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O.W.R.C.
Water Pollution
Survey -

THE
ONTARIO WATER RESOURCES
COMMISSION

WATER POLLUTION SURVEY

of the

VILLAGE OF BLYTH

COUNTY OF HURON



Feb. 20 1969

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REPORT
ON
WATER POLLUTION SURVEY
of the
VILLAGE OF BLYTH
COUNTY OF HURON

Date of Sampling - February 20, 1969

DIVISION OF SANITARY ENGINEERING
ONTARIO WATER RESOURCES COMMISSION

REPORT

ONTARIO WATER RESOURCES COMMISSION

INTRODUCTION

A water pollution survey was conducted in the Village of Blyth on February 20, 1969, in an effort to locate and evaluate all existing sources of pollution. Such surveys are performed routinely and upon request by the OWRC's Division of Sanitary Engineering as a basis for determining water supply and sewage treatment requirements.

Acknowledgement is here given to the following persons who provided assistance and information necessary for the completion of this report:

Mr. I. S. Wallace, Clerk-Treasurer, Village of Blyth
Mr. F. Meier, United Dairy Producers Co-operative

At the time of the survey the sky was sunny and the temperature was about 35 degrees F. No rain had been recorded in the area during the preceding several days and the ground was covered with a heavy fall of snow.

I GENERAL INFORMATION

The Village of Blyth is located in the north-east portion of the County of Huron on the border between the Townships of East Wawanosh and Morris. The Blyth Creek flows north-westerly through the municipality and unites with the Maitland River about six miles

west of the village.

According to the 1968 Municipal Directory, the population of the village was 747 persons and the total assessment amounted to \$659,000. No sizable population growth is forecast in the foreseeable future. Approximately 25 per cent of the population is located north of the creek while the remaining 75 per cent reside on the south side.

In general the economy of the village is based on retail outlets and services. A Canadian Pacific Railways joins the municipality with Goderich and Milverton. Highway #4 passes through the village and links it with Wingham and Clinton.

The entire area is underlain by the Norfolk formation which consists of grey, brownish-grey and brown, crystalline to fine grained limestone, magnesian limestone and dolomite in fairly even beds varying in thickness. The bedrock is covered by a medium-textured till to a depth averaging 100 ft. The overburden belongs to the Grey-Brown Podzolic great soil group. The topography throughout the village is strongly rolling and the soil is generally slightly stony Harriston loam which is well drained and fairly well supplied with plant nutrients.

II WATER USES

1. Municipal Water System

A 244 ft. deep drilled well located in the southern portion of the village serves as the source of supply. A Boller

Land vertical turbine pump rated at 8000 gph at a pressure of 70 psi transfers water to a 70,000 gallon capacity wooden reservoir. The untreated water is then pumped by a Smart-Turner horizontal centrifugal pump rated at 150 USgpm at a head of 50 psi to a 1200 gallon capacity pressure tank which serves the distribution system. Additional equipment consists of a 500 gpm Smart-Turner standby pump and a 500 gpm Babcock-Wilcox fire pump, each being driven by a gasoline engine.

The distribution system consists of 1.75 miles of 6 inch diameter cast iron main and 2000 ft. of 4 inch diameter cast iron main. There are about 180 residential, commercial, and industrial services in the municipality. Because of a lack of metering equipment at the water works, no consumption data is available.

2. Private Water Systems

At present there are 3 private water systems in operation which serve a total population of approximately 40 persons. The number of private systems has been decreasing over the years because of problems with mechanical equipment, with the result that consumers have subsequently made connection to the municipal water distribution system.

There is an elevated tank located within the municipality but it only serves the C.P.R. station and receives water from a well owned by Bainton Limited.

3. Recreational Water Uses

The Blyth Creek is not used substantially for recreation due to its limited size. Thus boating, swimming, and fishing are not practised to any degree.

4. Agricultural Uses

The Blyth Creek originates in farmlands to the east of the village in the Township of Morris and flows in a westerly direction through farmlands downstream of the municipality in the Townships of East Wawanosh, Hullett, and Colborne. Under these circumstances it can be assumed that the watercourse is used for cattle watering.

III WATER POLLUTION

1. Sanitary Waste Disposal

Domestic sewage disposal facilities consist of individual septic tanks and tile fields. The residential lots housing these septic tank systems have an approximate area of 0.20 acres. Since the Ontario Department of Health recommends at least 150 ft. of 18-inch wide trench and tile along with a minimum of 6 ft. of undisturbed earth between the trenches, it would appear that the lot areas available are sufficient for tile fields as long as single dwellings are situated thereon. However, in the closely built commercial area, sufficient space is not available for the installation of suitable tile fields. As a result it was reported that septic tanks need to be pumped out frequently.

The municipality is served by 4 separate storm sewers which all outfall into the Blyth Creek. These are the Code, Whitfield, New Queen Street, and Old Queen Street storm sewers. The Old Queen Street sewer is a 12-inch diameter glazed tile pipe on the west side of the street between King Street and the Blyth Creek. Several years ago when the highway was being repaired, a new 22-inch diameter storm sewer was placed on the east side of the road between King Street and the creek. Effluent was being discharged from all the storm sewers at the time of the survey and physical evidence indicated the presence of sewage in a few instances.

The results of laboratory analyses performed on samples collected during the survey are shown in a later portion of this report along with a map of the storm sewer system and sampling locations.

2. Industrial Wastes Disposal

The only source of industrial pollution is United Dairy Producers Co-operative, formerly known as United Dairy and Poultry Co-operative. Water for plant operations is obtained from a drilled well on the property and, if necessary, from the municipal system. The 156 ft. deep well was drilled in 1945 and test pumped at 60 gpm. Although an estimate of water consumption could not be made, it was reported that about 70 per cent of the water is employed for cooling purposes, whereas the remaining

30 per cent is used in wash-up operations.

Since the 1964 water pollution survey, cheese manufacture has ceased and the plant has only been used as a milk receiving station for the past three years. The milk received at the site is stored in large cooling vats until bulk carriers can transport it to a processing centre. The receiving station is in operation seven days a week and handles approximately 150,000 pounds of milk daily. The maximum and minimum amounts of milk received daily during the summer and winter were reported as 200,000 pounds and 80,000 pounds respectively.

Of the two cooling machines in operation, one discharges both cooling water and wash water to a septic tank. The second unit discharges only wash water to the tank while the cooling water bypasses it and is later combined with the tank effluent. The septic tank effluent flows in a ditch which empties into the Blyth Creek near the C.N.R. viaduct. Spray irrigation is employed between May 1 - October 31 annually and the spray area is approximately three acres.

The extent of pollution arising from operations at this creamery is discussed in a later section of this report.

3. Refuse Disposal

A refuse disposal site is located south-west of the village in the Township of Hullett. Domestic and industrial

refuse which is picked up weekly is burned at the site. No watercourse is in the vicinity of the dumpsite.

IV ANALYSES RESULTS

1. Terms

Coliforms per 100 ml

Coliform bacteria are commonly found in the intestinal tract of man and animals and in the fecal discharges from these sources. In polluted water their concentration is roughly proportional to the degree of sewage contamination present. The objective for natural waters is a concentration of not more than 2400 organisms per 100 millilitres.

Biochemical Oxygen Demand

The Biochemical Oxygen Demand (BOD) is a measure of the amount of oxygen required for the stabilization of decomposable organic matter present in sewage. OWRC objectives allow concentrations in natural waters and waste discharges of no greater than 4.0 and 15.0 parts per million (ppm) respectively.

Alkylbenzene Sulphonate

Alkylbenzene Sulphonate (ABS) is a surfactant extensively used in detergents and so is present in domestic sewage at levels averaging about 10 parts per million (ppm). Rivers usually average about 0.1 ppm or less and ground waters range from zero to several parts per million depending upon their proximity to sewage entry points.

2. Discussion

Table I, appended to this report, provides a summary of the results of the chemical analysis and bacteriological examination of the samples collected during the survey.

BOD, ABS and coliform concentrations in the New Queen Street and Old Queen Street storm sewers were sufficient to indicate the presence of domestic sewage. The inadequacy of septic tank systems in the commercial area through which these two sewers pass was thus emphasized. As regards the effluent from the milk receiving station, pollutants were of substantial strength to severely contaminate the watercourse.

V PROPOSED SEWAGE WORKS

In 1960 a preliminary report for a sanitary sewage system was prepared by Proctor and Redfern, Consulting Engineers. The proposal called for the construction of a complete municipal sanitary sewer system along with a pumping station, 6-inch diameter forcemain, and a 19 acre lagoon. A referendum was taken in May 1963, with the result that the project was rejected. Apparently the residents felt that the municipality was unable to finance the proposed sewage works. The original cost estimate was about \$180,000 and it assumed that Bainton Limited and United Dairy Producers Co-operative would benefit from these facilities.

However, with the cessation of cheese making operations by the United Dairy Producers Co-operative and the re-location of

Bainton Limited, a lower expenditure for adequate sewage works should be realized. In addition, it appears that problems with municipal sewage disposal are limited to the west side of Queen Street from King Street to Drummond Street. The relatively high water table causes saturation of the land in this area of the village. Perhaps the Old Queen Street storm sewer could be used to accept wastes from this area (approximately 50 services) and convey the same to a proposed pumping station which is to be located at the creek. The waste water could then be pumped to a lagoon of a few acres in size. This could be the first stage of a multi-staged programme that would ultimately encompass the entire village.

The only other area of major concern is the industrial waste disposal facilities at the milk receiving station. Since spray irrigation cannot be used as an effective means of disposal during the winter months, any revised proposal involving sewage treatment facilities for the municipality should include year-round treatment for these industrial wastewaters.

SUMMARY

On February 20, 1969 a water pollution survey was conducted in the Village of Blyth. The results indicate that domestic wastes from the commercial area were gaining access to municipal storm sewers. In addition, industrial wastes from the United Dairy Producers Co-operative were continuing to be a source of contamination to the creek.

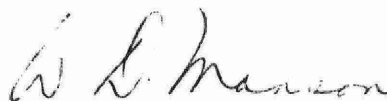
Since domestic and industrial waste loadings from the municipality have changed from the time of the previous pollution survey, it would appear that the sewage treatment requirements outlined in the 1960 consulting engineers report should be updated and revised to meet present needs.

VII RECOMMENDATION

It is recommended that a consulting engineer be retained to update and estimate the cost of sewage treatment requirements for the commercial area and the milk receiving station.

mj

Prepared by:

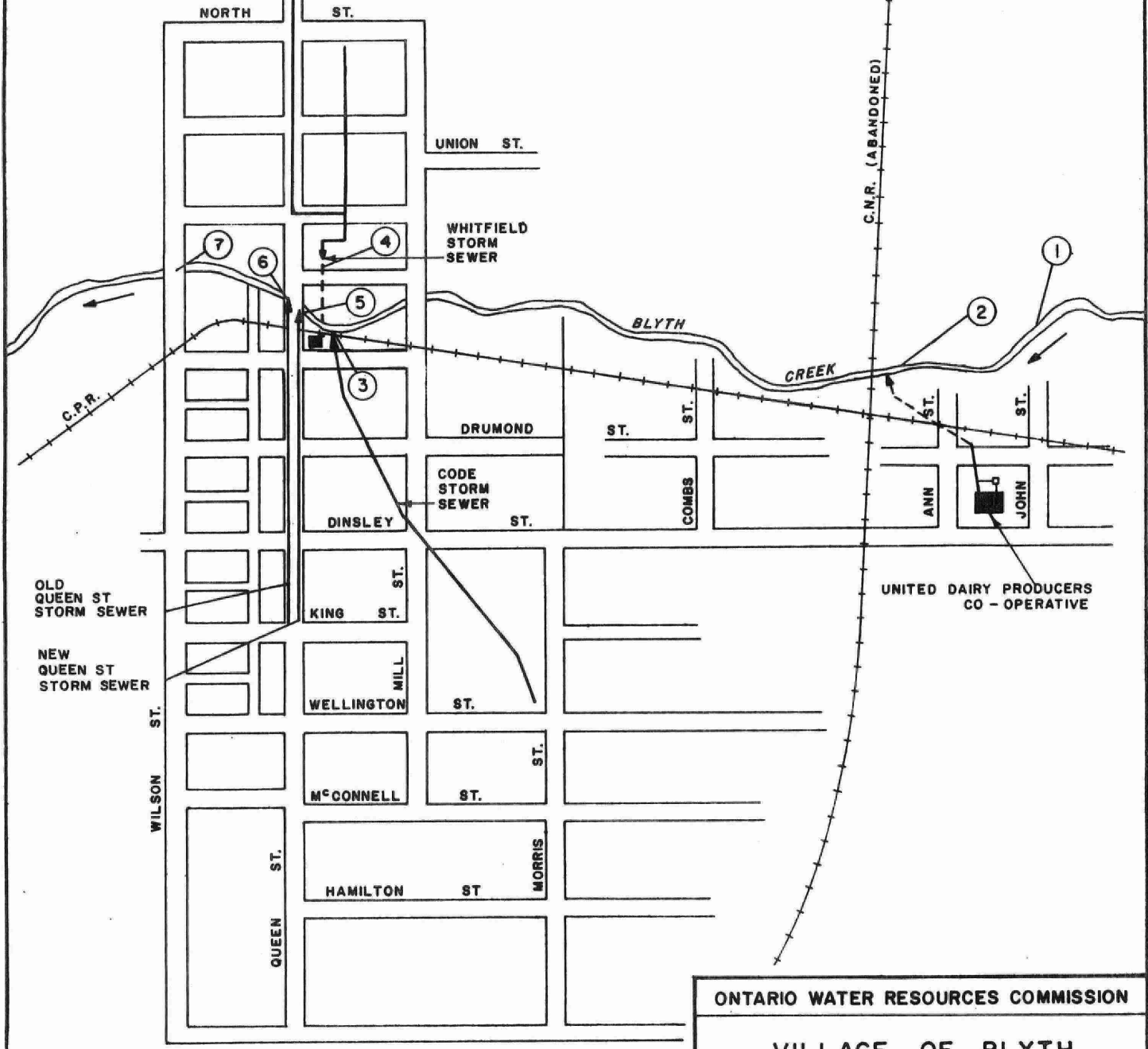


W. D. Manson, Engineer
Division of Sanitary Engineering

TABLE I

VILLAGE OF BLYTH
WATER POLLUTION SURVEY
SEWAGE ANALYSIS RESULTS

DATE 1969	SAMPLING POINT NUMBER	DESCRIPTION	5-DAY BOD	ANIONIC DETERGENTS		SOLIDS			COLIFORMS PER 100 ml	ESTIMATED FLOW (GPH)
				AS	ABS	TOTAL	SUSPENDED	DISSOLVED		
Feb.20	1	Blyth Creek 300 ft. east of CNR viaduct	0.6	0.6	380	5	375	36	-	
"	2	Effluent ditch from United Dairy Producers Co-operative	110	1.0	790	70	720	210,000	-	
"	3	24-inch diameter out- fall from Code storm sewer	3.0	0.4	720	5	715	10,800	-	
"	4	Whitfield storm ditch	1.4	0.0	480	20	460	1,600	-	
"	5	18-inch diameter out- fall from New Queen St. storm sewer	36	0.9	4830	170	4660	120,000	490	
"	6	16-inch diameter out- fall from Old Queen St. storm sewer	14	1.4	840	30	810	140,000	204	
"	7	Blyth Creek downstream of village	0.4	0.0	380	10	370	2,000	-	



LEGEND

- ← STORM SEWER OUTFALL
- - - OPEN DITCH
- ⑤ - SAMPLING POINTS

ONTARIO WATER RESOURCES COMMISSION	
VILLAGE OF BLYTH	
WATER POLLUTION SURVEY	
1968	
SCALE: 1" = 50,000' (APPROX.)	
DRAWN BY: A.R.S.	DATE: AUG. 1963
CHECKED BY: R.N.D.	DRAWING N ^o : 63-202



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