THE

ONTARIO WATER RESOURCES

COMMISSION

WATER POLLUTION SURVEY

of the

TOWN OF AJAX

1968

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COMMISSION

Report on a

WATER POLLUTION SURVEY

of the

TOWN OF AJAX

Division of Sanitary Engineering

District Engineers Branch

August, 1968

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INDEX PAGE NUMBER

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INTRODUCTION

A water pollution survey of the Town of Ajax was made by Commission staff during the Fall of 1967. This type of survey is intended to locate potential and existing sources of pollution which could adversely affect the water quality. If the results of the survey indicate a pollution problem, corrective action is recommended to those parties concerned.

Bacteriological and chemical samples were collected from various outfalls and watercourses which contained a significant flow. The samples collected were submitted to the Ontario Water Resources Commission Laboratory in Toronto for examination and analyses.

The appendices to this report included the laboratory results, a map showing the location of the sampling points as well as an interpretation of the analyses. At present the Town of Ajax does not have an official plan. To encourage an interest in planning, a section has been included on the need for local planning.

During the survey the following officials were contacted:

Mr. M. B. Beauchamp, Clerk, Town of Ajax

Mr. G. A. Robinson, Town Engineer, Town of Ajax

Mr. J. Canning, Public Health Inspector, Ontario County Health Unit

TOWN OF AJAX

General

The Town of Ajax is located 25 miles east of the Provincial capital of Toronto. On January 1, 1955, Ajax became an incorporated town having a population of approximately 6,000. Ajax has grown substantially with the present population near the 9,500 mark. The townsite presently encloses an area of approximately 45 square miles.

Drainage

The major drainage courses in the vicinity of Ajax are Duffin Creek and Carruthers Creek. Duffin Creek flows through the western section of Ajax and drains approximately one third of the town. Carruthers Creek lies just east of the town limit and accepts drainage from the eastern section of the town.

The water quality of Duffin Creek as indicated by the samples collected during September and October 1967 was varied. On September 22, 1967, the Ajax Water Pollution Control Plant was discharging treated waste water to Duffin Creek without the benefit of chlorination. The sample results tend to indicate and confirm the adverse effect the effluent from the sewage treatment plant was having on the water quality.

Carruthers Creek was not sampled during this survey. The sampling programme was limited to the drainage ditches and storm sewer outfalls which contained significant flow and drained into Carruthers Creek. Sampling points Stm-5, Stm-7, and Stm-8, are storm sewer outfalls whose effluent quality was unsatisfactory. The presence of excessive coliform bacteria was indicated in the samples collected.

Water Supply

The Town of Ajax is served by a municipal water works which obtains its raw water from Lake Ontario. The present capacity of the water works is 2.04 mgd. The municipal officials realizing the need for the expansion of the water works, have budgeted for expansion. The design for the expansion the water works is hoped to be completed this year and the anticipated date for the completion of constructed is scheduled for sometime in 1969.

Waste Disposal

The Town of Ajax is presently served by a municipal sewerage system. This includes a separate storm and sanitary sewer collection system plus an activated sludge sewage treatment plant having a capacity of 1.25 mgd. Primary treatment and chlorination is provided at this plant for flows up to 3.75 mgd. The sewage plant is currently overloaded and will require modifications and/or additions in the basic design to provide adequate treatment.

Solid wastes collected by the municipality are disposed by incineration. The municipal dump is located at a site adjacent to the municipal sewage works.

The industries located in Ajax are served by sanitary sewers. A number of waste disposal problems associated with the discharge of industrial wastes to the storm sewer system has been evident. Samples collected during the survey indicate areas where these problems existed. Through the efforts of our Division of Industrial Wastes and the Municipal Officials, the effending industries have taken or are presently taking steps to correct these problems.

Sample Results

A number of samples were collected from the town storm sewer system. Adverse sample results were obtained at sampling points, Stm-1, Stm-3, and Stm-4. These are believed to be caused by waste disposal problems assoicated with several industries. Action is being taken to correct this situation. Samples collected from sampling points, Stm-2, Stm-5, Stm-7, and Stm-8, were also unsatisfactory. These sampling points are located in residential areas and the results tend to indicate that there are sanitary connections to the storm sewers.

SUMMARY AND CONCLUSIONS

A water pollution survey was conducted during September and October 1967, to assess the water quality of the local watercourses.

The results of the survey indicate that a number of problems existed within the town. The presence of industrial and sanitary wastes were detected in the storm sewer system. Remedial steps are being taken by a number of local industries to correct their waste disposal problems. Further investigation by local officials is needed to locate the sources of sanitary wastes in the storm sewer system. The municipal Water Pollution Control Plant is presently overloaded and the effluent from this plant is having a deleterious effect on Duffin Creek. There is a need for expansion of this plant, but consideration must be given to the assimulative capacity of the receiving stream.

RECOMMENDATIONS

1. The Town of Ajax should proceed with the necessary expansion of their sewage treatment plant to relieve the present overloading as soon as possible.

2. The Town of Ajax should undertake to investigate their storm sewer system to locate and to remove any connections found to be discharging sanitary wastes.

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COMMUNITY PLANNING

The need for effective planning has become more important today than ever before. Municipalities are being burdened with the rising costs of land and labour. Therefore any project a community hopes to develop should be based on sound planning. Planning at all levels of government is essential but, community planning can be most effective if interest and initiative is generated at the local level. The enormous benefits accrued as a result of good planning can more than compensate for the initial investment.

Community planning can be described as an effort to control and direct development effectively. This can best be achieved through the development of an official plan. An official plan is the stated intention of the local authorities with respect to orderly development within the planning area, that is prepared and set forth with professional assistance and meets the requirements as set out by the Provincial Planning Act. An official plan can be a joint effort by a number of municipalities which have common basic characteristics and common problems, or one municipality can establish a plan on its own initiative.

Orderly development yields future economy in services. Development in the community can be retarded where an official plan does not exist. A plan provides, among other things

the framework for the rational design of water and sewage works and also the extensions of mains and collector sewer systems.

A local council having decided to proceed with a programme of community planning should contact the Ontario Department of Municipal Affairs. Through its many branches, information and guidance is provided to all interested parties.

JAC

APPENDIX III

SIGNIFICANCE OF LABORATORY ANALYSES

A. BACTERIOLOGICAL EXAMINATION

The presence of coliforms indicates pollution from human or animal excrement, or from non-faecal forms. The objective for surface water quality in Ontario is a maximum of 2400 organisms per 100 millilitres.

The Ontario Water Resources Commission Laboratories employ the Membrane Filter (MF) technique of examination to obtain a direct enumeration of coliform organisms. The Department of Health Laboratories use the Most Probable Number (MPN) enumeration and coliform counts are reported as Total Coliform Organisms (TC) and Faecal Coliform Organisms (FC).

B. SANITARY CHEMICAL ANALYSES

Biochemical Oxygen Demand (BOD)

Biochemical Oxygen Demand is reported in parts per million (ppm) and is an indication of the amount of oxygen required for the stabilization of decomposable organic or chemical matter in water. The completion of the laboratory test required five days, under the controlled incubation temperature of 20° Centigrade.

The Ontario Water Resources Commission objective for surface water quality is an upper limit of four (4) ppm.

Solids

The value for solids, expressed in parts per million (ppm) is the sum of the values for the suspended and the dissolved matter in the water. The concentration of suspended solids is generally the most significant of the solids analyses with regard to surface water quality.

The effects of suspended solids in water are reflected in difficulties associated with water purification, decompositions in streams and injury to the habitat of fish. Where suspended solids values are less than 20 ppm, laboratory difficulties are experienced and the turbidity is determined instead.

Turbidity

Turbidity is caused by the presence of suspended matter, such as clay, silt, finely divided organic matter, plankton and other microscopic organisms in water. It is an expression of the optical property of a sample and the results are reported in "turbidity units".

Phenols

The presence of phenol or phenolic equivalents is generally associated with discharges containing petroleum products, or with wastes from some industries. It is generally conceded that adequate protection of surface waters will be provided if the concentration of phenols in waste discharges does not exceed 20 parts per billion (ppb). Phenolic type waste can cause objectionable conditions in water supplies and might taint the flesh of fish.

Anionic Detergents (ABS)

The presence of anionic detergents as ABS is an indication that domestic waste is present.

pH

The pH value, for practical purposes, refers to acidity or alkalinity, and is a measure of intensity rather than quality. The pH scale extends from zero (very acidic) to 14 (very alkaline), with the middle value of 7 corresponding to neutrality at 25° Centrigrade. The pH of surface water should be in the range of 6.7 to 8.5.

C. PHYSICAL DETERMINATIONS

Dissolved Oxygen

The amount of dissolved oxygen contained in unpolluted water fluctuates with the temperature. A deficiency of oxygen in the water is replaced by oxygen from the atmosphere. There is a saturation value for each temperature. At 18° C this is 9.54 ppm of dissolved oxygen. Values below the saturation level indicate the presence of polluting organic substances which are absorbing oxygen from the water. The extent of this deficiency is one index of the degree of organic pollution. Substantial reduction in dissolved oxygen causes suffocation of fish.

Temperature.

The temperature of water influences the solubility of oxygen and the rate of oxidation and purification.

TABLE I

AJAX WATER POLLUTION SURVEY

SAMPLE POINT NO.	DESCRIPTION	5-DAY BOD	SOLIDS TOTAL	SOLIDS SUSP.	SOLIDS DISS.	BACTERIOLOGICAL EXAMINATION MF COLIFORMS per 100 ml	DATE 1967
D-0.00	Duffin Creek at east bank near mouth	0.8	326	50	276	550,000	September 22
		4.2	340	10	330	11,000	October 11
D-0.70	Duffin Creek at east bank	4.6	372	72	300	122,000	September 22
D-1.30	Duffin Creek at east bank below STP outfall	4.8	358	51	307	3,400,000	September 22
		3.5	330	9	321	36	October 11
D-1.40T	Sewage Treatment Plant outfall	37.0	912	130	782	14,400,000	September 22
		5.4	350	20	330	540	October 11
D-2.10	Duffin Creek east bank at Bayly St.	4.4	350	66	284	30,000	September 22
		3.8	318	7	311	6,100	October 11
D-2.15	Drainage ditch effluent north side of Bayly St.	6.0	242	38	204	360,000	September 22
		12.0	286	13	273	13,000	October 11
D-2.4	Duffin Creek at west bank	1.5	340	5	335	1,100	October 11
Stm-1	Storm sewer outfall at intersection of Bayly and Valley Rd.	88.0	450	100	350	2,900	September 22
		10.0	208	7	201	100	October 11

ABS - 0.15
pH - 7.6
Phenols - 8
Ether Solubles - 27

TABLE I (cont)

SAMPLE POINT NO.	DESCRIPTION	5-DAY BOD	SOLIDS TOTAL	SOLIDS SUSP.	SOLIDS DISS.	BACTERIOLOGICAL EXAMINATION MF COLIFORMS per 100 ml	DATE 1967
D.D.-2.9	Drainage ditch near Dupont of Canada Limited	32.0	182	15	167	400	September 22
	Phenols - 80 Ether Solubles - 7	16.0	236	9	227	15,000	October 11
Stm-2	Storm sewer MH north side of Elm St.	1.4	418	14	404	69,000	September 22
		2.5	1660	9	1651	18,000	October 11
Stm-3	Storm sewer outfall south of shopping centre	52.0	2194	1250	944	140,000	October 3
	Phenols - 1 Ether Solubles - trace pH - -- ABS - 0.0						
		11.0	478	18	460	99,000	October 11
	Phenols - 10 Ether Solubles - 30 pH - 8.9 ABS - 0.55						

TABLE I (cont)

SAMPLE POINT NO.	DESCRIPTION	5-DAY BOD	SOLIDS TOTAL	SOLIDS SUSP.	SOLIDS DISS.	BACTERIOLOGICAL EXAMINATION MF COLIFORMS per 100 ml	DATE 1967
Stm-4	Storm sewer outfall south of Bayly St. near Harwood Ave.	0.9	542	10	532	83,000	October 3
	Ether Solubles - 0.0 ABS - 0.0	1.7	542	9	533	490,000	October 11
Stm-5	Storm sewer outfall east of Admiral Rd.	1.2	270	8	262	27,000	September 22
		1.5	298	3	295	8,700	October 11
Stm-6	Storm sewer outfall east of Pickering Beach Rd. just south of Billingsgate Crescent	0.8	268	19	249	0	September 22
		1.2	248	5	243	<4	October 11
Stm-7	Storm sewer outfall at Clements Rd.	4.8	546	42	504	390,000	September 22
		2.9	754	68	586	34,000	October 11
Stm-8	Storm sewer outfall west of Pickering Beach Rd.	9.0	1,016	404	612	28,000	September 22
		2.6	734	25	709	80	October 11

TOWN OF AJAX

WATER POLLUTION SURVEY

SCALE = 0 500' 1000' 1500'

ONTARIO WATER RESOURCES COMMISSION

JUNE 1968

LEGEND

- STORM SEWER
- OPEN DITCH
- D-0.70 — SAMPLING POINT SHOWING MILEAGE
- STM-2 W — OUTFALL SAMPLING POINT TYPE OF OUTFALL
- T — TREATMENT PLANT
- W — STORM SEWER

LAKE ONTARIO