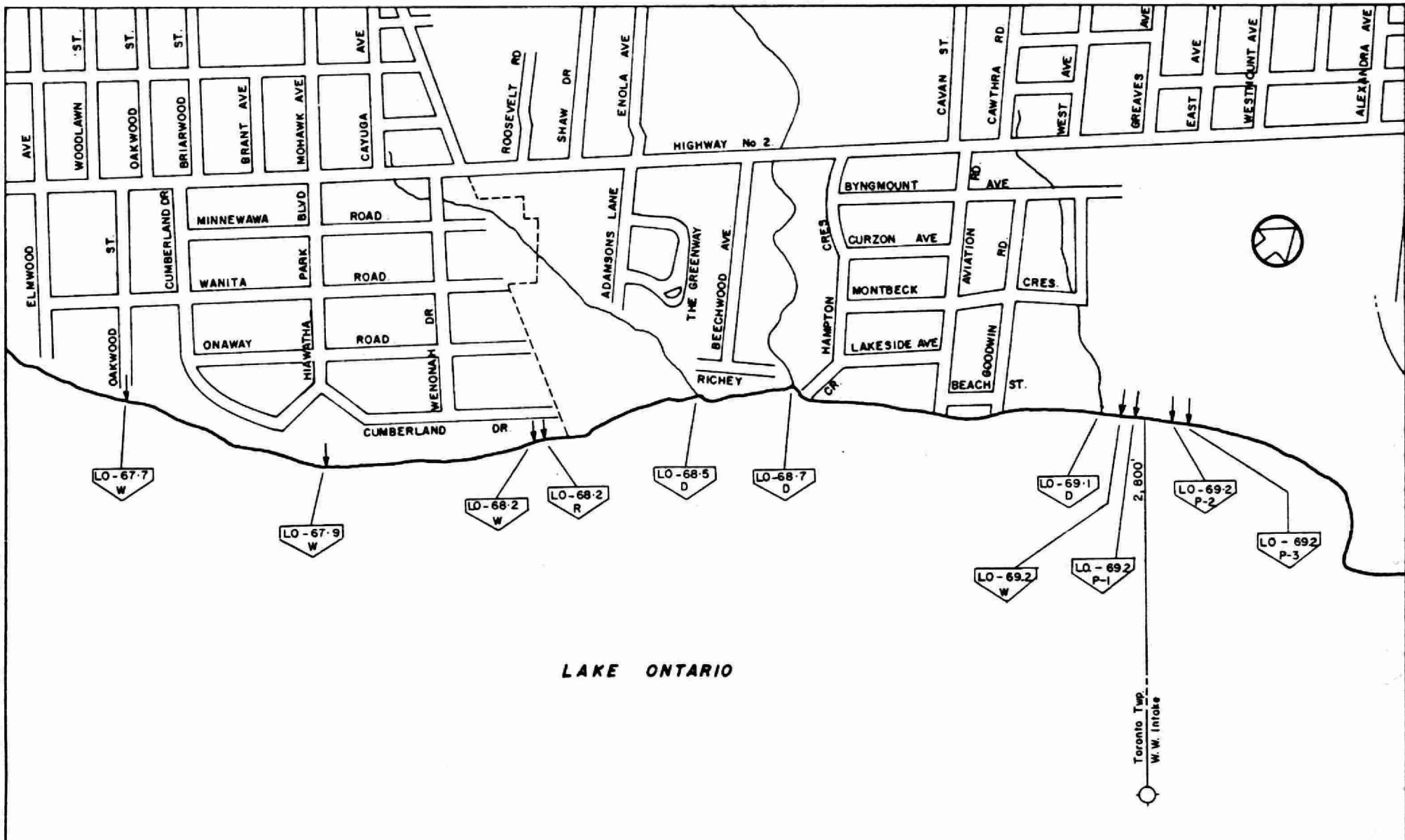
Scale: 1" = 800'

DWG. No. 61-105.



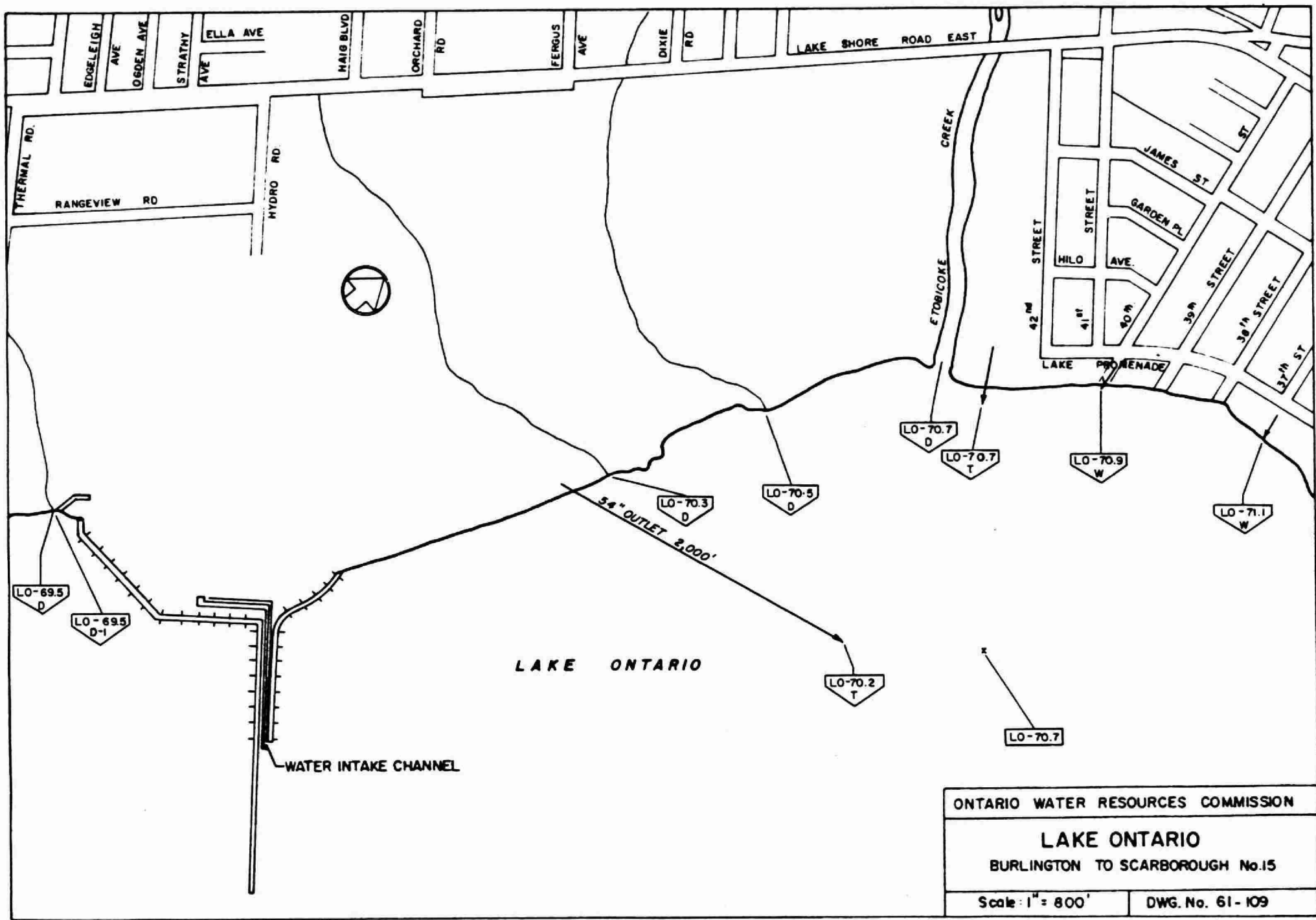


ONTARIO WATER RESOURCES COMMISSION	
LAKE ONTARIO	
BURLINGTON TO SCARBOROUGH No.13	
Scale: 1" = 800'	DWG. No. 61-107



LAKE ONTARIO

ONTARIO WATER RESOURCES COMMISSION	
LAKE ONTARIO	
BURLINGTON TO SCARBOROUGH No.4	
Scale: 1" = 800'	DWG. No. 61-108



LAKE ONTARIO

ONTARIO WATER RESOURCES COMMISSION	
LAKE ONTARIO	
BURLINGTON TO SCARBOROUGH No.15	
Scale: 1" = 800'	DWG. No. 61-109

A
REPORT

by

THE ONTARIO WATER RESOURCES COMMISSION

on a

WATER QUALITY and OUTFALL SURVEY

of LAKE ONTARIO

BURLINGTON TO SCARBOROUGH TOWNSHIP INCLUSIVE

SECTION II

Lakefront Survey - 1961

PART I

METROPOLITAN TORONTO AREA

In 1961, a sampling survey was made of the waters of Lake Ontario in the Metropolitan Toronto area and Toronto Harbour to determine what effects the discharges from the Metropolitan Toronto area were having on these waters with regard to pollution. This was in conjunction with the surveys being carried out by the staff of Metropolitan Toronto Works Department.

SAMPLING LOCATIONS

The survey area covered extends from the Long Branch Sewage Treatment Plant at mileage 10-70.7, to Maclean Ave. west of Balmy Beach at 10-88.3. The sampling locations are listed below. In the list, 10-70.7 refers to a sample from Lake Ontario 70.7 miles from the Niagara River. The designation LOT refers to a sample taken from Toronto Harbour.

<u>Location Number</u>	<u>Description</u>
L0-70.7	off outfall from Long Branch STP - 500 yards from shore - 300 yards east of end of pier
L0-72.2	mouth of Hospital Creek - New Toronto
L0-72.9	500 ft. west of New Toronto Water Works 100' from shore
L0-73.0	500 ft. east of New Toronto " " 100' from shore
L0-73.5	end of Royal York Rd. - 500 ft. from shore
L0-74.0	west of Mimico Beach - 200 ft. " "
L0-74.3	Mimico Beach - off foot of Superior Ave.
L0-75.0	mouth of Mimico Creek - 500 ft. off shore
L0-75.9	" " Humber River - " " " "
L0-76.7	outside breakwater at Sunnyside bathing pavilion
L0-77.3	outside breakwater at west side of Boulevard Club by wire fence
L0-79.4	outside breakwater at CNE Princess Gate - foot of Strachan Ave.
L0-79.9	middle of western end of western channel
LOT-4	at foot of north wall of Spadina Ave. slip
LOT-5	northwest corner of Pier #5 slip - east of Toronto Harbour Police Station
LOT-6	at storm sewer outlet at foot of Yonge St. by Pier #10
LOT-7	at storm sewer outlet at foot of Sherbourne St. by Pier #15
LOT-8A	in slip at foot of Parliament St. by Pier #18 - west of Victory Mills
LOT-8B	at outfalls of Victory Mills at Pier #18
LOT-14	at Cherry St. bridge outfall

<u>Location Number</u>	cont'd	<u>Description</u>
LOT - 17, 18		northwest corner of Turning Basin
L0-86.6		at marker at first bubbling spot off shore from Main STP
L0-86.8		midstream, half way up Coatsworth cut
L0-87.4		at storm sewer outlet at foot of Woodbine Ave. by park land
L0-87.9		at storm sewer outlet at foot of Lee Ave. inside breakwater
L0-88.3		at west storm sewer outlet at foot of Maclean Ave.
L0-88.3		at east " " " " " "
		Maclean Ave.

These locations were approximately the same as those used by the Metropolitan Toronto sampling crew and are shown on the accompanying maps.

PROCEDURE

The samples were taken at the locations listed, using the Ontario Water Resources Commission boat. In most cases the samples were taken as close to the outfall of the sewer as was possible unless otherwise stated. All samples were taken approximately one foot below the surface of the water.

The samples were returned to the OWRC laboratory the same day to be analyzed.

A total of three runs was made in this area September 18, October 17 and November 22, 1961.

PROCEDURE cont'd

Difficulty was experienced before the September sampling date in arranging for the OWRC boat operation in Toronto Harbour. This boat and operator were also used in making the sampling runs mentioned in Part II of this section.

The number of locations sampled on each run was not always complete but depended upon the weather conditions existing at the time. Some sampling points in the Toronto Harbour area were definitely hazardous to sample when adverse weather conditions were prevailing.

ANALYSES

Depending on the location of the sampling point, certain analyses were chosen for each sample to give the most information. The analyses usually consisted of total coliform count, 5-day biochemical oxygen demand (5-day BOD), total solids, chlorides, phenol, and turbidity.

The coliform counts and phenol analyses were performed as stated in the Lake Ontario Lakefront Survey, Part II. The other analyses were determined as stated in the Standard Methods with minor modifications.

The analytical results are tabulated on sheets included with this report.

DISCUSSIONBACTERIAL RESULTS

In the three sampling runs made 44 samples were

DISCUSSION cont'd

collected for bacterial analysis. Of these samples the maximum coliform count of 130,000 per 100 ml was found at location LOT-6 (at storm sewer outlet at foot of Yonge St. by Pier 10). However, of all the locations sampled, location LOT-7 had the highest average and median counts of 57,400 and 68,000 per 100 ml, respectively.

The results show that the Toronto Harbour and the Main sewage treatment plant areas had consistently high coliform counts. One appreciable count, 42,000 per 100 ml, was found in the sample taken off the mouth of the Hospital Creek in New Toronto.

Samples taken in other than these three areas had varying counts ranging from 4,600 to 20 per 100 ml.

BIOCHEMICAL OXYGEN DEMAND

Twenty-eight samples were analyzed for their biochemical oxygen demand. Of these samples, six had concentrations much above that of good quality lake water. These six concentrations ranged from 150 to 30 ppm, compared to the objective of the Ontario Water Resources Commission of 4 ppm. The locations with these concentrations were:

LO-72.2	48 ppm
LOT-14	130 "
LOT-17	150 and 82 ppm
LO-86.6	60 " 30 "

The high concentration of 48 ppm BOD off the mouth of the Hospital Creek in New Toronto suggests that some source was

DISCUSSION cont'd

discharging concentrated wastes into the creek. The other high concentrations occur near the Main sewage treatment plant discharge, and near storm sewer discharges in the Toronto Harbour. This latter case indicates that the storm sewers were carrying domestic and/or industrial wastes.

A slight, perceptible rise in BOD concentration occurred along the Metropolitan Toronto lakefront from the foot of Strachan Avenue to Woodbine Avenue.

PHENOL

Fifty samples were analyzed for phenol to determine levels of concentration and sources of this taste-producing substance.

Very high phenol concentrations were found in three samples collected from the area at the northwest corner of the Turning Basin (LOT-17, 18).

Other locations found to have above-normal phenol concentrations were:

LO-72.2	off Hospital Creek - New Toronto	40 ppb
LO-75.0	mouth of Mimico Creek	30 ppb
LOT-5	northwest corner of Pier #5 slip	25 ppb
LO-86.6	Main sewage treatment plant outfall	25, 15 ppb

Eleven of the samples collected and analyzed for phenol were above the maximum of 5 ppb, that is the objective of the Ontario Water Resources Commission.

CONCLUSIONS

Although it is difficult to come to any definite conclusion from the limited number of samples taken certain trends toward pollution in definite areas of the lake have become apparent.

The whole Toronto Harbour area is receiving wastes that cause high coliform counts and a tendency toward BOD and phenol concentrations exceeding the OWRC objectives. The area near LOT-17, 18, in the Turning Basin, shows the highest BOD and phenol concentration and appreciable bacterial counts.

The area off the mouth of Hospital Creek in New Toronto (LO-72.2) was consistent in its high levels of coliforms, phenol and BOD, indicating that possibly waste from domestic and/or commercial sources containing phenols was being discharged either into the creek or into the lake at that spot.

RECOMMENDATIONS

The sources of domestic and industrial wastes discharging directly to Lake Ontario or to storm sewers discharging to the lake or Toronto Harbour should be determined, and every effort should be made toward treatment and/or redirection of the wastes into the sanitary sewers wherever applicable.

LAKE ONTARIO LAKEFRONT SURVEYMETROPOLITAN TORONTO AREA

DATE SAMPLES: September 18, 1961

Sample Point No.	5-Day BOD ppm	Solids		Phenol ppb	Turbidity in Silica Units	Chlorides ppm	M.F. Coliform Count per 100 ml.
		Total ppm	Susp. ppm				
LO-70.7	1.7	198	-	-	3	1	2,300
LO-72.2	48.	460	60	400	40	-	42,000
LO-74.3	1.7	192	-	-	0	1	166
LO-76.7	1.3	194	-	-	0	2	296
LO-77.3	1.3	198	-	-	0	1	194
LO-79.4	2.4	202	-	-	0	2	20
LO-79.9	1.6	192	-	-	0	2	60
LOT-4	3.4	210	-	-	0	2	5,200
LOT-5	3.8	204	-	-	0	2	138
LOT-6	3.2	204	-	-	5	2	4,800
LOT-7	3.0	240	-	-	2	2	14,200
LOT-8A	3.6	270	-	-	5	3	13,900
LOT-17, 18	150.	466	174	292	2000	-	12,300
LO-86.6	60.	312	-	-	25	8	89,000
LO-86.8	2.6	240	-	-	0	6	45,000
LO-87.4	2.2	210	-	-	0	2	3,300
LO-87.9					0	-	310
LO-88.3					0	-	4,600

LAKE ONTARIO LAKEFRONT SURVEYMETROPOLITAN TORONTO AREA

DATE SAMPLED: October 17, 1961

SAMPLE POINT No.	5-Day BOD ppm	Solids		Phenol ppb	Turbidity in Silica Units	Chlorides ppm	M.F.Coliform Count per 100 ml.
		Total ppm	Susp. ppm				
L0-76.7				0			20
L0-77.3				0			176
L0-79.4				0			276
L0-79.9				0			82
LOT-4				0			20
LOT-5				4			234
LOT-6				0			2,040
LOT-7				3			90,000
LOT-8A				6			21,000
LOT-8B	8.0	274	-	-	6	7	5,300
LOT-17, 18				350			16
LOT-14	130	504	196	308	-		14,000
L0-86.6	30	274	46	228	15		50
L0-86.6				15			-
L0-86.8				0			29,000
L0-87.4				0			200
L0-87.9				0			20
L0-88.3				0			70

LAKE ONTARIO LAKEFRONT SURVEYMETROPOLITAN TORONTO AREA

DATE SAMPLED: November 22, 1961

SAMPLE POINT No.	5-Day BOD ppm	Solids		Phenol ppb	Turbidity in Silica Units	Chlorides ppm	M.F.Coliform Count per 100 ml.	
		Total ppm	Susp. ppm					Diss. ppm
LO-74.3	2.3	278	-	-	0	18	26	1,670
LO-79.4	2.4	212	-	-	0	6.5	27	1,980
LO-79.9	2.1	204	-	-	0	5.0	27	970
LOT-4	3.0	210	-	-	0	4.5	27	1,370
LOT-5	5.2	228	-	-	25	4.0	34	69,000
LOT-6	2.9	234	-	-	2	17.0	34	130,000
LOT-7	3.3	232	-	-	4	21.0	30	68,000
LOT-8A	6.4	264	-	-	6	14.0	35	21,000
LOT-17, 18	82.	440	-	-	5,000	43.0	44	630
LO-72.9					4			
LO-73.0					2			
LO-73.5					0			
LO-74.0					0			
LO-74.3					0			
LO-75.0					30			
LO-75.9					0			

▲
REPORT

by

THE ONTARIO WATER RESOURCES COMMISSION

on a

WATER QUALITY and OUTFALL SURVEY

of LAKE ONTARIO

BURLINGTON TO SCARBOROUGH TOWNSHIP INCLUSIVE

SECTION II

Lakefront Survey - 1961

PART II

in the Towns of Burlington, Oakville and Port Credit.

PURPOSE

This survey was a continuation of one started in 1960 to determine the quality of the water along the lakefront from Hamilton to Port Credit. The quality was assessed according to the phenol and coliform contents of the water being sampled. These two contaminants were considered as the best pollution indicators for taste in water and public health significance.

At one particular location, namely off Coronation Park between Bronte and Oakville, the levels of certain other constituents of the water were determined for the purpose of the algae (Cladophora) survey being run during the summer.

SAMPLING LOCATIONS

In 1960 certain key locations in proximity to sewage

treatment plants and industrial outfalls were chosen to be sampled. In 1961 additional points were selected between these key locations to give better coverage to the whole area included in the survey. In most instances these in-between points were spaced equally between the numbered locations used in 1960, and each was given a suffix B, or C, or D; each succeeding suffix denoting a point farther west. Later these numbers were altered to conform with the practice used by other divisions of the Commission. The locations were designated by the mileage along the lakefront with the starting point at the Niagara River. These intermediate points increased the number of sampling locations from 16 in 1960 to 37 in 1961.

These points were then identified with on-shore landmarks to facilitate sampling and as such are designated in the list contained in the tabulation of data. The points are shown on the accompanying maps.

The first of these 37 locations, LO-41.9, was located off the small red building south of Dodo's grill on Van Wagner's beach, and the last one, LO-67.6, off the St. Lawrence Starch Company outfall at Port Credit. The distance covered in the survey was approximately 25 miles.

All samples, except the special ones taken for the algae survey, were taken approximately 100 feet from shore.

The special samples taken for the algae survey were taken along a line extending perpendicularly out from the shore

SAMPLING LOCATIONS cont'd

at point LO-54.7. Along this line the sampling locations were 100 ft, 250 ft, 500 ft, 1000 ft, 1/2 mile, and 1 mile from shore. Samples taken at locations Bronte East (LO-54.1) and Bronte West (between LO-51.9 and LO-51.6) were used to determine chemical concentrations at or near algae test plots.

PROCEDURE

Sampling runs were made once a week commencing on June 7 and terminating on October 12, except for the weeks of July 2, July 30, September 17, September 24, and October 1. A total of 13.5 runs were made; only a half run was made on September 6 due to increasingly rough water.

In making the sampling runs sample number LO-41.9 was collected first and the samples were collected in numerical order in an eastward direction. Except as mentioned above on September 6 each run of 37 points was made in one day.

For the sake of safety and sampling convenience, two persons were assigned to the OWRC boat for each run. These operated the boat, collected the bacterial and phenol samples manually, and between the sampling locations added the buffer to the phenol samples as a preliminary step toward the complete phenol determinations. Since the samples were analyzed for phenol within a short time, no attempt was made to preserve the samples other than the addition of the buffer solution which has been considered to have some preservative effect.

PROCEDURE cont'd

The samples were collected approximately one foot below the surface of the water.

ANALYSES

The samples were taken to the OWRC laboratory to be analyzed. Except for the phosphate determinations, all analyses were begun on the same day the samples were taken, usually within 5 hours of collection.

Phenol and bacterial (coliform) determinations were made on all the samples collected, including those taken for the algae survey. On the special samples collected for the algae survey, total and soluble phosphorus, nitrogen as free ammonia, and total Kjeldahl nitrogen determinations were carried out.

The phenol determinations were made using the direct dosing and reading method; that is, the reagents were added directly to the sample aliquot without distillation. Also, the colour developed using Gibbs reagent (2, 6-dibromoquinone-chlorimide) was read by visual comparison with standards. As mentioned before, to save time in the laboratory, the buffer used in the analysis was added between sampling locations. The analyses were completed in the laboratory.

The coliform bacteria numbers were determined by the method prescribed in Standard Methods for the Examination of Water and Wastewater, 11th Edition, and described under the membrane filter technique.

SAMPLING OBSERVATIONS

On Tuesday, June 13, the sampling personnel observed many small dead fish along the shores and also considerable amounts of floating garbage. The fish mortality was presumed to be the result of natural causes since no known artificial causes were apparent.

On three days, patches of sooty material covering certain areas were noticed. This sooty material, similar to carbon black, is often the result of smoke particles drifting down to the water and covering the surface. This layer often has the appearance of an oil slick. The lake is usually very calm, the sky overcast and the wind very light or non-existent when this occurs.

Three cases of thin oil slicks were noticed. That on June 7 occurred at location LO-54.7 at 500 feet and 1000 feet offshore; on June 28 a slick was noticed at location LO-51.9 and that of July 11 stretched from LO-64.6 to east of the Regent Refining (Canada) Limited Plant at Port Credit.

ANALYTICAL RESULTS

The results of the 564 phenol and 564 bacterial samples taken during the survey are tabulated on the data sheets in the appendix.

DISCUSSION

BACTERIAL RESULTS

The Ontario Water Resources Commission's objective for

DISCUSSION cont'd

all waters in the Province of Ontario is that the total coliform count shall be not greater than 2400 per 100 ml of sample. During this survey 540 samples or 95.7 per cent had counts lower than this figure. Table I gives the disposition of the remaining 24 samples.

The maximum coliform concentration was 2,100,000⁰⁰⁰ per 100 ml found off the St. Lawrence Starch Co. at Location LO-67.6. The results also show that this location had the highest median concentration (480,000) and the highest minimum concentration (6300) of all the sampling points.

TABLE I

Sampling locations with coliform count over 2400/100 ml
(13 sample runs)

<u>Location No.</u>	<u>Description</u>	<u>Number of times 2400 coliforms/ 100 ml exceeded</u>
LO-67.6	off St. Lawrence Starch Co. outfall	13
LO-67.0	off mouth of Credit River	3
LO-65.6	off white hip roof dwelling	1
LO-63.3	off eastern extremity of B.A. tank farm	1
LO-63.0	" B.A. Oil Co. discharge	1
LO-57.8	" Oakville Creek mouth	2
LO-54.7	" Coronation Park	1
LO-48.4	" mouth of small creek	2

The reason for this high concentration of bacteria at this location, near this plant, is difficult to determine since grab samples collected on November 30, 1961 of the two creek outfalls and the industrial waste sewer discharging in that area,

DISCUSSION cont'd

did not contain high concentrations of coliforms (90,296, and 100 per 100 ml, respectively). It is noteworthy however, that one sample obtained from the St. Lawrence Starch Co. outfall in September, 1960 contained 4,800,000 coliforms per 100 ml.

Other locations that had persistently higher than normal median coliform counts, were those off the natural discharges to the lake, e.g. Credit River (LO-67.0), Oakville Creek (LO-57.8), Bronte Creek (LO-53.8), and the Burlington Canal (LO-44.9).

If all the locations sampled in this survey were considered as a single area, the bacterial results of the different days can be compared, as shown in Table II. The medians in this table show that the concentrations on the days toward the end of August were appreciably above those for the other sampling days suggesting an increase with the warmer weather.

It is interesting to note at the location used for the algae survey that the bacterial results of the samples there, although admittedly not many, generally show a decrease in concentration with increasing distance from shore.

TABLE II

Comparison of coliform count by days

<u>Date 1961</u>	<u>Coliforms per 100 ml</u>		<u>Median</u>
	<u>Maximum</u>	<u>Minimum</u>	
June 7	450,000	0	10
13	210,000	0	2
21	2,010,000	0	40
28	6,300	0	9
July 11	1,370,000	1	37
19	110,000	0	3
27	530,000	0	19
Aug. 9	480,000	0	14
17	150,000	0	28
22	730,000	34	440
29	2,100,000	2	238
Sept. 6	Not comparable		
12	370,000	0	15
Oct. 12	140,000	0	14

PHENOL RESULTS

The objective of the Ontario Water Resources Commission for all waters of the province is that after initial dilution, the average phenol concentration for any point should be not greater than 2 parts per billion (ppb) and the maximum concentration should not exceed 5 parts per billion.

Regarding the average phenol concentration, 29 of the 37 locations were below the 2 ppb average figure and the averages of the 8 remaining locations ranged from 2.3 ppb to 14.8 ppb.

The highest average concentration occurred at location LO-63.3 off a point west of the easterly extremity of the British American Oil Co. tank farm in Clarkson. The maximum phenol concentration of 150 ppb also occurred at this point. The fact that the

DISCUSSION cont'd

maximum concentration occurred on the same day that the locations on either side experienced their maxima, suggests that an appreciable amount of phenolic material existed in that area at that time. If such a concentration occurred at a water works intake, some chloro-phenolic taste would most likely develop. Although the incidence of the concentration of 150 ppb undoubtedly is the main cause of the highest average phenol concentration for point LO-63.3, the average is also influenced by the fact that this point also had 7 positive phenol results out of the 13 sampling runs made; only two less than that of point LO-67.6 which had the greatest number.

The summaries of the maximum and average phenol concentrations per sampling point are given in Tables III and IV.

Of the 564 samples taken for phenol analysis, 24 or 4.25 per cent had concentrations above the 5 ppb considered as the objective for maximum concentrations.

OTHER RESULTS

The results obtained for samples collected for the algae survey are not discussed here but will be included in a separate algae report.

TABLE IIIPhenol concentrations at sampling points
Summary of Maxima

1 point at 150 ppb	off eastern extremity of B.A. tank farm	(L0-63.3)
1 point at 50 ppb	" St. Lawrence Starch Co. outfall	(L0-67.6)
1 point at 45 ppb	" B. A. Oil Co. discharge	(L0-63.0)
1 point at 40 ppb	" Meadowood Park	(L0-63.8)
1 point at 20 ppb	" Oakville Creek	(L0-57.8)
* <u>5 points at 8 - 6 ppb</u> 27 points at 4 - 0 ppb		

* OWRC Objective not to exceed 5 ppb maximum after initial dilution.

TABLE IVPhenol concentrations
Summary of averages at sampling points

1 point at 14.8 ppb	off eastern extremity of B.A. tank farm	(L0-63.3)
1 point at 6.6 ppb	" St. Lawrence Starch Co. outfall	(L0-67.6)
1 point at 5.2 "	" B. A. Oil Co. discharge	(L0-63.0)
1 point at 4.8 "	" Meadowood Park	(L0-63.8)
** <u>3 points at 2.7 - 2.3 ppb</u> 29 points at 1.4 - 0 ppb		

** OWRC Objective not to exceed 2 ppb average after initial dilution.

CONCLUSIONS

As well as can be judged from the number of samples taken and the sampling locations used, there is no total gross pollution existing in the area covered by the survey although individual locations do exhibit signs of pollution.

Bacteriological pollution (coliforms) was severe and persistent near the St. Lawrence Starch Company outfall in Port Credit and also at the mouth of the Credit River.

Phenol concentrations were often excessive in the proximity of the British American Oil Company Refinery at Clarkson.

Investigations will be made to determine if the localized pollution is the result of industrial waste discharges, and if so steps can be taken to have the causes corrected.

APPENDIXSAMPLING POINTS IN LAKE ONTARIO

- LO-67.6 Off water tower of St. Lawrence Starch Co. - outfall
- LO-67.0 Mouth of Credit River
- LO-66.7 Off water tower, Port Credit Water Works
- LO-66.1 The point west of Port Credit Regent Refinery
- LO-65.6 White hip roof dwelling
- LO-65.1 Red and White house (group of four)
- LO-64.6 Off flag pole at golf course (sand field)
- LO-64.4 Housing subdivision
- LO-63.8 At white flag pole, Meadowood Park
- LO-63.3 West of eastern extremity of B.A. tank farm
- LO-63.0 Off B.A. Oil Discharge - Clarkson
- LO-62.2 Clarkson S.T.P. outfall east of Lawrence Cement Co. dock
- LO-61.6 Small creek east of dock with winch
- LO-60.9 Small white round tower with flag
- LO-60.1 Off Ninth Line between Clarkson & Oakville. Near Ford Co. S.T.P. outfall approximately 1,000 feet from shore (White marker in water)
- LO-59.6 Small creek beside Polo Ground
- LO-58.9 Off Eighth Line, Oakville
- LO-58.2 Off 2nd Church Tower
- LO-57.8 Off mouth of Oakville Creek
- LO-56.6 Yellow buoy close to shore
- LO-55.8 Small creek west of water tower
- LO-54.7 The point off Coronation Park
- LO-54.1 Bronte East

- L0-53.8 Off Bronte Creek mouth
- L0-52.5 Off Cities Service garden
- L0-51.9 Townline, beside Pig & Whistle restaurant
Bronte West
- L0-51.6 Large white house flying flag
- L0-50.0 Small creek east of four stone piers
- L0-49.6 Metal sewer protruding from rock face
- L0-48.4 Small creek, pumphouse 100 yards from shoreline
- L0-47.5 East of red brick apartment building. Near Drury Lane
S.T.P. outfall
- L0-47.1 Rambo creek
- L0-46.5 Entrance to breakwater area, 50 yards from eastern tip
- L0-45.7 Hydro tower marked Larry 57-58
- L0-44.9 Off Burlington Canal
- L0-43.6 Third Hydro tower north of large red brick school
Van Wagner's beach
- L0-41.9 Off small red brick building south of Dodo's grill
and south of swimming pool. Van Wagner's beach

LAKE ONTARIO - LAKEFRONT SURVEY

1961

VAN WAGNER'S BEACH, BURLINGTON TO ST. LAWRENCE STARCH COMPANY, PORT CREDIT
 COLIFORMS PER 100 ML (MEMBRANE FILTER METHOD) SAMPLES TAKEN 100 FEET FROM SHORE

RANGE (LD-)	ABBREVIATED DESCRIPTION	JUNE				JULY		
		7TH	13TH	21ST	28TH	11TH	19TH	27TH
67.6	OFF ST. LAWRENCE STARCH CO. OUTFALL	450,000	210,000	2,010,000	6,300	1,370,000	110,000	530,000
67.0	MOUTH OF CREDIT RIVER	230	140	690	140	70	760	100
66.7	PORT CREDIT WATER WORKS	230	20	1,360	20	150	850	40
66.1	PORT CREDIT REGENT REFINERY	50	200	300	-	41	6	11
65.6	WHITE HIP ROOF DWELLING	6	0	189	7	5	8	12
65.1	RED AND WHITE HOUSE	25	2	193	5	43	3	73
64.6	FLAG POLE - GOLF COURSE	2	1	40	9	32	7	6
64.4	HOUSING SUBDIVISION	70	1	37	0	11	2	0
63.8	MEADOWOOD PARK	10	0	5	3	8	0	32
63.3	EASTERN EXTREMITY B.A. TANK FARM	10	0	16	4	39	1	25
63.0	OFF B. A. OIL DISCHARGE - CLARKSON	3	0	20	217	162	327	3,300
62.2	CLARKSON S.T.P. OUTFALL	-	3	4	2	80	0	8
61.6	SMALL CREEK EAST OF DOCK	20	0	82	3	15	0	9
60.9	SMALL WHITE ROUND TOWER	9	0	4	2	34	0	3
60.1	NEAR FORD CO. S.T.P. OUTFALL	-	0	0	3	1	0	11
59.6	SMALL CREEK - POLO GROUND	0	8	207	84	106	109	57
58.9	EIGHTH LINE, OAKVILLE	0	0	21	1	37	0	9
58.2	2ND CHURCH TOWER	0	2	91	0	4	0	6
57.8	OAKVILLE CREEK	50	3	51	72	12,000	161	1,500
56.6	YELLOW BUOY	1	0	23	2	2	0	5
55.8	SMALL CREEK WEST OF WATER TOWER	10	0	17	14	64	0	211
54.7	CORONATION PARK	20	3	39	4	32	1	71
54.1	BRONTE EAST	10	4	24	12	3	0	423
53.8	BRONTE CREEK MOUTH	7	84	1,400	150	640	80	1,310
52.5	CITIES SERVICE GARDEN	300	0	2	5	178	0	2
51.9	PIG & WHISTLE RESTAURANT	0	2	2	43	29	0	21
51.6	WHITE HOUSE - FLAG	1	3	31	10	25	169	1
50.0	FOUR STONE PIERS	1	12	169	14	124	107	2
49.6	METAL SEWER	3	1	12	49	53	5	0
48.4	SMALL CREEK - PUMPHOUSE	10	55	207	63	4,900	10	2
47.5	NEAR DRURY LANE S.T.P. OUTFALL	4	3	110	5	21	1	41
47.1	RAMBO CREEK	40	27	103	9	35	5	1,800
46.5	ENTRANCE TO BREAKWATER AREA	30	34	118	10	1,200	0	43
45.7	HYDRO TOWER	8	27	97	21	9	5	4
44.9	OFF BURLINGTON CANAL	730	1,400	238	1,600	2,100	238	320
43.6	THIRD HYDRO TOWER VAN WAGNER'S BEACH	36	38	0	1	30	17	0
41.9	DODO'S GRILL VAN WAGNER'S BEACH	0	8	0	2	20	0	19

LAKE ONTARIO - LAKEFRONT SURVEY

1961

VAN WAGNER'S BEACH, BURLINGTON TO ST. LAWRENCE STARCH COMPANY, PORT CREDIT

COLIFORMS PER 100 ML (MEMBRANE FILTER METHOD)

SAMPLES TAKEN 100 FEET FROM SHORE

RANGE (LO-)	ABBREVIATED DESCRIPTION	AUGUST				SEPTEMBER		OCTOBER
		9TH	17TH	22ND	29TH	6TH	12TH	12TH
67.6	OFF ST. LAWRENCE STARCH CO. OUTFALL	480,000	>150,000	730,000	2,100,000	-	370,000	140,000
67.0	MOUTH OF CREDIT RIVER	1,020	72,000	830	9,000	-	1,800	17,000
66.7	PORT CREDIT WATER WORKS	900	680	1,520	2,300		34	66
66.1	PORT CREDIT REGENT REFINERY	91	47	410	38	T	2	14
65.6	WHITE HIP ROOF DWELLING	0	64	31,000	138	0	8	18
65.1	RED AND WHITE HOUSE	0	12	760	8	0	0	15
64.6	FLAG POLE - GOLF COURSE	0	0	850	324		8	26
64.4	HOUSING SUBDIVISION	4	8	800	22		4	10
63.8	MEADOWOOD PARK	0	9	860	34		3	5
63.3	EASTERN EXTREMITY B.A. TANK FARM	0	700	11,000	900	R	0	4
63.0	OFF B.A. OIL DISCHARGE - CLARKSON	6	2	900	16	0	29	8
62.2	CLARKSON S.T.P. OUTFALL	24	< 2	970	144	U	81	29
61.6	SMALL CREEK EAST OF DOCK	9	28	212	66	G	41	6
60.9	SMALL WHITE ROUND TOWER	0	28	292	1,400	H	2	1
60.1	NEAR FORD CO. S.T.P. OUTFALL	0	61	1,800	238		0	0
59.6	SMALL CREEK - POLO GROUND	35	0	-	1,800		5	5
58.9	EIGHTH LINE, OAKVILLE	0	31	192	710		3	3
58.2	2ND CHURCH TOWER	0	6	54	3		13	0
57.8	OAKVILLE CREEK	168	436	6,400	1,820		2,040	0
56.6	YELLOW BUOY	0	126	440	64		121	7
55.8	SMALL CREEK WEST OF WATER TOWER	60	127	34	910		10	6
54.7	CORONATION PARK	1	192	146	3,300		3	5
54.1	BRONTE EAST	-	< 2	138	36	202	6	3
53.8	BRONTE CREEK MOUTH	101	200	370	380	244	89	27
52.5	CITIES SERVICE GARDEN	4	<10	780	2	15	1	14
51.9	PIG & WHISTLE RESTAURANT	63	< 2	600	196	130	15	21
51.6	WHITE HOUSE - FLAG	14	32	54	81	62	86	3
50.0	FOUR STONE PIERS	67	12	68	200	150	381	38
49.6	METAL SEWER	103	6	264	76	100	6	13
48.4	SMALL CREEK - PUMPHOUSE	82	170	450	18,000	500	10	17
47.5	NEAR DRURY LANE S.T.P. OUTFALL	99	0	180	160	600	76	19
47.1	RAMBO CREEK	182	18	520	2,100	900	96	23
46.5	ENTRANCE TO BREAKWATER AREA	300	4	164	1,800	170	80	10
45.7	HYDRO TOWER	6	208	210	17	52	63	26
44.9	OFF BURLINGTON CANAL	900	192	134	830	103	80	2,000
43.6	THIRD HYDRO TOWER VAN WAGNER'S BEACH	2	14	76	400	26	2	3
41.9	DODO'S GRILL VAN WAGNER'S BEACH	7	0	44	238	128	17	9

LAKE ONTARIO - LAKEFRONT SURVEY

1961

VAN WAGNER'S BEACH, BURLINGTON TO ST. LAWRENCE STARCH COMPANY, PORT CREDIT
COLIFORMS PER 100 ML (MEMBRANE FILTER METHOD) SAMPLES TAKEN 100 FEET FROM SHORE

RANGE (LO-)	ABBREVIATED DESCRIPTION	AVERAGE	MAXIMUM	MINIMUM	MEDIAN
67.6	OFF ST. LAWRENCE STARCH CO. OUTFALL	665,869	2,100,000	6,300	480,000
67.0	MOUTH OF CREDIT RIVER	7,983	72,000	70	760
66.7	PORT CREDIT WATER WORKS	628	2,300	20	230
66.1	PORT CREDIT REGENT REFINERY	101	410	2	44
65.6	WHITE HIP ROOF DWELLING	2,420	31,000	0	8
65.1	RED AND WHITE HOUSE	88	760	0	12
64.6	FLAG POLE - GOLF COURSE	100	850	0	8
64.4	HOUSING SUBDIVISION	75	800	0	8
63.8	MEADOWOOD PARK	75	860	0	5
63.3	EASTERN EXTREMITY B.A. TANK FARM	977	11,000	0	10
63.0	OFF B.A. OIL DISCHARGE - CLARKSON	384	3,300	0	20
62.2	CLARKSON S.T.P. OUTFALL	112	970	0	18
61.6	SMALL CREEK EAST OF DOCK	38	212	0	15
60.9	SMALL WHITE ROUND TOWER	137	1,400	0	3
60.1	NEAR FORD CO. S.T.P. OUTFALL	176	1,800	0	1
59.6	SMALL CREEK - POLO GROUND	201	1,800	0	46
58.9	EIGHTH LINE, OAKVILLE	77	710	0	3
58.2	2ND CHURCH TOWER	14	91	0	3
57.8	OAKVILLE CREEK	1,900	12,000	0	168
56.6	YELLOW BUOY	60	440	0	5
55.8	SMALL CREEK WEST OF WATER TOWER	113	910	0	17
54.7	CORONATION PARK	294	3,300	1	20
54.1	BRONTE EAST	66	423	0	10
53.8	BRONTE CREEK MOUTH	363	1,400	7	197
52.5	CITIES SERVICE GARDEN	94	780	0	4
51.9	PIG & WHISTLE RESTAURANT	80	600	0	21
51.6	WHITE HOUSE - FLAG	41	169	1	28
50.0	FOUR STONE PIERS	96	381	1	87
49.6	METAL SEWER	49	264	0	12
48.4	SMALL CREEK - PUMPHOUSE	1,748	18,000	2	72
47.5	NEAR DRURY LANE S.T.P. OUTFALL	94	600	0	31
47.1	RAMBO CREEK	418	2,100	5	37
46.5	ENTRANCE TO BREAKWATER AREA	283	1,800	0	61
45.7	HYDRO TOWER	54	210	4	23
44.9	OFF BURLINGTON CANAL	848	2,000	80	525
43.6	THIRD HYDRO TOWER VAN WAGNER'S BEACH	46	400	0	15
41.9	DODO'S GRILL VAN WAGNER'S BEACH	35	238	0	8

LAKE ONTARIO - LAKEFRONT SURVEY

PHENOL CONCENTRATIONS

1961

VAN WAGNER'S BEACH, BURLINGTON TO ST. LAWRENCE STARCH COMPANY, PORT CREDIT

RANGE (LO-)	ABBREVIATED DESCRIPTION	SAMPLES TAKEN 100 FEET FROM SHORE						
		7TH	JUNE		28TH	11TH	JULY	
			13TH	21ST			19TH	27TH
67.6	OFF ST. LAWRENCE STARCH CO. OUTFALL	2	5	0	6	4	2	0
67.0	MOUTH OF CREDIT RIVER	0	2	2	2	0	4	0
66.7	PORT CREDIT WATER WORKS	0	2	0	0	0	2	0
66.1	PORT CREDIT REGENT REFINERY	0	1	2	0	4	6	0
65.6	WHITE HIP ROOF DWELLING	0	0	0	0	2	2	0
65.1	RED AND WHITE HOUSE	0	0	0	0	0	0	0
64.6	FLAG POLE - GOLF COURSE	0	0	2	0	0	0	0
64.4	HOUSING SUBDIVISION	0	0	0	0	2	0	0
63.8	MEADOWOOD PARK	0	6	0	3	40	0	9
63.3	EASTERN EXTREMITY B.A. TANK FARM	0	14	0	2	150	0	0
63.0	OFF B.A. OIL DISCHARGE - CLARKSON	3	3	0	2	45	0	0
62.2	CLARKSON S.T.P. OUTFALL	-	0	4	0	0	6	0
61.6	SMALL CREEK EAST OF DOCK	0	2	0	0	0	0	0
60.9	SMALL WHITE ROUND TOWER	3	0	0	0	0	0	0
60.1	NEAR FORD CO. S.T.P. OUTFALL	-	0	0	0	0	0	0
59.6	SMALL CREEK - POLO GROUND	0	0	0	2	0	0	0
58.9	EIGHTH LINE, OAKVILLE	0	0	0	0	0	0	0
58.2	2ND CHURCH TOWER	0	0	0	0	0	0	0
57.8	OAKVILLE CREEK	0	0	0	2	0	3	0
56.6	YELLOW BUOY	0	0	2	0	0	0	0
55.8	SMALL CREEK WEST OF WATER TOWER	0	0	0	0	0	0	0
54.7	CORONATION PARK	0	0	2	0	0	2	0
54.1	BRONTE EAST	0	0	0	0	0	0	0
53.8	BRONTE CREEK MOUTH	0	0	0	0	2	0	0
52.5	CITIES SERVICE GARDEN	0	0	0	0	2	0	0
51.9	PIG & WHISTLE RESTAURANT	0	0	0	2	4	0	0
51.6	WHITE HOUSE - FLAG	3	0	2	2	0	0	0
50.0	FOUR STONE PIERS	4	0	0	0	0	0	0
49.6	METAL SEWER	2	0	0	0	4	0	0
48.4	SMALL CREEK - PUMPHOUSE	0	0	2	0	0	0	0
47.5	NEAR DRURY LANE S.T.P. OUTFALL	0	0	2	0	0	0	0
47.1	RAMBO CREEK	0	0	0	0	0	0	0
46.5	ENTRANCE TO BREAKWATER AREA	0	0	0	0	0	0	0
45.7	HYDRO TOWER	0	0	4	0	0	0	0
44.9	OFF BURLINGTON CANAL	4*	4*	0	4	5	0	0
43.6	THIRD HYDRO TOWER VAN WAGNER'S BEACH	0	0	0	0	0	0	0
41.9	DODO'S GRILL VAN WAGNER'S BEACH	0	0	0	0	0	0	0

LAKE ONTARIO - LAKEFRONT SURVEY

PHENOL CONCENTRATIONS

1961

VAN WAGNER'S BEACH, BURLINGTON TO ST. LAWRENCE STARCH COMPANY, PORT CREDIT

PHENOLS IN PPB

SAMPLES TAKEN 100 FEET FROM SHORE

RANGE (LO-)	ABBREVIATED DESCRIPTION	9TH	AUGUST		29TH	SEPTEMBER		OCTOBER
			17TH	22ND		6TH	12TH	12TH
67.6	OFF ST. LAWRENCE STARCH CO. OUTFALL	6	6	5	50*	-	0	0
67.0	MOUTH OF CREDIT RIVER	0	2	4	0		2	0
66.7	PORT CREDIT WATER WORKS	0	0	4	0		0	0
66.1	PORT CREDIT REGENT REFINERY	8	8	6	0		0	0
65.6	WHITE HIP ROOF DWELLING	0	2	8*	0	T	0	0
65.1	RED AND WHITE HOUSE	0	4	0	0	0	0	0
64.6	FLAG POLE - GOLF COURSE	0	0	0	0	0	0	0
64.4	HOUSING SUBDIVISION	0	0	0	0		0	0
63.8	MEADOWOOD PARK	0	0	4	0		0	0
63.3	EASTERN EXTREMITY B.A. TANK FARM	4	6	6*	10		0	0
63.0	OFF B. A. OIL DISCHARGE - CLARKSON	2	0	10*	0		2	0
62.2	CLARKSON S.T.P. OUTFALL	0	0	2	0		0	0
61.6	SMALL CREEK EAST OF DOCK	0	0	0	0	R	0	0
60.9	SMALL WHITE ROUND TOWER	0	0	6	0	O	0	0
60.1	NEAR FORD CO. S.T.P. OUTFALL	0	0	4	0	U	0	0
59.6	SMALL CREEK - POLO GROUND	0	0	2	0	G	0	0
58.9	EIGHTH LINE, OAKVILLE	0	0	0	0	H	0	0
58.2	2ND CHURCH TOWER	0	0	0	0		0	0
57.8	OAKVILLE CREEK	3	20	2	0		0	0
56.6	YELLOW BUOY	2	0	0	0		0	0
55.8	SMALL CREEK WEST. OF WATER TOWER	0	4	0	0		0	0
54.7	CORONATION PARK	0	2	0	0		0	0
54.1	BRONTE EAST	-	0	0	0		0	0
53.8	BRONTE CREEK MOUTH	2	4	0	2	0	0	0
52.5	CITIES SERVICE GARDEN	0	0	0	4	0	0	0
51.9	PIG & WHISTLE RESTAURANT	0	4	0	2	0	0	0
51.6	WHITE HOUSE - FLAG	0	2	0	2	0	0	0
50.0	FOUR STONE PIERS	0	0	0	0	0	0	0
49.6	METAL SEWER	0	0	0	0	0	0	0
48.4	SMALL CREEK - PUMPHOUSE	0	0	0	4	2	0	0
47.5	NEAR DRURY LANE S.T.P. OUTFALL	0	0	0	0	0	0	0
47.1	RAMBO CREEK	0	4	0	4	0	0	0
46.5	ENTRANCE TO BREAKWATER AREA	2	0	0	0	0	0	0
45.7	HYDRO TOWER	0	0	2	2	0	0	0
44.9	OFF BURLINGTON CANAL	2	6	0	4	0	6*	2
43.6	THIRD HYDRO TOWER VAN WAGNER'S BEACH	0	0	0	2	0	0	0
41.9	DODO'S GRILL VAN WAGNER'S BEACH	0	0	0	0	0	0	0

LAKE ONTARIO - LAKEFRONT SURVEY

PHENOL CONCENTRATIONS

1961

VAN WAGNER'S BEACH, BURLINGTON TO ST. LAWRENCE STARCH COMPANY, PORT CREDIT

PHENOLS IN PPB

SAMPLES TAKEN 100 FEET FROM SHORE

RANGE (LO-)	ABBREVIATED DESCRIPTION	AVERAGE	MAXIMUM	MINIMUM	MEDIAN
67.6	OFF ST. LAWRENCE STARCH CO. OUTFALL	6.6	50	0	4
67.0	MOUTH OF CREDIT RIVER	1.4	4	0	2
66.7	PORT CREDIT WATER WORKS	.6	4	0	0
66.1	PORT CREDIT REGENT REFINERY	2.7	8	0	1
65.6	WHITE HIP ROOF DWELLING	1.1	8	0	0
65.1	RED AND WHITE HOUSE	.3	4	0	0
64.6	FLAG POLE - GOLF COURSE	.2	2	0	0
64.4	HOUSING SUBDIVISION	.2	2	0	0
63.8	MEADOWOOD PARK	4.8	40	0	0
63.3	EASTERN EXTREMITY B.A. TANK FARM	14.8	150	0	2
63.0	OFF B.A. OIL DISCHARGE - CLARKSON	5.2	45	0	2
62.2	CLARKSON S.T.P. OUTFALL	1.	6	0	0
61.6	SMALL CREEK EAST OF DOCK	.2	2	0	0
60.9	SMALL WHITE ROUND TOWER	.7	6	0	0
60.1	NEAR FORD CO. S.T.P. OUTFALL	.3	4	0	0
59.6	SMALL CREEK - POLO GROUND	.3	2	0	0
58.9	EIGHTH LINE, OAKVILLE	0	0	0	0
58.2	2ND CHURCH TOWER	0	0	0	0
57.8	OAKVILLE CREEK	2.3	20	0	0
56.6	YELLOW BUOY	.3	2	0	0
55.8	SMALL CREEK WEST OF WATER TOWER	.3	4	0	0
54.7	CORONATION PARK	.5	2	0	0
54.1	BRONTE EAST	0	0	0	0
53.8	BRONTE CREEK MOUTH	.7	4	0	0
52.5	CITIES SERVICE GARDEN	.4	4	0	0
51.9	PIG & WHISTLE RESTAURANT	.9	4	0	0
51.6	WHITE HOUSE - FLAG	.8	3	0	0
50.0	FOUR STONE PIERS	.3	4	0	0
49.6	METAL SEWER	.4	4	0	0
48.4	SMALL CREEK - PUMPHOUSE	.6	4	0	0
47.5	NEAR DRURY LANE S.T.P. OUTFALL	.1	2	0	0
47.1	RAMBO CREEK	.6	4	0	0
46.5	ENTRANCE TO BREAKWATER AREA	.1	2	0	0
45.7	HYDRO TOWER	.6	4	0	0
44.9	OFF BURLINGTON CANAL	2.6	6	0	0
43.6	THIRD HYDRO TOWER VAN WAGNER'S BEACH	.1	2	0	0
41.9	DODO'S GRILL VAN WAGNER'S BEACH	0	0	0	0

LAKE ONTARIO - LAKEFRONT SURVEY

1961

PHOSPHATES (PPM)
 - TOTAL (T)
 - SOLUBLE (S)

RANGES

DATES	100'		250'		500'		LO 54.7 1000'		½ MILE		1 MILE		(S) ^{AVG} (T)		LO 54.1 BRONTE EAST		LO 51.9- 51.6 BRONTE WEST	
	(S)	(T)	(S)	(T)	(S)	(T)	(S)	(T)	(S)	(T)	(S)	(T)	(S)	(T)	(S)	(T)	(S)	(T)
JUNE 7	0.01	0.06	0.00	0.04	0.00	0.05	0.00	0.04	0.00	0.03	0.00	0.02	0.00	0.04	0.02	0.06	0.01	0.60
13	0.02	0.06	0.04	0.04	0.02	0.03	0.00	0.05	0.00	0.06	0.00	0.03	0.01	0.05	0.01	0.05	0.01	0.05
21	0.03	0.08	0.01	0.06	<0.01	0.05	0.02	0.07	0.01	0.03	<0.01	0.04	0.01	0.06	0.01	0.04	0.01	0.06
28	0.02	0.03	0.02	0.04	0.02	0.03	0.02	0.03	0.02	0.04	0.02	0.03	0.02	0.03	0.02	0.05	0.02	0.04
JULY 11	0.01	0.05	0.02	0.05	0.02	0.06	0.02	0.06	0.02	0.05	0.02	0.05	0.02	0.05	0.01	0.06	0.01	0.05
19	0.01	0.09	0.00	0.07	0.00	0.07	0.00	0.07	0.00	0.06	0.00	0.05	0.00	0.07	0.01	0.06	0.00	0.01
27	0.01	0.07	0.01	0.07	0.00	0.05	0.00	0.03	0.00	0.03	0.00	0.03	0.00	0.05	0.00	0.08	0.01	0.08
AUG. 9	0.03	0.06	0.02	0.06	0.02	0.05	0.00	0.05	0.00	0.03	0.00	0.03	0.01	0.05	0.00	0.04	0.04	0.07
17	0.09	0.14	0.02	0.05	0.01	0.04	0.00	0.03	0.01	0.06	0.00	0.04	0.02	0.06	0.09	0.15	0.04	0.09
22	0.08	0.15	0.18	0.22	0.03	0.06	0.04	0.07	0.01	0.05	0.03	0.07	0.06	0.10	0.05	0.11	0.08	0.20
29	0.03	0.17	0.04	0.11	0.04	0.10	0.03	0.07	-	-	0.03	0.05	0.03	0.10	0.03	0.07	0.03	0.06
SEPT. 6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.01	0.06	-	-
12	0.00	0.01	0.00	0.04	0.00	0.05	0.00	0.04	0.01	0.06	0.00	0.04	0.00	0.04	0.04	0.09	0.00	0.06
AVERAGE	0.03	0.08	0.03	0.07	0.01	0.05	0.01	0.05	0.01	0.05	0.01	0.04	0.02	0.06	0.02	0.07	0.02	0.11
MAXIMUM	0.09	0.17	0.18	0.22	0.04	0.10	0.04	0.07	0.02	0.06	0.03	0.07			0.09	0.15	0.08	0.60
MINIMUM	0.00	0.01	0.00	0.04	0.00	0.03	0.00	0.03	0.00	0.03	0.00	0.02			0.00	0.04	0.00	0.01
MEDIAN	0.02	0.07	0.02	0.06	0.02	0.05	0.00	0.05	0.01	0.05	0.00	0.04			0.01	0.06	0.01	0.06

LAKE ONTARIO - LAKEFRONT SURVEY

1961

NITROGEN AS N (PPM)

- FREE AMMONIA (FA)
- TOTAL KJELDAHL NITROGEN (K)

R A N G E S

DATES	100'		250'		500'		LO54.7 1000'		$\frac{1}{2}$ MILE		1 MILE		AVG.		LO54.1 BRONTE EAST		LO51.9-51.6 BRONTE WEST	
	(FA)	(K)	(FA)	(K)	(FA)	(K)	(FA)	(K)	(FA)	(K)	(FA)	(K)	(FA)	(K)	(FA)	(K)	(FA)	(K)
JUNE 7	0.32	0.62	0.48	0.49	0.28	0.66	0.06	0.23	0.32	0.33	0.36	0.36	0.30	0.45	0.13	0.42	0.13	0.42
13	0.30	0.53	0.26	0.30	0.53	0.86	0.06	0.43	0.22	0.53	0.18	0.30	0.26	0.49	0.22	0.40	TRACES	0.23
21	0.20	0.43	0.12	0.66	0.08	0.16	0.12	0.33	0.08	0.26	0.18	0.39	0.13	0.37	0.12	0.23	0.20	0.26
28	0.26	0.30	0.18	0.20	0.20	0.23	0.10	0.13	0.14	0.20	0.36	0.36	0.21	0.24	0.18	0.18	0.08	0.13
JULY 11	0.20	0.26	0.38	0.46	0.23	0.26	0.20	0.20	0.15	0.30	0.29	0.30	0.24	0.30	0.08	0.20	0.13	0.20
19	0.28	0.40	0.49	0.92	0.28	0.94	0.13	0.26	0.13	0.46	0.26	0.75	0.26	0.62	0.13	0.23	0.03	0.33
27	0.30	0.33	0.21	0.76	0.28	0.33	0.10	0.13	0.26	0.26	0.13	0.17	0.21	0.33	0.16	0.30	0.15	0.20
AUG. 9	0.19	0.33	0.36	0.40	0.36	0.40	0.22	0.26	0.12	0.26	0.38	0.40	0.27	0.34	0.19	0.33	0.13	0.20
17	0.10	0.13	0.11	0.20	0.10	0.13	0.10	0.13	0.11	0.26	0.09	0.13	0.10	0.16	0.09	0.20	0.11	0.26
22	0.13	0.26	0.10	0.17	0.20	0.20	0.11	0.13	0.16	0.20	0.16	0.20	0.14	0.19	0.13	0.30	0.13	0.30
29	0.05	0.46	0.05	0.46	0.06	0.40	0.11	0.33	0.08	0.40	0.05	0.40	0.07	0.41	0.11	0.79	0.12	0.40
SEPT. 6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.21	0.46	-	-
12	0.39	0.53	0.07	0.70	0.10	0.92	0.20	0.36	TRACES	0.53	0.21	0.66	0.16	0.62	0.08	0.20	0.08	0.30
AVERAGE	0.23	0.38	0.23	0.48	0.23	0.46	0.13	0.24	0.16	0.33	0.22	0.37	0.20	0.38	0.14	0.33	0.12	0.27
MAXIMUM	0.39	0.62	0.49	0.92	0.53	0.94	0.22	0.43	0.32	0.53	0.38	0.75			0.22	0.79	0.20	0.42
MINIMUM	0.05	0.13	0.05	0.17	0.06	0.13	0.06	0.13	TRACES	0.20	0.05	0.13			0.08	0.18	TRACES	0.13
MEDIAN	0.23	0.37	0.20	0.46	0.22	0.37	0.11	0.25	0.15	0.28	0.20	0.36			0.13	0.30	0.13	0.26

LAKE ONTARIO - LAKEFRONT SURVEY

1961

M.F. COLIFORMS PER 100 ML

R A N G E S

DATES	LO 54.7							LO 54.1	LO 51.9 LO 51.6
	100 FT.	250 FT.	500 FT.	1000 FT.	$\frac{1}{2}$ MILE	1 MILE	AVG.	BRONTE EAST	BRONTE WEST
JUNE 7	20	17	31	9	2	0	13	1	10
13	3	3	1	4	1	0	2	3	4
21	39	1	0	1	0	0	7	31	24
28	4	0	0	0	8	1	2	10	12
JULY 11	32	71	52	9	21	25	35	26	3
19	1	0	0	0	0	0	0	10	0
27	71	234	2	2	0	1	52	5	423
AUG. 9	1	3	1	0	1	0	1	0	-
17	192	3	3	4	3	3	35	< 2	< 2
22	146	102	92	70	79	29	86	810	338
29	3,300	800	162	18	3	4	715	11	36
SEPT. 6	-	-	-	-	-	-	-	202	-
12	3	0	2	2	0	0	1	13	6
AVERAGE	318	103	29	10	10	5	79	86	60
MAXIMUM	3,300	800	162	70	79	29		810	423
MINIMUM	1	0	0	0	0	0		0	0
MEDIAN	26	3	2	3	2	1		10	10

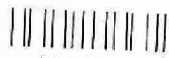
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LAKE ONTARIO - LAKEFRONT SURVEY
1961

PHENOLS IN PPB

R A N G E S

DATES	LO 54.7							LO 54.1	LO 51.9 - LO 51.6
	100 FT.	250 FT.	500 FT.	1000 FT.	$\frac{1}{2}$ MILE	1 MILE	AVG.	BRONTE EAST	BRONTE WEST
JUNE 7	0	0	0	0	0	0	0	3	0
13	0	0	0	0	0	0	0	0	0
21	2	4	6	2	2	2	3	2	0
28	0	0	5	0	0	5	2	2	0
JULY 11	0	0	0	0	0	0	0	6	0
19	2	2	4	2	0	4	2	2	0
27	0	0	0	0	0	0	0	0	0
AUG. 9	0	0	0	0	0	0	0	-	-
17	2	2	0	2	0	0	1	0	0
22	0	0	0	0	0	0	0	2	0
29	0	0	0	0	0	0	0	2	0
SEPT. 6	-	-	-	-	-	-	-	0	-
12	0	0	0	0	0	0	0	0	0
AVERAGE	0.5	0.7	1.3	0.5	0.2	0.9	0.7	1.6	0
MAXIMUM	2	4	6	2	2	5		6	0
MINIMUM	0	0	0	0	0	0		0	0
MEDIAN	0	0	0	0	0	0		2	0



(9221)

MOE/LAK O/RE P/ANL

DATE DUE

MOE/LAK O/RE P/ANL
DATE DUE