ANNUAL REPORT 1965

# PORT ARTHUR

## water pollution control plant



DIVISION OF PLANT OPERATIONS
Ontario Water Resources Commission

ONTARIO WATER RESOURCES COMMISSION

OFFICE OF THE GENERAL MANAGER

Members of the Local Advisory Committee,
City of Port Arthur.

Gentlemen:

I am pleased to provide you with the 1965 Annual Report for the Port Arthur Water Pollution Control Plant, OWRC Project No. 58-S-13.

We appreciate the co-operation you have extended to our Operations staff throughout the year, and trust that continuation of this close association will ensure even greater progress in the sphere of water pollution control.

Yours very truly,

D. S. Caverly,
General Manager.

ONTARIO WATER RESOURCES COMMISSION
801 BAY STREET
TORONTO 5

J. A. VANCE, LL.D.
CHAIRMAN

J. H. H. ROOT, M.P.P.
VICE-CHAIRMAN

D. S. CAVERLY
GENERAL MANAGER

W. S. MacDONNELL
COMMISSION SECRETARY

General Manager,
Ontario Water Resources Commission.

Dear Sir:

I am pleased to provide you with the 1965 Annual Report on the operation of the Port Arthur Water Pollution Control Plant, OWRC Project No. 58-S-13.

The report presents design data, outlines operating problems encountered during the year and summarizes in graphs, charts and tables all significant flow and cost data.

Yours very truly,

B. C. Palmer, P. Eng.,
Director,
Division of Plant Operations.

# FOREWORD

This report provides useful information on the operating efficiency of this project during 1965. It is intended to act as a guide in gauging plant performance. To implement that aim, it includes detailed statistical and cost data, a description of the project and a summary of its operation during the year.

Of particular interest will be the cost data, which show the total cost to the municipality and the areas of major expenditure.

The Regional Operations Engineer is primarily responsible for the preparation of the report, and has compiled and arranged the material. He will be pleased to answer any questions regarding it. Other groups, however, were involved in the production, and these include the statistics section, the Drafting Section of the Division of Sanitary Engineering and the Division of Finance.

B. C. Palmer, P. Eng.,
Director,
Division of Plant Operations.

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# PORT ARTHUR
## water pollution control plant

operated for

THE CITY OF PORT ARTHUR

by the

ONTARIO WATER RESOURCES COMMISSION

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CHAIRMAN: Dr. James A. Vance

VICE-CHAIRMAN: J. H. H. Root, M.P.P.

COMMISSIONERS

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D. A. Moodie
H. E. Brown
L. E. Venchiarutti

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GENERAL MANAGER: D. S. Caverly

ASSISTANT GENERAL MANAGER

L. E. Owers
F. A. Voege
K. H. Sharpe
A. K. Watt

COMMISSION SECRETARY

W. S. MacDonnell

---

DIVISION OF PLANT OPERATIONS

DIRECTOR: B. C. Palmer

Assistant Director: C. W. Perry
Regional Supervisor: A. C. Beattie
Operations Engineer: A. Clark

801 Bay Street Toronto 5

# '65 REVIEW

The total plant flow in 1965 was up 14% from that of 1964. The daily average flow for the year was 5.16 mg. At no time during the year was the flow less than the design capacity of 4.0 mgd.

The cost of operation for 1965 was $44,533.19, a decrease of $741.68 over the previous year. No substantial increase in costs are anticipated for 1966.

No major mechanical failures occurred in 1965. However, the increased loadings on the plant brought to attention the inadequacy of the digester mixing facilities. This problem was overcome by making substantial changes to the digester piping and by relocating the mixing pump. Improvements in operation of the digester are now being observed.

Regular inspections were carried out by Division of Plant Operations engineers and technical staff.

The low unit cost of treatment $23.64 per mg, is a reflection of the overloading conditions prevailing at the plant.

# GLOSSARY

| | |
|---|---|
| BOD | biochemical oxygen demand (a measure of organic content) |
| cfm | cubic feet per minute |
| comminution | shredding of solids into small fragments |
| DWF | dry weather flow |
| effluent | outflow |
| flocculation | bringing very small particles together to form a larger mass (the floc) before settling |
| fps | feet per second |
| gpcd | gallons per capita per day |
| gpm | gallons per minute |
| grit | sand, dust, stones, cinders and other heavy inorganic material |
| influent | inflow |
| lin. ft. | lineal feet |
| mgd | million gallons per day |
| mlss | mixed liquor suspended solids |
| ppm | parts per million |
| ss | suspended solids |
| TDH | total dynamic head (usually refers to pressure on a pump when it is in operation) |

# HISTORY
# 1956 - 1965

## INCEPTION

In 1956, the City Council of Port Arthur in conjunction with R. V. Anderson and Associates initiated plans for a new primary sewage disposal plant and extension to existing sewers.

## APPROVAL

Ontario Municipal Board approval was received for the above project in April of 1958 and the final agreement between the City of Port Arthur and the OWRC was signed during the same month.

## CONSTRUCTION

In May, 1958, a contract for the construction of storm relief and sanitary trunk sewers was awarded to Hacquoil's Construction. The cost of the 0.76 miles of storm relief sewers was estimated at $152,909.20 and the cost of the 2.22 miles of sanitary trunk sewers was estimated at $1,078,652.32 for a total of $1,265,057.17.

The Foundation Company was awarded the contract for the construction of the primary treatment plant in June, 1958, at an estimated cost of $699,544.00.

Construction, which was supervised by the Commission's Division of Construction, officially began in August, 1958. Construction was substantially completed, and the systems put into operation, early in 1960.

The plant was officially opened on June 15, 1961.

During 1962, construction work was carried out to increase the plant capacity from 2.0 MGD to 4.0 MGD and was completed during 1963. The new equipment and additions included an extension to the trunk interceptor sewer; two new settling tanks; a new 29,000 gpm storm pump, and a new 48 inch barminutor.

## TOTAL COSTS

58-S-13 - $2,156,991

62-S-101 - $ 241,909

R. ROMANICK

## Project Staff

| | |
|---|---|
| R. Romanick | Chief Operator |
| R. W. Johnstone | Operator |

### COMMENTS

There was considerable staff turnover in 1965 subsequent to the resignation of Mr. E. J. Hughes and S. Hrymnak. Operators were hired on a casual basis for the remainder of the year.

The positions have since been filled with regular staff.

Mr. R. W. Johnstone served throughout 1965 as operator.

PRIMARY CLARIFIERS

# Description of Project

## GENERAL

At present, the plant is designed to give primary treatment with heated sludge digestion to 4,000,000 gallons of sewage per day. The plant is now capable of serving 40,000 persons and can be ultimately enlarged to a secondary treatment plant with a capacity of 16,000,000 gallons per day and serving 80,000 people.

The facilities presently include a combined lift station and control building, two grit channels, four primary sedimentation tanks, a heated sludge digester, four sludge drying beds, a chlorine contact chamber and one chlorine feeder.

## CONTROL BUILDING

This building houses the raw sewage pumps, motors, storm pump, electrical controls, heat exchanger, sludge pumps, office, laboratory and limited storage space. There is also room for the installation of future equipment necessary for expansion.

## LIFT STATION

The raw sewage enters the wet well through a 60" diameter gravity sewer at sub-basement level. It is coarse screened before passing through two barminutors which cut and shred any solid material in the sewage. Before the sewage enters the wet well, it passes through an influent manhole which houses a control gate and a by-pass line. Due to the hydraulics of the sewer and wet well, this control gate has to be kept partially closed to avoid flooding the wet well. It is also impossible to use the by-pass without flooding basements upstream in Port Arthur.
Sewage is lifted by two 5,000 gallons per minute pumps approximately 40' to the grit channels. Each pump is equipped with a 75 H.P. electric motor, and one is also equipped with a 90 H.P. diesel motor which acts as a standby power source in case of electrical power failures.

## GRIT CHANNELS

Sand and grit is allowed to settle in two parallel grit channels, each 35' x 3' x 5' deep and having a detention time of 4.7 minutes at design flow. After leaving the grit channels, the sewage flows through the flow meter.

## PRIMARY SEDIMENTATION

From the grit channels, the sewage flows into four rectangular primary settling tanks. These tanks each measure 100' x 18' x 8' deep and have travelling combination scum skimmers and sludge collectors. The retention time is 2.14 hours at design flow, however, their combined maximum hydraulic capacity is 8 MGD, but at a reduced efficiency.

The sludge and scum collected in the primary tanks flows by gravity to an 11' x 11' x 10' deep raw sludge hopper, from which it is pumped by a 150 GPM, raw sludge pump to the digester.

In the event of a failure of the regular sludge and recirculation pumps, a 150 GPM standby pump powered by a 6 H. P. motor is provided.

## CHLORINATION

The primary tank effluent flows into the chlorine contact chamber where its bacterial content is reduced by the addition of chlorine. The chlorine contact chamber measures 45' x 20' x 10' deep and has a retention time of 20 minutes at design flow. The gas chlorinator has a capacity of 400 pounds per day.

The chlorine tank effluent is discharged to the McIntyre River through an effluent sewer equipped with a flap gate to prevent back-flow from the river.

## DIGESTION

The sludge collected in the two primary tanks is pumped from the raw sludge hopper to the digester. The sludge is heated to an average temperature of 93° Fahrenheit and is broken down by bacterial action into:

1. A thick, black, odourless sludge.
2. A relatively clear supernatant liquor which is returned to the wet well.
3. A digester gas which is utilized to heat the digester.

Natural gas is used as a standby fuel. The digested sludge is drained out onto the sand drying beds periodically throughout the warm season. The sludge is allowed to dry on the beds into a manageable sludge cake, and is then disposed of as a soil conditioner. Facilities are also available for disposal of this digested sludge in liquid form by tank trucks.

The digester measures 50 feet in diameter by 20 feet side wall depth. It has a capacity of 50,000 cubic feet or 312,000 gallons. This capacity allows for 1.25 cubic feet per capita at design flow.

The four drying beds have a total area of 10,000 square feet which represents 0.25 square feet per capita per year at design flow.

29,000 GPM STORM PUMP (40 MGPD)

# PROJECT COSTS

| | | | |
|---|---|---|---|
| NET CAPITAL COST (Final): | 58-S-13 | | $2,157,635.72 |
| | 62-S-101 | | 699,693.96 |
| | | | $2,857,329.68 |
| DEDUCT: Portion Financed By CMHC- | | | |
| | 58-S-13 | - | |
| | 62-S-101 | $457,785.36 | |
| Payments From Municipalities- | | | |
| | 58-S-13 | 644.42 | |
| | 62-S-101 | - | |
| | | | 458,429.78 |
| Long Term Debt to OWRC | | | $2,398,899.90 |
| Debt Retirement Balance at Credit (Sinking Fund) December 31, 1965: | | | |
| | 58-S-13 | $306,601.88 | |
| | 62-S-101 | 11,522.77 | |
| | | | $ 318,124.65 |
| Net Operating | 58-S-13 | $ 44,533.19 | |
| | 62-S-101 | 36.90 | 44,570.09 |
| Debt Retirement | 58-S-13 | $ 43,530.00 | |
| | 62-S-101 | 4,882.00 | 48,412.00 |
| Reserve | 58-S-13 | $ 11,120.01 | |
| | 62-S-101 | 4,801.23 | 15,921.24 |
| Interest Charges | 58-S-13 | $121,023.04 | |
| | 62-S-101 | 15,027.22 | 136.050.26 |
| TOTAL | | | $ 244,953.59 |

## RESERVE ACCOUNT

| | | | |
|---|---|---|---|
| Balance at January 1, 1965 | 58-S-13 | $82,103.92 | |
| | 62-S-101 | 6,858.77 | $ 88,962.69 |
| Deposited by Municipality | 58-S-13 | 11,120.01 | |
| | 62-S-101 | 4,801.23 | 15,921.24 |
| Interest Earned | 58-S-13 | 4,782.10 | |
| | 62-S-101 | 482.97 | 5,265.07 |
| | | | $ 110,149.00 |
| Less Expenditures | | | - |
| Balance at December 31, 1965 | | | $ 110,149.00 |

## MONTHLY OPERATING COSTS

| MONTH | TOTAL EXPENDITURE | PAYROLL | CASUAL PAYROLL | FUEL | POWER | CHEMICAL | GENERAL SUPPLIES | EQUIPMENT | REPAIRS & MAINTENANCE | *SUNDRY | WATER |
|---|---|---|---|---|---|---|---|---|---|---|---|
| JAN | 2042.20 | 1072.98 | 294.00 | | 433.17 | | 81.99 | | 160.06 | | |
| FEB | 3025.33 | 1072.98 | 398.95 | 180.25 | 432.63 | | 78.66 | | 15.45 | 846.41 | |
| MARCH | 2561.05 | 1265.80 | 269.92 | 182.82 | 442.42 | | 187.72 | 77.25 | 111.79 | 23.33 | |
| APRIL | 2496.32 | 1632.18 | | 180.93 | 430.07 | | 50.76 | | | 23.59 | 178.79 |
| MAY | 3800.24 | 1986.99 | 639.08 | 163.38 | 531.99 | | 266.16 | | 73.81 | 139.83 | |
| JUNE | 3384.96 | 1125.74 | 584.24 | 126.46 | 618.97 | 448.05 | 221.45 | 23.69 | 67.30 | 169.06 | |
| JULY | 3532.84 | 1021.15 | 613.93 | 121.79 | 459.06 | 448.05 | 91.81 | | 342.08 | 39.74 | 395.23 |
| AUG | 2859.48 | 785.12 | 817.38 | 110.35 | 466.66 | 448.05 | 89.86 | | 31.13 | 110.93 | |
| SEPT | 3832.23 | 934.46 | 1095.84 | 36.00 | 399.82 | 896.10 | 218.88 | 92.47 | 123.24 | 35.42 | |
| OCT | 6309.55 | 1773.15 | 1129.20 | 36.00 | 467.06 | 448.05 | 144.58 | 42.93 | | 1665.45 | 603.13 |
| NOV | 5701.63 | 841.93 | 863.57 | 51.45 | 455.12 | 448.05 | 198.80 | 432.89 | 16.66 | 2393.17 | |
| DEC | 4987.36 | 813.47 | 718.82 | 124.87 | 447.09 | | 331.46 | 677.97 | 381.19 | 897.46 | 595.03 |
| TOTAL | 44533.19 | 14325.94 | 7424.93 | 1314.30 | 5584.06 | 3136.35 | 1962.13 | 1347.20 | 1322.71 | 6343.39 | 1772.18 |

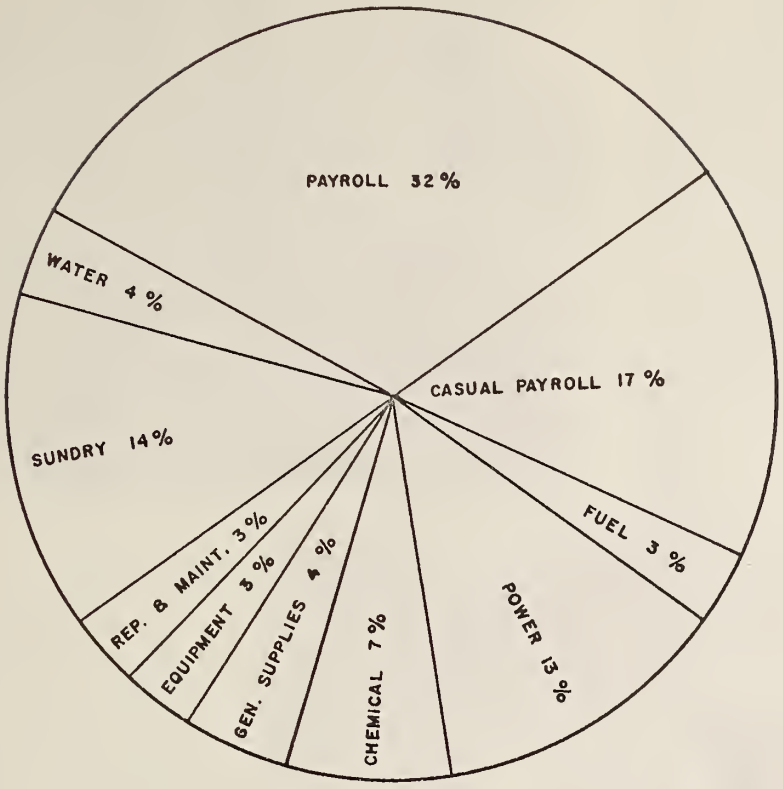
* SUNDRY INCLUDES SLUDGE HAULING COSTS WHICH WERE $4758.60
BRACKETS INDICATE CREDIT

## YEARLY OPERATING COSTS

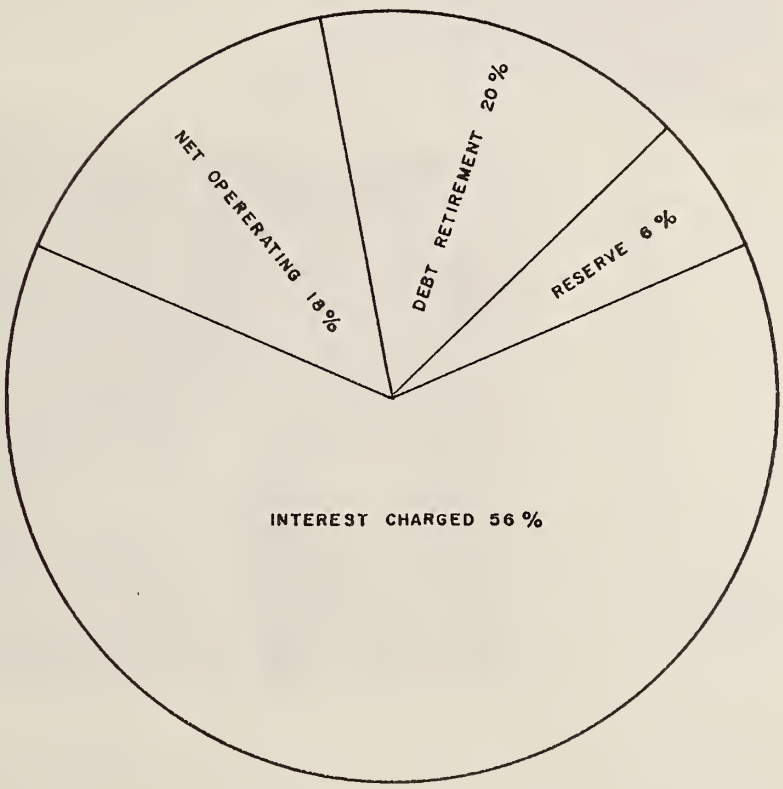
| YEAR | M.G. TREATED | TOTAL COST | COST PER FAMILY * PER YEAR | COST PER MILLION GALLONS | COST PER L.B. OF BOD REMOVED |
|---|---|---|---|---|---|
| 1961 | 840.41 | $ 29,861.94 | $ 2.77 | $ 35.52 | 3 CENTS |
| 1962 | 885.49 | 31,781.54 | 2.85 | 35.89 | 4 CENTS |
| 1963 | 1063.67 | 32,700.58 | 2.89 | 34.74 | 3 CENTS |
| 1964 | 1648.94 | 45,374.87 | 3.94 | 27.52 | 4 CENTS |
| 1965 | 1883.74 | 44,533.19 | 3.82 | 23.64 | 3 CENTS |

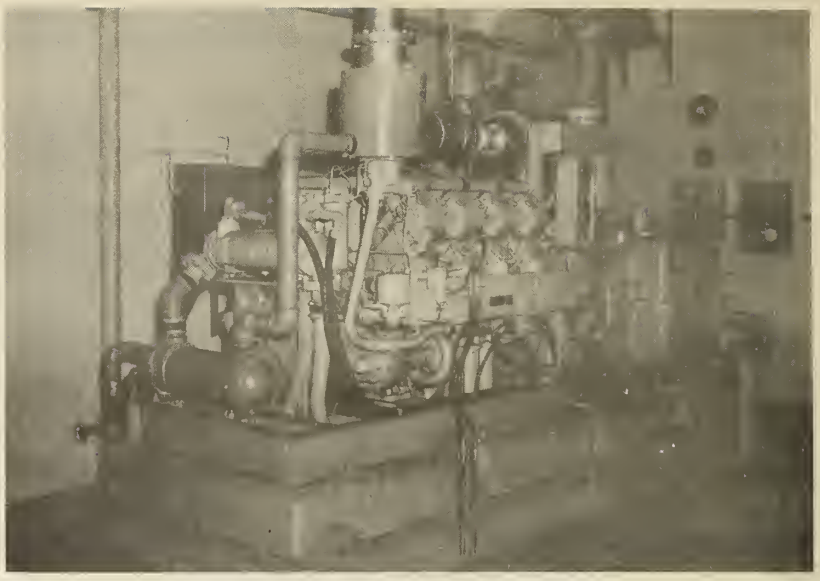
* BASED ON ANNUAL POPULATION ESTIMATE AND 3.9 PERSONS PER FAMILY

## 1965 OPERATING COSTS

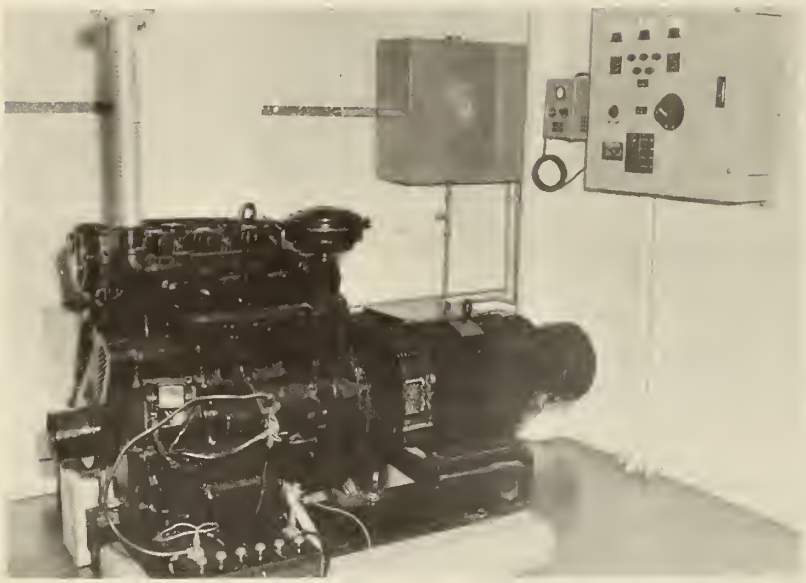



## TOTAL ANNUAL COST
## (BOTH PROJECTS)

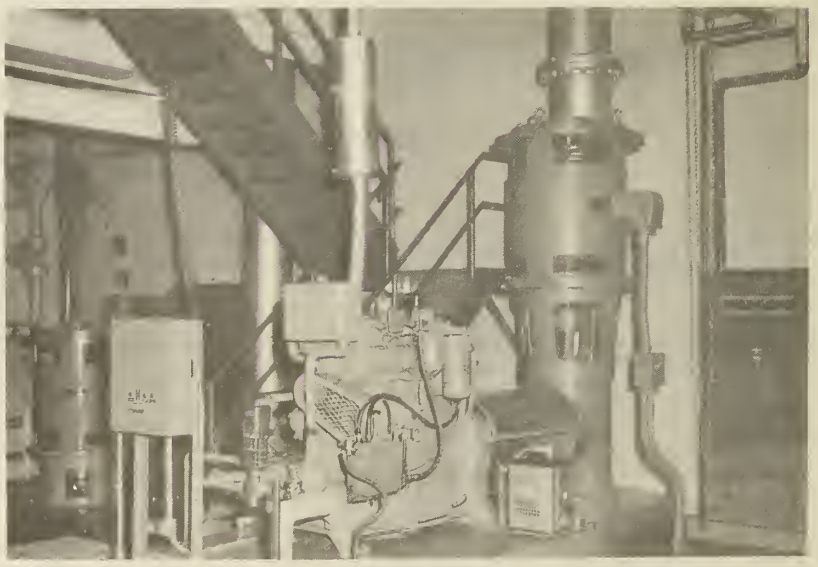




DORMAN DIESEL ENGINE (400 HP) ON STORM PUMP

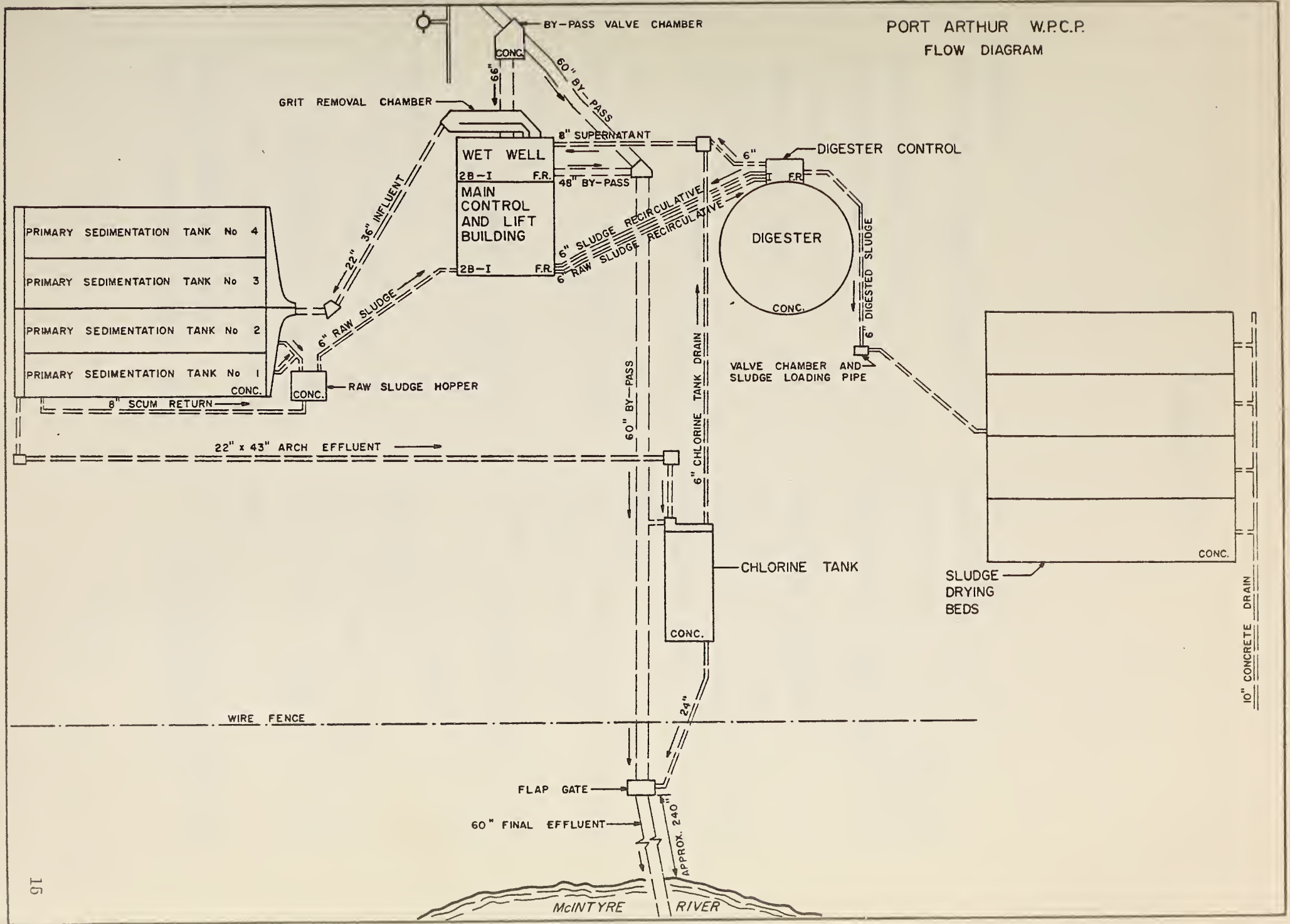


THIS 18 KW GENERATOR SET SUPPLIES POWER TO ALL EMERGENCY EQUIPMENT IN CASES OF POWER FAILURE



90 HP CUMMINS DIESEL ENGINE ON STANDBY. ALSO SHOWN IS 75 HP ELECTRIC MOTOR ON MAIN PUMP.

# Technical Section


PORT ARTHUR W.P.C.P.
FLOW DIAGRAM
BY-PASS VALVE CHAMBER
CONC.
60" BY-PASS
66"
GRIT REMOVAL CHAMBER
8" SUPERNATANT
WET WELL
2B-I
F.R.
MAIN CONTROL AND LIFT BUILDING
48" BY-PASS
DIGESTER CONTROL
6"
DIGESTER
6" SLUDGE RECIRCULATIVE
6" RAW SLUDGE RECIRCULATIVE
36" INFLUENT
22"
PRIMARY SEDIMENTATION TANK No 4
PRIMARY SEDIMENTATION TANK No 3
PRIMARY SEDIMENTATION TANK No 2
PRIMARY SEDIMENTATION TANK No 1
6" RAW SLUDGE
6" DIGESTED SLUDGE
RAW SLUDGE HOPPER
8" SCUM RETURN
VALVE CHAMBER AND SLUDGE LOADING PIPE
60" BY-PASS
6" CHLORINE TANK DRAIN
22" x 43" ARCH EFFLUENT
CHLORINE TANK
SLUDGE DRYING BEDS
10" CONCRETE DRAIN
WIRE FENCE
24"
FLAP GATE
60" FINAL EFFLUENT
APPROX. 240'
McINTYRE RIVER

# Design-Data

GENERAL

Type of Plant - Primary treatment with digester.

Design Population - 40,000.

Design Plant Flow - 4 MGD.

Per Capita Flow - 100 GPD.

PRIMARY TREATMENT

Grit Removal

Type - two rectangular parallel grit channels.

Size - 35' x 3' x 5' deep.

Detention Time - 4.7 minutes at 2 MGD per channel.

Barminutors

Sizes - one 35" model B Barminutor.

- one 48" model A1 Barminutor.

Sewage Lift Pumps

Sizes - one 29,000 GPM driven by a diesel engine.

- two 3,300 GPM - each driven by a 75 HP electric motor.

- one with a 90 HP diesel engine.

Primary Sedimentation Tanks

Type - 4 rectangular parallel units.

Size - 18' x 100' x 8' deep.

Retention - 2.14 hours.

Surface Settling Rate - 560 gallons per sq. ft. per day.

Overflow Rate - 6,000 gallons per ft. of weir per day.

Chlorine Contact Chamber

Size - 45' x 20' x 10' deep.

Retention Time - 20 minutes at 4 MGD.

Chlorinator Capacity - 400 lbs. per day.

Digester

Size - 50 ft. in diameter by 20 ft. deep.

Capacity - 312,000 gallons.

Loading - 1.25 cubic ft. per capita (population 40,000).

- 2.0 lbs. of solids per cubic ft. per month.

Sludge Drying Beds

Size - 4 for a total area of 10,000 sq. ft.

Area per capita - 225 sq. ft. @ 40,000 persons.

Outfall

Size - 240 ft. of 60 inch diameter corrugated metal pipe discharging into the McIntyre River.

## Process Data

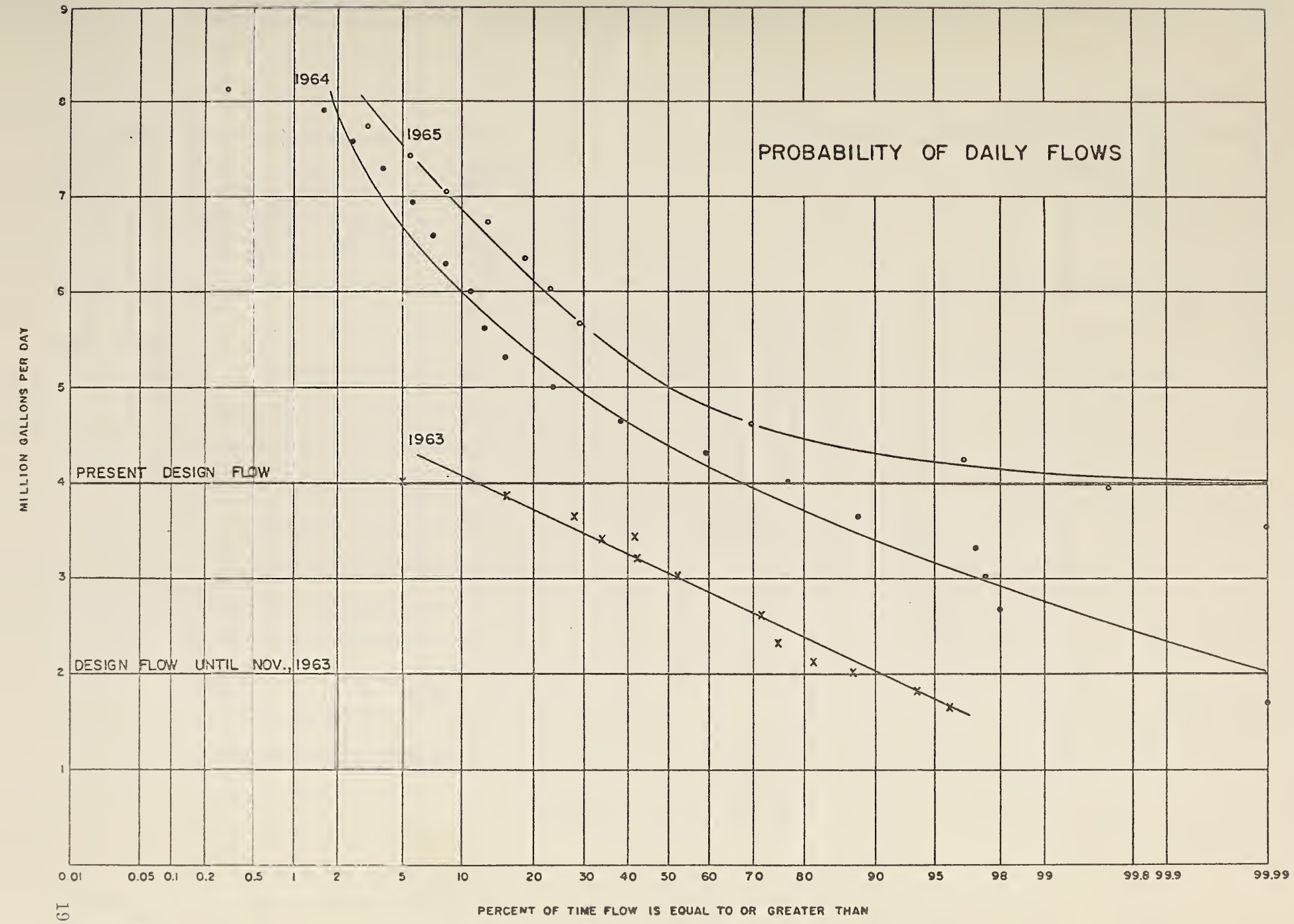
The daily average flow continues to show an upward trend, while the strength of the incoming sewage remained relatively unchanged from previous years.

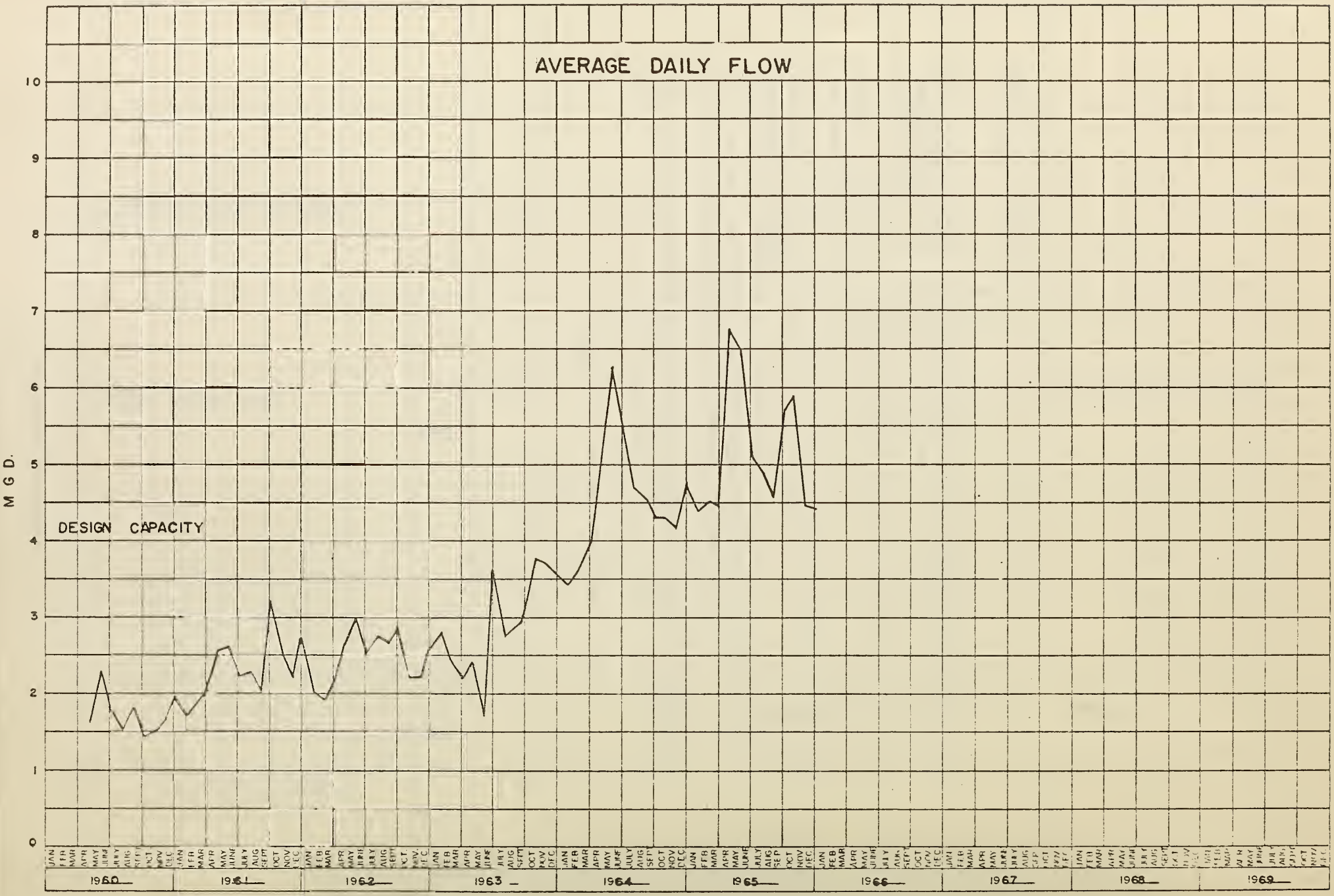
During 1965 a total of 1883.74 mg of sewage was treated, an increase of 14% over 1964.

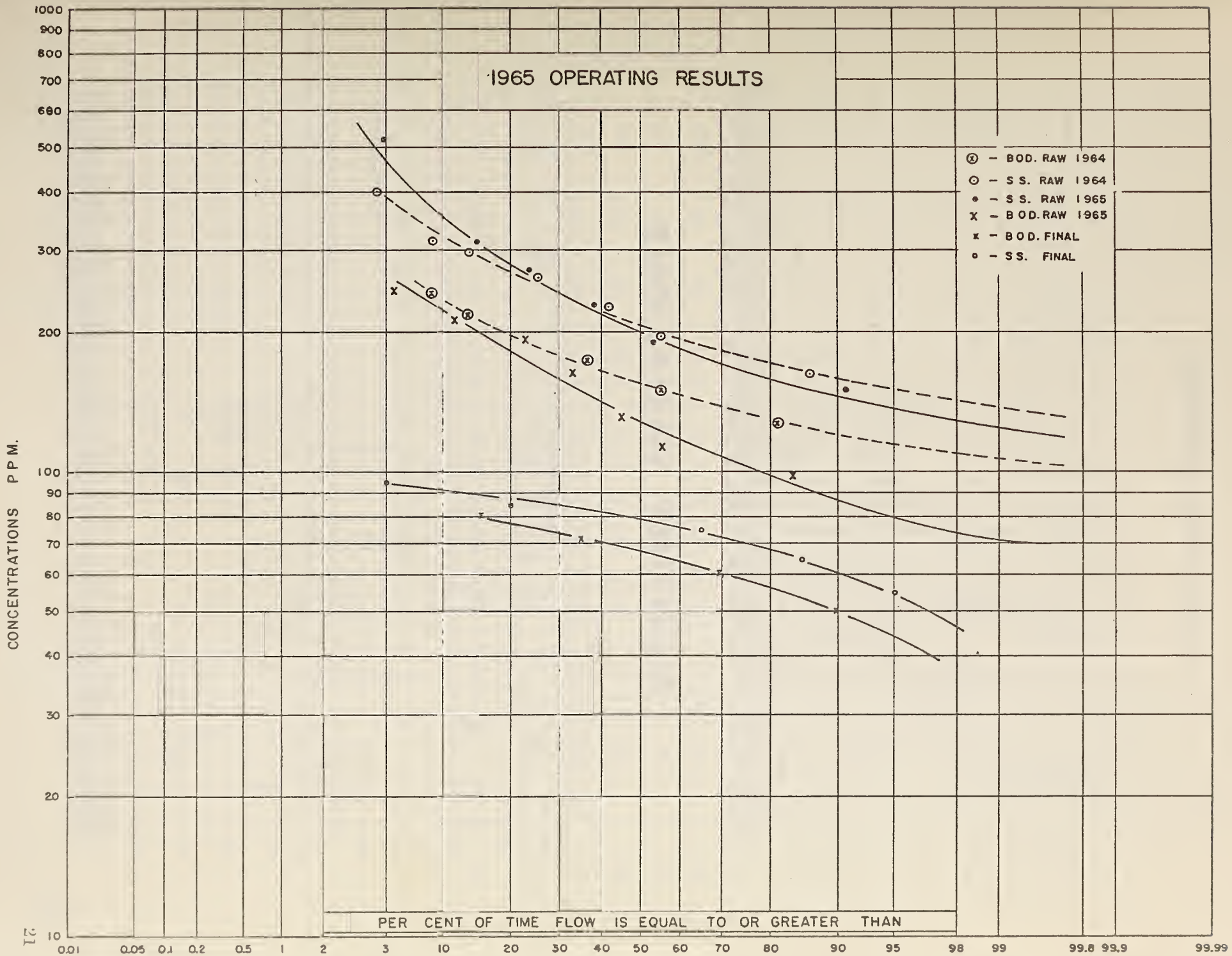
The daily average flow was 5.16 mgd, an overload of 29% over the plant capacity of 4.0 mgd.

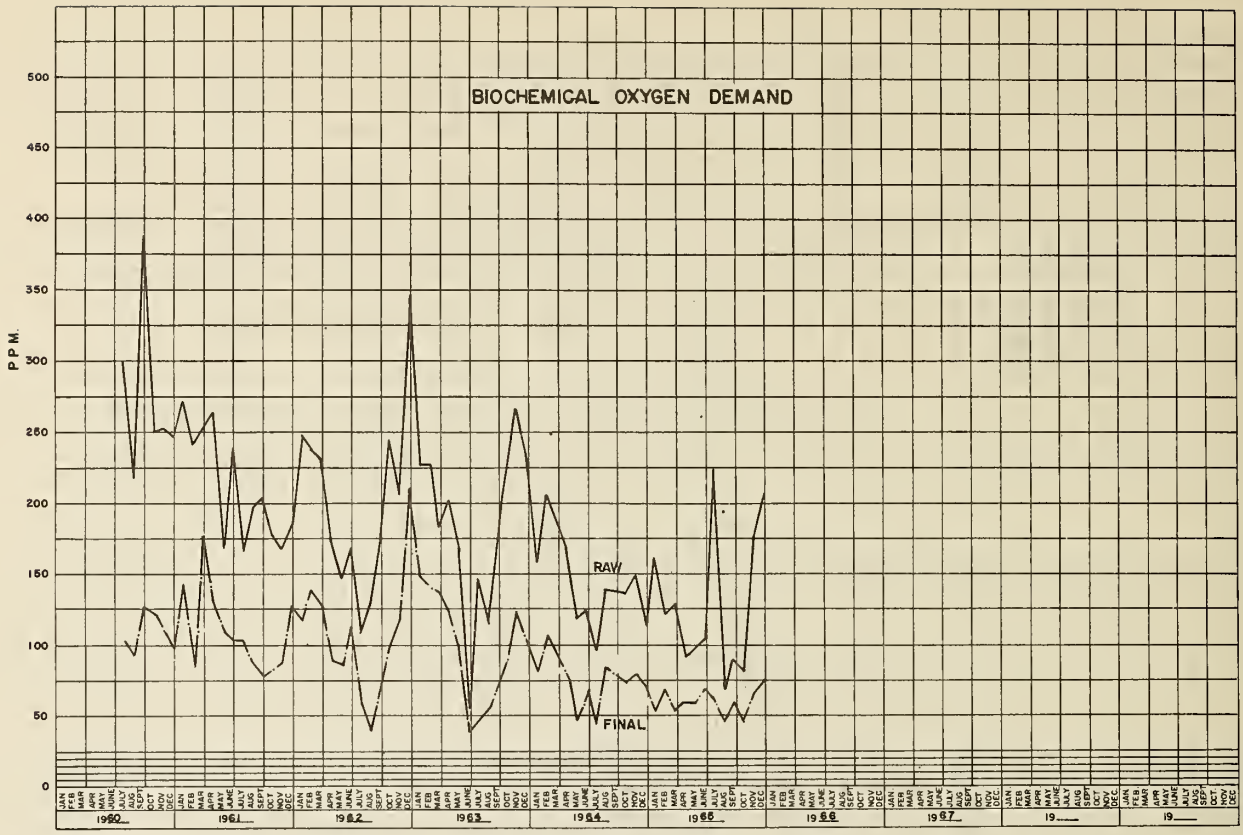
The average 5 day BOD of the raw sewage was 130 ppm and the average 5 day BOD of the plant effluent was 60 ppm, a reduction of 54%.

The comparable figures for SS were 204 ppm and 73 ppm, a reduction of 64%.

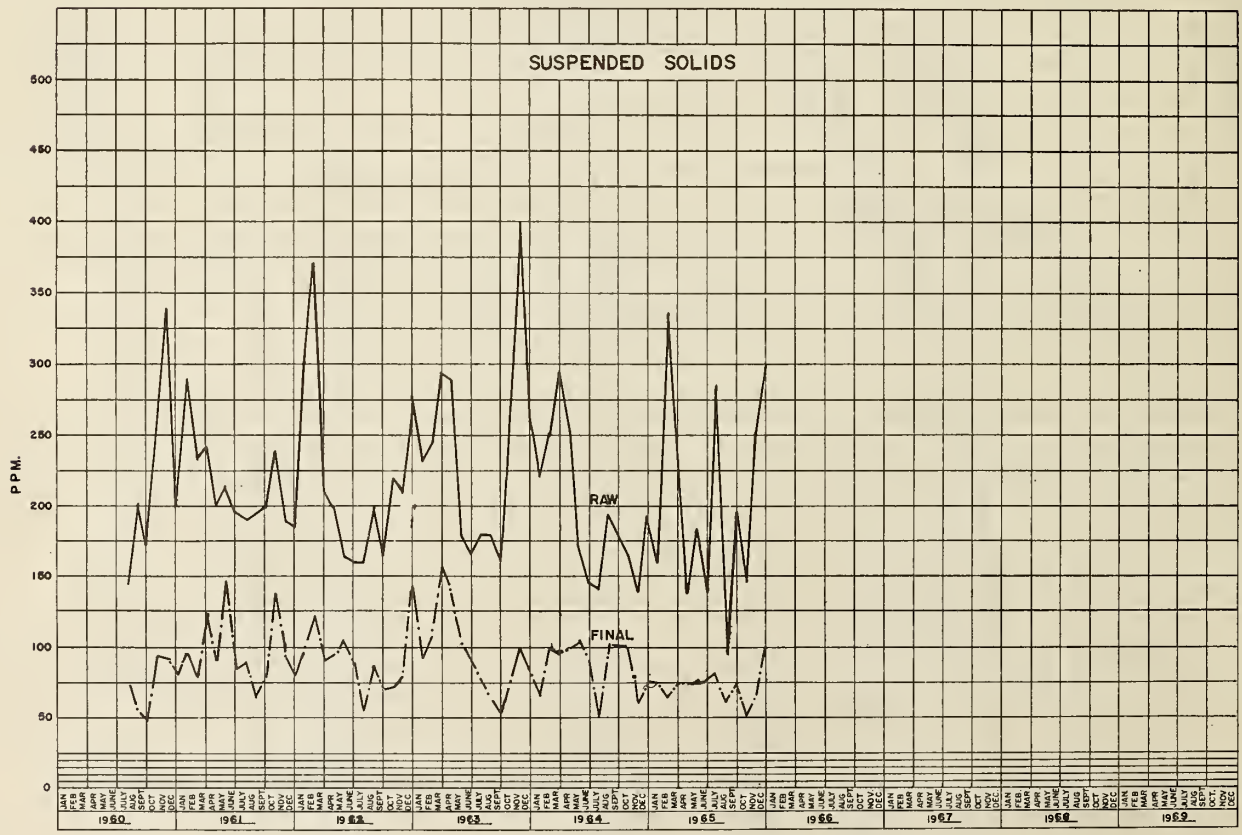

PROBABILITY OF DAILY FLOWS
1964
1965
1963
PRESENT DESIGN FLOW
DESIGN FLOW UNTIL NOV., 1963
MILLION GALLONS PER DAY
9
8
7
6
5
4
3
2
1
0.01
0.05
0.1
0.2
0.5
1
2
5
10
20
30
40
50
60
70
80
90
95
98
99
99.8
99.9
99.99
PERCENT OF TIME FLOW IS EQUAL TO OR GREATER THAN


AVERAGE DAILY FLOW
DESIGN CAPACITY
M G D.
0
1
2
3
4
5
6
7
8
9
10
1960
1961
1962
1963
1964
1965
1966
1967
1968
1969


1965 OPERATING RESULTS
⊗ – BOD. RAW 1964
⊙ – S S. RAW 1964
• – S S. RAW 1965
x – B OD. RAW 1965
x – B OD. FINAL
o – S S. FINAL
CONCENTRATIONS P P M.
1000
900
800
700
600
500
400
300
200
100
90
80
70
60
50
40
30
20
10
PER CENT OF TIME FLOW IS EQUAL TO OR GREATER THAN
0.01
0.05
0.1
0.2
0.5
1
2
3
10
20
30
40
50
60
70
80
90
95
98
99
99.8
99.9
99.99




# MONTHLY VARIATIONS

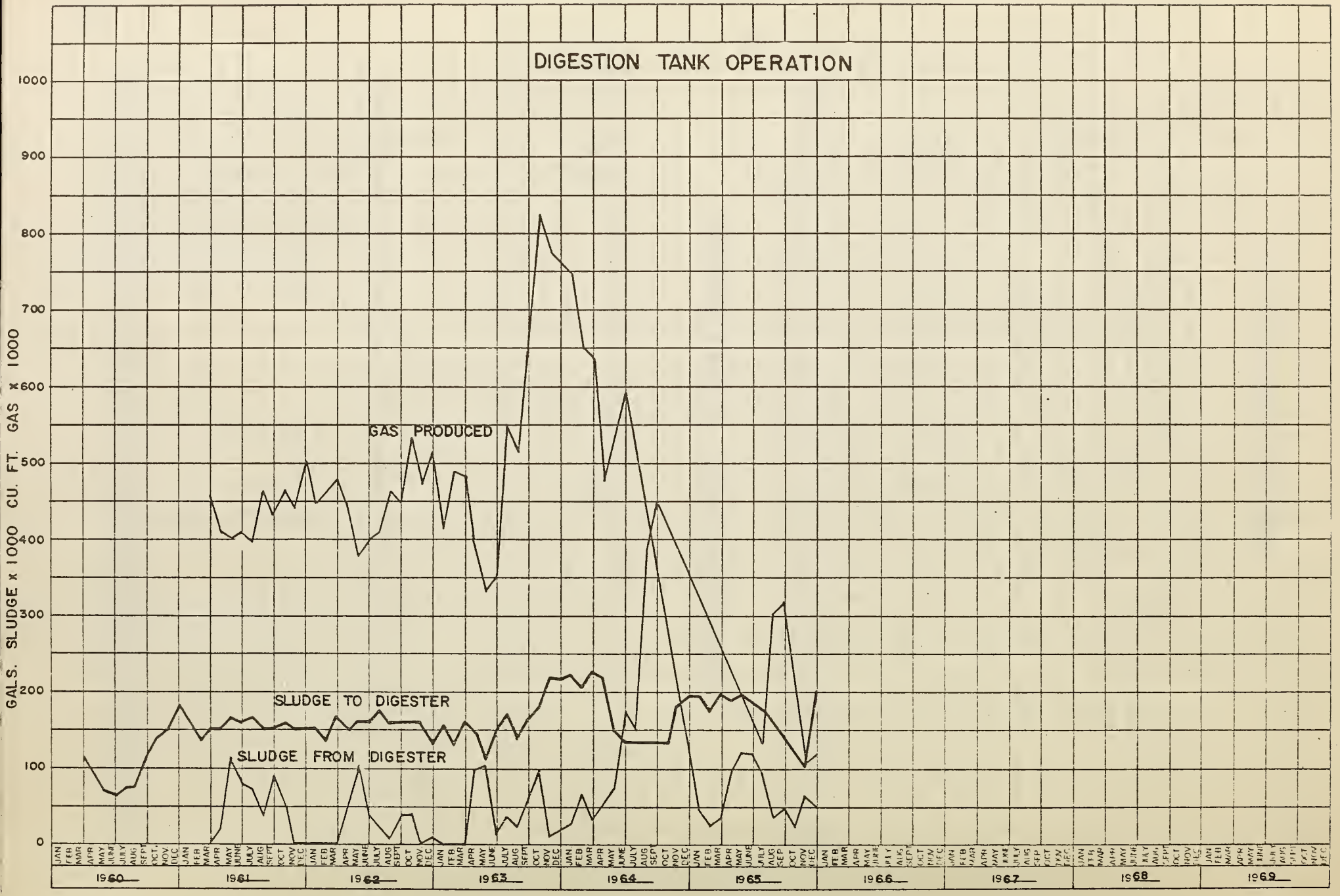


## GRIT, B.O.D AND S.S. REMOVAL

| MONTH | B. O. D. | | | | S. S. | | | | GRIT REMOVAL CU. FT. |
|---|---|---|---|---|---|---|---|---|---|
| | INFLUENT P.P.M. | EFFLUENT P.P.M. | % REDUCTION | TONS REMOVED | INFLUENT P.P.M. | EFFLUENT P.P.M. | % REDUCTION | TONS REMOVED | |
| JAN. | 165 | 54 | 67.0 | 75.1 | 160 | 75 | 53.0 | 57.5 | 136 |
| FEB. | 122 | 69 | 43.5 | 33.3 | 338 | 65 | 80.5 | 171.5 | 112 |
| MAR. | 130 | 55 | 57.5 | 51.7 | 211 | 76 | 64.0 | 93.0 | 172 |
| APR. | 92 | 60 | 34.5 | 32.6 | 133 | 75 | 43.5 | 59.0 | 180 |
| MAY | 100 | 58 | 42.0 | 42.2 | 189 | 74 | 61.0 | 115.5 | 263 |
| JUNE | 105 | 70 | 33.5 | 29.1 | 136 | 76 | 44.0 | 50.0 | 238 |
| JULY | 220 | 62 | 72.0 | 119.4 | 291 | 82 | 72.0 | 158.0 | 146 |
| AUG. | 68 | 46 | 32.0 | 15.5 | 94 | 63 | 33.0 | 21.9 | 226 |
| SEPT. | 92 | 62 | 32.5 | 25.4 | 205 | 75 | 63.5 | 110.2 | 189 |
| OCT. | 81 | 46 | 43.0 | 31.9 | 144 | 52 | 64.0 | 83.8 | 225 |
| NOV. | 178 | 66 | 63.0 | 74.8 | 251 | 68 | 73.0 | 122.2 | 188 |
| DEC. | 205 | 76 | 63.0 | 88.1 | 300 | 100 | 66.5 | 136.5 | 165 |
| TOTAL | - | - | - | 659.3 | - | - | - | 123.4 | 2240 |
| AVG. | 130 | 60 | 54.0 | 54.9 | 204 | 73 | 64.0 | 10.3 | 187 |

### COMMENTS

Percent removals of BOD and SS are as would be expected for a primary plant.


DIGESTION TANK OPERATION
GALS. SLUDGE x 1000 CU. FT. GAS x 1000
1000
900
800
700
600
500
400
300
200
100
0
GAS PRODUCED
SLUDGE TO DIGESTER
SLUDGE FROM DIGESTER
1960
1961
1962
1963
1964
1965
1966
1967
1968
1969

## DIGESTER OPERATION

| MONTH | SLUDGE TO DIGESTERS | | | SLUDGE FROM DIGESTERS | | | GAS PRODUCED 1000's Cu. Ft. |
|---|---|---|---|---|---|---|---|
| | 1000's CU FT. | % SOLIDS | % VOL. MAT. | 1000's CU. FT. | % SOLIDS | % VOL. MAT | |
| JAN. | 31.79 | 2.88 | 1.82 | - | - | - | 44.47 |
| FEB. | 28.72 | 2.86 | - | - | - | - | 25.97 |
| MAR. | 31.79 | - | - | - | - | - | 36.81 |
| APR. | 30.77 | 2.23 | 1.65 | - | - | - | 62.44+ |
| MAY | 31.79 | - | - | - | - | - | 120.50 |
| JUNE | 30.77 | - | - | - | - | - | 121.43 |
| JULY | 28.72 | - | - | *21.22 | - | - | 98.52 |
| AUG. | - | - | - | *49.30 | - | - | - |
| SEPT. | - | - | - | *H 51.38<br>TB 8.69 | - | - | - |
| OCT. | - | - | - | *37.42 | - | - | ++ 26.06 |
| NOV. | 16.82 | - | - | 17.23 | - | - | 65.36 |
| DEC. | 33.23 | | | 19.30 | | | 56.45 |
| TOTAL | 264.40 | | | H 195.85<br>TB 8.69 | | | 658.01 |
| AVG. | 29.38 | | | H 32.64<br>8.69 | | | 65.80 |

H - Hauled TB- To beds
+ 23 days data - meter out of order
* Tank Truck haulage. Digester down.
++ 15 days data. meter returned to service.

### COMMENTS

Digester operation was poor in 1965, mainly due to formation of scum mats in the digester. This put the digester out of operation for a 2 month period. The problem was overcome by moving the standby recirculation pump from the control building to the digester building. Piping head loss was therefore greatly reduced and adequate mixing of digester contents can now be achieved. It is improbable that scum blankets will now form.

## CHLORINATION

| MONTH | PLANT FLOW (MG) | POUNDS CHLORINE | DOSAGE RATE (P.P.M) |
|---|---|---|---|
| JANUARY | 135.32 | - | - |
| FEBRUARY | 125.63 | - | - |
| MARCH | 137.86 | - | - |
| APRIL | 203.49 | - | - |
| MAY | 200.80 | * 2055 | 1.76 |
| JUNE | 166.50 | 4191 | 2.52 |
| JULY | 151.16 | 4340 | 2.87 |
| AUGUST | 141.05 | ** 2779 | 2.91 |
| SEPTEMBER | 169.54 | 3940 | 2.32 |
| OCTOBER | 182.26 | 4104 | 2.25 |
| NOVEMBER | 133.60 | *** 109 | 1.22 |
| DECEMBER | 136.53 | - | - |
| TOTAL | 1883.74 | 21518 | - |
| AVERAGE | 156.98 | 3074 | 2.42 |

* 18 days chlorination
** 21 days chlorination
*** 2 days chlorination

## COMMENTS

Chlorination was carried out from late May to early November and 21518 pounds of chlorine were used to maintain a residual of 0.5 ppm. Modifications to the chlorine feed will have to be made to cope with the increasing flows.

## DORMAN DIESEL

Listed below are Dorman Diesel pumpage values in hours for 1965, and operator's comments:

| Date | Hrs. | Comments |
|---|---|---|
| Jan 24 - 30 | 2 | test following installation |
| Feb 21 - 27 | 1 | test and inspection |
| Apr 7 | 9 | |
| 8 | 7 | |
| 9 | 11 | |
| 10 | 8 | |
| 11 - 17 | 75.5 | |
| May 16 - 22 | 21 | |
| 23 - 29 | 2 | |
| Jun 27 | 5.9 | |
| Jul 1 | 6 | |
| 13 | 4 | rain storm |
| Aug 5 | 2 | " |
| 6 | 3 | " |
| 12 | 2 | " |
| 27 | 3 | " |
| 30 | 1 | " |
| Sep 14 | 15 | on storm pump |
| 15 | 6 | " |
| 21 | 2 | " |
| 29 | 12 | rain storm |
| 30 | 24 | " |
| Oct 1 | 20 | " |
| 2 | 21 | " |
| 3 | 15 | " |
| 4 | 6 | " |
| 7 | 5 | " |
| 9 | 9 | " |

## CONCLUSIONS

The increasing flows are taxing the existing plant facilities and close control must be exercised on grit removal, raw sludge pumping, digester operation and chlorination of final effluent. There is no indication that the trend of increase in flow has changed since 1963 through 1964 and 1965.

## RECOMMENDATIONS

Consideration should be given to increasing the capacity of treatment facilities at this plant.


ONTARIO WATER RESOURCES COMMISSION