INTERSTATE SANITATION COMMISSION

1971

NEW YORK NEW JERSEY CONNECTICUT

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R E P O R T

of the

INTERSTATE SANITATION COMMISSION

on the
Water Pollution Control Activities
and the
Interstate Air Pollution Program

INTERSTATE SANITATION COMMISSION

10 COLUMBUS CIRCLE • NEW YORK, N. Y. 10019

AREA CODE 212-582-0380

January 24, 1972

To His Excellency, William T. Cahill
His Excellency, Thomas J. Meskill
His Excellency, Nelson A. Rockefeller
and the Legislatures of the States of New Jersey, Connecticut, and New York

Sirs:

The Interstate Sanitation Commission respectfully submits its report for the year 1971.

The members of the Commission are confident that with the continued support of the Governors and the members of the Legislatures, the Commission will maintain active and effective water and air pollution abatement programs.

Respectfully submitted,

Natale Colosi

For the State of New York — Chairman

John B. Dioguardi

For the State of Connecticut — Vice Chairman

Louis J. Fontenelli

For the State of New Jersey — Vice Chairman

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C O N T E N T S

I L L U S T R A T I O N S

I. SUMMARY OF ACTIVITIES

SUMMARY OF ACTIVITIES

This year marked the thirty-fifth anniversary of the Interstate Sanitation Commission. The Tri-State Compact between the States of New York, New Jersey, and Connecticut, under which the Commission is organized, provides for the abatement of existing water pollution and the control of future water pollution in the tidal waters of the Metropolitan New York Area. In 1962, air pollution was added to the scope of the Commission's activities, and in 1970 the Commission was designated as the official Planning and Coordinating Agency for the New Jersey-New York-Connecticut Air Quality Control Region.

WATER POLLUTION

The Commission's Program Plan for Water Pollution Abatement is designed to provide assistance in an effective coordinated approach to regional problems. This effort has been concentrated on the problems which should receive top priority in this highly urbanized and industrialized area: enforcement by all levels of government, minimizing the effects of combined sewers, pretreatment of industrial wastes, removal of debris from the waters and shoreline, removal of oil from the waters, prevention of thermal pollution, and resistance to alternatives that only transfer the problem.

A great deal of planning and construction were initiated which provide for the abatement of pollution from municipal and industrial wastewaters discharging into District waters. It is estimated that more than $2.94 billion will be spent by municipalities in the District in the next several years for this purpose.

On April 15th of this year, following formal notice and public hearings, the Commission adopted new and improved water quality standards. The Commission's requirements now include upgraded standards for the amount of oxygen which must be present in the water, allowable solids, and a more rigid bacterial standard.

During this past summer, the Commission conducted an extensive survey of the Lower Hudson River south of the Bear Mountain Bridge, and in conjunction with the New Jersey State Department of Environmental Protection, conducted an in-depth survey of the Raritan Bay and Sandy Hook Bay. Each of these surveys were conducted over a several week period with samples taken three times a day to insure that representative sampling took place on which to base findings.

Besides the parameters of temperature, chlorides, dissolved oxygen, and fecal coliform density which are usually measured on surveys, the report contains data on pH, turbidity, nutrients (including ortho-phosphate phosphorus; nitrate, nitrite, and ammonia nitrogen), total organic carbon, algae as measured by chlorophyll A, and heavy metals including chromium, copper, nickel, zinc, cadmium, mercury, and lead. The Raritan Bay-Sandy Hook Bay survey reveals that the dissolved oxygen content of the waters in the western portion of Raritan Bay are not up to standards, and the Hudson River Survey report indicates that dissolved oxygen requirements in the Hudson River approximately south of Dobbs Ferry are not being met. The dissolved oxygen in these water bodies will not become satisfactory until expansion and upgrading of the treatment plants discharging into them are completed.

One of the major problems in the Interstate Sanitation District is caused by overflows from combined sewers. This Report contains a summary of the Commission's combined sewer overflow program to minimize the effect of this pollution.

The Commission also is continuing its training program for treatment plant operators, to enable treatment plants to be operated at their maximum efficiency consistent with their design.

AIR POLLUTION

During the past year, the Commission continued to coordinate the Regional Air Pollution Warning System in the New Jersey-New York-Connecticut Air Quality Control Region. As a result of a workshop sponsored by the Commission and attended by government officials, the criteria for the Air Pollution

Warning System were tightened up and a table showing the new criteria is included in this Report. The Commission has installed two additional wind speed and wind direction recording instruments, one at Port Richmond and one in Port Chester, for more efficient location of the source of an odor when reported to the Commission by citizens in the District.

II. W A T E R P O L L U T I O N

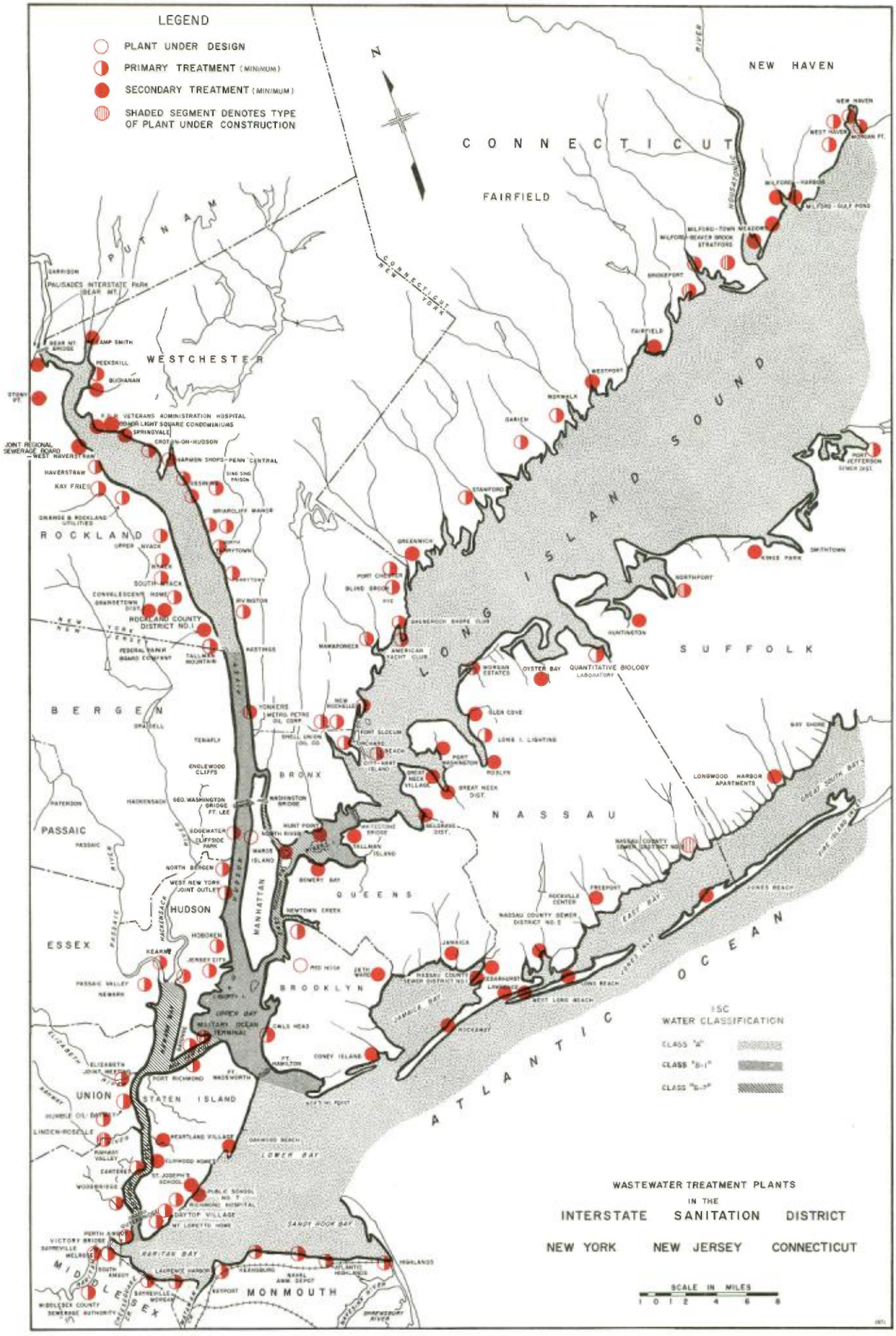
New York,
New Jersey & Connecticut

GENERAL

During 1971, 106 water pollution control projects in the Interstate Sanitation District were completed, were under construction, or were in the planning stage. A total of $2.94 billion was allocated for this work in accordance with the following breakdown: $14 million for 12 completed projects; $276 million for 17 projects under construction; and $2.65 billion for 77 future projects. These expenditures are being used to construct new facilities and to upgrade existing facilities and will result in improved quality of the effluents being discharged into District waters. The above statistics do not include large sums of money being expended by industries for in-plant changes and treatment units.

The Commission obtained the information on water pollution control projects presented in the following section from responsible officials in the respective state or local governmental agencies, sewerage authorities or consulting engineering firms.

The map of the Interstate Sanitation District on the following page shows the locations of waste treatment plants discharging into District waters, the degree of treatment at each plant, and the Interstate Sanitation Commission's water classifications. Additional information on each plant is listed in the Appendix.


LEGEND
PLANT UNDER DESIGN
PRIMARY TREATMENT (MINIMUM)
SECONDARY TREATMENT (MINIMUM)
SHADED SEGMENT DENOTES TYPE OF PLANT UNDER CONSTRUCTION
N
CONNECTICUT
NEW HAVEN
FAIRFIELD
PUTNAM
WESTCHESTER
ROCKLAND
BERGEN
PASSAIC
ESSEX
HUDSON
UNION
MIDDLESEX
MONMOUTH
BRONX
MANHATTAN
BROOKLYN
QUEENS
NASSAU
SUFFOLK
STATEN ISLAND
LONG ISLAND SOUND
ATLANTIC OCEAN
ISC
WATER CLASSIFICATION
CLASS "A"
CLASS "B-I"
CLASS "B-II"
WASTEWATER TREATMENT PLANTS
IN THE
INTERSTATE SANITATION DISTRICT
NEW YORK NEW JERSEY CONNECTICUT
SCALE IN MILES
0 1 0 1 2 4 6 8

WATER POLLUTION CONTROL PROJECTS

Atlantic Highlands-Highlands Regional Sewerage Authority, N.J. (Monmouth County)

Future Projects

A joint treatment plant is under design to be built in Atlantic Highlands to treat the sewage presently flowing to the existing Atlantic Highlands and Highlands Treatment Plants. The existing plants are to be converted into pump stations.

This new secondary treatment plant is to be of the activated sludge type with a minimum of 85 percent removal of biochemical oxygen demand and suspended solids. Sludge is to be disposed of by using a Dorr-Oliver F-S system. Target date for completion of the 2 million gallons per day plant is the end of 1972. Total cost of this project is estimated at $2,700,000.

The treated waste from this new plant will discharge to the ocean outfall being constructed by the Monmouth County Bayshore Outfall Authority.

Bayonne, N.J. (Hudson County)

Future Project

This plant will be incorporated into the newly created Hudson County Regional Sewerage Authority.

Plans call for the addition of a pump station with grit and screening facilities at a cost of approximately $4,000,000. The primary effluent from the present plant will be pumped to the new Jersey City, East Side, Plant facilities for secondary treatment.

Bayshore Regional Sewerage Authority Treatment Plant, N.J. (Monmouth County)

Future Projects

Final design plans have been completed and construction contract bids are to be received in late December (1971) for the construction of a 6 million gallons per day secondary treatment plant using accelerated activated sludge. The plant is designed for 95 percent biochemical oxygen demand removal and 90 percent suspended solids removal. New facilities will include a grit chamber, primary and secondary settling tanks, aeration tanks, chlorine equipment, and an incinerator for the sludge.

Total project cost is estimated at $12.1 million with construction scheduled to begin in early 1972 and completion of work in mid-1973. This plant's effluent will be served by the Monmouth County Bayshore Outfall Authority's ocean outfall.

The existing Keansburg Treatment Plant will be converted into a pump station and its flow sent to this new regional plant for treatment. Negotiations are under way for the present Keyport Treatment Plant to also be converted into a pump station and to send its flow to this new regional plant.

Belgrave Sewer District, N.Y. (Nassau County)

Future Projects

An engineering report is being prepared for upgrading this plant to tertiary treatment while doubling the capacity to 4.0 million gallons per day.

Phase I work is expected to begin in early 1972 and will cost approximately $750,000. This work involves doubling the capacity of the primary digestor and hydrogrit washer.

Phase II will upgrade to tertiary treatment by means of chemical precipitation and multi-media soil filter after a pilot plant study. Also, a pump station is to

be built for tidal control of flow. Anticipated target date is 3 to 4 years hence and costs are estimated at $3,000,000.

Blind Brook, Rye, N.Y. (Westchester County)

Future Projects

An engineering report is being prepared proposing an upgrading of the Blind Brook plant. The plans, to be approved by the State of New York, call for 85 percent reduction in biochemical oxygen demand and suspended solids and a design flow of 7 million gallons per day.

Construction is scheduled to begin in the summer of 1972 on the upgrading from primary to secondary treatment. Mechanical aerators will be used for activated sludge treatment. The present sludge incinerators will be abandoned and sludge will be pumped to the Port Chester plant for incineration.

Total cost for the upgrading is estimated at $6,100,000.

Bowery Bay, N.Y. (Queens County)

Completed Projects

Two improvement contracts have been awarded and construction completed on preliminary and final settling tanks.

Future Projects

Consultants have prepared a report to expand and upgrade the Bowery Bay Plant. Its capacity will increase to 150 million gallons per day (which is a 60 million gallons per day increase), and it will use the step aeration process designed to obtain minimum removals of 90 percent biochemical oxygen demand and suspended solids.

Cost of the entire project is estimated at $66,000,000.

The plant has received an offer from the Federal Environmental Protection Agency and New York State for a 60-percent reimbursement of eligible costs.

Bridgeport East Side Plant, Conn. (Fairfield County)

Project under Construction

Construction is now in progress for upgrading this treatment plant from primary to secondary treatment. Design of the new activated sludge facilities call for a 95 percent removal of biochemical oxygen demand and suspended solids. Design flow is 12 million gallons per day.

Total cost is estimated at $10,000,000.

Future Projects

Additional plans have been completed for the expansion of facilities to a design flow of 46 million gallons per day.

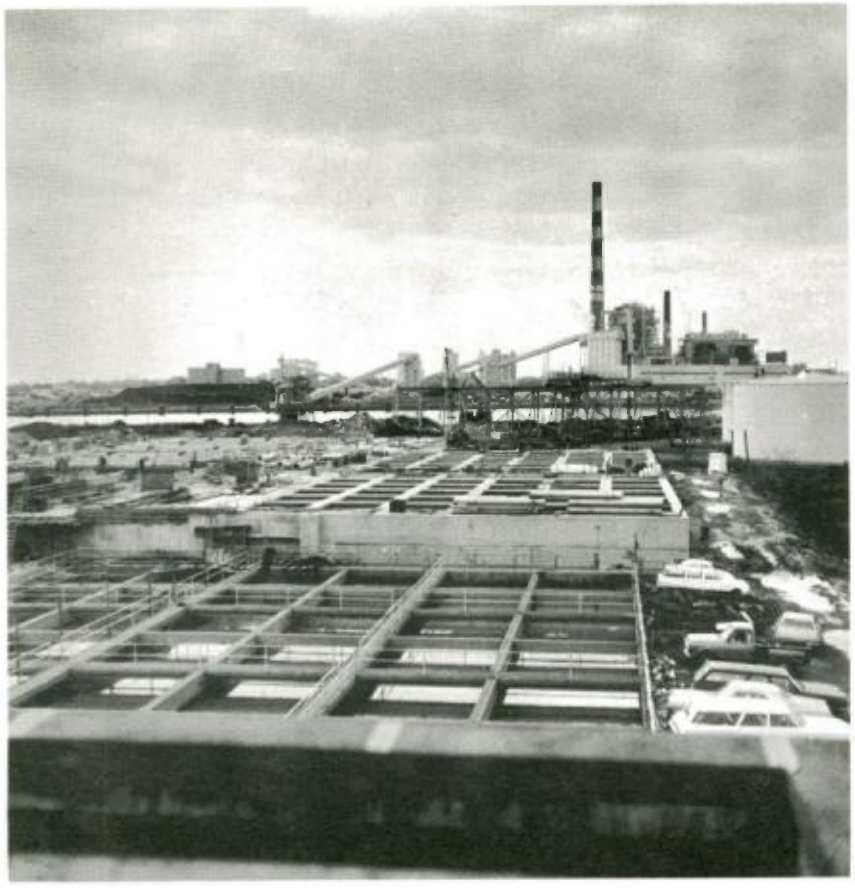
Two pump stations are also planned for the future.

Bridgeport West Side Plant, Conn. (Fairfield County)

Project under Construction

Construction has been 65 percent completed on the expansion and upgrading of the plant to activated sludge treatment. Design criteria call for 95 percent removal of biochemical oxygen demand and suspended solids. Capacity is for an average flow of 60 million gallons per day.

New screening equipment, settling and aeration tanks and sludge incineration facilities are to be built.



BRIDGEPORT, EAST SIDE PLANT - CONNECTICUT
Consulting Engineers: Teeter and Dobbins

BRIDGEPORT, WEST SIDE PLANT - CONNECTICUT
Consulting Engineers: Teeter and Dobbins

Two pump stations have been built this year and are now in operation.

Future Project

Plans are to expand the facilities to a capacity of 80 million gallons per day average flow at a future date.

Carteret, N.J. (Middlesex County)

Completed Projects

Storm and sanitary waste sewers were separated in the Chrome section of Carteret at a cost of $438,000. The sewers in the central and west Carteret sections of the Borough are also to be separated.

Future Project

Plans call for diverting the waste from the existing primary treatment plant to the expanded and upgraded Middlesex County Sewerage Authority Treatment Plant.

Coach Light Square Condominiums, Montrose, N.Y. (Westchester County)

Completed Project

An activated sludge package treatment plant has been placed in service with a design capacity of 60,000 gallons per day. The new plant has concentric aeration units and final settling tanks. It also chlorinates all year round using sodium hypochlorite.

Formerly, this sewerage system was called the Kings Park Sewerage Association.

Coney Island, N.Y. (Kings County)

Future Project

The Bureau of Water Pollution Control submitted an application for funding to New York State and the Federal Government and is presently awaiting approval.

The consultant's engineering report deals with the basis of design for converting this plant to step aeration with a 110 million gallons per day capacity.

Total cost of the plant upgrading and pumping station is estimated at $40,000,000.

Croton-on-Hudson, N.Y. (Westchester County)

Future Project

The 750,000 gallons per day Croton plant will be converted into a pump station upon construction of a new Westchester County Treatment Plant at Ossining.

Darien, Conn. (Fairfield County)

Future Project

Plans are under consideration to convert this primary plant into a pump station and tie-in to the future upgraded Stamford treatment plant.

Edgewater, N.J. (Bergen County)

Future Project

An engineering report has been prepared. This report is concerned with upgrading of the present facility to activated sludge treatment with 90 percent biochemical oxygen demand and total suspended solids reduction.

Plans are being made to start operation in January 1972 of a pilot plant operation at the existing primary treatment facilities. The pilot study will utilize the

"Bio-Disc" method of secondary treatment.

The feasibility of upgrading this plant to secondary treatment using this method of treatment will depend upon both economic considerations and the ability to achieve average removals of 90 percent biochemical oxygen demand and total suspended solids. Projected cost of plant upgrading is estimated at $3,000,000.

An alternative plan considers conversion into a pump station to discharge to the Bergen County Sewerage Authority at Little Ferry.

Elizabeth Joint Meeting, N.J. (Union County)

Future Project

Plans have been completed and have been approved by the State and Federal Governments to upgrade the plant to activated sludge treatment. The plant is designed for 75 million gallons per day and 90 percent biochemical oxygen demand removal and suspended solids reduction. Estimated cost for the project is $47,600,000.

An aeration tank, final settling tank, chlorine contact tank, and additional sludge storage will be built. Bids for construction are to be let in January 1972.

Estates of Great Neck Landing, Babylon, N.Y. (Suffolk County)

Future Project

Present plans call for the construction of a pump station and a tie-in to the County sewer system for this development of 230 homes on the South Shore.

Federal Paper Board Company, N.Y. (Rockland County)

Completed Projects

The treatment plant, which primarily handles the

effluent from this paper container manufacturer, was upgraded to secondary treatment with new treatment facilities and placed in service in 1970 at a construction cost of about $1,000,000.

This year, new equipment has been added to the plant facilities which introduces nutrients (phosphoric acid, ammonia, and electrolytes) into the treatment process. With this additional equipment now in full service, biochemical oxygen demand reduction is expected to be 90 percent. Cost of the additional equipment was approximately $16,000.

Freeport, N.Y. (Nassau County)

Projects in Progress

A 30,000 gallons per day pilot plant has been installed to study phosphate and nitrogen removal operations for utilization in plant expansion design.

Plans for upgrading and expansion await Federal approval after having been accepted by New York State. Present design calls for 95 percent biochemical oxygen demand and suspended solids reduction and 80 percent nitrogen removal.

Glen Cove, N.Y. (Nassau County)

Future Project

An engineering report is being prepared which suggests the expansion and upgrading of the Morris Avenue plant from secondary to tertiary treatment. The Morgan Island plant is to be discontinued and converted into a lift station pumping to the Morris Avenue plant. This work is to be done during the plant expansion.

At this time, a pilot plant is in operation to determine the best equipment for plant expansions.

Great Neck Sewer District, N.Y. (Nassau County)

Future Project

Plans for expansion of the Great Neck Sewer District plant to 8 million gallons per day await New York State and Federal approval before bids go out. The project cost is estimated at $4,450,000.

Units to be built are additional primary and secondary settling tanks, a sludge thickening tank, a sludge incineration system, and two additional trickling filters.

Great Neck Village, N.Y. (Nassau County)

Project in Progress

The Great Neck Village plant has upgraded its trickling filters at a cost of $65,000. The main pump station is being upgraded at an estimated cost of $16,000.

Haverstraw, N.Y. (Rockland County)

Future Project

Engineering plans have been completed to upgrade this 1.0 million gallons per day primary treatment plant.

Final plans call for the addition of the following new units: two high-rate trickling filters, two secondary settling basins, a chlorine contact tank, renovation of existing digestors, and the addition of a centrifuge. The completed plant should give an 85 percent biochemical oxygen demand removal and an 85 percent suspended solids reduction.

The total project cost is estimated at $1,200,000.

Hoboken, N.J. (Hudson County)

Future Project

This plant will be incorporated into the newly created Hudson County Regional Sewerage Authority.

Plans call for the addition of a pump station with grit and screening facilities at a cost of approximately $2,000,000.

The primary effluent from the present plant will be pumped to the new Jersey City, East Side, Plant facilities for secondary treatment.

Hudson County Regional Treatment Plant, N.J. (Hudson County)

Future Projects

A County Regional Sewerage Authority has been formed in Hudson County for the purpose of regionalizing the sewerage facilities on a county-wide basis.

Plans call for the concentration of all effluent discharges at one point in Upper New York Harbor, thereby eliminating all discharges to the Hackensack River, Newark Bay, and the Kill Van Kull. All secondary treatment would be concentrated at Jersey City, East Side, Plant. This plant will have a design flow of approximately 200 million gallons per day with 85-90 percent removal of biochemical oxygen demand and 85 percent removal of suspended solids. Sludge from the new secondary facilities will then be pumped to the Jersey City, West Side, Plant for incineration and disposal.

Total project cost including force mains, pump stations, and new facilities is estimated at $89,600,000.

Initial construction is scheduled to begin with the construction of sewer lines in North Bergen in the spring of 1972.

Huntington Sewer District, N.Y. (Suffolk County)

Completed Project

The Huntington Sewer District has completed rehabilitation of secondary settling tanks.

Hunts Point, N.Y. (Bronx County)

Future Projects

An engineering report and an application for aid for 60 percent of eligible costs have been approved by New York State and the Federal Government. Final specifications and plans are under review by the Water Quality Office of the U. S. Environmental Protection Agency.

This report deals with increasing the design flow to 200 million gallons per day, providing step aeration design for minimum removals of 90 percent of biochemical oxygen demand and suspended solids and improving existing facilities. Also included are new pumping stations for Orchard Beach, Hart and City Island flows. Present treatment plants on Orchard Beach and Hart Island are being abandoned.

Overall project cost is estimated at $48,000,000 with $40,000,000 of this allocated to construction work in the expanding and upgrading phase.

The first phase of this project, which includes work on the preliminary and final settling tanks, has been completed (July 1971).

The entire upgraded plant should be operational by the first quarter of 1975.

Irvington, N.Y. (Westchester County)

Future Project

This existing 1.0 million gallons per day treatment

plant is to have its flow diverted to Westchester County's Yonkers Joint Meeting Plant when expansion at Yonkers is completed.

Jamaica, N.Y. (Queens County)

Future Projects

Plans and specifications for upgrading the units in this plant to provide an overall biochemical oxygen demand design removal of at least 90 percent by the step aeration process for the present 100 million gallons per day flow are under review by New York State.

The first improvement contract for restoration of a digestion tank has been awarded and construction is under way.

Jersey City, East Side, Plant, N.J. (Hudson County)

Future Project

This plant will be incorporated into the newly created Hudson County Regional Sewerage Authority.

Plans call for upgrading this plant to secondary treatment with an 85-90 percent removal of biochemical oxygen demand and 85 percent removal of total suspended solids. Plant capacity will be increased to 200 million gallons per day. Sludge from the new plant is to be pumped to the Jersey City, West Side, Plant for incineration and disposal.

Jersey City, West Side, Plant, N.J. (Hudson County)

Future Project

This plant will be incorporated into the newly created Hudson County Regional Sewerage Authority.

Plans call for increasing the capacity of this primary plant to 76 million gallons per day at an

estimated cost of $10,000,000. The primary effluent from this plant will be pumped to the new Jersey City, East Side, Plant facilities for secondary treatment.

All sludge from the new sewerage authority will be pumped to this plant and disposed of through incineration.

Jewish Convalescent Home, N.Y. (Rockland County)

Future Project

Flow may be diverted from this plant to the Orangetown District Treatment Plant when the trunk line from the Nyacks is built.

Joint Regional Sewerage Board-Town of Haverstraw, West Haverstraw, N.Y. (Rockland County)

Completed Project

The new 4.0 million gallons per day modified activated sludge treatment plant was completed in the spring of 1971 at an approximate cost of $3,000,000. The districts served include the Village of West Haverstraw, the Town of Haverstraw, Letchworth Village, and the New York State Rehabilitation Hospital. Negotiations are also under way with Garnerville Holding Company.

Joint Outlet, West New York, N.J. (Hudson County)

Future Projects

This plant will be incorporated into the newly created Hudson County Regional Sewerage Authority.

Plans call for the addition of a pump station with grit and screening facilities at a cost of approximately $700,000. The primary effluent from the present plant will be pumped to the new Jersey City, East Side, Plant facilities for secondary treatment.

Jones Beach, N.Y. (Nassau County)

Project under Construction

The contractor is in the process of replacing the trickling filter distributor at the Jones Beach plant.

Keansburg, N.J. (Monmouth County)

Future Project

Plans call for converting this plant into a pump station and joining the regional treatment plant of the Bayshore Regional Sewerage Authority.

Kearny, N.J. (Hudson County)

Future Project

This plant will be incorporated into the newly created Hudson County Regional Sewerage Authority.

Plans call for the addition of a pump station at a cost of approximately $500,000. The primary effluent from the present plant will then be pumped to the new Jersey City, East Side, Plant facilities for secondary treatment.

Keyport, N.J. (Monmouth County)

Future Project

Plans call for converting this plant into a pump station and pumping to the regional treatment plant of the Bayshore Regional Sewerage Authority.

Kings Park State Hospital, N.Y. (Suffolk County)

Future Project

Engineering plans are being completed for the construction of a 20,000 gallon holding tank for septic

waste which will be trucked to the tank. A grit removal system and a new vacuum filter will also be installed. These facilities will be built on State property by the Town of Smithtown.

Waste from this holding tank will then be treated at the existing secondary treatment plant at a uniform rate to insure optimum waste treatment efficiency.

Total project cost is expected to be approximately $350,000.

Work is scheduled to begin in early 1972 and be completed by late 1972.

Letchworth Village, N.Y. (Rockland County)

Completed Project

This primary plant has been converted into a pump station and is diverting its flow to the new Joint Regional Sewerage Board Treatment Plant at West Haverstraw.

Linden-Roselle, N.J. (Union County)

Future Project

Final plans have been completed and approved by the State for the expansion and upgrading of this existing primary plant. The plant will be expanded to a design capacity flow of 18.5 million gallons per day with secondary treatment using activated sludge preceded by a roughing filter. Design calls for 90 percent removal of biochemical oxygen demand and settleable solids. A revision of the original method of sludge disposal which was barging to sea is presently under consideration. When this has been determined, the application for Federal funding will be resubmitted.

Litigation is presently in progress to acquire four additional acres to the plant property to provide

space for this expansion.

Long Beach, N.Y. (Nassau County)

Future Project

An engineering report was completed recommending doubling the present plant capacity to 13 million gallons per day. The cost of this expansion of the trickling filter treatment is estimated at $2,571,000.

Units to be added are as follows: main sewage pumps, grit chamber, 2 primary settling tanks, 2 trickling filters, 2 secondary settling tanks, recirculation pumps and piping, sludge pump, sludge storage tank, and skimmers and weirs for existing settling tanks.

Madison Township Sewerage Authority - Laurence Harbor, N.J. (Middlesex County)

Completed Projects

A pump station plus laterals in the Leone Park section of Madison Township has been completed at a cost of $600,000.

Future Project

Plans call for converting this plant into a pump station and pumping to the Middlesex County Sewerage Authority.

Middlesex County Sewerage Authority, N.J. (Middlesex County)

Future Projects

Plans call for increasing the plant's capacity to 120 million gallons per day and for providing secondary treatment using a pure-oxygen activated sludge process. A 90 percent biochemical oxygen demand reduction and an 85 percent suspended solids removal are anticipated.

The existing primary facilities are to be incorporated into the completed plan.

Facilities to be added are listed below:

1. Primary treatment facilities including aerated grit chambers, influent piping, meter chamber, and primary sedimentation tanks.

2. Secondary treatment facilities including the oxygen modification of activated sludge process with oxygenation tanks and equipment, final settling tanks, oxygen generation facility, effluent conducts and piping, and chlorination facilities.

3. Aerobic sludge digestion and disposal facilities for barging to sea.

Project costs for these primary and secondary treatment units and aerobic digestion facilities are estimated at $84,000,000. Work should start in mid-1972.

Preliminary plans have also been completed to expand the Sayreville Pumping Station, dualize several major trunk sewers tributary to the plant, and dualize the treatment outfall to handle the flow in the year 2010. The total project cost for the expanded sewer system is estimated at $73,000,000.

The City of South Amboy and the Borough of Sayreville should complete their final design of the South Bay Collection System by the end of 1971. Completion of construction is expected by 1973 at a project cost of approximately $4,000,000. The proposed project will eliminate municipal primary sewage treatment plants at South Amboy and the Morgan and Melrose plants in the Borough of Sayreville. These plants will be converted into pump stations. All waste will then be conveyed to the Central Treatment Plant of the Middlesex County Sewerage Authority through a system of force mains and interceptors.

Plans also call for the waste from the Perth Amboy, Carteret, and Woodbridge Treatment Plants to be conveyed to the expanded and upgraded Middlesex County Sewerage Authority Treatment Plant.

Milford-Beaver Brook, Conn. (New Haven County)

Completed Project

This 3.2 million gallons per day activated sludge treatment plant was put into service in November 1970. Construction cost for the treatment plant was $3,500,000. Full service is expected when a $4,500,000 sewer tributary construction program is completed. This construction program will connect the southern tip of Milford to the treatment plant.

Milford-Gulf Pond, Conn. (New Haven County)

Future Projects

Milford and the Town of Orange are presently negotiating to provide sewage treatment at the Gulf Pond Treatment Plant. When agreement is reached, the capacity of the Gulf Pond Plant will be tripled. No date has been set for the start of construction.

Milford-Harbor, Conn. (New Haven County)

Project under Construction

Plans call for the abandonment of this plant and the diversion of its flow to the Beaver Brook Treatment Plant. A pump station is being built to accommodate this flow.

Milford-Town Meadows, Conn. (New Haven County)

Project under Construction

A pump station with 1.0 million gallons per day capacity is now being built to divert a portion of this

plant's flow to the Beaver Brook plant.

Plans call for completion of this pump station by April 1972.

Military Ocean Terminal, N.J. (Hudson County)

Project under Construction

An engineering plan has been completed by the Army Corps of Engineers to upgrade existing facilities to activated sludge treatment.

Construction of new units is approximately 90 percent completed. Total cost is estimated at $1,000,000. New units will include two aeration tanks, primary and secondary settling tanks, and a chlorine contact tank.

Monmouth County Bayshore Outfall Authority, N.J. (Monmouth County)

Future Projects

Final plans have been completed and contracts have been let for Phase I construction of a $12 million, 48" diameter ocean outfall line from the Keyport area to a point 4,500 feet out in the ocean just north of the Highlands Bridge -- a distance of about 15 miles.

The future Bayshore Regional Sewerage Authority Treatment Plant, Atlantic Highlands-Highlands Regional Sewerage Authority Treatment Plant, and Middletown Township Sewerage Authority are to be serviced by this ocean outfall line.

Phase I construction is expected to be completed by late 1972.

Nassau County Sewer District #2, N.Y. (Nassau County)

Future Project

A $100,000 engineering study is being prepared investigating expansion and upgrading proposals for the existing Bay Park Treatment Plant. The study is to be submitted in early 1972.

Nassau County Sewer District #3, N.Y. (Nassau County)

Projects under Construction

Construction work on the new plant is about 98 percent completed. The plant will employ step aeration treatment and is designed for 90-95 percent suspended solids and biochemical oxygen demand removals. Treatment plant costs are estimated at $47,000,000.

The Federal Government has approved plans for a 2½ mile long ocean outfall. Contracts have been accepted and work on the outfall should be completed in two and a half years. The cost of the pipeline project is estimated at $54,000,000.

New Haven-Boulevard Plant, Conn. (New Haven County)

Future Project

This plant will be upgraded to an activated sludge treatment plant with a design capacity for an average flow of 26 million gallons per day.

The primary effluent from the East Street plant will then be pumped here for secondary treatment.

New Haven-East Shore, Conn. (New Haven County)

Future Project

This present primary treatment plant is scheduled for a future expansion of facilities to secondary treatment with a 32 million gallons per day average design flow. The engineering report has been completed.

New Haven-East Street, Conn. (New Haven County)

Future Project

The primary treatment effluent from this plant will be diverted to the New Haven-Boulevard Plant when the plant's proposed upgrading to secondary treatment is completed.

New Rochelle, N.Y. (Westchester County)

Future Projects

This 15 million gallons per day treatment plant will be upgraded to secondary treatment by means of activated sludge treatment using the pure oxygen system. The plant will be designed for 85 percent biochemical oxygen demand and suspended solids removal.

The existing primary tanks will be used and pure-oxygen activated sludge units will be constructed for secondary treatment. New aeration and secondary tanks will be built and the present digestors will be converted to holding tanks. Sludge disposal will be by incineration.

The cost of the treatment plant project is estimated at $14,000,000.

The 5th Avenue pump station will be remodeled at a cost of $525,000.

Newtown Creek, N.Y. (Kings County)

Project under Construction

Construction of the Manhattan pumping station, which is being built to transmit a flow of 170 million gallons per day, has been about 66 percent completed. This project was scheduled to be completed in 1967 when the treatment plant was put into operation but has been delayed for several years by foundation problems. Cost

of this work will be approximately $12,000,000.

Future Projects

An application has been filed with the Federal Government for funding for the upgrading of the degree of treatment by this plant.

A 20 million gallons per day pilot plant will soon begin operation, using pure oxygen in the activated sludge aeration tanks. This speeds bacterial action which reduces detention time in the tanks. If this pilot plant proves satisfactory, the process may be used to upgrade Newtown Creek to 90 percent biochemical oxygen demand removal.

New York State Rehabilitation Hospital, N.Y. (Rockland County)

Completed Project

This plant has been converted into a pump station and is diverting its flow to the new Joint Regional Sewerage Board Treatment Plant at West Haverstraw.

North Bergen-Woodcliff, N.J. (Hudson County)

Future Project

This plant will be incorporated into the newly created Hudson County Regional Sewerage Authority.

Plans call for the addition of a pump station and the renovation of some of the present facilities for a total estimated cost of $1,100,000. The primary effluent from this plant will then be pumped to the new Jersey City, East Side, Plant facilities for secondary treatment.

Northport, N.Y. (Suffolk County)

Project under Construction

Upgrading and expansion of the Northport plant is

in progress. The plant will treat 300,000 gallons per day by extended aeration with 90 percent biochemical oxygen demand and suspended solids removals.

Grit chamber, aeration tanks, a secondary clarifier, and a chlorine contact tank should be completed by July 1972. Total cost is estimated at $700,000.

North River, N.Y. (New York County)

Projects under Construction

There are four interceptors presently under construction. These interceptors are expected to be completed in the third quarter of 1974 at a cost of $121,000,000.

Future Project

This plant, which will be located between 137th and West 145th Streets on the North River, is being designed to handle 220 million gallons per day of raw wastes. These wastes are now entering the Hudson and Harlem Rivers from upper Manhattan.

The North River Plant will be a step aeration treatment plant, designed for a minimum of 90 percent biochemical oxygen demand and suspended solids removal. The treatment plant will be constructed in conjunction with a recreational facility known as Riverbank.

North River should be completed and operational by the fourth quarter of 1979 at a cost of approximately $800,000,000.

A feasibility report on the plant foundation and treatment units has been approved by New York State and the Federal Government. Foundation contracts have been advertised for bids and are being evaluated.

Bids are currently being accepted for the construction of a 100,000 cubic foot sludge vessel.

North Tarrytown, N.Y. (Westchester County)

Future Project

This primary treatment plant is scheduled to be abandoned. The flow to this plant will then be diverted to a new pump station and pumped to the Yonkers Joint Meeting Plant for treatment.

Norwalk, Conn. (Fairfield County)

Future Project

A $7,600,000 Phase II expansion of this primary plant has been proposed. Plans call for the upgrading to secondary treatment using activated sludge. An average design flow of 30 million gallons per day and 95 percent removal of biochemical oxygen demand and suspended solids are also planned. Proposed units include final settling tanks, a sludge incineration unit, aeration tanks, additional thickening tanks, and a heat exchanger.

No date for the beginning of construction of Phase II has been set.

Nyack, South Nyack, and Upper Nyack, N.Y. (Rockland County)

Future Project

Plans and specifications are in progress for the diversion of sanitary wastes from the Village of Nyack, South Nyack, and Upper Nyack to the Orangetown District Treatment Plant.

Oakwood Beach, N.Y. (Richmond County)

Future Projects

Final plans and specifications for upgrading to step aeration and expanding from 15 million gallons per day to 40 million gallons per day (second stage) with

minimum design removals of 90 percent biochemical oxygen demand and suspended solids have been submitted to New York State and the Federal Government. Outfall design has been given careful consideration to insure that there will be no degradation of Staten Island beaches from this plant.

Several contracts will be let for the construction of force mains, interceptors, and pumping stations at a cost of $155,000,000.

Total cost of this entire project is estimated near $216,000,000.

Orangetown Sewer District, N.Y. (Rockland County)

Completed Project

Recent completion of improvements to the existing facilities has increased the biochemical oxygen demand reduction to 85 percent. The improvements included two domes over the primary clarifiers, two domes over the trickling filters, enclosure of the grit chamber, and the addition of ozonization equipment. The cost was approximately $700,000.

Future plans call for the diversion of flows from Nyack, South Nyack, and Upper Nyack to the Orangetown plant.

Ossining, N.Y. (Westchester County)

Future Project

The two existing treatment plants in Ossining at Liberty Street and at Water Street are scheduled to divert their flows to the new Westchester County Treatment Plant now being planned at Ossining.

Design plans for the new plant are nearing completion. Construction is expected to begin in mid-1972.

Owls Head, N.Y. (Kings County)

Future Projects

The Bureau of Water Pollution Control submitted an application for funding to New York State and the Federal Government and is presently awaiting approval. However, approval has been granted to award an interceptor contract along Shore Parkway prior to receipt of final commitment of funds.

The scope of work includes the upgrading of treatment from modified to that of step aeration, thus assuring design removals of a minimum of 90 percent of the biochemical oxygen demand and suspended solids. Also included are contracts for interceptors, a pumping station and a motor vessel.

Total cost of the project is estimated at $99,000,000.

Oyster Bay, N.Y. (Nassau County)

Completed Project

The lift station at Highwood Road has been completed at a cost of $53,000. Two 150 gpm centrifugal pumps and a 25 KW trailer mounted auxiliary generator have been installed.

Peekskill, N.Y. (Westchester County)

Future Project

Engineering plans are being prepared to upgrade this plant to secondary treatment using activated sludge with 85 percent removal of biochemical oxygen demand and suspended solids. The upgraded plant will then be incorporated into the Westchester County Department of Environmental Facilities system.

The cost of upgrading this plant is estimated to be about $22,700,000.

Perth Amboy, N.J. (Middlesex County)

Future Project

Plans call for converting this primary treatment plant into a pumping station and diverting its flow to the Middlesex County Sewerage Authority Treatment Plant.

Port Chester, N.Y. (Westchester County)

Future Project

An engineering report on the upgrading of the Port Chester plant to secondary treatment has been completed and submitted to the State of New York for approval. Construction is expected to begin in the summer of 1972 with the cost of plant improvements estimated at $8,900,000.

The plant will be operated by the Westchester County Department of Environmental Facilities. Secondary treatment by means of activated sludge is expected to remove 85 percent of the suspended solids and biochemical oxygen demand.

Sludge from both Port Chester and Blind Brook will be incinerated at the Port Chester plant. The effluent from the Port Chester plant will be pumped to the Blind Brook plant outfall for discharge into Long Island Sound.

Port Jefferson Sewer District, N.Y. (Suffolk County)

Future Project

An engineering report has been completed recommending a physical-chemical plant for Port Jefferson. The proposed 5.0 million gallons per day plant awaits New York State approval.

The plant will be designed with biochemical oxygen demand and suspended solids removals in the 95-98 percent range and will have a chemical coagulation unit,

multi-media filters, a carbon absorption unit, a sludge incineration, and a carbon reactivation incinerator.

Operation is expected within three years at a cost of $14,000,000. The outfall line from the plant will be one and one-half miles off shore in Long Island Sound.

Port Richmond, N.Y. (Richmond County)

Future Projects

Plans and specifications for converting the Port Richmond Plant from a 10 million gallons per day primary facility to a 60 million gallons per day step aeration plant, designed for 90 percent minimum biochemical oxygen demand and suspended solids removals, are being reviewed by the Federal Government.

Included in the expansion are additional pumping stations, force mains, and interceptors in the plant's tributary area. The completed facility is expected to be operational in 1975 after an outlay of $28,200,000.

The west branch interceptor has been completed and permission to advertise for the east branch interceptor has been received and will be advertised shortly.

Construction has begun on the Mersereau Avenue pump station and force main. Completion is expected in the fourth quarter of 1972.

Port Washington, N.Y. (Nassau County)

Future Project

An engineering report has been completed proposing doubling of the present plant capacity to 6 million gallons per day. The plans have been approved by New York State and the Federal Government, and work will start in about six months. Total cost is estimated at $3,800,000.

Rahway Valley Sewerage Authority, N.J. (Middlesex County)

Project under Construction

Construction is in progress to upgrade this primary plant to secondary treatment to provide an 85 percent removal of biochemical oxygen demand and total suspended solids. The new plant will be of the activated sludge type with step aeration. The estimated total cost of the project has increased to $16,000,000.

First-stage construction has been completed. Second-stage work is 50 percent completed.

Red Hook, East River Environmental Protection Center, N.Y. (Kings County)

Future Project

A feasibility report to construct a step aeration treatment plant designed for minimum removals of 90 percent biochemical oxygen demand and suspended solids at the former site of the Brooklyn Navy Yard has been approved by New York State.

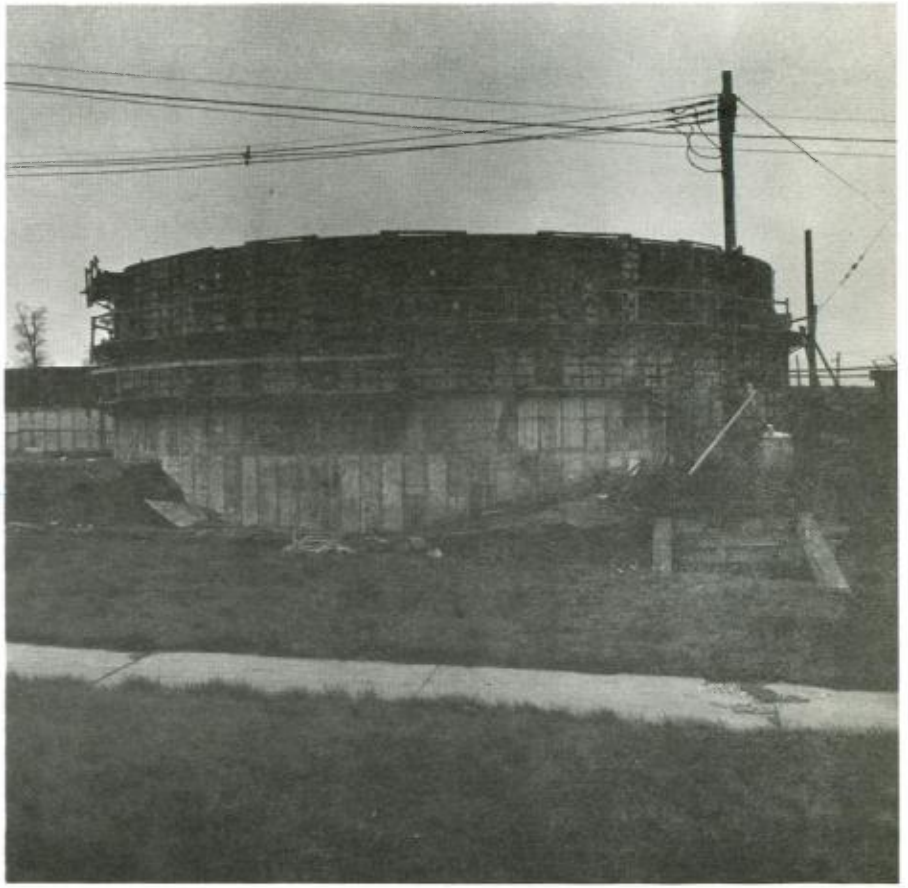
Applications for New York State and Federal Government funds are being reviewed by New York State. Final plans and specifications on three interceptor lines have been completed and submitted to New York State. Construction of these interceptors awaits commitment of State and Federal funds.

The total cost of the project is expected to be about $194,000,000. The plant will be designed for a capacity of 70 million gallons per day.

Rockaway, N.Y. (Queens County)

Future Project

Final plans and specifications for expanding and upgrading this plant have been submitted to New York



RAHWAY VALLEY SEWERAGE AUTHORITY - NEW JERSEY
Consulting Engineers: Elson T. Killam Associates, Inc.

State during the third quarter of 1971 for final approval. Total project cost is estimated at $53,000,000.

Construction is expected to begin in 1972 and be completed in early 1975.

Bids are currently being accepted for the construction of the Bayswater Avenue Pumping Station.

Rockland County Sewer District #1, N.Y. (Rockland County)

Project under Construction

Work on a sewer system is under way and is expected to be completed by the first quarter of 1972 at an estimated total cost of $36,000,000.

The new system will include 63 miles of sewers and nine pumping stations. Over 500 miles of lateral sewers, tributary to the County system, are being constructed by the Towns of Clarkstown and Ramapo and the Village of Spring Valley.

Future Project

Design work is under way for doubling the capacity of the treatment plant and expanding the service to include the now unsewered portions of District #1. Plant specifications will call for design criteria of 95 percent removal of biochemical oxygen demand and suspended solids.

Construction is expected to begin in early 1972 at an estimated cost of $30,000,000.

Roslyn, N.Y. (Nassau County)

Future Project

Microstrainers are being installed between the trickling filters in order to improve suspended solids reduction at a cost of $20,000. A new trickling filter

distribution arm has been installed costing $4,000.

An engineering report is being prepared using data supplied from the pilot plant in operation.

Sayreville, Melrose, N.J. (Middlesex County)

Future Project

This primary treatment plant will be converted into a pump station and the waste flow will be conveyed to the Middlesex County Sewerage Authority's Treatment Plant.

The total cost for the conversion work for the Melrose and Morgan Treatment Plants will be approximately $4,000,000.

Sayreville, Morgan, N.J. (Middlesex County)

Future Projects

A new Crossway Creek interceptor sewer is to be constructed which will eliminate various small pump stations and service areas of Sayreville that are presently unsewered and also reduce flow in overtaxed force mains and sewers. All waste will be conveyed to the Morgan section of Sayreville.

The existing primary sewage treatment plant will be converted into a pump station. The waste will be pumped to South Amboy on its route to the Central Treatment Plant of the Middlesex County Sewerage Authority.

The total cost for the conversion work for the Morgan and Melrose Treatment Plants will be approximately $4,000,000.

Sing Sing State Prison, Ossining, N.Y. (Westchester County)

Future Project

The flow from the Prison is to be diverted to the

Westchester County Treatment Plant which is to be built in Ossining.

South Amboy, N.J. (Middlesex County)

Future Project

The present primary treatment plant is to be converted into a pump station and a force main to the Middlesex County Sewerage Authority is to be built. The project is estimated to cost $350,000.

Southwest Sewer District #3, N.Y. (Suffolk County)

Future Projects

Final design plans are due to be completed in March of 1972 for the construction of a 30 million gallons per day secondary treatment plant using the activated sludge method of treatment.

Construction is scheduled to begin by the end of 1972. Cost of the plant is estimated at $40,000,000. The outfall for the new plant, which will discharge its effluent to the Atlantic Ocean, is estimated to cost $60,000,000.

Construction for trunk lines and laterals contributory to the new plant was begun in August and is estimated to cost $400,000,000. The sewer lines and treatment plant will serve an estimated 300,000 population in the Towns of Babylon and Islip.

Spring Creek, N.Y. (Kings County)

Projects under Construction

The New York City sewer system is of the combined type. As a result, a large amount of raw sewage is discharged into the receiving waters during rainstorms. This sewage is especially detrimental in the vicinity of potential bathing beaches where it becomes a public health hazard.

SPRING CREEK COMBINED WASTE TREATMENT FACILITY - BROOKLYN, NEW YORK
Consulting Engineers: Greeley and Hansen
Photo Courtesy of: New York State Department of Environmental Conservation

An auxiliary program plan is being completed to impound, disinfect, settle, and degrit these combined flows in the vicinity of proposed bathing beaches. Construction of the first prototype plant has been 85 percent completed and is located at Spring Creek on Jamaica Bay. This plant and allied interceptors will have a reservoir with an impoundment capacity of 12 million gallons, at a cost of approximately $18,000,000.

Interceptors tributary to the Spring Creek plant are being constructed in three phases. The first and second are completed. Bids on the last interceptor contract were received and are being evaluated by the State of New York and the Federal Government.

After each storm, the water which has been collected in the impoundment reservoir will be pumped to the 26th Ward plant for full treatment.

In conjunction with this work, an extensive study was begun in 1968 at an approximate cost of $1,000,000 to make an evaluation of water quality before and after the Spring Creek plant starts its operation.

Springvale, N.Y. (Westchester County)

Project under Construction

Plans have been submitted and accepted by the State of New York for the upgrading of the Springvale Treatment Plant.

Construction has begun and a new settling tank, a sludge collection tank, and a sludge recirculation pump have been added. The work began in August 1971 and is approximately 50 percent completed.

Stamford, Conn. (Fairfield County)

Future Project

Plans for upgrading to step aeration and expanding

this treatment plant are being reviewed by the Connecticut State Department of Environmental Protection. Construction will change the design flow from 10 to 20 million gallons per day and provide a 95 percent biochemical oxygen demand reduction at an estimated cost of $16,500,000. Construction is scheduled to begin in February 1972.

New equipment will include mechanical aerators and aeration tanks, primary and secondary clarifiers, a new lab building and pump stations.

Stratford, Conn. (Fairfield County)

Project under Construction

Final design for upgrading this plant has been completed and approved. Bids for construction were accepted in December 1970. Work was begun in the spring of 1971 and is expected to be completed in the fall of 1972.

Activated sludge treatment will be provided for a 10 million gallons per day flow at an approximate total project cost of $10,600,000. Sludge will be disposed of by vacuum filtration and incineration. The increase in plant capacity provides for some areas of the City which were previously unsewered.

Tallman Island, N.Y. (Queens County)

Future Project

The Bureau of Water Pollution Control is planning to make this an 80 million gallons per day step aeration plant designed for minimum removals of 90 percent biochemical oxygen demand and suspended solids at a cost of $33,000,000.

Final plans have been approved by New York State and are awaiting Federal Government approval.

Tarrytown, N.Y. (Westchester County)

Future Project

The existing 1.5 million gallons per day primary plant is scheduled to be converted into a pump station and have its flow diverted to the Westchester County System at Yonkers.

26th Ward, N.Y. (Kings County)

Future Projects

Bids have been taken on plant extension and upgrading, and contracts have been awarded to the low bidders. Construction is to be completed by the second quarter of 1975.

Construction work on the plant pier sludge line and access road is almost completed.

Cost of the entire project is estimated at $48,600,000.

Wards Island, N.Y. (New York County)

Future Projects

Plans for the proposed extension and upgrading of Wards Island to 290 million gallons per day by the step aeration process designed for minimum removals of 90 percent biochemical oxygen demand and suspended solids are to be submitted to New York State by the second quarter of 1972.

The construction on improvements to the Bronx-Manhattan grit chamber which started in October 1970 is scheduled to be completed by the second quarter of 1972. The completion of construction of a dock at the north end of the property is also expected to be completed by the second quarter of 1972.

West Haven, Conn. (New Haven County)

Project under Construction

Work is continuing to upgrade this 23 million gallons per day plant to provide activated sludge treatment designed for 95 percent biochemical oxygen demand and suspended solids reduction. Plant capacity will be expanded to 26 million gallons per day.

Total project cost is estimated at $6,500,000 with completion target date of October 1972.

West Long Beach, N.Y. (Nassau County)

Future Projects

The West Long Beach Sewer District has discontinued sludge dumping for landfill purposes due to orders from the Nassau County Department of Health.

Plans for barging sludge to sea by means of a sludge pump to the pier facility are awaiting Federal approval. The cost of the 1500 gallons per minute pump and 8" pipeline is estimated at $80,000.

Westport, Conn. (Fairfield County)

Future Project

This secondary treatment plant will expand its capacity to a design flow of 2.8 million gallons per day with a 95 percent biochemical oxygen demand reduction and suspended solids removal.

Plans have received State approval and are awaiting Federal approval before bids can be let.

Rehabilitation of the Imperial Avenue pump station and the Center Street pump station are also planned improvements for the future.

Projected cost of total project is $6,000,000.

Woodbridge, N.J. (Middlesex County)

Future Project

Plans call for diverting the waste from this primary plant to the Middlesex County Sewerage Authority Treatment Plant.

Yonkers Joint Meeting, N.Y. (Westchester County)

Project under Construction

Site preparation is in progress with overall project construction 5 percent completed on the conversion of the existing 63 million gallons per day primary treatment plant into a 93 million gallons per day step aeration activated sludge treatment plant. Design plans call for 85 percent removal of biochemical oxygen demand and total suspended solids. Total cost of construction is estimated at $55,000,000. Completion date is scheduled for mid-1975.

Plans also call for the diversion of the present flows from Tarrytown, North Tarrytown, and Irvington to the new Yonkers plant when it is completed.

YONKERS JOINT MEETING SEWERAGE TREATMENT PLANT - YONKERS, NEW YORK
Consulting Engineers: Greeley and Hansen
Photo Courtesy of: N.Y.S. Department of Environmental Conservation

1971 HUDSON RIVER SURVEY

INTRODUCTION

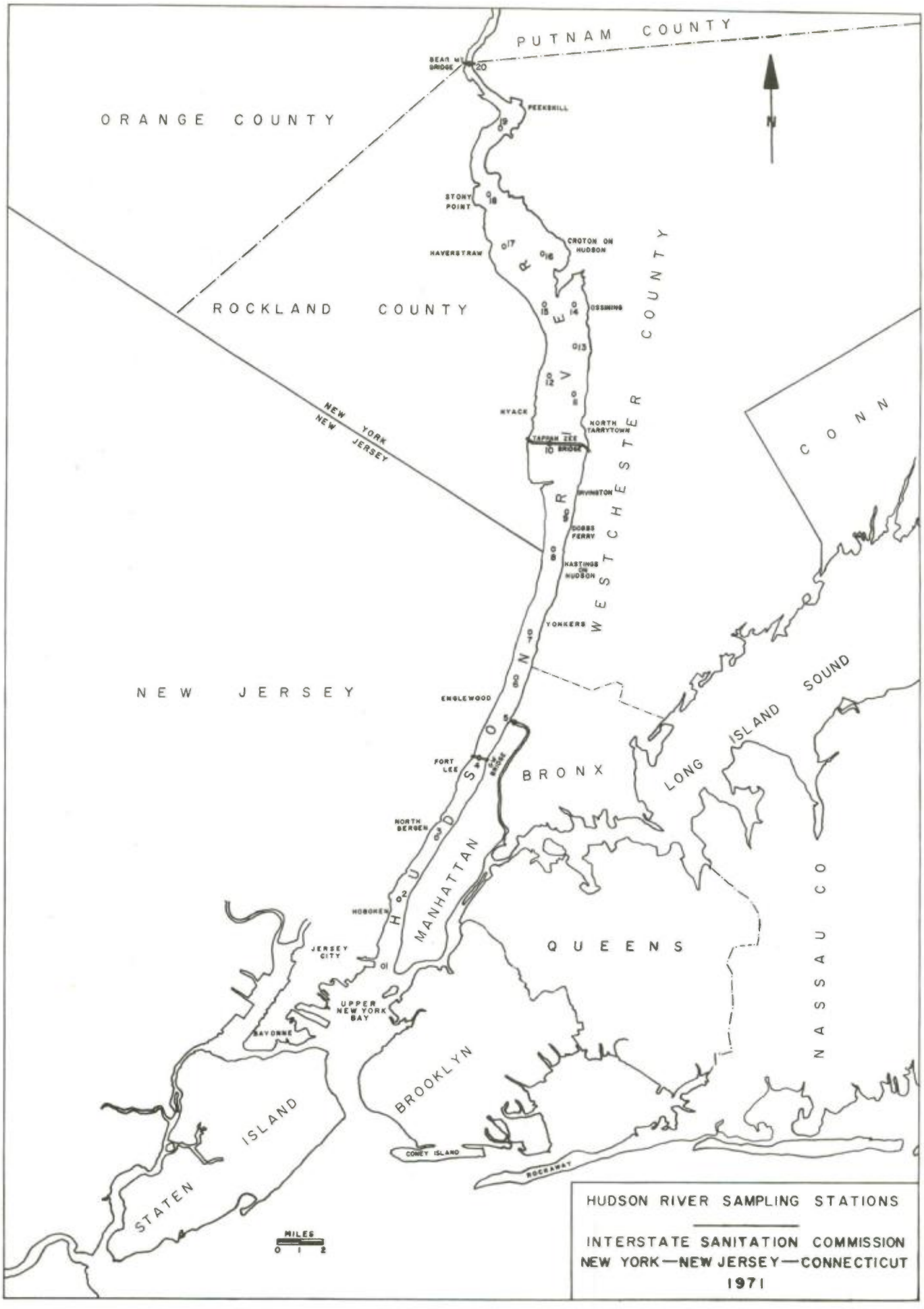
The Hudson River is approximately 306 miles long and runs southward from Henderson Lake in Essex County, New York, to the Upper New York Bay. The southernmost 40 nautical miles of the Hudson River lie within the Interstate Sanitation District; this is the portion of the river that was studied. This section of the river is bounded on the south by the Upper New York Bay and on the north by the Bear Mountain Bridge. The purposes of the study were to determine the present condition of the waters and to establish a baseline for future studies.

PROCEDURE

Nineteen sampling stations were selected in the Hudson River and one station (Station 5) was selected in the Harlem River where it meets the Hudson. The stations are shown on the survey map on the following page and a description of each station is given at the end of this report.

Five boats were used to collect samples on eight days between August 2, 1971, and August 12, 1971. All samples were taken during daylight hours. Each station was sampled three times a day approximately five feet below the surface. Determinations were made for the following parameters: temperature, chlorides, dissolved oxygen, fecal coliform density, pH, biochemical oxygen demand, turbidity, orthophosphate phosphorus, nitrate, nitrite, ammonia, nitrogen, total carbon, total organic carbon, chlorophyll A, chromium (hexavalent), copper, nickel, zinc, cadmium, mercury, and lead. All tests were made using instrumental techniques or according to Standard Methods for the Examination of Water and Wastewater.

The data for each station were analyzed and arithmetic means were calculated for each parameter except fecal coliform density and pH. The geometric mean was computed for fecal coliform density and logarithmic averages were used for pH.


PUTNAM COUNTY
ORANGE COUNTY
ROCKLAND COUNTY
WESTCHESTER COUNTY
CONN
NEW YORK
NEW JERSEY
NEW JERSEY
BEAR MT BRIDGE
PEEKSKILL
STONY POINT
HAVERSTRAW
CROTON ON HUDSON
OSSINING
NYACK
NORTH TARRYTOWN
TAPPAN ZEE BRIDGE
IRVINGTON
DOBBS FERRY
HASTINGS ON HUDSON
YONKERS
ENGLEWOOD
FORT LEE
GEORGE WASHINGTON BRIDGE
NORTH BERGEN
HOBOKEN
JERSEY CITY
UPPER NEW YORK BAY
BAYONNE
HUDSON RIVER
MANHATTAN
BRONX
LONG ISLAND SOUND
QUEENS
BROOKLYN
NASSAU CO
STATEN ISLAND
CONEY ISLAND
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HUDSON RIVER SAMPLING STATIONS
INTERSTATE SANITATION COMMISSION
NEW YORK—NEW JERSEY—CONNECTICUT
1971

RESULTS

The results obtained at each station are summarized in the table on the following page.

Dissolved Oxygen

The average dissolved oxygen values ranged from a low of 2.26 mg/l at Station 1 to a high of 6.93 mg/l at Station 12. The minimum dissolved oxygen values ranged from 1.56 mg/l at Station 1 to 6.15 mg/l at Station 10. The values obtained at Station 5 in the Harlem River for average and minimum dissolved oxygen are 3.04 mg/l and 1.95 mg/l, respectively. Chart 1 shows the dissolved oxygen profile along the Hudson River.

Fecal Coliform Density

The average fecal coliform density ranged from a maximum value of "less than" 2500 organisms/100 ml to a minimum value of 45 organisms/100 ml. In the Harlem River (Station 5), the average fecal coliform density was "greater than" 1000 organisms/100 ml. The fecal coliform density profile along the Hudson River is shown in Chart 2.

Other Parameters

Temperature and pH showed little variation from station to station. Chlorides showed decreasing values, as the stations sampled were farther upstream. Turbidity ranged from 2.8 JTU at Station 1 to 5.4 JTU at Station 10 with no trend being observed between stations.

Ortho-phosphate phosphorus, one of the nutrients measured, decreased, as the stations sampled were farther upstream. The other nutrients yielded the following results: nitrate nitrogen values increased from Stations 1 to 18 and then decreased slightly; nitrite nitrogen showed no variation at any of the stations; and ammonia nitrogen had a high value of 1.14 mg/l at Station 18 and a low value of 0.48 mg/l at Station 9.

SUMMARY OF RESULTS (A)

STATION	TEMPERATURE	CHLORIDES	D. O.	D.O. (MIN)	FECAL COLIFORM DENSITY (B)	pH (C)	B.O.D.	ORTHO-PO_4-P	NO_3-N	NO_2-N	NH_3-N
1	24.0	11000	2.26	1.56	< 2500	7.0	3.53	0.23	0.67	0.08	0.96
2	24.4	9230	2.41	1.88	> 1900	7.2	3.57	0.22	0.61	0.07	1.04
3	24.5	8400	2.65	1.92	> 1400	7.3	3.84	0.20	0.65	0.08	0.88
4	24.8	7060	3.23	2.40	760	7.3	2.72	0.17	0.73	0.07	1.01
5(D)	24.4	6370	3.04	1.95	> 1000	7.1	3.24	0.19	0.71	0.08	0.94
6	24.6	5130	4.43	2.95	250	7.3	3.39	0.14	0.84	0.07	0.61
7	24.7	4620	4.89	3.75	180	7.4	3.32	0.14	0.77	0.07	0.60
8	24.8	3820	5.68	4.92	99	7.4	3.20	0.11	0.83	0.06	0.76
9	24.2	3220	6.22	5.60	140	6.9	3.41	0.10	0.86	0.05	0.48
10	24.2	2790	6.57	6.15	45	7.0	2.99	0.10	0.86	0.06	0.56
11	24.6	2360	6.63	6.10	< 85	7.0	3.32	0.08	0.92	0.06	0.53
12	24.1	2410	6.93	6.10	< 68	7.0	3.29	0.09	0.90	0.06	0.78
13	24.6	1920	6.45	5.68	< 71	6.9	3.08	0.08	0.90	0.06	0.58
14	24.7	1810	6.53	5.50	79	7.0	4.22	0.08	0.91	0.06	0.64
15	24.8	1650	6.54	5.48	210	6.9	3.20	0.07	0.95	0.06	0.68
16	25.0	1470	6.60	5.62	> 160	7.0	3.09	0.07	0.93	0.07	1.01
17	25.2	1110	6.16	5.80	> 190	6.9	2.69	0.07	0.99	0.08	1.03
18	25.1	800	5.90	5.50	> 350	7.0	2.25	0.06	1.01	0.09	1.14
19	25.1	430	5.86	5.40	> 800	7.0	2.63	0.06	0.89	0.08	1.04
20	25.2	230	6.06	5.60	> 200	7.0	2.39	0.06	0.95	0.07	0.98

NOTES:

(A) All values are averages except the column headed "D.O. (MIN)" which is the minimum dissolved oxygen value obtained at each station. All units are mg/l except Temperature which is °C, Fecal Coliform Density which is the number of organisms per 100 ml, Turbidity which is JTU, and pH.

(B) Geometric Mean

(C) Logarithmic Average

(D) Station is located in the Harlem River.

(Continued on Next Page)

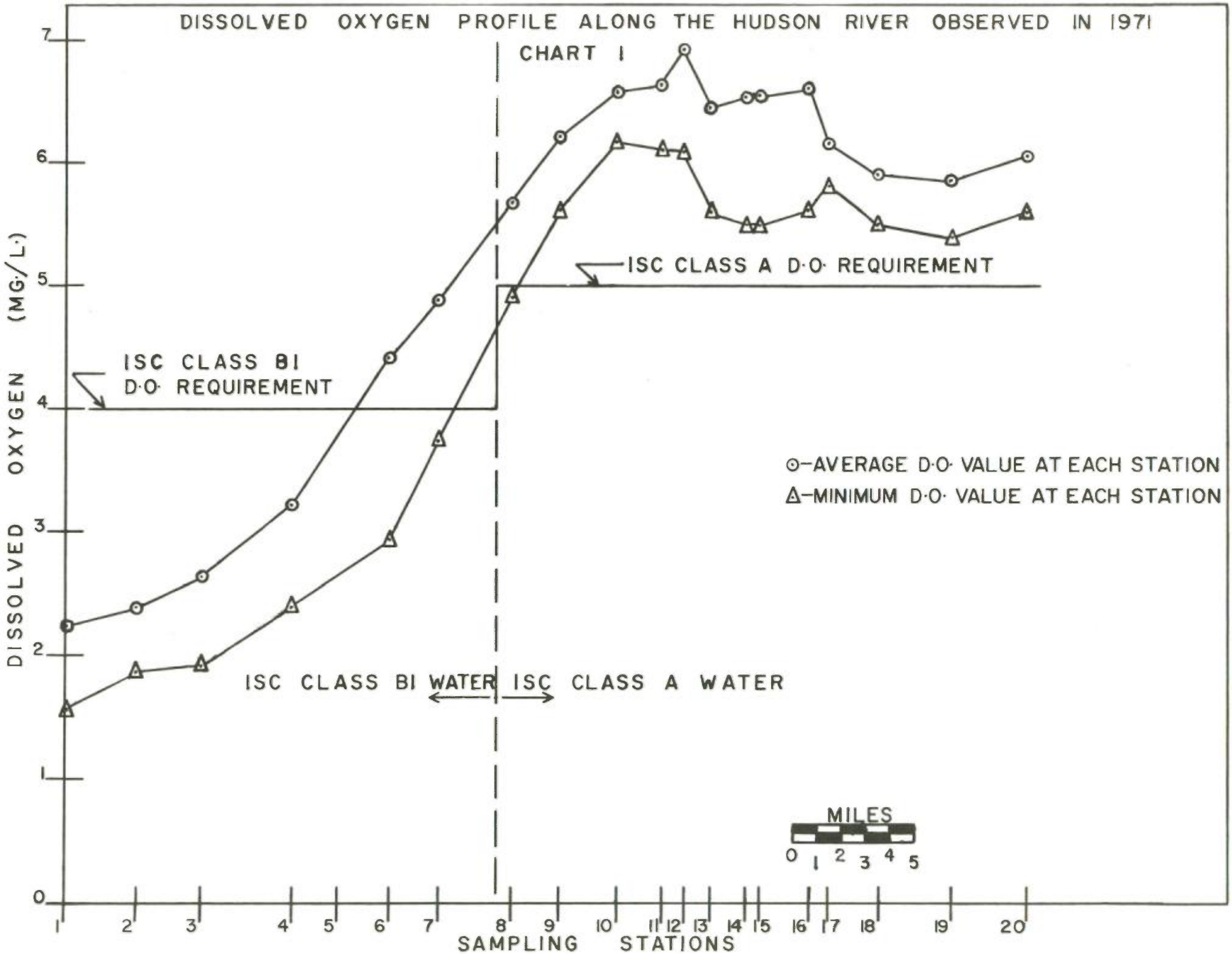
SUMMARY OF RESULTS (A) continued

STATION	TURBIDITY	TOTAL CARBON	TOTAL ORGANIC CARBON	CHLOROPHYLL A	CHROMIUM	COPPER	NICKEL	ZINC	CADMIUM	MERCURY	LEAD
1	2.8	35.7	11.3	0.0178	< 0.01	0.071	0.021	0.050	0.0005	< 0.00011	0.003
2	3.2	33.6	11.9	0.0175	< 0.01	0.060	0.021	0.023	0.0007	< 0.00012	0.003
3	3.4	32.9	12.8	0.0231	< 0.01	0.063	0.019	0.026	0.0006	< 0.00008	0.003
4	3.9	30.1	11.5	0.0280	< 0.01	0.067	0.018	0.024	0.0006	< 0.00009	0.003
5(D)	3.9	32.6	13.4	0.0177	< 0.01	0.068	0.020	0.048	0.0007	< 0.00006	0.003
6	3.9	28.5	10.9	0.0285	< 0.01	0.072	0.018	0.032	0.0009	< 0.00005	0.003
7	3.8	27.2	11.1	0.0331	< 0.01	0.067	0.015	0.033	0.0009	< 0.00009	0.003
8	4.2	27.8	11.8	0.0321	< 0.01	0.063	0.014	0.029	0.0007	< 0.00006	0.003
9	4.0	25.3	10.1	0.0368	< 0.01	0.055	0.017	0.026	0.0010	< 0.00008	0.003
10	5.4	24.6	10.1	0.0395	< 0.01	0.056	0.014	0.024	0.0009	< 0.00009	0.004
11	4.2	24.4	10.5	0.0341	< 0.01	0.046	0.015	0.029	0.0008	< 0.00013	0.003
12	5.0	23.9	9.8	0.0389	< 0.01	0.054	0.013	0.024	0.0008	< 0.00010	0.003
13	4.2	26.3	12.2	0.0361	< 0.01	0.062	0.014	0.042	0.0016	< 0.00008	0.004
14	4.4	24.8	10.3	0.0398	< 0.01	0.057	0.013	0.031	0.0010	< 0.00006	0.005
15	3.7	28.4	14.1	0.0321	< 0.01	0.055	0.012	0.028	0.0010	< 0.00006	0.003
16	3.8	24.4	10.6	0.0280	< 0.01	0.055	0.011	0.029	0.0010	< 0.00007	0.004
17	3.7	22.6	8.7	0.0300	< 0.01	0.060	0.014	0.027	0.0008	< 0.00011	0.003
18	4.1	26.3	12.1	0.0185	< 0.01	0.067	0.011	0.058	0.0009	< 0.00009	0.003
19	3.7	23.9	10.1	0.0139	< 0.01	0.047	0.010	0.038	0.0011	< 0.00008	0.003
20	4.4	24.6	11.2	0.0129	< 0.01	0.044	0.009	0.022	0.0009	< 0.00008	0.004

NOTES:

(A) All values are averages except the column headed "D.O.(MIN)" which is the minimum dissolved oxygen value obtained at each station. All units are mg/l except Temperature which is ^{o}C, Fecal Coliform Density which is the number of organisms per 100 ml, Turbidity which is JTU, and pH.

(D) Station is located in the Harlem River.


DISSOLVED OXYGEN PROFILE ALONG THE HUDSON RIVER OBSERVED IN 1971
CHART 1
DISSOLVED OXYGEN (MG/L)
ISC CLASS A D·O· REQUIREMENT
ISC CLASS BI
D·O· REQUIREMENT
⊙–AVERAGE D·O· VALUE AT EACH STATION
△–MINIMUM D·O· VALUE AT EACH STATION
ISC CLASS BI WATER
ISC CLASS A WATER
MILES
0 1 2 3 4 5
SAMPLING STATIONS

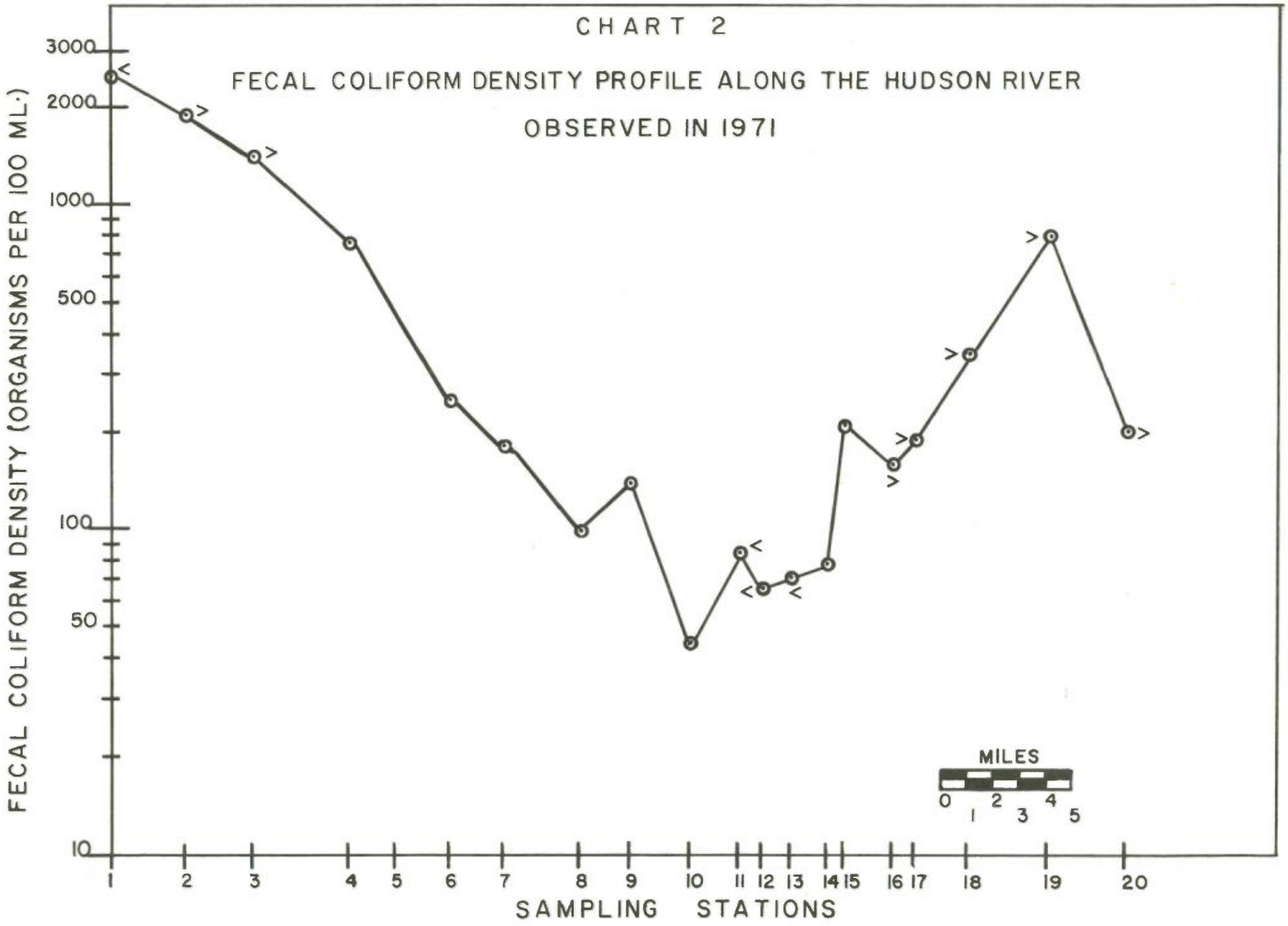


CHART 2
FECAL COLIFORM DENSITY PROFILE ALONG THE HUDSON RIVER
OBSERVED IN 1971
FECAL COLIFORM DENSITY (ORGANISMS PER 100 ML.)
3000
2000
1000
500
100
50
10
SAMPLING STATIONS
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
MILES
0 1 2 3 4 5

Total carbon yielded higher results at Stations 1 through 4 with the highest value (35.7 mg/l) occurring at Station 1. The other stations showed little variation in the values. Total organic carbon showed little variation at any of the stations.

Chlorophyll A values ranged from 0.0129 mg/l at Station 20 to 0.0398 mg/l at Station 14 and showed a general increasing trend from Stations 1 to 14 and a decreasing trend from Stations 14 to 20.

All chromium (hexavalent) values measured at all stations were "less than" 0.01 mg/l. The other metals measured (copper, nickel, zinc, cadmium, mercury, and lead) showed little variation between stations and no upward or downward trend throughout the range of the stations.

Biochemical oxygen demand values were calculated using three dilutions: 0% dilution water, 33.3% dilution water, and 66.7% dilution water. In general, the biochemical oxygen demand value increased in the higher dilutions. It was not determined whether this "sliding scale" was due to dilution of naturally occurring salinity or due to toxic substances present in the river. The biochemical oxygen demand values shown in the Summary of Results are averages of the values obtained with the highest dilution.

DISCUSSION

The minimum dissolved oxygen observed at Stations 1 through 8 do not meet the Interstate Sanitation Commission's dissolved oxygen requirements (see Chart 1).

The dissolved oxygen and the fecal coliform density values show a need for improvement in the lower portion of the Hudson River. These values can be expected to improve when new waste treatment facilities presently under construction and older plants being upgraded are completed. Improvements can also be expected when means are found to lessen the impact of the combined sewer systems emptying into the Hudson River.

Except for the aforementioned parameters (such as dissolved oxygen and ortho-phosphate phosphorus) showing trends, the other parameters do not show any appreciable trends throughout the section of the Hudson River which was surveyed. The magnitude of the chlorophyll A values do not indicate the presence of algal blooms.

SUMMARY AND CONCLUSIONS

(1) A baseline for many parameters has been established for future reference.

(2) The dissolved oxygen requirements of the States of New York and New Jersey and the Interstate Sanitation Commission are not met at Stations 1 through 8.

(3) Dissolved oxygen and fecal coliform density values cannot be expected to improve until new and upgraded treatment facilities and improved combined sewer systems are completed along the Hudson River.

DESCRIPTION OF SAMPLING STATIONS

STATION 1 — Mid-channel of Hudson River

North-South Range --
Line of black buoys

East-West Range --
Fire boat pier (N.Y.) and railroad pier (N.J.)

STATION 2 — Mid-channel of Hudson River

East-West Range --
Heliport (N.Y.) and Seatrain pier (N.J.)

STATION 3 — Mid-channel of Hudson River

East-West Range --
Soldiers and Sailors Monument (N.Y.) and circular apartment building (N.J.)

STATION 4 — Mid-channel of Hudson River

Under George Washington Bridge

STATION 5 — Mid-channel of Spuyten Duyvil Creek

Under Henry Hudson Bridge

STATION 6 — Mid-channel of Hudson River

East-West Range --
Opposite green spire at Mount St. Vincent (N.Y.) and mooring buoy (N.J.)

STATION 7 — Mid-channel of Hudson River

East-West Range --
Opposite Phelps Dodge (Yonkers)

STATION 8 — Mid-channel of Hudson River

East-West Range --
Opposite marina at Hastings (N.Y.) and rock slide (N.J.)

STATION 9	West of south end of Weyerhaeuser Lumberyard dock, about 500 yards from shore
STATION 10	100 feet south of Tappan Zee Bridge, pile number 160
STATION 11	North-South Range -- 1 mile north of buoy number 2A East-West Range -- Line of four apartment houses (N.J.) and two-story red brick structure adjacent to railroad tracks (N.Y.)
STATION 12	500 yards due east of white house at water's edge and southeast of foot of Hook Mountain
STATION 13	At flashing buoy number 6
STATION 14	North-South Range -- Line of smoke stack at Sing Sing Prison and Teller Point (Croton) East-West Range -- Line of flashing buoy number 6 and stack at Croton-Harmon Yards of Penn Central Railroad
STATION 15	Mid-channel of Hudson River Buoy number 10
STATION 16	North-South Range -- Line of buoy number 10 and east of 2 towers at F.D.R. Veterans Hospital (Montrose) East-West Range -- Consolidated Edison stack at West Haverstraw and smoke stack at Croton-Harmon Yards of Penn Central Railroad
STATION 17	Mid-channel of Hudson River Buoy number 14
STATION 18	Mid-channel of Hudson River East-West Range -- Stony Point and Montrose Point

STATION 19 Mid-channel of Hudson River

East-West Range --
Jones Point and Lovett Power Plant stack

STATION 20 Mid-channel of Hudson River

Under Bear Mountain Bridge

1971 RARITAN BAY AND SANDY HOOK BAY SURVEY
jointly conducted by
INTERSTATE SANITATION COMMISSION
and
NEW JERSEY STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION

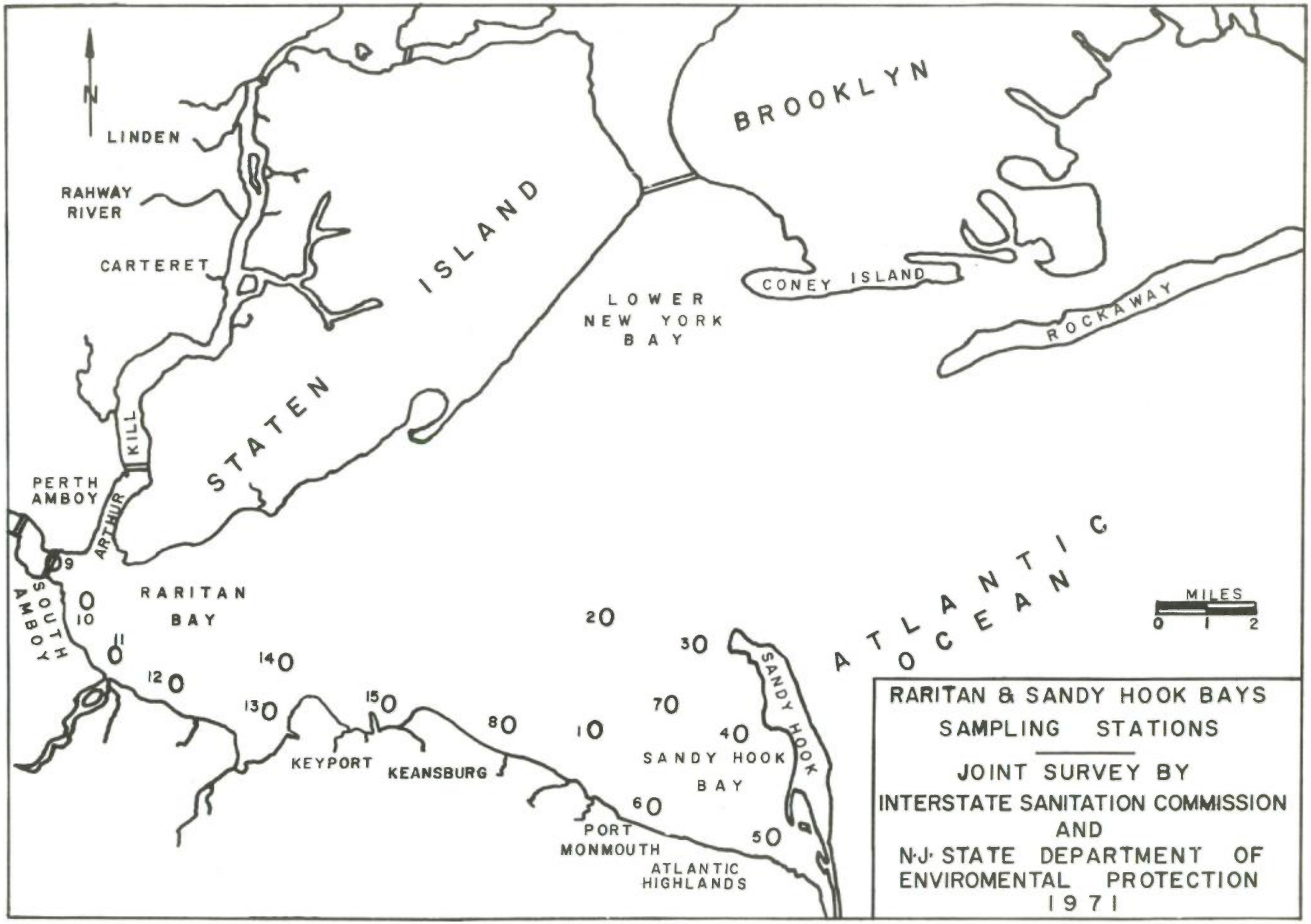
INTRODUCTION

A joint water quality survey was conducted by the Interstate Sanitation Commission and the New Jersey State Department of Environmental Protection in Raritan Bay and Sandy Hook Bay during the summer of 1971. Raritan Bay and Sandy Hook Bay are bounded by New Jersey, Staten Island, and Lower New York Bay. These waters are used for boating and recreational purposes, fishing and shellfish harvesting, as well as navigational purposes for ships and barges travelling up the Arthur Kill and the Raritan River. This survey was conducted to determine the present condition of the waters prior to construction of regional abatement facilities and to establish a baseline for future studies.

PROCEDURE

Fifteen sampling stations were selected for the survey. The stations are shown on the survey map on the following page and a description of each station is given at the end of this report.

Two boats were used to collect samples on eight days between July 12, 1971,and July 22, 1971. Additionally, the Interstate Sanitation Commission collected samples on July 26, 1971, and both agencies conducted a 24-hour survey at Station 6 from 11:00 A.M. (EST) on July 27, 1971, to 11:00 A.M. (EST) on July 28, 1971. The Interstate Sanitation Commission collected the samples for Stations 1 through 8 and the New Jersey State Department of Environmental Protection personnel sampled Stations 9 through 15. Stations 1 through 8 were sampled twice daily and Stations 9 through 15 were sampled three times a day -- all samples being taken approximately five feet below the surface. All samples, except some on the 24-hour survey, were taken during daylight hours. Determinations were made for the following parameters: temperature, chlorides, dissolved oxygen, fecal coliform density, pH, turbidity, ortho-phosphate phosphorus, nitrate, nitrite and ammonia nitrogen, total carbon, total organic carbon, chromium (hexavalent), copper,


N
LINDEN
RAHWAY RIVER
CARTERET
STATEN ISLAND
KILL
ARTHUR
PERTH AMBOY
SOUTH AMBOY
RARITAN BAY
LOWER NEW YORK BAY
BROOKLYN
CONEY ISLAND
ROCKAWAY
ATLANTIC OCEAN
SANDY HOOK
SANDY HOOK BAY
KEYPORT
KEANSBURG
PORT MONMOUTH
ATLANTIC HIGHLANDS
9
10
11
12
13
14
15
8
1
2
3
4
5
6
7
MILES
0 1 2
RARITAN & SANDY HOOK BAYS
SAMPLING STATIONS
JOINT SURVEY BY
INTERSTATE SANITATION COMMISSION
AND
N.J. STATE DEPARTMENT OF
ENVIROMENTAL PROTECTION
1971

nickel, zinc, cadmium, mercury, and lead. To take advantage of all available facilities, analyses were divided between the laboratories of the two participating agencies. All tests were made using instrumental techniques or according to Standard Methods for the Examination of Water and Wastewater.

The data for each station were analyzed and arithmetic means were calculated for each parameter except fecal coliform density and pH. The geometric mean was computed for fecal coliform density and logarithmic averages were used for pH.

RESULTS

The results obtained at each station are summarized in the table on the following page.

Dissolved Oxygen

The dissolved oxygen ranged from a low average and minimum value of 3.50 mg/l and 1.60 mg/l at Station 9 to a high average value of 9.44 mg/l at Station 6 and a high minimum value of 7.55 mg/l at Station 8. An average value of 10.80 mg/l and a minimum value of 6.80 mg/l were obtained at Station 6 during the 24-hour survey.

Fecal Coliform Density

The averages for the fecal coliform density ranged from a maximum value of 230 organisms/100 ml to a minimum value of "less than" 3 organisms/100 ml.

Other Parameters

The water temperature and chlorides showed little variation at all the sampling stations.

The pH averaged from 6.8 at Station 1 to 8.1 at Station 15. An average pH of 8.1 was also obtained during the 24-hour survey at Station 6.

The values for turbidity at all stations were in the range of 17 to 22 Jackson Turbidity Units.

The values for the nutrients (ortho-phosphate phosphorus and nitrate, nitrite and ammonia nitrogen) were lower

SUMMARY OF RESULTS (A)

STATION	TEMPERATURE	CHLORIDES	D. O.	D.O. (MIN)	FECAL COLIFORM DENSITY (B)	pH (C)	TURBIDITY	ORTHO-PO_4-P	NO_3-N	NO_2-N	NH_3-N
1	21.7	14,830	8.36	6.30	< 17	6.8	17	0.13	0.44	0.08	2.55
2	21.3	14,530	8.15	5.25	< 59	7.0	17	0.12	0.39	0.07	1.50
3	21.3	14,500	8.16	6.65	< 20	7.3	18	0.11	0.43	0.17	3.03
4	22.7	14,210	8.80	7.38	< 6	7.3	18	0.16	0.37	0.13	3.32
5	22.6	14,400	8.15	5.85	< 14	7.2	18	0.18	0.41	0.07	2.93
6	22.2	13,870	9.44	6.85	< 11	7.3	18	0.13	0.41	0.07	2.64
7	22.0	14,100	8.60	6.55	< 15	7.2	18	0.14	0.41	0.08	2.24
8	22.8	13,930	9.16	7.55	< 8	7.2	19	0.16	0.48	0.10	3.19
9	21.7	14,290	3.50	1.60	230	7.7	20	0.18	1.03	0.13	4.44
10	21.3	14,070	3.73	2.40	120	7.5	21	0.23	0.91	0.13	3.73
11	21.2	14,070	4.30	2.70	< 30	7.7	19	0.21	0.86	0.11	3.62
12	21.2	14,280	5.06	2.10	< 7	7.8	21	0.22	0.89	0.12	4.28
13	21.1	14,130	5.97	2.45	< 4	7.9	20	0.21	0.53	0.12	4.57
14	20.9	14,570	5.79	3.40	< 3	7.9	22	0.20	0.79	0.13	3.76
15	20.9	14,830	7.26	5.00	< 3	8.1	22	0.19	0.76	0.17	2.39
(D)	21.9	14,500	10.80	6.80	< 10	8.1	--	0.14	0.69	0.07	---

NOTES:

(A) All values are averages except column headed "D.O. (MIN)" which is the minimum dissolved oxygen value observed at each station. All units are mg/l except Temperature which is °C, Fecal Coliform Density which is the number of organisms per 100 ml, Turbidity which is JTU, and pH.

(B) Geometric Mean

(C) Logarithmic Average

(D) 24-Hour survey taken at Station 6 from 11 A.M., July 27, through 11 A.M., July 28, 1971.

(Continued on Next Page)

SUMMARY OF RESULTS (A) continued

STATION	TOTAL CARBON	TOTAL ORGANIC CARBON	CHLOROPHYLL A	CHROMIUM	COPPER	NICKEL	ZINC	CADMIUM	MERCURY	LEAD
1	36	10	0.018	< 0.01	0.066	0.046	0.055	0.0010	0.00024	0.002
2	35	9	0.021	< 0.01	0.067	0.045	0.043	0.0011	0.00026	0.004
3	34	8	0.020	< 0.01	0.065	0.048	0.063	0.0007	0.00019	0.006
4	34	10	0.010	< 0.01	0.059	0.048	0.045	0.0007	0.00019	0.003
5	35	10	0.010	< 0.01	0.058	0.049	0.040	0.0007	0.00021	0.003
6	35	9	0.012	< 0.01	0.067	0.046	0.045	0.0008	0.00030	0.004
7	34	8	0.018	< 0.01	0.066	0.048	0.049	0.0007	0.00023	0.005
8	34	9	0.018	< 0.01	0.067	0.043	0.052	0.0018	0.00022	0.007
9	36	9	0.017	< 0.01	0.076	0.033	0.111	0.0007	0.00026	0.005
10	38	10	0.017	< 0.01	0.080	0.054	0.124	0.0007	0.00024	0.006
11	37	9	0.018	< 0.01	0.081	0.045	0.119	0.0007	0.00036	0.006
12	37	9	0.025	< 0.01	0.082	0.047	0.121	0.0007	0.00028	0.006
13	36	9	0.021	< 0.01	0.064	0.044	0.109	0.0015	0.00019	0.005
14	36	9	0.016	< 0.01	0.063	0.046	0.154	0.0049	0.00019	0.003
15	35	9	0.020	< 0.01	0.064	0.046	0.149	0.0074	0.00028	0.009
(D)	--	--	0.086	---	-----	-----	-----	------	-------	-----

NOTES:

(A) All values are averages except column headed "D.O.(MIN)" which is the minimum dissolved oxygen value observed at each station. All units are mg/l except Temperature which is ^{o}C, Fecal Coliform Density which is the number of organisms per 100 ml, Turbidity which is JTU, and pH.

(D) 24-Hour survey taken at Station 6 from 11 A.M., July 27, through 11 A.M., July 28, 1971.

at Stations 1 through 8 (Sandy Hook Bay) than at Stations 9 through 15 (Raritan Bay). Zinc values showed this same pattern but the other metals showed little variation at any of the stations except the values of cadmium which were higher at Stations 8, 13, 14, and 15. Total carbon and total organic carbon values also showed little variation at any of the stations.

During the survey period from July 12 through July 22, the chlorophyll A values ranged from 0.010 mg/l to 0.025 mg/l. However, during the 24-hour survey (July 27 and 28), an average value of 0.086 mg/l of chlorophyll A was obtained at Station 6.

SUMMARY AND CONCLUSIONS

(1) A baseline for many parameters has been established for future reference.

(2) The dissolved oxygen requirements of the Interstate Sanitation Commission and the State of New Jersey are met at all stations except Stations 9 through 14. The abatement plans for this area will correct this condition.

DESCRIPTION OF SAMPLING POINTS

STATION 1	Nun buoy N"2" at channel entrance for Compton Creek, Port Monmouth
STATION 2	Flashing Red bell buoy R"6" in Raritan Bay, East Reach Channel
STATION 3	Flashing Green buoy "17" in Sandy Hook Channel, West of Sandy Hook Point
STATION 4	East-West Range -- Largest radar dome on Sandy Hook and south of fish net poles North-South Range -- Line of flashing White bell buoy at Sandy Hook Point and R"2" bell buoy off Navesink Park
STATION 5	Bell buoy R"2" off Navesink Park
STATION 6	Flashing Red private buoy "2" east of the southernmost tip of Leonardo (U.S.N.) pier
STATION 7	Flashing Red buoy R"4" off the tip of Leonardo (U.S.N.) pier
STATION 8	East-West Range -- Line of Nun buoy N"2" at channel entrance to Compton Creek and standpipe on Point Comfort North-South Range -- Approximately 200 yards west of Pews Creek
STATION 9	Mid-channel Under C.R.R. of New Jersey bridge
STATION 10	Flashing Green buoy "3" in Great Beds Reach

STATION 11	Due south of the western edge of Staten Island and in line with the Channel of Cheesequake Creek approximately 700 yards off shore
STATION 12	East-West Range -- Line of flashing buoy "7" at channel entrance of Keyport Harbor and flashing Red buoy at entrance to Cheesequake Creek North-South Range -- Line of flashing Green boundary light and entrance to Whale Creek
STATION 13	Flashing buoy "7" at channel entrance to Matawan Creek in Keyport Harbor
STATION 14	Buoy C"3" off Conaskonk Point at channel entrance to Keyport Harbor
STATION 15	Private flashing Green buoy "1" off Belvedere Beach Point Comfort

COMBINED SEWER OVERFLOW PROGRAM

One of the major problems within the Interstate Sanitation District is that caused by overflows from combined sewers. Although billions of dollars are scheduled to be spent in the District within the next several years to construct secondary treatment plants and upgrade presently existing primary treatment plants to secondary treatment, the problem of combined sewers will remain. Every time it rains, much of the combined rainfall and raw sewage will bypass the treatment plants and directly enter the receiving waters of the District, fouling the waters as well as beaches. It is estimated that after a rainfall, approximately 850 million gallons of this combined untreated sewage will spill through the Narrows. Although it is not feasible to separate the sewers in the District, especially in urban areas, means must be taken to minimize the effects of the combined sewers and to insure the proper operation of existing regulators to minimize the combined sewer effects.

Late last year, the Commission started on a program to study the combined overflow problem. In July of this year, the Commission received a small grant from the United States Environmental Protection Agency to conduct a one-year study of ten combined sewer overflow systems within that portion of the Hudson River Basin lying within the Interstate Sanitation District. These ten systems are: (1) Yonkers, New York; (2) North River, New York; (3) Newtown Creek, New York; (4) Red Hook, New York; (5) Owls Head, New York; (6) Port Richmond, New York; (7) Bayonne, New Jersey; (8) Jersey City, East Side Plant, New Jersey; (9) Hoboken, New Jersey; and (10) West New York Joint Outlet, New Jersey.

The work includes identification and study of these combined sewer systems in order to determine their location, physical characteristics and service areas. The procedures employed include a physical examination of the combined sewer overflow points to determine their location, type, dimensions, and condition of the regulators; a study of available records concerning such overflow points to determine their hydraulic capacity; and characterization of the drainage areas served which includes population densities, land use, and topographic

characteristics.

The Commission will develop and make a report covering its findings as soon as the study is completed.

TREATMENT PLANT OPERATOR TRAINING PROGRAM

In the past year, the Interstate Sanitation Commission has continued its laboratory training course for sewage treatment plant personnel. The Commission's mobile laboratory is used as the laboratory training facility for this course which is necessary for the proper operation of wastewater treatment plants.

In addition to the parameters previously covered which include biochemical oxygen demand, volatile acids, solids, and other tests needed, the Commission with the advent of its new standards adopted in April of this year, now includes fecal coliforms by both the MPN fermentation technique and the membrane filter technique in the parameters covered.

Based upon the inquiries made to the Commission for repeat visits, the parameters already covered will be given to new personnel added since the last visit, and new parameters will be covered as needed.

In addition to the above, the Commission has assisted the State of New York in certifying treatment plant operators by giving the necessary chemistry related tests to the operators as part of their requirements for obtaining operating licenses.

AUTOMATIC DATA PROCESSING

In 1971, the Commission continued to use a CALL/360 Time Share system for its data processing. The Commission has a 2741 Communications Terminal, a card reader, and two Type 35 ASR teletypes hooked up to the CALL/360 system. This equipment provides keyboard and paper tape input and output and card input. The Commission also has facilities to prepare punched cards and paper tape off-line for entry into the data processing system. In December, the Time Share system was converted to a CALL/370 system and the equipment in the Commission office which was previously linked, via a Dataphone, to an IBM 360 Data Processing System is now linked to an IBM 370 Data Processing System.

The Commission's information retrieval system for industries discharging into District waters has been expanded to include all sewage treatment plants discharging into District waters. Whenever the Commission samples a sewage treatment plant or an industry, the sampling results are entered in the computer and reports of the sampling results are generated by the computer. The computer has proven itself an invaluable tool for the generation of these reports with the end result being expeditious transmittal of the reports to the appropriate parties. Information on over 400 industries and sewage treatment plants which discharge into District waters is permanently stored in the computer and any or all of the information can be accessed in real time.

When the High Air Pollution Alert and Warning System in the New Jersey-New York-Connecticut Air Quality Control Region is activated, the Commission's data processing facilities are used to process pollutant data from sampling stations within the Air Quality Control Region. The information is updated hourly and the Commission transmits the latest pollutant information to each participating agency on an hourly basis.

In addition to the applications already mentioned, the Commission's data processing facilities were used to analyze data collected by the Commission during water quality surveys

conducted in the Raritan Bay and in the Hudson River. Additionally, the computer is used for statistical and mathematical analyses and for any other Commission work which requires data handling.

THE COMMISSION LABORATORY

The laboratory facilities of the Interstate Sanitation Commission have continued to be utilized to their fullest extent. In addition to some 24,000 analyses performed on over 1000 samples collected by the Commission during its normal sampling of municipal and industrial facilities, the Commission has conducted water quality survey samplings throughout the year and has continued to analyze samples for State and Federal agencies.

With the adoption of new Commission standards this past April, the laboratory analyses now include fecal coliforms which can be performed by the MPN fermentation technique as well as the membrane filter technique.

The Commission is utilizing its facilities to identify and compare oils submitted to it as the result of spills and, in addition, is conducting an extensive sampling of industrial and municipal effluents to determine the quantities of oils which are being discharged to ascertain whether they are meeting requirements.

INDUSTRIAL SURVEILLANCE PROGRAM

In 1971, the Interstate Sanitation Commission continued its industrial surveillance program by surveying and sampling additional industrial plants within its District. The Commission sampled industries along the Arthur Kill, the Hudson River, New York City, and in Connecticut. Samples were analyzed for a wide variety of parameters including oils and greases, heavy metals, B.O.D., solids, and nutrients.

So as to aid in a strong enforcement program at all levels of government, in addition to the industries sampled by the Commission, the Commission analyzed industrial samples for many Federal and State agencies including the New York State Department of Environmental Conservation, the New Jersey State Department of Environmental Protection, the Corps of Engineers, the U. S. Attorney offices, and the Federal Environmental Protection Agency.

The results of these analyses are stored in a computer and printouts of the results of the analyses are provided to the companies sampled and regulatory agencies which have jurisdiction in the area. This use of computer processing has significantly decreased the time required to provide this data.

III. A I R P O L L U T I O N

NEW YORK,
NEW JERSEY & CONNECTICUT

GENERAL

As the Coordinating and Planning Agency for the New Jersey-New York-Connecticut Air Quality Control Region, the Interstate Sanitation Commission played an active role in 1971 in the initiation and orderly development on a regional basis of several important programs in air pollution.

This year, the Commission's 24-hour answering service continued to receive complaints from citizens in the Region pertaining to odor emissions. A total of approximately 190 complaints were acted upon by the Commission either independently or jointly with other agencies.

The Commission receives daily ambient air quality data from the New York City monitoring stations located at 121st Street and at Cooper Union, three New York State stations, and five stations in New Jersey. This data is subsequently relayed back to the States. The New York City and Newark, New Jersey, data are also sent to the U.S. Environmental Protection Agency. In addition, daily Air Stagnation Forecasts are received from the National Weather Service and are relayed to the States and New York City.

The Commission has two mobile air pollution monitoring units capable of measuring concentrations in ambient air of sulfur dioxide, carbon monoxide, and smoke shade in addition to wind speed and direction. These mobile vans are used to verify readings of the fixed continuous sampling monitoring stations located in the Region during periods of stagnant air.

In addition to the instrument at Arthur Kill in Staten Island, continuous wind speed and direction instruments have been installed at Port Richmond in Staten Island and Port Chester, New York. These instruments telemeter their data continuously into the Commission office in New York City.

REGIONAL AIR POLLUTION WARNING SYSTEM

The first Air Pollution Warning System was put into operation in 1964 and, through coordination by the Interstate Sanitation Commission, has been periodically updated and strengthened in the light of accumulating knowledge of air pollution abatement practices.

This year, a third generation of Air Pollution Warning System criteria were developed and put into effect. This latest modification was a result of a second Mohonk Workshop held in September 1970 and sponsored by the Interstate Sanitation Commission to review the then-current criteria. Personnel attending the Workshop were from the States of New York, New Jersey, Connecticut, Pennsylvania, and Delaware, the Cities of New York and Philadelphia, representatives of the Air Pollution Control Office of the U.S. Environmental Protection Agency, the National Weather Service, and the Interstate Sanitation Commission. Through information obtained in the Workshop and subsequent discussions and meetings by a committee consisting of representatives of the States of New York, New Jersey, and Connecticut and the Interstate Sanitation Commission, the revised criteria were developed (see Table).

Principal new features of the revised Air Pollution Warning System are as follows:

I. Prerequisite

As in the previous criteria document, the prerequisite can be a 36-hour Stagnation Advisory from the National Weather Service with at least 12 hours remaining. Combined with this Stagnation Advisory is the co-condition for entering the Alert that minimum criteria values be met or exceeded at four stations. For the first time, however, an Alert may be entered in the absence of a Stagnation Advisory Forecast taking into account buildup of contaminants under specified localized conditions.

II. Contaminant

The contaminants in the System being used are sulfur dioxide, particulates, carbon monoxide, and for the first time, oxidants. A sulfur dioxide-particulate

CRITERIA FOR THE AIR POLLUTION WARNING SYSTEM

		ALERT				
PREREQUISITE	CONTAMINANT	STAGE I	STAGE II	EMERGENCY	LOWERING OF ALERT STAGE	TERMINATION
A* 36-Hour Stagnation Advisory with at least 12 hours remaining + Contaminant Concentration at or above a Criteria level at 4 stations or	SO_2 or Particulates or	0.3ppm (6-hr.avg.) 5.0 COHs (6-hr.avg.) or 3.0 COHs (24-hr.avg.)	0.5ppm (6-hr.avg.) 7.0 COHs (6-hr.avg.) or 6.0 COHs (24-hr.avg.)	0.6ppm (24-hr.avg.) 7.0 COHs (24-hr.avg.)	From Emergency Stage: If contaminant level(s) decrease(s) to less than Stage II and there is expectation of cleansing of the atmosphere for a period of 24 hours, Stage I of the Alert is in effect.	A. Where system was entered through "Prerequisite A," termination will occur when the Advisory is rescinded; or
B* Contaminant Concentration at or above a Criteria level at less than 4 stations + Expectation that this condition will persist within part of -- or spread throughout -- the Region or	Product SO_2 x Particulates or CO	0.5ppm - COHs (24-hr.avg.) 15ppm (8-hr.avg.)	1.2ppm - COHs (24-hr.avg.) 30ppm (8-hr.avg.)	1.4ppm - COHs (24-hr.avg.) 40ppm (8-hr.avg.)	From Stages I and II: These Stages will be lowered only through termination.	B. Where system was entered through "Prerequisite B," termination will occur when contaminant levels decrease to less than Stage I and there is an expectation of cleansing of the atmosphere for 24 hours; or
C* Oxidants Concentration at or above a Criteria level + Forecast of sunshine and stagnation the following day which leads to an expectation of adverse oxidants concentrations throughout a significant portion of the Region.	Oxidants	0.15ppm (4-hr.avg.)	0.25ppm (4-hr.avg.)	0.35ppm (4-hr.avg.)		C. Where system was entered through "Prerequisite C," termination will occur when oxidants concentrations decrease to less than Stage I and there is no forecast of sunshine and/or stagnation on the following day.

*THE INTERSTATE SANITATION COMMISSION MAY RECOMMEND CALLING AN ALERT BASED UPON AN EVALUATION OF CONDITIONS WHEN LESS THAN 4 STATIONS ARE AT OR ABOVE A CRITERIA LEVEL.

product is also included in the criteria due to concern over synergistic effects.

III. Alert

The Alert is subdivided into Stage I, Stage II, and Emergency. The Emergency stage criteria are contaminant concentrations less than that which would entail imminent and substantial endangerment to health.

Arithmetic average concentrations rather than dosages are used in the revised System.

IV. Data Communications

Smooth functioning of the Air Pollution Warning System during an Alert depends on efficient data interchange and data processing. The Interstate Sanitation Commission has developed a set of computer programs to process and store air quality data.

The Commission and all participating agencies have installed compatible data communications equipment. Each agency has a Type 33 or Type 35 Teletype (or equivalent) with a dataphone or an acoustic coupler capable of sending and receiving both hard copy and 8-Channel ASCII coded paper tape.

This integrated data processing and communication system has been put into operation with the Interstate Sanitation Commission receiving raw pollutant data during an Alert from the various monitoring stations in the New Jersey-New York-Connecticut Air Quality Control Region, performing computations on the data by computer, printing the results and generating a paper tape of the results for communication to the participating agencies.

SUMMARY OF AIR POLLUTION EPISODES

August 18-19, 1971

On August 18, 1971, at 11:00 A.M., the Commission received a 36-hour Stagnation Advisory from the National Weather Service predicting poor ventilation prevailing during this period for extreme southeastern New York and northern New Jersey. This information was relayed to the States and New York City, and a 24-hour watch was started by the Commission.

The Air Stagnation Advisory was discontinued at Noon on August 19th on the basis of projected stronger winds and scattered afternoon and evening showers.

During this period, the pollutant concentrations did not reach a level requiring the calling of Stage I of the Alert system.

October 21-23, 1971

On October 21, 1971, at 11:00 A.M., a 36-hour Stagnation Advisory was received from the National Weather Service predicting widespread poor ventilation due to low windflow in a stationary high pressure system and a temperature inversion in the atmosphere.

A 24-hour watch was started with monitoring of the air quality at the various telemetry stations in the New Jersey-New York-Connecticut Air Quality Control Region. The build-up of air contamination was not sufficient to warrant calling an Alert.

The Stagnation Advisory was terminated at 11:00 A.M. on October 23, 1971.

November 17-19, 1971

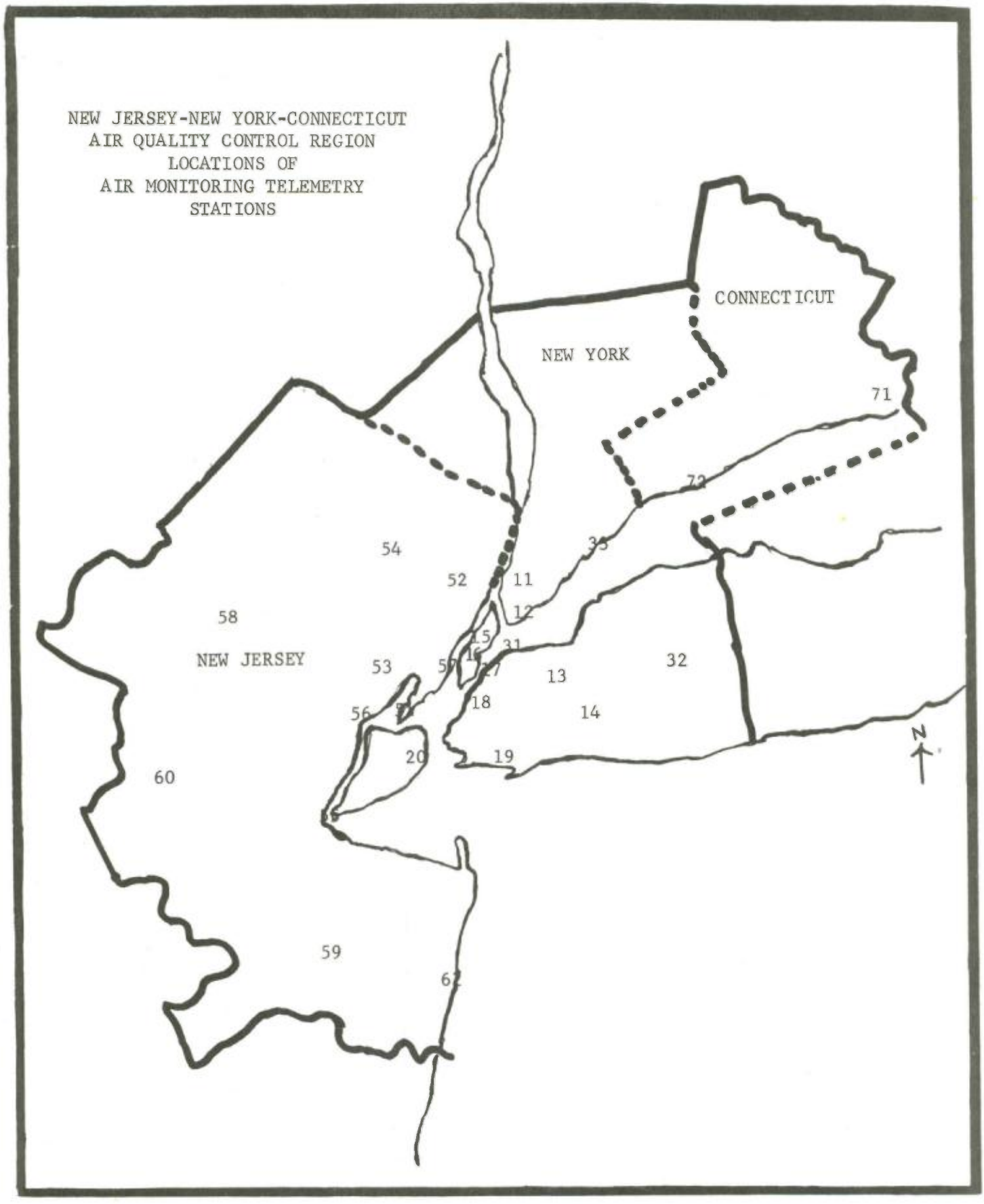
On November 17th, at 4:00 P.M., the Commission received a 36-hour Stagnation Advisory from the National Weather Service predicting a stable, nearly stationary high pressure air mass over the Eastern Seaboard.

On November 19th, at 11:00 A.M., the Air Stagnation Advisory was terminated owing to increasing windflow.

During this period, the pollutant concentration did not reach a level requiring calling of an Alert.

AIR MONITORING TELEMETRY STATIONS

There are 26 air monitoring telemetry stations in the New Jersey-New York-Connecticut Air Quality Control Region operated by the States or by the City of New York. A map of the Region, prepared by the Commission, showing the locations of all these stations based on street addresses and Universal Transverse Mercator (UTM) Coordinates was distributed to the participating agencies for use during air pollution episodes. A reduced scale sketch of this map and the list of stations are shown on the following pages.


NEW JERSEY-NEW YORK-CONNECTICUT
AIR QUALITY CONTROL REGION
LOCATIONS OF
AIR MONITORING TELEMETRY
STATIONS
CONNECTICUT
NEW YORK
NEW JERSEY
71
72
54
52
11
58
12
15
31
53
13
32
18
14
56
20
19
60
59
62
N

LOCATION OF AIR MONITORING TELEMETRY STATIONS

ISC NO.	BOROUGH	CITY	STATE
11	Bronx	New York	New York
12	Bronx	New York	New York
13	Queens	New York	New York
14	Queens	New York	New York
15	Manhattan	New York	New York
16	Manhattan	New York	New York
17	Brooklyn	New York	New York
18	Brooklyn	New York	New York
19	Brooklyn	New York	New York
20	Staten Island	New York	New York
31		New York	New York
32		Hempstead	New York
33		Mamaroneck	New York
51		Bayonne	New Jersey
52		Hackensack	New Jersey
53		Newark	New Jersey
54		Paterson	New Jersey
55		Perth Amboy	New Jersey
56		Elizabeth	New Jersey
57		Jersey City	New Jersey
58		Morristown	New Jersey
59		Freehold	New Jersey
60		Somerville	New Jersey
61		Asbury Park	New Jersey
71		Bridgeport	Connecticut
72		Stamford	Connecticut

IV. LEGAL ACTIVITIES

LEGAL ACTIVITIES

1971 was a year filled with diverse developments having legal significance for the Commission. Each of the major subjects will be discussed in turn.

Water Quality Standards.

In September 1970, a new Article was added to the Tri-State Compact. Its purpose was to authorize the Commission to make both effluent and receiving water standards by administrative action. Previously, the Commission's standards were specifically set forth in the Compact. Although these standards have served well for many years, they could not be changed to keep abrease of new conditions or to embody additional water quality control techniques.

The standards which the Commission can now make are not necessarily intended to replace those contained in specific terms in the Compact. They may be either in addition to or in substitution for the older standards.

After considerable preparatory work, the Commission held hearings on proposed standards in February 1971. These were in Newark, New Jersey, on February 17th; Bridgeport, Connecticut, on February 18th; and New York City on February 19th. Thereafter, the Commission reconsidered its original proposals in the light of the testimony adduced at the hearings and made certain changes. The standards were adopted by the Commission at its meeting of March 3, 1971, with an effective date of April 15, 1971. The text of the standards is appended to this report.

Long Island Sound Conference.

Early in the year, the Commission was informed that the Environmental Protection Agency of the Federal Government proposed to hold a Conference under Section 10 of the Federal Water Pollution Control Act. The subject was to be the waters of Long Island Sound.

Since the Commission's jurisdiction includes the entire western portion of the Sound up to a line from the easterly side of New Haven Harbor to the opposite Long Island shore, we were again in the role of a conferee. The Conference held on April 13-14 determined that in the main, the waters of the Sound are in good condition and that such problems as

do exist are the subjects of construction already in progress and of orders for abatement. The conferees agreed to recommend courses of action which were in effect continuations of the measures being taken by the States of Connecticut and New York, the Interstate Sanitation Commission, and the Federal agencies.

Federal Permits for Waste Discharges.

In December 1970, an Executive Order of the President broadened the administrative applicability of the Army Engineers permit system under the Refuse Act of 1899. That statute was a little known enactment requiring permits for the discharge of wastes into navigable waters of the United States, except for discharges from municipal waste disposal facilities and street runoff.

Despite the sweeping nature of the law, it had not been enforced, except in a few geographic areas and on a very small scale. Consequently, the Executive Order may justly be said to have ushered in a new pollution control program, even though the statute on which it rested was over seventy years old.

The sudden appearance of the new program and its magnitude have combined to make the past year a difficult one characterized by much confusion. On a nationwide basis, it has been estimated that forty thousand or more industrial waste sources must now apply for and receive Army Engineers permits, if they are to be in lawful operation. Because of the heavy concentration of industry in the Interstate Sanitation District, many hundreds of these sources are within the jurisdiction of the Commission. Under the new system, the appropriate state water quality agencies must certify as to the likely effects of each proposed discharge on their water quality standards. Difficult informational, factual, and analytical questions are raised.

In order to reduce the complexities of the certification system and to make sure that duplicate certifications from agencies of the individual states and the Commission are not required, agreements were drawn after consultation with each of the party states. Under them, the Commission acts to gather and analyze data concerning permit applications and the sources they cover within the Interstate Sanitation District. The information, together with the Commission's recommendations, are then transmitted to the state concerned

and the subsequent state certification action represents the determination of both the state and the Commission.

It should also be pointed out that the processing of the certifications also involves consultations with industrial establishments in order to determine what discharges would be acceptable. The Commission has participated in a number of these consultations.

The Commission now has agreements covering this work with New Jersey and New York. A similar agreement with Connecticut has been delayed because of the administrative reorganization of the environmental functions of the Connecticut State Government pursuant to legislation that did not take effect until October 1, 1971.

Other Matters.

Much of the work of Counsel cannot be classified under major headings. It consists of the furnishing of advice on policy and administrative matters on a continuing basis. In total amount, this work bulks large, but the items are not of the type meriting inclusion in an annual report. During the past year, Counsel has served the Commission in these matters as well as in the work on the larger program subjects summarized earlier in this report.

INTERSTATE SANITATION COMMISSION: WATER QUALITY REGULATIONS

Pursuant to the authority conferred upon the Interstate Sanitation Commission by the provision variously demoninated as Article XVII or Article 7.3 of the Tri-State Compact, the following classifications of waters of the Interstate Sanitation District requirements therefor are in effect from and after April 15, 1971.

1. General

1.01. All waters of the Interstate Sanitation District (whether of Class A, Class B, or any subclass thereof) shall be of such quality and condition that they will be free from floating solids, settleable solids, oil, grease, sludge deposits, color or turbidity to the extent that none of the foregoing shall be noticeable in the water or deposited along the shore or on aquatic substrata in quantities detrimental to the natural biota; nor shall any of the foregoing be present in quantities that would render the waters in question unsuitable for use in accordance with their respective classifications.

1.02. No toxic or deleterious substances shall be present, either alone or in combination with other substances, in such concentrations as to be detrimental to fish or inhibit their natural migration or that will be offensive to humans or which would produce offensive tastes or odors or be unhealthful in biota used for human consumption.

2. Classification of Waters

2.01. There are two classes of waters within the Interstate Sanitation District: Class A (waters suitable for recreation, shellfish culture and development of fishlife), and Class B (waters not suitable primarily for recreation, shellfish culture and development of fishlife). Class B shall be divided into two subclasses to be known respectively as "B-1" and "B-2." In addition to the general requirements set forth in Section 1 of these regulations, requirements for each class, subclass and effluent are as set forth below.

2.02. Streams and other water bodies shall have a minimum dissolved oxygen content in accordance with their respective classifications as follows:

A: 5 parts per million.
B-1: 4 parts per million.
B-2: 3 parts per million.

2.03. In addition to meeting the dissolved oxygen requirements set forth in Section 2.02 hereof, waters shall in all respects be suitable for their best intended uses, as follows:

A: Suitable for primary contact recreation. Also suitable in designated areas for shellfish harvesting.

B-1: Suitable for fishing and secondary contact recreation.

B-2: Suitable for fish survival, passage of anadramous fish and for any other reasonable purposes compatible with their use for navigation.

2.04. As used in these regulations:

2.04(a). "Primary Contact Recreation" means recreational activity that involves significant ingestion risk, including but not limited to wading, swimming, diving, surfing, and water skiing.

2.04(b). "Secondary Contact Recreation" means recreational activity in which the probability of significant contact with the water or water ingestion is minimal including but not limited to boating, fishing, and shoreline recreational activity involving limited contact with surface waters.

2.05. Effluents discharged or flowing into waters of any class shall meet the following requirements:

2.05(a). pH within the range from 6.5 to 8.5 may be required if the receiving waters are outside this range.

2.05(b). Fecal Coliform levels shall not exceed 200 per 100 ml at any time when disinfection is required to protect the best intended uses of the waters in question.

2.05(c). Biochemical Oxygen Demand removal shall not be less than 80 percent. In addition, a discharge from

an industrial source shall meet any requirements for effluent quality imposed by permit or otherwise pursuant to state law.

2.05(d). Settleable Solids removal shall be at least 90 percent.

2.05(e). All wastes shall be of a character that will not violate or cause violation of the requirements contained in Section 1 "General."

3. Consistency with States.

3.01(a). The following waters of the Interstate Sanitation District are hereby classified as Class A:

(1) the East River east of the Whitestone Bridge and extending out and including the Long Island Sound waters west of a line from the easterly side of New Haven harbor at Morgan Point in Connecticut to the easterly side of Port Jefferson harbor in New York;

(2) the Hudson River from the New York-New Jersey State Line opposite Hastings-on-Hudson to the Bear Mountain Bridge;

(3) the Raritan River east of the Victory Bridge and into Raritan Bay and to the lower end of the Arthur Kill on a line drawn from the southernmost point of Staten Island to the southernmost point of Perth Amboy;

(4) Sandy Hook Bay;

(5) the lower New York Bay northerly to a line drawn from the tip of Fort Wadsworth on Staten Island to the tip of Seagate in Brooklyn;

(6) the Atlantic Ocean and the estuaries and tidal waters thereof west of the easterly side of Fire Island Inlet and continuing into lower New York Bay.

3.01(b). The following waters of the Interstate Sanitation District are hereby classified as Class B-1:

(1) the Hudson River south of a line from the New York-New Jersey State Line opposite Hastings-on-Hudson south and including the portion of the Harlem River to the Washington Bridge and into the Upper New York Harbor and the portion of the Lower Bay which is north of a line from Fort Wadsworth in Staten Island to the tip of Seagate in Brooklyn. For the purposes of these regulations, the Upper New York Harbor terminates at the mouth of the Kill Van Kull (at a north-south line drawn from the northernmost point of Staten Island to the easternmost point at Constable Hook in Bayonne) and to the mouth of the East River (a true east-west line passing through the southernmost tip of Manhattan Island at the Battery and extending to the east shore of the East River in Brooklyn);

(2) the waters of the Upper East River north and east of a line between Hunts Point in the Bronx and Sanford Point in Queens and including those waters up to the Whitestone Bridge;

(3) the lower portion of the Arthur Kill north of a line from the southernmost part of Staten Island to the southernmost part of Perth Amboy and south of Outer Bridge.

3.01(c). The following waters of the Interstate Sanitation District are hereby classified as Class B-2:

(1) the waters of the Arthur Kill north of Outer Bridge and into and including the Newark Bay up to the mouths of the Passaic and Hackensack Rivers and into the Kill Van Kull west of a north-south line drawn from the northernmost point of Staten Island to the easternmost point at Constable Point in Bayonne;

(2) the lower East River north of a true east-west line passing through the southernmost tip of Manhattan Island to the Battery extending to the east shore of the East River in Brooklyn up to west of a line drawn from Hunts Point, Bronx, to Sanford Point in Queens and into the Harlem River up to and

including the waters south of the Washington Bridge.

3.02. The classifications made by these regulations shall be governed by and implement any water and related land resource plans, water use plans, or pollution control plans adopted by appropriate agencies of the signatory states. To this end particular waters within a geographic area designated by these regulations as belonging to a given class or subclass shall, not withstanding such designation, be deemed to belong to the class or subclass which is appropriate for the use or uses prescribed in the state water and related land resource plan, water use plan, or pollution control plan of the state in which the waters in question are situated and which is applicable thereto.

4. Extent to Which Previous Requirements Superseded

4.01. These regulations impose requirements which are in addition to those prescribed in Article VII of the Tri-State Compact. Requirements of said Article VII remain in effect and will be enforced by the Interstate Sanitation Commission except to the extent that they are inconsistent with or less stringent than requirements set forth in these regulations.

5. Policy

5.01. It is recognized that requirements with respect to the treatment and discharge of liquid wastes are subject to change from time to time and that an upgrading of requirements and standards may occur as circumstances make appropriate.

5.02. Nothing in these regulations shall be construed to encourage or give the sanction of the Interstate Sanitation Commission to the degradation of any waters which may be of a quality higher than necessary to meet the requirements of these regulations.

A P P E N D I X

WASTEWATER TREATMENT PLANTS
Discharging into the
INTERSTATE SANITATION DISTRICT

WASTEWATER TREATMENT PLANTS
Discharging into the
INTERSTATE SANITATION DISTRICT WATERS
1971

Plant	ISC Receiving Water Classification	Date of Const.	Flow MGD Average	Flow MGD Design	Type of Treatment	Estimated Population Served
CONNECTICUT						
Fairfield County						
Bridgeport - East Side	B-1	1950+	10.6	14.0	Primary	47,000
- West Side	B-1	1951+	24.3	18.0	Primary	109,000
Darien	A	1956+	1.2	1.2	Primary	6,500
Fairfield	A	1967+	3.9	6.0	Secondary (AS)	30,000
Greenwich - Central	A	1964+	6.4	8.5	Secondary (AS)	42,000
Norwalk	B-1	1953+	9.0	30.0	Primary	55,000
Stamford	B-1	1943+	12.3	10.0	Primary	60,000
Stratford	A	1953+	7.1	5.0	Primary	40,000
Westport	A	1960	0.6	0.6	Secondary (AS)	5,000
New Haven County						
Milford - Beaver Brook	A	1970	0.015	3.2	Secondary (AS)	
- Gulf Pond	A	1960	2.2	2.5	Secondary (AS)	6,000
- Harbor	A	1937	0.7	0.5	Secondary (AS)	4,000
- Town Meadows	A	1954	1.6	1.2	Secondary (AS)	10,000
New Haven - Boulevard	B-1	1959+	14.5	13.0	Primary	63,100
- East Shore	B-1	1953+	7.1	12.5	Primary	35,000
- East Street	B-1	1966+	15.4	22.5	Primary	67,100
West Haven	B-1	1969+	5.9	23.0	Primary	40,000
NEW JERSEY						
Bergen County						
Edgewater	B-1	1958+	2.1	4.0	Primary	5,000
Hudson County						
Bayonne	B-2	1954	8.1	20.0	Primary	73,000
Hoboken	B-1	1958	13.0	20.0	Primary	70,000
Jersey City - East Side	B-1	1967+	37.1	45.4	Primary	160,000
- West Side	B-2	1967+	13.6	36.0	Primary	110,000
Joint Outlet (West New York)	B-1	1953	5.9	7.5	Primary	50,000
Kearny	B-2	1955	2.9	4.0	Primary	30,000
North Bergen - Woodcliff	B-1	1962	1.7	4.4	Primary	14,741
Middlesex County						
Carteret	B-2	1953	2.9	3.0	Primary	21,000
Madison Township Sewerage Authority - Laurence Harbor	A	1963+	0.6	1.4	Primary	8,000
Middlesex County Sewerage Authority	A	1965+	69.7	78.0	Primary	500,000
Perth Amboy	A	1934	6.7	10.0	Primary	41,000
Rahway Valley Sewerage Authority	B-2	1937	34.3	35.0	Primary	68,000
Sayreville - Melrose	A	1949	0.02	0.1	Primary	1,000
- Morgan	A	1951	0.15	0.3	Primary	2,000
South Amboy	A	1940	0.7	1.0	Primary	9,000
Woodbridge	B-2	1954	6.2	10.0	Primary	25,000
Monmouth County						
Atlantic Highlands	A	1928	0.3	0.6	Primary	4,100
Highlands	A	1928	0.4	1.2	Primary	3,500
Keansburg	A	1964+	1.8	5.0	Primary	6,900
Keyport	A	1962+	0.6	2.9	Primary	6,400
Union County						
Elizabeth Joint Meeting	B-2	1958+	63.7	100.00	Primary	465,000
Linden-Roselle	B-2	1952	13.5	12.5	Primary	66,000
*Humble Oil-Bayway Refinery	B-2	1970	-	-	Primary	Industrial
Essex County						
**Passaic Valley	B-1	1937+	250.0	-	Primary	2,899,000
NEW YORK						
Nassau County						
Belgrave Sewer District	A	1965+	1.3	2.0	Secondary (TF)	15,000

WASTEWATER TREATMENT PLANTS
Discharging into the
INTERSTATE SANITATION DISTRICT WATERS
1971

Plant	ISC Receiving Water Classification	Date of Const.	Flow MGD Average	Flow MGD Design	Type of Treatment	Estimated Population Served
NEW YORK (continued)						
Nassau County (continued)						
Cedarhurst	A	1934+	1.0	1.5	Secondary (TF)	7,000
Freeport	A	1960+	3.8	6.0	Secondary (TF)	40,000
Glen Cove - Morgan Island Estates	A	1948	-	-	Septic Tank	-
- Morris Avenue	A	1965+	4.9	2.7	Secondary (TF)	25,000
Great Neck Sewer District	A	1962+	2.5	2.7	Secondary (TF)	14,000
Great Neck Village	A	1948+	1.1	1.5	Secondary (TF)	9,000
Jones Beach	A	1951	0.13	1.0	Secondary (TF)	Seasonal
Lawrence	A	1966+	0.7	1.5	Secondary (TF)	6,000
Long Beach	A	1953+	7.5	6.6	Secondary (TF)	29,000
*Long Island Lighting Company (Glenwood Landing)	A	1929	-	-	3-Septic Tanks	Industrial
Nassau County Sewer District #1	A	1961	2.0	2.5	Secondary (TF)	9,000
Nassau County Sewer District #2	A	1962+	65.6	60.0	Secondary (AS)	600,000
Oyster Bay Sewer District	A	1965+	1.2	1.2	Secondary (AS)	6,000
Port Washington Sewer District	A	1952+	2.8	3.0	Secondary (TF)	25,000
*Quantitative Biology Laboratory	A	1965	-	0.008	Imhoff Tank Plus Sand Filter	40
Roslyn	A	1950+	0.4	0.45	Secondary (TF)	3,000
West Long Beach Sewer District	A	1960+	0.6	1.5	Secondary (TF)	Seasonal
NEW YORK CITY						
Bronx County						
City-Hart Island	A	1942	1.0	1.5	Primary	5,000
Hunts Point	B-2	1965+	145.9	150.0	Secondary (AS)	770,000
Orchard Beach	A	1945+	Seasonal	0.1	Primary	Seasonal
Kings County (Brooklyn)						
Coney Island	A	1965+	92.8	110.0	Secondary (AS)	535,000
Newtown Creek	B-2	1967	169.0	310.0	Intermediate (AS)	2,500,000
Owls Head	B-1	1952	97.1	160.0	Intermediate (AS)	750,000
26th Ward	A	1951+	72.0	60.0	Secondary (AS)	385,000
New York County (Manhattan)						
Dyckman Street	B-1	1917	5.0	7.5	Screening	39,000
Wards Island	B-2	1948+	245.5	220.0	Secondary (AS)	1,470,000
Queens County						
Bowery Bay	B-2	1958+	105.3	120.0	Secondary (AS)	1,000,000
Jamaica	A	1965+	93.0	100.0	Secondary (AS)	415,000
Rockaway	A	1961+	19.2	30.0	Secondary (AS)	90,000
Tallman Island	B-1	1964+	59.7	60.0	Secondary (AS)	251,000
Richmond County (Staten Island)						
*Daytop Village	A	-	-	-	Septic Tank	-
*Elmwood Homes	B-2	-	-	-	Extended Aeration	-
*Heartland Village	B-2	-	-	-	Extended Aeration	-
*Mount Loretto Home - Plant #1	A	-	-	-	Septic Tank	-
- Plant #2	A	-	-	-	Septic Tank	-
Oakwood Beach	A	1956	17.3	15.0	Secondary (AS)	85,000
Port Richmond	B-2	1953	14.6	10.0	Primary	60,000
*Public School #7	A	1965	-	-	Extended Aeration	2,200
*Richmond Memorial Hospital	A	1936	-	-	Septic Tank	-
*Saint Joseph's School	A	1965	-	-	Extended Aeration	910
Rockland County						
*Federal Paperboard Company Inc.	A	1954+	2.5	3.0	Secondary	Industrial
Haverstraw	A	1940	-	1.0	Primary	6,000
*Jewish Convalescent Home - Grandview	A	-	-	-	Septic Tank	-
*Kay-Fries Chemicals, Inc.	A	1966	-	0.01	Neutralization	Seasonal
Joint Regional Sewerage Board-Town of Haverstraw	A	1971	-	4.0	Secondary (AS)	10,000
Nyack	A	1940	1.1	1.0	Primary	6,000

WASTEWATER TREATMENT PLANTS
Discharging into the
INTERSTATE SANITATION DISTRICT WATERS
1971

Plant	ISC Receiving Water Classification	Date of Const.	Flow MGD Average	Flow MGD Design	Type of Treatment	Estimated Population Served
NEW YORK (continued)						
Rockland County (continued)						
Orange & Rockland Utilities	A	-	-	-	Septic Tank	Industrial
Orangetown Sewer District	A	1967+	5.7	8.5	Secondary (TF)	6,100
Palisades Interstate Park						
(Bear Mountain Plant)	A	1951+	0.10	0.3	Secondary (TF)	Seasonal
(Tallman Mountain Plant)	A	1969	Seasonal	0.024	Primary	Seasonal
Rockland County Sewer District #1	A	1968	10.7	10.0	Secondary (AS)	-
**South Nyack	A	1941	0.3	0.6	Imhoff Tank	3,100
Stony Point	A	1969	0.6	1.0	Secondary (AS)	1,000
Upper Nyack	A	1953	0.07	0.1	Imhoff Tank	1,500
Suffolk County						
Huntington Sewer District	A	1957+	1.6	2.0	Secondary (TF)	34,700
*Kings Park State Hospital	A	1964+	0.8	2.0	Secondary (AS)	9,500
*Longwood Harbor Apartments	A	1968	0.03	0.1	Secondary	-
Northport	A	1949+	0.17	0.5	Imhoff Tank	6,000
Port Jefferson Sewer District	A	1963+	1.4	1.5	Primary	2,000
Westchester County						
*American Yacht Club (Rye)	A	-	Seasonal	-	2-Septic Tanks	Seasonal
Briarcliff Manor - River Road	A	1951+	-	-	Septic Tank	200
- Scarborough Dock	A	1926+	-	-	Septic Tank	1,500
Buchanan	A	1962	0.1	0.55	Secondary (AS)	-
*Coach Light Square Condominiums	A	1971	-	0.06	Secondary (AS)	-
Croton-on-Hudson	A	1951	0.87	0.75	Primary	7,000
Irvington	A	1950	0.8	1.0	Primary	5,500
*Metropolitan Petroleum Corporation	A	1954	-	-	Septic Tank	-
*Penn C.R.R. Harmon Shop (Croton)	A	1941+	0.14	0.7	Primary	Industrial
North Tarrytown	A	1940+	1.4	1.7	Primary	8,800
Ossining - Liberty Street	A	1939	0.4	1.0	Imhoff Tank	3,000
- Water Street	A	1940	1.7	5.0	Primary	16,000
Peekskill	A	1953	2.1	4.0	Primary	19,000
Port Chester	B-1	1965+	4.6	6.0	Primary	27,000
*Shell Union Oil Co. (Mount Vernon)	A	1949+	-	-	Septic Tank	Industrial
*Shenerock Shore Club (Rye)	A	-	Seasonal	-	Septic Tank	Seasonal
*Sing Sing State Prison (Ossining)	A	1950+	0.2	0.6	Primary	2,000
Springvale	A	1959	0.08	0.1	Secondary (TF)	1,000
Tarrytown	A	1940+	1.2	1.5	Primary	11,100
Westchester County D.P.W.						
Blind Brook (Rye)	A	1963+	2.0	5.0	Primary	23,000
Mamaroneck	A	1965+	17.0	70.0	Primary	95,000
New Rochelle	A	1955+	12.6	15.0	Primary	75,000
Yonkers Joint Meeting	B-1	1960+	66.0	60.9	Primary	475,000
FEDERAL & MILITARY						
Camp Smith - (Westchester Co.)	A	-	-	-	Secondary (TF)	-
Earle Naval Ammunition (Monmouth Co.)	A	-	-	-	Imhoff Tank Plus Sand Filter	-
FDR Veterans Administration Hospital (Westchester Co.)	A	-	-	-	Secondary (TF)	-
Military Ocean Terminal (Hudson Co.)	B-2	-	-	-	Imhoff Tank	-

\+ Year of major additions or reconstruction

* Private, institutional and industrial sewage treatment plants

** Estimated Flows

(AS) Activated Sludge

(TF) Trickling Filter