

Duffin Cr.



THE
ONTARIO WATER RESOURCES
COMMISSION
REPORT ON
INDUSTRIAL WASTES SURVEY
of the
COUNTY OF ONTARIO

1966

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1966
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A report on an industrial wastes
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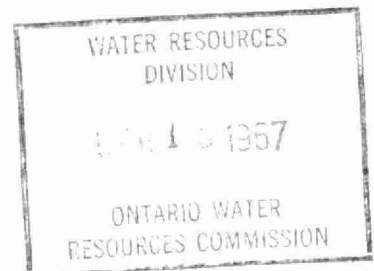
A REPORT
on
AN INDUSTRIAL WASTES SURVEY
of
THE COUNTY OF ONTARIO

1966

by
Division of Industrial Wastes
ONTARIO WATER RESOURCES COMMISSION

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SECTION I

AN INDUSTRIAL WASTES SURVEY OF THE COUNTY OF ONTARIO

1966

INTRODUCTION

This survey of the industries in the County of Ontario was carried out in conjunction with studies by other Divisions of the Ontario Water Resources Commission.

Information was requested from the various municipal officials, on industries using more than 20,000 gallons of water per month. The industries with liquid discharges to storm sewers or watercourses were intensively investigated. When the waste flow from an industry was to the municipal sanitary system, and when the operation of the sewage treatment plant was not impaired by this flow, a minimum amount of information was obtained and is presented.

The industries in the Town of Bowmanville (County of Durham) were investigated, as information on all discharges to Lake Ontario in this vicinity was desired.

SUMMARY

A summarization of the information obtained in this survey may best be presented by the following table.

TABLE I

MUNICIPALITY	INDUSTRY	WATER CONSUMPTION and/or LIQUID WASTE FLOW	WASTE LOADING TO	REMARKS
Oshawa (city)	Fittings Ltd. (metal working)	Consumption 316,000 gpd Waste flow- 150,000 gpd (cooling and process wastes)	Municipal storm system L. Ont. 1,000 lb/day suspended solids 50 lb/day zinc	Waste high in suspended solids and zinc and is acidic. Action requested.
	Pedlar People Limited (metal working)	Consumption 28,000 gpd Waste flow 15,000 gpd to storm system	Cooling water - storm system. Process and domestic wastes - sanitary system	Satisfactory (chromium content of waste to slightly high)
	Houdaille Industries Ltd. (plating)	Consumption 2,000,000 gpd Waste flow 1,440,000 gpd	76 lb/day chromium 240 " susp.sol. 170 " nickel being discharged to Oshawa Creek	Company carrying out study to reduce contaminants to Creek
	Reynold's Extrusion Company (aluminum extrusion)	Consumption 75,000 gpd to storm system	Cooling - storm - L. Ont. Domestic - sanitary system	Satisfactory
	Duplicate Canada Ltd. (mfg. of glass windows)	Consumption 550,000 gpd 300,000 gpd to storm to L. Ont.	Process - storm - L. Ont. Domestic - sanitary system 180 lb/day susp. sols. 750 lb/day ether solubles 20 lb/day BOD	Process wastes high in suspended solids, BOD and ether solubles. Action requested.

....continued

TABLE I (continued)

MUNICIPALITY	INDUSTRY	WATER CONSUMPTION and/or LIQUID WASTE FLOW	WASTE LOADING TO	REMARKS
Oshawa (city) (continued)	Ontario Malleable Iron Co. (foundry)	Consumption 143,000 gpd	Cooling - storm - L. Ont. Domestic - sanitary system	Satisfactory
	General Motors of Canada Ltd. (mfg. of automobiles)	Consumption 2,630,000 gpd	Process and domestic wastes to sanitary system	Possibly excessive concentrations of contaminants going to sanitary system
	Robson-Lang Leathers Ltd. (tannery)	Consumption 340,000 gpd Waste flow approximately 334,000 gpd	1,950 lb/day BOD 4,250 lb/day susp. solids 185 lb/day chromium 68 " sulphides to Oshawa Creek	Unsatisfactory. Negotiations under way between City and Company to have wastes treated at sewage treatment plant.
	Oshawa Dairy Ltd.	Consumption 24,000 gpd	Process and domestic wastes to sanitary system	Satisfactory
	Smith Beverages Ltd. (soft drinks)	Consumption 12,400 gpd	Process and domestic wastes to sanitary system	Satisfactory
	Coulter Mfg. Ltd. (mfg. of small metallic items)	Consumption 90,000 gpd	Process and domestic wastes to sanitary system	Satisfactory
	Ontario Steel Co. (mfg. of coil springs)	Consumption 40,000 gpd	Cooling water - storm sewer Domestic - sanitary system	Satisfactory

....continued

TABLE I (continued)

MUNICIPALITY	INDUSTRY	WATER CONSUMPTION and/or LIQUID WASTE FLOW	WASTE LOADING TO	REMARKS
Ajax (Town)	Ajax Textiles Processing Co. Ltd. (textile manufacture)	Consumption 47,500 gpd	Process and domestic wastes - sanitary system	Colour high in waste flow
	Tenco - A Division of Coca-Cola Ltd. (instant coffee)	Consumption 140,000 gpd	All wastes to sanitary system	Colour high in waste flow
	Temuss Products Can. Ltd. (manufacture of shellac)	Consumption 50,000 gpd	Process wastes - L. Ont. Domestic - sanitary system	Satisfactory
	Staley (Canada) Ltd. (manufacture of detergents and polymers)	Consumption 30,000 gpd	Cooling waters - ditch - L. Ont. Process - sanitary system	Satisfactory
	Drew Food Products Division of Drew Chemicals Ltd. (food processing) (Since the survey, has been purchased by Monarch Fine Foods)	Consumption 380,000 gpd	Cooling water - 7,000 gpd - ditch Duffin Creek Process wastes - sanitary system	In-plant problems have allowed contaminating process wastes to go to ditch - more control requested
	Dupont of Canada Ltd. (manufacture of paints, lacquers, etc.)	Consumption 160,000 gpd	490 lb/day BOD 195 lb/day susp. solids 30 lb/day ether solubles pH - 10.5 to Duffin Creek Domestic wastes - sanitary system	Company carrying out study on improved treatment methods

....continued

TABLE I (continued)

MUNICIPALITY	INDUSTRY	WATER CONSUMPTION and/or LIQUID WASTE FLOW	WASTE LOADING TO	REMARKS
Ajax (Town) (cont'd.)	Canadian Bakels Ltd. (fats for baking)	Consumption 70,000 gpd 7,800	Process and domestic - sanitary system	Satisfactory
	Cametoid Ltd. (plating)	Consumption 71,000 gpd	Process and domestic - sanitary system	Satisfactory
Uxbridge (Town)	Comco Electroplating Co. Ltd. (plating)	Consumption 135,000 gpd	Process and domestic wastes - sanitary system	Plating wastes - affecting efficiency of operation at sewage plant
	Fritz Glitsch and Sons (mfg. of machinery)	Consumption 20,000 gpd	Pickle liquor to seepage ponds on property. All other wastes - sanitary system	Satisfactory
	Uxbridge Beverages (soft drinks)	Consumption 6,800 gpd	All wastes - sanitary system	Satisfactory
	Uxbridge Creamery (butter)	Consumption 1,600 gpd	Cooling water - creek Process - sanitary system Buttermilk sold to farmers	Satisfactory
	Uxbridge Dairy (milk)	Consumption 8,200 gpd	All wastes - sanitary system	Satisfactory

.....continued

TABLE I (continued)

MUNICIPALITY	INDUSTRY	WATER CONSUMPTION and/or LIQUID WASTE FLOW	WASTE LOADING TO	REMARKS
Uxbridge (Town) (cont'd.)	B. Dyson (slaughterhouse)	-	Liquid wastes - seepage pit Solid wastes - hauled away	Satisfactory
	G. Hamelin (slaughterhouse)	-	Liquid wastes - septic tank and seepage pit. Solid wastes - hauled away	Satisfactory
Whitby (Town)	Dupont Co. of Canada Ltd. (polyethylene extrusion)	Consumption 480,000 gpd	Cooling water - L. Ont. Domestic - sanitary system	Satisfactory
	Dunlop of Can. Ltd. (mfg. of tires)	Consumption 650,000 gpd	Cooling water - L. Ont. Domestic - sanitary system	Satisfactory
	Lake Ontario Steel Co. Ltd. (mfg. of steel)	Consumption 1,440,000 gpd	2,000 lb/day of suspended solids to L. Ont.	Further treatment of gas scrubbing wastes requested
	Stokely Van Camp of Can. Ltd. (food processing)	Consumption 300,000 gpd	All wastes - sanitary system	Satisfactory
	Nutria Products Ltd. (confectionary products)	Consumption 19,300 gpd	All wastes - sanitary system	Satisfactory

....continued

TABLE I (continued)

MUNICIPALITY	INDUSTRY	WATER CONSUMPTION and/or LIQUID WASTE FLOW	WASTE LOADING TO	REMARKS
Whitby (Town) (cont'd.)	Andrew Antenna Corp. Ltd. (mfg. of metal domes, etc.)	Consumption 1,700 gpd	Process wastes - ditch - Lynde Creek Domestic - sanitary system	Process wastes high in chromium - Action requested
	Bathurst Containers Ltd. (fabrication of cardboard containers)	Consumption 27,200 gpd	All wastes - sanitary system	Satisfactory
	Hillcrest Dairy (dairy, creamery and cheese factory)	Consumption 20,000 gpd	All wastes - sanitary system	Satisfactory
	Lofthouse Mfg. Co. (brass forging)	Consumption 1,300 gpd	Process wastes - seep into ground Domestic - septic tank and tile system	Satisfactory
	Matheson Co. Ltd. (compressed gases)	Consumption 700 gpd	All wastes to sanitary system	Satisfactory
	Croven Ltd. (mfg. of electronic components)	Consumption 13,000 gpd	All wastes to sanitary system	Satisfactory
Bowmanville (Town)	Goodyear Tire and Rubber Co. of Can. Ltd. (rubber goods)	Consumption 1,430,000 gpd	Cooling water - Bowmanville Creek Domestic - sanitary system	Satisfactory

....continued

TABLE I (continued)

MUNICIPALITY	INDUSTRY	WATER CONSUMPTION and/or LIQUID WASTE FLOW	WASTE LOADING TO	REMARKS
Bowmanville (Town) (cont'd.)	R. Hollingshead Co. of Can. Ltd. (automotive additives)	Consumption 4,700 gpd	Process - septic system Domestic - sanitary system	Satisfactory
	Bowmanville Foundry	Consumption 33,000 gpd	Cooling water - Bowmanville Creek Domestic - sanitary system	Satisfactory
Beaverton (Village)	Beaverton Specialties Limited (plating)	Consumption 69,000 gpd	Process wastes - Beaverton Creek Domestic wastes - septic system	Satisfactory
Cannington (Village)	Griffiths Laboratories (bakery type operation)	-	No industrial wastes	Satisfactory
Pickering (Village)	Primeau-Argo Block Ltd. (mfg. of concrete blocks)	Consumption 17,000 gpd	No process wastes	Gravel washing operation planned
Port Perry (Village)	Port Perry Packers (chicken killing)	Consumption 11,000 gpd	Process - septic system and lagoon Domestic - septic system	Satisfactory
	Chalet Farms Ltd. (chicken killing)	Consumption 6,500 gpd	Process - lagoon to ditch (some pumped on land) Domestic - septic system	Unsatisfactory. To discharge to sanitary system as soon as it is constructed

.....continued

TABLE I (continued)

MUNICIPALITY	INDUSTRY	WATER CONSUMPTION and/or LIQUID WASTE FLOW	WASTE LOADING TO	REMARKS
Port Perry (Village) (cont'd.)	Port Perry Bottling Works (soft drinks)	Consumption 6,000 gpd	Process - L.Scugog Domestic - sanitary system	Satisfactory
	Cawker Bros. Slaughterhouse	-	Liquid wastes - septic system Solid wastes - hauled away	Satisfactory
Brock (Township)	Charter's Slaughterhouse	-	Liquid wastes - septic system Solid wastes - hauled away	Satisfactory
	Free's Creamery (butter)	-	Process wastes - lagoon to land (no run-off) Buttermilk sold to farmers	Lagoon to be enlarged
Mara (Township)	Orr Slaughterhouse	-	Liquid wastes - septic system Solid wastes - hauled away	Satisfactory
Pickering (Township)	Price and Knott (mfg. of aircraft components)	Consumption 4,600 gpd	Cooling water - ditch Domestic - sanitary system	Suspended solids and chromium content high in flow to ditch
	Supreme Aluminum Industries Ltd. (metal working)	Consumption 7,500 gpd	All wastes - sanitary system	Satisfactory

.....continued

TABLE I (continued)

MUNICIPALITY	INDUSTRY	WATER CONSUMPTION and/or LIQUID WASTE FLOW	WASTE LOADING TO	REMARKS
Pickering (Township) (cont'd.)	Dominion Allchrome Co. Ltd. (finishing of auto trim)	Consumption 20,000 gpd	Process wastes are pre-treated and then go to sanitary system	Wastes have low pH - neutralization needed
	Fretz Bros. Slaughterhouse	-	Liquid wastes - septic system Solid wastes - hauled away	Satisfactory
Rama (Township)	Chemical Developments of Canada Ltd. (mfg. of surface active agents)	Consumption 232,000 gpd	262 lb/day BOD 19 lb/day ether solubles 22 lb/day susp. solids to L. St. John Domestic - septic system	Company is carrying out a study on improved treatment method
Reach (Township)	nil			
Scott (Township)	nil			
Scugog (Township)	nil			
Thorah (Township)	T. McCuaig Slaughterhouse	-	Liquid wastes - land Solid wastes - hauled away	Satisfactory
Uxbridge (Township)	Nil			
Whitby (Township)	Nil			
Whitby East (Township)	Nil			

Note: A follow-up program has been initiated on the industries that were considered unsatisfactory in the above table.

A routine surveillance of the "satisfactory" industries is planned.

SECTION II

OSHAWA

The industries in the City of Oshawa that use more than 20,000 gallons of water per month and have significant quantities of liquid industrial waste are:

Fittings Limited
Pedlar People Limited
Houdaille Industries Limited
Reynold's Extrusion Company
Duplate Canada Limited
Ontario Malleable Iron Company
General Motors Canada Limited
Robson-Lang Leathers
Oshawa Dairy Limited
Smith Beverages Limited
Coulter Manufacturing Limited
Ontario Steel Company

Industries in the City which do not have significant liquid waste are:

General Printers Limited
Henderson Concrete Products
Fabricated Metals
Alger Press Limited
Curran and Briggs Limited
Oshawa Engineering
Oshawa Times
T. G. Gale Limited

A summary of these industries is shown in Table II.

TABLE II

SUMMARY OF INDUSTRIES WITHOUT SIGNIFICANT INDUSTRIAL WASTE

Name of Industry	Type of Industry or Product	Water Consumption		Remarks
		Sanitary (gpd)	Industrial	
General Printers Ltd.	Printing Shop	4,000	500	All liquid wastes to the sanitary system
Henderson Concrete Products	Concrete Products	300	22,000	Domestic wastes to the sanitary sewers
Alger Press Ltd.	Printing Shop	4,000	5,000	Domestic sewage to sanitary sewers
Curran and Briggs Ltd.	Ready-mix cement	300	15,000	Water used for concrete mix. Domestic sewage to sanitary sewers
Oshawa Engineering	Machine Shop	1,000	14,000	Cooling water and domestic sewage to sanitary sewers
Oshawa Times	Printing	500	-	All domestic wastes to sanitary sewers
T. G. Gale Ltd.	Fabrication of wooden boxes, crates, etc.	500	-	Only domestic wastes to sanitary sewers
Fabricated Metals	Stamping and machine shop	300	5,300	Cooling waters to storm sewers - satisfactory. Domestic wastes to sanitary sewers

FITTINGS LIMITED

This plant is located on Bruce Street and it was visited on April 26, 1966.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. H. Faint, Plant Engineer
Number of Employees	-	800
Operating Schedule	-	16 hours per day 5 days per week
Raw Materials	-	Scrap and pig iron, mouldings and core-making sands

PROCESS

This company manufactures a variety of malleable and cast iron fittings, castings, chain, electrical fittings and other foundry products. There is some galvanizing of parts in the following manner:

- (1) the removal of undesirable solids in an acid solution
- (2) rinsing of these parts in a running water bath
- (3) sensitizing of the metal surface for outer coatings, and the coating by immersion in a molten zinc bath
- (4) final cooling in a running water bath

Water Consumption

Supply	-	from Oshawa P. U. C.
Domestic	-	16,000 gpd (gallons per day)
Process	-	300,000 gpd
Total	-	<hr/> 316,000 gpd (monthly average)

Sources and Disposal of Wastes

The various sources of liquid wastes in this plant are:

- 1) cooling water from the cupola, compressors and spot welders
- 2) boiler blowdown
- 3) effluent from the scrubbing of the vent gases in the rotoclone
- 4) rinse and cooling waters from the galvanizing room
- 5) sanitary sewage

All these wastes, with the exception of the sanitary sewage are discharged into a dry well and thence to the storm sewers.

Sampling Programme

A grab sample of the combined foundry and galvanizing room effluent was taken on April 26, 1966.

Analytical Results

As on page 6.

DISCUSSION OF FINDINGS

The analytical results of the grab sample revealed that the waste has a low pH (4.9) due to the acid rinses in the galvanizing room. The high content of the zinc (22 ppm) is also the result of the operations in the galvanizing room.

The suspended solids content (i.e. 670 ppm) was in excess of the recommended OWRC objectives (15 ppm) and originated from the effluent of the rotoclone. The sample taken showed good settling properties, with a retention time of approximately 5 - 6 minutes. Therefore, removal of the suspended solids and also the zinc content, should be easily effected, by providing a sufficient detention time for the waste flow.

CONCLUSIONS AND RECOMMENDATIONS

Fittings Limited is discharging a waste to the storm sewers containing concentrations of waste constituents in excess of the OWRC objectives. The concentrations recommended by the OWRC are:

Suspended Solids	-	15 ppm (parts per million)
Zinc	-	15 ppm
pH range	-	5.5 - 10.6

Even though this conclusion was based on the results of one grab sample, it is quite apparent that any unsettled effluent from a rotoclone in a foundry-type operation would contain a suspended solids content in excess of the OWRC objective of 15 ppm.

Therefore, it is recommended that the company install proper treatment facilities for this waste prior to discharging it to the storm sewers. The design of these facilities should be approved by the Design Approvals Branch of the Industrial Wastes Division before installation.

ONTARIO WATER RESOURCES COMMISSION
CHEMICAL LABORATORIES

INDUSTRIAL WASTE ANALYSIS

All analyses except pH
reported in ppm unless
otherwise indicated

1 ppm = 1 mgm/litre
= 1 lb/100,000 Imp. Gals.

Municipality: Oshawa

Source: Fittings Limited

Date Sampled: April 26, 1966 by: R. Hussain

Lab. No.	5-Day BOD	Solids			pH at Lab.	Zinc as Zn
		Total	Susp.	Diss.		
T-1195	20	1,070	670	400	4.9	22

T-1195 1. Effluent to Storm Sewers - Grab - 2:00 pm

PEDLAR PEOPLE LIMITED

This company is located on Simcoe Street South in Oshawa and it was visited on April 19, 1966.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. M. C. Finley, Vice-President
Number of Employees	-	400
Operating Schedule	-	24 hours per day, 5 days per week
Raw Materials	-	Sheet metal, alkali cleaners, phosphates, acid, chromic acid and paint

PROCESS

The company manufactures farm roofing, barn and stable equipment, metal lath and plastering accessories, bins and lockers, metal culverts and other such products. Some products, such as lockers, are spray-painted.

The metal surfaces are prepared for painting by use of an alkali cleaner and a water rinse. They are then bonderized in a phosphate solution, are passed through another water rinse, followed by a chromic acid dip and then finally are rinsed and dried before spray-painting.

Water Consumption

Supply	-	from Oshawa P. U. C.
Domestic	-	8,000 gpd (gallons per day)
Process	-	20,000 gpd
Total	-	<hr/> 28,000 gpd (average monthly)

Sources and Disposal of Wastes

The sources of liquid waste are:

- 1) spray paint booth overflows and boiler house wastes
- 2) wastes originating from the preparation of the metal for spray-painting
- 3) cooling waters
- 4) domestic sewage

All the wastes with the exception of the cooling waters, are discharged to the municipal sanitary system. The cooling waters are discharged to the storm system.

Sampling Programme

A grab sample was taken of the flow from the painting line on April 19, 1966. No samples were taken of the cooling waters as they were not contaminated within the plant.

Analytical Results

See page 10.

DISCUSSION OF FINDINGS

The results of this survey indicate that, except for the chromium ion content, the waste characteristics of the discharge to the sanitary sewers are within the limits set down by the municipal by-law. The OWRC recommended objectives for industrial waste discharges to a sanitary sewer as well as the limits of the by-law are:

pH range - 5.5 - 9.5

Total chromium - 3 ppm

CONCLUSIONS AND RECOMMENDATIONS

The concentration of the chromium ion in the waste from this plant exceeds the desirable limit, however, the problems caused by this waste at the sewage treatment plant should be minimal. One possible way of reducing this concentration would be to install an air spray or blower following the chromic acid dip and thus allow for better removal of the chromium ions prior to the rinsing operation.

The cooling water appeared to be of satisfactory quality for discharge to a watercourse.

ONTARIO WATER RESOURCES COMMISSION
CHEMICAL LABORATORIES

INDUSTRIAL WASTE ANALYSIS

All analyses except pH reported in
ppm unless otherwise indicated

1 ppm = 1 mgm/litre
= 1 lb/100,000 Imp. Gals.

Municipality: Oshawa

Source: Pedlar People Limited

Date Sampled: April 19, 1966 by: R. Hussain

Lab. No.	5-Day BOD	Solids			pH at Lab.	Phosphate as PO ₄	Chromium Total	Anionic Detergents as ABS
		Total	Susp.	Diss.				
T-1049	18	694	200	494	7.4	36.0	5.	0.2

T-1049 1. Effluent from painting line - Grab (3:15 pm)

HOUDAILLE INDUSTRIES LIMITED

This plant is located on Simcoe Street South in Oshawa and was visited on June 6, and 9, 1966.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. R. Hess, Control Manager
Number of Employees	-	700 (approximate)
Operation Schedule	-	24 hours per day, 5 days per week
Raw Materials	-	sheet metal
Products	-	automobile bumpers and guard rails

PROCESS

After the metal parts have been fabricated into the appropriate sizes and shapes, they are finished to final product requirements. The finishing involves pickling, cleaning with alkaline solutions and electro-cleaners, and finally plating in the appropriate solutions.

For the pickling operation, the metal parts are first immersed into two 4,000 gallon tanks of 20% sulphuric acid, then into a water rinse, followed by a hot lime rinse to neutralize any adhering sulphuric acid. All overflow and batch discharges from these tanks are directed to a neutralization sump where the appropriate amount of caustic is added. This neutralized waste flow is finally directed to the sanitary system.

The plating operations consist of the application of a nickel finish to the metal parts in a series of tanks, ranging in capacity from 3,000 to 9,000 gallons. The metal parts are then subjected to a chromium

finish on an adjacent plating line. The respective plating solutions used are nickel sulphate and chromic acid.

After each plating operation there is a series of water rinses which remove any plating solution drag-out remaining on the metal parts. A flow diagram of the cleaning and plating operations is shown in Fig.1. Wastes overflowing to the final effluent are indicated by a double arrow.

Once plated, the parts are inspected to determine the quality of the final products. Any defective products are stripped in sulphuric acid and acid salt solutions, and then re-plated.

Water Consumption

Supply	-	from Oshawa P. U. C.
Plating	-	28,800,000 gpm (gallons per month)
Other uses	-	11,200,000 gpm
Total	-	<hr/> 40,000,000 gpm

Sources of Liquid Wastes and Disposal

The main sources of waste from the plating line operation are overflow rinses, spray rinse waters containing drag-out losses, and spills of the plating solutions. These wastes are collected in a sump and discharged to Oshawa Creek. A pH-meter records the pH of the total effluent in the sump, and company records show that this value varies from 7 to 8.5

Spent alkaline cleaners and electro-cleaners are dumped in conjunction with spent acid cleaners. By doing this, the company feels that the pH of the effluent can be controlled within acceptable limits.

The plating solutions are never dumped. The nickel sulphate solution is continuously filtered, cooled, purified, and re-used. The initial drag-out from the chromic acid tanks is collected in two still reclaim rinses, and these solutions are evaporated and purified for re-use.

Spills and drag-out losses to the floor are reduced appreciably by draining boards attached to the plating and rinse tanks. This measure enables the full strength liquid draining from the products to be collected and returned to the main tank.

Other liquid wastes from the plant include the flow from the neutralization sump in the pickling line, and the rinse waters from the stripping line. The former is discharged to the sanitary sewer system, and the latter to the collection sump along with the plating wastes.

Domestic wastes are discharged to the sanitary sewer system.

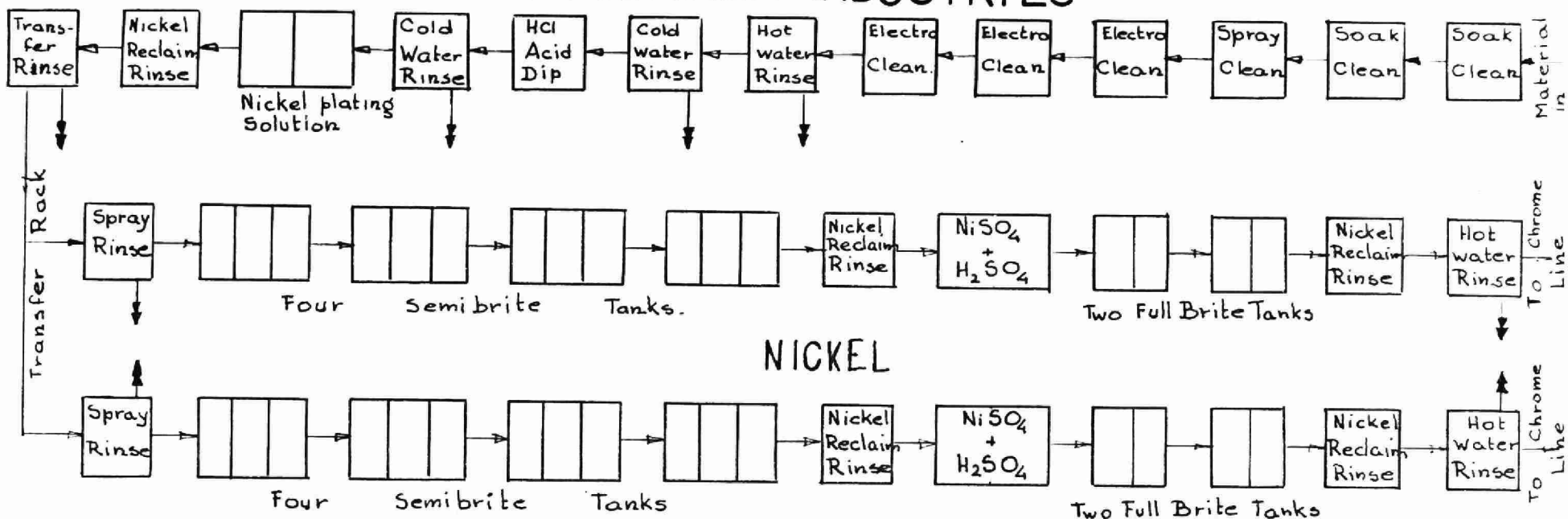
SUMMARY

The results of the 72-hour sampling programme indicate that the chromium and nickel ion concentrations of the effluent to Oshawa Creek are above the acceptable limits for discharge to a watercourse. (Total Chromium - 1 ppm - Nickel - 1 ppm).

The company is presently undertaking further investigations of the in-plant reclamation system in an attempt to reduce the chromium and nickel ion concentrations.

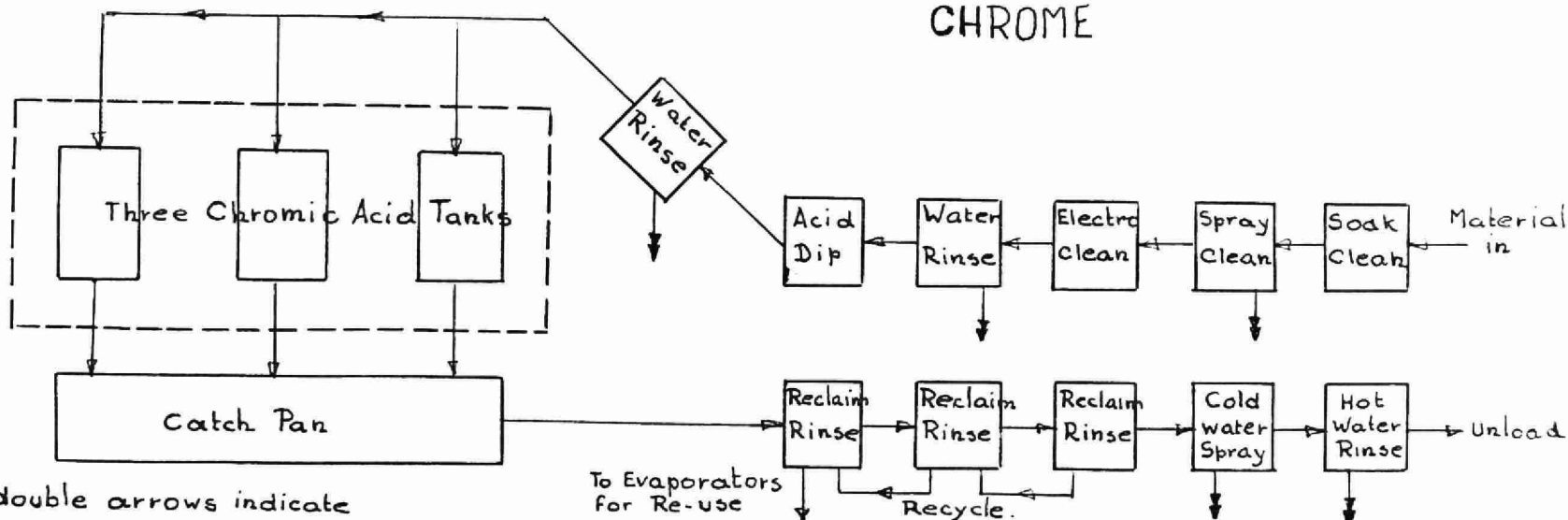
Close contact will be maintained with this company in an effort to reduce the concentration of the contaminants to acceptable limits.

HOUDAILLE INDUSTRIES



NICKEL

CHROME



NOTE: All double arrows indicate wastes to final effluent.

FIG.1 NICKEL & CHROME PLATING LINES.

ONTARIO WATER RESOURCES COMMISSION
CHEMICAL LABORATORIES

INDUSTRIAL WASTE ANALYSIS

All analyses except pH reported in
ppm unless otherwise indicated

1 ppm = 1 mgm/litre
= 1 lb/100,000 Imp. Gals.

Municipality: Oshawa

Source: Houdaille Industries

Date Sampled: June 6, 9, 1966 by: G. U. Buxton

Lab. No.	5-Day BOD	Solids			pH at Lab.	C H R O M I U M as Cr		Nickel as Ni
		Total	Susp.	Diss.		Total	Hex.	
T-1681		270	12	258	7.6	3.8	3.0	8.5

T-1681 72 hour Composite Sample from Pit

REYNOLD'S EXTRUSION COMPANY

This company, formerly known as R. D. Werner Co. (Canada) Ltd., is located on Simcoe Street South in Oshawa and was visited on May 6, 1966.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. J. Bino, Plant Engineer
Number of Employees	-	137
Operating Schedule	-	24 hours per day, 5 days per week
Raw Materials	-	aluminum sheets

PROCESS

This company manufactures extruded aluminum articles, drawn tubes, roll-formed shapes, ladders and mouldings.

Operations in this plant involve extrusion and metal forming processes.

Water Consumption

Supply	-	from Oshawa P. U. C.
Domestic	-	3,000 gpd (gallons per day)
Process	-	230,000 gpd
Total	-	<u>233,000 gpd (average monthly)</u>

Sources of Waste and Disposal

The main source of waste in this plant is the cooling water. Other sources of waste include boiler blowdowns and floor washups.

Most of the cooling water is re-circulated, although some is discharged to the storm sewer.

Sanitary wastes are directed to the municipal sanitary sewage system.

Sampling Programme

A grab sample of the effluent to the storm sewers was taken on May 6, 1966.

Analytical Results

See page 18.

DISCUSSION

The analysis of the grab sample to the storm system revealed that the waste from this plant is satisfactory for discharge to a watercourse. This is based on the concentrations of the waste constituents when compared to the OWRC recommended objectives.

pH range	-	5.5 to 9.5
Aluminum	-	1 ppm (parts per million)

It must be remembered that floor washings and boiler water high in solids, should be directed to the sanitary not the storm sewer system.

ONTARIO WATER RESOURCES COMMISSION
CHEMICAL LABORATORIES

INDUSTRIAL WASTE ANALYSIS

All analyses except pH reported in
ppm unless otherwise indicated

1 ppm = 1 mgm/litre
= 1 lb/100,000 Imp. Gals.

Municipality: Oshawa Report to: T. Armstrong*
Source: Reynold's Extrusion Company Limited
Date Sampled: May 6, 1966 by: R. Hussain

Lab. No.	5-Day BOD	Solids			Aluminum as Al.	pH at Lab.
		Total	Susp.	Diss.		
T-1218	0.4				.16	7.9

T-1218 1. Overflow to Storm Sewers Grab (11:30 am).

DUPLATE CANADA LIMITED

This plant is located on First Street in Oshawa and it was visited on May 6, 1966.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. W. F. Taylor, Plant Engineer
Number of Employees	-	900
Operating Schedule	-	24 hours per day, 5 days per week
Raw Materials	-	Sheet glass, detergents and oils

PROCESSES

This company fabricates safety glass windows for the automotive industry.

Sheet glass from a manufacturer is cleaned by a series of detergent washes and then is formed in a furnace to the appropriate shape. This is followed by placing, under controlled humidity and temperature conditions, a sheet of specially prepared plastic between two plates of the sheet glass. The plates are then treated in a low-temperature furnace, immersed in an oil bath to bond the three pieces together, and finally the oil adhering to the surface is removed by application of detergent and hot water. The sheets are allowed to dry, are tested and packed for shipping.

Safety glass plates for the rear and side windows of the automobile are fabricated in the same manner, with the plastic sheet being omitted.

Water Consumption

Supply	-	from Oshawa P. U. C.
Process	-	530,000 gpd (gallons per day)
Domestic	-	20,000 gpd
		<hr/>
Total	-	550,000 gpd (average)

Sources and Disposal of Waste

The sources are:

- 1) detergent wash (some re-circulated)
- 2) boiler blowdown
- 3) washings of oil from the final products
- 4) cooling water from the various machines
- 5) domestic sewage

All liquid wastes, with the exception of the domestic sewage, are discharged to a storm sewer.

Sampling Programme

A grab sample of the effluent, from the detergent wash and oil wastes, was taken on May 6, 1966.

Analytical Results

As on page 22.

DISCUSSION OF FINDINGS

The waste characteristics of the effluent to the storm sewer are in excess of the OWRC objectives for discharge to a watercourse.

These objectives are:

Suspended Solids	-	15 ppm (parts per million)
5-Day BOD	-	15 ppm
Ether Solubles	-	15 ppm

These three waste constituents are a result of the removal of oil from the finished parts by detergent and hot water. A separation of oil from this waste should reduce the other two contaminants and produce a more acceptable effluent.

CONCLUSIONS AND RECOMMENDATIONS

Duplicate Canada Limited is discharging an effluent from the washing section with waste characteristics which do not meet the OWRC objectives for discharge to storm sewers. Even though this conclusion was based on the analytical results of a grab sample, it appears that an excess (i.e. over 15 ppm ether solubles) of oil would always be present in this waste flow.

It is therefore recommended that this waste be treated so that the quality will comply with the OWRC objectives for discharge to a storm sewer or watercourse.

ONTARIO WATER RESOURCES COMMISSION
CHEMICAL LABORATORIES

INDUSTRIAL WASTE ANALYSIS

All analyses except pH reported in
ppm unless otherwise indicated

1 ppm = 1 mgm/litre
= 1 lb/100,000 Imp. Gals.

Municipality: Oshawa

Report to: T. Armstrong*

Source: Duplate Canada Limited

Date Sampled: May 6, 1966 by: R. Abbott

Lab. No.	5-Day BOD	Solids			Ether Solubles	Anionic Detergents as ABS
		Total	Susp.	Diss.		
T-1217	46	1,058	372	686	1,496	0.1

T-1217 1. Effluent to Storm Sewers - Grab (11:00 pm)

ONTARIO MALLEABLE IRON COMPANY

This plant is located on Prospect Street in Oshawa. An inspection was carried out on April 19, 1966.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. K. Hegerman, Cost Department
Number of Employees	-	600
Operating Schedule	-	24 hours per day, 5 days per week
Raw Materials	-	includes scrap and pig iron

PROCESS

Operations at this plant are essentially those of a foundry nature. A wide variety of malleable and pearlitic iron castings are produced by various heat treatment methods.

Water Consumption

Supply	-	from Oshawa P. U. C.
Domestic	-	12,000 gpd (gallons per day)
Process	-	131,000 gpd
		<hr/>
Total	-	143,000 gpd (average monthly)

Sources and Disposal of Waste

The sources are:

- a) boiler blowdown
- b) cooling waters from various machines
- c) cooling water from quench-oil tank
- d) cooling and spray washings of castings
- e) floor washings (mostly dry clean-up)
- f) domestic sewage

There are at least two waste outlets (storm and sanitary) from this plant, however, the exact location of discharge of the wastes is unknown. It is therefore assumed that sanitary wastes and wash water are discharged to the sanitary sewers and the cooling waters to the storm sewers.

SUMMARY

It appears that the discharge to the storm sewers from this plant should be of acceptable quality, however, a further survey is planned for the spring of 1967.

The discharge to the municipal sanitary system should be within the by-law limits.

GENERAL MOTORS OF CANADA LIMITED

There are two General Motors plants in Oshawa.

DETAILS OF SURVEY

Personnel Interivewed	-	Mr. W. Stirling, Maintenance Superintendent, North Plant
Number of Employees	-	15,000
Operating Schedule	-	24 hours per day, 7 days per week

PROCESS

The two plants are engaged in the assembly and finishing of trucks and passenger cars from basic parts manufactured elsewhere.

North Plant

The operations here include:

- (a) Stamping - tool and dye shop
- (b) Battery department
- (c) Radiator department - copper strips are plated, formed, assembled and tested for leaks in water baths
- (d) Truck assembly plant - plating shop and prime painting
- (e) Truck body paint shop
- (f) Truck interior shop

South Plant

The operations here are

- (a) Body plant - includes wet sanding, painting and testing
- (b) Chassis and car final assembly - painting and finishing
- (c) Final conditioning line

Water Consumption

Source	-	from P. U. C.
Domestic	-	300,000 gpd (gallons per day)
Process	-	2,330,000 gpd
		<hr/>
Total		2,630,000 gpd (average monthly)

Sources and Disposal of Wastes

From the North Plant

- (a) plating rinses and radiator department overflow
- (b) acid wastes from battery department
- (c) water used in testing radiators
- (d) some paint wastes

From the South Plant

- (a) wet sanding wastes
- (b) Paint shop and paint finishing wastes
- (c) water used in testing bodies for leaks

The plating and the radiator department wastes are neutralized and treated for the destruction of chromium and cyanides prior to being discharged to the municipal sanitary sewer system.

Other wastes, including domestic sewage from both plants, are directed to the sanitary sewers, untreated.

SUMMARY

The company is proposing to double the present size of the plating department for the 1966 model year. This would double the present waste

loads from this area. However, insufficient sewer capacity would prevent discharge of this waste (approximately one-half million gallons per day) to the sanitary sewer system. The company intends therefore, to divert the neutralized wastes to the storm sewers, while the pre-treated cyanides and chromium wastes would be discharged, as at present, to the sanitary sewer system.

Close contact will be maintained with this company to see what action is taken regarding the disposal of the additional wastes from these plants.

If the waste flows receive adequate pre-treatment at the General Motors Plant, they should not impair the efficiency of the operation at the sewage treatment plant. The secondary treatment section of the sewage plant was expanded during the summer of 1966 (by one-third).

ROBSON-LANG LEATHERS LIMITED

This plant is located on Whitting Avenue in Oshawa and was visited on January 12 and February 2, 1966.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. H. Westwood, Plant Superintendent
Number of Employees	-	300 (approximately)
Operating Schedule	-	9 hours per day, 5 days per week
Raw Materials	-	hides, chrome tanning solutions, lime, etc.

PROCESS

This company operates a typical tannery. The operations may be divided into three main categories i.e. beamhouse, tanyard, and finishing.

In the beamhouse, curing, fleshing, washing, soaking, de-hairing, lime splitting, bating, pickling and de-greasing operations are carried out. In the tanyard, the processes which prepare the leather for colouring and finishing, are completed. These processes include chrome tanning, shaving and finishing. The finishing operation includes bleaching, stuffing, liquoring and colouring.

Water Consumption

Supply	-	from P. U. C. and Oshawa Creek
Domestic	-	6,000 gpd (gallons per day)
Process	-	334,000 gpd
		<hr/>
Total	-	340,000 gpd (estimate)

Sources and Disposal of Wastes

Liquid wastes originate in all the operations mentioned previously, with the greatest volumes coming from the colouring operations, lime baths, and bating vats.

All the plant wastes are discharged to two plant sewers which in turn discharge to sumps at the head of six parallel settling basins. (see attached diagram). The north sump discharges to settling basins (1), (2) and (3), and the south sump discharges to settling basins (4), (5) and (6). The overflows from the opposite ends of the basins discharge to a single pipe which conveys the wastes to Oshawa Creek. Normally only five settling basins are in operation at any given time as one is continually down for sludge removal. Sludge drying beds are maintained on the property and the drainage from them is directed via underdrains to the sewer leading to Oshawa Creek.

Sampling Programme

Hourly composite-samples of the total plant effluent to Oshawa Creek were taken on January 12 and February 2, 1966, by collecting equal aliquots at 15-minute intervals.

These samples were submitted to the OWRC laboratory for analysis for pH, Total Chromium, Solids, BOD, and Sulphides in accordance with the procedures described in "Standard Methods for Examination of Water and Waste Water", 12th Edition.

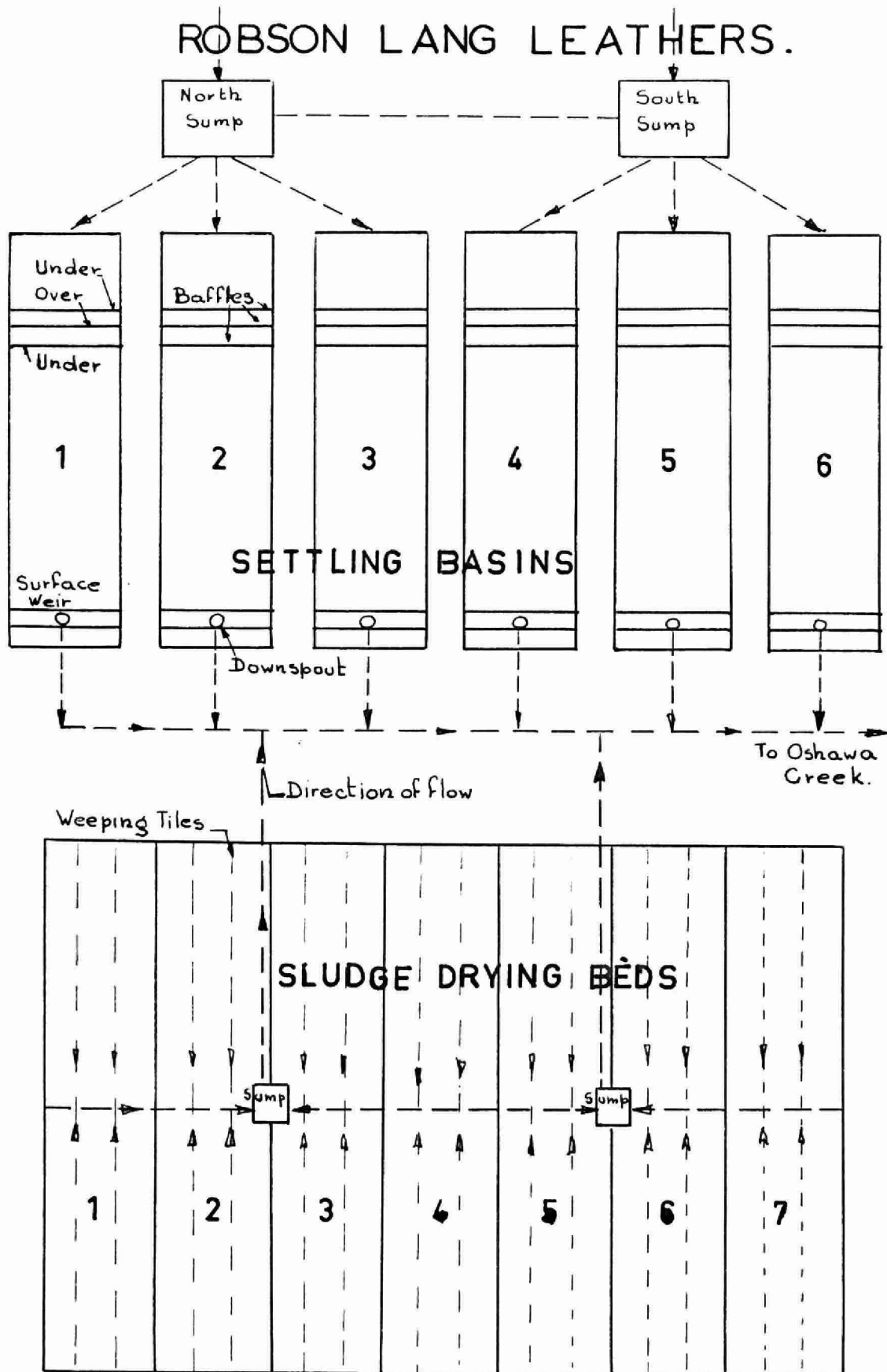


FIG. 2 PRETREATMENT FACILITIES.

Analytical Results

The average quality of the effluent to Oshawa Creek was:

	5-Day BOD	Solids		Total Chromium	pH at Lab.	Sulphides	
		Total	Susp. Diss.				
Jan. 12	410	4,358	314	4,044	14.3	10.5	12.5
Feb. 2	575	4,775	1,250	3,525	54.0	10.6	16.5
OWRC recommended objectives	15	-	15	-	1.0	5.5 - 9.5	-

The average daily waste loadings to Oshawa Creek were:

5-Day BOD	-	1,950 lbs.
Suspended Solids	-	4,250 lbs.
Chromium	-	185 lbs.
Sulphides	-	68 lbs.

SUMMARY

It was found from the two sampling programmes, that the effluent from this plant to Oshawa Creek was unsatisfactory for discharge to a watercourse. This is based on a comparison of these results with the objectives of the OWRC.

This Division is presently negotiating with the company and the City for the possible inclusion of the tannery wastes into the municipal sanitary system.

OSHAWA DAIRY LIMITED

This dairy is located at 431 Simcoe Street South in Oshawa and was visited on April 26, 1966.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. G. Hart, Plant Manager
Number of Employees	-	80
Operating Schedule	-	10 hours per day, 5 days per week
Raw Materials	-	80,000 lb/day of milk

PROCESS

This Company operates a typical milk processing plant. The raw milk is dumped, sampled, weighed, classified, filtered, pre-heated, pasteurized, cooled, and then poured into glass or paper containers.

Any excess milk is processed to a concentrated product.

Water Consumption

Supply	-	from Oshawa P. U. C.
Domestic	-	2,000 gpd (gallons per day)
Process	-	<u>22,000 gpd</u>
Total	-	24,000 gpd (average)

Wastes and Disposal

Waste producing operations in this plant include washing of bottles, cases, cans, trucks, processing equipment, and floors.

All these wastes, along with the domestic sewage, are discharged to the municipal sanitary system.

DISCUSSION

The wastes from this plant are of satisfactory quality for discharge to the municipal sanitary system.

SMITH BEVERAGES LIMITED

This plant is located at 750 Farewell Street in Oshawa and it was visited on April 26, 1966.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. B. Mairs, Plant Manager
Number of Employees	-	15 - 20
Operating Schedule	-	8 hours per day, 5 days per week
Production	-	1,500 cases/day (12 bottles/case)
Raw Materials	-	alkali cleaners, syrups, flavourings etc.

PROCESS

Soft drinks are produced at this plant. Treated water is blended with the appropriate quantities of syrup, sweetener, and flavouring; then it is bottled, carbonated, mixed and packed in cases.

Water Consumption

Supply	-	from Oshawa P. U. C.
Domestic	-	400 gpd (gallons per day)
Process	-	12,000 gpd (including product and washing operations)
Total	-	12,400 gpd (average monthly)

Water used for the bottled product is treated by a process of pH control, coagulation, settling and filtering.

Sources and Disposal of Wastes

The only source of contaminated waste is from the bottle-washing operation (dilute caustic solution). This waste, along with floor washings

and sanitary sewage, is discharged to the municipal sanitary system. The alkali cleaner-baths are dumped three times per year.

SUMMARY

Wastes from this plant should normally have no detrimental effect on the municipal treatment plant. However, the thrice-yearly batch dumpings of the alkali cleaners would probably impair the operation of the plant, because of the high pH. It is therefore recommended that these tanks be bled slowly to the sewers, in conjunction with large volumes of water, so that adequate dilution may be provided.

COULTER MANUFACTURING LIMITED

This plant is located at 30 Richmond Street West in Oshawa and was visited on April 19, 1966.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. W. H. McKee, Plant Engineer
Number of Employees	-	175
Operating Schedule	-	24 hours per day, 6 days per week
Raw Materials	-	different types of metals, zinc solution, acid, alkali cleaners

PROCESS

This plant manufactures automotive trim and small kitchen utensils. The castings and stampings are finished by plating in a zinc cyanide bath, either in barrels or on racks.

Before plating, the parts are prepared in a series of de-greasing and alkali cleaning solutions. Then, the normal procedure for zinc plating is followed - HCl dip, water rinse, zinc brightener, cold and hot rinses. These parts are then shipped to a plant in Uxbridge for copper, nickel and chromium plating.

Water Consumption

Supply	-	from Oshawa P. U. C.
Domestic	-	3,500 gpd (gallons per day)
Process	-	86,500 gpd
		<hr/>
Total	-	90,000 gpd (monthly average)

Sources and Disposal of Wastes

The sources are:

- 1) liquid wastes from the plating room (40% of water consumption)
- 2) cooling waters from the die-casting operations (20%)
- 3) cooling waters from the compressors and spot welders (15%)
- 4) domestic wastes (5%)

The cooling waters are re-circulated within the plant. Plating room wastes and domestic sewage are directed to the sanitary system.

Sampling Programme

A grab sample was taken of the effluent from the plating room to the sanitary sewers.

Analytical Results

See page 38.

DISCUSSIONS

The waste characteristics of the effluent from the plating line appear to closely comply with the OWRC objectives and with the municipal by-law.

Both of which have the following limits:

Zinc	-	5 ppm (parts per million)
Cyanide	-	2 ppm
Suspended Solids	-	350 ppm
pH range	-	5.5 - 9.5

CONCLUSIONS

At the time of this survey, the discharge from the plating room was found to be slightly in excess of the desirable limits but should not impair the operation of the sewage plant.

ONTARIO WATER RESOURCES COMMISSION
CHEMICAL LABORATORIES

INDUSTRIAL WASTE ANALYSIS

All analyses except pH reported in
ppm unless otherwise indicated

1 ppm = 1 mgm/litre
= 1 lb/100,000 Imp. Gals.

Municipality: Oshawa Report to: R. Hussain*

Source: Coulter Mfg. Ltd.

Date Sampled: April 19, 1966 by: R. Hussain

Lab. No.	5-Day BOD	Solids			pH at Lab.	Zinc as Zn	Cyanide as HCN
		Total	Susp.	Diss.			
T-1050	-	260	39	221	8.4	1.7	2.3

T-1050 1. Effluent from Plating line - Grab (11:45 am)

ONTARIO STEEL COMPANY

This plant is located at 133 Riston Road North in Oshawa and it was visited on April 26, 1966.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. D. Seely, Production Control Manager
Number of Employees	-	130
Operation Schedule	-	16 hours per day, 5 days per week
Raw Materials	-	steel rods

PROCESS

This plant fabricates coil springs from steel metal rods. The rods are first rolled to the desired form and then heat-treated in an oven to draw out the grain in the steel. The steel is then ready for finishing.

Water Consumption

Supply	-	from Oshawa P. U. C.
Domestic	-	2,500 gpd (gallons per day)
Process	-	37,500 gpd
		<hr/>
Total	-	40,000 gpd (average monthly)

Sources and Disposal of Wastes

The sources are:

- 1) boiler blowdown
- 2) cooling of steel (bath and sprays)
- 3) cooling of oil quench tank
- 4) domestic wastes

Some cooling water is re-circulated through cooling towers, and some is discharged to the storm sewers.

Domestic wastes are discharged to the sanitary sewers.

SUMMARY

The cooling waters appeared to be of satisfactory quality for discharge to the storm system.

AJAX

The industries in the Town of Ajax that use more than 20,000 gallons of water per month and have significant quantities of liquid industrial waste are:

Ajax Textiles Processing Company, Limited

Tenco, A Division of Coca-Cola Limited

Temuss Products of Canada Limited

Staley (Canada) Limited

Drew Food Products - Division of Drew Chemicals Limited

Canadian Bakels Limited

Cametoid Limited

Industries in the town which do not have significant liquid wastes or only discharge uncontaminated cooling water, are given in Table III.

TABLE III

SUMMARY OF INDUSTRIES WITHOUT SIGNIFICANT INDUSTRIAL WASTES

Name of Industry	Type of Industry or Product	Water Consumption (gpd)		Remarks
		Sanitary	Industrial	
Atlas Tag Company	Manufacture of name tags	500	1,500	Some cooling water and domestic sewage to the sanitary sewers
Canadian Celotex-Cweco Industries Limited	Manufacture of acoustical ceiling tile	700	2,000	Cooling waters to ditch. Domestic wastes to sanitary sewers.
Cloudfoam Limited	Compounding of latex	700	2,500	All wastes are discharged to the sanitary sewers
Corplast-ics of Canada Limited	Manufacture of insulating materials	400	9,300	Cooling waters to ditch to swampy area. Domestic wastes to sanitary sewers
Canadian Automotive Trim	Manufacture of auto trim parts (upholstery)	1,500	-	No process wastes, only domestic wastes
Dowty Equipment of Canada Limited (South Plant)	Sales and Research	600	2,300	All wastes are discharged to the sanitary system
Dowty Equipment of Canada Limited (North Plant)	Manufacture of aircraft legs and wheels	3,400	11,400	All wastes are discharged to the sanitary sewers. Cooling waters included.

...continued

Table III (continued)

Name of Industry	Type of Industry or Product	Water Consumption (gpd)		Remarks
		Sanitary	Industrial	
Dunlop Canada Limited (industrial division)	Extrusion and compound colouring of plastics	300	71,600	San.wastes are discharged to the sanitary sewers. Extrusion cooling waters to Lake
Drew Chemicals Limited	Manufacture of boiler treatment chemicals	1,000	2,400	All wastes, cooling waters included, are discharged to the sanitary system.
Hamilton Cotton Company, Limited	Spinning Mill for yarn	2,400	48,600	Overflow from humidity control system to storm sewers. Domestic wastes to sanitary sewers.
Hein-Werner of Canada Limited	Manufacture of hydraulic jacks	350	1,000	Cooling waters to storm sewers. Domestic wastes to sanitary sewers.
Koeing Knitting Mills Limited	Manufacture of knitted goods	500	4,600	No industrial waste. Water used for steam generation. Domestic wastes to sanitary sewers.
Nabob Foods Limited	Roasting of coffee and peanuts; packing of tea	450	4,500	All wastes, including some cooling waters, are discharged to the sanitary sewers.
Martile Company Limited	Manufacture of ceramic tiles	50	1,200	Domestic wastes to sanitary sewers.

...continued

Table III (continued)

Name of Industry	Type of Industry or Product	Water Consumption (gpd)		Remarks
		Sanitary	Industrial	
Ontario Machine and Tool Works Limited	Machine shop	1,000	2,800	All wastes, including cooling waters, are discharged to the sanitary sewers.
Phoenix Manufacturing	Manufacture of oilcloth	1,000	3,700	Cooling waters to storm sewers. Domestic wastes to sanitary sewers.
Power Automatic Tools Limited	Machine shop	200	1,600	Domestic wastes to sanitary sewers along with some cooling waters.
Trim Trends Canada Limited	Manufacture of auto trim parts	2,000	8,000	Cooling water recycled. Make-up from the town. Domestic wastes to sanitary sewers.
Redifit Wood Specialties	Fabrication of windows and doors	600	-	Domestic wastes to sanitary sewers. No process wastes.
Federal Packing and Partition Company	Fabrication of beer cases	1,000	-	Domestic wastes to sanitary sewers. No process wastes.
Fledes Pipe	Manufacture of concrete pipes	1,000	17,000	Water used for mixing concrete. Domestic wastes to sanitary sewers.
Bayly Engineering Limited	Manufacture of electronic parts	2,000	6,000	Cooling waters and domestic sewage to sanitary sewers.

....continued

Table III (continued)

Name of Industry	Type of Industry or Product	Water Consumption (gpd)		Remarks
		Sanitary	Industrial	
Industrial Steam	Generation of steam for local industries	200	184,000	Water used for producing steam. Domestic wastes to sanitary sewers.
Stark Electronic Instruments Limited	Fabrication of instrument panels	2,000	2,500	Some cooling waters and domestic wastes to the sanitary sewers.
Curran and Briggs	Ready-mix concrete	600	660,000	Water used for mixing concrete and washing truck. Domestic sewage to sanitary system.
Glenn S. Woolley and Company	Plastic moulding	1,000	57,000	Cooling waters and domestic wastes to the sanitary sewers.
Permaglass Incorporated	Glass tempering	600	8,800	Domestic sewage and glass washings are directed to the sanitary system.
Centralab Canada Limited	Manufacture of electronic parts	1,000	7,000	Cooling waters and domestic wastes to sanitary sewers.

AJAX TEXTILES PROCESSING COMPANY LIMITED

This plant is located on Mills Road in Ajax and was visited on July 27, 1966.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. H. K. Serra, General Manager
Number of Employees	-	25
Operation Schedule	-	16 hours per day, 6 days per week
Raw Materials	-	dyes, chemicals, knitted woollens, cotton, and synthetic goods

PROCESS

This plant dyes and finishes knitted goods produced in another plant. The pieces are first prepared for dyeing by scouring and bleaching in a detergent-alkali solution. The degree of scouring depends on the nature of the knitted goods (i. e. woollen, cotton or synthetic fibres). Next, the pieces are dyed in bath-mixers containing hot dye solutions and these solutions are re-circulated by pumps through the pieces. The articles are then finished by sizing or fulling to make them more resistant to wear and smoother to the touch. This operation involves mixing the pieces in a vat containing soap, soda ash and a sequestering agent. Excess fulling solution is then washed out of the fabric. The pieces are finally dried in laundry-type driers and readied for packing and shipping.

Water Consumption

Supply	-	from Ajax P. U. C.
Domestic	-	500 gpd (gallons per day)
Process	-	47,000 gpd
Total	-	<u>47,500 gpd (monthly average)</u>

The water from the P. U. C. is treated in an ion-exchange unit and is pre-heated in a heat-exchanger by the outgoing hot dye waters prior to being used. The water is stored at around 130° F in a tower before usage.

Sources and Disposal of Wastes

The sources are:

- a) some softener regenerating brine
- b) dumping of dye vats
- c) dumping of scouring and bleaching and fulling solutions
- d) wash waters
- e) domestic wastes

All the liquid wastes are discharged to the sanitary sewers.

Sampling Programme

A grab sample was taken of the effluent to the sanitary sewers on July 27, 1966.

Analytical Results

See page 48.

SUMMARY

The results of the grab sample indicate that the wastes from this plant, with the exception of the colour, seem to be acceptable for discharge to the sanitary sewers.

The black colour presently being experienced in the influent to the Ajax Sewage Treatment Plant could be partly due to the colour of the waste discharges from this plant.

ONTARIO WATER RESOURCES COMMISSION
CHEMICAL LABORATORIES

INDUSTRIAL WASTE ANALYSIS

All analyses except pH reported in
ppm unless otherwise indicated

1 ppm = 1 mgm/litre
= 1 lb/100,000 Imp. Gals.

Municipality: Ajax Report to: R. Hussain*

Source: Ajax Textiles Processing Company Limited

Date Sampled: July 27, 1966 by: R. Hussain

Lab. No.	5-Day BOD	Solids			COD	* Chlorine Demand	Anionic Detergents as ABS	pH at Lab.	Colour Dilu- tion
		Total	Susp.	Diss.					
T-2131	202.	2,182	298	1,884	2,022	42.5	380	6.5	1:50

*This result was based on a chlorine residual of 0.3 ppm at 20°C and
after a contact time of 15 minutes (sample was diluted in a ratio of
25:1)

T-2131 1. Effluent to sanitary sewers - Grab 1:30 pm

TENCO, A DIVISION OF COCA-COLA LIMITED

This plant is located on Mills Road in Ajax and was visited on August 4, 1966.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. E. Dickson, Plant Manager
Operating Schedule	-	24 hours per day, 5 days per week
Number of Employees	-	approximately 70
Raw Materials	-	green coffee beans
Products	-	instant coffee

PROCESS

This plant produces instant coffee from green coffee beans. The procedure involves blending various grades of beans, grinding them and extracting the coffee with the aid of water in a series of extraction columns. The extracted coffee is removed in a wet condition from the columns, weighed, spray-dried and then packaged.

Water Consumption

Supply	-	from Ajax P. U. C.
Domestic	-	1,500 gpd (gallons per day)
Extraction	-	30,000 gpd (no liquid wastes)
Blowdown	-	10,000 gpd
Other	-	<u>98,500 gpd</u> (unknown)
Total	-	140,000 gpd (monthly average)

Sources and Disposal of Wastes

The sources are:

- 1) blowdown from extraction columns
- 2) tanks and floor wash-ups
- 3) various cooling waters (most re-circulated)
- 4) domestic wastes

All wastes are discharged to the sanitary sewers.

Sampling Programme

A grab sample of the effluent to the sanitary sewers was taken on August 4, 1966.

Analytical Results

See page 91.

DISCUSSION

First, the water usage in this plant did not correspond to the figures given by the Ajax P. U. C. The flow from this plant was estimated to be in the range of 20-40 gpm or 28,800 - 57,600 gallons per 24 hours. This is far below the 110,000 gallons per day as given by the P. U. C. To clarify this discrepancy, new meters should be installed on the water mains to this plant.

Secondly, the black colour found at the Ajax Sewage Treatment Plant and in Duffin Creek at the exit from the treatment plant, is due partly to this company. A dilution factor of 200:1 was needed on the day of sampling, to eliminate the colour from the waste.

CONCLUSIONS AND RECOMMENDATIONS

Tenco is discharging a highly-coloured waste to the sanitary sewers and is partly responsible for the black colour in the influent to the Ajax Sewage Treatment Plant.

ONTARIO WATER RESOURCES COMMISSION
CHEMICAL LABORATORIES

INDUSTRIAL WASTE ANALYSIS

All analyses except pH reported in
ppm unless otherwise indicated

1 ppm = 1 mgm/litre
= 1 lb/100,000 Imp. Gals.

Municipality: Ajax

Report to: R. Hussain*

Source: Tenco - A Division of Coca-Cola Limited

Date Sampled: August 4, 1966.

by: R. Hussain

Lab. No.	5-Day BOD	Solids			pH at Lab.	Ether Solubles	Colour Dilution
		Total	Susp.	Diss.			
T-2172	140	1,166	494	672	6.5	19	1:200

T-2172 1. Effluent to Sanitary Sewers (Grab 2:15 pm)

TEMUSS PRODUCTS CANADA LIMITED

This plant is located on Mackenzie Avenue in Ajax and was visited on March 28, 1966.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. H. Smith, Owner
Number of Employees	-	15
Operating Schedule	-	8 hours per day, 5 days per week
Raw Materials	-	"stick lac" or "natural lac", methanol and bleaching agents
Products	-	"shellac" or "lac resin" for varnishes

PROCESS

This plant manufactures "shellac" or "lac resin" for the varnish industry. The product is made from a form of insect life, "stick lac", by a purification process. The process involves the rolling, crushing, separating, washing, and finally bleaching of the material to the final product.

Water Consumption

Supply	-	from Ajax P. U. C.
Domestic	-	300 gpd (gallons per day)
Process	-	50,000 gpd
		<hr/>
Total	-	50,300 gpd (average monthly)

Sources and Disposal of Wastes

The sources are:

- 1) washing of the product
- 2) water used in the separation process
- 3) cooling waters
- 4) domestic wastes

The process wastes are discharged to Lake Ontario via a ditch.
Domestic wastes are directed to the sanitary sewers.

Sampling Programme

A grab sample of the discharge to the ditch was taken on March 28,
1966.

Analytical Results

See page 54.

SUMMARY

From the analytical results it may be seen that the waste constituents are within the OWRC recommended objectives for discharge to a watercourse.

These objectives are:

5-Day BOD	-	15 ppm (parts per million)
Suspended Solids	-	15 ppm
Phenols	-	20 ppb (parts per billion)
pH range	-	5.5 - 10.6

STALEY (CANADA) LIMITED

This plant is situated on Finely Street in Ajax and was visited on July 27, 1966.

DETAILS OF SURVEY

Personnel Interviewed	--	Mr. R. Shelley, Plant Manager
Number of Employees	--	10
Operating Schedule	--	8 hours per day, 5 days per week
Raw Materials	--	monomers, emulsifiers, catalysts, starch and detergents
Products	--	polymer latices, liquid starch and fabric softeners

PROCESS

This plant manufactures polymer latices (emulsions) that are used to formulate liquid floor polishes, and mixes and bottles liquid starch and fabric softeners, for the consumer market.

All the above products are made in batch reactions. The polymer latices are formed by a mixing or emulsifying step with water, emulsifiers and monomer, and then a polymerization step in which the emulsified materials are heated or cooled, as required, by the addition of catalysts. The liquid starch and softeners are manufactured by blending the necessary ingredients in batch cookers. The mixtures are then bottled and packaged.

Water Consumption

Supply	-	from Ajax P. U. C.
Domestic	-	200 gpd (gallons per day)
Process	-	<u>31,500 gpd</u>
Total	-	31,700 gpd (average monthly)

Sources and Disposal of Wastes

The sources are:

- 1) washings of the tanks and reactors (not more than 500 gpd)
- 2) cooling waters for the reactors (about 95%)
- 3) domestic wastes

The tank and reactor washings are directed to a sump for settling of some solid particles, and then discharged along with the domestic wastes to the sanitary sewers. In the event of a blockage of the sewer, the wash wastes may be pumped to an outside ditch. The cooling waters are also discharged to this ditch.

Sampling Programme

A grab sample of the wash wastes to the sanitary sewers was taken on July 27, 1966.

Analytical Results

See page 57.

DISCUSSION

In view of the small volume (500 gpd) of the wastes involved, no adverse conditions should result from this company's wastes at the sewage treatment plant.

The washing wastes should never be directed to the ditch.

ONTARIO WATER RESOURCES COMMISSION
CHEMICAL LABORATORIES

INDUSTRIAL WASTE ANALYSIS

All analyses except pH reported in
ppm unless otherwise indicated

1 ppm = 1 mgm / litre
= 1 lb/100,000 Imp. Gals.

Municipality: Ajax		Report to: R. Hussain*					
Source: Staley							
Date Sampled: July 27, 1966.		by: R. Hussain					
Lab. No.	5-Day BOD	Total	Solids Susp.	Diss.	COD.	Ether Solubles	pH at Lab.
T-2130	980	14,656	1,017	13,639	6,892	12,000	8.6
T-2130	1. Effluent to sanitary sewer (Grab 10:30 pm)						

DREW FOOD PRODUCTS - DIVISION OF DREW CHEMICALS LIMITED

This plant is located on Bayley Street in Ajax and was visited on March 22, 1966.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. J. Ward, Plant Manager
Operating Schedule	-	24 hours per day, 5 days per week
Number of Employees	-	approximately 50
Raw Materials	-	soy beans; peanut, cottonseed, rapeseed, palm, palm kernel, coconut, herring, and manhaden oils

PROCESS

The raw materials enter the plant and are stored (see Fig. III). Caustic is added to the raw oils when they go through the refining process. By means of primary centrifugation a soapstock is produced, which is transferred to acidulation vats. The heavier portion from the primary centrifuge is washed, and the soapy wash water is also transferred to the acidulation vats. At this point, bleaching clay is added to the remaining oily liquid to remove any suspended particles by adsorption. The clay and particles are then filtered out, and the refined and bleached oil goes to a storage tank. Sulphuric acid (pH-1) is added to the soapstock solution in the acidulation vats under controlled conditions, and fatty acids are produced and stored. The resulting acid waste has a pH of not less than 4, and it is stored prior to disposal.

Depending on the product desired, the refined and bleached oil may go to either the hardening plant or the deodorizer or both.

In the hardening plant, a nickel catalyst is added to the oil and under controlled temperature and pressure in the presence of electrolytic hydrogen, hydrogenation of the oil is achieved. The cooling water needed for this operation is re-circulated in a closed system through a cooling tower and is re-used. The nickel catalyst is removed by filtration.

It then remains for the desired combination of refined and bleached and hardened oils to be sent to the deodorizing section.

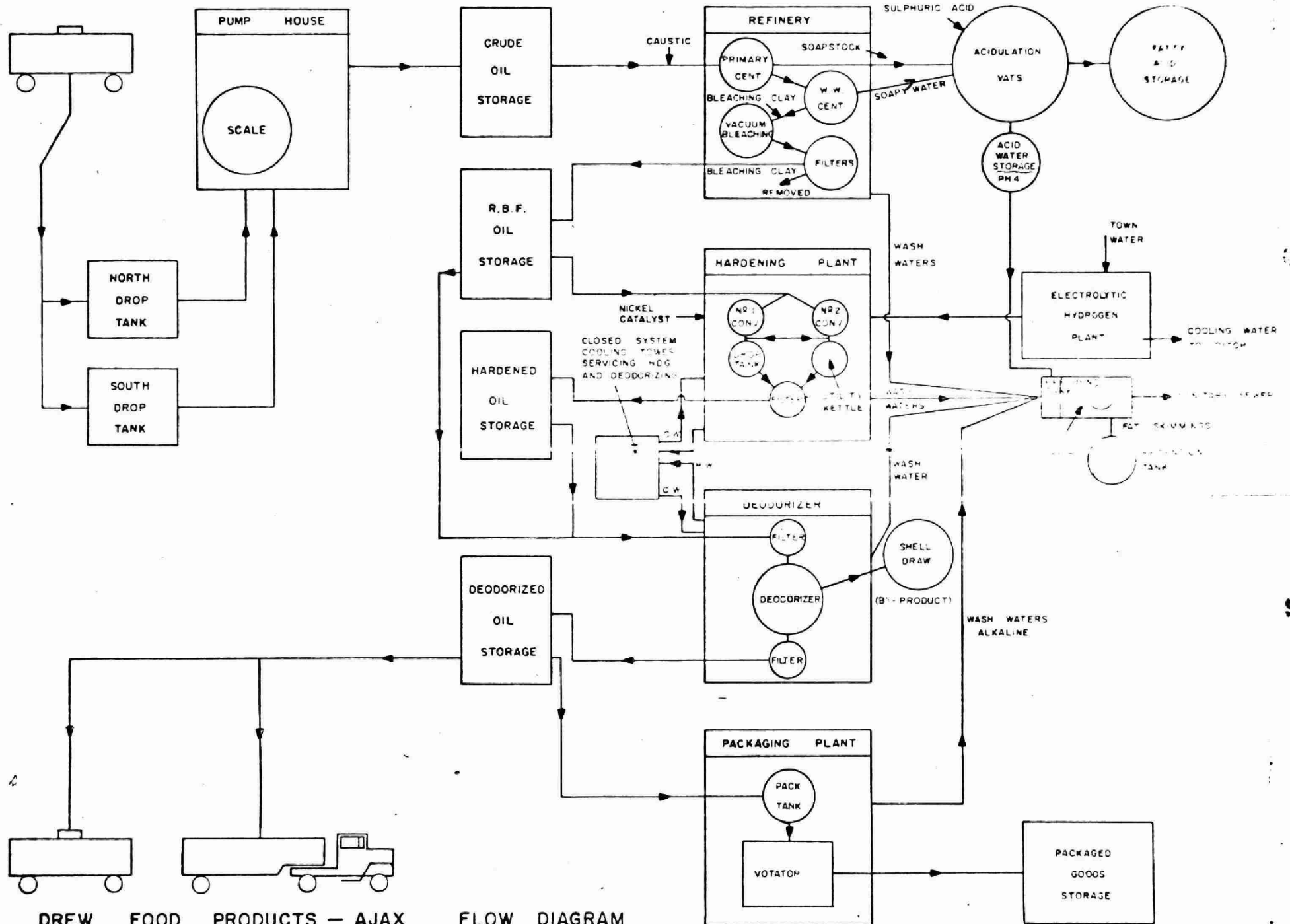
Water Consumption

Supply	-	from P. U. C.
Domestic	-	1,000 gpd (gallons per day)
Process	-	<u>379,000 gpd</u> (including cooling waters)
Total	-	380,000 gpd

Sources and Disposal of Wastes

To Sanitary Sewer

Steam throughout the various processes is routed to a condensation tower. The wash water is taken from this tower and any make-up water needed is taken from the cooling water in the electrolytic hydrogen plant. Alkaline cleaning compounds are added to the wash water and the wash water, containing soap, grease, etc., is pumped from the various collection sumps in the basement, to the effluent tank. (see Fig. 3). Approximately 70% of the flow to the effluent tank is wash water (pH 8-9). Thus, when this wash water is combined with the acidic waste from the acidulation vats, neutralization takes place. With normal waste flows, the pH of the effluent to



DREW FOOD PRODUCTS - AJAX
 FIG. 3
 FLOW DIAGRAM

the sanitary sewer is about 6. The grease and fat are skimmed off the effluent tank and pumped to a storage tank, where the retention time is such that fat recovery is possible. The liquid from the lower part of this storage tank is returned to the effluent tank as shown in Fig. 4.

Wastes to the ditch consist of cooling water from the electrolytic hydrogen cells and drainage from the yard.

Sampling Programme

A grab sample of the waste to the ditch was taken on March 22, 1966, and was submitted to the OWRC laboratory for analysis on BOD, COD, Solids, Phenols and Ether Solubles, in accordance with the procedures outlined in the Twelfth Edition of "Standard Methods for Examination of Water and Waste Water".

Analytical Results

The results of this sample are as follows:

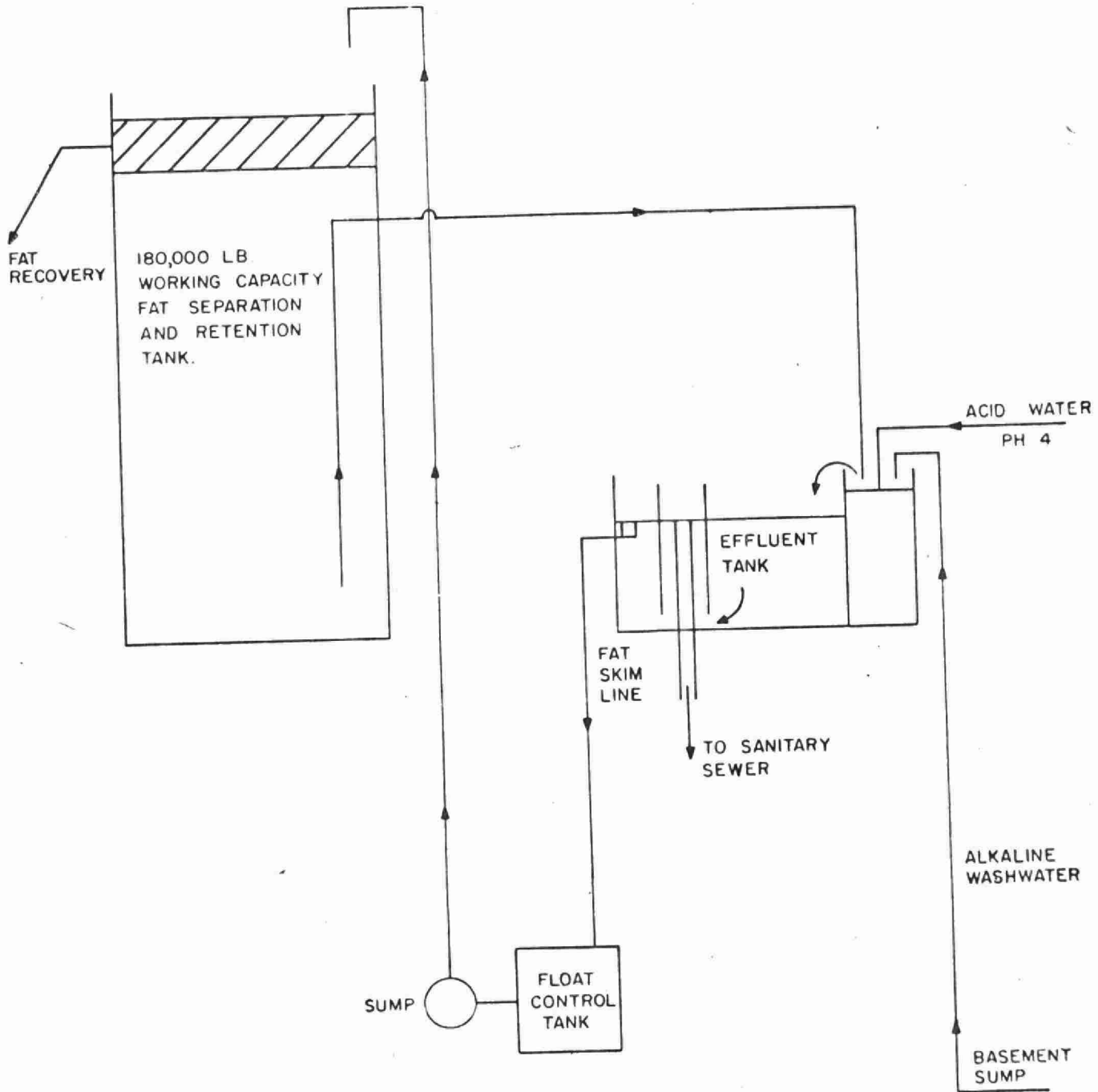
	5-Day BOD	Solids		COD	Phenols ppb	Ether Solubles	
		Total	Susp.	Diss.			
Sample from storm sewer to ditch	54	320	52	268	65	80	8.2
OWRC recom- mended objectives	15	-	15	-	-	20	15

SUMMARY

The results of this grab sample indicate that the 5-Day BOD, Suspended Solids and Phenol content of the plant wastes to the ditch are above the recommended OWRC objectives.

DREW FOOD PRODUCTS - AJAX
DETAIL OF FAT SEPARATION SYSTEM

FIG. 4



The cause of the excessive concentrations in the flow to the ditch was traced back to spills from the acidulation vats that reached the yard drainage system. Those spills are then conveyed to the ditch with ordinary yard drainage and cooling waters from the electrolytic hydrogen cells.

The company has cleared the ditch of all fatty materials, and close contact will be maintained with this Company to ensure adequate treatment measures are adopted in future.

DUPONT OF CANADA LIMITED

This plant is located on Fairall Street in Ajax and was visited on July 26, 1966.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. B. Holt, Plant Engineer
Number of Employees	-	275
Operating Schedule	-	16 hours per day, 5 days per week
Raw Materials	-	resins, plasticizers, pigments, solvents, oils, dryer solutions, nitro cellulose, etc.

Water Consumption

Supply	-	from Ajax P. U. C.
Domestic	-	5,500 gpd (gallons per day)
Cooling	-	150,000 gpd
Process	-	<u>6,000 gpd</u>
Total		161,500 gpd (average monthly)

PROCESS

This plant produces latex or water-based paints, lacquers, oil-based paints, solvent blends, thinners and other industrial finishes or coated fabrics such as non-stick "Teflon".

Essentially, the various processes include the weighing and mixing of the raw materials in batch operations. For the paint manufacture, the mixture is thinned and tinted in large agitated mixing tanks and then strained before final packing. The paint is poured into cans, labelled, packed and moved to storage.

Sources of Liquid Wastes

The sources are:

- a) water washings of the latex paint process tanks (batch process)
- b) a ten percent (10%) caustic wash water as well as a water rinse of the oil-based paint process tanks
- c) water or solvent rinses for other process tanks
- d) floor spills and washings
- e) cooling water from various machines and processes
- f) domestic wastes

Waste Treatment and Disposal

The process wastes, with the exception of the cooling waters, are directed to a newly-constructed treatment facility. Wastes are received in a holding tank and then pumped to a mixing chamber. Alum and sulphuric acid are added in the line to the mixing chamber to maintain a pH within the desired range of 5.5 to 7.0 and also to produce a suitable floc. The wastes are then directed to a clarifier for skimming and solid removal. The clarified effluent is chlorinated prior to discharge to the ditch where dilution with the cooling waters occurs. The sludge and skimmings are presently land dumped.

Domestic wastes are discharged to the Town's sanitary sewage system.

Sampling Programme

Five hour composite samples were taken on July 26, 1966 of the influent and effluent at the treatment facilities. (equal aliquots were collected at fifteen-minute intervals) Also, two hour composite samples

were taken from the ditch about 20 yards below the junction of the treated wastes and the cooling waters. In addition, composite samples were taken on June 16, 1966.

These samples were submitted to the OWRC laboratories for analyses for pH, 5-Day BOD, Ether Solubles and Solids, in accordance with the procedures described in "Standard Methods for Examination of Water and Waste Water," Twelfth Edition.

Analytical Results

The results of the composite and grab samples are appended to the report.

DISCUSSION OF FINDINGS

The characteristics of the process waste depend a great deal on the type of paints or other products being processed, and because of this, varying waste strengths will be observed in these batch discharges throughout a given time period. This is illustrated by noting the BOD content of the influent to the treatment facilities of 1,250 parts per million on June 16, as compared with a reading of 40,000 parts per million on July 26, 1966.

The important characteristics of the waste to be considered in this discussion are: 5-Day BOD, Suspended Solids, Ether Solubles, pH and colour. The recommended OWRC objectives for these waste constituents in a discharge to a watercourse are as follows:

5-Day BOD	- 15 ppm (parts per million)	pH Range	- 5.5 to 9.5
Suspended Solids	- 15 ppm	Colour	- 4:1
Ether Solubles	- 15 ppm	Dilution	(with water)

These treatment works were designed to handle waste flows according to the company's engineers, with the following characteristics:

Volume	-	3,000 gallons per 8-hour period
pH	-	12.0
Suspended Solids	-	2,000 ppm
5-Day BOD	-	less than 50 ppm

The 5-Day BOD is defined as the quantity of oxygen in parts per million utilized in the biochemical oxidation of organic matter under standard laboratory procedures in five (5) days at twenty degrees centigrade. The samples taken on July 26, 1966, indicate fluctuating BOD readings ranging from a high of 69,000 to 14,500 parts per million, or an average of 40,000 parts per million in the influent to the unit. Clearly, concentrations of such magnitudes are far in excess of the design criteria as specified by engineers of Dupont. According to the Company - "BOD readings on the lucite waste were less than 50 parts per million; on other samples, including the composite, it was 'nil'". Readings from a high of 24,500 to 4,500 parts per million with the average BOD being 11,500 parts per million, were recorded in the effluent from the unit, thus giving an overall BOD removal efficiency of around 70%. The average BOD reading of the final effluent i. e., cooling water plus process wastes, was found to be approximately 315 parts per million. This is in excess of the OWRC objective of 15 parts per million.

The suspended solids removal efficiency (3,176 ppm to 1,786 ppm) was found to be approximately 45% on July 26, 1966 and the average final

content of the combined discharge was approximately 120 parts per million. However, the fact that the flow in the ditch prior to the Dupont property contains a suspended solids content of approximately 94 parts per million (T-1931) should not be overlooked.

The pH of the final waste (9.9 to 11.0) does not comply with the OWRC objectives. On July 26, 1966, the pH adjusting unit was not functioning properly, and as a result, the pH of the waste was not maintained in the desired range of 5.5 to 7.0. The overall treatment problems could be partially attributed to this fact.

The average ether soluble (i.e., greases and oils) content of the effluent to the ditch was found to be 20 parts per million. Efficient baffling in the treatment unit would considerably reduce this loading prior to discharge to the ditch.

The colour dilution factor was not recorded, as a fairly clear effluent was observed in the ditch during both sampling programs.

CONCLUSIONS AND RECOMMENDATIONS

The new treatment facilities at the Dupont Plant in Ajax were found to be ineffective in treating the process wastes prior to discharge to the ditch. The difficulties encountered at this unit can be attributed to poor pH control, insufficient baffling for the clarified wastes, inadequate holding facilities, and the fluctuating strengths of the process wastes.

It is therefore recommended that:

- 1) The Company should provide additional holding facilities to

minimize the effects of the varying strengths of the process wastes on the treatment unit. This was clearly specified in the special terms and conditions of the Design Approval Certificate (65-C-14) from the OWRC.

- 2) Better pH control be provided for the incoming wastes to maintain a pH in the range of (7.0 - 6.5). This would aid in the proper treatment of the process waste.
- 3) The high pH caustic cleaning solutions should not be allowed to discharge into the process waste flow. These occasional cleanings would cause variations in the pH, and they should be collected and neutralized separately in the plant.
- 4) A better baffling system be provided for the clarified wastes. The present system of 3" baffles is inadequate to contain the oils and grease on the top of the clarified effluent.
- 5) A proper skimming apparatus be installed on the clarifier. The present system does not provide for the large quantity of scum on the clarifier and difficulty has been experienced in conveying this scum to the sludge storage compartment.
- 6) Finally, if the company continues to provide inadequate treatment for the process wastes before discharge to the ditch, the possibility of re-directing this treated waste from the ditch to the municipal sanitary sewers should be investigated.

ONTARIO WATER RESOURCES COMMISSION
 CHEMICAL LABORATORIES
 INDUSTRIAL WASTE ANALYSIS

All analyses except pH reported
 in ppm unless otherwise indicated

1 ppm = 1 mgm/litre
 = 1 lb/100,000 Imp. Gals.

Municipality: Ajax

Report to: R. Hussain

Source: Dupont

Date Sampled: July 26, 1966

by: R. Hussain and G. G.

Lab. No.	5-Day BOD	Solids		Ether Sol-ables	pH at Lab.	COD	
		Total	Susp. Diss.				
T-2115	69,000	25,806	2,576	23,230	1,100	12.4	104,770
T-2116	4,550	12,322	2,280	10,042	1,000	12.4	16,358
T-2117	37,500	30,884	4,034	26,850	1,500	11.6	209,520
T-2118	9,200	15,470	1,540	13,930	440	12.2	13,417
T-2119	34,000	20,490	3,784	16,706	4,300	12.3	60,288
T-2120	11,300	15,112	7,776	7,336	180	12.4	13,969
T-2121	45,000	12,838	3,460	9,378	4,700	12.2	66,904
T-2122	24,500	24,380	2,286	22,094	580	12.4	31,980
T-2123	14,500	18,838	2,024	16,814	1,100	12.4	15,991
T-2124	8,500	10,766	1,038	9,728	640	12.4	13,601
T-2125	460	618	158	460	14	11.0	478
T-2126	170	674	88	586	27	9.9	390

T-2115	1. Influent to treatment facilities	Composite 9:30 - 10:30 am
T-2116	2. Effluent from treatment facilities	Composite 9:30 - 10:30 am
T-2117	3. Influent to treatment facilities	Composite 10:30 - 11:30 am
T-2118	4. Effluent from treatment facilities	Composite 10:30 - 11:30 am
T-2119	5. Influent to treatment facilities	Composite 11:30 - 12:30 pm
T-2120	6. Effluent from treatment facilities	Composite 11:30 - 12:30 pm
T-2121	7. Influent to treatment facilities	Composite 1:30 - 2:30 pm
T-2122	8. Effluent from treatment facilities	Composite 1:30 - 2:30 pm
T-2123	9. Influent to treatment facilities	Composite 2:30 - 3:30 pm
T-2124	10. Effluent from treatment facilities	Composite 2:30 - 3:30 pm
T-2125	11. Effluent to final ditch	Composite 1:30 - 2:30 pm
T-2126	12. Effluent to final ditch	Composite 2:30 - 3:30 pm

CANADIAN BAKELS LIMITED

This plant is located on Frankcom Street in Ajax and was visited on July 27, 1966.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. F. J. Marais, General Manager
Operating Schedule	-	8 hours per day, 5 days per week
Number of Employees	-	5
Raw Materials	-	fish and vegetable oils, preservatives and emulsifiers
Products	-	emulsified marine and vegetable fat

PROCESS

This plant manufactures and packages emulsified marine and vegetable fats to supply the baking industry. The various raw materials are blended and heated in a batch reactor with a measured quantity of hot water. This reaction takes about forty minutes and then the finished product is packaged in drums or cans.

Water Consumption

Supply	-	from Ajax P. U. C.
Domestic	-	100 gpd (gallons per day)
Process	-	<u>7,700 gpd</u>
Total	-	7,800 gpd (average monthly)

Sources and Disposal of Wastes

The sources are:

- 1) tank and reactor washings
- 2) floor washings and spills
- 3) domestic wastes

The washings (about 50 gpd) are directed to a three-compartment fat trap and thence to the sanitary system. The trap is cleaned out periodically.

Domestic sewage is discharged into the sanitary sewers via a separate sewer.

Sampling Programme

A grab sample was taken of the final discharge of the washing wastes to the sanitary sewers on July 27, 1966.

Analytical Results

See page 73.

SUMMARY

In view of the small quantity of liquid wastes from this plant, no adverse effects should result at the Sewage Treatment Plant.

ONTARIO WATER RESOURCES COMMISSION
CHEMICAL LABORATORIES
INDUSTRIAL WASTE ANALYSIS

All analyses except pH reported in
ppm unless otherwise indicated

1 ppm = 1 mgm/litre
= 1 lb/100,000 Imp. Gals.

Municipality: Ajax Report to: R. Hussain*
Source: Canadian Bakels
Date Sampled: July 27, 1966 by: R. Hussain

Lab. No.	5-Day BOD	Solids			COD	pH at Lab.	Ether Solubles
		Total	Susp.	Diss.			
T-2132	790.	1,286	380	906	1,470	5.8	550

* Skim off solids at top

T-2132 1. Effluent to sanitary sewers * (Grab 11:30 pm)

CAMETOID LIMITED

This plant is located on Fairall Street in Ajax and was visited on July 26, 1966.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. D. Newman, General Manager
Number of Employees	-	approximately 30
Operating Schedule	-	16 hours per day, 7 days per week
Raw Materials	-	ferrous and non-ferrous materials and various plating solutions
Production	-	small parts for aircraft, electronic and general defence industries

PROCESS

A breakdown of the various types of plating operations in this plant is as follows:

1. Electroplating

On ferrous and non-ferrous (including aluminum) bare materials, the following coatings are added: cadmium, copper, silver, tin, nickel, gold, zinc, chromium and rhodium.

All these operations are carried out conventionally.

2. Chemical Plating

Electroless nickel, a very hard, corrosion-resistant, semi-brite deposit which may be applied to most metals in uniform layers.

3. Anodizing

Utilizing sulphuric and chromic acid solutions

4. Cametizing

A thick, hard, anodized coating for aluminum formed in a concentrated sulphuric acid refrigerated solution.

5. Chemical Treatments

Chromate conversion for aluminum.

Phosphating for steel.

Black oxide for steel.

Corrosion protective films for magnesium.

Water Consumption

Supply	-	from Ajax P. U. C.
Domestic	-	600 gpd (gallons per day)
Process	-	<u>70,400 gpd</u>
Total	-	71,000 gpd (average monthly)

Source and Disposal of Wastes

As in a typical plating shop, the sources of wastes are:

- 1) running rinses after plating baths
- 2) floor washups and spills
- 3) occasional dumps of batch solutions (acids and alkali)
- 4) domestic wastes

The plating solutions are never dumped, but are continuously filtered and made up to strength.

The plating room effluents are assumed to go to the sanitary sewers, although neither the Company nor Town officials could confirm this fact. The location of the combined plating room effluent outfall is unknown.

Domestic wastes are directed to the sanitary sewers and it is justifiable to assume the plating wastes are discharged to the same connection.

DISCUSSION

In view of the lack of evidence to the contrary, it will be assumed that this industry's plating room effluent is discharged to the sanitary sewer system. A discussion with the STP operator revealed that no adverse effects were noticeable in the biological processes and gas production at the plant. This would indicate that the plating room wastes from this industry, if discharging to the sanitary sewers, do not impair the efficiency at the sewage treatment plant.

UXBRIDGE

The industries in the Town of Uxbridge that use in excess of 20,000 gallons of water per month and/or have significant quantities of industrial wastes are:

Comco Electroplating Company Limited

Fritz Glitsch and Sons

Uxbridge Beverages

Uxbridge Creamery

B. Dyson Slaughterhouse

G. Hamelin Slaughterhouse

There is only one industry in the Town that does not have significant liquid wastes. It is:

The Industrial Tannery

COMCO ELECTROPLATING COMPANY LIMITED

This plant is the largest industry in the Town of Uxbridge and it was visited on April 6th and 28th, 1966.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. F. Shortt, Plant Manager
Number of Employees	-	300 (approximately)
Operating Schedule	-	24 hours per day, 7 days per week
Raw Materials	-	formed metal parts

PROCESS

This Company is engaged in the manufacture of parts for the automotive industry. Stamping and assembling operations are carried out, along with the plating of various parts. Also, some finished metal parts (zinc plated) from another plant in Oshawa that require additional electroplate coatings, are received and processed in one of the two plating lines at this plant.

The two plating lines are identical, except that the new line is entirely automatic whereas the old line is manually operated. Prior to the actual electroplating in a copper plating solution, the pieces are thoroughly cleaned in an alkali base solution and in an acid etch or pickle solution. Following each of these cleaning dips, the articles are rinsed in running-water tanks. Similar rinses are employed immediately following the actual plating operations, i.e., copper, nickel, and chrome.

Water Consumption

Supply	-	from a private well
Domestic	-	6,000 gpd (gallons per day)
Plating	-	<u>129,000 gpd</u>
Total	-	135,000 gpd

Sources and Disposal of Liquid Wastes

The main sources of waste from the plating lines are, the overflow rinses following the plating and cleaning operations, periodic discharges of acid dip and alkali solutions, and spills of the plating solutions. These wastes are discharged to the sanitary sewer system.

The plating solutions are never dumped. The nickel sulphate solution is periodically filtered, cooled, purified, and re-used. The chromic acid and copper cyanide solutions are made up to strength as required.

Spills and drag-out losses to the floors in the new plating line have been reduced appreciably by the use of boards on the plating and rinsing tanks. This measure enables the full strength plating solutions dragged out of the tanks, to be collected and returned to the main tanks. However, close inspection of the chromic acid plating area revealed some spillage of the chromic acid to the floor. This was caused by the extensive suction of air to remove toxic fumes from the plating solutions.

Domestic wastes are discharged to the sanitary sewer system via a separate sewer.

Sampling Programme

Samples of the final effluent from both plating lines were taken at 15-minute intervals and composited hourly over a three-hour period (11:00 am to 2:00 pm). Also, some grab samples were taken at different places in the plating line.

These samples were submitted to the OWRC laboratories for analysis for pH, Solids, Cyanide, Chrome, Copper, Nickel and Zinc, in accordance with the procedures described in "Standard Methods for the Examination of Water and Wastewater", Twelfth Edition.

Analytical Results and Waste Loadings

The average analytical results on June 14 were:

Sample Point	Chrome		Cyanides as HCN	pH at Lab.	Copper as Cu.	Nickel Ni.	Zinc Zn.
	Total	Hexa.					
Old plating line effluent	1.40	0.90	4.2	8.3	0.65	4.5	1.3
New plating line effluent	14.5	10.7	3.4	8.6	1.1	1.8	3.0

The approximate waste loadings discharged from this plant on June 14, 1966 to the sanitary sewers can be estimated by using one-half of the daily plating water usage for each plating line and the average of the analytical results recorded for the composite samples on that day.

The average waste loadings were:

Total Chromium	-	not less than 10 pounds	per day
Cyanides	-	" " " 5	" " "
Copper	-	" " " 1.1	" " "
Nickel	-	" " " 4	" " "
Zinc	-	" " " 3	" " "

DISCUSSION OF FINDINGS

The recommended OWRC objectives for waste discharges to a sanitary sewer system are as follows:

Total Chromium	-	3 ppm (parts per million)
Cyanides as HCN	-	2 ppm
Copper	-	1 ppm
Nickel	-	3 ppm
Zinc	-	15 ppm (approximately)
Range of pH	-	5.5 - 9.5

On the day of the survey, the average concentration of chromium and cyanides present in the effluent from the new plating line were in excess of these recommended objectives. These concentrations, especially the chromium at 14.5 ppm may be causing impairment to biological processes at the Uxbridge Sewage Treatment Plant. This theory is supported when one observes the poor BOD-removal efficiency of 36% being achieved at the S. T. P. This figure was calculated from the latest samples submitted by the S. T. P. on May 2nd, 1966. They were:

Sampling Points	BOD	Solids		
		Total	Susp.	Diss.
Raw Influent	70	608	106	502
Plant Effluent	45	610	36	514

The results of the grab sample (T-1705) of the running rinse following the chromic acid plating solution, showed a total chromium ion concentration of 103 ppm, and, reduction or elimination of this waste flow would no doubt aid appreciably in reducing the amount of chromium reaching the sanitary sewers.

The effluent from the old plating line showed concentrations of nickel (4.5 ppm) and cyanides (4.2 ppm) to be in excess of the OWRC objectives. It appears that improper drag-out procedures and poor housekeeping practices are utilized in this plant. The combination of these waste constituents in the two flows would certainly have a detrimental effect on the performance of the sewage treatment plant, since no more than a 3:1 dilution with domestic waste exists in the Town sewage system. Therefore, every possible step should be taken by the Company to reduce the discharge of these toxic ions to the sanitary sewers.

The results of samples taken on April 6, 1966, were only used as a reference in this evaluation, since the new plating line was only in use for three to four weeks, and operating difficulties were still being experienced.

CONCLUSIONS AND RECOMMENDATIONS

Comco Electroplating Company Limited in Uxbridge was found to be discharging high concentrations of toxic ions to the Town's sanitary sewer system. Total chromium (14.5 ppm), cyanides (4.2 ppm) and nickel (4.5 ppm) are all in excess of the recommended OWRC objectives. The effect of these concentrations on the sewage treatment plant is further compounded by the fact that little dilution is available for these wastes in the sewers.

It is therefore recommended that Comco Electroplating Company Limited conduct a complete survey of their waste treatment procedures. Better drag-out and housekeeping practices in the old plating line will no doubt reduce appreciably the concentrations of the toxic ions in the effluent.

In the new plating line, the practice of discharging the water rinse immediately following the chrome plating operation, should be discontinued since it contains a relatively high concentration of chromium. The work pieces should be allowed to drain into the chromic acid solution tank for a longer period and the two succeeding tanks should be used as reclaim rinse tanks. If this were done, the chromium content of the waste discharge would be reduced considerably.

FRITZ GLITSCH AND SONS

This company is located on Dallas Street in Uxbridge and was visited on June 14, 1966.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. A. Simpson, Plant Engineer
Number of Employees	-	85
Operating Schedule	-	9 hours per day, 5 days per week
Raw Materials	-	copper and steel sheets

PROCESS

This plant fabricates heavy industrial machinery from brass and steel sheets. Products manufactured by a series of stamping, cutting and welding operations, include oil refinery equipment and vending machines. Some parts are pickled in sulphuric acid baths, but there are no metal plating processes.

Water Consumption

Supply	-	from Uxbridge P. U. C.
Domestic	-	2,000 gpd (gallons per day)
Process	-	<u>18,000 gpd</u>
Total	-	20,000 gpd (average monthly)

Sources and Disposal of Wastes

The sources are:

- a) cooling waters from compressors, welders and other stamping machines
- b) water used in tanks for testing the finished products

- c) boiler blowdown
- d) spent pickle liquor
- e) sanitary wastes

All these wastes with the exception of the pickle liquor, are discharged to the Town's sanitary sewage system.

The pickle liquor is transferred periodically to two seepage lagoons on the property.

SUMMARY

The sewage treatment plant should experience no difficulty with the wastes from this plant. However, extreme caution should be taken to prevent any overflow from the acid seepage lagoons in times of heavy rainfall or precipitation.

UXBRIDGE BEVERAGES

This company is located on Franklin Street in Uxbridge and was visited on June 14, 1966.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. G. MacKellar, Plant Manager
Number of Employees	-	16
Operating Schedule	-	8 hours per day, 5 days per week
Raw Materials	-	alkali cleaners (caustic), syrups, concentrates, etc.
Production	-	1,000 - 2,000 (12 bottle) cases per day

PROCESS

Soft drinks (coca-cola) are produced at this plant. Treated water is blended with syrups, sweeteners and flavourings, the mixture is then bottled, carbonated and packed in cases.

Water Consumption

Supply	-	from Uxbridge P. U. C.
Domestic	-	300 gpd (gallons per day)
Process	-	6,500 gpd (including use in product and bottling washings)
Total	-	6,800 gpd (monthly average)

Water used for the bottled product is treated by a series of processes - pH control, coagulation, settling and filtering.

Sources and Disposal of Wastes

The only source of contaminated wastes is the bottle washing operation and the waste is a dilute caustic solution. This waste, together with floor washings and sanitary sewage, are discharged to the Town's sanitary system. The alkali cleaning baths are dumped periodically. (once per year).

SUMMARY

In view of the nature of the wastes from this plant, no adverse effects should be experienced at the Town's sewage treatment plant. However, batch dumpings of the alkali cleaners would tend to have a harmful effect on the sewer system, if dumped without adequate dilution. It is therefore recommended that these tanks be bled slowly to the sewers along with sufficient dilution water.

UXBRIDGE CREAMERY

This plant is located in the western portion of Uxbridge and was visited on June 14, 1966.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. M. Smith, Owner
Number of Employees	-	3
Operating Schedule	-	8 hours per day, 5 days per week
Production	-	1,600 lbs. per day of butter
Raw Materials	-	4,800 lbs. per day of cream

PROCESS

This plant processes cream into butter. The churned butter goes to a wrapping machine for packaging. The final product is refrigerated and stored for shipping.

Water Consumption

Supply	-	from P. U. C.
Domestic	-	100 gpd (gallons per day)
Process	-	<u>1,500 gpd</u>
Total		1,600 gpd

Sources and Disposal of Wastes

The sources are:

- 1) cooling water used for refrigeration purposes
- 2) wash waters for (a) can washings (b) churn washing
- 3) sanitary sewage

The wash waters and the sanitary wastes are discharged to the municipal sanitary system. The cooling water is directed to a nearby creek and the buttermilk is sold to farmers.

SUMMARY

The wash waters should not be the cause of any problem at the Uxbridge Treatment Plant because of the relatively small volume of water involved.

Since the cooling water does not come into contact with any raw or finished materials, it may be considered satisfactory for discharge to a watercourse.

UXBRIDGE DAIRY

This plant is located on the east side of the Village of Uxbridge and was visited on June 14, 1966.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. G. Mitchell, Owner
Number of Employees	-	7
Operating Schedule	-	8 hours per day, 5 days per week
Raw Materials	-	5000lbs. per day of milk

PROCESS

This company operates a typical milk processing plant. The milk is received, dumped, sampled, weighed, clarified, filtered, pre-heated, pasteurized, cooled, and then poured into containers.

Water Consumption

Supply	-	from P. U. C.
Domestic	-	200 gpd (gallons per day)
Process	-	<u>8,000 gpd</u>
Total	-	8,200 gpd (average)

Sources and Disposal of Wastes

Waste producing operations in this plant consist of washing of bottles, cases, cans, trucks, processing equipment and floors. There is also some cooling water that must be discharged.

All wastes, including the sanitary sewage, are discharged to the municipal sanitary system.

SUMMARY

The Sewage Plant at Uxbridge should experience no difficulty in treating the wastes from this Dairy.

B. DYSON SLAUGHTERHOUSE

This plant is located in the Town of Uxbridge and was visited on July 12, 1966.

DETAILS OF SURVEY

Type of Plant	-	commercial slaughterhouse
Personnel Interviewed	-	no one present
Employees	-	3
Operating Schedule	-	1 - 2 days per week
Production	-	slaughter of cows and pigs

Waste Disposal

All liquid wastes are directed to a seepage pit at the rear of the plant, and observation of this area revealed no pollution of any watercourse.

All solid wastes are trucked away for disposal.

REMARKS

This plant will be visited periodically to review the waste disposal practices.

G. HAMELIN SLAUGHTERHOUSE

This plant is located in the eastern end of Uxbridge and was visited on July 12, 1966.

DETAILS OF SURVEY

Type of Plant	- custom slaughterhouse
Personnel Interviewed	- G. Hamelin
Employees	- 2
Operating Schedule	- 3 - 4 hours per day, 2 - 3 days per week
Production	- slaughter of 4 - 5 cows per week " " 3 - 4 pigs per week

Waste Disposal

All liquid wastes are directed to a septic tank and thence to a seepage pit. There was little runoff from this pit, and there was no visible contamination of the nearby watercourse, one hundred yards away.

The solid wastes are trucked away for disposal.

REMARKS

This plant will be visited periodically to review the waste disposal facilities.

WHITBY

The industries in the Town of Whitby that use more than 20,000 gallons of water per month and discharge significant quantities of liquid wastes are:

Dupont Company of Canada, Limited
Dunlop of Canada, Limited
Lake Ontario Steel Company, Limited
Stokely Van Camp of Canada, Limited
Nutriaproducts Limited
Andrew Antenna Corporation Limited
Bathurst Containers Limited
Hillcrest Dairy
Lofthouse Brass Manufacturing Company
Matheson Company, Limited
Croven Limited

Other industries in the Town that use appreciable quantities of water but do not discharge significant quantities of liquid wastes are:

Ralston Purina Company, Limited
North American Steel Equipment Company, Limited
Slichters Limited

DUPONT COMPANY OF CANADA, LIMITED

This plant is located on Dunlop Drive in Whitby and was visited on March 15, 1966.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. J. Schultz, Design Engineer
Number of Employees	-	approximately 50
Operating Schedule	-	8 hours per day, 5 days per week
Raw Materials	-	polyethylene film

PROCESS

This plant extrudes polyethylene into rolled polyethylene film.

Water Consumption

Supply	-	from Lake Ontario
Domestic	-	1,000 gpd (gallons per day)
Other Uses		<u>480,000 gpd</u>
Total		481,000 gpd (average over a year)

Sources of Wastes and Disposal

The sources are:

- 1) cooling water from the extruders
- 2) domestic wastes

The cooling waters are discharged to Lake Ontario via a ditch.

Sanitary wastes are directed to the municipal sanitary system.

DISCUSSION

The cooling waters are of satisfactory quality for discharge to a watercourse.

DUNLOP OF CANADA, LIMITED

This plant is located on Dunlop Drive in Whitby and was visited on March 15, 1966.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. M. Podborski, Plant Engineer
Number of Employees	-	700
Operating Schedule	-	24 hours per day, 5 days per week
Raw Materials	-	natural and synthetic rubber and blending chemicals

PROCESS

This company manufactures automotive tires from natural and synthetic rubbers. The raw materials are blended by a series of washing, compounding, calendering and curing operations. The cured rubber is made into tires by cutting into strips and forming over an iron core to produce the tire carcass. The tread, a heavy strip of rubber, is shaped around the carcass and finally, the bead is applied. The assembled tire is placed in a mould for tread design and is heated by steam and pressure for vulcanization. The vulcanized tire is inspected and wrapped.

Water Consumption

Supply	-	from Lake Ontario
Domestic	-	14,000 gpd (gallons per day)
Process	-	636,000 gpd (including boiler usage and cooling waters)
Total	-	<hr/> 650,000 gpd (average over a year)

Sources and Disposal of Wastes

The sources are:

- 1) cooling water from various machines
- 2) boiler blowdown
- 3) domestic sewage

The cooling waters are discharged to Lake Ontario via a ditch.

The domestic sewage is directed to the sanitary sewage system.

DISCUSSION

The cooling water is of satisfactory quality for discharge to a watercourse.

LAKE ONTARIO STEEL COMPANY, LIMITED

This company is located in the Township of Whitby but as the water is obtained from the Town it will be included in this section. The plant was visited on June 28, 1966.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. G. Blake, Maintenance Superintendent
Number of Employees	-	approximately 500
Operating Schedule	-	24 hours per day, 7 days per week
Raw Materials	-	scrap metal and steel
Production	-	200,000 tons per year of steel products

PROCESS

This company operates a steel-rolling mill, specializing in the production of steel sheets, rods and bars for use by secondary fabricating and manufacturing industries.

The raw materials for the mill consist of scrap iron and steel which are heated in two electric arc furnaces and formed into steel billets. The billets are reduced in gage to the desired product by hot-rolling on a four-stand tandem mill.

Water Consumption

Supply	-	from Whitby P. U. C.
Domestic	-	10,000 gpd (gallons per day)
Cooling	-	1,200,000 gpd
Scrubbing	-	230,000 gpd
Total	-	<u>1,440,000 gpd (average over 1 year)</u>

Sources and Disposal of Liquid Wastes

The sources are:

- 1) bleed-off water from storage pond (1,200,000 gpd)
- 2) scrubbing water from the two gas scrubbers (230,000 gpd)
- 3) domestic sewage

The waters from the gas scrubbers are directed to a settling basin (approximately 15' x 5' x 5') which overflows to Lake Ontario via a ditch.

The cooling water used in the melt shop (33%) and the mill shop (66%) is returned through two scale pits to the storage pond. In order to ensure an adequate cooling temperature in this pond, about 1.2 million gallons per day are bled-off to the same ditch, and make-up water is purchased from the Town of Whitby.

Domestic wastes are discharged to a septic tank system.

Sampling Programme

Hourly-composite samples were taken from:

- a) influent to the settling facilities (10:30 am to 12:30 pm)
- b) effluent from the settling facilities (10:30 am to 12:30 pm)
- c) combination of the cooling water and effluent from the settling facilities
- d) final effluent to Lake Ontario (10:30 am to 1:30 pm)

These samples were submitted to the OWRC laboratories for analyses for Solids, Iron and Ether Solubles, in accordance with the procedures described in the "Standard Methods of Examination of Water and Waste Water", Twelfth Edition.

Analytical Results

The results of the composite samples are on page 100.

DISCUSSION

The results of the sampling programme on June 28, 1966, showed an average suspended solids content of 141 ppm in the effluent to the Lake. Assuming a daily flow of 1,430 gpd from the settling facilities and the cooling pond, this indicates that not less than 2,000 pounds of suspended solids are discharged daily to Lake Ontario. Also, this waste imparts a distinct reddish-brown colour to Lake Ontario in the vicinity of Lasco's outfall. It is possible that the waste loadings in the effluent to the Lake could vary due to fluctuations in the amount of gases scrubbed daily.

On the day of the survey, there was evidence that the settling basin had been recently cleaned, therefore, the retention time in the basin was at a maximum. Based on a flow of 160 gallons per minute to the basin from the scrubbers, the retention time of the waste could not have been more than 7 or 8 minutes, and the solids removal efficiency was calculated to be in excess of 97%. However, the pre-treatment of the scrubber-water wastes is not satisfactory in that an effluent of 296 ppm suspended solids is being discharged from the settling basin to the ditch. This waste must be given a higher degree of treatment prior to its discharge to Lake Ontario. It is possible that sedimentation with chemical coagulants and a longer detention time could give the required improvement in treatment.

ONTARIO WATER RESOURCES COMMISSION
 CHEMICAL LABORATORIES
 INDUSTRIAL WASTE ANALYSIS

All analyses except pH reported in
 ppm unless otherwise indicated

1 ppm = 1 mgm/litre
 = 1 lb/100,000 Imp. Gals.

Municipality: Whitby

Report to: R. Hussain*

Source: Lasco

Date Sampled: June 28, 1966

by: G.G. and R.H.

Lab. No.	Solids			Iron as Fe	Ether Solubles
	Total	Susp.	Diss.		
T-1887	18,484	17,970	514	277	-
T-1888	19,272	18,880	392	168	-
T-1889	1,036	450	586	74	0.6
T-1890	560	142	418	17.1	0
T-1891	686	376	310	53.0	0
T-1892	660	374	286	61.0	0
T-1893	312	60	252	14.3	0
T-1894	424	180	244	26.3	0
T-1895	450	96	354	38	0
T-1896	388	146	242	25.5	0

T-1887	1. Influent to settling facilities	composite (10:30 - 11:30)
T-1888	2. Influent to settling facilities	composite (11:30 - 12:30)
T-1889	3. Effluent from settling facilities	composite (10:30 - 11:30)
T-1890	4. Effluent from settling facilities	composite (11:30 - 12:30)
T-1891	5. Start of ditch to lake	composite (10:30 - 11:30)
T-1892	6. Start of ditch to lake	composite (11:30 - 12:30)
T-1893	7. Start of ditch to lake	composite (12:30 - 1:30)
T-1894	8. Effluent to Lake Ontario	composite (10:30 - 11:30)
T-1895	9. Effluent to Lake Ontario	composite (11:30 - 12:30)
T-1896	10. Effluent to Lake Ontario	composite (12:30 - 1:30)

CONCLUSIONS

Lake Ontario Steel Company Limited is discharging a waste of high suspended solids content (141 ppm) to Lake Ontario. This figure far exceeds the OWRC recommended limit of 15 ppm for discharge to a watercourse.

It is estimated that about 2,000 pounds of suspended solids is discharged daily to the Lake in approximately 1.43 million gallons per day. Also a reddish-brown colour is imparted to the waters in the Lake in the vicinity of the outfall, and this condition is not in keeping with the OWRC objectives for industrial waste control.

RECOMMENDATIONS

The waste flow from Lake Ontario Steel Company Limited, must be given additional treatment prior to its discharge to Lake Ontario. It is possible that sedimentation preceded by chemical coagulation and a longer detention time could give this additional treatment.

STOKELY VAN CAMP OF CANADA LIMITED

This plant is located on Beech Street in Whitby and was visited on August 25, 1966.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. E. Quantrill, Plant Manager
Number of Employees	-	45 - 300 (according to product)
Operating Schedule	-	16 hours per day, 7 days per week 4 months per year
Raw Materials	-	vegetables, e.g., corn, peas and squash

PROCESS

This company is involved with the washing, cooking and canning of vegetables. This operation exists between July 1 and the end of October each year. The vegetables processed are: peas, corn and squash.

Water Consumption During Production

Supply	-	from P. U. C. Whitby
Domestic	-	6,000 gpd (gallons per day)
Process	-	<u>300,000 gpd (including cooling waters)</u>
Total	-	306,000 gpd (average over 4 months)

Sources and Disposal of Wastes

The sources are:

- 1) washings of raw materials (majority of wastes)
- 2) some cooling water for finished products
- 3) cleaning of process equipment
- 4) domestic sewage
- 5) boiler blowdown

The process wastes are screened (20 mesh) prior to discharge to the sanitary sewers. The residue is dried and sold as animal food. Domestic sewage is also discharged to the sanitary system.

The cooling water is re-used in the boiler room.

Sampling Programme

A grab sample of the screened corn processing wastes was taken on August 25, 1966.

Analytical Results

See page 104.

DISCUSSION

Canning is a highly seasonal business, and hence the volume and characteristics of the waste waters vary considerably from month to month. The analytical results on the day of the survey, showed waste characteristics typical of the creamed-corn processing operation.

ONTARIO WATER RESOURCES COMMISSION
CHEMICAL LABORATORIES
INDUSTRIAL WASTE ANALYSIS

All analyses except pH reported in
ppm unless otherwise indicated

1 ppm = 1 mgm/litre
= 1 lb/100,000 Imp. Gals

Municipality: Whitby Report to: R. Hussain*
Source: Stokley Van Camp
Date Sampled: August 25, 1966 by: R. Hussain

Lab. No.	5-Day BOD	Solids			COD	Colour Dilution	pH at Lab.
		Total	Susp.	Diss.			
T-2342	12,500.	10,646	4,154	6,492	12,829	2,000.1	4.0

T-2342 1. Effluent to sanitary sewers - grab (2:00 pm)

NUTRIAPRODUCTS LIMITED

This plant is located at 173 Brock Street North in Whitby and was visited on March 16, 1966.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. D. Willan, Plant Manager
Number of Employees	-	13
Operating Schedule	-	8 hours per day, 4 days per week
Raw Materials	-	vegetable oils, sugar and other flavourings

PROCESS

This company manufactures confectionery products from a mixture of water, sugar and vegetable oils. The raw materials are blended, pasteurized (essentially a dairy operation), cooled and prepared for packing.

Water Consumption

Supply	-	from Whitby P. U. C.
Domestic	-	300 gpd (gallons per day)
Process	-	<u>19,000 gpd</u>
Total	-	19,300 gpd (average over 1 year)

Sources and Disposal of Wastes

The sources are:

- 1) cooling water from various machines
- 2) equipment wash water
- 3) domestic sewage

The cooling water and process wastes are treated in three settling tanks where the creams and fats are skimmed off and land dumped. The effluent,

along with the domestic sewage, are discharged to the sanitary sewage system.

Sampling Programme

A grab sample of the settling tank effluent to the sanitary sewers was taken on March 16, 1966.

Analytical Results

See page 107.

DISCUSSION

The results of this sample reveal that the wastes are satisfactory for discharge to the sanitary sewage system.

ANDREW ANTENNA CORPORATION LIMITED

This plant is located on Beech Street West in Whitby and was visited on March 15, 1966.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. E. Gage, Plant Engineer
Number of Employees	-	80
Operating Schedule	-	8 hours per day, 5 1/2 days per week
Raw Materials	-	sheet metal, chromic acid and caustic detergent

PROCESS

This company manufactures metal domes for micro-wave relay systems. After welding and assembling, the domes are bonderized with caustic and chromic acid solutions. The domes are then painted and prepared for shipping.

Water Consumption

Supply	-	from Whitby P. U. C.
Domestic	-	800 gpd (gallons per day)
Process	-	<u>900 gpd</u>
Total	-	1,700 gpd (average over a year)

Sources and Disposal of Wastes

The sources are:

- 1) some cooling water from the machines
- 2) rinse water from domes
- 3) domestic wastes

All these wastes, with the exception of the domestic sewage, are discharged to a ditch. This ditch runs to the back of the property and into a creek.

Domestic sewage is discharged to the sanitary system.

Sampling Programme

A grab sample of the effluent to the creek was taken on March 15, 1966.

Analytical Results

As on page 110.

DISCUSSION

The analytical results of the grab sample indicate that an excessive concentration of chromium is being discharged to the watercourse. The OWRC recommended objective for discharge to a watercourse, is 1 ppm total chromium.

In the bonderizing operation, the caustic and chromic acid solutions are mopped onto the metal domes and then removed by rinsing with water. The company is planning to construct a series of tanks for the bonderizing operation so that wastes high in chromium will not be discharged from the plant.

CONCLUSIONS AND RECOMMENDATIONS

Andrew Antenna Corporation Limited was discharging, on March 15, 1966, an effluent from the bonderizing room with a chromium content that exceeded the OWRC objectives for discharge to a watercourse.

It is recommended that if, in future there is still a discharge to a watercourse or storm sewer system, the company must obtain approval from the OWRC.

ONTARIO WATER RESOURCES COMMISSION
CHEMICAL LABORATORIES
INDUSTRIAL WASTE ANALYSIS

All analyses except pH reported in
ppm unless otherwise indicated

1 ppm = 1 mgm/litre
= 1 lb/100,000 Imp. Gals.

Municipality: Whitby

Report to: G. Buxton

Source: Ditch

Date Sampled: March 15, 1966

by: G. Buxton

Lab. No.	5-Day BOD	Solids			Chromium		pH at Lab.	COD
		Total	Susp.	Diss.	Total	Hex.		
T-588	135	628	18	610	6.	6.	7.7	181

T-588

- Grab effluent to ditch 3:30 pm

BATHURST CONTAINERS LIMITED

This plant is located at 300 Watson Street in Whitby and was visited on March 15, 1966.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. B. Flarell, Plant Superintendent
Number of Employees	-	180
Operating Schedule	-	16 hours per day, 6 days per week
Raw Materials	-	starch and cardboard

PROCESS

This plant fabricates containers, predominantly of corrugated cardboard. The company also prepares the glue for fabrication of the boxes.

Water Consumption

Supply	-	from P. U. C. of Whitby
Domestic	-	3,500 gpd (gallons per day)
Process	-	<u>23,700 gpd</u>
Total		27,200 gpd (average yearly)

Sources and Disposal of Wastes

The sources are:

- 1) cooling waters for various equipment
- 2) process wastes from glue preparation
- 3) domestic sewage

All wastes are discharged to the sanitary sewers.

DISCUSSION

Since all wastes from this plant are discharged to the sanitary system and it appears that they have not impaired the efficiency of operation, no samples were taken.

HILLCREST DAIRY

This plant is located at Byron Street South in Whitby and was visited on March 16, 1966.

DETAILS OF SURVEY

Personnel Interviewed	- Mr. D. Enderus, Office
Number of Employees	- 18
Operating Schedule	- 8 hours per day, 5 days per week
Raw Materials	- raw milk - 15,000 lbs. per day

PROCESS

This plant is a combination dairy, creamery and cheese factory. The products include butter, pasteurized milk and cottage cheese. All operations at the plant are typical of the dairy industry. Any milk by-product is removed from the premises.

Water Consumption

Supply	-	Whitby P. U. C.
Domestic	-	400 gpd (gallons per day)
Process	-	<u>19,600 gpd</u>
Total	-	20,000 gpd (yearly average)

Sources and Disposal of Wastes

The sources are: 1) wash waters from the processing equipment and containers
2) cooling water from various machines
3) domestic sewage

These wastes are discharged to the sanitary sewage system.

DISCUSSION

Since all wastes from this plant are discharged to the sanitary system, and no problems have existed at the sewage treatment plant because of these wastes, no samples of the effluent were taken.

LOFTHOUSE BRASS MANUFACTURING COMPANY

This plant is located on 310 Hopkins Street in Whitby and was visited on March 15, 1966.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. B. Brown, Assistant General Manager
Number of Employees	-	40
Operating Schedule	-	8 hours per day, 5 days per week
Raw Materials	-	brass, nitric acid, sulphuric acid

PROCESS

The process carried out at this plant is brass forging. The brass is heated in small ovens to approximately 400° F. and then stamped into various shapes, mostly pipe fittings. After forging, the parts are brightened in tanks of nitric acid, sulphuric acid, water, lime and finally water.

Water Consumption

Supply	-	from Whitby P. U. C.
Domestic	-	800 gpd (gallons per day)
Process	-	<u>500 gpd</u>
Total	-	1,300 gpd (average over 1 year)

Sources and Disposal of Wastes

The sources are: 1) spent acid, lime and acidified water (100 - 500 gpd)
2) domestic sewage

The brightening wastes are discharged directly to floor drains, thence to a sump with a crushed stone base, and then are allowed to dissipate into the ground. Domestic sewage is directed to a septic tank and tile-bed system.

SUMMARY

In view of the small quantities of waste involved, the present method of disposal may be considered satisfactory.

MATHESON COMPANY LIMITED

This plant is located on 530 Watson Street in Whitby.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. Knight, Plant Manager
Number of Employees	-	10
Operating Schedule	-	8 hours per day, 5 days per week
Raw Materials	-	chemicals for generation of gases eg. Cl ₂ , O ₂ , etc.

PROCESS

This company prepares compressed gases, varying in nature from air to inert gases, for the scientific market.

Water Consumption

Supply	-	from Whitby P. U. C.
Domestic	-	200 gpd (gallons per day)
Process	-	<u>500 gpd</u> (included 350 pd for steam generation)
Total	-	700 gpd (average over 1 year)

Sources and Disposal of Wastes

The sources are: 1) equipment-cooling water
 2) domestic waste

All liquid wastes are discharged to the sanitary sewage system.

DISCUSSION

The liquid wastes appear to be satisfactory for discharge to the municipal sanitary system.

CROVEN LIMITED

This plant is situated at 500 Beech Street West in Whitby.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. J. Brooks, Production Manager
Number of Employees	-	300
Operating Schedule	-	16 hours per day, 5 days per week
Raw Materials	-	quartz crystals, nickel plating solution and several types of metals

PROCESS

This company manufactures and assembles miniature electronic components, particularly those utilizing quartz crystals. The quartz crystals are ground to a precise thickness and then are plated with a nickel sulphate solution until they attain the proper weight.

Water Consumption

Supply	-	from the Town of Whitby
Process	-	7,000 gpd (gallons per day)
Domestic	-	6,000 gpd
Total	-	<u>13,000 gpd</u> (average over 1 year)

Sources and Disposal of Wastes

The sources are:

- 1) wastes from the plating operation (insignificant)
- 2) cooling waters from the pumps
- 3) domestic sewage

All liquid wastes are discharged to the municipal sanitary system.

DISCUSSION

In view of the nature of the wastes, these discharges may be considered satisfactory for discharge to the sanitary system.

BOWMANVILLE

This town is located in the County of Durham but as information was desired on all discharges to watercourses in the Township of Darlington, it was surveyed.

The industries in the town which discharge wastes to the watercourses are given in the following table.

TABLE IV

Name of Industry	Type of Industry or Product	Water Consumption		Remarks
		Sanitary	Industrial gpd	
Goodyear Tire and Rubber Co. Ltd.	Rubber goods	14,000	1,430,000	All process wastes to the Bowmanville Creek - not contaminated. Domestic wastes to sanitary system satisfactory.
R. M. Hollingshead Co. of Canada Ltd.	Automotive additives	1,000	3,700	Process wastes to septic tank and tile bed system. Domestic wastes to sanitary system.
Bowmanville Foundry	Foundry type operations	2,700	33,000	Only cooling water to Creek. Domestic wastes to sanitary system satisfactory.

VILLAGE OF BEAVERTON

The only industry in the Village of Beaverton which was discharging a significant liquid waste at the time of the survey was Beaverton Specialties Limited. It is probable that the former Lake Simcoe Industries Plant will be re-opened and a follow-up will be maintained on this plant.

BEAVERTON SPECIALTIES LIMITED

This plant is located on Mill Street in Beaverton.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. O. Smith, General Manager
Number of Employees	-	35
Operating Schedule	-	8 hours per day, 5 days per week
Raw Materials	-	prefabricated wire products

PROCESS

This company manufactures and plates wire products for the milk and other industries.

Wire is cut and fabricated to the desired shape or form and then is zinc or brass plated as required. The normal procedure is followed in the zinc plating line. The metal product is cleaned first in an alkali bath, rinsed again in cold running water, and finally is plated in a zinc cyanide and sodium hydroxide solution. Following the plating operation are two 'perchloran' cyanide treatment tanks, a zinc brightener tank, and cold and hot running water rinses.

In the brass plating line, the metal is cleaned in the same manner as for zinc plating, and then nickel plated in a nickel sulphate solution.

The material is immersed in two cold and one hot running water rinses, and then is brass plated in the appropriate solution. A 'perchloran' cyanide treatment tank is provided after the plating operation, followed by a cold water running rinse, and finally a lacquer bath. The finished product is dried and packed for shipping.

Water Consumption

Supply	-	from Beaverton P. U. C.
Cooling water	-	69,000 gpd (gallons per day)
Plating	-	60,000 gpd (re-cycled cooling water)
Domestic	-	<u>1,000 gpd</u>
Total	-	70,000 gpd (average)

Sources and Disposal of Liquid Wastes

The main use of water in this plant is for cooling purposes in the welders and other machines. This water is then re-circulated to a holding tank and used for the running rinses in the plating lines. Some of this water (about 10%) is discharged directly to a collection sump. The rinse waters from the two plating lines are discharged in two sewers to a sump on the property, and finally to the Beaverton River via a storm sewer.

Spent alkali cleaners and acid cleaners are dumped periodically. The plating solutions are never dumped. The nickel sulphate solution is continuously filtered, cooled, purified, and re-used. The zinc and brass plating solutions are constantly regenerated by the addition of chemicals.

The 'perchloran' solutions used for the treatment of any cyanide drag-out from the zinc and brass plating tanks, are allowed to discharge slowly at night, when the lines are shut down. These tanks are regenerated

before the start of the plating operations, with 'perchloran' to a specified pH value and chlorine residual concentration.

Sanitary and domestic wastes are discharged to a septic tank and tile system.

Sampling

Composite and grab samples of the effluent were taken on December 16, 1965 and again on June 13, 1966. These samples were submitted to the OWRC laboratories for analysis on (pH, solids, zinc, copper, nickel, cyanides and chlorine residual) in accordance with the procedures described in "Standard Methods for Examination of Water and Waste Water", Twelfth Edition.

Analytical Results

The analyses of the samples are on pages 121 and 122.

DISCUSSION OF FINDINGS

The recommended OWRC objectives for waste discharges to a water-course are as follows: 15 (parts per million) suspended solids, 0.1 ppm cyanides, 1 ppm nickel, 1 ppm copper, 15 ppm zinc and pH range of 5.5 to 10.6.

On the days of the survey, the concentrations of waste constituents in the plating room effluent were all within these recommended objectives. There was no cyanide or nickel present in the final effluent and this indicated that efficient cyanide treatment and good housekeeping practices were being carried out. In addition, the rinse waters, after the 'perchloran' treatment, were found to contain no cyanides, again showing the efficiency of the two 'perchloran' treatment tanks in eliminating the cyanide drag-out.

It was indicated by the company, that batches of spent alkali and

pickle liquor (hydrochloric acid) were occasionally dumped to the storm sewer. This practice should be discontinued since the alternate low and high pH discharges could lead to corrosion of the sewer line as well as possible impairment of the quality of the Beaverton River in the vicinity of the outfall.

CONCLUSIONS AND RECOMMENDATIONS

The normal daily rinse waters from the plating lines were found to be satisfactory for discharge to an open watercourse. This is based on the concentrations of the waste characteristics when compared to the OWRC objectives. However, batch dumping of the alkali cleaners and acid pickle liquors should be discontinued and some means provided for the controlled discharge of these wastes to the storm sewers, preferably after pre-treatment.

It is therefore recommended that Beaverton Specialties should consider the following alternatives in dealing with the batch dumps of highly acidic and alkaline wastes to the storm sewers:

- (1) Construction of a holding tank for neutralization of the acidic and alkaline wastes before discharge to the storm sewers. This is the most desirable approach, since in this way it may be possible to obtain a solution in the desired pH range of 5.5 to 10.6 by the mixing of the two spent wastes.
- (2) Trickle off the individual batches at night, providing proper dilution with cooling water, as with the 'perchloran' tanks.
- (3) The controlled discharge of the acidic waste in conjunction with the spent alkali cleaner.

ONTARIO WATER RESOURCES COMMISSION
CHEMICAL LABORATORIES
INDUSTRIAL WASTE ANALYSIS

All analyses except pH reported in
ppm unless otherwise indicated

1 ppm = 1 mgm/litre
= 1 lb/100,000 Imp. Gals.

Municipality: Beaverton Report to: R. Hussain*

Source: Beaverton Specialties

Date Sampled: June 13, 1966

Lab. No.	Solids		pH at Lab.	Cya- nide as HCN	Zinc as Zn	Copper as Cu	Nickel as Ni	Free Chlor- ine as Cl ₂
	Total	Susp.						
T-1680			7.2	0.0	1.0			0
T-1690			8.5	0.0	0.3			0.08

T-1680 1. Effluent to River Grab (1:15 pm)

T-1690 2. Rinse tank after treatment Grab (1:30 pm)

ONTARIO WATER RESOURCES COMMISSION
 CHEMICAL LABORATORIES
 INDUSTRIAL WASTE ANALYSIS

All analyses except pH reported in
 ppm unless otherwise indicated

1 ppm = 1 mgm/litre
 = 1 lb/100,000 Imp. Gals.

Municipality: Beaverton

Report to: R. Hussain*

Source: Beaverton Specialties

Date Sampled: December 16, 1965 by: R. H.

Lab. No.	Solids			pH at Lab.	Cya- nide as HCN	Zinc as Zn	Copper as Cu	Nickel as Ni	Free Chlorine as Cl ₂
	Total	Susp.	Diss.						
T-2478	246	5	241	8.3	0	1.2	0.2	0.0	0.15
T-2479	256	4	252	8.0	0	1.2	0.1	0.0	0.15
T-2480	272	1	271	7.9	0	1.3	0.2	0.0	0.10
T-2481	180	2	178	8.4	0	0.0	0.2	0.0	0.04
T-2482	194	1	193	8.4	0	0.0	0.2	0.0	0.10

T-2478	1.	Composite (1 hr.))	11 - 12 am)) Effluent to sewer
T-2479	2.))	1 - 2 pm)	
T-2480	3.))	2 - 3 pm)	
T-2481	4.	Rinse after brass plating)) Grab 11:30 am	
T-2482	5.	Rinse after zinc plating)		

VILLAGE OF CANNINGTON

There is only one industry in the Village of Cannington that uses more than 20,000 gallons of water per day.

This industry, Griffiths Laboratories, was visited on August 12, 1966. The industry process may be termed bakery-type operation. A seasoned flour mix for adding to meat, fish and poultry at other plants, is manufactured at this plant by first mixing the necessary ingredients (including water), then baking the mixture, grinding the baked product and screening and packing the ground product. The only use of water, apart from domestic purposes, is for mixing the initial ingredients. As a result, there is no industrial waste from this plant.

VILLAGE OF PICKERING

When this survey was carried out, there was only one industry in the Village of Pickering that used more than 20,000 gallons of water per month.

This industry, Primeau-Argo Block Limited, is situated on Station Street and manufactures concrete blocks for the building industry.

The only use of water (17,000 gpd) apart from domestic purposes, is for mixing concrete in the fabrication of these blocks. However, the company is contemplating starting a gravel washing operation some time in the near future. The washing wastes are to be directed to a settling pond system prior to entrance to Duffin Creek.

FOLLOW-UP

This plant will be revisited, prior to the starting of the washing operation to determine the treatment that will be provided for waters before they enter Duffin Creek.

VILLAGE OF PORT PERRY

The industries in the Village of Port Perry that use more than 20,000 gallons of water per month and have significant quantities of liquid industrial wastes are:

Port Perry Packers
Chalet Farms Limited
Port Perry Bottling Works
Cawker Brothers Slaughterhouse

Other industries in the Village which do not have significant liquid wastes are:

R. A. Peel Poultry

PORT PERRY PACKERS

This plant is located on Union Street in the Township of Reach.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. D. Gibson, Plant Manager
Number of Employees	-	24
Operating Schedule	-	8 hours per day, 5 days per week
Production Volume	-	10 - 12 thousand birds per week

PROCESS

This is a typical chicken processing plant. The operations involved are the killing, de-feathering, cleaning and packing of the birds.

Water Consumption

Supply	-	from P. U. C.
Domestic	-	500 gpd (gallons per day)
Process	-	<u>10,500 gpd</u>
Total	-	11,000 gpd (average over 1 month)

Sources and Disposal of Wastes

The sources are:

- a) sanitary wastes and
- b) process wastes

The sanitary waste is discharged to a septic tank and tile system.

The process wastes from this plant (without viscera, blood and feathers) are directed to a fat trap and then to a four-compartment septic tank and tile field (1,200 feet of tile). The discharge from the tile field is directed via an open ditch to a large, well-dyked lagoon. This lagoon

is operated as a total retention pond and alga growth was prominent in the lagoon. There was no noticeable odour or discharge from this lagoon. There is no watercourse in the immediate area of this plant.

SUMMARY

The wastes from this plant are presently disposed of in a satisfactory manner.

It is the intention of the management of this industry to connect to the sewers as soon as the municipal sanitary system is installed.

The analytical results of a grab sample taken at this plant on July 14, 1966, are on page 128.

ONTARIO WATER RESOURCES COMMISSION
CHEMICAL LABORATORIES
INDUSTRIAL WASTE ANALYSIS

All analyses except pH reported
in ppm unless otherwise indicated

1 ppm = 1 mgm/litre
= 1 lb/100,000 Imp. Gals.

Municipality: Port Perry Report to: R. Hussain*

Source: Port Perry Packers

Date Sampled: July 14, 1966 by: R. H.

Lab. No.	5-Day BOD	Solids			COD	Ether Solubles
		Total	Susp.	Diss.		
T-2013	580	954	380	574	1,396	31

T-2013 1. Effluent to lagoon Grab (10:15 am)

CHALET FARMS LIMITED

This plant is located in the northern section of Port Perry.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. N. MacMillan, Foreman
Number of Employees	-	25
Operating Schedule	-	8 hours per day, 5 days per week
Production Volume	-	12 - 17 thousand birds per week

PROCESS

This is a typical chicken killing operation. The operations involved are the killing, de-feathering, cleaning and packing of the birds.

Water Consumption

Supply	-	from P. U. C.
Domestic	-	500 gpd (gallons per day)
Process	-	<u>6,000 gpd</u>
Total		6,500 gpd (average 1 month)

Sources and Disposal of Wastes

The sources are:

- a) sanitary wastes and
- b) process wastes

The sanitary wastes are discharged to a septic tank and tile bed system.

The process wastes, minus feathers and viscera, are directed via a ditch to a lagoon. The wastes are then pumped periodically from the lagoon to the surrounding area, when weather conditions permit.

SUMMARY

The present method of disposing of the process wastes is not acceptable since there is no way of properly pumping these wastes to the surrounding area when the ground is frozen. However, the management plans to connect to the municipal sanitary system, when it is installed.

Analytical results of a grab sample taken on July 14, 1966, are on page 131.

ONTARIO WATER RESOURCES COMMISSION
CHEMICAL LABORATORIES
INDUSTRIAL WASTE ANALYSIS

All analyses except pH reported
in ppm unless otherwise indicated

1 ppm = 1 mgm/litre
= 1 lb/100,000 Imp. Gals.

Municipality: Port Perry Report to: R. Hussain*
Source: Chalet Farms
Date Sampled: July 14, 1966 by: R. H.

Lab. No.	5-Day BOD	Solids			Ether Solubles	COD
		Total	Susp.	Diss.		
T2014	88	668	156	512	3.2	396.

T-2014 1. Effluent to lagoon - Grab 11:30 am

Sampling Programme

A grab sample was taken on January 25, 1966, of the discharge from this plant to Lake Scugog.

Analytical Results

As on page 134.

DISCUSSIONS AND CONCLUSIONS

The results of the sample indicate that the waste from this plant is satisfactory for discharge to a watercourse. This is based on comparison of these results with the OWRC recommended objectives for discharge to a watercourse.

ONTARIO WATER RESOURCES COMMISSION
CHEMICAL LABORATORIES
INDUSTRIAL WASTE ANALYSIS

All analyses except
pH reported in ppm
unless otherwise
indicated

1 ppm = 1 mgm/litre
= 1 lb/100,000 Imp. Gals.

Municipality: Port Perry Report to: T. Armstrong*

Source: Port Perry Bottling Works

Date Sampled: January 25, 1966 by: T. Armstrong

Lab. No.	5-Day BOD	Solids			COD	Amnionic Detergents as ABS	pH at Lab.
		Total	Susp.	Diss.			
T-152	3.7	286	3	283	35	0.0	7.3

T-152 1. Bottle rinse water to Lake Scugog - Grab 2:30 pm

CAWKER BROTHERS SLAUGHTERHOUSE

This plant is located in the western section of Port Perry.

DETAILS OF SURVEY

Personnel Interviewed - A. Cawker, Owner
Type of Plant - custom and commercial slaughterhouse
Number of Employees - 3
Operating Schedule - 2 - 3 days per week, 3 - 4 hours per day
Production - slaughter of 8 - 10 pigs per week
10 - 15 cows per week

Waste Disposal

All liquid process wastes are directed to a septic tank and tile bed system. There was no visual runoff from this system to a nearby stream at the time of this survey. The tank is cleaned out 3 or 4 times per year.

The solid wastes are disposed of on the land.

REMARKS

This plant will be visited periodically to review the waste disposal practices.

The waste disposal situation was satisfactory at the time of this survey.

TOWNSHIP OF BROCK

There are two industries in the Township of Brock that have significant industrial wastes. These two industries are:

Charter's Slaughterhouse

Free's Creamery

CHARTER'S SLAUGHTERHOUSE

This plant is located on the east side of Highway 12, approximately one-half mile south of the community of Sunderland and it was visited on August 11, 1966.

DETAILS OF SURVEY

Type of Plant	- custom and commercial slaughterhouse
Personnel Interviewed	- Mr. R. Charter, Owner
Number of Employees	- 2
Operating Schedule	- 4 - 5 hours per day, 2 - 4 days per week
Production	- slaughter of 15 cattle and/or pigs per week

Waste Disposal

The liquid wastes are directed to a septic tank and tile bed system. There was no runoff from the bed.

SUMMARY

The disposal of wastes from this slaughterhouse may be considered satisfactory.

Periodic visits will be made to review the waste disposal practices at this plant.

FREE'S CREAMERY

This plant is located in the northern part of the community of Sunderland, and was visited on August 11, 1966.

DETAILS OF SURVEY

Type of Plant	- creamery
Personnel Interviewed	- Mr. E. Free
Number of Employees	- 5
Operating Schedule	- 8 hours per day, 5 days per week
Production	- 6,000 lbs. of cream per day

Waste Disposal

All process wastes, except the buttermilk, are discharged via 300 feet of tile bed to a lagoon. The buttermilk is sold to the farmers for pig feed. The lagoon discharges to a swampy area to the north-east of the creamery, and a survey of this area revealed no runoff from this swamp to any watercourse, thus the disposal of wastes may be considered satisfactory.

REMARKS

Mr. Free indicated that the lagoon would be excavated and widened to provide more capacity for the process wastes. This plant will be checked periodically to review the waste disposal practices.

TOWNSHIP OF MARA

There is only one industry in the Township of Mara.

ERIC ORR SLAUGHTERHOUSE

This plant is located in the community of Uptergrove and was visited on August 29, 1966.

DETAILS OF SURVEY

Type of Plant	- custom and commercial slaughterhouse
Personnel Interviewed	- Mr. E. Orr, Owner
Number of Employees	- 2
Operating Schedule	- 4 - 5 hours per day, 5 days per week
Production	- slaughter of 8 - 12 cattle per week

Waste Disposal

The liquid wastes are directed to a septic tank and a newly constructed tile bed system. There was no runoff from the bed. All solid wastes are trucked away for land disposal.

SUMMARY

The waste disposal situation at this plant may be considered satisfactory.

TOWNSHIP OF PICKERING

The industries in the Township of Pickering that use more than 20,000 gallons of water per month and/or have significant quantities of liquid wastes are:

Price and Knott

Supreme Aluminum Industries Limited

Dominion Allchrome Company Limited

Fretz Brothers Slaughterhouse

Consolidated Sand and Gravel is the only other industry in the Township of Pickering that uses more than 20,000 gallons of water per month but it does not discharge any wastes to a ditch or watercourse.

PRICE AND KNOTT LIMITED

This plant is located on Sheppard Avenue in West Rouge and it was visited on August 9, 1966.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. D. A. Price, President
Number of Employees	-	50
Operating Schedule	-	8 - 10 hours per day, 5 days per week
Raw Materials	-	aluminum alloys and other metals

PROCESS

Metal items for the aircraft and electronic industries are manufactured at this plant. The metal parts are fabricated by a series of stamping and welding operations, and then finished by dipping in a caustic solution. A chromate dip is sometimes utilized for certain alloys.

Water Consumption

Source	-	Township of Pickering
Domestic	-	1,000 gpd (gallons per day)
Process	-	<u>3,600 gpd</u>
Total	-	4,600 gpd (quarterly average)

Sources and Disposal of Wastes

The sources are:

- 1) cooling waters from various machines
- 2) rinse waters after caustic dip
- 3) occasional chromate dumps (once per year)
- 4) sanitary wastes

The cooling waters and rinse waters are presently directed to an outside ditch and thence to a swampy area. There is no direct discharge to the Lake.

Sanitary wastes are discharged to the sanitary sewer system.

Sampling Programme

A grab sample was taken on August 9, 1966, of the discharge of the outside ditch.

Analytical Results

See page 143.

SUMMARY

At the time of this visit, the characteristics of the waste from this plant, in terms of suspended solids and chromium, were not acceptable for discharge to a watercourse. This is based on a comparison with OWRC recommended objectives of 15 ppm suspended solids and 1.0 ppm total chromium. The spent chromate solution should not be discharged with the other liquid wastes, but should be independently disposed of on the land.

As the volume of waste is small, and as there is no discharge to a watercourse, no action need be taken at the present time.

A regular surveillance program has been set up at this plant.

ONTARIO WATER RESOURCES COMMISSION
CHEMICAL LABORATORIES
INDUSTRIAL WASTE ANALYSIS

All analyses except pH reported in
ppm unless otherwise indicated.

1 ppm = 1 mgm/litre
= 1 lb/100,000 Imp. Gals.

Municipality: West Rouge Report to R. Hussain*
Source: Price and Knott
Date Sampled: August 9, 1966 by: R. H.

Lab. No.	5-Day BOD	Solids			pH at Lab.	CHROME	
		Total	Susp.	Diss.		Total	Hexa.
T-2199		746	92	654	8.9	2.9	0.43

T-2199 1. Effluent to ditch Grab (4:30 pm)

SUPREME ALUMINUM INDUSTRIES LIMITED

This plant is located on Sandy Beach Road in Bay Ridges and it was visited on August 9, 1966.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. C. Collard, Plant Manager
Number of Employees	-	40
Operating Schedule	-	8 hours per day, 5 days per week
Raw Materials	-	aluminum sheets and ingots
Products	-	aluminum trays and cast pressure-cookers

PROCESS

This company is essentially a metal-working shop. The processes depend on the product.

In the manufacture of pressure-cookers, the aluminum ingots are melted and cast to the desired shape. The cast products are finished by a series of stamping and welding operations.

The aluminum serving trays are fabricated from a round sheet by a series of shaping operations. The parts are finished by applying a lacquer film to the surface of the tray. The parts are then etched in an alkaline solution, rinsed in water, treated in a chromic acid bath, and finally rinsed in cold and hot water tanks; they are then packed and prepared for shipping.

Water Consumption

Supply	-	Township of Pickering P. U. C.
Domestic	-	1,000 gpd (gallons per day)
Process	-	<u>6,500 gpd</u>
Total	-	7,500 gpd (average quarterly)

Sources and Disposal of Wastes

The sources are:

- 1) cooling waters from compressors and welders
- 2) rinse waters from tray-finishing operations
- 3) domestic wastes

The cooling waters are re-used in the rinse tanks and as make-up in the chemical tanks. The additional cooling water and the rinse waters are then discharged along with domestic wastes to the sanitary sewers.

Sampling Programme

A grab sample was taken of the wastes to the sanitary sewers on August 9, 1966.

Analytical Results

See page 146.

SUMMARY

Based on the analytical results, the waste flow from this company is suitable for discharge to the sanitary sewers. The OWRC objectives for discharge to sanitary systems are: 300 ppm BOD, 350 ppm suspended solids, 3 ppm chrome and 5.5 - 10.5 pH range.

ONTARIO WATER RESOURCES COMMISSION
CHEMICAL LABORATORIES
INDUSTRIAL WASTE ANALYSIS

All analyses except pH reported in
ppm unless otherwise indicated

1 ppm = 1 mgm/litre
= 1 lb/100,000 Imp. Gals.

Municipality: Bay Ridges Report to: R. Hussain *

Source: Supreme Aluminum

Date Sampled: August 9, 1966 by: R. Hussain

Lab. No.	5-Day BOD	Solids			pH at Lab.	C H R O M E	
		Total	Susp.	Diss.		Total	Hexa.
T-2198	3.2	440	88	352	9.2	1.42	1.40

T-2198 1. Effluent to sanitary sewers - grab (2:45 pm)

DOMINION ALLCHROME COMPANY LIMITED

This plant is located in Bay Ridges and it was visited on August 9, 1966.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. G. Ritchie, Plant Superintendent
Number of Employees	-	18
Operating Schedule	-	16 hours per day, 5 days per week
Raw Materials	-	auto trim

PROCESS

This plant anodizes, buffs, and sometimes spray-paints auto trim that has been fabricated at other plants.

The anodizing operation may be subdivided into two parts according to the type of finish desired. The parts may be (1) etched in a hot alkali solution, treated in a chromate dip (as a weak deoxidization agent) and then anodized in a hot sulphuric acid tank or (2) brightened in a hot mixture of nitric, phosphoric and sulphuric acids, treated in a chromate tank, and finally anodized in a sulphuric acid bath.

In either case, parts are dried and finished by buffing or spray-painting.

Water Consumption

Supply	-	Township of Pickering P. U. C.
Domestic	-	500 gpd (gallons per day)
Process	-	<u>19,500 gpd</u>
Total	-	20,000 gpd (quarterly)

Sources and Disposal of Wastes

The sources are:

- 1) various rinse waters
- 2) occasional alkali dumps
- 3) leaks and spills of etching and anodizing solutions
- 4) drag-outs of these solutions
- 5) domestic wastes

The various anodizing wastes are collected in a three-compartment sump before entering the sanitary sewers. The purpose of this sump is to settle out any settleable solids and also to act as a neutralizing basin. A caustic solution is used to adjust any low pH flows in this sump. This sump is cleaned out about three times per year.

Domestic wastes are also discharged to the sanitary sewers.

Sampling Programme

A grab sample of the anodizing wastes in the sump was taken on August 9, 1966.

Analytical Results

See page 150.

DISCUSSION

The waste from this plant had a very low pH (2.2) due to the acid rinses from the various anodizing processes. The alkali rinse enters the same sewer line, but it is not strong enough to neutralize the waste. A caustic solution is utilized to adjust the pH of the waste before it enters the sanitary sewer, however, lack of constant control makes it impossible to properly treat the waste, as the pH is constantly fluctuating. The low pH discharge

could lead to corrosion of the sanitary sewer lines as well as possible impairment of the processes at the Bay Ridges Sewage Treatment Plant.

CONCLUSIONS AND RECOMMENDATIONS

Dominion Allchrome Company Limited was found to be discharging a waste of very low pH to the sanitary sewers. The chromium content of this waste was found to be 0.8 ppm.

To eliminate the discharge of highly acidic wastes to the sanitary sewers, the company should maintain constant surveillance on the pH of the wastes at the sump and neutralize as required.

A better way of ensuring a desirable pH range would be to install an automatic pH control system. In this way, the appropriate additions of caustic solutions would be made automatically.

ONTARIO WATER RESOURCES COMMISSION
CHEMICAL LABORATORIES
INDUSTRIAL WASTE ANALYSIS

All analyses except pH reported in
ppm unless otherwise indicated

1 ppm = 1 mgm/litre
= 1 lb/100,000 Imp. Gals

Municipality: Bay Ridges Report to: R. Hussain*
Source: Dominion Allchrome
Date Sampled: August 9, 1966 by: R. H.

Lab. No.	pH at Lab.	Acidity as CaCO ₃	C H R O M E	
			Total	Hexa.
T-2197	2.2	3,680	0.8	0

T-2197 1. Effluent to sanitary sewer Grab (2:15 pm)

FRETZ BROTHERS SLAUGHTERHOUSE

This plant is located near Claremont in the Township of Pickering.

DETAILS OF SURVEY

Type of Plant	-	custom and commercial slaughterhouse
Personnel Interviewed	-	Mr. L. Fretz, Owner
Number of Employees	-	3
Operating Schedule	-	4 - 5 hours per day, 2 - 4 days per week
Production	-	slaughter of 20 cattle and 25 pigs per week (yearly average)

Waste Disposal

Liquid wastes, consisting mainly of wash water, are directed via a floor drain to a septic tank and tile bed system. This unit also receives the domestic wastes. Offal is removed three times weekly by a local contractor, and the septic tank is pumped out about twice per year. There was no runoff from the bed and there is no watercourse in the vicinity.

SUMMARY

The waste disposal situation is satisfactory at the present time. A routine surveillance program will be maintained at this plant.

TOWNSHIP OF RAMA

The only industry in the Township of Rama that discharges a significant waste is Chemical Developments of Canada Limited.

CHEMICAL DEVELOPMENTS OF CANADA LIMITED

This plant is located in the Settlement of Longford Mills.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. W. L. Bishop, Plant Manager
Operating Schedule	-	24 hours per day, 5 days per week
Number of Employees	-	approximately 75
Raw Materials	-	phenols, organic amines, cellulose, mono chloracetic acids, isopropanol, methanol, sulphur trioxide, fatty acids, detergent alkylate, methyl chloride, etc.
Products	-	surface active agents, detergents, and carboxymethyl cellulose

PROCESS

Detergents, surface active agents and carboxymethyl cellulose are formulated from various raw materials in batch operations. The appropriate quantities of raw materials are compounded and reacted in agitated pressure kettles, sometimes in the presence of a catalyst, to formulate the desired product.

Water Consumption

Supply	-	from Lake St. John
Domestic	-	1,500 gpd (gallons per day)
Process	-	230,500 gpd (includes steam usage, washup and cooling waters)
Total	-	<u>232,000 gpd</u>

Sources and Disposal of Wastes

The kettle and floor washup waters in the production and formulation areas, as well as all cooling and steam condensate waters, are discharged to a separation pit. The liquid discharge from this pit is directed to Lake St. John.

Other discharges to the Lake include cooling waters from a new sulphonation unit, boiler blowdown and equipment cooling waters.

Domestic sewage is directed to a septic tank and tile system.

Sampling Programme

A forty-eight hour composite sampling programme was conducted on the various discharges to Lake St. John on February 8, 9, and 10, 1966. These samples were submitted to the OWRC laboratory for pH, solids, BOD, COD, ABS, phenols and ether solubles, in accordance with the procedures described in the Twelfth Edition of "Standard Methods for Examination of Water and Waste Water".

SUMMARY OF RESULTS

AVERAGE DAILY WASTE CONCENTRATIONS

Date and Time	Sampling Points	5-Day BOD	Susp. Solids	Phenols in ppb	Ether Solubles	Anionic Detergent as ABS	pH at Lab.
Feb. 8th - 9th, 1966. 4 pm to 4 pm	Separator	218	7	700	19	48	7.1
	Boiler	20	5	20	-	1	7.3
	Sulphonator	5	3	18	-	1	7.2
Feb. 9th - 10th, 1966. 4 pm to 4 pm	Separator	215	15	750	17	72	6.5
	Boiler	50	3	22	-	1	7.3
	Sulphonator	5	4	15	-	1	7.2
Acceptable Limits		15	15	15	15	-	5.5 - 10.6

Note: All results in parts per million except for pH and phenols determination.

DISCUSSION

The results of this survey indicate that the concentrations of the individual waste components - 218 ppm BOD, 700 ppb phenols, 19 ppm ether solubles and 48 ppm ABS - of the effluent from the Separator Pit are unacceptable for discharge to Lake St. John. The other two waste flows (mainly cooling water) contain concentrations of contaminants that are acceptable for discharge to a watercourse.

CONCLUSIONS AND RECOMMENDATIONS

The separator effluent is unacceptable for discharge to a watercourse.

The company should undertake a program to:

- (1) provide better control of wastes in the production, formulation and oil separation areas and
- (2) provide biological treatment for the separator effluent.

Negotiations are continuing between the company and the OWRC in an attempt to solve this waste disposal problem.

TOWNSHIPS OF REACH, SCOTT AND SCUGOG

There are no industries discharging significant quantities of liquid waste in these Townships.

TOWNSHIP OF THORAH

There is only one slaughterhouse in the Township of Thorah.

T. McCUAIG SLAUGHTERHOUSE

DETAILS OF SURVEY

Type of Industry	- custom slaughtering
Personnel Interviewed	- Mr. S. T. McCuaig
Number of Employees	- 1
Operating Schedule	- 1 day per week
Production	- slaughter of 1 cattle beast per week

Waste Disposal

The liquid wastes are discharged on the land. There is no contamination of any watercourse. Solid wastes are disposed of on the land.

SUMMARY

The waste disposal situation is satisfactory.

TOWNSHIPS OF UXBRIDGE, WHITBY AND WHITBY EAST

There are no industries discharging significant quantities of liquid wastes in these Townships.