

## P A S S A I C   V A L L E Y   W A T E R   C O M M I S S I O N

Passaic Valley Water Commission is owned by the cities of Paterson, Passaic and Clifton.

It is managed and operated by a Commission consisting of seven (7) members - three (3) from Paterson, two (2) from Passaic and two (2) from Clifton.

The Commissioners are appointed by the governing bodies of the owner cities for a term of four (4) years.

Passaic Valley Water Commission, through its owner cities is a partner in the Wanaque-Ramapo Projects, owning 37.75% of the Projects.

The Wanaque-Ramapo Projects are managed and operated by North Jersey District Water Supply Commission for the owner cities. This Commission has five (5) members appointed by the Governor for a term of four (4) years.

Passaic Valley has a grant from the State for 75 MGD from the Passaic River and as a partner in the Wanaque-Ramapo Projects, is entitled to 40 MGD from the Projects, making a total supply of 115 MGD. 101

The pumping capacity of the Little Falls Filtration Plant is 120 MGD. 1

Passaic Valley has four (4) reservoirs and two (2) storage tanks.

### R E S E R V O I R S

	<u>Capacity</u>
Point View	2.9 B.G.*
Great Notch	178.5 M.G.
New Street	56.0 M.G.
Grand Street	20.0 M.G.

### T A N K S

Paterson-Totowa	150,000 GAL.
Prospect Park	100,000 GAL.

\*Raw Water



# PASSAIC VALLEY WATER COMMISSION

## LITTLE FALLS TREATMENT PLANT PROJECT

### PRESENT COMMISSIONERS

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STANLEY M. LEVINE, Vice President  
LOUIS G. TRELLA, Commissioner  
WILLIAM DIECH, Commissioner

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PAUL G. DeMURO, Passaic  
JOSEPH J. VANECEK, Clifton

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EUGENE L. BOYLE, JR.



JEAN L. FIVEHOUSE  
Secretary

NEWTON A. ROEMER  
Counsel and General Attorney

CHARLES G. BOURGIN  
General Supt. and Chief Engineer

HAVENS and EMERSON, Consultants

1966



### DEDICATION

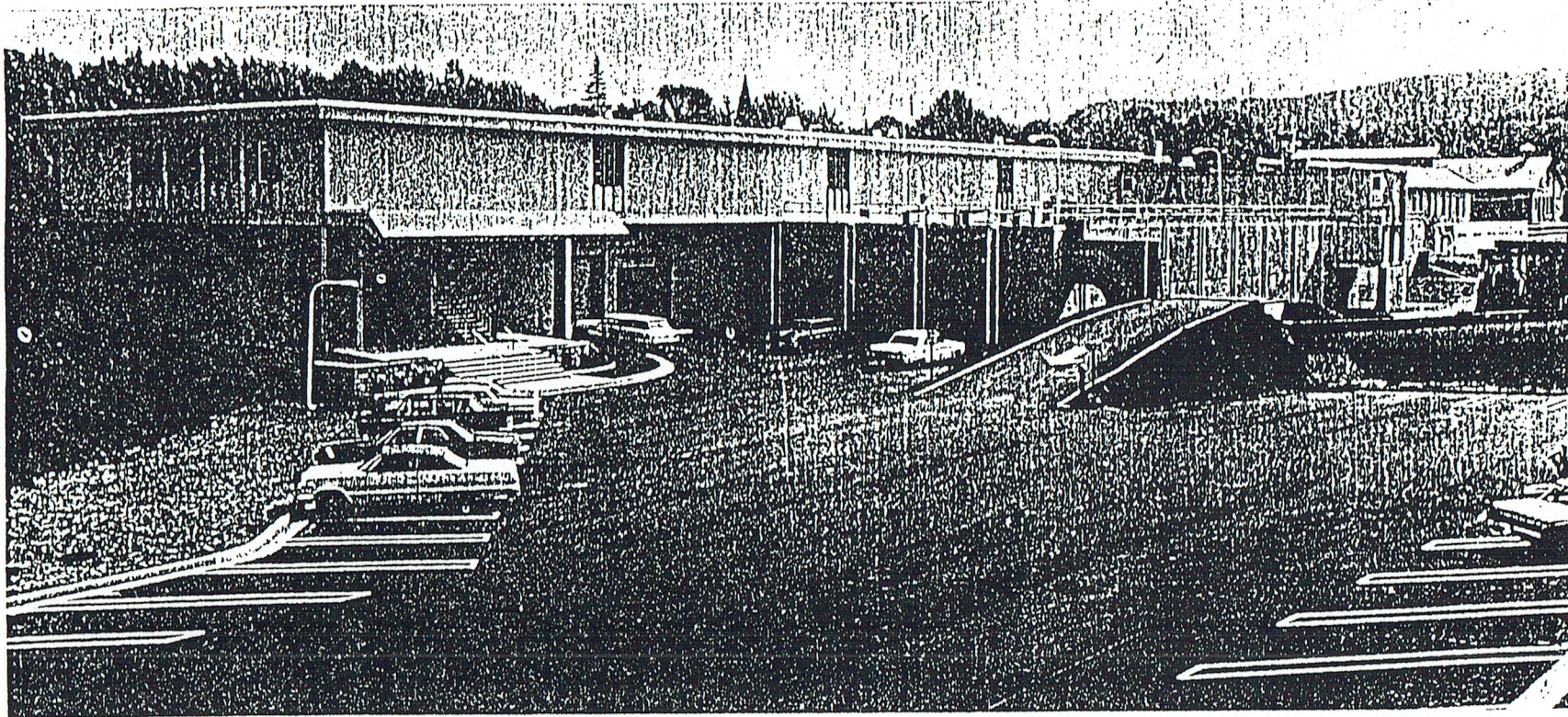
LITTLE FALLS GRAVITY WATER FILTRATION PLANT  
IMPROVEMENT AND ENLARGEMENT

SEPTEMBER 8, 1966

AT LITTLE FALLS

TOTOWA, NEW JERSEY





## CONTROL BUILDING

Seen from River View Avenue — looking across parking lot toward new basins

The Control Building, in left foreground, is entered from the new parking lot served from the River View Avenue entrance. At extreme right are the uncovered 1913 coagulation basins, to be modernized and covered in the next Phase of work.

The ramp and emerging pipe at the new flocculation basins are temporary. The raw water conduits to be constructed in the next Phase will form a bridge structure over a lower road with a Connecting Passage to the Chemical Building on top. The start of the new conduits and Passage are in middle ground atop Flocculation Basin No. 4, starting at the juncture of the Control and New Filter Buildings.

The gravity water filtration plant at Little Falls, dating from 1902, is at the rear. The superstructure of these filters, still standing, will be replaced with construction matching the new filters later in the program. The 1902 coagulation basin, now converted to clear well, wash water storage, pump control panel, electrical substation and storage room are in the several levels together with new filters, pipe and operating galleries.

In the Control Building, the large doors enter the Meeting Room, and the stair leads to offices and laboratories. Adjacent the Meeting Room is the Garage, with maintenance shops beyond. The Garage, for staff vehicles only, serves as an access portal for vehicles to the river side of the basins and clear wells for inspection and maintenance. The restricted site made it necessary to cantilever part of the road over the river bank.



# LITTLE FALLS GRAVITY WATER FILTRATION PLANT

## HISTORY AND DEVELOPMENT

Starting in 1899 raw water taken from the Passaic River at Beattie's Dam, Little Falls, was pumped directly into a consumer distribution system, without treatment.

The full historical importance began in 1902 when the gravity water filtration plant was put into operation with a capacity of 30 million gallons a day (mgd). Engineer George W. Fuller made engineering history by the composite use of several known principles, and some innovations, in the design. The first use in the United States of the gravity rapid sand filter principle is best remembered. Even today the plant is copied in theory. The innovations were the use of square, rather than cylindrical, and reinforced concrete, rather than wood or steel, filters.

Also application of the coagulant aids was transferred from the point where raw water flowed to the filters to the point where treated water entered a detention basin in which it was held for a period to permit chemical reaction and flocculation. Also, bottom fed compressed air was used to agitate the filter sand rather than top rake stirring as an aid in cleansing before the reverse flow wash.

Some of the features of the original plant are still in use, although additions and renovations have been carried out through the years. The major enlargement and modernization started in 1962 has saved as much as possible of what was good, and either modernized or converted the use. As an example, the original clear well was saved structurally, as the concrete tested at over 11000 psi compressive strength, probably due to the long water cure.

The first contract in the current program included a new upstream gravity intake separate from the culverts for power generating water. This assured a more dependable raw water source for both the plant and generating station. A submerged weir with surface rack eliminates much of the bottom sediment and surface flotsam. The latter is sluiced back to the power canal. Compressed air is now injected at the intake to deter ice formation. A new screen house with two traveling screens was built, as well as a new covered channel to handle aeration. Foam from the aeration process is sluiced to the River.

Two new carbon storage tanks were built. Each will hold 44000 pounds of activating carbon delivered from a railroad car. Carbon slurry and feed

equipment was added in a new two-story building. The slurry discharges by gravity to either weir or discharge channel from the screen house.

The entire plant had to remain in full operation through all work accomplished to date. Hence temporary pumping facilities and conduits were built. The nominal capacity of the enlarged and completely modernized plant will make it possible for the Commission to process that daily volume of water from the intake at Little Falls to which it has rights of ownership. This, supplemented by full use of the capacity rights in the Wanaque-Ramapo System, will supply the estimated average daily and maximum day consumption of the territory served by the Passaic Valley Water System through 1985.

The new low lift pumps which deliver raw water in two conduits through the Parshall Flumes under the Chemical Building, also serve as a rapid mixer of chemicals.

Most of the construction recently completed under Phase I of the second contract is described and pictured on the opposite and following pages. However, some interesting facets of the enlarged plant should be mentioned. The division of the raw water flow into two separate courses to the two groups of filters allows parallel flow and controlled test at full plant output of various modifications in treatment.

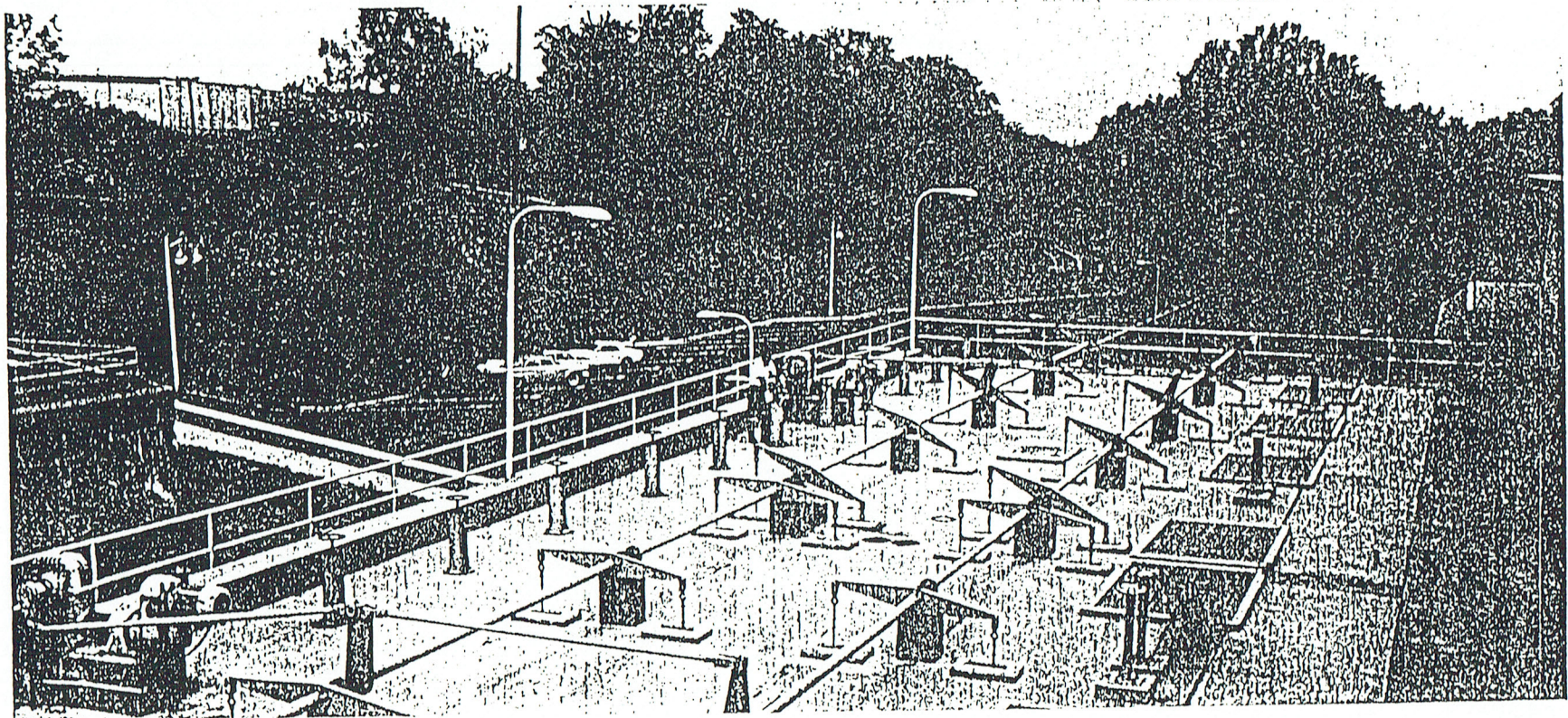
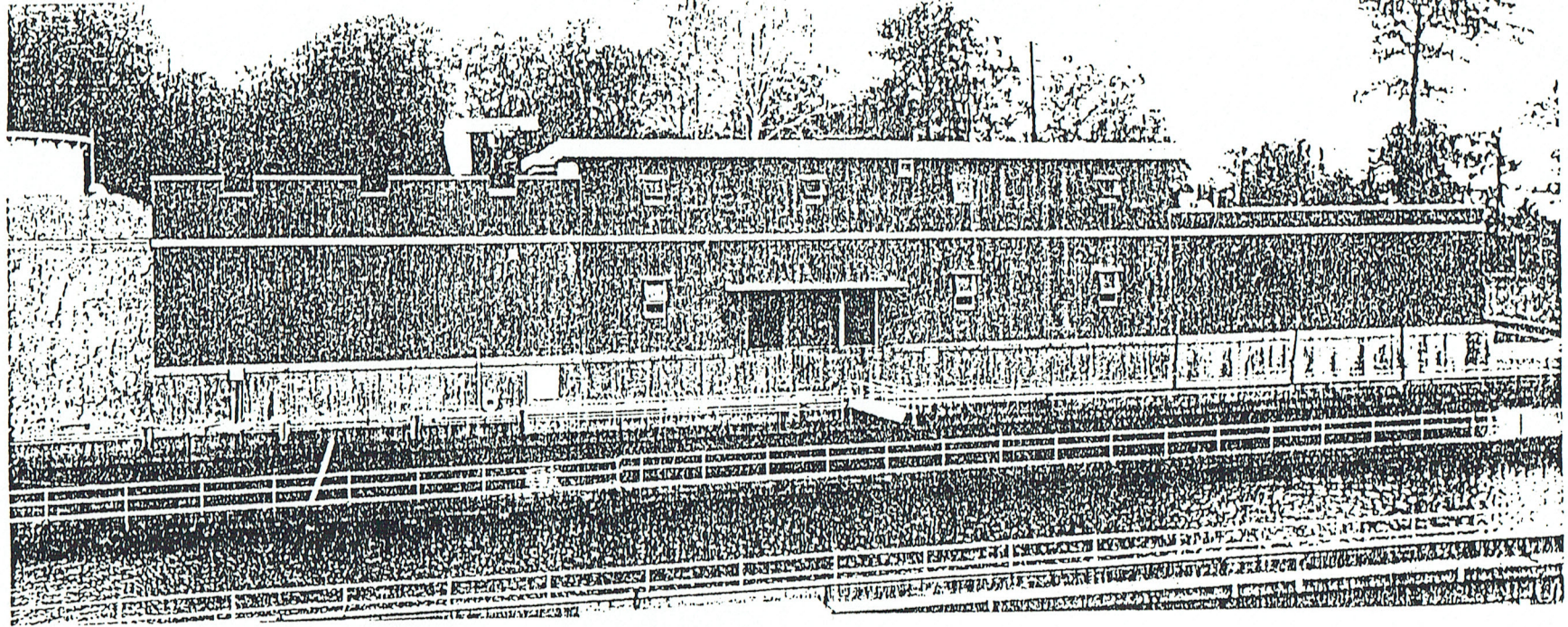
As an added safeguard larger chemical treatment capabilities are provided than in plants of comparable size. This is to handle further additives, if needed to maintain production of high quality finished water.

In dedicating the enlarged plant the progressiveness of the Commission should be noted for the incorporation of numerous outstanding training aids and specially designed facilities for training water works personnel, as well as teaching students and the public the pure water production process and the value of pure water — man's greatest need.

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The Passaic Valley Water Commission acknowledges with gratitude the financial aid of the United States Government in making available \$1,000,000 in Federal funds under Project No. APW-N.J.-58 to help pay the cost of the recently completed work. This was under the Accelerated Public Works Program of the Community Facilities Administration, Housing and Home Finance Agency.

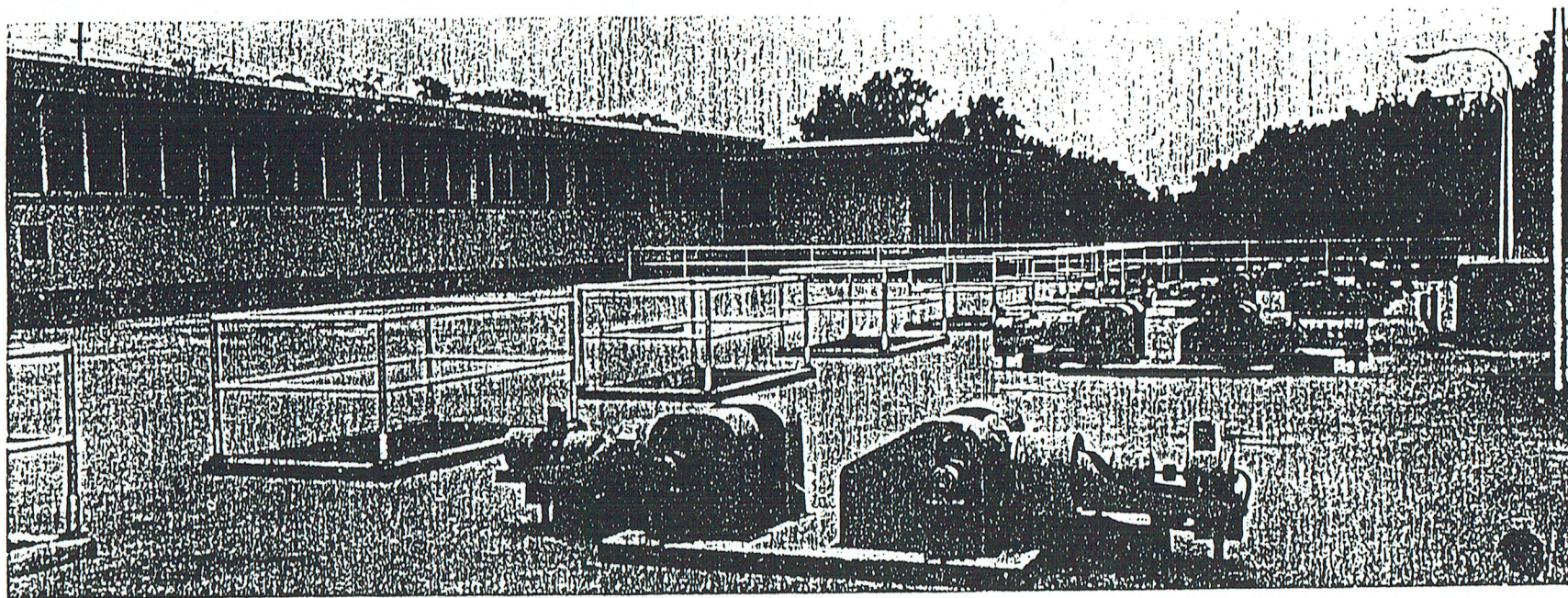






◀ **CHEMICAL BUILDING** The left wing contains the low lift pumps which mix raw water and chemical additives. The building is above the two Parshall Flumes and twin conduits which deliver water to the flocculation basins. Ample unloading and storage facilities are accessible from the upper level which has railroad sidings and truck space. The chlorine and other chemical additive rooms and facilities are in the right wing. A pump control station and controls for chemical additives are on the main floor. Access from the Filter and Control Buildings will be through the middle door above basin when the Connecting Passage is finished.

Looking north over new sedimentation basins toward offices. Laboratories are at left, above new basins because of restricted site and existing facilities worth saving, or necessary, and offices at east over Meeting Room. The climb to reach the offices, laboratories, lunch and locker rooms will not occur as often after joining of new and modernized filters above grade and the Passage connects Chemical Building across tops of basins.



## ◀ **TOPS OF NEW FLOCCULATION BASINS**

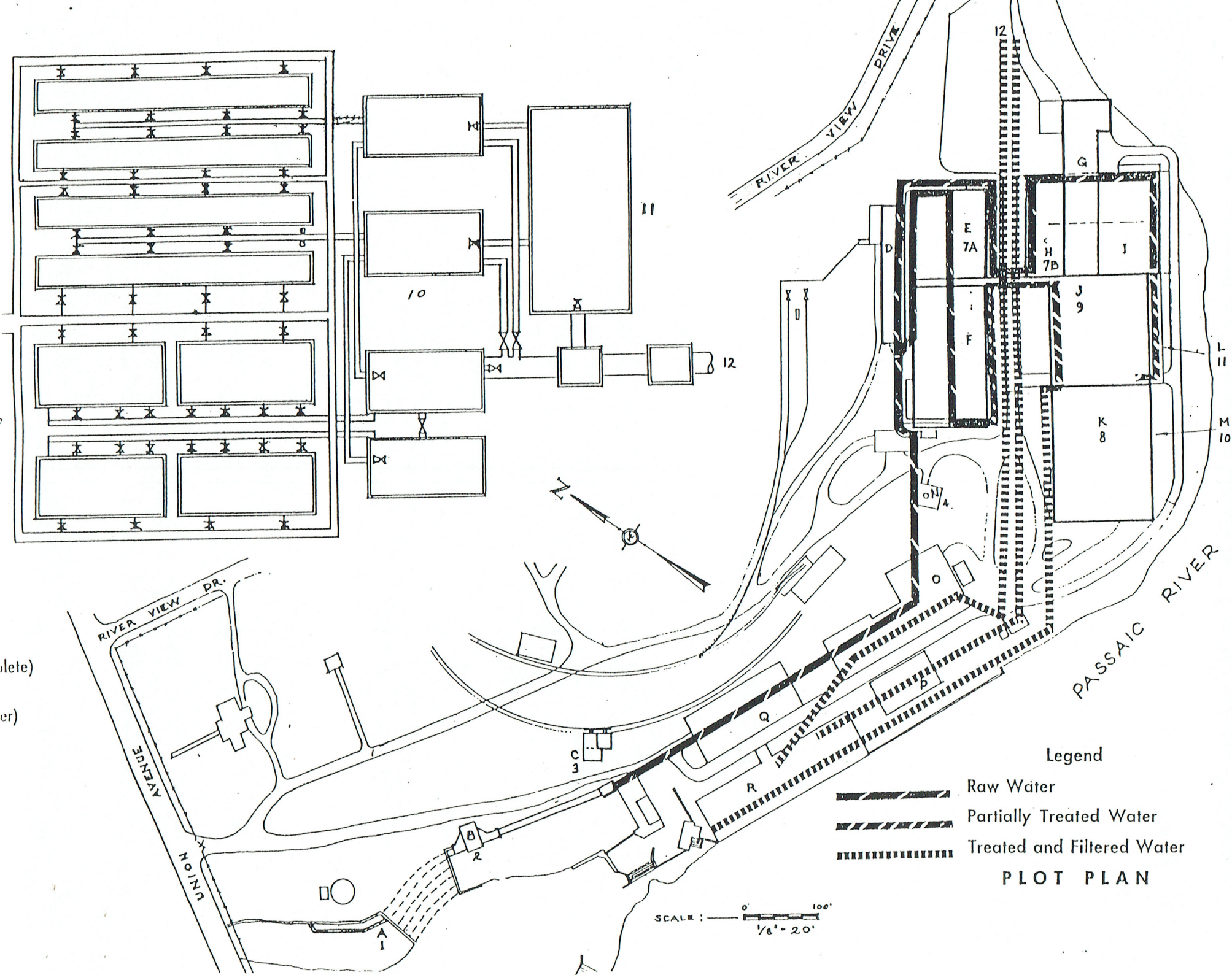
### **Towards new entrance from Connecting Passage**

The covered flocculation basins reduce the amount of chemicals needed and prevent ice formation. Chemical coagulants are agitated by machinery, part of which is seen here as walking beams. At the far left is a corner of the old uncovered sedimentation basin. In the modernization stage, this basin and adjoining ones will be reworked to produce more levels, and equipment and top cover will be added as seen in this picture and the one above. Ample artificial illumination has been provided. Beyond the 100 car parking lot is the new entrance gate from River View Avenue. A Gate House to control plant entry will be added in the next Phase.

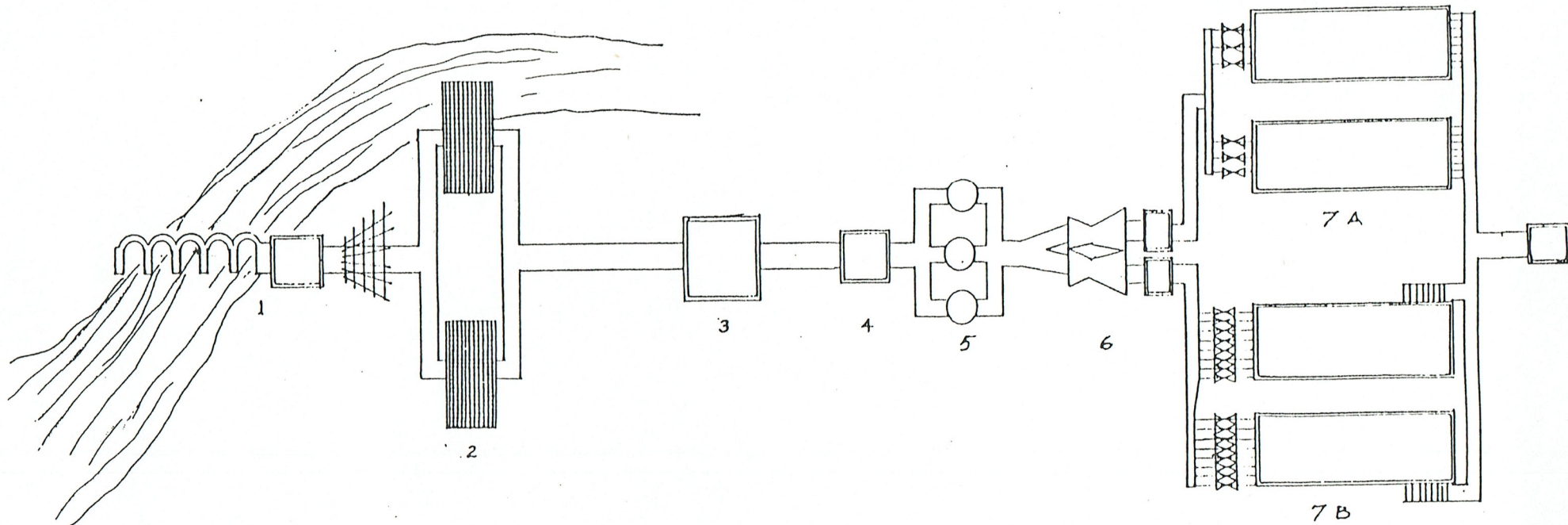
On the 4-tired sedimentation basins are motors to drive the cleansing apparatus to remove settled components, sludge, continuously. Ultimately this sludge will be used again in the process to save new chemicals.

The Meeting Room, lower floor East, is designed for instruction use as well as community affairs. The room has a lecture podium, sliding display and chalk boards, lighting with dimmers and facilities for showing pictures in a darkened space. Seating is removable to allow multi-purpose use of the space. Toilets are incorporated to permit use of the room without entering other spaces.





# Drawing of Schematic 3 Dimensional Mural in Meeting Room



## Flow Diagram Key

- 1 - Raw Water Intake
- 2 - Screen House
- 3 - Pre-Chlorination
- 5 - Low Lift Pumps and Mixers
- 6 - Parshall Flumes under Chemical Building
- 7A - Existing Flocculation and Sedimentation Basins Nos. 1 & 2
- 7B - New Flocculation and Sedimentation Basins Nos. 3 & 4
- 8 - New Filters
- 9 - Modernized Filters
- 10 - Clear Wells Nos. 2, 3, 4 and 5.
- 11 - Clear Well No. 1 (new).

## Structures Plot Plan Key

- A - Intake Structures
- B - Screen House
- C - Carbon Storage
- D - Chemical Building
- E - Existing Flocculation Basins Nos. 1 & 2
- F - Existing Sedimentation Basins Nos. 1 & 2
- G - Control Building
- H - New Flocculation Basins Nos. 3 & 4  
(Connecting Passage on top)
- I - New Sedimentation Buildings Nos. 3 & 4

- J - New Filter Building
- K - Modernized Filter Building (not complete)
- L - Clear Well No. 1 (under)
- M - Clear Wells Nos. 2, 3, 4 and 5 (under)
- N - Pre-chlorination Building
- O - Pressure Filter Building (old)
- P - Transformer Station
- Q - Boiler House (old)
- R - Pumping Station (old)

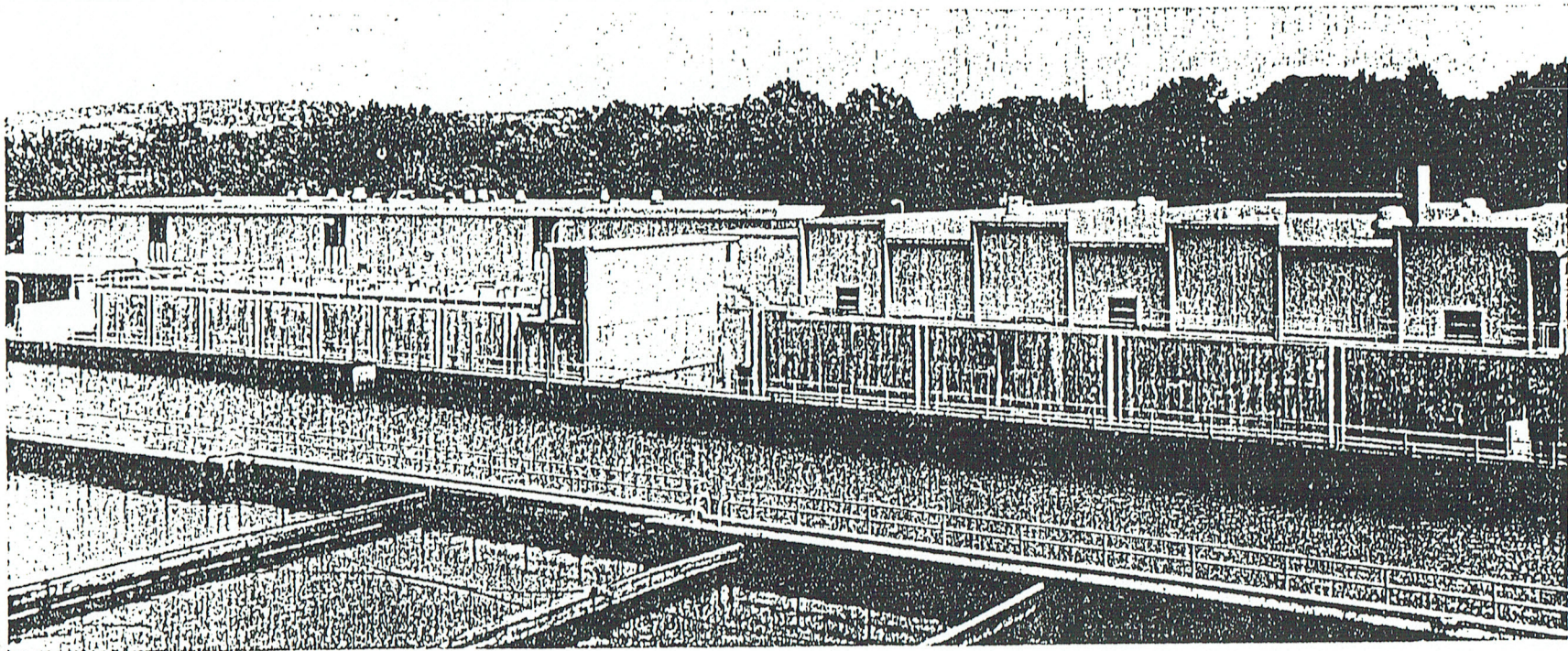


## NEW FILTER AND CONTROL BUILDINGS

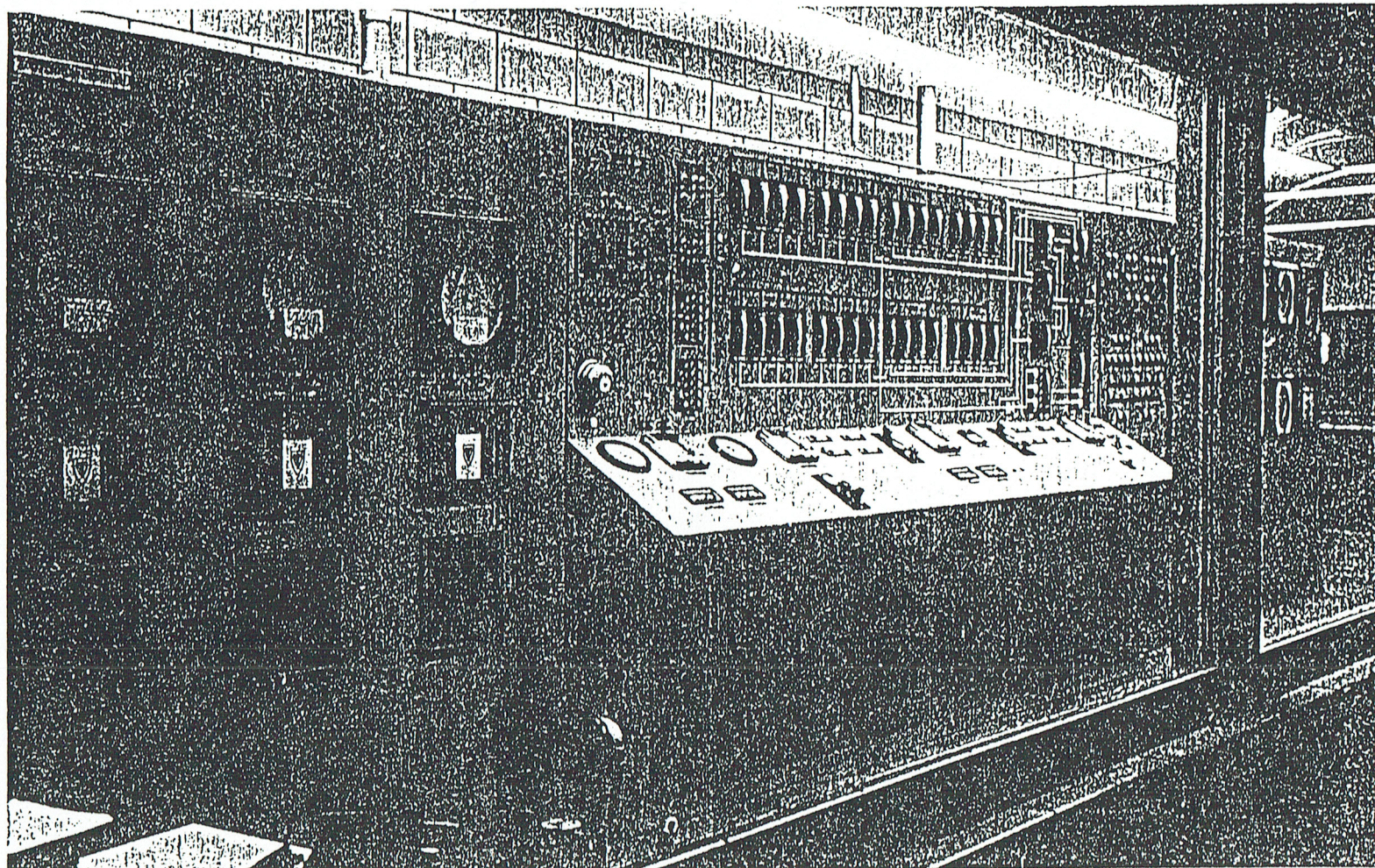
Seen from the Chemical Building over 1913 sedimentation tanks

The upset roof beam structure over the new filters joins the partially built Connecting Passage and water conduits at flocculation basin No. 4, with the laboratory and lunch room sections of the Control Building over the two new covered sedimentation basins. The offices with Meeting Room and Garage below are at the left, with the river beyond. In an effort to retain as much of the existing construction as possible, the old walls of the original coagulation basin under the new filters were left standing, and a unified exterior ornamental series of vertical roof drainage channels applied to new and old walls. Since much of the plant may be seen from slightly higher ground, particularly in the winter months, colored roofs have been used to brighten the view, and equipment has been grouped without being housed, for economy.

The ten 1918 filter units which comprised the former superstructure were demolished, making their site available for a new clear well, extension of the filters, a central control area and facilities for heating, dehumidification and air conditioning.







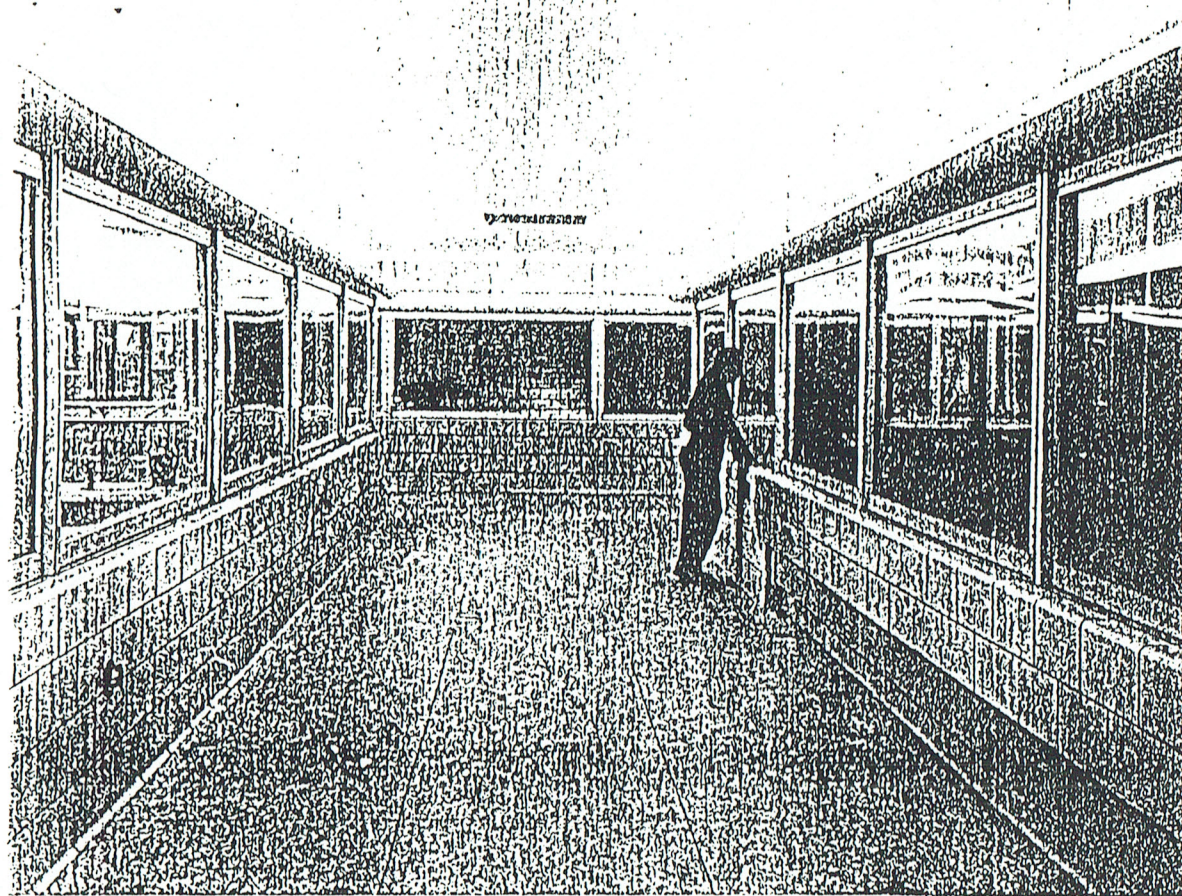
## FILTRATION CONTROL ROOM

Located on the upper floor of the New Filter Building

The control and monitoring panels for the entire filtration process are located in this primary control center, here seen from an operating gallery in the Filter Building. The many recording graph instruments may be seen at both ends. Ample file space is available for charts and reference material. The area also serves as a filter plant office. The quality of the water can be monitored through meters. Monitoring is also provided for all plant motors and dehumidification.

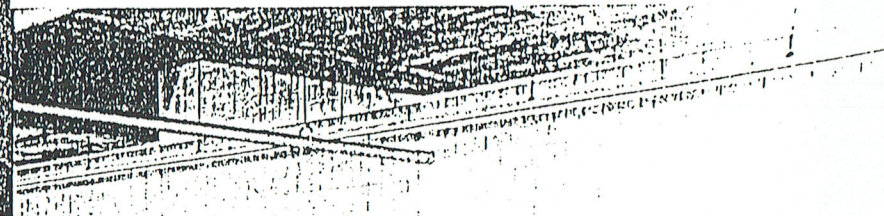
The operating galleries and rooms within the new filter building are actually buildings enveloped in a secondary, unheated superstructure. The strategic location of this control center makes actual verification of recorded conditions very easy.





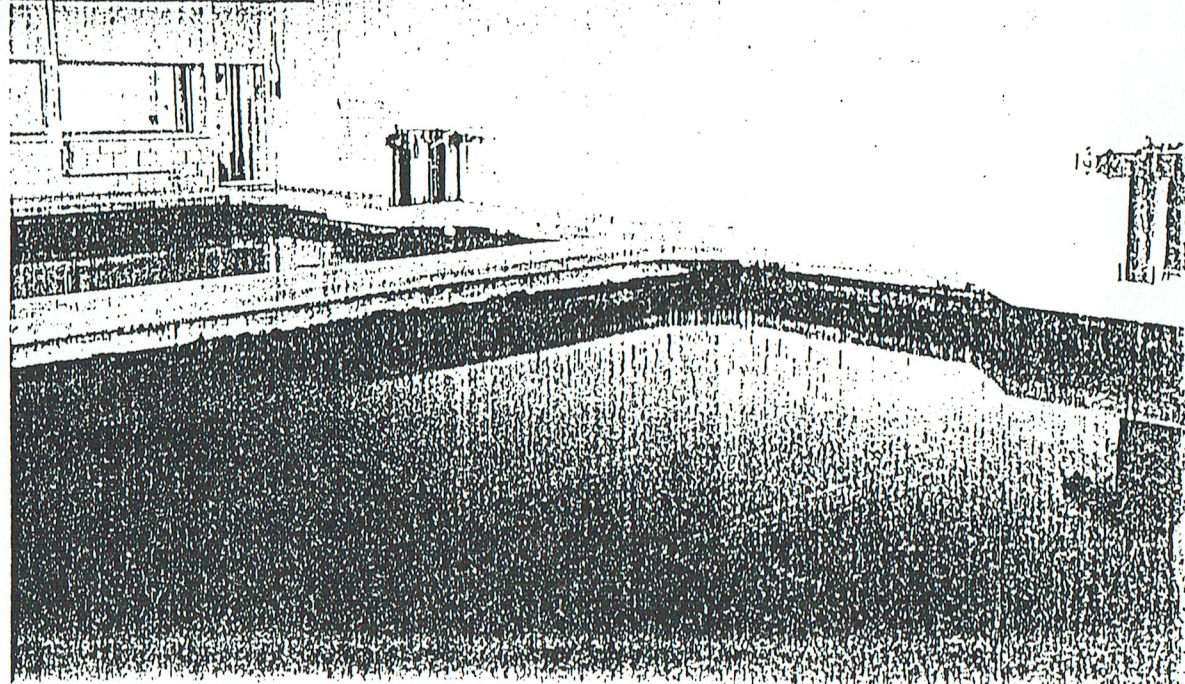
### NEW DOUBLE COMPARTMENTED FILTER

Operators can visually inspect, with the aid of various lighting patterns, both from sources in and above the water, the performance of the treatment and the filters. The filter area is unheated, but the operating galleries are heated and separated by insulating plastic windows and plastic doors. The choice of plastic is an innovation to reduce possible breakage from tools and equipment necessary in the maintenance function.

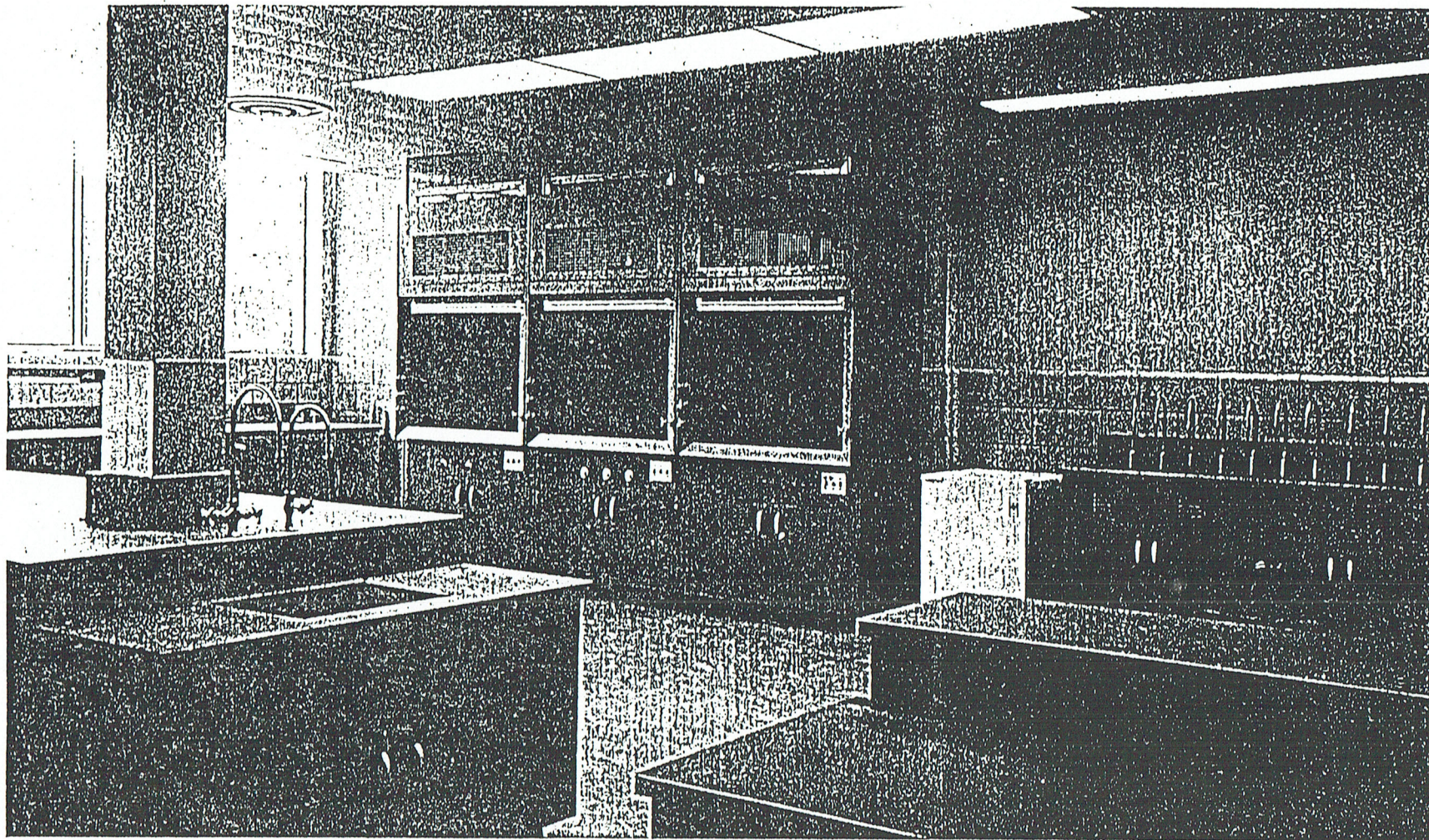


### NEW FILTER OPERATING GALLERY

The educational aspect of the new plant design is apparent in the spacious indirectly lit filter operating galleries between banks of filters. The filters, too, are brightly lit and attractively colored, making the slightest variance in process results easy to detect, and also affording the student and public visual proof of the results of physical and chemical treatment of a rather murky raw river water.



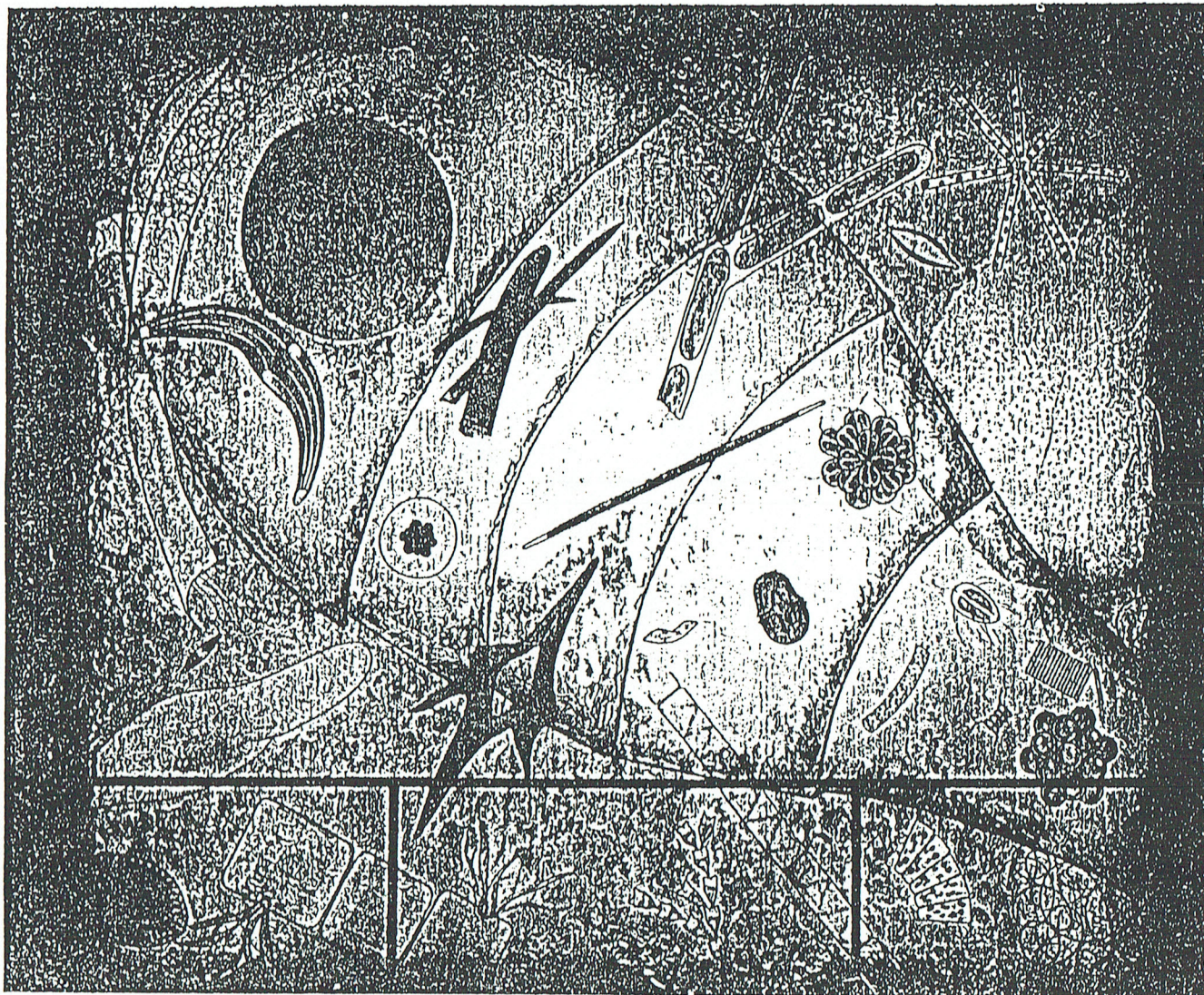




## PART OF THE LABORATORIES

Mass observation and monitoring instrumentation alone are not enough to assure meticulous scientific control of uniform ever improved finished water supply. Laboratory facilities are most necessary and useful at a filtration plant, even though some of the work accomplished may deal with watershed surveillance. The laboratories are divided into three sections, chemical, bacteriological and research to permit diverse simultaneous operations. About 2400 square feet are devoted to this important unit, including sample preparation room, storage, toilets and lockers for laboratory personnel. When Phase II construction is complete, the laboratory will be very conveniently located to practically all of the filtration and treatment plant functions without the need for going outdoors.



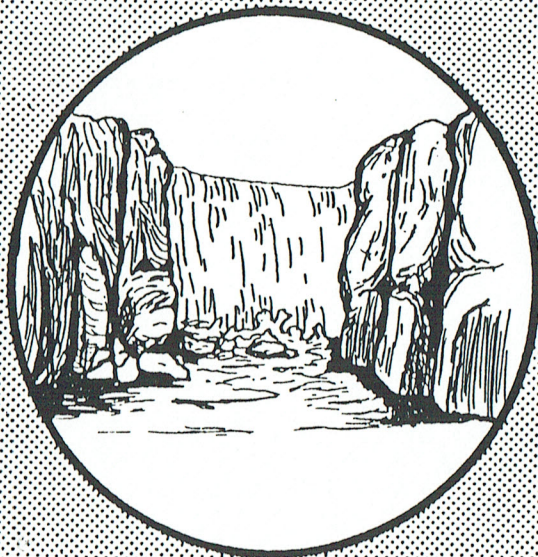
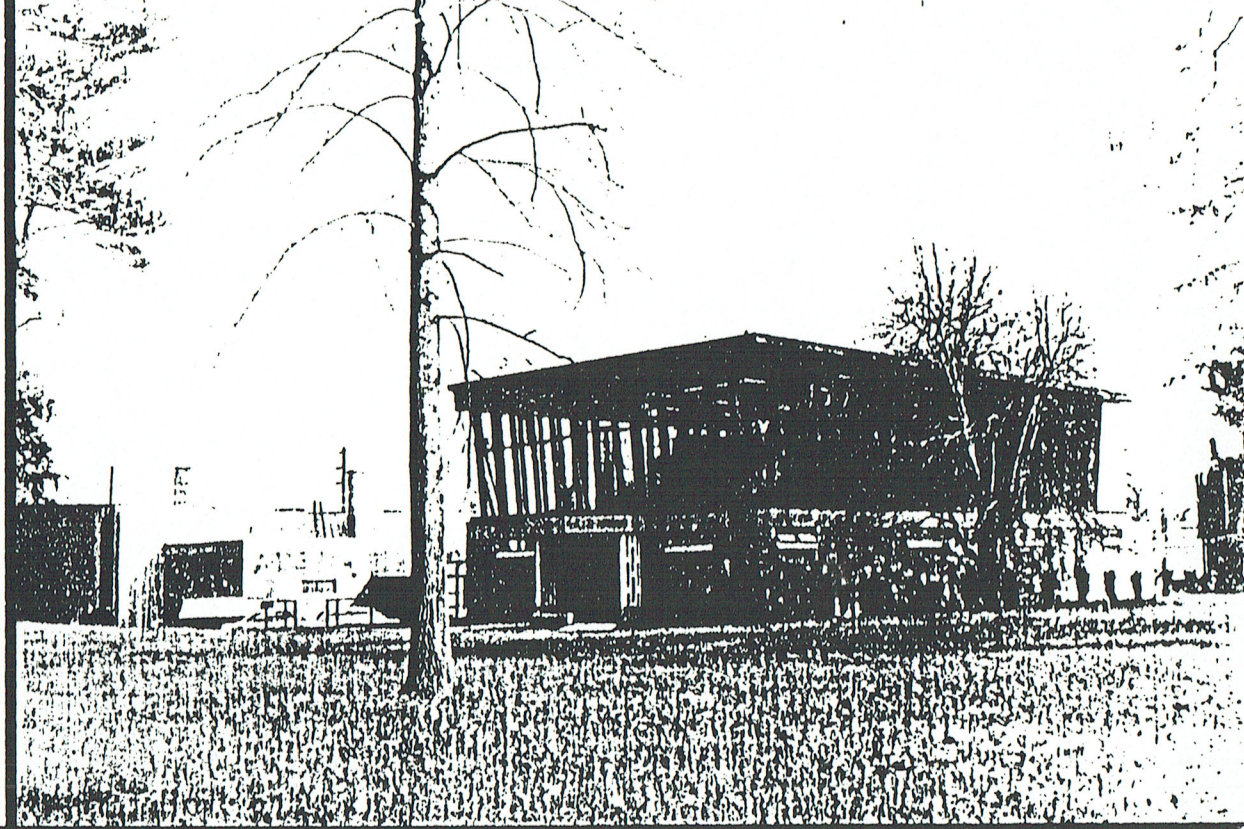


TRANSPARENT LOBBY SCULPTURE  
MARINE MICRO-ORGANISMS  
MAGNIFIED 4000 TIMES

The colored plastic and art metal transparent sculpture in the Control Building Lobby between the offices and laboratories depicts to scale some of the more common algae and microscopic organisms known to be present in the raw water. This feature was designed for educational purposes. It is anticipated that student and customer groups will visit the enlarged modernized facilities and enrich their knowledge of how clean water of high quality is produced.



PASSAIC  
VALLEY  
WATER  
COMMISSION



FILTER WASHWATER AND ALUM SLUDGE  
DISPOSAL FACILITY

DEDICATED

JANUARY 6, 1976



# MESSAGES

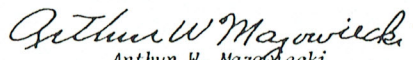
The dedication of this facility commemorates a major step by Passaic Valley Water Commission in its service to the citizens and industry of seventeen communities in northern New Jersey. This occasion also represents a prime example of the type of excellence achieved when a water utility and government agency work in close cooperation toward a common goal.

Throughout the history of the Commission, the owner cities of Paterson, Passaic, and Clifton have endeavored to provide a safe and dependable supply of potable water to citizens and industry and, at the same time, abate pollution within the Passaic River Watershed. One of the ways in which this is accomplished is to treat our own waste by means of this Washwater and Sludge Disposal Plant. Its concept and design is the result of many years work by the Commission and its consulting engineers, Havens and Emerson, Ltd.

This facility, and those that it now joins at the Commission's Little Falls treatment plant, are a national showcase both for water treatment technology and environmental protection. It is not possible to singly express our deep appreciation to the many individuals who rendered their interest, enthusiasm, and specialized skills for the successful execution of the project. We do acknowledge, however, particular appreciation to the U.S. Environmental Protection Agency and the N. J. State Department of Environmental Protection for their financial backing, the member cities for their foresight and political support, and our Consultants for their technical expertise.

We encourage the public to see and learn first hand of the continuing efforts being made by the Commission to supply potable water and reduce pollution in northern New Jersey.

Cordially,

  
Arthur W. Mazowiecki  
President, PVWC

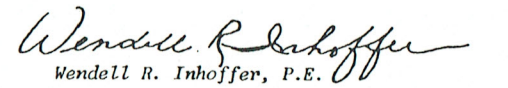
Serving nearly 600,000 persons as well as industry in northern New Jersey, Passaic Valley Water Commission supplies an average of 90 million gallons of potable water each day, deriving raw water from the Manaque Reservoir and the Passaic River.

Supplying potable water, however, is not the only function of PVWC. Although primary responsibility for pollution control lies with the N. J. State Department of Environmental Protection, the Commission itself, with its unique interest in keeping the Passaic River clean, has been very active in restraining industrial and municipal waste discharges upstream of its treatment plant at Little Falls.

The facility described in this brochure is further representative of the Commission's efforts to reduce pollution. Tons of spent chemicals required at the Little Falls plant to treat polluted water, together with the contaminants they removed, were previously discharged back into the Passaic River. This new facility, only the second comprehensive filter washwater and alum sludge disposal scheme in the country, is a treatment system specifically designed to reduce these discharges to zero in accordance with Federal Standards prescribed by Public Law 92-500.

Clean water and pollution control require careful planning, advanced and innovative technology, and an active interest in the welfare of people. PVWC has been a leader in all of these areas for almost 50 years. We intend to keep it this way.

Sincerely,

  
Wendell R. Inhoff, P.E.  
General Superintendent and Chief Engineer



PASSAIC VALLEY WATER COMMISSION

# FILTER WASHWATER & ALUM SLUDGE DISPOSAL FACILITY

1975

## COMMISSIONERS

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SANFORD KADE, PATRON  
VICE PRESIDENT

ANTHONY PASQUARELLI, PATRON

NICHOLAS DE LUCCIA, JR., PATRON

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BERNARD W. HAYDEN, PATRON

LOUIS C. FREDA

PATRON

THEODORE W. KENNEDY, PATRON

WENDELL R. INHOFFER

GENERAL SUPERINTENDENT & CHIEF ENGINEER

JEAN E. FIVEHOUSE  
SECRETARY

NEWTON W. ROEMER  
COUNSEL & GENERAL ATTORNEY

HAVENS & EMERSON LTD.  
CONSULTING ENGINEERS

KEANE CONSTRUCTION CO., INC.  
GENERAL CONTRACTOR



# FILTER WASHWATER AND ALUM SLUDGE DISPOSAL FACILITY

*The Commission facilities at Little Falls consist of three parallel treatment plants; the original 1902 gravity filters treating water from the Passaic River having a capacity of some 39 million gallons a day (mgd) at nominal filter rates; the new gravity filters also treating Passaic River water rated at 36 mgd and finally, a pressure filtration system treating water obtained from an upland water source, the Wanaque Reservoir, having a capacity of 40 mgd. The filter washwater from all three systems together with the sludge from the sedimentation basins of both gravity filter plants were previously discharged into the Passaic River.*

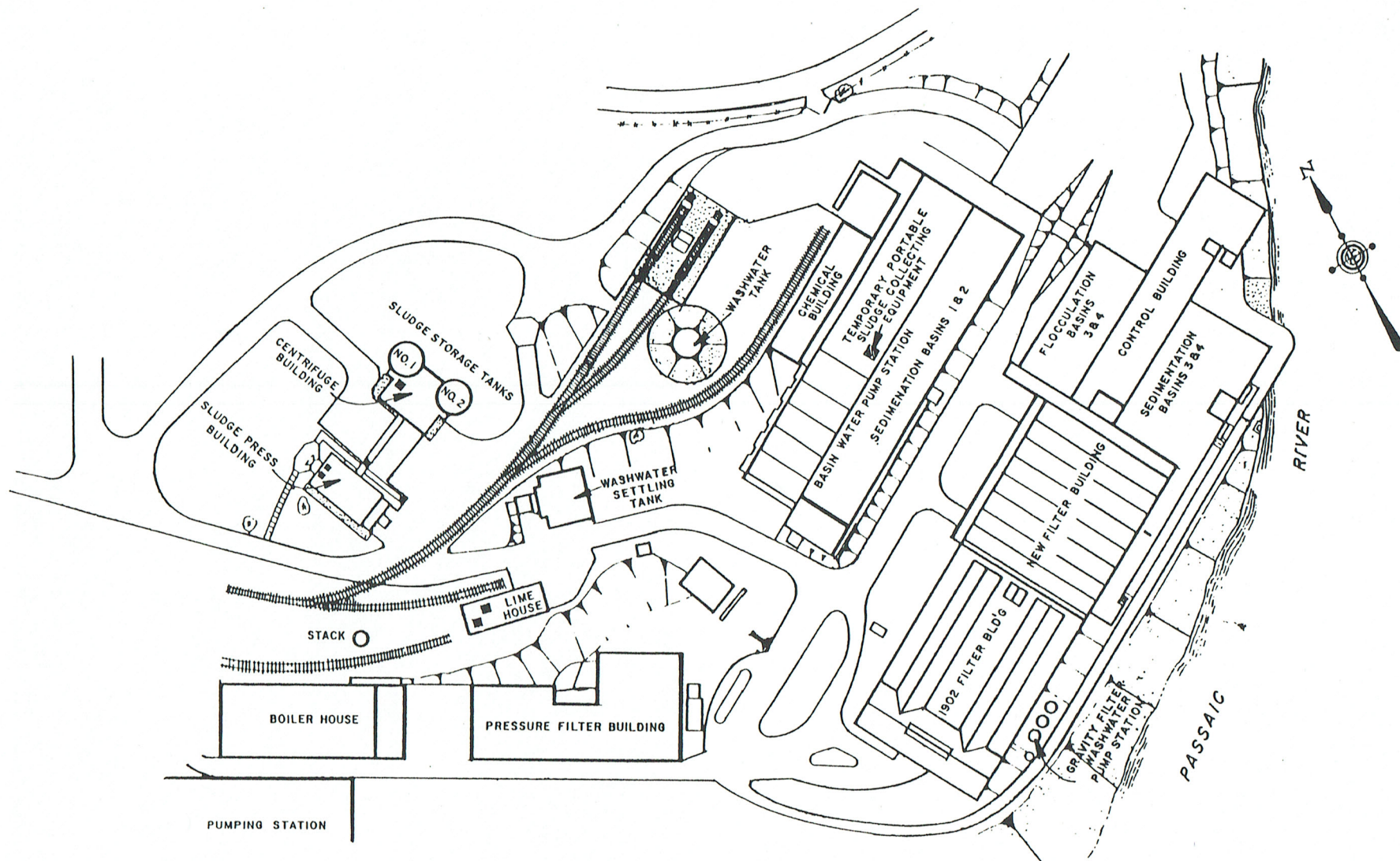
*The comprehensive filter washwater and alum sludge disposal facility is an innovative treatment project comprising four pump stations, a chemical dosing system, a washwater settling tank and a sludge thickening complex and sludge press building. Sludge is*

*withdrawn from four sedimentation basins and pumped to a sludge thickening complex. Washwater from the gravity filters and the pressure filters is pumped to a washwater settling tank from which the settled solids will be pumped to the sludge thickening complex, clear supernatant being returned to the plant inlet. The thickened sludge will be pumped to a sludge press building, and the filtrate discharged eventually to a new public sewer system. The latter system is not presently available; instead, however, the filtrate is treated and returned to the head of the plant. The sludge cakes are taken by truck to landfill areas on Commission-owned property.*

*With the completion of the facility, Passaic Valley Water Commission has met the 1985 zero discharge requirements established by the Federal Water Pollution Control Act Amendments of 1972 (PL 92-500).*

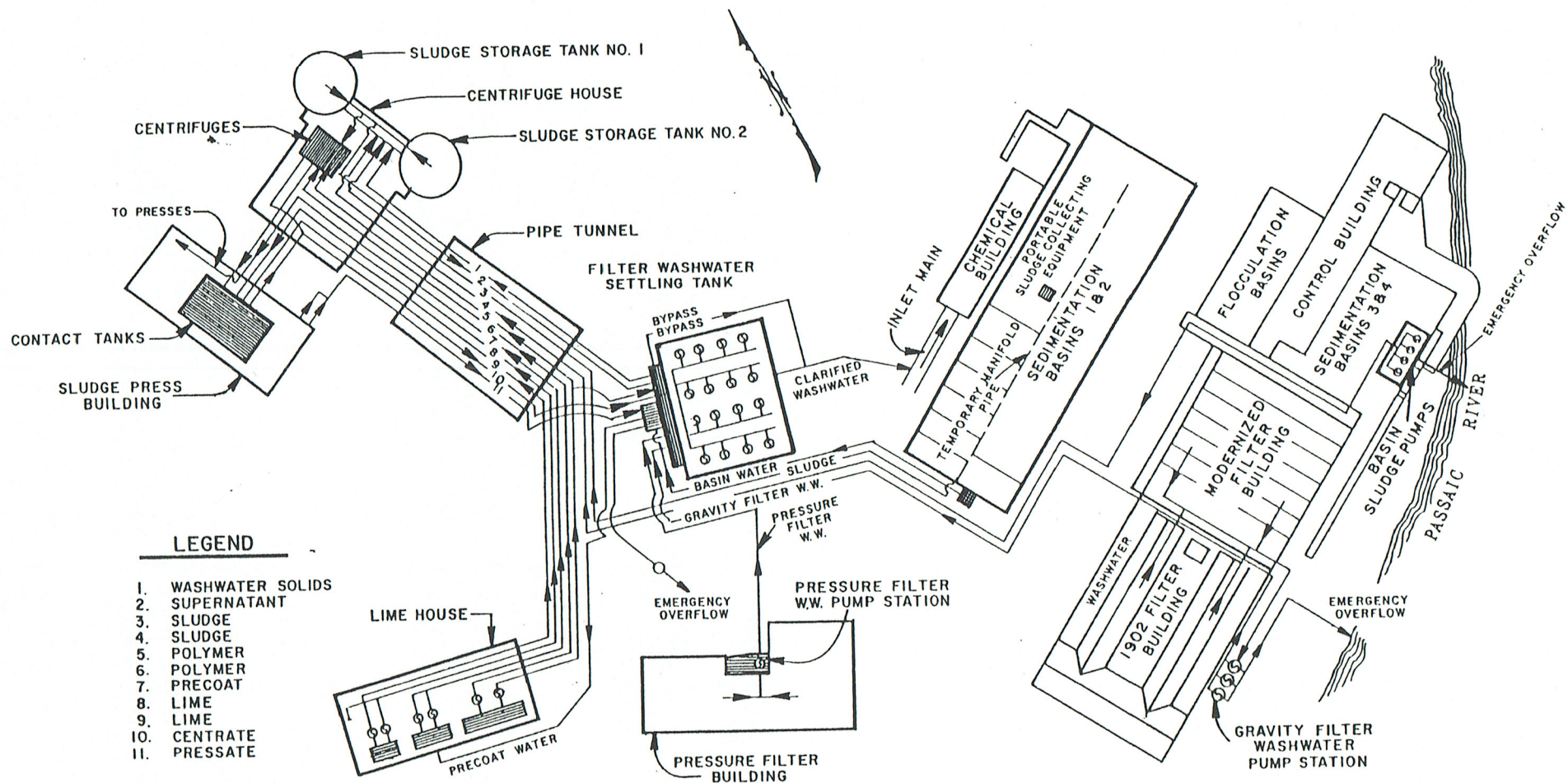
## GENERAL DESCRIPTION





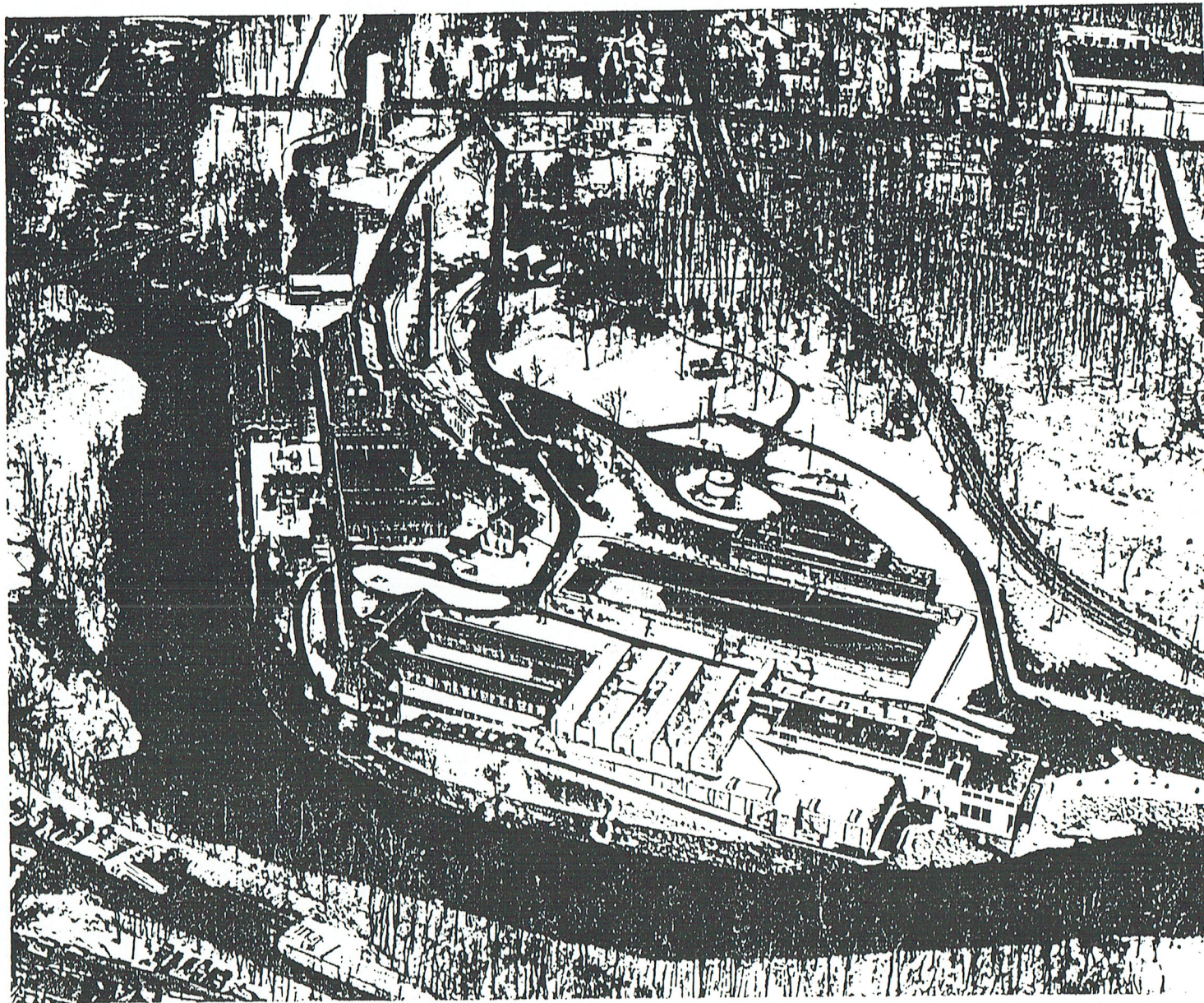
SITE LAYOUT





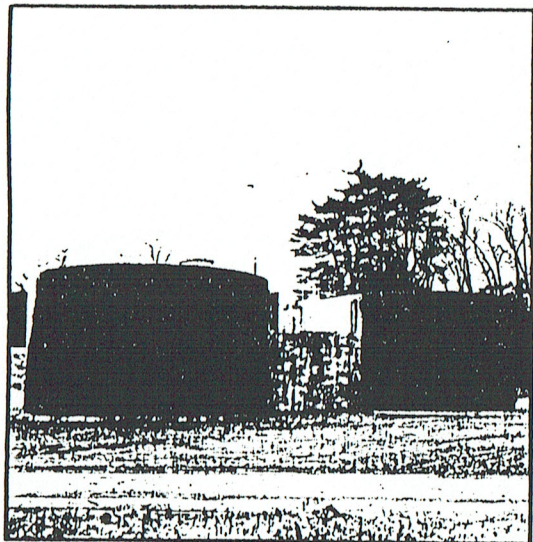
PLANT SCHEMATIC





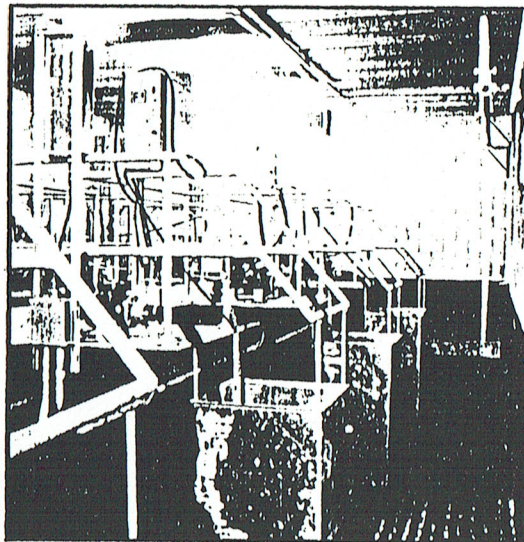
*The new Filter Washwater and Alum Sludge Disposal Facility is an innovative addition to Passaic Valley Water Commission's Treatment Plant in Totowa, New Jersey. The Treatment Plant, shown in the aerial photograph above, is renowned for the progressive technology it utilizes in treating raw water from the Passaic River and producing a potable water supply for PVWC customers. The new sludge disposal facility is not shown in the aerial photograph.*





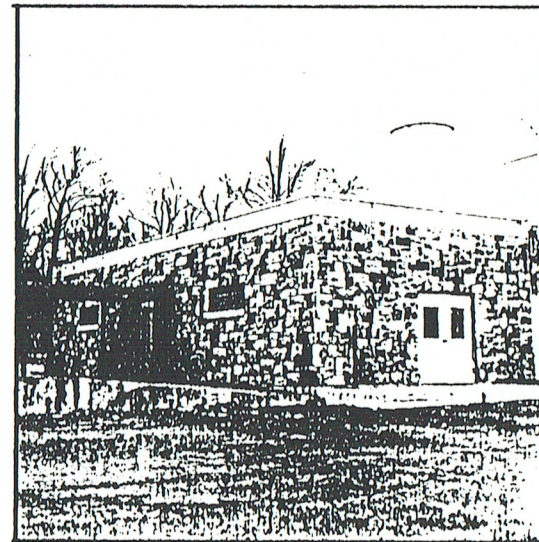
1

SLUDGE STORAGE TANKS



2

WASHWATER SETTLING TANK



3

CENTRIFUGE BUILDING

Four positive displacement sludge pumps in the collecting chamber of tiered sedimentation basins No. 3 and 4 withdraw sludge on a timed cycle basis from each of the two levels of the two sedimentation basins. The sludge is pumped via a six inch diameter cast iron pipe, from the gravity filter area to the sludge storage tanks (1).

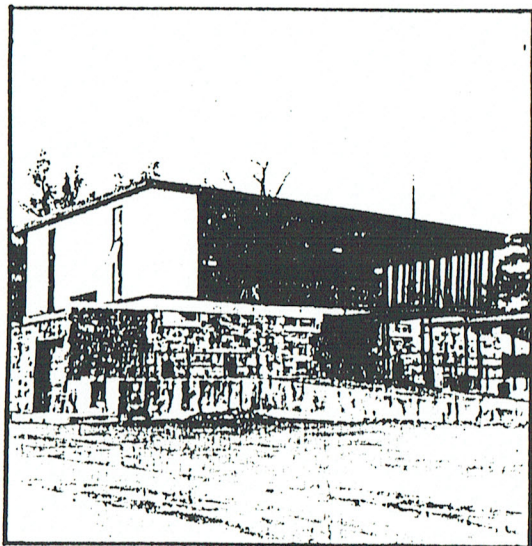
As a temporary measure, despite the difficulties of removing sludge from the 1902 sedimentation basins in their present design, a temporary pump and pipe system is provided to pump the sludge to the storage tanks until such time as reconstruction of these basins is completed.

Washwater is piped from the 1902 gravity filters and the new gravity filters into a common pumping station and thence pumped through a new 18-inch diameter pipe to the washwater settling tank (2). Pressure filter system washwater is pumped to the washwater settling tank.

Polyelectrolyte is added to the sludge, which is thickened using centrifuges in the sludge thickening complex (3), prior to pumping to the sludge press building (4) in which two presses are located.

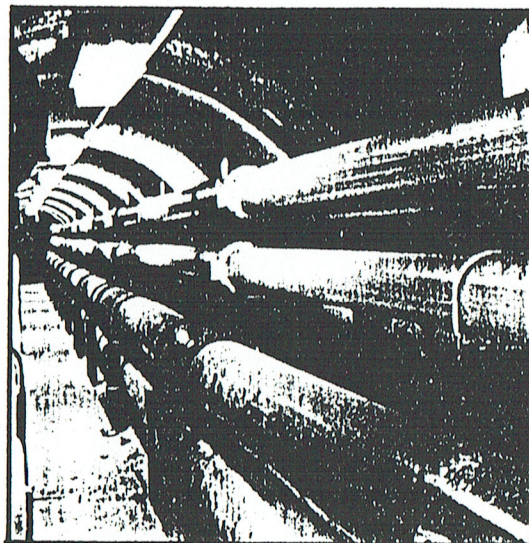
The sludge thickening complex and the press building are located immediately to the north of the existing





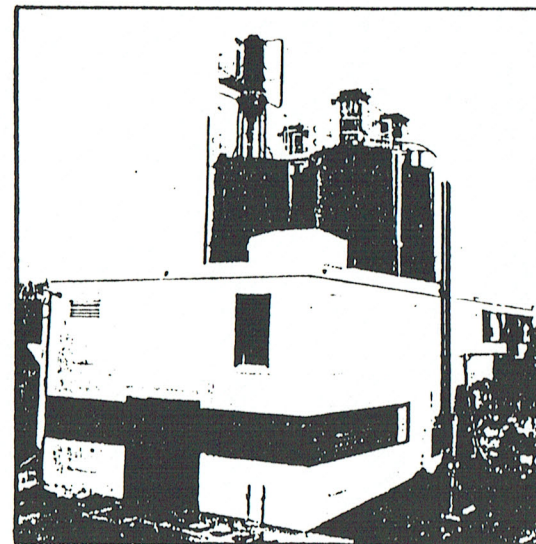
4

PRESS BUILDING



5

PIPE TUNNEL



6

LIME HOUSE

filtration plant on Commission-owned property. All pipes bringing sludge or chemical feed to this part of the system pass through a single precast concrete pipe culvert (5). Overflows are provided at all locations in case of emergency.

The sludge press is an advanced design incorporating improvements resulting from several years operating experience of similar machines. Precoating and charging the press with sludge, plus hydraulic opening and closing, are completely automated, as is the discharge of filter cake at the completion of the pressing cycle. The control console features instrumentation to record cycle pressures, cycle times, and rate of flow of the filtrate so that any cycle

can be analyzed in detail at a later date. This, coupled with periodic analysis of the filter cake will permit continuous adjustments to maintain the optimum operational conditions to suit the anticipated variations in the sludge. The console also includes an alarm system connected to the main control room of the filtration plant in case of emergency.

All chemicals required for the sludge disposal facilities are stored, mixed and pumped in an existing structure (6) which for many years was used to manufacture alum on-site. Provision is made for lime addition, precoat material and polyelectrolyte.



# MANUFACTURERS / SUPPLIERS

Passavant Corporation . . . . . Sludge filter press, cake conveyor, and feed pumps; snubbers  
 Wallace and Tiernan . . . . . Distribution water meters, polymer feeder and mixing tanks, lime slurry tanks and mixers, lime feeders and slakers, control system and valves  
 Dorr-Oliver . . . . . Sludge centrifuges, rotary strainers, sludge transfer pumps, degritting equipment  
 Ingersoll-Rand . . . . . Basin water centrifugal pump, washwater vertical turbine pump  
 Pacific Pumping Co. . . . . Washwater centrifugal pumps and controller  
 Peabody Barnes . . . . . Wastewater submersible pumps, sludge collecting equipment  
 Shick Tube-Veyor . . . . . Chemical storage and unloading equipment, control system, storage bins, pneumatic rail unload system, bin level indication, precoat unload system, truck inlet panel and valves  
 Vibra-Screw Inc. . . . . Precoat rotary feeder, bin activators  
 Worthington Pumps . . . . . Water seal system, air compressors  
 Link-Belt . . . . . Precoat screw conveyor  
 Gould Pumps . . . . . Precoat transfer pumps  
 Interpace Corp. . . . . Precast concrete pipe  
 Fisher Tank Co. . . . . Sludge Storage Tanks

BIF . . . . . Metering equipment, lime slurry feeders, polymer transfer pumps, polymer feed pumps  
 Square D . . . . . Double-ended load center unit substation, motor control centers, remote motor starters  
 Trane . . . . . Unit heaters, air handling units, cabinet heaters  
 Komline-Sanderson . . . . . Sludge pumps, positive displacement  
 Enpo-Cornell . . . . . Submersible sump pumps  
 Neptune Micro-Floc . . . . . Sludge settling equipment  
 Roots-Dresser . . . . . Air blower equipment  
 Fisher & Porter . . . . . Magnetic flow meters  
 Moyno Pump . . . . . Sludge feed pumps  
 Consolidated Electric . . . . . Float Switches  
 Flex-Kleen . . . . . Dust collectors  
 WEMCO . . . . . Lime slurry pumps  
 Aurora . . . . . Water seal system  
 LeRoi-Dresser . . . . . Compressed air system  
 Chester Hoist . . . . . Monorail equipment  
 Cleaver Brooks . . . . . Packaged boiler  
 Federal Pump . . . . . Condensate return pump  
 Patterson-Kelly . . . . . Hot water heater  
 Remington-Singer . . . . . Air conditioner  
 Minnesota Honeywell . . . . . Heater unit control system  
 Valve & Primer . . . . . Air/vacuum relief valves  
 Kennedy Valve . . . . . Gate valves  
 Hammond Valve . . . . . Gate valves  
 DeZurik . . . . . Plug valves  
 Henry Pratt . . . . . Butterfly valves  
 Nibco Scott . . . . . Valves  
 Red Valve Co. . . . . Pinch valves



# STATISTICS

## STATISTICS FOR BASIS OF DESIGN<sup>a</sup>

Process	Average Conditions	Maximum Sludge Conditions
<u>Water Filtration Plant</u>		
<u>Manaque Backwashing:</u>		
Design Capacity	40 mgd	40 mgd
Washwater Daily	516,000 gal	516,000 gal
Suspended Solids	56 mg/l	56 mg/l
Weight of Solids	242 lbs	242 lbs
<u>1902 Gravity Filters:</u>		
Design Capacity	39.0 mgd	39.0 mgd
Washwater Daily	462,000 gal	462,000 gal
Suspended Solids	195 mg/l	195 mg/l
Weight of Solids	750 lbs	750 lbs
<u>New Gravity Filters:</u>		
Design Capacity	36.0 mgd	36.0 mgd
Washwater Daily	426,000 gal	426,000 gal
Suspended Solids	195 mg/l	195 mg/l
Weight of Solids	692 lbs	692 lbs
<u>Basins 1 &amp; 2: (1902 Gravity Filters)</u>		
Solids	325/mg	650/mg
Wt. of solids	12,675 lbs	25,350 lbs
Concentration	1.0%	1.0%
Volume of Sludge	152,000 gal	304,000 gal
<u>Basins 3 &amp; 4 (New Gravity Filters)</u>		
Solids	325/mg	650/mg
Wt. of solids	11,700 lbs	23,400 lbs
Concentration	1.0%	1.0%
Volume of Sludge	140,000 gal	280,000 gal
<u>Total Sludge for Disposal</u>		
(@ 1% concentration)	316,200 gal	595,000 gal
<u>Sludge Disposal Plant</u>		
Centrifuge input @ 2%	158,100 gal	297,000 gal
Centrifuge output @ 5%	63,240 gal	119,000 gal
<u>Sludge Press</u>		
Total Solids	26,059 lbs	50,434 lbs
+15% Lime	3,910 lbs	7,560 lbs
+Precoat (7.5 lbs/100 sq ft)	1,890 lbs	3,620 lbs
Total Dry Solids	31,859 lbs	61,614 lbs
Total Wt. at 68.4% H <sub>2</sub> O	101,000 lbs	195,000 lbs
Total Wt. of Cake	50.5 tons	97.5
<u>Press Design (Based on cake density of</u>		
75#/cu ft & @ 2-1/2 hr. cycle)		
Vol. of Cake/day	1,350 cu ft	2,600 cu ft
Vol. of each press	220 cu ft	220 cu ft
No. of cycles/day	3.1	5.9
Total Pressing Time	7.8 hr	14.8 hr

<sup>a</sup>Based on a 7 day week

## SERVICE AREA OF PASSAIC VALLEY WATER COMMISSION

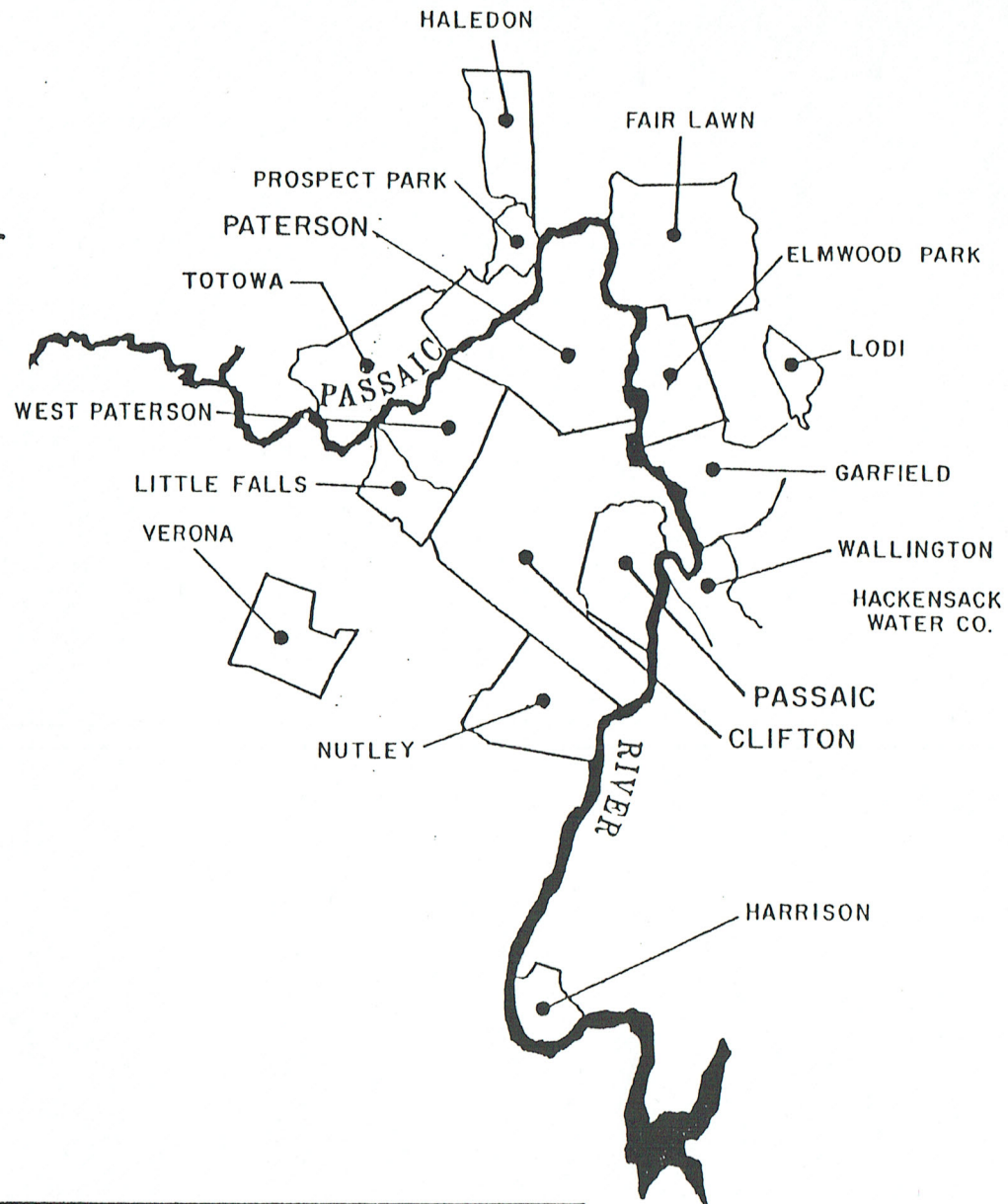
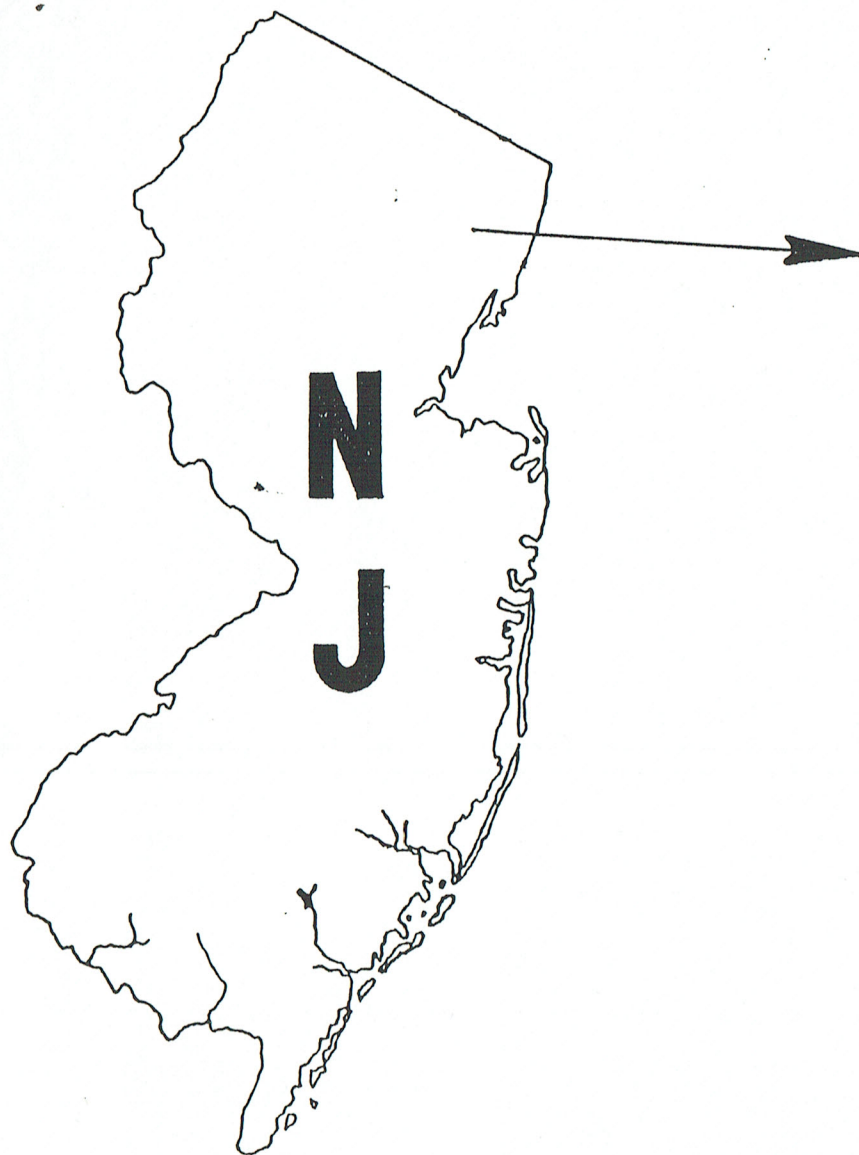
### IN SQUARE MILES AND POPULATION

(SEPTEMBER 1975)

OWNER CITIES	SQUARE MILES	POPULATION (1970 Census)
Paterson	8.49	144,824
Passaic	3.34	55,124
Clifton	11.67	87,437
Totals	23.50	202,385
<u>OUTSIDE 100%</u>		
Prospect Park	0.46	5,176
Little Falls	2.84	11,727
West Paterson	2.96	11,692
Elmwood Park	2.71	20,511
Harrison	1.00	11,811
Nutley	3.00	31,913
Totowa	4.04	11,580
Verona	2.98	15,067
First Republic	----	-----
Totals	19.99	119,477
<u>OUTSIDE PARTIAL SUPPLY</u>		
Garfield	2.22	30,797
Lodi	2.29	25,163
Fair Lawn	5.33	37,975
Wallington	1.98	10,284
Hackensack Water Co.	----	10,000 <sup>a</sup>
Haledon	1.26	6,767
Totals	13.08	120,986
<u>FUTURE CUSTOMER</u>		
North Arlington	2.52	18,036
<u>GRAND TOTALS</u>		
	56.57 sq. miles	540,944
	2.52 (future)	

<sup>a</sup>Estimated





COMMUNITIES SERVED  
PASSAIC VALLEY WATER COMMISSION