THE

ONTARIO WATER RESOURCES

COMMISSION

INDUSTRIAL WASTE SURVEY

of the

TOWN OF BRAMPTON

and the

SUB-DIVISION OF BRAMALEA

April, 1965

A

REPORT

on

AN INDUSTRIAL WASTE SURVEY OF THE TOWN OF BRAMPTON

and

THE SUB-DIVISION OF BRAMALEA

April, 1965.

by

Division of Industrial Wastes

ONTARIO WATER RESOURCES COMMISSION

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AN INDUSTRIAL WASTE SURVEY OF THE TOWN OF BRAMPTON AND THE SUB-DIVISION OF BRAMALEA

April, 1965

INTRODUCTION

The Town of Brampton was first surveyed by the OWRC in 1957, and again in 1961 in conjunction with the adjoining sub-division of Bramalea, following the construction of the OWRC sewage treatment plant.

Since that time it has become increasingly apparent that the combined capacity of this plant and the old municipal plant in Brampton is inadequate to treat the waste load received from this urban and industrial area.

The purpose of this survey has been to review the data originally collected in 1957 and 1961, and to investigate new industries located in Brampton and Bramalea since 1961. Emphasis has been placed on those industries discharging high organic or hydraulic loadings to the sanitary sewers which may contribute disproportionately to the overloading of the municipal treatment facilities.

WATER SUPPLY

All industries in Brampton obtain their water from the Brampton municipal system while those in Bramalea are supplied from the Chinguacousy Township system.

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The sources of supply for both these municipal systems are drilled wells located within the boundaries of Chinguacousy Township. The Town of Brampton has recently drilled a new well in the Huttonsville area which, it is hoped, will relieve serious water shortages during periods of drought and peak demand. There is also an emergency connection from Heart Lake to the town distribution system.

During 1964 the Town of Brampton showed an average daily water consumption figure of 2.15 million gallons which is an increase of approximately 0.5 mgd over that of 1961.

During the same period the sub-division of Bramalea consumed an average of 581,000 gallons daily. It should be noted that Bramalea is a rapidly expanding community so that current water consumption is probably in excess of the 1964 daily average and is likely to increase further.

Thus, the total water consumption for Brampton and Bramalea is in the order of 2.7 million gallons per day. The industrial water consumption included in the above is approximately 1.5 million gallons per day of which 300,000 gallons per day is used by (1) greenhouses in Brampton for irrigation purposes and (2) for domestic use at the Ontario Training Centre. Also included in the total industrial water consumption is approximately 300,000 gallons per day of cooling water which are discharged to the municipal storm sewers or surface waters in the area. Therefore, the total volume of waste discharged to the municipal treatment facilities is in the order of 2.2 million gallons per day of which approximately one-third is of industrial orgin.

SEWAGE TREATMENT

In the Town of Brampton, wastes are collected in combined and sanitary sewers. The west section of the town discharges to the old sewage treatment plant (design capacity 0.8 mgd) owned and operated by the Town of Brampton on Main Street South. The overflow from this plant discharges to the 2 mgd OWRC plant on Second Line East via the west branch sewer. The eastern section of town including the main industrial section is serviced by the east branch sewer which also discharges to the OWRC plant. The sub-division of Bramalea and sections of Chinguacousy Township are also serviced by combined and sanitary sewers which discharge to the OWRC plant via the Bramalea Line.

Both plants are of the activated sludge type providing primary settling with sludge digestion of the settled solids and secondary or biological treatment of the primary effluent. The final effluents after chlorination are discharged to the west branch of Etobicke Creek.

The processes which are susceptable to interference by toxic materials present in certain industrial wastes are the sludge digestion operations and biological oxidation. These processes must be protected from such materials in order to ensure the continued growth and survival of microscopic organisms responsible for the biological activity. The mechanical equipment of the sewerage system must also be protected from corrosive chemicals present in certain industrial wastes, and at the same time industrial discharges must not present a danger to the health of sewerage system workers.

Brampton By-law 1572 regulates the use of public drains and sewers and describes the conditions and penalties that are intended to ensure the protection of the sewerage system and its personnel.

During the period January 28 to March 24, 1965, weekly composite samples of the three main sewers discharging to the OWRC plant were taken for analysis for BOD and solids.

The results of these analyses are summarized as follows:--

	BOD - ppm			SUSPENDED SOLIDS - ppm		
	Max.	Min.	Avg.	Max.	Min.	Avg.
Raw Sewage East Line	860	310	524	730	340	523
Raw Sewage West Line	390	220	286	644	244	422
Raw Sewage Bramalea Line	310	106	202	402	159	240
Raw Sewage Combined	680	250	378	674	280	437

These results indicate the extent of the overloading of the OWRC plant in terms of BOD and suspended solids and that the main source of this overloading is from the East Line.

At the same time analyses for zinc and chromium were carried out on certain of these samples. The results of these analyses show a consistently high concentration of chromium in the West Line and a similarly high concentration of zinc in the East Line and the Bramalea Line.

This situation is further aggravated by the flows from Brampton and Bramalea to the OWRC plant which during 1964 were as follows:--

Month	Brampton Avg. (mgd)	Bramalea Avg. (mgd)	Avg. Total Flow (mgd)	Avg. Total Max. (mgd)
January	1.39	0.61	2.00	4.1
February	1.28	0.52	1.80	4.2
March	1.51	0.69	2.20	3.7
April	1.72	0.68	2.40	4.4
May	1.76	0.54	2.30	4.2
June	1.83	0.47	2.30	4.4
July	1.77	0.53	2.30	4.6
August	1.68	0.52	2.20	4.4
September	1.71	0.49	2.20	4.6
October	1.32	0.68	2.00	4.6
November	--	--	2.40	4.8
December	--	--	--	--
Average for year	1.60	0.57	2.20	4.4

Peak flows occur on most days in the order of 4-5 mgd during an 8-10 hour period when waste strength in terms of BOD and suspended solids are at a maximum. This results in a very poor quality final effluent being discharged to the west branch of Etobicoke Creek in conjunction with raw sewage which the plant is unable to treat at times of peak flow.

It is therefore evident that if the sources of this overloading can be detected and minimized or eliminated, the final effluent quality can be improved and the pollution of Etobicoke Creek considerably reduced.

CONDUCT OF THE SURVEY

The previous municipal surveys of Brampton and Bramalea and subsequent follow-up work by the Industrial Wastes Division of the OWRC have indicated a number of industries discharging concentrated wastes which may adversely effect the efficient operation of the municipal treatment facilities. During the present survey emphasis was placed on these known problem industries while the other industries investigated in the 1961 survey were reviewed in less detail, except where changes in operating procedures or water consumption indicated significant increases in the volume and strength of wastes discharged to the municipal sanitary sewers. New industries not included in the 1961 data were also investigated in some detail where the type of process or water consumption indicated a significant source of industrial waste.

Data included in this report were obtained by interview with company personnel and from the collection and analyses of effluent samples. All samples were submitted to the OWRC laboratory for analysis in accordance with the procedures described in the American Public Health Association "Methods for the Examination of Water and Waste Water" eleventh edition.

Water consumption data were supplied by the Brampton Water Commission and by the Chinguacousy Township Engineering Department.

SUMMARY

Approximately two-thirds of all the industries in Brampton and Bramalea have no wet processing and discharge only sanitary wastes to the municipal sewerage system. Others discharge only negligible quantities of cooling or wash waters. Those industries contributing wastes high in volume and/or strength are covered in individual industrial reports which are appended.

Industries using significant quantities of cooling water in almost all cases discharge this uncontaminated water to the municipal storm sewers or surface waters in the area. It appears that poorly segregated industrial wastes are not a significant factor in the hydraulic overloading of the municipal treatment facilities.

During 1964, an average daily flow of 2.2 million gallons was received at the OWRC sewage treatment plant in Brampton and approximately 0.8 million gallons per day at the old municipal plant. Thus a total waste flow of 3 million gallons per day was received from Brampton and Bramalea.

The total volume of water supplied to Brampton and Bramalea by the respective municipal water commissions was 2.73 million gallons per day of which 2.18 million gallons were discharged to the municipal sanitary sewers during the same period. Thus, based on the average daily water consumption of Brampton and Bramalea, no hydraulic overloading should exist in the municipal treatment facilities. The difference between the sewered waste volume and the total waste flow received at the municipal treatment facilities is in the order of 0.8 million gallons per day which is most likely attributable to infiltration into the sewers of ground water and storm water from combined sewers.

This is further emphasized by the fact that waste flows to the municipal treatment facilities are computed on an average daily basis from a statistical analysis of the daily flow charts at the treatment plant. Peak flows considerably in excess of the 2.2 million gallons per day (average flow for the OWRC plant) are frequently experienced indicating that the extent of the hydraulic overloading is much greater than the above data would suggest.

This matter should be investigated further, and where possible sources of infiltration eliminated before further expansion of the municipal treatment facilities is initiated. It is certain that expansion will be needed in the near future as rapid urban development in and around Brampton is continuing.

The industries contributing significantly to the industrial organic loading on the municipal treatment facilities are shown in Table I.

TABLE I - PRINCIPAL INDUSTRIAL WASTE LOADINGS IN TERMS OF BOD AND SUSPENDED SOLIDS AND THEIR RELATED POPULATION EQUIVALENTS.

NAME	BOD lbs/day	POP. EQUIV.	SUSP. SOLIDS lbs/day	POP. EQUIV.
American Motors	254	1,520	242	1,210
Brampton Poultry	2,872	17,200	1,163	5,815
Gerry Lewis	188	1,125	419	2,095
General Latex	9	53	116	580
T. J. Lipton	134	803	--	--
Gummed Papers	47	282	18	90

Wastes from Brampton Poultry Ltd. represent approximately 90 per cent of this loading in terms of BOD and 60 per cent in terms of suspended solids. It is unlikely that this waste strength will be reduced significantly without the installation of extensive pretreatment facilities by the company. The recovery of blood may result in a 10 per cent reduction in the BOD loading but further reductions can only be achieved by the efficient removal of suspended solids, fat and grease. Due to the poor settling characteristics of these wastes, this would require more complex equipment than a simple settling

tank. The Town of Brampton may insist that this degree of pretreatment be a prerequisite for the continued acceptance of this company's wastes into the municipal sewerage system, or may elect to impose a surcharge to cover the extra treatment costs being incurred. It is suggested that the municipality and the company reach an agreement outlining the conditions under which the municipality will continue to treat this company's wastes.

The effluent quality from the Gerry Lewis leather tannery continues to be characteristic of this type of industry (high BOD and suspended solids), and as in 1961, the effectiveness of the pretreatment facilities installed by the company depends to a large extent on regular maintenance.

The batch dumps of paint spray booths and cleaners at the American Motors plant are the principal sources of the BOD loading from this plant apart from sanitary wastes. These operations continue to be carried out during the night shift when the loading on the municipal treatment facilities is at a minimum, and for this reason there should be no adverse effects.

It was difficult to assess precisely the BOD loading from the T. J. Lipton plant due to the absence of accessible sampling locations. However, an estimate was obtained from the analyses of wastes from a similar plant in Quebec and from the company's original estimate prior to the construction of the Bramalea plant. From this data it appears likely that the BOD loading from this plant will have no adverse effects on the municipal treatment facilities.

Industries discharging wastes to the sanitary sewer which may be harmful to the biological processes at the municipal treatment facilities are contained in Table II with their respective waste loadings in pounds per day.

TABLE II - PRINCIPAL SOURCES OF TOXIC WASTES AND THEIR RESPECTIVE WASTE LOADINGS

NAME	CHROMIUM lbs/day	ZINC lbs/day	COPPER lbs/day	CYANIDE lbs/day
American Motors Ltd.	4.6	4.0	---	---
Canada Ferro Ltd.	----	1.0	---	0.14
Gerry Lewis Ltd.	7.9	---	---	---
Union Screen Plate Ltd.	3.0	---	0.17	0
Northern Electric Co. Ltd.	0.1	1.4	0.1	0.5

Wastes from the American Motors Plant contain significant quantities of chromium and zinc. These result from the continuous rinses on the bonderizing line and from the periodic dumping of a spent chromate sealer solution after treatment to reduce the chromium to the trivalent state and precipitate it. Due to the overloaded conditions at the municipal treatment facilities, it is difficult to assess the cumulative effects of this company's effluent, and those from the other industries discharging chromium bearing wastes. With the exception of Union Screen Plate Company Limited, all these industries treat their wastes for the reduction and/or precipitation of chromium. It is recommended that Union Screen Plate Company Limited treat their wastes in a similar manner.

A reduction in the waste loading in terms of chromium from the Gerry Lewis Tannery could likely be achieved by more regular cleaning of the settling pits since chromium would then be removed in the form of suspended solids.

In the event that adverse conditions attributable to chromium are encountered at the municipal treatment facilities, those industries discharging chromium as the precipitated hydroxide should remove this material from their effluents by sedimentation or filtration.

Waste treatment facilities in operation at the Canada Ferro and Northern Electric Company's plants appear to be successful in reducing concentrations of toxic ions to acceptable levels for discharge to the municipal sanitary sewers.

Two industries in Brampton discharge significant quantities of industrial wastes directly to surface waters.

Iko Asphalt Roofing Company Limited discharges approximately 28,000 gpd of cooling water to a storm ditch adjacent to their property. The company intends to re-use this water in its pulping operation for the manufacture of felt paper.

Brampton Optical Company Limited discharges 30,000 gpd of lens polishing wastes, containing large quantities of abrasive and having a significant BOD, to the west branch of Etobicoke Creek. A series of three small settling basins are designed to remove suspended solids from this effluent. However, solids removal is not being successfully carried out, and in view of the BOD of this waste treatment in the municipal treatment facilities would appear to be the obvious solution to this problem, provided adequate solids removal efficiency can be achieved (300 ppm in the final effluent).

The remaining industries covered in the appendix of this report consist largely of small secondary industries, discharging small quantities of cooling or wash waters, and not included in previous surveys. No adverse conditions should result from these companies' operations.

AMERICAN MOTORS LTD. - BRAMPTON

American Motors Ltd., located on Kennedy Road, manufactures the "Rambler" line of automobiles. The plant currently manufactures 164 units per day and has recently expanded operations to include engine assembly.

DETAILS OF SURVEY

Personnel interviewed	-	Mr. A. Trueman, Facilities Engineer
Number of employees	-	Plant - 1,700 - Office - 275
Operating schedule	-	2 x 8 1/2 hour production shifts per day 5 days per week - 1 x 8 hour maintenance night shift 6 days per week
Production volume	-	164 units per day
Water consumption	-	Sanitary and domestic - 60,000 gpd - Bonderizer rinses - 50,000 gpd - Cooling - 60,000 gpd - Wet sanding and washing - 18,000 gpd - Maintenance clean-up - 50,000 gpd 238,000 gpd

MANUFACTURING PROCESSES AND SOURCES OF WASTES

The plant is essentially engaged in the assembly and finishing of automobiles from basic parts manufactured elsewhere. The various stages in manufacturing and their attendant sources of wastes may be summarized as follows:

Body Assembly

The body-chassis units are assembled and spot-welded together from parts received at the plant pre-formed and cut to the correct size and shape. This operation produces very little contaminated waste water since cooling water used in the welding

machines is softened and continuously recycled, extra water only being added periodically by a thermostatically controlled valve to maintain a desired temperature. However, regeneration of the water softening unit will produce a small volume of waste high in suspended solids and chlorides which is discharged to the Steeles Avenue storm sewer together with overflow cooling water.

Following the assembly of the body-chassis units, lead or solder is applied in certain areas to produce a desirable contour and minor cracks and imperfections are filled with plastic filler. At the same time, sound deadening coatings are applied to the body interior.

No contaminated waste waters are produced from these operations.

Bonderizing

After rough sanding, the assembled body-chassis units are treated for rust protection in a series of tanks into which they are immersed and sprayed with the following solutions:

Tank #1	Alkali Cleaner
Tank #2	Alkali Cleaner
Tank #3	Running Rinse
Tank #4	Zinc Phosphate
Tank #5	Running Rinse
Tank #6	Chromium Sealer

Wastes from this operation are the running rinses and the periodic dumping of spent solutions which are all discharged to the sanitary sewer.

All tank cleaning and dumping of spent solutions is carried out during the night shift when no manufacturing is in progress.

The approximate volume and dumping schedule of the various spent solutions may be summarized as follows:

Tank #1 - 10,000 gallons dumped every 6 weeks
Tank #2 - 5,000 gallons dumped every 6 weeks
Tank #3 - 5,000 gallons dumped every week
Tank #4 - 5,000 gallons never dumped. This tank has a continuous sludge draw-off for the removal of settled solids which are land dumped. However, it is occasionally necessary to clean this tank and during this operation the solution is pumped to another tank where solids are allowed to settle. After cleaning, the clean supernatant is returned to the process tank and the settled sludge land dumped.
Tank #5 - 5,000 gallons. This is dumped every two days in conjunction with Tank #6.
Tank #6 - 5,000 gallons dumped every two days after treatment with sodium bisulphite and soda ash to reduce and precipitate chromium as chromium hydroxide.

The only other use of water in the bonderizing process is a small deionized water spray following treatment in the chromium sealer which serves to rinse the assembly line racks and as make-up for the chromium tank.

Painting

The bonderized body-chassis units are hot-air dried and then dipped to the roof line in an epoxy based primer. After baking, this finish is wet sanded and washed with deionized water before the second primer and colour coats are applied. Wet sanding and wash waters are discharged to the sanitary sewer. The deionizer is regenerated after approximately 20,000 gallons of town water have been treated. This is carried out by passing hydrochloric acid and sodium hydroxide solutions through the unit. The waste acid and alkali are confined in a holding tank to allow neutralization to take place before discharge to the sanitary sewer.

The second primer, the first colour, the interior colour and the second colour are applied in water-walled paint spray booths. These are skimmed every night and the sludge land dumped. A surface active material is added to the water in the spray booths to prevent coagulation of the paint.

The approximate volumes and dumping schedule of the respective paint spray booths to the sanitary sewer is as follows:

Second primer	6,700 gallons dumped every 6 weeks
First colour	8,600 gallons dumped every 6 weeks
Interior colour	3,900 gallons dumped every 6 weeks
Second colour	12,800 gallons dumped every 6 weeks

Following painting, the various suspension fixtures, bright trim, instrument panel, and wiring are applied to the finished body. These operations produce no contaminated waste waters.

Leak Testing

Leak testing of the bodies follows and this is carried out by subjecting the bodies to high pressure jets of water. This water is continuously recycled from a 300 gallon tank which is dumped every two weeks to the storm sewer.

Upholstery

Application of interior trim and upholstery uses very little water except for a small 10 hp boiler which is used to generate steam for the shrinking of upholstery fabrics.

Engine Assembly

After upholstery the power train and running gear are attached to the completed body-chassis unit.

The assembly of engines is carried out in a separate plant. The basic units such as blocks, crankshafts, cylinder heads, torque convertors, pistons etc. are received at the plant ready for assembly. These are cleaned prior to assembly in a two-stage unit. Wastes from this unit consist of the spent solutions which are dumped every two weeks to the sanitary sewer.

The balancing and assembly of engines produces no contaminated waste waters. However, a small water-walled paint spray booth is used to finish assembled engines and this is dumped every month. Also, a compressor for air powered tools discharges a small volume of cooling water to the sanitary sewer.

The testing of engines uses cooling water which is continuously recycled and uses only make-up for temperature control.

The company plans to install a dynamometer test unit in the near future which will use a small quantity of cooling water. At the request of the Brampton Works Department, a baffled separator has been installed in preparation for this unit so that the possibility of loss of gasoline or oil to the town sewers is eliminated.

Space is available for the expansion of operations at this plant to include the machining and finishing of engine parts from rough castings but this is not contemplated in the near future.

SAMPLING

Since no production is in progress during the night shift composite samples representing the total plant effluents to the sanitary and storm sewers between the periods 10 a.m. to 4 p.m. were taken by combining samples of these effluents taken at 30 minute intervals.

At the same time a number of grab samples of batch discharges of spent solutions from the bonderizing and engine parts cleaning operations and from the respective paint spray booths were taken by company personnel.

These were submitted to the OWRC Laboratory for analysis for BOD, solids, pH, COD, acidity, alkalinity, chromium and zinc.

ANALYTICAL RESULTS

See pages 18, 19, and 20.

ONTARIO WASTER RESOURCES SOMMISSION
CHEMICAL LABORATORIES

All analysis except pH reported in ppm unless otherwise indicated

INDUSTRIAL WASTE ANALYSIS

Municipality: Brampton Report to: D. P. Caplice*

Source: American Motors Ltd.

Date samples: Feb. 16/65 by: R. A. Abbott

Lab. No.	5-Day BOD	Solids			pH at Lab.	Alka-linity as $CaCO_3$	Acidity as $CaCO_3$	Total Chrome as Cr	Hex. Chrome as Cr	Zinc as Zn	Iron as Fe
		Total	Susp.	Diss.							
T 183	122.	672	45	627	7.4	272	-	0.6	0.4	2.2	0.78
T 184	2.2	596	14	582	8.1	292	-	-	-	-	0.62
T 185	4.4	740	31	709	7.4	284	-	0.0	0.0	6.2	0.52
T 186	2.0	636	30	606	7.7	244	-	1.0	0.6	5.4	2.70
T 187	-	1988	590	1398	9.5	464	-	135.	12.0	-	11.2

T 183	1.	Sanitary Sewer Effluent Composite (30 mins.) 1030 - 1600 hrs.
T 184	2.	Storm Sewer Effluent Composite (30 mins.) 1030 - 1600 hrs.
T 185	3.	#3 Rinse Grab Sample 330 PM.
T 186	4.	#5 Rinse Grab Sample 300 PM.
T 187	5.	Chrome Sealer after Treatment Grab Sample Thurs. Evening.

All analysis except pH reported in ppm unless otherwise indicated

ONTARIO WATER RESOURCES COMMISSION
CHEMICAL LABORATORIES

INDUSTRIAL WASTE ANALYSIS

Municipality: Brampton Report to: H. A. Clarke

Source: American Motors Ltd.

Date Sampled: See below by:

Lab. No.	5-Day BOD	Solids			pH at Lab.	Phenols in ppb	Phosphate as PO_4	Ether Solubles	COD
		Total	Susp.	Diss.					
T 400	1400.	31252	26450	4802	8.9	75	-	-	7600
T 401	56.	2654	356	2298	8.6	-	1200.	-	1386
T 402	2000.	7660	476	7184	8.4	650	-	-	5417
T 403	-	20440	12572	7868	-	-	-	5550	-
T 404	-	4308	***	***	-	-	-	1080	-
T 405	1300.	-	-	-	**	2250	-	-	808

*** Sample exhausted, test could not be performed.

** Sample broken in lab. accident.

T 400	1.	#1 tank - alkali cleaner)		March 5/65.
T 401	2.	#2 tank - alkali cleaner)	#1 Plant	March 5/65.
T 402	3.	1st colour spray booth)		March 21/65.
T 403	4.	#1 tank - spray washer - March 15/65)		
T 404	5.	#2 tank - spray washer - March 10/65)		Engine assembly plant.
T 405	6.	Paint spray booth - March 10/65)		

ONTARIO WATER RESOURCES COMMISSION
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All analysis except pH reported in ppm unless otherwise indicated

INDUSTRIAL WASTE ANALYSIS

Lab. No.	5-Day BOD	Solids			pH at Lab.	Alkalinity as $CaCO_3$	Acidity as $CaCO_3$	Total Chromium
		Total	Susp.	Diss.				
T-414	340.	3200	828	2372	8.1	751	---	52.
T-415	2700.	13708	12592	1116	9.2	5500	---	---

T-414	1.	Primer Paint Spray Booth - Grab Sample 2.00 p.m.
T-415	2.	Final Colour Spray Booth - Grab Sample 2.00 p.m.

DISCUSSION OF FINDINGS

The analytical results of the samples from the running rinses on the bonderizing unit and the sanitary sewer effluent indicate that whilst manufacturing is in progress wastes from this plant should have no adverse effects on the municipal sewerage system.

The analysis of the spent solutions indicate that large concentrations of organic material and chromium are discharged during the night shift. In the majority of cases this does not appear to be critical since these solutions are discharged at infrequent intervals and at a time when the loading on the municipal sewerage system is at a minimum. Spent chromate sealer receives only partial treatment by additions of sodium besulphite and soda ash before discharge. This reduces chromium to the trivalent state and precipitates trivalent chromium as the hydroxide but does not reduce the total loading of chromium discharged which is in the order of three pounds per day.

Wastes from the new engine assembly plant do not appear to be excessive since they consist of infrequent batch discharges of alkali cleaners and paint spray booth water which should have no adverse effects on the municipal sewerage system.

CONCLUSIONS AND RECOMMENDATIONS

The major sources of BOD, COD, and chromium from this plant are the periodic dumps of spent solutions and paint spray booths.

The treatment and disposal of spent chromate sealer may be cause for some concern in that no facilities are available for the removal of chromium hydroxide floc. However, no adverse biological conditions have been encountered at the municipal treatment facilities despite present overload conditions. Consideration should be given to the installation of a settling tank or filter for the complete removal of chromium hydroxide.

BRAMPTON OPTICAL

This plant located on George Street North in Brampton produces optical lenses.

DETAILS OF SURVEY

Personnel interviewed	-	Mr. Hore, Plant Foreman
Number of employees	-	70
Operating schedule	-	Eight hours per day, five days per week
Water consumption	-	Sanitary - 2,000 gpd
	-	Process - 30,000 gpd

PROCESS

Lens are cut to shape from optical glass and ground with emery. The lens are then polished with an aqueous suspension of cerium oxide which contains approximately 25 pounds of the oxide in 45 gallons of water. Following polishing the lens are rinsed in open troughs. These rinses are contained and at the end of the day solids are removed and the effluent drained to the plant sewers.

Polishing wastes are carried by covered channels from which they are pumped to a series of three small settling basins. The effluent from these basins discharges to a storm drain and ultimately to the west branch of Etobicoke Creek.

SAMPLING

The plant was visited on March 9th, 1965, and a sample of the effluent from the final settling basin obtained. This was submitted to the OWRC Laboratory for analysis for BOD, pH, and solids.

ANALYTICAL RESULTS

See page 24.

All analysis except pH reported in ppm unless otherwise indicated

ONTARIO WATER RESOURCES COMMISSION
CHEMICAL LABORATORIES

INDUSTRIAL WASTE ANALYSIS

Municipality: Brampton Report to: D. Tolson*

Source: Brampton Optical Co. Ltd.

Date Sampled: March 9/65 by: D. Tolson and M. Zachanko

Lab. No.	5-Day BOD	Solids			pH at Lab.
		Total	Susp.	Diss.	
T 314	120.	4524	3616	908	9.3

T 314 1. Total Effluent from Final Settling Basin - Grab - 11:30 a.m.

DISCUSSION OF FINDINGS

According to Mr. Hore the settling basins are cleaned out once per week. However, at the time of the survey they were full and little or no settling was being achieved. This is verified by the analytical results of the effluent sample which is high in suspended solids (3616 ppm). At the same time, the BOD of 120 ppm is in excess of OWRC objectives for discharge to a natural watercourse and suggests that these wastes should be discharged to the municipal treatment facilities.

CONCLUSIONS AND RECOMMENDATIONS

As in 1961, the major problem with this company's wastes are the large amounts of suspended solids being discharged to the municipal storm sewer. The problem of discolouration of Etobicoke Creek has been eliminated by the replacement of jewellers rouge with a white metallic oxide. However, the presence of a high concentration of BOD in this effluent indicates the need for biological treatment.

It is therefore recommended that greater attention be maintained on the regular cleaning of the settling basins. At the same time, consideration should be given to the inclusion of these wastes into the municipal sanitary sewerage system, which is feasible provided the pretreatment facilities now in operation at this plant are operated satisfactorily.

BRAMPTON POULTRY LIMITED

This plant located on Kennedy Road is engaged in the processing and dressing of chickens. Since 1961, the number of birds processed has increased from 13,000 to a maximum of 24,000 per day.

DETAILS OF SURVEY

Personnel interviewed - Mr. D. McTaggert, Plant Superintendent

Number of employees - 92

Operating schedule - 9 hours per day
5 days per week

Production volume - 2,880 birds per hour maximum

Water consumption and distribution

- Sanitary and domestic		- 3,000 gpd
- Ice making (24,000 lbs/day)		- 5,000 gpd
- Eviscerating room	(new sump)	- 72,000 gpd
- Killing room, Receiving room	(old sump)	- 55,000 gpd
	Total	135,000 gpd

All volumes quoted above except total are estimates obtained by examination of the waste flows concerned and pipe diameters etc.

PLANT PROCESSES AND SOURCES OF WASTES

Receiving Room

Chickens are received in crates, from which they are removed and hung by the feet on an overhead conveyor. The crates are washed in an automatic unit and disinfected with formaldehyde. Wastes from this area consist of general floor washings and the overflow from the crate washer. The receiving room becomes covered with dirt and feathers which are shovelled up before the floor is hosed down. Solids retained in the crate washer are removed and land dumped at the end of the killing period.

Killing Room

The conveyor transports the birds to the killing room where they are stunned and killed with an electric knife. The birds are then scalded and dropped into an automatic defeathering machine. Wastes from this area consist of blood and rinse waters from the killing room, which is water walled, and feathers and rinse waters from the defeathering machine. The bulk of the feathers fall onto a rubber fingered conveyor from which they are collected in drums and sent to the town dump. At the end of the daily killing period, feathers and coagulated blood are shovelled up before hosing down. The hot scald tank is cleaned and dumped every night.

Eviscerating Room

After defeathering, the birds are placed on another conveyor and passed through a singeing operation and then flayed with rotating rubber fingers to remove any remaining feathers or loose skin. The birds then pass through the eviscerating process. The abdominal cavity is withdrawn by hand and unwanted viscera and heads dropped into a trough below the conveyor through which water is running continuously. Viscera such as livers and gizzards are separated by hand and conveyed via a separate trough to a chilling and washing process after which they are wrapped for eventual inclusion with the finished birds.

The other organs in the chest cavity are removed by vacuum. Finally the feet are cut off and the birds attached to a further conveyor which passes them through a washing and chilling tank prior to packing.

The remaining cutting and packing operations are essentially dry processes.

Waste Disposal

Wastes from the eviscerating room pass through an escalator-type mechanical screen where solids are removed either for sale as such or ground for pet food. The effluent from the mechanical screen passes through a grease separator to a sump which is screened by a fixed wire screen and a basket-type fine mesh screen. These screens are cleaned every hour.

Run-off from the area where solids removed by the mechanical screen are processed also discharges to this sump together with cooling water from a freezer.

Floor washings in the receiving area are discharged to another sump together with run-off from the eviscerating room and the killing area.

The effluents from both these sumps then discharge to the sanitary sewer.

SAMPLING

Samples were taken at 30 minute intervals of the following waste streams:

1. Evisceration area wastes before the mechanical screen

2. Evisceration area wastes after the mechanical screen

3. Combined evisceration area and receiving area wastes before discharge to the sanitary sewer.

These were combined to obtain composite samples representing operations between the hours 0930 hours to 1130 hours, and between 1230 hours and 1400 hours.

At the same time grab samples were taken of the killing area and receiving room wash-up wastes, evisceration area wash-up wastes before the mechanical screen and the combined killing area and chill room wastes.

These samples were submitted to the OWRC Laboratory for analysis for BOD, solids, and ether solubles.

ANALYTICAL RESULTS

See pages 30 and 31.

All analysis except pH reported in ppm unless otherwise indicated

ONTARIO WATER RESOURCES COMMISSION
CHEMICAL LABORATORIES

INDUSTRIAL WASTE ANALYSIS

Municipality: Brampton Report to: D. P. Caplice*

Source: Brampton Poultry Ltd.

Date Sampled: Feb. 24/65 by: R. A. Abbott

Lab. No.	5-Day BOD	Solids			pH at Lab.	Ether Solubles Supernatant	Ether Solubles on Solid Matter in Sample	
		Total	Susp.	Diss.				
T 221	700.	1444	684	760	7.0	420	231000	* Insufficient
T 222	3000.	2340	1684	656	7.0	151	*	solid portion
T 223	960.	1526	828	698	6.9	156	*	for test to be
T 224	2100.	3726	3052	674	6.9	173	537000	carried out.
T 225	540.	1140	496	644	7.2	20	259000	
T 226	1650.	2168	1076	1092	7.2	107	164000	
T 227	2300.	3654	1124	2530	6.9	65	29800	
T 228	360.	2008	1338	670	7.2	38	23600	

T 221	1.	Evisceration Area Wastes before mechanical screen - Composite 09.30 - 11.30.
T 222	2.	Evisceration Area Wastes after mechanical screen - Composite 09.30 - 11.30.
T 223	3.	Combined evisceration and receiving area Effluent - Composite 09.30 - 11.30.
T 224	4.	Evisceration Area Wastes before mechanical screen - Composite 12.30 - 2.00.
T 225	5.	Evisceration Area Wastes after mechanical screen - Composite 12.30 - 2.00.
T 226	6.	Combined evisceration and receiving area Effluent - Composite 12.30 - 2.00.
T 227	7.	Killing and receiving area wash-up wastes - Grab. - 2.30.
T 228	8.	Eviscerating Area wash-up before mechanical screen- Grab. - 2.30.

All analysis except pH reported in ppm unless otherwise indicated

ONTARIO WATER RESOURCES COMMISSION
CHEMICAL LABORATORIES

INDUSTRIAL WASTE ANALYSIS

Municipality: Brampton Report to: R. A. Abbott*

Source: Brampton Poultry Ltd.

Date Sampled: Apr. 28/65 by: R. A. Abbott

Lab. No.	5-Day BOD	Solids			Ether Solubles
		Total	Susp.	Diss.	
T-544	3600	3336	888	2448	61

T-544 1. Combined Killing Area and chill room wastes.

WASTE LOADINGS

The following table contains the analytical results of samples of the principal points of discharge to the sanitary sewer and the respective waste loadings in pounds per day based on the average daily water consumption.

		Old Sump	New Sump		Total
			a.m.	p.m.	
BOD	ppm	3,600	960	1,650	
	lbs/day	1,960	384	528	2,872
Suspended Solids	ppm	888	828	1,976	
	lbs/day	488	331	344	1,163
Ether Solubles	ppm	61	156	107	
	lbs/day	34	62	34	130
Flow gallons per day		55,000	72,000		

DISCUSSION OF FINDINGS

Waste loadings in terms of BOD and suspended solids from this plant are considerably in excess of those considered characteristic of this type of operation. A Technical Report of the U.S. Department of Health* states that loadings in the order of 40 lbs. BOD and 20 lbs. suspended solids per thousand birds processed are to be expected from poultry plants in which wastes are adequately screened but in which there is no recovery of blood. In comparison, this plant discharges waste loadings in the order of 160 lbs. BOD and 60 lbs. suspended solids per thousand birds processed.

* "Wastes From The Poultry Processing Industry" - The Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio - Technical Report W62-3, 1962.

Improvements in operating procedures and waste disposal practices should result in a reduction in the strength of wastes discharged to the municipal sewerage system. However, at the present time the plant is operating at near maximum capacity and has installed screening facilities which generally conform to accepted standards. Therefore, it appears that further improvements of these facilities are unlikely to substantially reduce waste loadings in terms of suspended solids.

The analytical results on pages 30 and 31 indicate that the major sources of high BOD wastes are the evisceration area and the killing room. A large proportion of this high BOD concentration can be attributed to blood which has a BOD in the order of 100,000 ppm.

It has been found that approximately 8 per cent of the body weight of chickens may be blood of which 70 per cent is drainable. In terms of BOD this represents approximately 15 lbs. BOD per thousand birds processed.

Thus efficient blood recovery at this plant could result in a BOD reduction of 300 lbs per day or greater than ten per cent of the present waste loading. However, this is unlikely to reduce the BOD concentration to less than the Brampton Sewer Use By-law requirement of 350 ppm maximum.

CONCLUSIONS AND RECOMMENDATIONS

Waste loadings from this plant in terms of BOD and suspended solids are equivalent to 17,200 and 5,810 persons respectively.

At the same time the total organic loading in terms of BOD represents a concentration of approximately 300 ppm in the East Branch sewer with an estimated flow of 1 mgd. This does not take into account the contribution of BOD from domestic sewage and other industrial sources or the fact that during periods of dry weather the flow in this sewer is likely to be considerably less than the estimated 1 mgd.

It therefore appears that this plant is the most likely source of high BOD loadings on the municipal sewerage system and in particular the East Line. A partial reduction in this loading may be possible to achieve by the installation of blood recovery facilities at this plant but it is unlikely that this company's wastes will meet the requirement of the Brampton Sewer-Use By-law.

The Town of Brampton may be prepared to accept this situation or may elect to impose a surcharge to cover the increased treatment costs.

It is therefore recommended that Brampton Poultry negotiate an agreement with the Town of Brampton, on the basis of this report, defining the requirements for the continued acceptance of this company's wastes into the municipal sewerage system.

CANADA- FERRO LIMITED

This company located on Rutherford Road in Brampton is engaged in the manufacture and assembly of automobile parts.

DETAILS OF SURVEY

Personnel	-	Mr. B. Boal - Mr. F. Kriesche
Number of employees	-	30
Operating schedule	-	8 hours per day 5 days per week
Water consumption	-	Sanitary - 1,000 gpd - Metal finishing - 10,000 gpd

PROCESS

Manufacturing processes are essentially the same as indicated in the report of May, 1964 by D. P. Caplice.

The principal source of wastes continues to be the rinses from the two zinc barrel platers and the circular automatic zinc plater.

A proprietory "Epurix" treatment unit treats these essentially cyanide bearing wastes by alkaline chlorination to oxidize cyanide to cyanate. The cyanide bearing wastes discharge to a 350 gallon mixing tank and from here they are pumped to the Epurix unit where the required amounts of sodium hypochlorite and sodium hydroxide are added by means of oxidation-reduction potential controlled valves.

The effluent from this unit discharges to two baffled retention tanks connected in series. The first tank is air agitated to ensure adequate mixing of the effluent and treatment chemicals. The second tank ensures sufficient retention time for reaction and settling to occur.

Acid and alkaline rinses from the various cleaning and bright dipping operations prior to plating by-pass the treatment unit and retention basins and discharge in conjunction with the treated cyanide wastes to the sanitary sewer.

SAMPLING

The plant was visited on January 12, 1965, and samples were taken at half-hourly intervals and combined to give composites of the following waste streams:

1. Effluent from the mixing tank to the Epurix unit
2. Effluent from the second retention basin
3. Total plant effluent to the sanitary sewer

ANALYTICAL RESULTS

See page 37.

All analysis except pH reported in ppm unless otherwise indicated

ONTARIO WATER RESOURCES COMMISSION
CHEMICAL LABORATORIES

INDUSTRIAL WASTE ANALYSIS

Municipality: Brampton Report to: M. N. Zachanko*

Source: Canada-Ferro Co. Ltd.

Date Sampled: Jan. 12/65 by: M. N. Z.

Lab. No.	5-Day BOD	Solids			Cyanide as HCN	Zinc as Zn	Alkalinity as $CaCO_3$	Hardness as $CaCO_3$	pH at Lab.
		Total	Susp.	Diss.					
T 58		804	-	-	550.	340.	-	370	-
T 59		-	-	-	34.	10.	-	40	-
T 60		804	47	757	0.9	6.1	304	404	7.4

T 58 1. Mixing tank - 4-hr. composite - 1/2 hourly.

T 59 2. Effluent from #2 retention basin - 4-hr. composite - 1/2 hourly.

T 60 3. Total plating area effluent to San. Sewer - 4-hr. composite - 1/2 hourly.

DISCUSSION OF FINDINGS

The analytical results on page 37 indicate that the effluent from this plant is acceptable for discharge to the sanitary sewer. Greater than 90 per cent reduction in cyanide concentration is being achieved by the Epurix unit and the corresponding reduction in zinc concentration is 97 per cent.

The discharge of untreated acid and alkaline wastes in conjunction with the treated cyanide wastes does not appear to have any adverse effects on the pH of the final effluent or the concentration of cyanide.

CONCLUSIONS AND RECOMMENDATIONS

Waste treatment facilities in operation at this plant are effective in reducing the concentrations of cyanide and zinc to acceptable levels for discharge to a sanitary sewer. It is therefore recommended that this company continue to exercise conscientious control of their metal finishing wastes. Every attempt should be made to ensure that concentrated solutions are not discharged without adequate pretreatment.

CANADIAN VELCRO

This company, located on East Drive in Bramalea, manufactures a range of nylon tape fasteners.

DETAILS OF SURVEY

Personnel	-	Mr. J. Forties, Plant Manager
Number of employees	-	12
Operating schedule	-	8 hours per day 5 days per week
Water consumption	-	7,600 gpd

PROCESS

The manufacturing processes involved in the production of hook and pile type fasteners for clothing and upholstery produce no contaminated waste waters except for a small dyeing operation which operates on an intermittent basis. Wastes from this operation consist of the occasional dumps of spent dye vats. These are conveyed to a small sump where solid material settle out before discharge to the sanitary sewer.

The major use of water in the plant is for cooling purposes which is discharged to the sanitary sewer.

SUMMARY

Since the majority of water used in this plant is for cooling, it is unlikely that this company's operations will have any adverse effect on the municipal sewerage system. Consideration should be given to the possibility of diverting this uncontaminated cooling water to the municipal storm sewers.

CARRIER AIR CONDITIONING (CANADA) LIMITED

Located on Orenda Road in Bramalea, this plant is engaged in the manufacture and assembly of air conditioning units.

DETAILS OF SURVEY

Personnel	-	Mr. T. Graser, Plant Engineer
Number of employees	-	140
Operating schedule	-	Two 8-hour shifts per day 5 days per week
Water consumption	-	Sanitary and domestic - 3000 gpd
	-	Cooling - 5000 gpd
	-	Bonderizing - 5000 gpd

PROCESS

Processes involved in the manufacture and assembly of the refrigeration units and associated hardware produce no contaminated waste waters apart from cooling waters.

Cabinets are fabricated from sheet steel and spot welded together. The assembled cabinets are then subjected to a bonderizing process prior to painting in a water-walled paint spray booth. The bonderizing process involves the application of an alkali cleaner, zinc phosphate solution and a chromate sealer solution with cold water running rinses following the alkali cleaner and the zinc phosphate solution.

Wastes from this process consist of the running rinses and the occasional dumping of spent solutions which are all discharged to the sanitary sewer. The zinc phosphate solution is never dumped while the chromate sealer is treated with sodium bisulphite and hydrated lime to reduce and precipitate chromium as the hydroxide. This is allowed to

settle and the clear supernatant decanted and discharged to the sanitary sewer. The remaining chromium sludge is trucked away for land disposal. The alkali cleaner is neutralized with phosphoric acid before discharge to the sanitary sewer.

Uncontaminated cooling waters from the spot welders and a vapour degreaser are segregated and discharged to the Orenda Road storm sewer.

SAMPLING

Grab samples were taken of the running rinses from the bonderizing process since these are the major sources of contaminated waste waters from this plant. At the same time, a grab sample was taken of the alkali cleaner before dumping to the sanitary sewer. These were submitted to the OWRC Laboratory for analyses for BOD, solids, pH, alkalinity, zinc and phosphate.

ANALYTICAL RESULTS

See page 42.

All analysis except pH reported in ppm unless otherwise indicated

ONTARIO WATER RESOURCES COMMISSION
CHEMICAL LABORATORIES

INDUSTRIAL WASTE ANALYSIS

Municipality: Brampton - Bramalea Report to: D. S. Tolson*

Source: Carrier Air Conditioning

Date Sampled: March 16/65 by: D. S. Tolson

Lab. No.	5-Day BOD	Solids			pH at Lab.	Alkalinity as $CaCO_3$	Zinc as Zn	Phosphate as PO_4
		Total	Susp.	Diss.				
T 354	40.	2438	150	2288	9.4	1262	-	-
T 355	0.8	1302	10	292	8.5	218	-	-
T 356	1.6	1330	98	1232	8.1	43	40	490

T 354 1. #1 Tank - Alkali Cleaner -Grab - 2:10 p.m.

T 355 2. #2 Tank - Rinse -Grab - 2:10 p.m.

T 356 3. #4 Tank - Phosphate rinse-Grab - 2:10 p.m.

DISCUSSION OF FINDINGS

The analytical results on page 42 indicate that, in general, this company's wastes should have no adverse effects on the municipal sewerage system.

It was not possible to evaluate the effectiveness of the treatment procedures for spent chromate sealer, but it would appear that this conforms to accepted practice for the treatment of this type of industrial waste.

RECOMMENDATIONS

It is therefore recommended that this company continue to exercise control of the strength of wastes being discharged to the municipal sewers. Every attempt should be made to ensure that concentrated solutions are not discharged without adequate pretreatment.

CARTER CARBURETOR

Located on East Drive in Bramalea, Carter Carburetor is engaged in the manufacture of automobile fuel pumps and carburetors.

DETAILS OF SURVEY

Personnel	- Mr. R. Best, Purchasing Agent
Number of employees	- 40
Operating schedule	- 8 hours per day 5 days per week
Water consumption	- 7000 gpd

PROCESS

The machining and finishing of zinc die-cast fuel pump and carburetor bodies produces no contaminated waste waters. Water soluble cutting oils are used in the machining operations and these are recirculated and never discharged to the municipal sewers.

The major use of water, apart from sanitary, is for vapour degreaser and oil compressor cooling. Most of this water is on a closed system which is recirculated through a cooling tower. The remainder is discharged to the sanitary sewers.

SUMMARY

Since the majority of wastes discharged from this plant are uncontaminated cooling waters, these should be segregated and discharged to the municipal storm sewers.

CHUBB MOSLER SAFES LIMITED

This company located on Queen Street East in Brampton is engaged in the manufacture of a wide range of safes for fire and theft protection.

DETAILS OF SURVEY

Personnel	-	Mr. R. Castle, Plant Manager
Number of employees	-	250
Operating schedule	-	8 hours per day 5 days per week
Water consumption	-	Sanitary - 7000 gpd Process - 4000 gpd

PROCESS

Safes are fabricated from steel and various alloys, spray painted and insulated with cement and refractory materials.

Industrial wastes from this plant consist of welder cooling water and washings from the area where safes are insulated. Cement and refactory washings are passed through a small settling tank for the removal of suspended solids and the effluent from this tank is discharged with uncontaminated cooling water to Etobicoke Creek.

Two water-walled paint spray booths are the only other source of waste apart from sanitary sewage and these are skimmed every night to remove coagulated paint and are dumped to the sanitary sewer once per month.

SUMMARY

The principle waste from this plant being discharged to the sanitary sewer is sanitary sewage.

Close attention should be maintained on the settling tank for cement wastes since this has been a source of contamination of Etobicoke Creek in the past.

C.I.L. MASTEX INDUSTRIES LIMITED

This plant, located on Kennedy Road in Brampton, is engaged in the manufacture of a variety of plastic bags.

DETAILS OF SURVEY

Personnel	-	Mr. M. H. Steele, Maintenance Superintendent
Number of employees	-	200
Operating schedule	-	Three 8-hour shifts per day 7 days per week
Water consumption	-	Sanitary - 6000 gpd Cooling make-up - 1000 gpd

PROCESS

Bags are manufactured from extruded and blown polyethylene film. Water is used to cool the screw and barrel of the three extruders in operation. This cooling water is on a closed system with a refrigeration unit to maintain the desired temperature.

Air compressors for blowing the film are also water cooled and this is in a closed system with an air-cooled water tower to maintain the correct temperature.

The only use of water in the plant apart from sanitary purposes is for steam generation for heating and this on a complete condesate return system.

SUMMARY

Operations at this plant do not involve any wet processing. Negligible quantities of water are used as make-up in the cooling system so that the only wastes discharged to the municipal sewers are sanitary wastes.

DIXIE CUP CANADA

This plant located on Queen Street West in Brampton is engaged in the manufacture of wax coated paper cups.

DETAILS OF SURVEY

Personnel	-	Mr. G. Camplin, Plant Engineer
Number of employees	-	100
Operating schedule	-	Two 8-hour shifts per day 5 days per week
Water consumption	-	Sanitary - 3,000 gpd Cooling - 17,500 gpd

PROCESS

Cups are first formed from paper in automatic machines, printed and sprayed with wax. These operations produce no contaminated waste waters although the printing presses are water cooled.

The major use of water in the plant is for cooling purposes. There is a large compressor and a vacuum pump which use the largest proportion of cooling water.

The only source of contaminated waste water is the weekly clean-out of approximately twenty glue pots. Since these pots are of very small capacity, about a quart each, the waste loading is negligible.

Boiler water and domestic hot water are softened in a zeolite softening unit which is regenerated twice monthly with salt. These regeneration wastes are discharged to the sanitary sewer.

All uncontaminated cooling water is now discharged to the Queen Street storm sewer.

SUMMARY

As in 1961 the majority of water used at this plant is for cooling purposes. The only change has been the direction of this cooling water to the storm sewer as opposed to the sanitary sewer.

It is therefore unlikely that this company's operations will have any harmful effects on the municipal sewerage system.

FLEXONICS CORPORATION OF CANADA LIMITED

This plant located on Nelson Street in Brampton is engaged in the manufacture of a wide range of flexible metal tubing and expansion couplings.

DETAILS OF SURVEY

Personnel	-	Mr. J. Downing, Plant Manager
Number of employees	-	120
Operating schedule	-	Two 8-hour shifts per day 5 days per week
Water consumption	-	Sanitary - 3,000 gpd Process - 5,000 gpd

PROCESS

Flexible tubing is manufactured on machines which wind mild steel strip into a spiral and automatically overlap and join the edges. This may be covered by a woven wire casing for high pressure tubing or sold as such for electrical conduit.

Most of the water used is for cooling purposes on arc welders and air compressors.

The only other use of water apart from sanitary purposes is in a small bright dipping operation for flange castings used in the manufacture of expansion couplings.

Rinses and the occasional dumpings of spent nitric and sulphuric acids are the principal wastes from this operation.

SUMMARY

The majority of wastes from this plant are uncontaminated cooling waters and the rinses and spent solutions from the bright dipping operation.

Spent acids from the bright dipping operation should be neutralized before discharge. According to Mr. Downing, there is a tank available for this purpose and this should be put into service.

GERRY LEWIS LIMITED

This company operates a tannery on McMurchy Street in Brampton.

DETAILS OF SURVEY

Personnel	-	Mr. E. Rylance, Plant Manager	
Number of employees	-	26	
Operating schedule	-	9 hours per day 5 days per week	
Water consumption	-	Sanitary and domestic	- 1,000 gpd
	-	Process	- 48,000 gpd

PROCESS

Plant processes and operating procedures have not altered significantly from those described in the report of D. P. Caplice of September, 1963.

An average of 10 to 12 cow hide packs weighing 2,800 pounds are processed each week and tan yard production varies accordingly.

Briefly the processes involved in the production of the various types of leathers is as follows:

Dehairing

Hides are dehaired by paddling in a vat containing lime, sodium sulphide and sodium sulphydrate solutions for six to seven hours.

This process dissolves the hair from the hide and removes dirt, dung, and soluble protein.

Wastes from this operation consist of approximately 1,000 gallons of solution and associated wash water.

Fleshing

Following dehairing and washing, the hides are defleshed by passing across a revolving knife in a fleshing machine. The hides are then trimmed and cut to the separate belly and neck portions.

Reliming

Hides for use as moccasin leather are relimed by soaking and paddling in a lime solution for eight days.

Bating

This consists of treating the hides in a pancreatic enzyme solution. This removes excess lime and certain undesirable proteins and prepares the hide for tanning.

Pickling

This involves the treatment of the hide in a sulphuric acid-salt solution. This reduces the pH of the hides in preparation for tanning.

Chrome Tanning

After pickling the hides are tanned in revolving drums containing a chromium-base tanning liquor. Following this, the hides are rinsed and neutralized with sodium bicarbonate in a second drum. Approximately 50 per cent of all hides are then retanned with a natural vegetable tanning liquor.

Fat Liquoring

This involves impregnating the tanned hides with oil to make them supple. This is carried out by tumbling the hides in a drum containing various oils.

Finishing

These operations consist of treating the surface of the leather with pigment and then drying, waxing, and buffing which are all dry operations.

WASTE DISPOSAL

Spent tanning liquors, bating solution, reliming solution, and pickling liquor are discharged to pretreatment facilities at the rear of the plant.

Spent solution and wash waters from the dehairing vats together with floor drainage from the fleshing area are treated separately in an 8' x 15' concrete settling tank. Chemical coagulation and precipitation of the heavy solids contained in these wastes, which amount to approximately 2,000 gallons per day, is carried out on a daily basis with under drainage going to the pretreatment facilities, while the floated solids are skimmed off and trucked away for land disposal.

The pretreatment facilities at the rear of the plant consist of a four compartment settling basin. The north half and the south half are operated alternately, one half being used for settling while the other half is being pumped out and cleaned. Each half is divided by a baffle into two cells to provide primary and secondary settling. The sludge is pumped out every week and trucked away for land disposal. The effluent from the settling basins is directed to a sump which overflows to the sanitary sewer. A recently installed chlorinator meters a chlorine solution to this sump before discharge to the sanitary sewer to reduce the sulphide content of the waste.

SAMPLING

Samples of the influent and effluent of the settling basins were taken at half hourly intervals and combined to give composite samples regresenting the period 10 a.m. to 12 a.m. and 1 p.m. to 3 p.m. At the same time, grab samples were taken of the influent and effluent at times when the wastes appeared particularly concentrated.

These samples were submitted to the OWRC Laboratory for analysis for BOD, solids, pH, sulphide, alkalinity, chromium and ether solubles.

WASTE LOADINGS IN POUNDS PER DAY

	Influent to Settling Pits			Effluent to Settling Pits			1964
	a.m.	p.m.	Total	a.m.	p.m.	Total	Total
BOD	28.6	193.6	222.2	23.2	165.	188.2	77.4
Susp. Solids	224.	503.	727.	255.	164.	419.	117.5
Ether Solubles	10.5	117.3	27.8	13.4	9.1	22.5	3.1
Total Chrome	16.4	9.9	26.3	17.0	7.9	24.9	6.9
Sulphide	1.35	0.84	2.19	1.35	0.	1.35	0.74

Note:
Based on an estimated flow of 27,000 gallons between 7 a.m. and 10:30 a.m., and 22,000 gallons between 2:30 p.m. and 5 p.m.

ANALYTICAL RESULTS

See page 55.

All analysis except pH reported in ppm unless otherwise indicated

ONTARIO WATER RESOURCES COMMISSION
CHEMICAL LABORATORIES

INDUSTRIAL WASTE ANALYSIS

Municipality: Brampton Report to: D. S. Tolson*

Source: Gerry - Lewis Co. Ltd.

Date Sampled: March 3/65 by: D. S. Tolson

Lab. No.	5-Day BOD	Solids			pH at Lab.	Sulphide as H_2S	Chromium		Ether Solubles	Alkalinity as $CaCO_3$
		Total	Susp.	Diss.			Tot.	Hex.		
T-285	106	2946	828	2118	12.0	5.	61.	0.0	39.	496
T-286	880	7756	2384	5372	11.9	3.8	45.	0.0	78.	1030
T-287	86	3826	946	2880	11.6	5.	63.	0.0	49.	364
T-288	750	3760	746	3014	10.8	0.8	36.	0.0	41.	672
T-289	280	4984	1814	3170	11.9	0.	103.	0.0	13.7	1360
T-290	5200	39840	11180	28660	12.2	9.	15.	0.0	29.	3790

T-285	1.	Influent to Settling Pits -	Composite 10:00 a.m. to 12:00 a.m.
T-286	2.	Influent to Settling Pits -	Composite 1:00 p.m. to 3:00 p.m.
T-287	3.	Effluent from Settling Pits -	Composite 10:00 a.m. to 12:00 a.m.
T-288	4.	Effluent from Settling Pits -	Composite 1:00 p.m. to 3:00 p.m.
T-289	5.	Effluent from Settling Pits -	Grab - 2:30 p.m.
T-290	6.	Influent to Settling Pits -	Grab - 3:00 p.m.

DISCUSSION OF FINDINGS

The analytical results indicate the variable nature of this company's wastes. Concentrations of BOD and suspended solids in the effluent from the settling basins have increased since the last time this plant was surveyed in June, 1964. Waste loadings in the order of 190 pounds BOD and 400 pounds suspended solids per day are never the less typical of this type of process.

High concentrations of chromium in the final effluent are also characteristic of this type of waste. However, this could possibly be reduced by more efficient settling since at the pH of this waste the chromium is most likely in the form of suspended solids.

The effect of the chlorination of these wastes is difficult to evaluate in terms of a reduction in the concentration of sulphide in the final effluent since there was little or no sulphide in the influent. However, previous surveys have indicated that sulphide is being satisfactorily oxidized.

CONCLUSIONS AND RECOMMENDATIONS

Waste loadings from this plant in terms of BOD and suspended solids have increased since the 1964 survey although they continue to be characteristic of this type of process.

However, it is evident from the variable nature of analyses over the past four years that at times the settling basins become overloaded.

It is therefore recommended that a more frequent schedule of cleaning of the settling basins be carried out. This would have the added advantage of reducing the concentration of chromium discharged to the municipal sewerage system.

GENERAL LATEX CHEMICALS

This company located on Eastern Avenue in Brampton is engaged in the preparation of synthetic and natural latex emulsions for the paint, textile and floor-covering industries.

DETAILS OF SURVEY

Personnel	-	Mr. J. C. Sturgeon, Plant Superintendent
Number of employees	-	23
Operating schedule	-	9 hours per day 5 days per week
Water consumption	-	5000 gpd

PROCESS

Latex emulsions are prepared in a grinder-mixer which uses approximately 1,000 gpd of cooling water. The principal use of water in the plant is for clean-up purposes. Wastes from this operation contains latex and traces of additives used in the preparation of the emulsion. These wastes are discharged to two tanks in the plant, each of approximately 1,000 gallons capacity. When full, sulphuric acid is added to these tanks to coagulate the latex. Air agitation is then used to ensure complete mixing. After settling, the coagulated latex is removed from the surface and the water pumped to settling tanks outside the plant where alkali is added to adjust the pH if necessary. The effluent from these tanks discharges to the sanitary sewers.

SAMPLING

A grab sample was obtained of the effluent from the final settling tanks to the sanitary sewer.

WASTE LOADINGS

The following table contains the waste loadings in terms of BOD and suspended solids based on an estimated water consumption of 4,000 gpd and the analytical results on page 59.

Waste Loadings to Sanitary Sewer in Pounds Per Day

BOD	8.8
Suspended Solids	116.1

DISCUSSION OF FINDINGS

The waste loading in terms of BOD is essentially the same as in 1961, However, the suspended solids loading is considerably higher than the 1961 figure. At the time of sampling, the final settling tank appeared much overloaded with suspended solids which accounts for the high concentration obtained in the sample.

CONCLUSIONS AND RECOMMENDATIONS

In view of the excessive quantity of suspended solids being discharged from the final settling tanks, it is recommended that these tanks be cleaned out more frequently.

All analysis except pH reported in ppm unless otherwise indicated

ONTARIO WATER RESOURCES COMMISSION
CHEMICAL LABORATORIES

INDUSTRIAL WASTE ANALYSIS

Municipality: Brampton Report to: R. A. Abbott*

Source: General Latex Chemicals Ltd.

Date Sampled: July 5/65 by: R. Abbott

Lab. No.	5-Day BOD	Solids			pH at Lab.
		Total	Susp.	Diss.	
T 1072	220.	4104	2902	1202	8.0

T 1072 Treated Latex Washings to Sanitary Sewer - Grab 2:30 p.m.

GUMMED PAPERS LIMITED

This plant located on Henderson Avenue in Brampton is engaged in the manufacture of a variety of coated and laminated papers.

DETAILS OF SURVEY

Personnel	-	Mr. Hood, Manager	
	-	Mr. W. Fendley, Assistant Millwright	
Number of employees	-	110	
Operating schedule	-	Two 8-hour shifts per day 5 days per week	
Water consumption	-	Sanitary and domestic	- 3,000 gpd
	-	Gum washings	- 4,000 gpd
	-	Foil washing	- 3,000 gpd
	-	Asphalt cooling	- 7,000 gpd
	-	Wax cooling	- 7,000 gpd
	-	Compressor cooling	- 4,000 gpd
	-	Foil brake cooling	- 4,000 gpd
	-	Plastic cooling	- 3,000 gpd
	-	Boiler feed water softening	- 3,000 gpd
		Total	38,000 gpd

PROCESS

The plant is divided into four main processing areas producing the four types of coated papers.

(1) Gummed Papers are produced by applying various glues to the paper which is then air dried. Water used in this area is for general clean-up purposes for washing rollers, felts, and containers and as make-up water for the glue. These wastes are discharged to the Henderson Avenue storm sewer and ultimately to Fletchers Creek, a tributary of the Credit River.

(2) Asphalt Laminated and asphalt coated papers are produced on two machines which use water for roller cooling. A catch basin on the sewer from this area ensures that accidental spills of asphalt do not reach the municipal storm sewer which is the ultimate disposal point for these wastes.

(3) Aluminium Foil is produced, either printed, embossed, or paper-coated, on a series of machines, four of which are equipped with water-cooled roller brakes.

The only other use of water in this area is for foil washing. Wastes from this operation may contain traces of lacquer, used for surface treating the paper coating, and glues used to attach the foil to the paper backing. These wastes in conjunction with the cooling waters are discharged to the sanitary sewer.

(4) A Plastic Coating operation has been installed since 1961 but this process uses only cooling water which is discharged to the Henderson Avenue storm sewer.

SAMPLING

Grab samples were taken of the gum washing container before discharge to the storm sewer and the combined cooling water and foil washing effluent to the sanitary sewer.

ANALYTICAL RESULTS

See page 62.

All analysis except pH reported in ppm unless otherwise indicated

ONTARIO WATER RESOURCES COMMISSION
CHEMICAL LABORATORIES

INDUSTRIAL WASTE ANALYSIS

Municipality: Brampton Report to: R. A. Abbott*

Source: Gummed Papers Ltd.

Date Sampled: July 5/65 by: R. A. Abbott

Lab. No.?	5-Day BOD	Solids			pH at Lab.
		Total	Susp.	Diss.	
T-1070	235	710	88	622	9.3
T-1071	3550	5206	104	5102	4.9

T-1070 1. Plant Effluent to Sanitary Sewer Grab 3:00 p.m.

T-1071 2. Gum washings to storm sewer Grab 3:00 p.m.

DISCUSSION OF FINDINGS

Since 1961, production and consequently water consumption has decreased somewhat.

Modifications to plant sewers have resulted in the partial segregation of cooling water for discharge to the municipal storm sewer. However, some uncontaminated cooling water continues to be discharged to the sanitary sewer.

The analytical results on page 62 indicate that both the sanitary sewer and storm sewer contain significant concentrations of BOD.

The disposal of gum washings to the storm sewer, although of limited volume, is cause for some concern due to the high BOD of this waste.

The largest portion of the waste flow to the sanitary sewer is cooling water from the asphalt rollers, foil brake cooling, wax cooling, and plastics cooling with lesser contributions from foil washings and sanitary wastes. Much of theBOD of this effluent is attributable to foil washings and sanitary wastes.

Waste loadings in terms of BOD and suspended solids are summarized in the following table.

Waste Loadings in Pounds Per Day

	BOD	Susp. Solids
*Sanitary sewer effluent	47	18
Gum washings to storm sewer	142	42

* This is a maximum loading since foil washing was in progress at the time of sampling.

CONCLUSIONS AND RECOMMENDATIONS

Waste loadings in terms of BOD and suspended solids have increased significantly since 1961. Some reduction in hydraulic loading to the municipal sewerage system has been achieved by the partial segregation of cooling waters for disposal to the storm sewer. This should be continued so that all cooling water discharging to the sanitary sewer is redirected to the storm sewer. At the same time, gum washings being discharged to the storm sewer should be directed to the sanitary sewer.

IKO ASPHALT ROOFING COMPANY LTD.

This company located on Orenda Road in Brampton manufactures asphalt coated papers and roofing shingles.

DETAILS OF SURVEY

Personnel	-	Mr. I. Koschitzky, President	
	-	Mr. Harper, Felt Mill Superintendent	
Number of employees	-	Felt Mill	- 12
	-	Roofing Plant	- 40
Operating schedule	-	Roofing Plant:	- 16 hours per day 5 days per week
	-	Felt Mill:	- 24 hours per day 4 days per week
Water consumption	-	Felt Mill	- 70,000 gpd maximum
	-	Roofing Plant	- 28,000 gpd maximum
	-	Sanitary	- 2,000 gpd

PROCESS

Roofing Plant

Roofing shingles are made by passing felt through hot asphalt and coating with grit. Cooling water passes through a roller to cool the asphalted paper after the grit is applied, and before the shingles are cut to shape. Water is also used to cool an air compressor. These cooling waters discharge to an open ditch at the rear of the plant.

Felt Mill

In this area the felt is manufactured from a blend of 30 per cent mechanical wood fibre and 70 per cent scrap paper, felt, kraft board and sawdust.

Wood is received at the plant as debarked logs. These pass through a grinder to form the wood fibre pulp which then passes through a grader to a storage chest. Pulped scrap paper etc. is stored in another chest and wood fibre pulp and paper pulp are blended together in a proportioner before being charged to a Jordan Screen and hence to the Felt Machine stock chest. From here, the stock passes through two flat screens before being charged to a vat where grit is allowed to settle out. The flat screens produce the continuous felt sheet which passes over suction boxes and presses to remove excess moisture before passing through a series of twenty-four dryers.

The majority of water used in this operation is made up to account for evaporation losses. There is very little sewered waste except during weekly clean-up periods when equipment and vats are cleaned out. Every attempt is made to conserve stock as much as possible but some white water is discharged to the sanitary sewer during these clean-up periods which may amount to one to two thousand gallons.

SAMPLING

The plant was visited on April 28, 1965 and grab samples obtained of the Roofing Plant cooling water and white water form the Felt Mill.

ANALYTICAL RESULTS

See page 67.

All analysis except pH reported in ppm unless otherwise indicated

ONTARIO WATER RESOURCES COMMISSION
CHEMICAL LABORATORIES

INDUSTRIAL WASTE ANALYSIS

Municipality: Brampton Report to: R. A. Abbott*

Source: IKO Asphalt Roofing

Date Sampled: Apr. 28/65 by: R. Abbott

Lab. No.	5-Day BOD	Solids			pH at Lab.	Phenols in ppb
		Total	Susp.	Diss.		
T-545	1900	3282	938	2344	5.9	4
T-546	2.0	828	235	593	9.3	0

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T-545 2. White water from felt machine - Grab - 10:30 a.m.

T-546 3. Cooling water to ditch - Grab - 11:00 a.m.

DISCUSSION OF FINDINGS

The analytical results of the cooling water from the Roofing Plant indicate that this is generally acceptable for the present method of disposal with the exception of the suspended solids concentration.

The analysis of the white water from the Felt Mill indicates that this material should continue to be discharged to the sanitary sewer due to the high concentration of BOD present.

The Company plans to investigate the feasibility of directing the waste cooling water from the Roofing Plant to the Felt Mill to be used as make-up in the felt machine. This would appear feasible provided suspended solids do not adversely effect operations in this area.

CONCLUSIONS AND RECOMMENDATIONS

The expansion of operations to include felt manufacture has not significantly increased waste loadings from this plant. The re-use of cooling water in the Felt Mill to reduce the possibility of contamination of surface waters in the area by phenols and suspended solids should be investigated.

T.J. LIPTON COMPANY LIMITED

This plant located on Dixie Road in Bramalea is engaged in the manufacture of dehydrated peas, soup mixes, pre-cooked rice and salad dressings.

DETAILS OF SURVEY

Personnel	-	Mr. F. Stasink, Plant Manager Mr. T. K. McGuire, Manager Engineering Services	
Number of employees	-	200	
Operating schedule	-	Three 8-hour shifts per day 5 days per week	
Water consumption	-	Sanitary	- 5,000 gpd
	-	Rice Washer	- 8,000 gpd
	-	Soak and Blanch Water	- 1,000 gpd
	-	Boiler9	- 5,000 gpd
	-	General wash-up	- 20,000 gpd
		Total	39,000 gpd

PROCESS

Peas and rice are soaked, blanched and cooked prior to dehydration in cabinet dryers. Sources of waste from these operations are the soak and blanch waters and the effluent from a small rice washer.

The drum drying of certain salad oil bases and soup mixes produce no contaminated waste waters.

The largest volume of water used in the plant is for clean-up operations during the night shift. This involves the hosing down of equipment and the floors and walls of the building.

All plant wastes discharge to two main sewers servicing the upper and lower floors and these are equipped with interceptors for the removal of grease and solids from the effluent before discharge to the municipal sewers.

SUMMARY

It was not possible to obtain samples of this company's wastes due to the absence of convenient sampling points and because Federal Department of Agriculture regulations prohibit the uncovering of sewers during plant operations. However, data submitted to the OWRC in 1962 before this plant began operations indicated that the waste loading on the sewage treatment plant would be 100,000 gallons per day containing 400 lbs. BOD. At the present time, the plant uses less than half this volume of water and consequently it is unlikely that the projected loading of 400 lbs. per day BOD has been reached.

Thus, in view of the fact that the majority of operations are essentially dry processes and that production has not reached the projected maximum this company's wastes should have no adverse effects on the municipal sewerage system.

NORTHERN ELECTRIC COMPANY, LIMITED

This plant located on Dixie Road in Bramalea is engaged in the manufacture of telephone switch-gear and associated electronic devices.

DETAILS OF SURVEY

Personnel	-	Mr. A. Kramer, Facilities Engineer - Mr. H. Nierstrasz, Methods Engineer
Number of employees	-	1700
Operating schedule	-	Two 8-hour shifts per day, some night shift. 5 days per week
Water consumption	-	Sanitary - 50,000 gpd - Cooling - 30,000 gpd - Metal Finishing - 100,000 gpd

PROCESS

The most important source of contaminated waste waters in this plant is the metal finishing department. Various small component parts are copper, zinc or tin plated in barrel plating units. There are also automatic chromium on nickel and chrome passivated zinc lines. There are also facilities for etching aluminum parts and a hydrofluoric acid silicon stripper for armature cores.

Approximately 40 per cent of the total water consumption of the metal finishing department is used in the zinc, copper and tin barrel plating lines while the hydrofluoric acid dip for armatures uses a large proportion of the remainder.

Wastes from the metal finishing area are segregated into a number of waste streams as follows:

1. Dilute alkaline and cyanide-bearing wastes.
2. Concentrated alkaline and cyanide wastes.
3. Dilute acidic and chromium-bearing wastes.
4. Concentrated acidic anc chromium wastes.

These are pumped to a waste treatment complex adjacent to the boiler-house. Facilities are available for the destruction of cyanide by alkaline chlorination, the reduction and precipitation of chromium by acid sulphonation, final pH adjustment, and solids removal when necessary. The concentrated waste streams consisting mainly of spent solutions are treated separately and then metered into the dilute waste streams for final treatment.

All treatment operations are controlled automatically by oxidation-reduction controls on the units and by pH and level controls on the treatment tanks. At the same time, all rinse tanks are equipped with solu-bridge controllers which govern the volume of rinse water used at a pre-set conductivity and thus at a constant concentration of waste constituent.

The effluent from these facilities is discharged to the sanitary sewer and at times when the suspended solids concentration exceeds the Municipal By-Law requirement of 300 ppm it is passed through a pressure filtration system before discharge.

SAMPLING

Samples were taken at half hourly intervals between 10:30 a.m. and 3:30 p.m. and combined to give composite samples of the following waste streams:

1. Dilute alkaline and cyanide rinses.
2. Dilute acidic and chromium rinses.
3. Combined effluent from the waste treatment facilities.

At the same time, grab samples were taken of the concentrated alkaline and cyanide wastes, the concentrated acidic chromium wastes and the total plant effluent to the sanitary sewer.

These were submitted to the OWRC Laboratory for analyses for solids, pH, cyanide, total and hexavalent chromium nickel, copper, tin and zinc.

DISCUSSION OF FINDINGS

The analytical results on page 74 show that the waste treatment facilities are effective in reducing the concentrations of cyanide and toxic metal ions to satisfactory levels for discharge to the municipal sewerage system.

However, according to company personnel, at times of peak production the waste treatment facilities become overloaded. An expansion of these facilities is planned so that the metal finishing department can be used at full capacity.

CONCLUSIONS AND RECOMMENDATIONS

Northern Electric Company are removing toxic constituents from their wastes such that no adverse conditions should occur in the municipal sewerage system.

It is therefore recommended that this company continue to exercise conscientious control of the volume and toxicity of their industrial wastes.

ONTARIO WATER RESOURCES COMMISSION
CHEMICAL LABORATORIES

All analysis except pH reported in ppm unless otherwise indicated

INDUSTRIAL WASTE ANALYSIS

Municipality: Bramalea-Chinguacousy Twp. Report to: D. S. Tolson*

Source: Northern Electric Co. Ltd.

Date Sampled: Feb. 16/65 by: D. S. Tolson

Lab. No.	5-Day BOD	Solids			pH at Lab.	Cyanide as HGN	Chromium as Cr		Nickel as Ni	Copper as Cu	Zinc as Zn	Tin as Sn
		Total	Susp.	Diss.			Tot.	Hex.				
T 177	-	38640	671	37969	13.1	340.	23.	0.6	2.7	140.	38.	7.0
T 178	-	550	13	537	9.7	26.7	0.0	0.0	0.0	0.2	14.	1.8
T 179	-	10596	12	10584	0.9	-	2400.	2400	9.	3.3	930.	1.0
T 180	-	332	2	330	3.0	-	5.2	0.6	15.	0.2	19.	1.8
T 181	-	4644	161	4483	8.7	1.9	4.0	1.3	7.0	5.8	13.	2.4
T 182	2.8	768	128	640	8.1	0.5	0.1	0.0	0.0	0.1	1.4	1.0

T 177 1. Alkali and Cyanide Conc. Dumps - Grab.

T 178 2. Alkali and Cyanide Rinses - Composite 10:00 a.m. - 3:30 p.m.

T 179 3. Acid and Chrome Conc. Dumps - Grab.

T 180 4. Acid and Chrome Rinses - Composite 10:00 a.m. - 3:30 p.m.

T 181 5. Combined Treated Cyanide and Chrome Wastes - Composite 10:00 a.m. - 3:30 p.m. *

T 182 6. Total Plant Effluent to San. Sewer - Grab.

* A duplicate sample preserved for cyanide.

OAKITE PRODUCTS LIMITED

Oakite Products Limited located at 115 East Drive in Bramalea is engaged in the manufacture of industrial cleaning compounds.

The plant was visited on March 9, 1965.

DETAILS OF SURVEY

Personnel	-	Mr. R. D. McEachern, Plant Superintendent
Number of employees	-	8
Operating schedule	-	5 days per week 8 hours per day
Water consumption	-	2,000 gpd

PROCESS

Raw materials such as caustic soda, soda ash, silicates, kerosene, phosphoric acid, varsol and various wetting agents are blended in tanks to produce the desired end product. The major source of contaminated waste water occurs during clean-up periods when the various tanks and equipment are hosed down. Wastes are directed to either of two 2,000 gallon holding tanks. One tank receives mostly caustic wastes with a pH of approximately 13.0. These are neutralized with phosphoric or other acids to approximately 8.5 before discharge to the sanitary sewer.

The remaining tank may contain traces of kerosene, varsol or detergent which is dumped in conjunction with neutralized caustic tank about once per month.

The company is considering the manufacture of a line of chromate based cleaners and were made aware of the suggested maximum concentration of chromium for discharge to the municipal sewers of 3 ppm.

SUMMARY

In view of the limited volume and strength of the wastes involved, no adverse conditions should result from this company's operations.

Under no circumstances should concentrated products be discharged to the municipal sewers without adequate treatment.

SARA LEE (CANADA) LIMITED

Sara Lee Limited located on Orenda Road in Bramalea is engaged in the preparation of frozen cakes and confectionery.

DETAILS OF SURVEY

Personnel	-	Mr. Doyle, Plant Engineer
Number of employees	-	60
Operating schedule	-	8 hours per day 5 days per week
Water consumption	-	14,000 gpd

PROCESS

Cakes and confectionery are manufactured from a variety of food materials. Much of the water used in the plant is incorporated in the product. Other uses of water are for cooling, humidity control, refrigeration and general clean-up. Uncontaminated cooling water is directed to the Orenda Road storm sewer, while clean-up wastes are discharged to the sanitary sewer.

SUMMARY

In general, wastes from this company's operations will resemble domestic sewage, and for this reason, should have no adverse effects on the municipal treatment facilities. However, this may change when the proposed expansion to two shifts per day is implemented.

THE SIMMONS MATTRESS COMPANY

This plant located on Orenda Road in Bramalea is engaged in the manufacture of mattresses and other soft furnishings.

DETAILS OF SURVEY

Personnel	-	Mr. R. Woodruff, Plant Engineer	
Number of employees	-	165	
Operating schedule	-	8 hours per day 5 days per week	
Water consumption	-	Sanitary and domestic	- 2,000 gpd
	-	Boiler, Compressor cooling, and air conditioning	- 6,000 gpd

PROCESS

Mattress and furniture frames are constructed from wood and the upholstery materials applied. No metal working is done at the plant; all metal parts being brought in from outside suppliers. These operations are essentially dry processes, water only being used for cooling purposes and for steam generation.

All uncontaminated cooling waters are discharged to the Orenda Road storm sewer.

SUMMARY

Since no wet processing is carried out at this plant, it is unlikely that this company's operations will have an adverse effect on the municipal sewerage system.

SONCO TUBE LIMITED

Sonco Tube Limited, formerly Sonco Steel Products Limited, is located on Holtby Road in Brampton. The plant manufactures steel tube for the furniture industry.

DETAILS OF SURVEY

Personnel	-	Mr. J. Sunshine, Plant Manager
Number of employees	-	70
Operating schedule	-	Two 8-hour shifts per day 5 days per week
Water consumption	-	6,000 gpd

PROCESS

Sheet steel is cut to the desired width and fed to an automatic machine which forms the strip to a cylindrical shape and welds along the seam. The welding operation uses a small volume of water for cooling. Uncontaminated cooling water is discharged to the Holtby Road storm sewer.

SUMMARY

Problems have been encountered in the past with the disposal of soluble lubricating and quenching oil from this plant. At the present time, this is trucked away to a land disposal site by a local contractor. At the same time, the storage tank for this material has been sealed to prevent leakage.

It therefore appears that this company's waste disposal procedures are satisfactory.

SUMMERVILLE PLASTICS

This company located on Orenda Road in Bramalea is engaged in the manufacture of a wide variety of plastic products.

DETAILS OF SURVEY

Personnel	-	Mr. E. Anada, Plant Engineer
Number of employees	-	120
Operating schedule	-	Three 8-hour shifts per day 7 days per week
Water consumption	-	Sanitary - 3,500 gpd - Cooling - 16,000 gpd

PROCESS

Extrusion, moulding and blowing operations at this plant produce no contaminated waste waters. Water is used mainly for cooling purposes and is discharged uncontaminated to the municipal storm sewers. The company proposes to install a recirculatory system which should considerably reduce the volume of cooling water.

SUMMARY

This company discharges only sanitary wastes to the municipal sanitary sewer.

TUNG-SOL OF CANADA LIMITED

This company located on Orenda Road in Bramalea manufactures sealed beam headlamps, miniature lamps and flashers for the automotive industry.

DETAILS OF SURVEY

Personnel	-	Mr. Longland, Plant Engineer
Number of employees	-	100
Operating schedule	-	8 hours per day 5 days per week
Water consumption	-	Sanitary - 3,000 gpd - Cooling - 19,000 gpd

PROCESS

Water used in this plant is mainly for cooling purposes in a gas reformer and air compressor, as well as for electrode cooling, and solvent recovery in a vapour degreaser. Various minor washing and cleaning operations do not use an appreciable volume of water. Uncontaminated cooling water is discharged to the municipal storm sewer.

SUMMARY

Operations at this plant do not contribute appreciable quantities of contaminated waste waters. Wastes discharged to the sanitary sewer are largely sanitary sewage which should therefore have no adverse effects on the municipal sewerage system.

UNION SCREEN PLATE

This company located on Kennedy Road South in Brampton is engaged in hard chrome plating of large machinery parts such as axles, drive shafts and ancilliary parts. Some copper and cadmium plating are also carried out on an intermittent basis.

DETAILS OF SURVEY

Personnel	-	Mr. P. Waud, Plant Manager
	-	Mr. W. Hall, Foreman
Number of employees	-	20
Operating schedule	-	2 shifts per day
	-	5 days per week
Water consumption	-	22,000 gpd

PROCESS

Chromium, cadmium, acid copper and cyanide copper plating are carried out in a series of tanks varying in capacity from 40 to 800 gallons. Accompanying these operations are the attendant metal cleaning procedures for parts prior to plating, rinses following plating, acid dips and dewaxing for the removal of masking wax following plating.

The sequence of operations and the length of time that articles remain in a particular tank varies with the requirements specified for each article. The various operations may be summarized under the following headings.

Preparation for Plating

The articles to be plated are usually new or used machinery parts. New parts are first wiped with a solvent-soaked cloth and then spray rinsed. Used parts are occasionally machined, or old plating is stripped off by acids such as muriatic or phosphoric.

Wastes from these operations consist of the spray rinse waters and periodic dumps of spent stripping acids. Spent acids do not generally exceed 50 gallons of 50 per cent acid in any one day and are discharged slowly over the whole day.

Plating

Following the metal cleaning stages, articles to be plated are suspended in the plating tanks and electrolysed for varying lengths of time and at varying current densities depending on the thickness and quality of the electrodeposit required.

The plating tanks contain steam-heated or water-cooled coils which maintain the plating solution at the desired temperature. The condensed steam or cooling water from these coils discharges to the pit below the plating tanks and ultimately to the sanitary sewer on Kennedy Road.

Rinsing

Immediately following plating the articles are spray rinsed over the plating tank and this rinse water is allowed to return to the tank. The articles are then transferred to a running rinse tank or rinsed by water sprays over the pit. Rinse water used in the running rinse tank consists of cooling water from a vapour degreaser and the overflow from the dewaxing tank. The effluent from this tank discharges to the sanitary sewer via the pit.

A large proportion of the water used in the plant is for cooling purposes on the vapour degreaser, cooling coils on the plating tanks and an air compressor. This is all discharged to the pit in the plating area and thus to the Kennedy Road sanitary sewer.

SAMPLING

This plant has been the subject of regular analytical checks since 1961. Thus, a fairly complete picture of the quality of the effluent from this plant is available. However, a further grab sample of the plant effluent to the sanitary sewer was obtained.

ANALYTICAL RESULTS

The following is a summary of the more recent analyses of the effluent to the sanitary sewer:

Date	Type of Sample	Total	Solids		pH	Total Chrome	Hexa-valent	Copper	Cadmium
			Susp.	Diss.					
May 15/63	Grab	-	-	-	6.4	88.2	88.	-	0.2
July 10/63	Composite	586	22	564	8.0	5.2	5.2	0.6	<1.
Aug. 1/63	Composite	544	39	505	7.9	5.6	4.2	0.7	<0.1
Feb. 3/64	Composite	496	18	478	7.8	8.7	8.7	1.8	0.
April 6/64	Grab	570	13	557	7.8	5.0	3.5	0.2	0.
Nov. 26/64	Grab	550	11	539	7.5	0.7	0.6	0.9	-
July 5/65	Grab	850	60	790	7.2	25.	15.	3.3	0.

Note: All results except pH in parts per million.

DISCUSSION OF FINDINGS

As can be seen from the previous summary, conditions at this plant have not altered since the report of August, 1963 by D. P. Caplice. The analyses of grab samples continue to indicate much greater concentrations of chromium than composite samples. This is most likely attributable to the fact that, except at times when plated articles are being rinsed, the wastes from this plant are essentially uncontaminated cooling waters. No significant concentrations of cyanide, cadmium or copper have been detected in any of the samples. It would therefore appear that the treatment of chromium bearing wastes and the segregation of cooling waters for disposal to the municipal storm sewer should result in a reduction in the hydraulic loading to the municipal treatment facilities and in the concentration of chromium in the final effluent.

The company has not been slow in taking steps to eliminate batch or slug discharges of chromium. The installation of automatic shut-off valves on plating tank make-up lines has reduced the possibility of the overflow of concentrated plating solutions to the sanitary sewer. However, the use of dilution by cooling waters as a means of waste treatment is of questionable value in view of the present hydraulic overloading of the municipal treatment facilities.

This applies also to the disposal of spent stripping acids and alkali cleaners. These should be neutralized before discharge to the sanitary sewer.

Perhaps the most logical approach to this problem is to treat chromium bearing wastes by acidification with spent acid, addition of sodium bisulphite or sulphur dioxide (to reduce hexavalent chromium to the trivalent state) and using spent alkali to neutralize and precipitate chromium as the hydroxide. This could then be discharged to the sanitary sewer on the condition that, should adverse conditions be encountered at the sewage treatment plant, sedimentation or filtration facilities will be installed by the company for the complete removal of precipitated chromium.

CONCLUSIONS AND RECOMMENDATIONS

Average daily wastes from this plant do not normally contain excessive concentrations of chromium or other toxic ions. However, it is evident from the analyses of grab samples that excessive concentrations of chromium are frequently discharged from this plant.

It is therefore recommended that cooling water be segregated from other industrial wastes and discharged to the municipal storm sewer. Also, chromium bearing wastes should be treated, possibly in conjunction with spent acids and cleaners, for the reduction and precipitation of chromium. This treated effluent could then be discharged to the sanitary sewer provided no adverse conditions result at the sewage treatment plant.

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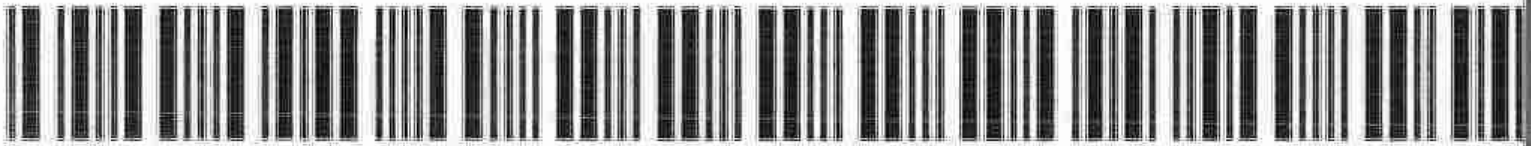
Director,
Division of Industrial Wastes.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