A REPORT ON A SANITARY SURVEY OF THE PASSAIC RIVER FROM THE GREAT FALLS IN PATERSON, NEW JERSEY TO NEWARK BAY

to the Passaic Valley Sewerage Commission

by

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The purpose of this survey was to determine probable or actual violations along the Passaic River and was not intended to cover the actual pollution or degree of same in the River itself.

A history of the Passaic River from early days to the present time might be a history of any of the larger rivers throughout the country. A beautiful river with few inhabitants along its banks and no pollution has been transformed by the uses and abuses of large concentrations of population. As populations increased along its drainage area the River became increasingly more polluted. The early uses for potable water supply, industrial water supply, transportation and recreational activities have become so affected that today most of these uses are lost to industries and communities and because of these uses and abuses, the river has lost most of its economic value. As is the case in other large industrial areas, American Progress has spelled fouling of natural resources. Progressive pollution has reached the point where natural stream purification has been unable to keep pace with the degrading forces of pollution.

The Passaic Valley Sewerage Commission has done much in recent years to abate pollution of the Passaic River, and is striving constantly to restore the River to its proper condition. This is not an easy job, but is one which when satisfactorily attained may be rightfully acclaimed a job well done.

There are a number of Pollution Control agencies established in the East whose problems are essentially the same as the Passaic Valley Sewerage Commission. These Commissions are:

1. Interstate Sanitation Commission, comprising representatives of New York, New Jersey, and Connecticut
2. The Interstate Commission on the Delaware River Basin, commonly called the "Incodel", with representatives from Delaware, New Jersey, New York, and Pennsylvania, and
3. The Interstate Commission on the Potomac River Basin, which has been formed in recent years, comprising representatives from Maryland, West Virginia, Pennsylvania, Virginia, and the District of Colombia.

The Passaic Valley Sewerage Commission is the senior organization by many years, and in its efforts to abate pollution of the Passaic River it has constructed and is operating a vast trunk sewerage system and sewage treatment plant to care for the sewage, both domestic and industrial, of many of the communities along the River below the Great Falls in Paterson. The tremendous industrial activity in this area and the ever increase in population has placed a serious burden on the Passaic Valley Sewerage Commission system. Outlying municipal sewerage systems and sewage plants have become inadequate, and in most instances have applied to the Passaic Valley Sewerage Commission for permission to use their Trunk Sewer. The

inability of the growing communities to satisfactorily handle their problem with their own existing sewerage facilities either because of inadequate sewage plants or sewer lines or both, has led them to seek relief elsewhere. By joining the Passaic Valley Sewerage Commission, their problems are greatly relieved and the headaches are mainly transferred to the Passaic Valley Sewerage Commission.

The various Commissions mentioned earlier in this report are intrastate in scope, whereas the Passaic Valley Sewerage Commission problems, while being comparable, are limited to the lower reaches of the Passaic River and its tributaries; but it is doubtful if there are any more diversified industrial waste problems facing any of the Interstate Commissions.

The goal to restore the Passaic River to its former pristine condition is a worthy one, and is fraught with many difficulties including the probable financing of expensive trunk sewer extensions and enlargements and sewage plant extensions and improvements in treatment. That most, if not all, of these are now necessary, is obvious to one familiar with the problem. During this survey, the most glaring domestic pollution noted was caused by an overflowing sewer line along the River in Paterson. The result of pollution of this type may be minimized during periods of heavy rainfall and high run-off, but is certainly a serious factor when it occurs during a period of low run-off when the proportion of sewage contributed is a large portion of the flow in the River.

Attached is a table showing approximate river flows of the Passaic River near Great Falls during the period August 15 to and including September 19, 1948, and the rainfall in this area during the same period. The maximum river flow was approximately one billion gallons daily on August 24, following a rainfall of 0.94 inches, and the minimum river flow was approximately 60 million gallons daily on September 16, 17, and 18, 1948. This data is recorded for the purpose of determining the dilution factor.

The character of the water in the river in the early days was such that on August 15, 1854 water was pumped from the River at Belleville to be used as a public water supply for Jersey City. About 1873, the River had become polluted and agitation was begun for a change in the supply. The use of the River for potable purposes was continued until about 1895. The gradual deterioration in quality necessitated the moving of intakes farther away from the industrial areas to the up-stream sections of the River.

Today the more important uses of the Passaic River below Great Falls in Paterson are for industrial water supply and recreational use. The principal industrial water supply is taken through the Dundee Canal. Below the Dundee Canal and along the River there are a number of yachting clubs where many fine pleasure craft are docked. This is the principal recreational use of the River today. The industrial use of the River for transportation of materials is still quite heavy. The continued use of the River for these purposes will depend largely on the ability of the Passaic

Valley Sewerage Commission to stop pollution and to prevent further abuse of the River. This is not an easy task when one realizes that the viewpoints on the proper use of rivers range from; (1) that the river should be preserved in its natural condition, to the other extreme, (2) that the river may be used to carry sewage and industrial waste, regardless of the pollution load. Both of these viewpoints are extremes. It is certainly difficult with a large concentration of population and the large number of industries along the River bank to maintain the River as it once was before these conditions existed. Now that industry has become established along the River, and some of their past practices have been questionable, it is difficult but not impossible to prevent them from continually fouling the River. There is adequate law prohibiting pollution of the River. Continual policing coupled with active cooperation on the part of municipal governments and municipal health agencies and firm but fair prosecution of all violators appears to be the only means of stamping out the bad practices of the past. Today industry is showing a tendency to cooperate with agencies who have control over a river or stream, but it must be continually brought to their attention that pollution of the River exists and that for economic reasons alone, if for no other reason, pollution should cease or the use of the River will be lost to them and what was once a boon to an area will become not only an eyesore but a health hazard as well. Rules and regulations to prohibit the pollution of rivers and streams throughout the country have been adopted. As a result, numerous industrial waste treatment plants and municipal sewage plants have been constructed to eliminate sources of pollution

in an attempt to reclaim these rivers to their former status. The Interstate Commission on the Potomac River has established a "Waste Treatment Guide" which is worth study by the Passaic Valley Water Commission. The Delaware River Basin under the control of the Incodel has established four different zones along the Delaware River which will permit the use of the river for potable water supplies in the up-land reaches of the river with various uses as the river flows towards Philadelphia, varying from potable water supply use to uses of recognized lesser importance.

The Passaic River between Great Falls and Newark Bay is not used for a potable water supply, and so this section of the River need no longer be considered either now or in the future for such purposes. However, there is a considerable amount of this water used for industrial purposes, and the volume of water used may be a large proportion of the total river flow during dry weather periods. The control of pollution, therefore, in the Passaic River, must of necessity be of prime importance for these industrial users. There is still a considerable amount of industrial transportation in the lower reaches of the river, and this continues to be a factor of importance. Another use of the river between these points is the recreational use. It was evident to the writer that there is at present a very limited amount of swimming in the river, and it is doubtful if swimming can be very enjoyable or healthful at the present time. Therefore, the recreational uses are presently limited to boating. Only close adherence

to strict sanitary regulations will permit a return to safe swimming in the Passaic River.

The Passaic Valley Trunk Sewer affords means for the disposal of most of the sewage for the communities and industries bordering the River and has been and should in the future be a more important factor in maintaining the purity of the River. However, the entire area has developed so rapidly that the trunk sewer lines as well as the individual municipal sewer lines have in a number of cases become seriously overloaded. A break in any of these municipal sewer systems or an emergency which requires bypassing of a sewage plant or the overloading of the trunk sewer line results in domestic sewage flowing into the Passaic River without the advantages of any treatment whatsoever. During our investigation there were a number of spots where domestic sewage flowed directly into the River because of one or more of the above mentioned emergencies. Correction of this condition may be found in more adequate sewering by providing additional trunk sewer capacity. This may be forestalled for a short period by militantly insisting that each municipality contributing sewage to the Passaic Valley trunk sewer take immediate steps to minimize or eliminate infiltration to their system. If this is not done, the Commission will face the necessity of providing additional trunk sewer capacity and at a time when these costs are nearly prohibitive. That infiltration exists is evident from the large increase of contributed sewage to the trunk sewer at times of heavy rainfall and consequent heavy run-off. It might be advisable to consider more serious

penalties for a municipality for excessive contribution of sewage over and above a normal maximum flow. A study has not been made by the writer of the sewage treatment plant capacity. It would not be surprising, however, to find it overloaded under present conditions.

In general, industry has provided means for preventing most of its industrial waste from entering the River directly at the source. However, this survey indicates that there has been, in the recent past, pollution by industry and there is also evidence that actual pollution still exists.

Industries along the river may at times contribute any of the following wastes;

1. Textile wastes.
2. Dye house wastes.
3. Chemical industry wastes.
4. Laundry wastes.
5. Plating room waste.

A number of the industries have been or are at [redacted] present providing means for at least partial purification of their waste before discharging into the Trunk Sewer. The elimination of all industrial waste containing putrescible organic matter either in solution or in suspension to the River will eventually permit the River to return to a biological balance. By biological balance the writer means a state in which the dissolved oxygen in the River itself is sufficient to support aquatic plant life as well as fish life. In the absence of dissolved oxygen, putrifaction or decomposition takes place and, in the extreme instance, generation of hydrogen sulfide occurs.

In addition to sanitary sewer overflows and industrial waste pollution there is also the frequent appearance of oil slicks on the river. This pollution may be traceable to poor housekeeping at gas stations, which permits oil or gas to be carelessly carried into storm drains. On Sunday morning, September 19, an inspection indicated a heavy slick of oil the full width of the River from the Lincoln Highway down to the confluent of the Passaic River and the Hackensack River in Newark Bay with evidence of oil above and below this area. This was not traced to its source but there was no evidence that such an amount of oil had been dumped into the river above the bay. It may be concluded, therefore, that this contamination occurred in the Bay itself and probably came from an oil barge.

A considerable amount of driftwood was noted in the river at various times. This is a hazard to the only remaining recreational users of the River; namely, those enjoying boating. A number of old hulks are lying in the water along the shore and are gradually falling apart.

Bank erosion and weakening of bulkheads is taking place at several different points and as a result a number of trees are undermined and find their way out into the river. In one case in particular there is danger of the failure of a retaining wall holding back property which is now used as an automobile junk yard. This is located at the North Arlington Junk Yard, River Road, North Arlington.

Several small active dumps were sited along the river in the Paterson area. Orange peels, garbage and other

litter were noted floating in the river. Individual dumps may appear to be harmless but when multiplied many times by those of others who find it convenient to dispose of their garbage in this manner, a considerable nuisance results. On a number of occasions these small dumps were noted and immediately after a rain the evidence had been washed into the River. These dumping grounds are spotted on the accompanying map of the Passaic River between Great Falls in Paterson and Newark Bay, along with the sampling stations from which samples of industrial waste were collected.

Table number II shows the pertinent analytical data collected during this survey and following this are comments on the results of analytical work.

TABLE I

PASSAIC RIVER FLOW IN MILLION GALLONS DAILY
and
RAINFALL IN INCHES AT PATERSON GREAT FALLS.

Date		Approximate Flow in M.G.D.	Rainfall in Inches
August	15, 1948	330	
	16	240	
	17	168	
	18	138	
	19	120	
	20	114	
	21	360	0.39
	22	660	
	23	900	0.94
	24	960	
	25	900	
	26	900	
	27	780	
	28	600	
	29	360	
	30	240	
	31	150	
September	1	114	
	2	96	
	3	96	
	4	102	
	5	102	
	6	96	
	7	84	
	8	102	
	9	66	
	10	72	0.10
	11	84	0.21
	12	96	
	13	78	
	14	66	
	15	72	
	16	60	
	17	60	
	18	60	
	19	72	0.05

TABLE II

ANALYTICAL DATA

Sample No. 1283
Date - August 20, 1948.
Location - Sewer manhole overflow at River and Montgomery Streets, Paterson.
Amount of Discharge - 6.0 million gallons daily.
Bacterial Analysis:
Coli aerogenes group present in 5 ten cc, 1 one cc portions.
Total bacteria per cc on agar at 37°C in 24 hours, 60,000.
Odor - Distinct oily-septic
Turbidity - 45
Color - 70 - pale amber
pH - 7.3
Remarks - Thin film of oil, bulky sludge.

Sample No. 1284
Date - August 20, 1948.
Location - River above sewer manhole overflow at River and Montgomery Streets, Paterson.
Amount of Discharge -
Bacterial Analysis:
Coli aerogenes group present in 5 ten cc, 1 one cc portions.
Total bacteria per cc on agar at 37°C in 24 hours, 8,900.
Odor - Faint moldy
Turbidity - 6
Color - 35 - very pale amber
pH - 7.5
Remarks - No oil, no sludge.

Sample No. 1285
Date - August 20, 1948.
Location - River below sewer manhole overflow at River and Montgomery Streets, Paterson.
Amount of Discharge -
Bacterial Analysis:
Coli aerogenes group present in 5 ten cc, 1 one cc portions.
Total bacteria per cc on agar at 37°C in 24 hours, 86,000.
Odor - Decided septic
Turbidity - 35
Color - 70 - pale amber
pH - 7.3
Remarks - Thin film of oil, some sludge.

Sample No. 1288
Date - August 20, 1948.
Location - Inter Chemical Corporation, Van Houten Street, Paterson.
Amount of Discharge - 4800 gallons per minute, or approximately 7.0 million gallons daily.
Odor - Distinct chemical-medicinal
Turbidity - 80
Color - 1600 - dark greenish brown
pH - 9.5
Remarks - Thin film of oil; little sludge.

Sample No. 1345
Date - September 2, 1948.
Location - Inter Chemical Corporation, Van Houten Street, Paterson.
Amount of Discharge -
Odor - Distinct medicinal
Turbidity - 70
Color - 800 - brownish red
pH - 11.5
Remarks - Thin film of oil, some fine sludge.

Sample No. 1287
Date - August 20, 1948.
Location - Public Service, Leon Street, Paterson
Amount of Discharge - 3.12 gallons per minute or approximately 4500 gallons per day.
Odor - Decided gasoline
Turbidity - 200
Color - 180 - muddy brown
pH - 7.8
Remarks - Film of oil; very little sludge.

Sample No. 1286
Date - August 20, 1948.
Location - East Main Avenue and North 6th Street, Hawthorne.
Amount of Discharge - 188 gallons per minute, or approximately 270,000 gallons per day.
Odor - Distinct oily-septic
Turbidity - 400
Color - 65 - milky grey
pH - 6.9
Remarks - Faint trace of oil; heavy fine sludge.

Sample No. 1315
Date - August 26, 1948.
Location - Heyden Chemical Company, Garfield.
Amount of Discharge - 51 gallons per minute, or 72,000 gallons per day.
Odor - Decided Chemical
Turbidity - 10
Color - 25 - pale amber
pH - 8.8
Remarks - No oil; little fine sludge.

Sample No. 1313
Date - August 26, 1948.
Location - J. L. Prescott Company, 8th Street, Passaic.
Amount of Discharge - 12.5 gallons per minute, or 18,000 gallons per day.
Odor - Decided disagreeable-moldy
Turbidity - 200
Color - 300 - dark green brown
pH - 5.7
Remarks - Thin film of oil; some fine sludge.

Sample No. 1314
Date - August 26, 1948.
Location - Paterson Paper Parchment Company, 8th Street, Passaic.
Amount of Discharge - Liquid bubbling out of ground.
Odor - Decided disagreeable
Turbidity - 50
Color - 35 - milky grey
pH - 7.0
Remarks - No oil; little fine sludge.

Sample No. 1324
Date - August 30, 1948.
Location - U. S. Rubber Company, Passaic Street, Passaic.
Amount of Discharge - 10 gallons per minute, or 15,000 gallons per day.
Odor - Very strong disagreeable-rubber
Turbidity - 35
Color - 40 - milky grey
pH - 7.5
Remarks - No oil; little bulky sludge.

Sample No. 1316
Date - August 26, 1948.
Location - Weasle Brook, Jefferson Street, Passaic, between Pantasote Company and Okonite Company.
Amount of Discharge - approximately 8 cubic feet per second. or 5 million gallons daily.
Odor - Decided disagreeable-oily
Turbidity - 15
Color - 40 - brownish yellow
pH - 7.0
Remarks - Lumps of dark brown grease throughout.

Sample No. 1317
Date - August 26, 1948.
Location - Okonite Company, Passaic
Amount of Discharge - Trickle
Odor - Distinct laundry soap
Turbidity - 10
Color - 30 - very pale amber
pH - 7.4
Remarks - No oil; some white precipitate.

Sample No. 1323
Date - August 30, 1948.
Location - United Wool Piece Dye Works, Canal Street, Passaic.
Amount of Discharge - Broken pipe - heavy spray
Odor - Decided disagreeable oily
Turbidity - 400
Color - 400 - muddy pinkish orange.
pH - 3.4
Remarks - Faint trace of oil; heavy fine sludge.

Sample No. 1342 and 1343
Date - September 1, 1948.
Location - United Wool Piece Dye Works
Amount of Discharge - 2 gallons per minute.
Odor - Very faint chemical
Turbidity - 50
Color - 1200 - grape wine
pH - 6.0
Remarks - Very faint trace of oil; some sludge.

Sample No. 1311
Date - August 26, 1948.
Location - Stamdard Bleachery and Royce Chemical Company, Carlton Hill, Rutherford, New Jersey.
Amount of Discharge - 772 gallons per minute, approximately 1 million gallons daily.
Odor - Distinct chemical
Turbidity - 200
Color - 60 - muddy brown with silver flecks.
pH - 7.7
Remarks - Heavy fine sludge.

Sample No. 1312
Date - August 26, 1948.
Location - Standard Bleachery and Royce Chemical Company, Carlton Hill, Rutherford, New Jersey.
Amount of Discharge - Collected from Brook - no flow recorded.
Odor - Faint earthy
Turbidity - 500
Color - 400 - dark brown
pH - 7.9
Remarks - Faint trace of oil; very heavy fine sludge.

Sample No. 1318
Date - August 27, 1948.
Location - Flexicote Company, Delawanna, River Road.
Description - White latex-like material.

Sample No. 1319
Date - August 27, 1948.
Location - Flexicote Company, Delawanna, River Road.
Description - Yellow greasey material.

Sample No. 1320
Date - August 27, 1948.
Location - Flexicote Company, Delawanna, River Road.
Description - White pasty material.

Sample No. 1321
Date - August 27, 1948.
Location - New Jersey Metal izing Company, River Road, Delawanna.
Description - White powdery material (chalk-like) in lumps picked up here.

Sample No. 1322
Date - August 27, 1948.
Location - Rutherford Boat Club
Description - Wax-like waste found in River here.

Sample No. 1289
Date - August 20, 1948.
Location - Lackawanna Railroad in Lyndhurst.
Amount of Discharge - 1888 gallons per minute.
Odor - Distinct oily
Turbidity - 35
Color - 60 - pale green yellow
pH - 7.2
Remarks - Thin film of oil; some bulky sludge.

Sample No. 1310
Date - August 25, 1948.
Location - Belleville, New Jersey about 1000' North of Federal Leather Company.
Amount of Discharge - 675 gallons per minute.
Odor - Faint oily
Turbidity - 40
Color - 50 - pale green with brilliant green paint.
pH - 4.8
Remarks - Bright green, oily, paint-like material--not moss.

Sample No. 1348
Date - September 4, 1948.
Location - Federal Leather Company, Belleville, New Jersey.
Amount of Discharge - 120 gallons per minute.
Odor - not done
Turbidity - 35
Color - 500 - amber
pH - 10.3
Remarks - No oil; on sludge.

Sample No. 1309
Date - August 25, 1948.
Location - Walter Kidde Company, Belleville.
Amount of Discharge - 1350 gallons per minute.
Odor - 0
Turbidity - 25
Color - 45 - pale amber
pH - 6.5
Remarks - No oil; very little sludge.

Sample No. 1305
Date - August 25, 1948.
Location - New York Color and Chemical Company, Main Street, Belleville.
Description - Material found in barrels along the river bank - hunks of dye stuff gentian violet in color.

Sample No. 1304
Date - August 25, 1948.
Location - New York Color and Chemical Company, Main Street, Belleville.
Amount of Discharge - Collected from puddle.
Odor - Faint oily
Turbidity - 40
Color - 120 - lime green
pH - 7.5
Remarks - Red paint on inside of bottle; some sludge.

Sample No. 1347
Date - September 2, 1948.
Location - New York Color and Chemical Company, Main Street, Belleville.
Amount of Discharge -
Odor - Distinct oily
Turbidity - 30
Color - 50 - pale yellow, milky
pH - 7.6
Remarks - Green oily sludge - paint-like.

Sample No. 1385
Date - September 15, 1948.
Location - Woburn Chemical Company, Harrison Avenue, Kearny, weir box coming out of lagoon #2.
Amount of Discharge - 500 gallons per minute.
Odor - Very strong Hydrogen Sulfide.
Turbidity - 100
Color - 100 - mud black
pH - 7.5
Remarks - No noticeable oil; some fine sludge. This sample contained many larvae-like "bugs."

Sample No. 1386
Date - September 15, 1948.
Location - Woburn Chemical Company, Frank's Creek, above weir box - creek is dammed up by driftwood, etc.
Amount of Discharge -
Odor - Distinct moldy
Turbidity - 8
Color - 30 - pale amber
pH - 7.6
Remarks - No oil; no sludge.

Sample No. 1387
Date - September 15, 1948.
Location - Woburn Chemical Company, Franks Creek at Harrison Avenue, 1/4 mile from weir box.
Amount of Discharge -
Odor - Distinct Hydrogen Sulfide
Turbidity - 500
Color - 400 - mud black
pH - 7.7
Remarks - Contained some oil and grease and heavy fine sludge.

Sample No. 1403
Date - September 24, 1948.
Location - Federal Textile Processing Company, 5th Avenue, Paterson.
Amount of Discharge - Trickle.
Odor - Distinct oily-musty
Turbidity - 100
Color - 300 - pinkish brown
pH - 6.8
Remarks - Thin film of oil; some sludge.

COMMENTS ON ANALYTICAL DATA

Refer to Data for Corresponding Sample Number on Analytical Data Sheets.

Sample No. 1283.

This sample was collected from a main line overflowing directly to the river. No investigation was made to determine whether the overflowing sewer was running above capacity or blocked up. The river bed in the area of discharge indicated that the sewer had been overflowing for some time. This was a decided source of pollution as samples numbers 1284 and 1285 confirm. A rough measurement indicated that the rate of flow of sewage was 6 million gallons daily. The river flow on this day was approximately 114 million gallons daily which did not afford much dilution. The general appearance of the river was definitely effected below this point.

Sample No. 1284.

See under Sample No. 1283.

Sample No. 1285.

See under Sample No. 1283.

Sample No. 1288.

This analysis would indicate that an alkaline dye bath was being discharged to the river. The discharge was highly colored and turbid and contained considerable settleable solids and a thin film of oil. The volume of discharge was measured at an approximate rate of 7.0 million gallons daily. This discharge was also a relatively large percentage of the river flow on that day. Spillage in the yard of this plant may cause pollution during rainy weather.

Sample No. 1345.

This was a repeat sample taken at the same location as sample number 1288. This analysis indicates that at the time of this sampling, the color of the discharge had changed from a dark greenish brown on August 20 to a brownish red on this date. The turbidities on both days were approximately the same, but the color on this day was only one-half as great as on August 20. The waste, however, was considerably more alkaline on this date. On both days there was a thin film of oil present and on each day there was a slight amount of sediment. This type of pollution is a flagrant violation and is capable of seriously effecting the quality of the river water, especially during periods of low river flow. This plant has 4-4-inch discharge pipes, two of which were discharging red dye liquors. The plants connection to the trunk sewer leaks in several places.

Sample No. 1287.

This sample was collected from a 14-inch outlet and was discharging at a rate of approximately 4500 gallons per day. The volume was small, but the presence of oil in the sample and an oil slick on the river below the point of confluence was objectionable.

Sample No. 1286.

This sample was very turbid and of milky appearance. It was being discharged to the river through a surface drain. It was not possible to readily determine the source of the violation. It would be advisable to recheck this area to determine the source of pollution. In addition to the high turbidity, the sample contained a large amount of heavy, fine, settleable solids. The rate of discharge was approximately 270,000 gallons daily. The general appearance of the area would indicate that this violation has been active for some time.

Sample No. 1315.

This sample was relatively low in color and turbidity, and contained only a small amount of fine solids and no oil. The odor of the sample was decidedly chemical. An alkaline deposit on the rocks along the river bed in this area indicates past violations.

Sample No. 1313.

This sample was collected from a 24-inch outlet which was discharging at a rate of 18,000 gallons daily. It was highly turbid and had a greenish brown color. It contained some oil and finely divided solids. An inspection of the area disclosed evidence of past and probably more serious violations.

Sample No. 1314.

This sample was milky grey in appearance, but contained only a slight amount of fine solids.

Sample No. 1324.

This sample had a greyish milky appearance. The rate of this discharge was 15,000 gallons daily. The river was discolored for a distance of about 35 feet above and 100 yards below this point by this discharge.

Sample No. 1316.

This is a sample from Weasel Brook taken at a point between the Pantasote Company and the Okonite Company plants. The rate of flow of the brook was approximately 8 cubic feet per second, or 5 million gallons daily. The odor of the sample was decidedly disagreeable and oily. The sample contained grease and oil. It is felt that this brook is the most serious contributor of oil into the river.

Sample No. 1317.

This sample was collected from a 4-inch cast iron pipe which was dripping at a very low rate a waste of little turbidity and color, but possessed a distinct laundry soap odor.

Sample No. 1323.

This sample was highly turbid and contained a heavy fine sediment. The color was high and was pinkish orange in character. The pH of this waste was very low, indicating acidity. A slight trace of oil was noted. This waste would be objectionable from a number of counts:

1. Heavy fine sediment.
2. Highly colored, and
3. Acid.

Samples Nos. 1342 and 1343. Identical samples.

These samples were repeat samples taken from the same location as sample number 1323, but two days later. The results of analyses of these samples show that the waste on this day was much lower in turbidity, but was higher in color and had changed to a grape wine color. The pH of the waste had also changed and was only slightly below neutral on the acid side. Plant sewer line connecting to the Trunk Sewer has several leaks. Yard housekeeping is poor.

Sample No. 1311.

This sample was collected from a 70-inch storm sewer between the Standard Bleachery and Royce Chemical Company plants at Carlton Hill. The rate of flow was approximately one million gallons daily. The waste was slightly alkaline, low in color, but highly turbid with silver flecks. A heavy fine precipitate was noted. This storm sewer outlet is to the rear of the Erie Railroad station and about 500 yards from the Passaic River.

Sample No. 1312.

This sample was collected from the brook about 25 feet below the pipe from which sample number 1311 was collected. The brook at this point was dark brown in color, and highly turbid. The sample had a heavy fine precipitate and a faint trace of oil.

Sample No. 1305.

This sample was collected from barrels along the shore at the New York Color and Chemical Company, River Road, Belleville, New Jersey.

Samples Nos. 1318, 1319, 1320, and 1322.

These are samples of industrial waste, some of which had been washed into the river probably from the Flexicote Company plant at River Road, Delawanna, New Jersey.

Sample No. 1321.

This sample is an industrial waste which has been dumped onto the ground at the New Jersey Metallizing Company, River Road, Delawanna, New Jersey.

Sample No. 1289.

This sample was collected from a 70-inch storm sewer which was flowing at a rate of nearly 3 million gallons daily. The sample was pale greenish yellow in color and contained a bulky sludge. There was a slight film of oil and a distinct oily odor. It was apparent that at times a very heavy discharge of oil was coming through this pipe.

Sample No. 1310.

This sample was collected from a brook about 1000 feet north of the Federal Leather Company in Belleville, New Jersey. The brook then discharges into the river. Flow in the brook amounted to nearly 1 million gallons daily. The effluent had a faint oily odor and a pale green color. The sample, which was low in pH, contained globs of brilliant green paint. Piling along the river was marked a bright green by this waste. The markings resembled moss from a distance, but on closer examination proved to be the same material as found in the sample.

Sample No. 1348.

This highly alkaline waste was discoloring an area approximately 50 feet square around the pipe outlet.

Sample No. 1309.

This sample showed no evidence of contaminants. The flow was approximately 2 million gallons daily. There was evidence of an oily coating on this discharge pipe indicating oil discharge at some time in the past.

Sample No. 1305.

This material was found in steel drums which apparently had been discarded along the river bank by the New York Color and Chemical Company. The material was wasted dyestuff of a gentian violet color. There was no flowing discharge to the river at this time.

Samples Nos. 1304 and 1347.

These samples both contained a green to yellow color. Apparently only occasional spillage finds its way into the river from this plant.

Sample No. 1385.

This sample was collected from the weir box at the Woburn Chemical Company plant and had a very strong hydrogen sulfide odor which is indicative of decomposition of putrescible organic matter.

Sample No. 1386.

Sample shows that Frank's Creek above the Woburn Chemical Company plant did not have a hydrogen sulfide odor and was relatively clear.

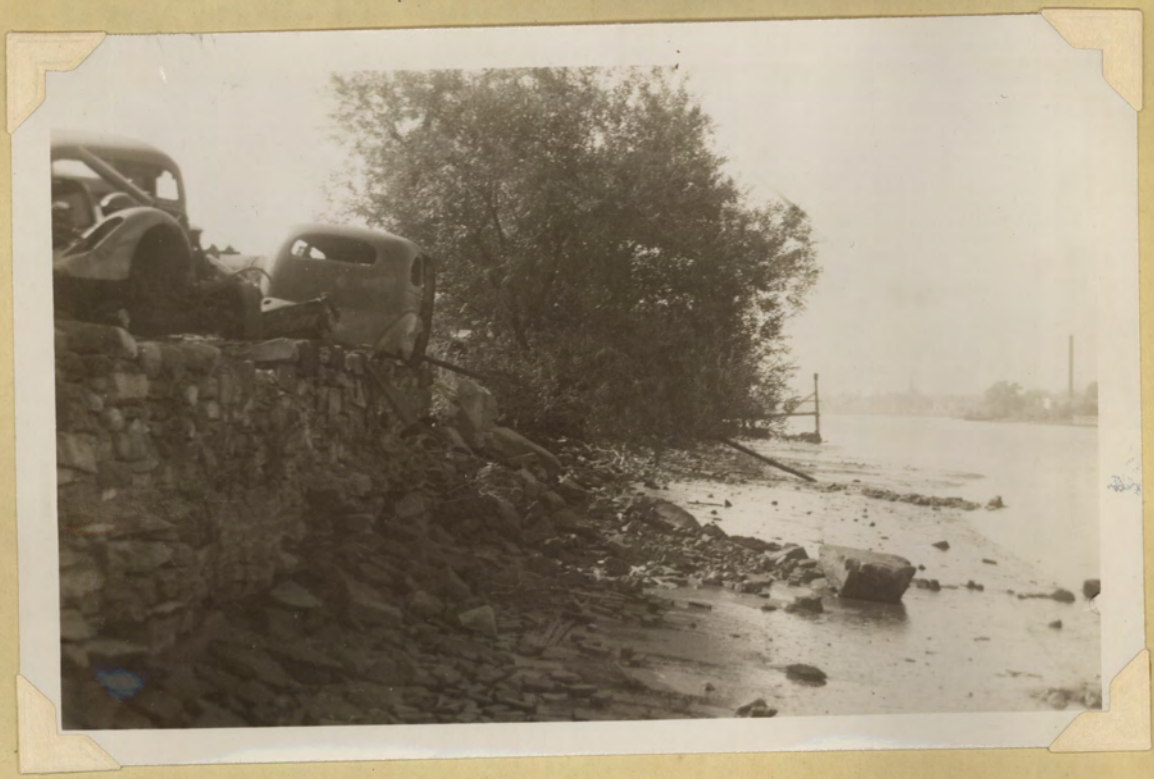
Sample No. 1387.

This sample collected from Frank's Creek about 1/4 mile below the Woburn Chemical Company plant had a very high color and turbidity and a distinct hydrogen sulfide odor.

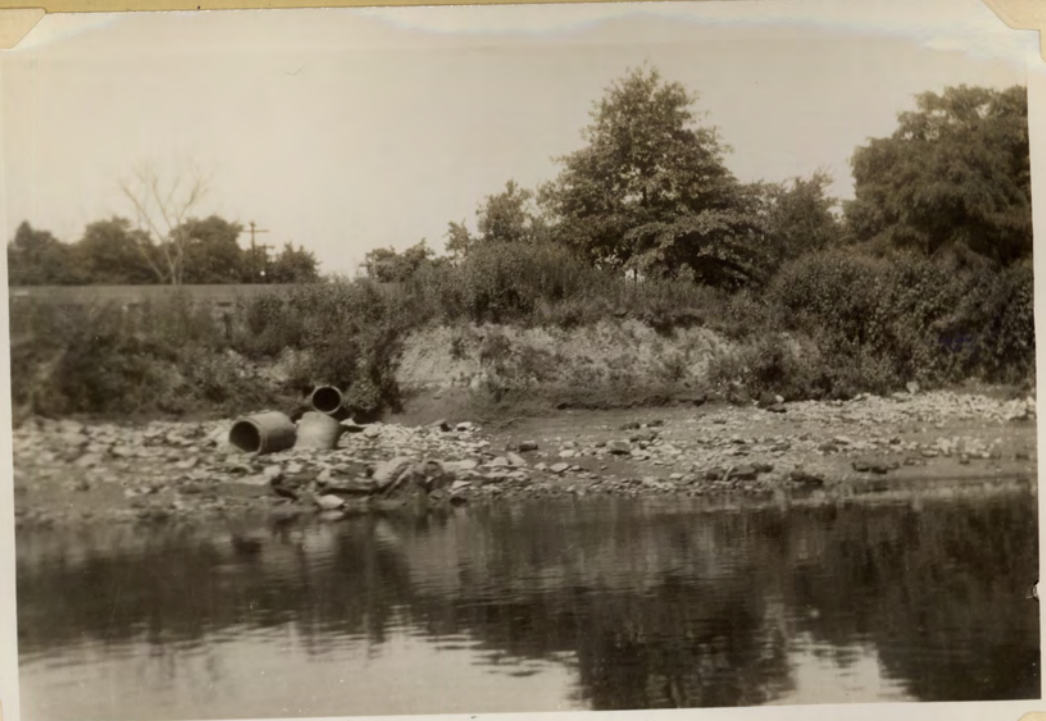
Sample No. 1403.

This sample was collected from an 8-inch cast iron pipe. Although the color was high, at the time of sampling there was no visual effect on the river.

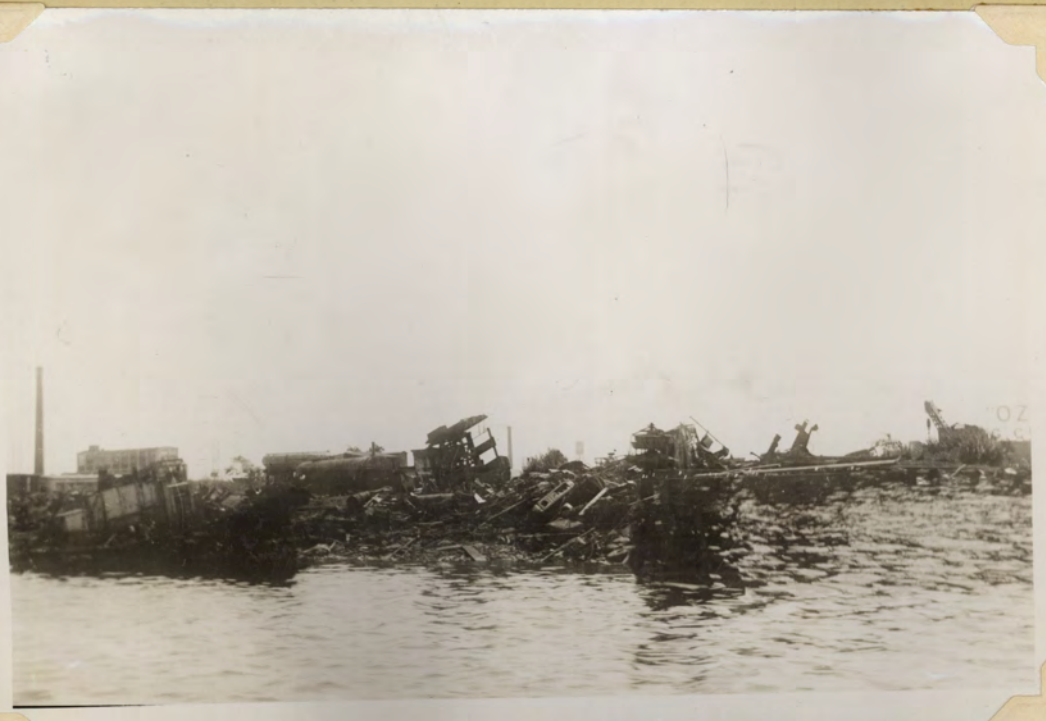
EROSION



Undermined Retaining Wall North Arlington Junk Yard
River Road, North Arlington, New Jersey
August 29, 1948

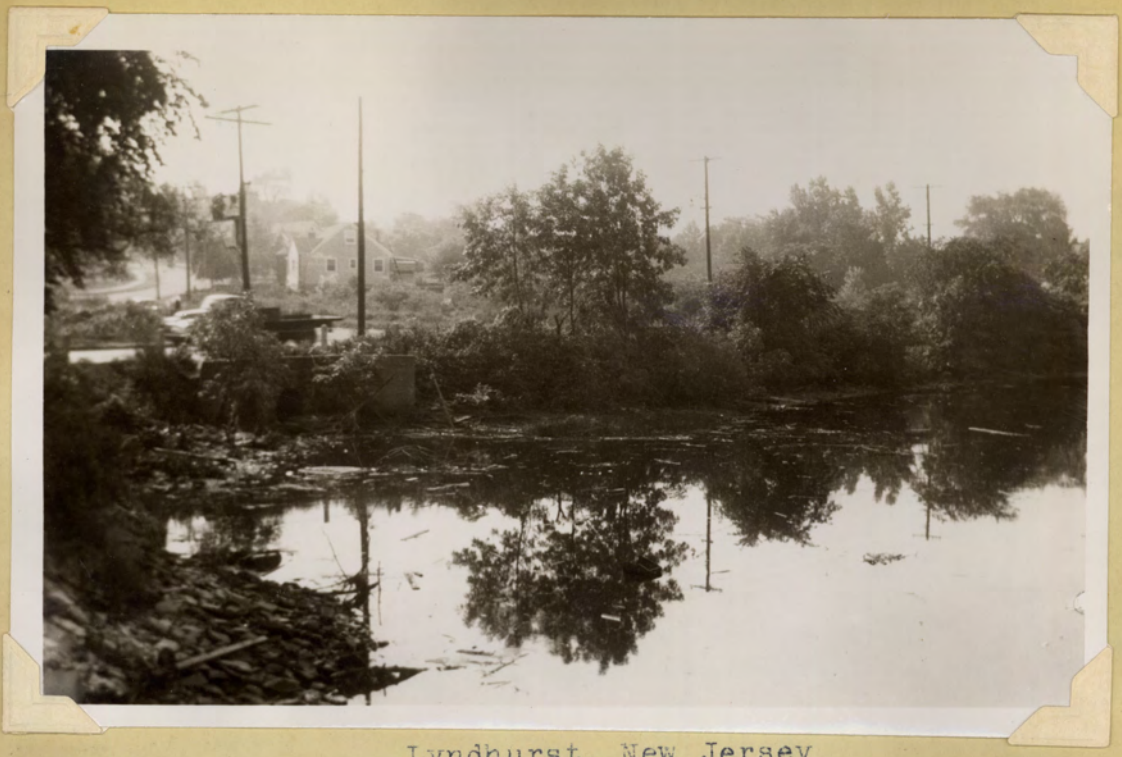


Storm Sewer Outlet Washing Away At Passaic City Dock
Passaic, New Jersey August 29, 1948



Old Buses Burned and Junked Along River
Newark, New Jersey August 29, 1948

FLOATING DEBRIS



Lyndhurst, New Jersey
August 29, 1948

Lyndhurst, New Jersey
August 29, 1948

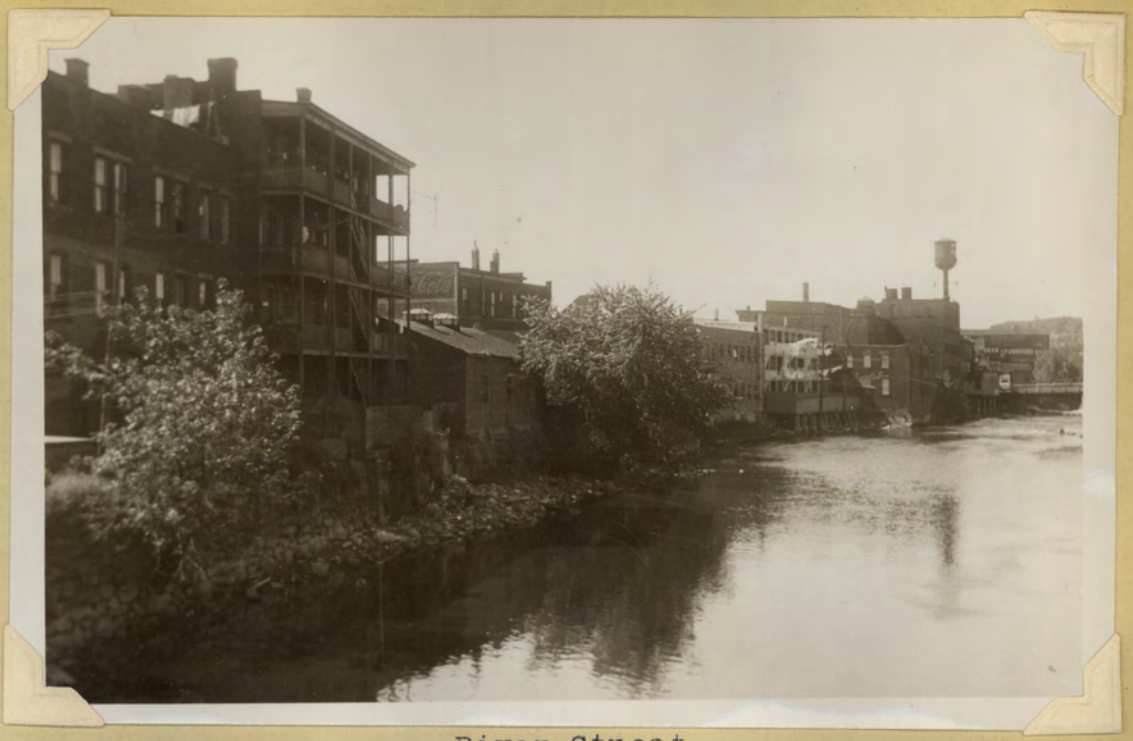
FLOATING DEBRIS

Nutley, New Jersey
August 29, 1948

Wallington, New Jersey
August 29, 1948

DUMPS

Dump in Rear of Ajax Floor Products Company
Passaic, New Jersey
August 30, 1948



River Street
Paterson
August 30, 1948

River Street
Paterson
August 30, 1948

August 29, 1948

Brook Avenue Passaic, New Jersey

BOATING HAZARDS

Sunken Barge

Lyndhurst, New Jersey August 29, 1948

Sunken Barge
To the Rear of Flexicote Company Delawanna, New Jersey
August 29, 1948

Sunken Barge
Newark, New Jersey August 29, 1948

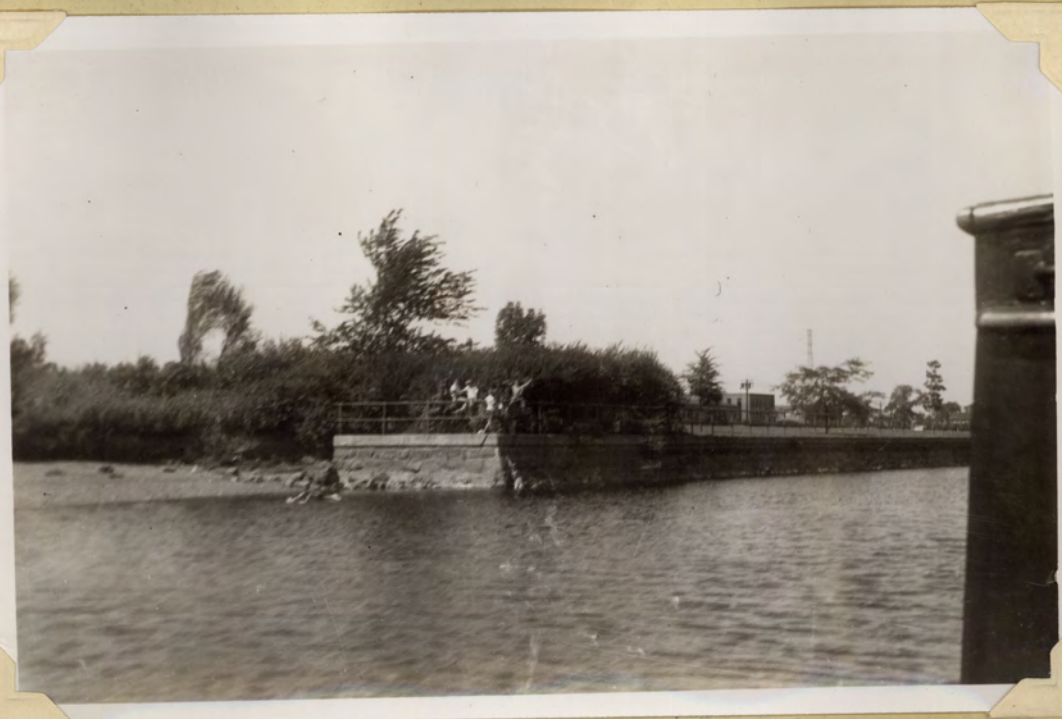
Arlington, New Jersey
August 29, 1948

Lyndhurst, New Jersey
August 29, 1948

SWIMMING

Rutherford, New Jersey
August 29, 1948

PARK



Belleville, New Jersey
August 29, 1948

Rutherford, New Jersey
August 29, 1948

Small Craft and Oil Storage Barge
Rutherford, New Jersey
August 29, 1948

United Wool Piece Dye Works
Canal Street, Passaic, New Jersey August 29, 1948

Woburn Chemical Company
Frank's Creek at Harrison Avenue Bridge, Kearny, New Jersey
September 14, 1948

RECOMMENDATIONS

1. A brief but comprehensive report of all industries along the River and its tributaries emptying into the River between Great Falls and the mouth of Newark Bay should be maintained. This report should contain basic facts as to the type of industry, the materials manufactured and the materials used in manufacturing, the amount of sewage or waste contributed to municipal sewage systems or the Trunk Sewer and the amount of water consumed by each industry. These records can be obtained particularly when the industry in question is purchasing water from a municipality. These reports should be kept up to date. A record of any waste treatment by industry when such exists should be noted as well as the efficiency of such treatment.

2. A record of all sewage treatment plants contributing effluents to the area should be maintained. These records should include the type of treatment, volume of sewage, character of sewage, the kind and number of units making up the plant and the adequacy of the plant.

3. The maximum capacity of the Passaic Valley Trunk Sewer Commission's Plant should be determined as well as the Trunk lines. If these are found to be adequate for normal maximum flows but inadequate for abnormal peak flows which can be definitely attributed to infiltration, then steps should be taken to minimize infiltration in those systems where it occurs. The present penalty of charging for excess flows may not be sufficient to make necessary a tightening up of the system. Infiltration, if not reduced, can easily lead to larger treatment plant units as well as larger trunk lines.

4. Old hulks of barges, etc., which have been left along the River to waste away, should be removed. This may require the assistance of the Federal Navigation Authorities. Future storage of this kind should be prohibited.

5. Individual or small dumping grounds where refuse, industrial waste, garbage and the like are deposited along the River should be reported and prohibited. This will require the cooperation of Municipal Governments and Local Boards of Health.

6. Storm sewer outfalls should be inspected and when found to be improperly anchored should be reported to the proper municipal authorities for correction.

7. Establishment of parks, particularly along the less industrially developed eastern shore line, should be encouraged. The Belleville Park is a good example of shore line beautification. Shore line parks may at this time appear to be unnecessary and a wasteful extravagance of

Municipal funds, but proper planning at this time is necessary or such vacant properties will fall into disuse.

8. Definite Rules and Regulations and Standards should be established to regulate the kind of discharge an industry may contribute to the River and To the Trunk Sewer.

Active and sincere cooperation on the part of health agencies, industry and municipalities will provide the impetus necessary to restore the River to its former position of one of this area's most valuable natural assets.

The late Mr. Justice Oliver Wendell Holmes, in handing down the opinion of the United States Supreme Court on the Delaware River Case, established a guide when he stated, "A river is more than an amenity, it is a treasure. It offers a necessity of life that must be rationed among those who have power over it."

Respectfully submitted,

L. T. Purcell

Lee T. Purcell